Fargher Lake Grocery Groundwater Monitoring Results, April and July 2019: Data Summary Report

Environmental Assessment Program
Publication Number: 21-03-006
Authored by: Jacob D. Carnes

Abstract

Fargher Lake Grocery is a gasoline station and convenience store near Yacolt, Washington, in the foothills of the Cascade Mountains. In 1987, the domestic water supply well for the store was found to be contaminated with petroleum products. Site investigations indicated that the source of the contamination was one or more leaking underground storage tanks.

Between 1989 and 1993, the Washington State Department of Ecology (Ecology) removed six tanks and excavated nearly 600 tons of gasoline-contaminated soil. Groundwater samples collected in 1992 and 1993 documented petroleum contamination of groundwater in excess of Model Toxics Control Act (MTCA) Method A cleanup levels. The total extent of the contaminant plume or the direction of groundwater flow was not characterized during the work conducted in the late 1980s and early 1990s. Groundwater monitoring and cleanup activity at the site has been limited since the mid-1990s.

In 2019, Ecology sampled two wells at Fargher Lake Grocery. Sample results from a monitoring well located in the backfilled excavated area indicate that benzene is still present in excess of MTCA Method A cleanup levels. A sample from a domestic well completed around a depth of 300 feet did not have detectable levels of BTEX compounds, petroleum hydrocarbons, or lead.

Publication Information

This report is available on the Department of Ecology's website at:
https://apps.ecology.wa.gov/publications/SummaryPages/2103006.html.

Data for this project are available in Ecology's EIM Database. Study ID: FS1045.

The Activity Tracker Code for this study is 18-006.

Suggested Citation:
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The Water Resource Inventory Area (WRIA) for the study area is 27.

Contact Information

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Olympia, WA 98504-7600
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This report was prepared under the supervision of a licensed hydrogeologist. A signed and stamped copy of the report is available upon request.

Washington State Department of Ecology – https://ecology.wa.gov

- Headquarters, Olympia 360-407-6000
- Northwest Regional Office, Bellevue 425-649-7000
- Southwest Regional Office, Olympia 360-407-6300
- Central Regional Office, Union Gap 509-575-2490
- Eastern Regional Office, Spokane 509-329-3400

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Background

Fargher Lake Grocery is a gasoline station and convenience store near Yacolt, Washington, located at the intersection of NW Fargher Lake Hwy (SR 503) and NE 156th Ave. (Figure 1). The site is in the foothills of the Cascade Mountains at an approximate elevation of 660 feet above mean sea level. Fargher Lake Grocery is adjacent to Rock Creek, which flows south to the East Fork of the Lewis River (WRIA 27).

The Lewis River Watershed stretches from the western flank of the Cascade Mountains to the Columbia River. The watershed consists of the Lewis River proper and many tributary creeks and streams.

The annual precipitation in the watershed ranges from 40 inches to over 150 inches per year. Most of the precipitation occurs during the winter months. (Ecology, 2016).

Site deposits are characteristic of glacial till and consist of unstratified clay, silt, sand, gravel, cobbles, and boulders. These glacial till and outwash deposits appear to extend to a depth of about 100 feet below ground surface (bgs). Site soil borings advanced to about 30 feet revealed deposits composed primarily of sandy silt with some gravel. A clayey silt and sand layer that averaged about eight feet in thickness was encountered at 15 feet bgs. Groundwater was encountered at about 13 feet bgs, perched in an overlying gravelly clay layer (Ecology & Environment, 1992).

In 1987, the domestic water supply well for the store was found to be contaminated with petroleum products. The source of the contamination was thought to be a spill that originated from a faulty coupling on a leaded gasoline retail pump. Later investigations indicated that one or more of the underground storage tanks were leaking.

In November 1989, Ecology had six tanks removed and nearly 300 tons of gasoline-contaminated soil were excavated and sent for treatment and disposal (Figure 1). Riedel Environment (1990) collected soil samples from the excavation following the tank removal. Results from that sampling indicated the presence of residual soil contamination not meeting (exceeding) MTCA Method A cleanup levels (CULs). The CULs are intended to protect human health and the environment.

The remedial investigation completed by Ecology & Environment (1992) confirmed the presence of contaminated soil east and north of the 1989 excavation site. During June and October of 1991, Ecology & Environment sampled three domestic wells and one monitoring well for this remedial investigation. Those sampling efforts failed to assess the full extent of contamination. A sample from the Fargher Lake Grocery domestic well (DW-1) exceeded the MTCA Method A CULs for BTEX compounds and gasoline in both sampling events.

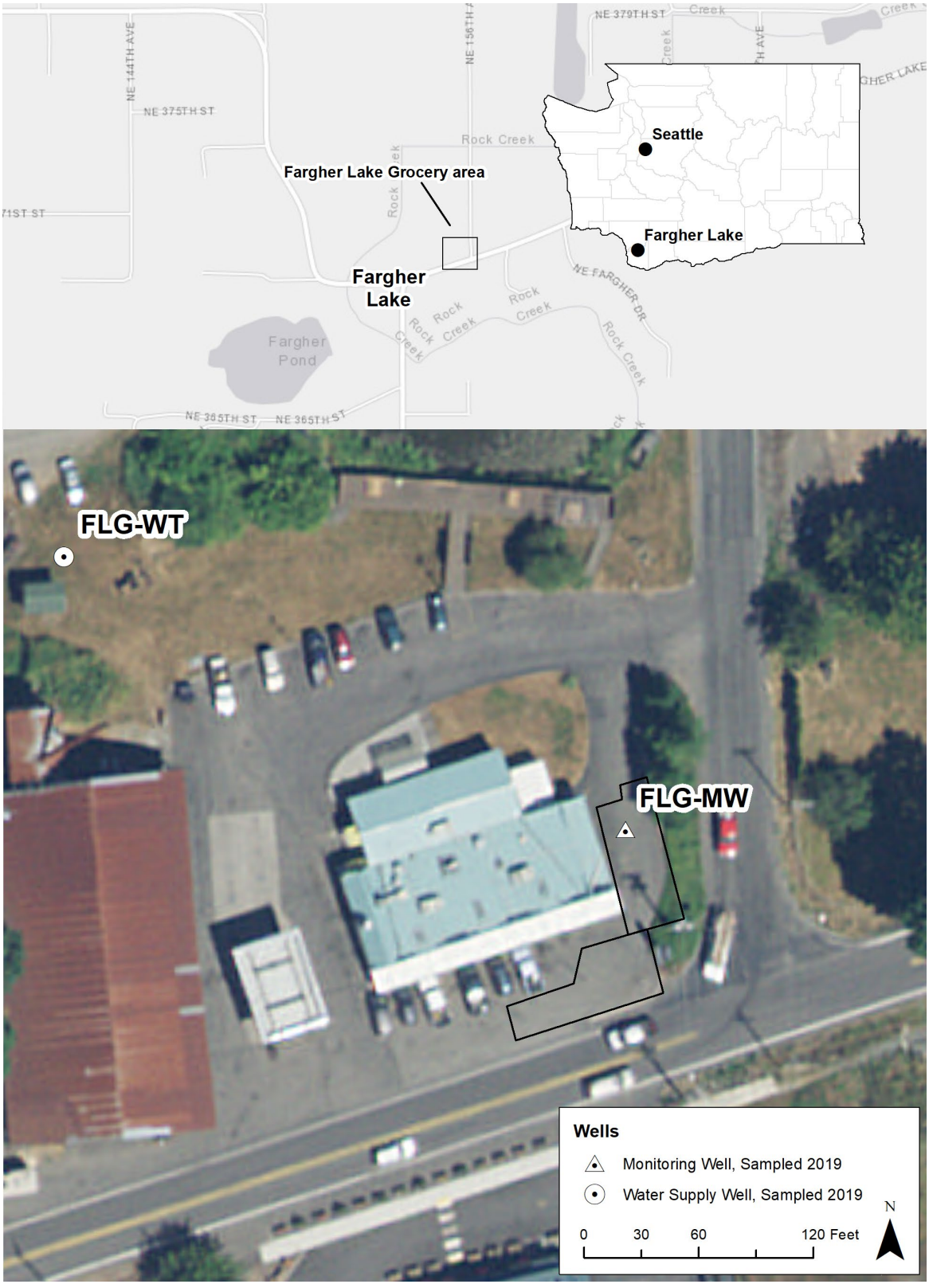


Figure 1. Location of Fargher Lake Grocery and wells sampled in 2019.

In March 1993, Ecology implemented a cleanup action plan to remove additional petroleum-contaminated soils and address contaminated groundwater. About 293 additional tons of soil was excavated, but due to structural confinements, not all of the contaminated soil could be removed from the site. The drinking water well (DW-1) serving Fargher Lake Grocery and a monitoring well (MW-1) north of the site were properly abandoned. A monitoring well (FLG-MW) was installed in the backfilled, excavated area.

Groundwater samples collected from FLG-MW had gasoline-range petroleum hydrocarbons exceeding their respective CULs (Enviros, 1993). Concentrations were reported as 7,100 µg/L TPH-G, 900 µg/L benzene, 640 µg/L toluene, 110 µg/L ethylbenzene, and 1,100 µg/L total xylene. The total extent of the contaminant plume or the direction of groundwater flow was not characterized. Activity at the site has been limited since the mid-1990s.

Methods and Results

In preparation for groundwater sampling at the Fargher Lake Grocery site, Ecology performed preliminary field work in the spring of 2018. Because monitoring well FLG-MW sat dormant for a long period of time, Ecology re-developed the well by surging and pumping.

In April 2019, Ecology sampled groundwater from the monitoring well (FLG-MW). The tap closest to the domestic water supply well (FLG-WT) was not functioning; therefore, a sample was grabbed from a faucet on the west end of the Fargher Lake Grocery building facing the fuel island. Because diesel and lead were detected at concentrations near their respective reporting limits from the domestic well, Ecology returned in July 2019 to resample the well.

The wells were sampled in accordance with the site-specific Quality Assurance Project Plan (Marti, 2019) and applicable standard operating procedures (SOPs). The field crew followed Ecology's SOPs EAP052 (Marti, 2016a) and EAP078 (Marti, 2016b) when sampling the monitoring well, and SOP EAP077 (Marti, 2016c) when sampling the water supply well.

Ecology sampled the monitoring well with a peristaltic pump using industry-standard, low-flow sampling techniques. The well was purged at a rate of 0.5-liter/minute or less. The pump tubing intake was placed at the mid-well screen. Prior to sampling, the well was purged through a continuous flow cell until field parameters (pH, temperature, specific conductance, dissolved oxygen, and oxidation reduction potential) stabilized as specified in SOP EAP078 (Marti, 2016b).

In July 2019, the domestic supply well was sampled at the tap closest to the wellhead. Upon arriving at the site, the well was in use and the well pump was operating. The tap configuration could not accommodate the flow cell for field parameter measurements. Since the well was in use, the tap line was purged for 15 minutes prior to sampling.

Samples were collected in clean laboratory-supplied bottles and submitted for analysis of benzene, toluene, ethylbenzene, and xylene (BTEX), total petroleum hydrocarbons as gasoline and diesel (TPH-G and TPH-D), and total lead. All samples were analyzed by Ecology's Manchester Environmental Laboratory. Copies of the chain-of-custody forms are included in Appendix A.

Field measurements of purged water collected immediately before sampling the monitoring well are presented in Table 1.

Tables 2 and 3 summarize analytical results. Copies of the analytical lab reports for the April 2019 sampling are included in Appendix B. Copies of the analytical lab reports for the July 2019 sampling are included in Appendix C.

Field duplicate samples were collected from both wells. The relative percent difference[1] calculated for the duplicate results ranged from 0% to 5%, meeting the data quality objectives established in the QAPP (Marti, 2019).

In well FLG-MW, benzene was detected at a concentration of 48.3 µg/L, above the CUL of 5 µg/L. The other BTEX compounds were identified in FLG-MW at concentrations below the CULs. The TPH-D analyses yielded results above the reporting limit, but the chromatograms did not match the standard diesel pattern. TPH-G and lead were not identified in FLG-MW. No contaminants of concern were present in the July 2019 sample from the domestic well (FLG-WT).

Table 1. Field measurements collected prior to sampling, April 2019.

Well ID	Well Depth (feet, bgs)	Ground-water Level (feet, bgs)	pH (standard units)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)
FLG-MW	15.2	5.79	6.1	362	0.5	-5.2

bgs: below ground surface

Table 2. Analytical results for BTEX compounds, April and July 2019.

Well ID	Benzene (µg/L)	Toluene (µg/L)	Ethyl Benzene (µg/L)	m,p-Xylene (µg/L)	o-Xylene (µg/L)
FLG-MW	**48.3**	**5.04**	**32.6**	**16.3**	**1.55**
FLG-MW Duplicate	**47.6**	**5.22**	**35.0**	**17.3**	**1.59**
FLG-WT	1U	1U	1U	2U	1U
FLG-WT Duplicate	1U	1U	1U	2U	1U
MTCA Cleanup Level	*5*	*1000*	*700*	*1000[a]*	*1000[a]*

[a] The cleanup level is 1000 µg/L total xylenes (m,p-Xylene + o-Xylene).

U: Analyte was not detected at or above the reported value.

Bold: Analyte was positively detected.

Underlined/bold: Analyte was positively detected above the MTCA Method A cleanup level.

[1] Relative percent difference is the difference between replicate sample results, divided by the replicate mean, expressed as a percentage. This calculation provides a measure of the overall sampling and analytical precision. Precision estimates are influenced by the random error introduced by collection and measurement procedures, and by the natural variability of the concentrations in the media being sampled.

Table 3. Analytical results for total petroleum hydrocarbons and lead, April and July 2019.

Well ID	TPH-G (µg/L)	TPH-D (µg/L)	Total Lead (µg/L)
FLG-MW	70U	**280**[a]	0.1U
FLG-MW Duplicate	70U	**310**[a]	0.1U
FLG-WT	70U	150U	0.1U
FLG-WT Duplicate	70U	140U	0.1U
MTCA Cleanup Level	*800-1000*[b]	*500*	*15*

[a] TPH-D results for the April 2019 sampling exhibited chromatograms that did not match the diesel standard.
[b] MTCA Method A Cleanup Level for Gasoline is 800 µg/L if benzene is present in groundwater and 1000 µg/L if benzene is not detectable in groundwater.
U: Analyte was not detected at or above the reported value.
Bold: Analyte was positively detected.

Conclusions

Water quality results from the 2019 monitoring confirms that BTEX contamination persists in the shallow groundwater in the backfilled, excavated area at the Fargher Lake Grocery site. Although BTEX concentrations in monitoring well FLG-MW have decreased since the last sampling event in 1993, the 2019 benzene concentrations still exceed CULs. Toluene, ethylbenzene, and xylene are present in the backfilled, excavated area below the CUL.

TPH-D was detected in FLG-MW at a concentration below the cleanup limit. However, the chromatogram pattern from this sample did not match that of the diesel standard. TPH-G and lead were not detected in FLG-MW.

Contaminated soils left in place during the 1993 cleanup action are a likely source of continued dissolved-phase petroleum hydrocarbons in shallow groundwater beneath this area of the site.

The water supply well, FLG-WT, did not have detectable levels of BTEX compounds, petroleum hydrocarbons, or lead.

References

Ecology, 2016. Water Resources Program – Focus on Water Availability: Lewis River Watershed, WRIA 27. Publication 11-11-031.

Ecology & Environment. 1992. Final Remedial Investigation Report for Fargher Lake Grocery, Yacolt, Washington. Prepared for Washington State Department of Ecology, February 1992.

Enviros, 1993. Fargher Lake Grocery Cleanup Action Plan – Letter Report. Correspondence to Tammy Hall, Ecology's Toxics Cleanup Program, Southwest Regional Office. April 21, 1993.

Marti, P. 2019. Quality Assurance Project Plan: Shell Mart McKenzie Automotive and Fargher Lake Grocery Groundwater Assessment Monitoring. Publication 19-03-101. Washington State Department of Ecology, Olympia. https://apps.ecology.wa.gov/publications/SummaryPages/1903101.html

Marti, P., 2016a. Standard Operating Procedure EAP052, Version 1.2: Manual Well-Depth and Depth-to-Water Measurements. Washington State Department of Ecology, Olympia. https://apps.ecology.wa.gov/publications/SummaryPages/1803215.html

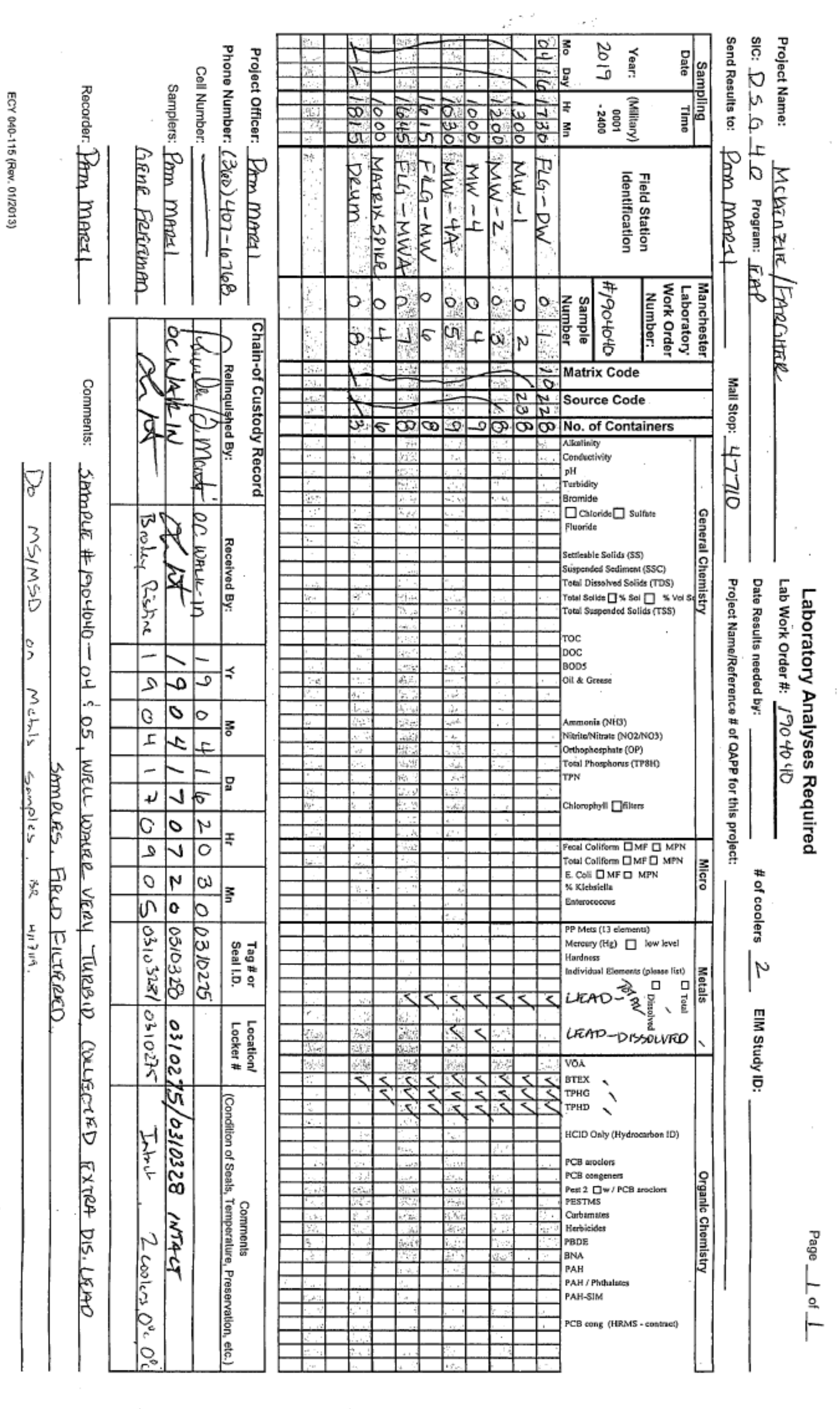
Marti, P. 2016b. Standard Operating Procedure for Purging and Sampling Monitoring Wells plus Guidance on Collecting Samples for Volatiles and other Organic Compounds. Washington State Department of Ecology SOP EAP078, Version 2.0. www.ecology.wa.gov/programs/eap/quality.html

Marti, P. 2016c. Standard Operating Procedure for Purging and Sampling Water Supply Wells plus Guidance on Collecting Samples for Volatiles and other Organic Compounds. Washington State Department of Ecology, Environmental Assessment Program, EAP077, Version 2.0. www.ecology.wa.gov/programs/eap/quality.html

Riedel Environmental Services. 1990. Final Report for Fargher Lake Spill Response. Prepared for Washington State Department of Ecology, March 16, 1990.

Appendix A. Chain of Custody Documentation

Chain of custody forms for the 2019 sampling that included the Fargher Lake Grocery groundwater samples, as well as groundwater samples from a separate site.



Washington State Department of Ecology
Manchester Environmental Laboratory
Cooler Receipt and Preservation Form

Project Name: McKenzie / Fargher

WO#: 1904040   # of coolers: 2

Delivered by (circle): FedEx UPS (MEL-Courier) Client Other   Describe if "other": ______

For any parameters out of compliance, list affected samples in table on next page.

(Cooler temperature MUST be measured upon opening)

Temperature of each cooler (criterion: ≤6°C; or ≤10°C for microbiology samples, only.)   0°C, 0°C

Did cooler(s) arrive at the proper temperature?   (Yes)   No   N/A

If "No", list samples affected on Page 2.

Receipt at MEL

Date and time:
4 / 17 / 19   9 : 05

Signature: [signature]

Were all samples removed?

(Yes) No   If so; List analyses removed: ______

Remainder of samples unloaded by someone else?

Yes No (NA)

If yes, sign and date

Date and time:

___/___/___ ___:___

Signature: ______

Check:

		Yes	No	NA
1a.	Are Custody Seal(s) Present?	(Yes)	No	
1b.	If so, are Custody Seal(s) Intact?	(Yes)	No	NA
2.	Was LAR present, correct, and complete?	(Yes)	No	
3.	Was chain-of-custody section properly filled out (complete, in ink, signed, etc.)?	(Yes)	No	
4.	Did all bottles arrive in good condition (unbroken, no leakage)?	(Yes)	No	
5.	Do sample tags on bottles match the LAR paperwork?	(Yes)	No	
6.	Were all sample labels complete (i.e.: analysis, sample date, etc.)?	(Yes)	No	
7.	Were the samples in correct container for analysis?	(Yes)	No	
8.	Were the samples preserved to the proper pH?	(Yes)	No	NA
9.	Did all samples arrive within holding time?	(Yes)	No	
10.	Did all samples arrive with more than ½ of the hold time left for analysis?	(Yes)	No	
11.	If "No", was the analyst notified? Yes No If so, who? ______			
12.	Were VOA/TPHG vials received without bubbles/headspace?	(Yes)	No	NA

Headspace → "hs" (> 6 mm) ●

(Write "HS" on container if bubble size exceeds 6 mm.)

Did you contact the project officer for any problems?   (Yes) No ~~NA~~

(Include details on next page.)   BR 4/17/19

Page 1 of 2   Y:\QA Forms

Washington State Department of Ecology
Manchester Environmental Laboratory
Cooler Receipt and Preservation Form

WO#: 1904040 Receipt date and time: 4/17/19 9:05

How were discrepancies resolved? *List any discrepancies and their resolution below.*

Sample numbers	Analysis	Comments

Other notes of clarification from project officer and/or analysts.

Perform MS/MSD on Total and Dissolved lead samples as per project officer. (See attached email). BR 4/18/19.

Laboratory Analyses Required

Page 1 of 1

Project Name: FARGHER LAKE STORE
Lab Work Order #: 1907069

SIC: DSG40 Program: EAP
Date Results needed by:
# of coolers 1
EIM Study ID:

Send Results to: Pam Marti
Mail Stop: 47710
Project Name/Reference # of QAPP for this project:

Manchester Laboratory Work Order Number: 1907069

Date (Year: 2019) Mo	Day	Time (Military 0001-2400) Hr Mn	Field Station Identification	Sample Number	Matrix Code	Source Code	No. of Containers	Metals: Individual Elements (Total) – LEAD	BTEX	TPHG	TPHD
07	24	1045	FIG-WT	01	10	22	6	✓	✓	✓	✓
〃	〃	1115	FIG-WT 2	02	10	22	6	✓	✓	✓	✓
〃	〃	1045	MATRIX SPIKE	01	10	22	5	✓	✓	✓	

Other analyses printed on the form:
- General Chemistry: Alkalinity; Conductivity; pH; Turbidity; Bromide; Chloride / Sulfate; Fluoride; Settleable Solids (SS); Suspended Sediment (SSC); Total Dissolved Solids (TDS); Total Solids / % Sol / % Vol Sol; Total Suspended Solids (TSS); TOC; DOC; BOD5; Oil & Grease; Ammonia (NH3); Nitrite/Nitrate (NO2/NO3); Orthophosphate (OP); Total Phosphorus (TPH); TPN; Chlorophyll / filters
- Micro: Fecal Coliform MF / MPN; Total Coliform MF / MPN; E. Coli MF / MPN; % Klebsiella; Enterococcus
- Metals: PP Mets (13 elements); Mercury (Hg) / low level; Hardness; Individual Elements (please list) – Total / Dissolved
- Organic Chemistry: VOA; BTEX; TPHG; TPHD; HCID Only (Hydrocarbon ID); PCB aroclors; PCB congeners; Pest 2 / w / PCB aroclors; PESTMS; Carbamates; Herbicides; PBDE; BNA; PAH; PAH / Phthalates; PAH-SIM; PCB cong (HRMS - contract)

Project Officer: Pam Marti
Phone Number: (360) 407-6768
Cell Number: —
Samplers: Pam Marti
Recorder: Pam Marti

Chain-of Custody Record

Relinquished By:	Received By:	Yr	Mo	Da	Hr	Mn	Tag # or Seal I.D.	Location/ Locker #	Comments (Condition of Seals, Temperature, Preservation, etc.)
Pamela B. Marti	OC WALK-IN	19	07	24	13	15	0010540		
OC WALK IN	[signature]	19	07	25	07	30	0010540	INTACT	
[signature]	Bailey Rosine	19	07	25	09	15	0010540	Intact	1 cooler, 0°C

Comments:

ECY 040-115 (Rev. 01/2013)

Washington State Department of Ecology
Manchester Environmental Laboratory
Cooler Receipt and Preservation Form

Project Name: Fargher Lake Store

WO#: 1907069 # of coolers: 1

Delivered by (circle): FedEx UPS (MEL-Courier) Client Other Describe if "other":

For any parameters out of compliance, list affected samples in table on next page.

(Cooler temperature MUST be measured upon opening)

Temperature of each cooler (criterion: ≤6°C or ≤10°C for microbiology samples, only.) 0°C

Did cooler(s) arrive at the proper temperature? (Yes) No N/A

If "No", list samples affected on Page 2.

Receipt at MEL

Date and time: 7/25/19 9:15

Signature: Bob Barr

Were all samples removed?

(Yes) No If so; List analyses removed:

Remainder of samples unloaded by someone else?

Yes No (NA)

If yes, sign and date

Date and time: ___/___/___ ___:___

Signature:

Check:

1a. Are Custody Seal(s) Present?	(Yes)	No	
1b. If so, are Custody Seal(s) Intact?	(Yes)	No	NA
2. Was LAR present, correct, and complete?	(Yes)	No	
3. Was chain-of-custody section properly filled out (complete, in ink, signed, etc.)?	(Yes)	No	
4. Did all bottles arrive in good condition (unbroken, no leakage)?	(Yes)	No	
5. Do sample tags on bottles match the LAR paperwork?	(Yes)	No	
6. Were all sample labels complete (i.e.: analysis, sample date, etc.)?	(Yes)	No	
7. Were the samples in correct container for analysis?	(Yes)	No	
8. Were the samples preserved to the proper pH?	(Yes)	No	NA
9. Did all samples arrive within holding time?	(Yes)	No	
10. Did all samples arrive with more than ½ of the hold time left for analysis?	(Yes)	No	
11. If "No", was the analyst notified? Yes No	If so, who?		
	(at a minimum, record initials of analyst)		
12. Were VOA/TPHG vials received without bubbles/headspace?	Yes	No	(NA)
Headspace → "hs" (>6 mm)	(Write "HS" on container if bubble size exceeds 6 mm.)		

Did you contact the project officer for any problems? Yes No (NA)

(Include details on next page.)

Page 1 of 1

Y:\QA Forms

Appendix B. Analytical Laboratory Reports, April 2019

Analytical laboratory reports from Manchester Environmental Laboratory on the results of the April 2019 groundwater sampling at Fargher Lake Grocery, and at a separate site.

DEPARTMENT OF ECOLOGY
Manchester Environmental Laboratory
7411 Beach Drive East • Port Orchard, Washington 98366-8204

Case Narrative

April 22, 2019

To: Marti, Pam

Project: Mckenzie Auto & Fargher Lake Grocery

Work Order: 1904040

Subject: Volatile Petroleum Products

From: Dolores Montgomery DL

Sample Receipt

Enclosed are the TPHG results for the samples received by MEL on April 17, 2019. All samples were received in acceptable condition unless noted in Analyst Comments. All samples were prepared and analyzed within holding times unless noted in Analyst Comments.

Analytical Methods

These samples were prepared, analyzed, and verified by MEL according to the submitted chain-of-custody and MEL's procedures. A Sample Correlation Table with batch summary is located in Appendix A. The samples were:

- extracted following a modification of method SW5030B.
- analyzed following a modification of method NWTPH-GX.

Analyst Comments

None noted.

Sample Qualification

The samples were qualified according to MEL's procedures. The table in Appendix B summarizes the manual qualifiers added by MEL. All results reported below the method reporting limit (RL) were automatically qualified as estimates, but not included in Appendix B. The qualifiers are defined in Appendix C.

Sample Verification

All analyses met QC acceptance criteria except as noted in Appendix D. All analytes met linearity requirements unless noted in Appendix E.

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Petroleum Products

Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: FLG-DW**

Work Order: 1904040	**Lab ID #: 1904040-01**	**Batch ID: B19D116**
Project Officer: Marti, Pam	**Collected: 4/16/2019**	**Prepared: 4/17/2019**
Initial Vol: 5 mL	**Prep Method: SW5030B**	**Analyzed: 4/17/2019**
Final Vol: 5 mL	**Analysis Method: NWTPH-GX**	**Matrix: Water**
		Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
86290-81-5	Gasoline	0.070	U	0.070	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	22.3	24.0	93	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	50.7	56.0	91	70-130

Authorized by: _____ **Release Date:** 04/22/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Petroleum Products

Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: MW-1**

Work Order: 1904040	**Lab ID #: 1904040-02**	**Batch ID: B19D116**
Project Officer: Marti, Pam	**Collected: 4/16/2019**	**Prepared: 4/17/2019**
Initial Vol: 5 mL	**Prep Method: SW5030B**	**Analyzed: 4/17/2019**
Final Vol: 5 mL	**Analysis Method: NWTPH-GX**	**Matrix: Water**
		Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
86290-81-5	Gasoline	0.070	U	0.070	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	22.4	24.0	93	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	49.9	56.0	89	70-130

Authorized by: DLL **Release Date:** 04/22/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Petroleum Products

Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: MW-2**

Work Order: 1904040	**Lab ID #: 1904040-03**	**Batch ID: B19D116**
Project Officer: Marti, Pam	**Collected: 4/16/2019**	**Prepared: 4/17/2019**
Initial Vol: 5 mL	**Prep Method: SW5030B**	**Analyzed: 4/17/2019**
Final Vol: 5 mL	**Analysis Method: NWTPH-GX**	**Matrix: Water**
		Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
86290-81-5	Gasoline	0.070	U	0.070	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	22.3	24.0	93	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	49.5	56.0	88	70-130

Authorized by: _____ **Release Date:** 04/22/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Petroleum Products

Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: MW-4**

Work Order: 1904040	**Lab ID #: 1904040-04**	**Batch ID: B19D116**
Project Officer: Marti, Pam	**Collected: 4/16/2019**	**Prepared: 4/17/2019**
Initial Vol: 5 mL	**Prep Method: SW5030B**	**Analyzed: 4/17/2019**
Final Vol: 5 mL	**Analysis Method: NWTPH-GX**	**Matrix: Water**
		Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
86290-81-5	Gasoline	0.070	U	0.070	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	22.4	24.0	93	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	51.5	56.0	92	70-130

Authorized by: _____ **Release Date:** 04/22/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Petroleum Products

Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: MW-4A**

Work Order: 1904040	**Lab ID #: 1904040-05**	**Batch ID: B19D116**
Project Officer: Marti, Pam	**Collected: 4/16/2019**	**Prepared: 4/17/2019**
Initial Vol: 5 mL	**Prep Method: SW5030B**	**Analyzed: 4/17/2019**
Final Vol: 5 mL	**Analysis Method: NWTPH-GX**	**Matrix: Water**
		Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
86290-81-5	Gasoline	0.070	U	0.070	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	22.2	24.0	93	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	50.7	56.0	90	70-130

Authorized by: _____ **Release Date:** 04/22/19

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Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: FLG-MW**

Work Order: 1904040	**Lab ID #: 1904040-06**	**Batch ID: B19D116**
Project Officer: Marti, Pam	**Collected: 4/16/2019**	**Prepared: 4/17/2019**
Initial Vol: 5 mL	**Prep Method: SW5030B**	**Analyzed: 4/17/2019**
Final Vol: 5 mL	**Analysis Method: NWTPH-GX**	**Matrix: Water**
		Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
86290-81-5	Gasoline	0.070	U	0.070	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	25.7	24.0	107	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	58.3	56.0	104	70-130

Authorized by: _____ **Release Date:** 04/22/19

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Volatile Petroleum Products

Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: FLG-MWA**

Work Order: 1904040
Project Officer: Marti, Pam
Initial Vol: 5 mL
Final Vol: 5 mL

Lab ID #: 1904040-07
Collected: 4/16/2019
Prep Method: SW5030B
Analysis Method: NWTPH-GX

Batch ID: B19D116
Prepared: 4/17/2019
Analyzed: 4/17/2019
Matrix: Water
Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
86290-81-5	Gasoline	0.070	U	0.070	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	25.4	24.0	106	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	58.7	56.0	105	70-130

Authorized by: _____ **Release Date:** 04/22/19

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Project: Mckenzie Auto & Fargher Lake Grocery **QC Type : Method Blank**

Work Order: Batch QC	**Lab ID #: B19D116-BLK1**	**Batch ID: B19D116**
Project Officer: Marti, Pam	**Prep Method: SW5030B**	**Prepared: 4/17/2019**
Initial Vol: 5 mL	**Analysis Method: NWTPH-GX**	**Analyzed: 4/17/2019**
Final Vol: 5 mL	**Source Field ID: B19D116-BLK1**	**Matrix: Water**
		Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
86290-81-5	Gasoline	0.070	U	0.070	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	22.6	24.0	94	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	51.4	56.0	92	70-130

Authorized by: DJL **Release Date:** 04/22/19

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Project: Mckenzie Auto & Fargher Lake Grocery — **QC Type : LCS**

Work Order: Batch QC	**Lab ID #: B19D116-BS1**	**Batch ID: B19D116**
Project Officer: Marti, Pam	**Prep Method: SW5030B**	**Prepared: 4/17/2019**
Initial Vol: 5 mL	**Analysis Method: NWTPH-GX**	**Analyzed: 4/17/2019**
Final Vol: 5 mL	**Source Field ID: B19D116-BS1**	**Matrix: Water**
		Units: %

Analyte	Result	Spike Level	RL	%Rec	%Rec Limits
Gasoline	0.661	0.750	0.070	88	70-130

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	24.1	24.0	100	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	55.4	56.0	99	70-130

Authorized by: _____ **Release Date:** 04/22/19

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Project: Mckenzie Auto & Fargher Lake Grocery — **QC Type : LCS Dup**

Work Order: Batch QC	**Lab ID #: B19D116-BSD1**	**Batch ID: B19D116**
Project Officer: Marti, Pam	**Prep Method: SW5030B**	**Prepared: 4/17/2019**
Initial Vol: 5 mL	**Analysis Method: NWTPH-GX**	**Analyzed: 4/17/2019**
Final Vol: 5 mL	**Source Field ID: B19D116-BSD1**	**Matrix: Water**
		Units: %

Analyte	Sample Result	Spike Level	%Rec	RPD	%Rec Limits	RPD Limit
Gasoline	0.681	0.750	91	3	70-130	40

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	24.2	24.0	101	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	53.2	56.0	95	70-130

Authorized by: _____ **Release Date:** 04/22/19

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Project: Mckenzie Auto & Fargher Lake Grocery — **QC Type : Matrix Spike**

Work Order: Batch QC	**Lab ID #: B19D116-MS1**	**Batch ID: B19D116**
Project Officer: Marti, Pam	**Prep Method: SW5030B**	**Prepared: 4/17/2019**
Initial Vol: 5 mL	**Analysis Method: NWTPH-GX**	**Analyzed: 4/17/2019**
Final Vol: 5 mL	**Source Field ID: B19D116-MS1**	**Matrix: Water**
	Source Lab ID #: 1904040-04	**Units: %**

Analyte	Result	Spike Level	Source Result	%Rec	%Rec Limits
Gasoline	0.648	0.750	0.00	86	70-130

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	22.5	24.0	94	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	50.9	56.0	91	70-130

Authorized by: DKL **Release Date:** 04/22/19

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Project: Mckenzie Auto & Fargher Lake Grocery **QC Type : Matrix Spike Dup**

Work Order: Batch QC	**Lab ID #: B19D116-MSD1**	**Batch ID: B19D116**
Project Officer: Marti, Pam	**Prep Method: SW5030B**	**Prepared: 4/17/2019**
Initial Vol: 5 mL	**Analysis Method: NWTPH-GX**	**Analyzed: 4/17/2019**
Final Vol: 5 mL	**Source Field ID: B19D116-MSD1**	**Matrix: Water**
	Source Lab ID #: 1904040-04	**Units: %**

Analyte	Sample Result	Spike Level	Source Result	%Rec	RPD	%Rec Limits	RPD Limit
Gasoline	0.639	0.750	0.00	85	1	70-130	40

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	22.9	24.0	95	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	51.6	56.0	92	70-130

Authorized by: _____ **Release Date:** 04/22/19

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Appendix A
Sample Correlation Table

Batch ID: B19D116 **Prep Method:** SW5030B

Prepared: 4/17/2019 **Analysis Method:** NWTPH-GX

Field ID	MEL ID
FLG-DW	1904040-01
MW-1	1904040-02
MW-2	1904040-03
MW-4	1904040-04
MW-4A	1904040-05
FLG-MW	1904040-06
FLG-MWA	1904040-07
Blank	B19D116-BLK1
LCS	B19D116-BS1
LCS Dup	B19D116-BSD1
Matrix Spike (MW-4)	B19D116-MS1
Matrix Spike Dup (MW-4)	B19D116-MSD1

Appendix B
Manual Qualification Table

WO: 1904040	**Analysis:** TPHG

No manual qualifiers were added to the samples or batch QC.

Appendix C
Data Qualifier Definitions

Code	Definition
E	Reported result is an estimate because it exceeds the calibration range.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the present of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
NAF	Not analyzed for.
NC	Not calculated.
REJ	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
U	The analyte was not detected at or above the reported sample quantitation limit.
UJ	The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately measure the analyte in the sample.
bold	The analyte was present in the sample. (Visual aid to locate detected compounds on the analytical report.)

Appendix D
QC Exceptions Report

Lab ID	Analyte	Exception
No QC exceptions reported.		

QC Exceptions determined using unrounded QC results but are reported as integers throughout this analytical report.
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Appendix E
Initial Calibration Exceptions Report

Calibration ID: B8C2801 **Analysis:** TPHG

LabNumber	Analyte	QC Exception

No ICAL exceptions.

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DEPARTMENT OF ECOLOGY
Manchester Environmental Laboratory
7411 Beach Drive East • Port Orchard, Washington 98366-8204

Case Narrative

April 30, 2019

To: Marti, Pam

Project: Mckenzie Auto & Fargher Lake Grocery

Work Order: 1904040

Subject: Semivolatile Petroleum Products

From: Karin Bailey KB

Sample Receipt

Enclosed are the TPHD results for the samples received by MEL on April 17, 2019. All samples were received in acceptable condition unless noted in Analyst Comments. All samples were prepared and analyzed within holding times unless noted in Analyst Comments.

Analytical Methods

These samples were prepared, analyzed, and verified by MEL according to the submitted chain-of-custody and MEL's procedures. A Sample Correlation Table with batch summary is located in Appendix A. The samples were:

- extracted following a modification of method SW3535A.
- analyzed following a modification of method NWTPH-DX.

Analyst Comments

TPHD by GCFID. Samples 1904040-01, -06, -07 had results for Diesel above the reporting limit, but the sample chromatograms didn't match the chromatogram of the Diesel standard.

Sample Qualification

The samples were qualified according to MEL's procedures. The table in Appendix B summarizes the manual qualifiers added by MEL. All results reported below the method

reporting limit (RL) were automatically qualified as estimates, but not included in Appendix B. The qualifiers are defined in Appendix C.

Sample Verification

All analyses met QC acceptance criteria except as noted in Appendix D. All analytes met linearity requirements unless noted in Appendix E.

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Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: FLG-DW**

Work Order: 1904040	**Lab ID #: 1904040-01**	**Batch ID: B19D136**
Project Officer: Marti, Pam	**Collected: 4/16/2019**	**Prepared: 4/17/2019**
Initial Vol: 1010 mL	**Prep Method: SW3535A**	**Analyzed: 4/24/2019**
Final Vol: 3 mL	**Analysis Method: NWTPH-DX**	**Matrix: Water**
		Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
68476-34-6	**#2 Diesel**	**0.15**		**0.15**	
NULL	Lube Oil	0.37	U	0.37	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	0.203	0.218	93	50-150

Authorized by: VB **Release Date:** 4/30/19

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Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: MW-1**

Work Order: 1904040
Project Officer: Marti, Pam
Initial Vol: 995 mL
Final Vol: 3 mL

Lab ID #: 1904040-02
Collected: 4/16/2019
Prep Method: SW3535A
Analysis Method: NWTPH-DX

Batch ID: B19D136
Prepared: 4/17/2019
Analyzed: 4/24/2019
Matrix: Water
Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
68476-34-6	#2 Diesel	0.15	U	0.15	
NULL	Lube Oil	0.38	U	0.38	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	0.218	0.221	99	50-150

Authorized by: KB **Release Date:** 4/30/19

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Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: MW-2**

Work Order: 1904040
Project Officer: Marti, Pam
Initial Vol: 1000 mL
Final Vol: 3 mL

Lab ID #: 1904040-03
Collected: 4/16/2019
Prep Method: SW3535A
Analysis Method: NWTPH-DX

Batch ID: B19D136
Prepared: 4/17/2019
Analyzed: 4/24/2019
Matrix: Water
Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
68476-34-6	#2 Diesel	0.15	U	0.15	
NULL	Lube Oil	0.38	U	0.38	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	0.234	0.220	106	50-150

Authorized by: KB **Release Date:** 4/30/19

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Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: MW-4**

Work Order: 1904040
Project Officer: Marti, Pam
Initial Vol: 1010 mL
Final Vol: 3 mL

Lab ID #: 1904040-04
Collected: 4/16/2019
Prep Method: SW3535A
Analysis Method: NWTPH-DX

Batch ID: B19D136
Prepared: 4/17/2019
Analyzed: 4/24/2019
Matrix: Water
Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
68476-34-6	#2 Diesel	0.15	U	0.15	
NULL	Lube Oil	0.37	U	0.37	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	0.223	0.218	102	50-150

Authorized by: KB **Release Date:** 4/30/19

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Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: MW-4A**

Work Order: 1904040	**Lab ID #: 1904040-05**	**Batch ID: B19D136**
Project Officer: Marti, Pam	**Collected: 4/16/2019**	**Prepared: 4/17/2019**
Initial Vol: 1005 mL	**Prep Method: SW3535A**	**Analyzed: 4/24/2019**
Final Vol: 3 mL	**Analysis Method: NWTPH-DX**	**Matrix: Water**
		Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
68476-34-6	#2 Diesel	0.15	U	0.15	
NULL	Lube Oil	0.37	U	0.37	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	0.218	0.219	100	50-150

Authorized by: KB **Release Date:** 4/30/19

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Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: FLG-MW**

Work Order: 1904040
Project Officer: Marti, Pam
Initial Vol: 1010 mL
Final Vol: 3 mL

Lab ID #: 1904040-06
Collected: 4/16/2019
Prep Method: SW3535A
Analysis Method: NWTPH-DX

Batch ID: B19D136
Prepared: 4/17/2019
Analyzed: 4/24/2019
Matrix: Water
Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
68476-34-6	#2 Diesel	0.28		0.15	
NULL	Lube Oil	0.37	U	0.37	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	0.220	0.218	101	50-150

Authorized by: _____ Release Date: 4/30/19

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Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: FLG-MWA**

Work Order: 1904040	**Lab ID #: 1904040-07**	**Batch ID: B19D136**
Project Officer: Marti, Pam	**Collected: 4/16/2019**	**Prepared: 4/17/2019**
Initial Vol: 1000 mL	**Prep Method: SW3535A**	**Analyzed: 4/24/2019**
Final Vol: 3 mL	**Analysis Method: NWTPH-DX**	**Matrix: Water**
		Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
68476-34-6	**#2 Diesel**	**0.31**		**0.15**	
NULL	Lube Oil	0.38	U	0.38	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	0.217	0.220	99	50-150

Authorized by: LG **Release Date:** 4/30/19

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Project: Mckenzie Auto & Fargher Lake Grocery **QC Type : Method Blank**

Work Order: Batch QC	**Lab ID #:** B19D136-BLK1	**Batch ID:** B19D136
Project Officer: Marti, Pam	**Prep Method:** SW3535A	**Prepared:** 4/17/2019
Initial Vol: 1000 mL	**Analysis Method:** NWTPH-DX	**Analyzed:** 4/24/2019
Final Vol: 3 mL	**Source Field ID:** B19D136-BLK1	**Matrix:** Water
		Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
68476-34-6	#2 Diesel	0.15	U	0.15	
NULL	Lube Oil	0.38	U	0.38	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	0.218	0.220	99	50-150

Authorized by: _____ **Release Date:** 4/30/19

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Project: Mckenzie Auto & Fargher Lake Grocery — **QC Type : LCS**

Work Order: Batch QC
Project Officer: Marti, Pam
Initial Vol: 1000 mL
Final Vol: 3 mL

Lab ID #: B19D136-BS1
Prep Method: SW3535A
Analysis Method: NWTPH-DX
Source Field ID: B19D136-BS1

Batch ID: B19D136
Prepared: 4/17/2019
Analyzed: 4/24/2019
Matrix: Water
Units: %

Analyte	Result	Spike Level	RL	%Rec	%Rec Limits
#2 Diesel	2.54	3.00	0.15	85	70-130

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	0.215	0.220	98	50-150

Authorized by: VB **Release Date:** 4/30/19

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Project: Mckenzie Auto & Fargher Lake Grocery — **QC Type : LCS Dup**

Work Order: Batch QC
Project Officer: Marti, Pam
Initial Vol: 1000 mL
Final Vol: 3 mL

Lab ID #: B19D136-BSD1
Prep Method: SW3535A
Analysis Method: NWTPH-DX
Source Field ID: B19D136-BSD1

Batch ID: B19D136
Prepared: 4/17/2019
Analyzed: 4/24/2019
Matrix: Water
Units: %

Analyte	Sample Result	Spike Level	%Rec	RPD	%Rec Limits	RPD Limit
#2 Diesel	2.67	3.00	89	5	70-130	40

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	0.209	0.220	95	50-150

Authorized by: LB — Release Date: 4/30/19

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Appendix A
Sample Correlation Table

Batch ID: B19D136 **Prep Method:** SW3535A

Prepared: 4/17/2019 **Analysis Method:** NWTPH-DX

Field ID	MEL ID
FLG-DW	1904040-01
MW-1	1904040-02
MW-2	1904040-03
MW-4	1904040-04
MW-4A	1904040-05
FLG-MW	1904040-06
FLG-MWA	1904040-07
Blank	B19D136-BLK1
LCS	B19D136-BS1
LCS Dup	B19D136-BSD1

Appendix B
Manual Qualification Table

WO: 1904040	**Analysis:** TPHD

No manual qualifiers were added to the samples or batch QC.

Appendix C
Data Qualifier Definitions

Code	Definition
E	Reported result is an estimate because it exceeds the calibration range.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the present of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
NAF	Not analyzed for.
NC	Not calculated.
REJ	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
U	The analyte was not detected at or above the reported sample quantitation limit.
UJ	The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately measure the analyte in the sample.
bold	The analyte was present in the sample. (Visual aid to locate detected compounds on the analytical report.)

Appendix D
QC Exceptions Report

Lab ID	Analyte	Exception

No QC exceptions reported.

QC Exceptions determined using unrounded QC results but are reported as integers throughout this analytical report.

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Appendix E
Initial Calibration Exceptions Report

Calibration ID: B9D0402		Analysis: TPHD
LabNumber	**Analyte**	**QC Exception**

No ICAL exceptions.

DEPARTMENT OF ECOLOGY
Manchester Environmental Laboratory
7411 Beach Drive East • Port Orchard, Washington 98366-8204

Case Narrative

April 22, 2019

To: Marti, Pam

Project: Mckenzie Auto & Fargher Lake Grocery

Work Order: 1904040

Subject: BTEX

From: Dolores Montgomery DEL

Sample Receipt

Enclosed are the BTEX results for the samples received by MEL on April 17, 2019. All samples were received in acceptable condition unless noted in Analyst Comments. All samples were prepared and analyzed within holding times unless noted in Analyst Comments.

Analytical Methods

These samples were prepared, analyzed, and verified by MEL according to the submitted chain-of-custody and MEL's procedures. A Sample Correlation Table with batch summary is located in Appendix A. The samples were:

- extracted following a modification of method SW5030B.
- analyzed following a modification of method SW8021B.

Analyst Comments

None noted.

Sample Qualification

The samples were qualified according to MEL's procedures. The table in Appendix B summarizes the manual qualifiers added by MEL. All results reported below the method reporting limit (RL) were automatically qualified as estimates, but not included in Appendix B. The qualifiers are defined in Appendix C.

Sample Verification

All analyses met QC acceptance criteria except as noted in Appendix D. All analytes met linearity requirements unless noted in Appendix E.

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
BTEX

Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: FLG-DW**

Work Order: 1904040
Project Officer: Marti, Pam
Initial Vol: 5 mL
Final Vol: 5 mL

Lab ID #: 1904040-01
Collected: 4/16/2019
Prep Method: SW5030B
Analysis Method: SW8021B

Batch ID: B19D139
Prepared: 4/18/2019
Analyzed: 4/18/2019
Matrix: Water
Units: ug/L

CAS#	Analyte	Result	Qualifier	RL	MDL
71-43-2	Benzene	1.00	U	1.00	0.258
100-41-4	Ethylbenzene	1.00	U	1.00	0.106
179601-23-1	m,p-Xylene	2.00	U	2.00	0.240
95-47-6	o-Xylene	1.00	U	1.00	0.177
108-88-3	Toluene	1.00	U	1.00	0.145

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	24.0	24.0	100	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	59.6	56.0	106	70-130

Authorized by: _____ **Release Date:** 04/21/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
BTEX

Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: MW-1**

Work Order: 1904040
Project Officer: Marti, Pam
Initial Vol: 5 mL
Final Vol: 5 mL

Lab ID #: 1904040-02
Collected: 4/16/2019
Prep Method: SW5030B
Analysis Method: SW8021B

Batch ID: B19D139
Prepared: 4/18/2019
Analyzed: 4/18/2019
Matrix: Water
Units: ug/L

CAS#	Analyte	Result	Qualifier	RL	MDL
71-43-2	Benzene	1.00	U	1.00	0.258
100-41-4	Ethylbenzene	1.00	U	1.00	0.106
179601-23-1	m,p-Xylene	2.00	U	2.00	0.240
95-47-6	o-Xylene	1.00	U	1.00	0.177
108-88-3	Toluene	1.00	U	1.00	0.145

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	24.2	24.0	101	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	58.4	56.0	104	70-130

Authorized by: _____ **Release Date:** 04/22/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
BTEX

Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: MW-2**

Work Order: 1904040
Project Officer: Marti, Pam
Initial Vol: 5 mL
Final Vol: 5 mL

Lab ID #: 1904040-03
Collected: 4/16/2019
Prep Method: SW5030B
Analysis Method: SW8021B

Batch ID: B19D139
Prepared: 4/18/2019
Analyzed: 4/18/2019
Matrix: Water
Units: ug/L

CAS#	Analyte	Result	Qualifier	RL	MDL
71-43-2	Benzene	1.00	U	1.00	0.258
100-41-4	Ethylbenzene	1.00	U	1.00	0.106
179601-23-1	m,p-Xylene	2.00	U	2.00	0.240
95-47-6	o-Xylene	1.00	U	1.00	0.177
108-88-3	Toluene	1.00	U	1.00	0.145

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	23.9	24.0	100	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	57.1	56.0	102	70-130

Authorized by: _____ **Release Date:** 04/22/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
BTEX

Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: MW-4**

Work Order: 1904040	**Lab ID #: 1904040-04**	**Batch ID: B19D139**
Project Officer: Marti, Pam	**Collected: 4/16/2019**	**Prepared: 4/18/2019**
Initial Vol: 5 mL	**Prep Method: SW5030B**	**Analyzed: 4/18/2019**
Final Vol: 5 mL	**Analysis Method: SW8021B**	**Matrix: Water**
		Units: ug/L

CAS#	Analyte	Result	Qualifier	RL	MDL
71-43-2	Benzene	1.00	U	1.00	0.258
100-41-4	Ethylbenzene	1.00	U	1.00	0.106
179601-23-1	m,p-Xylene	2.00	U	2.00	0.240
95-47-6	o-Xylene	1.00	U	1.00	0.177
108-88-3	Toluene	1.00	U	1.00	0.145

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	23.7	24.0	99	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	56.9	56.0	102	70-130

Authorized by: _____ **Release Date:** 04/22/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
BTEX

Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: MW-4A**

Work Order: 1904040
Project Officer: Marti, Pam
Initial Vol: 5 mL
Final Vol: 5 mL

Lab ID #: 1904040-05
Collected: 4/16/2019
Prep Method: SW5030B
Analysis Method: SW8021B

Batch ID: B19D139
Prepared: 4/18/2019
Analyzed: 4/18/2019
Matrix: Water
Units: ug/L

CAS#	Analyte	Result	Qualifier	RL	MDL
71-43-2	Benzene	1.00	U	1.00	0.258
100-41-4	Ethylbenzene	1.00	U	1.00	0.106
179601-23-1	m,p-Xylene	2.00	U	2.00	0.240
95-47-6	o-Xylene	1.00	U	1.00	0.177
108-88-3	Toluene	1.00	U	1.00	0.145

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	24.2	24.0	101	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	57.6	56.0	103	70-130

Authorized by: _____ **Release Date:** 04/22/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
BTEX

Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: FLG-MW**

Work Order: 1904040	Lab ID #: 1904040-06	Batch ID: B19D139
Project Officer: Marti, Pam	Collected: 4/16/2019	Prepared: 4/18/2019
Initial Vol: 5 mL	Prep Method: SW5030B	Analyzed: 4/18/2019
Final Vol: 5 mL	Analysis Method: SW8021B	Matrix: Water
		Units: ug/L

CAS#	Analyte	Result	Qualifier	RL	MDL
71-43-2	Benzene	48.3		1.00	0.258
100-41-4	Ethylbenzene	32.6		1.00	0.106
179601-23-1	m,p-Xylene	16.3		2.00	0.240
95-47-6	o-Xylene	1.55		1.00	0.177
108-88-3	Toluene	5.04		1.00	0.145

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	26.4	24.0	110	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	70.4	56.0	126	70-130

Authorized by: _____ Release Date: 04/22/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
BTEX

Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: FLG-MWA**

Work Order: 1904040
Project Officer: Marti, Pam
Initial Vol: 5 mL
Final Vol: 5 mL

Lab ID #: 1904040-07
Collected: 4/16/2019
Prep Method: SW5030B
Analysis Method: SW8021B

Batch ID: B19D139
Prepared: 4/18/2019
Analyzed: 4/18/2019
Matrix: Water
Units: ug/L

CAS#	Analyte	Result	Qualifier	RL	MDL
71-43-2	Benzene	47.6		1.00	0.258
100-41-4	Ethylbenzene	35.0		1.00	0.106
179601-23-1	m,p-Xylene	17.3		2.00	0.240
95-47-6	o-Xylene	1.59		1.00	0.177
108-88-3	Toluene	5.22		1.00	0.145

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	28.0	24.0	117	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	75.6	56.0	135	70-130

Authorized by: _____ Release Date: 04/22/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
BTEX

Project: Mckenzie Auto & Fargher Lake Grocery **Field ID: DRUM**

Work Order: 1904040	**Lab ID #: 1904040-08**	**Batch ID: B19D139**
Project Officer: Marti, Pam	**Collected: 4/16/2019**	**Prepared: 4/18/2019**
Initial Vol: 5 mL	**Prep Method: SW5030B**	**Analyzed: 4/18/2019**
Final Vol: 5 mL	**Analysis Method: SW8021B**	**Matrix: Water**
		Units: ug/L

CAS#	Analyte	Result	Qualifier	RL	MDL
71-43-2	**Benzene**	**2.63**		**1.00**	**0.258**
100-41-4	**Ethylbenzene**	**2.31**		**1.00**	**0.106**
179601-23-1	**m,p-Xylene**	**1.84**	**J**	**2.00**	**0.240**
95-47-6	**o-Xylene**	**0.651**	**J**	**1.00**	**0.177**
108-88-3	Toluene	1.00	U	1.00	0.145

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	23.9	24.0	99	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	64.3	56.0	115	70-130

Authorized by: _____ **Release Date:** 04/22/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
BTEX

Project: Mckenzie Auto & Fargher Lake Grocery **QC Type : Method Blank**

Work Order: Batch QC
Project Officer: Marti, Pam
Initial Vol: 5 mL
Final Vol: 5 mL

Lab ID #: B19D139-BLK1
Prep Method: SW5030B
Analysis Method: SW8021B
Source Field ID: B19D139-BLK1

Batch ID: B19D139
Prepared: 4/18/2019
Analyzed: 4/18/2019
Matrix: Water
Units: ug/L

CAS#	Analyte	Result	Qualifier	RL	MDL
71-43-2	Benzene	1.00	U	1.00	0.258
100-41-4	Ethylbenzene	1.00	U	1.00	0.106
179601-23-1	m,p-Xylene	2.00	U	2.00	0.240
95-47-6	o-Xylene	1.00	U	1.00	0.177
108-88-3	Toluene	1.00	U	1.00	0.145

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	24.3	24.0	101	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	58.8	56.0	105	70-130

Authorized by: DLL **Release Date:** 04/22/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
BTEX

Project: Mckenzie Auto & Fargher Lake Grocery **QC Type : LCS**

Work Order: Batch QC
Project Officer: Marti, Pam
Initial Vol: 5 mL
Final Vol: 5 mL

Lab ID #: B19D139-BS1
Prep Method: SW5030B
Analysis Method: SW8021B
Source Field ID: B19D139-BS1

Batch ID: B19D139
Prepared: 4/18/2019
Analyzed: 4/18/2019
Matrix: Water
Units: %

Analyte	Result	Spike Level	RL	%Rec	%Rec Limits
Benzene	10.0	10.0	1.00	100	70-130
Ethylbenzene	9.6	10.0	1.00	96	70-130
m,p-Xylene	18.3	20.0	2.00	91	70-130
o-Xylene	9.3	10.0	1.00	93	70-130
Toluene	9.8	10.0	1.00	98	70-130

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	24.1	24.0	101	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	58.7	56.0	105	70-130

Authorized by: _____ **Release Date:** 04/22/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
BTEX

Project: Mckenzie Auto & Fargher Lake Grocery — **QC Type : LCS Dup**

Work Order: Batch QC
Project Officer: Marti, Pam
Initial Vol: 5 mL
Final Vol: 5 mL

Lab ID #: B19D139-BSD1
Prep Method: SW5030B
Analysis Method: SW8021B
Source Field ID: B19D139-BSD1

Batch ID: B19D139
Prepared: 4/18/2019
Analyzed: 4/18/2019
Matrix: Water
Units: %

Analyte	Sample Result	Spike Level	%Rec	RPD	%Rec Limits	RPD Limit
Benzene	10.4	10.0	104	4	70-130	40
Ethylbenzene	10.1	10.0	101	5	70-130	40
m,p-Xylene	19.3	20.0	96	5	70-130	40
o-Xylene	9.7	10.0	97	4	70-130	40
Toluene	10.2	10.0	102	5	70-130	40

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	24.4	24.0	102	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	58.2	56.0	104	70-130

Authorized by: DH — **Release Date:** 04/22/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
BTEX

Project: Mckenzie Auto & Fargher Lake Grocery **QC Type : Matrix Spike**

Work Order: Batch QC
Project Officer: Marti, Pam
Initial Vol: 5 mL
Final Vol: 5 mL

Lab ID #: B19D139-MS1
Prep Method: SW5030B
Analysis Method: SW8021B
Source Field ID: B19D139-MS1
Source Lab ID #: 1904040-04

Batch ID: B19D139
Prepared: 4/18/2019
Analyzed: 4/18/2019
Matrix: Water
Units: %

Analyte	Result	Spike Level	Source Result	%Rec	%Rec Limits
Benzene	10.4	10.0	0.0	104	70-130
Ethylbenzene	9.9	10.0	0.0	99	70-130
m,p-Xylene	19.0	20.0	0.0	95	70-130
o-Xylene	9.6	10.0	0.0	96	70-130
Toluene	10.2	10.0	0.0	102	70-130

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	24.0	24.0	100	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	56.6	56.0	101	70-130

Authorized by: DLV **Release Date:** 04/22/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
BTEX

Project: Mckenzie Auto & Fargher Lake Grocery **QC Type : Matrix Spike Dup**

Work Order: Batch QC
Project Officer: Marti, Pam
Initial Vol: 5 mL
Final Vol: 5 mL

Lab ID #: B19D139-MSD1
Prep Method: SW5030B
Analysis Method: SW8021B
Source Field ID: B19D139-MSD1
Source Lab ID #: 1904040-04

Batch ID: B19D139
Prepared: 4/18/2019
Analyzed: 4/18/2019
Matrix: Water
Units: %

Analyte	Sample Result	Spike Level	Source Result	%Rec	RPD	%Rec Limits	RPD Limit
Benzene	10.7	10.0	0.0	107	3	70-130	50
Ethylbenzene	10.2	10.0	0.0	102	3	70-130	50
m,p-Xylene	19.6	20.0	0.0	98	3	70-130	50
o-Xylene	9.9	10.0	0.0	99	3	70-130	50
Toluene	10.5	10.0	0.0	105	3	70-130	50

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	24.1	24.0	100	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	59.4	56.0	106	70-130

Authorized by: DJR **Release Date:** 04/22/19

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Appendix A
Sample Correlation Table

Batch ID: B19D139 **Prep Method:** SW5030B

Prepared: 4/18/2019 **Analysis Method:** SW8021B

Field ID	MEL ID
FLG-DW	1904040-01
MW-1	1904040-02
MW-2	1904040-03
MW-4	1904040-04
MW-4A	1904040-05
FLG-MW	1904040-06
FLG-MWA	1904040-07
DRUM	1904040-08
Blank	B19D139-BLK1
LCS	B19D139-BS1
LCS Dup	B19D139-BSD1
Matrix Spike (MW-4)	B19D139-MS1
Matrix Spike Dup (MW-4)	B19D139-MSD1

Appendix B
Manual Qualification Table

WO: 1904040	**Analysis:** BTEX

No manual qualifiers were added to the samples or batch QC.

Appendix C
Data Qualifier Definitions

Code	Definition
E	Reported result is an estimate because it exceeds the calibration range.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the present of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
NAF	Not analyzed for.
NC	Not calculated.
REJ	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
U	The analyte was not detected at or above the reported sample quantitation limit.
UJ	The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately measure the analyte in the sample.
bold	The analyte was present in the sample. (Visual aid to locate detected compounds on the analytical report.)

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Appendix D
QC Exceptions Report

Lab ID	Analyte	Exception
1904040-07	surr: Benzene, 1,4-dibromo-2-methyl-	Exceeds upper control limit

QC Exceptions determined using unrounded QC results but are reported as integers throughout this analytical report.

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Appendix E
Initial Calibration Exceptions Report

Calibration ID: B8C2801 **Analysis:** TPHG

LabNumber	Analyte	QC Exception

No ICAL exceptions.

Manchester Environmental Laboratory
7411 Beach Drive E, Port Orchard, Washington 98366

Case Narrative - Metals

April 22, 2019

Project: Mckenzie Auto & Fargher Lake Grocery

Work Order: 1904040

Project Manager: Marti, Pam

By: Dean Momohara

Summary

The laboratory followed EPA 200.8 for the preparation and analysis of trace metals.

All analyses requested were evaluated by established regulatory quality assurance guidelines.

Sample Information

The samples were received at the Manchester Laboratory on 4/17/2019. The samples were received in good condition and were properly preserved. Seven samples were received and assigned laboratory identification numbers 01 to 07.

Holding Times

The laboratory performed all analyses within their hold times.

Calibration

The instruments were calibrated following the appropriate methods. All initial and continuing calibration verification checks were within the acceptance limits. All initial and continuing calibration blank checks were within the acceptance limits. All standard residuals were within acceptance limits. All r-values were within acceptance limits. The instruments were calibrated with NIST traceable standards and verified to be in calibration with a second source NIST traceable standard.

Method Blanks

No analytically significant levels of analyte were detected in the method blanks associated with these samples.

Laboratory Control Samples

All laboratory control sample recoveries were within the acceptance limits.

Replicates

All associated duplicate relative percent differences of samples with concentrations greater than 5 times the reporting limit were within the acceptance limits.

Matrix Spikes

All matrix spike recoveries were within the acceptance limits.

Internal Standards

All internal standard recoveries were within the acceptance limits.

Other Quality Assurance Measures and Issues

U - The analyte was not detected at or above the reported result.

bold - The analyte was present in the sample. (Visual Aid to locate detected compounds on report sheet.)

Please call Dean Momohara at (360) 871-8808 to further discuss this project.

cc: Project File

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Analysis Report for
Lead

Project Name: Mckenzie Auto & Fargher Lake Grocery

Project Officer: Marti, Pam
Work Order: 1904040
Analyte: Lead

Prep Method: EPA200.2
Prepared: 04/18/19
Batch ID: B19D121

Analysis Method: EPA200.8
Matrix: Water
Units: ug/L

Sample #	Sample ID	Result	Qualifier	RL	MDL	Collected	Analyzed
1904040-01	**FLG-DW**	**0.33**		0.10	0.02	04/16/19	04/19/19
1904040-02	MW-1	0.10	U	0.10	0.02	04/16/19	04/19/19
1904040-03	MW-2	0.10	U	0.10	0.02	04/16/19	04/19/19
1904040-04	**MW-4**	**0.67**		0.10	0.02	04/16/19	04/19/19
1904040-05	**MW-4A**	**0.70**		0.10	0.02	04/16/19	04/19/19
1904040-06	FLG-MW	0.10	U	0.10	0.02	04/16/19	04/19/19
1904040-07	FLG-MWA	0.10	U	0.10	0.02	04/16/19	04/19/19

QC Results for Batch ID: B19D121

Method Blank	Sample ID	Result	Qualifer	RL	MDL
B19D121-BLK1	Blank	0.10	U	0.10	0.02

Sample #	QC Sample	Result	Spike Level	Source Sample	Source Result	%Rec	%Rec Limits	RPD	RPD Limit
B19D121-BS1	LCS	25.3	25.0			101	85-115		
B19D121-BSD1	LCS Dup	25.1	25.0			100	85-115	0.9	20
B19D121-MS1	Matrix Spike	25.7	25.0	1904040-04	0.666	100	75-125		
B19D121-MSD1	Matrix Spike Dup	25.9	25.0	1904040-04	0.666	101	75-125	0.5	20

Authorized by: DH **Release Date:** 4/22/19 **Page 1 of 2**

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Analysis Report for
Lead, Dissolved

Project Name: Mckenzie Auto & Fargher Lake Grocery

Project Officer: Marti, Pam
Work Order: 1904040
Analyte: Lead

Prep Method:
Prepared: 04/19/19
Batch ID: B19D145

Analysis Method: EPA200.8
Matrix: Water
Units: ug/L

Sample #	Sample ID	Result	Qualifier	RL	MDL	Collected	Analyzed
1904040-04	MW-4	0.020	U	0.020	0.007	04/16/19	04/19/19
1904040-05	MW-4A	0.020	U	0.020	0.007	04/16/19	04/19/19

QC Results for Batch ID: B19D145

Method Blank	Sample ID	Result	Qualifer	RL	MDL
B19D145-BLK1	Blank	0.020	U	0.020	0.007

Sample #	QC Sample	Result	Spike Level	Source Sample	Source Result	%Rec	%Rec Limits	RPD	RPD Limit
B19D145-BS1	LCS	9.81	10.0			98	85-115		
B19D145-BSD1	LCS Dup	9.84	10.0			98	85-115	0.3	20
B19D145-MS1	Matrix Spike	19.4	20.0	1904040-04	0.020 U	97	75-125		
B19D145-MSD1	Matrix Spike Dup	19.5	20.0	1904040-04	0.020 U	98	75-125	0.7	20

Authorized by: DM **Release Date:** 4/22/19 **Page 2 of 2**

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Appendix C. Analytical Laboratory Reports, July 2019

Analytical laboratory reports from Manchester Environmental Laboratory on the results of the July 2019 groundwater sampling at Fargher Lake Grocery.

DEPARTMENT OF ECOLOGY
Manchester Environmental Laboratory
7411 Beach Drive East • Port Orchard, Washington 98366-8204

Case Narrative

July 30, 2019

To: Marti, Pam

Project: Fargher Lake Grocery

Work Order: 1907069

Subject: Volatile Petroleum Products

From: Dolores Montgomery DM

Sample Receipt

Enclosed are the TPHG results for the samples received by MEL on July 25, 2019. All samples were received in acceptable condition unless noted in Analyst Comments. All samples were prepared and analyzed within holding times unless noted in Analyst Comments.

Analytical Methods

These samples were prepared, analyzed, and verified by MEL according to the submitted chain-of-custody and MEL's procedures. A Sample Correlation Table with batch summary is located in Appendix A. The samples were:

- extracted following a modification of method SW5030B.
- analyzed following a modification of method NWTPH-GX.

Analyst Comments

None noted.

Sample Qualification

The samples were qualified according to MEL's procedures. The table in Appendix B summarizes the manual qualifiers added by MEL. All results reported below the method reporting limit (RL) were automatically qualified as estimates, but not included in Appendix B. The qualifiers are defined in Appendix C.

Sample Verification

All analyses met QC acceptance criteria except as noted in Appendix D. All analytes met linearity requirements unless noted in Appendix E.

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Petroleum Products

Project: Fargher Lake Grocery **Field ID: FLG-WT**

Work Order: 1907069	**Lab ID #: 1907069-01**	**Batch ID: B19G150**
Project Officer: Marti, Pam	**Collected: 7/24/2019**	**Prepared: 7/25/2019**
Initial Vol: 5 mL	**Prep Method: SW5030B**	**Analyzed: 7/25/2019**
Final Vol: 5 mL	**Analysis Method: NWTPH-GX**	**Matrix: Water**
		Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
86290-81-5	Gasoline	0.070	U	0.070	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	21.8	24.0	91	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	52.0	56.0	93	70-130

Authorized by: DLV **Release Date:** 07/30/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Petroleum Products

Project: Fargher Lake Grocery **Field ID: FLG-WT2**

Work Order: 1907069	**Lab ID #: 1907069-02**	**Batch ID: B19G150**
Project Officer: Marti, Pam	**Collected: 7/24/2019**	**Prepared: 7/25/2019**
Initial Vol: 5 mL	**Prep Method: SW5030B**	**Analyzed: 7/25/2019**
Final Vol: 5 mL	**Analysis Method: NWTPH-GX**	**Matrix: Water**
		Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
86290-81-5	Gasoline	0.070	U	0.070	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	21.8	24.0	91	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	49.9	56.0	89	70-130

Authorized by: DR **Release Date:** 07/30/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Petroleum Products

Project: Fargher Lake Grocery **QC Type : Method Blank**

Work Order: Batch QC	**Lab ID #: B19G150-BLK1**	**Batch ID: B19G150**
Project Officer: Marti, Pam	**Prep Method: SW5030B**	**Prepared: 7/25/2019**
Initial Vol: 5 mL	**Analysis Method: NWTPH-GX**	**Analyzed: 7/25/2019**
Final Vol: 5 mL	**Source Field ID: B19G150-BLK1**	**Matrix: Water**
		Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
86290-81-5	Gasoline	0.070	U	0.070	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	21.6	24.0	90	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	53.0	56.0	95	70-130

Authorized by: _____ **Release Date:** 07/30/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Petroleum Products

Project: Fargher Lake Grocery **QC Type : LCS**

Work Order: Batch QC
Project Officer: Marti, Pam
Initial Vol: 5 mL
Final Vol: 5 mL

Lab ID #: B19G150-BS1
Prep Method: SW5030B
Analysis Method: NWTPH-GX
Source Field ID: B19G150-BS1

Batch ID: B19G150
Prepared: 7/25/2019
Analyzed: 7/25/2019
Matrix: Water
Units: %

Analyte	Result	Spike Level	RL	%Rec	%Rec Limits
Gasoline	0.681	0.750	0.070	91	70-130

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	23.9	24.0	100	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	54.4	56.0	97	70-130

Authorized by: _____ **Release Date:** 07/30/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Petroleum Products

Project: Fargher Lake Grocery **QC Type : LCS Dup**

Work Order: Batch QC	**Lab ID #: B19G150-BSD1**	**Batch ID: B19G150**
Project Officer: Marti, Pam	**Prep Method: SW5030B**	**Prepared: 7/25/2019**
Initial Vol: 5 mL	**Analysis Method: NWTPH-GX**	**Analyzed: 7/25/2019**
Final Vol: 5 mL	**Source Field ID: B19G150-BSD1**	**Matrix: Water**
		Units: %

Analyte	Sample Result	Spike Level	%Rec	RPD	%Rec Limits	RPD Limit
Gasoline	0.666	0.750	89	2	70-130	40

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	24.1	24.0	100	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	51.9	56.0	93	70-130

Authorized by: DLL **Release Date:** 07/30/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Petroleum Products

Project: Fargher Lake Grocery **QC Type : Matrix Spike**

Work Order: Batch QC	**Lab ID #: B19G150-MS1**	**Batch ID: B19G150**
Project Officer: Marti, Pam	**Prep Method: SW5030B**	**Prepared: 7/25/2019**
Initial Vol: 5 mL	**Analysis Method: NWTPH-GX**	**Analyzed: 7/25/2019**
Final Vol: 5 mL	**Source Field ID: B19G150-MS1**	**Matrix: Water**
	Source Lab ID #: 1907069-01	**Units: %**

Analyte	Result	Spike Level	Source Result	%Rec	%Rec Limits
Gasoline	0.694	0.750	0.00	93	70-130

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	23.6	24.0	98	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	55.5	56.0	99	70-130

Authorized by: DLL **Release Date:** 07/30/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Petroleum Products

Project: Fargher Lake Grocery **QC Type : Matrix Spike Dup**

Work Order: Batch QC	**Lab ID #: B19G150-MSD1**	**Batch ID: B19G150**
Project Officer: Marti, Pam	**Prep Method: SW5030B**	**Prepared: 7/25/2019**
Initial Vol: 5 mL	**Analysis Method: NWTPH-GX**	**Analyzed: 7/25/2019**
Final Vol: 5 mL	**Source Field ID: B19G150-MSD1**	**Matrix: Water**
	Source Lab ID #: 1907069-01	**Units: %**

Analyte	Sample Result	Spike Level	Source Result	%Rec	RPD	%Rec Limits	RPD Limit
Gasoline	0.812	0.750	0.00	108	16	70-130	40

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	21.2	24.0	88	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	55.1	56.0	98	70-130

Authorized by: DLL **Release Date:** 07/30/19

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Appendix A
Sample Correlation Table

Batch ID: B19G150 **Prep Method:** SW5030B

Prepared: 7/25/2019 **Analysis Method:** NWTPH-GX

Field ID	MEL ID
FLG-WT	1907069-01
FLG-WT2	1907069-02
Blank	B19G150-BLK1
LCS	B19G150-BS1
LCS Dup	B19G150-BSD1
Matrix Spike (FLG-WT)	B19G150-MS1
Matrix Spike Dup (FLG-WT)	B19G150-MSD1

Appendix B
Manual Qualification Table

WO: 1907069	**Analysis:** TPHG

No manual qualifiers were added to the samples or batch QC.

Appendix C
Data Qualifier Definitions

Code	Definition
E	Reported result is an estimate because it exceeds the calibration range.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the present of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
NAF	Not analyzed for.
NC	Not calculated.
REJ	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
U	The analyte was not detected at or above the reported sample quantitation limit.
UJ	The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately measure the analyte in the sample.
bold	The analyte was present in the sample. (Visual aid to locate detected compounds on the analytical report.)

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Appendix D
QC Exceptions Report

Lab ID	Analyte	Exception

No QC exceptions reported.

QC Exceptions determined using unrounded QC results but are reported as integers throughout this analytical report.

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Appendix E
Initial Calibration Exceptions Report

Calibration ID: B8C2801		**Analysis:** TPHG
LabNumber	**Analyte**	**QC Exception**

No ICAL exceptions.

DEPARTMENT OF ECOLOGY
Manchester Environmental Laboratory
7411 Beach Drive East • Port Orchard, Washington 98366-8204

Case Narrative

August 1, 2019

To: Marti, Pam

Project: Fargher Lake Grocery

Work Order: 1907069

Subject: Semivolatile Petroleum Products

From: Karin Bailey KB

Sample Receipt

Enclosed are the TPHD results for the samples received by MEL on July 25, 2019. All samples were received in acceptable condition unless noted in Analyst Comments. All samples were prepared and analyzed within holding times unless noted in Analyst Comments.

Analytical Methods

These samples were prepared, analyzed, and verified by MEL according to the submitted chain-of-custody and MEL's procedures. A Sample Correlation Table with batch summary is located in Appendix A. The samples were:

- extracted following a modification of method SW3535A.
- analyzed following a modification of method NWTPH-DX.

Analyst Comments

None noted.

Sample Qualification

The samples were qualified according to MEL's procedures. The table in Appendix B summarizes the manual qualifiers added by MEL. All results reported below the method reporting limit (RL) were automatically qualified as estimates, but not included in Appendix B. The qualifiers are defined in Appendix C.

Sample Verification

All analyses met QC acceptance criteria except as noted in Appendix D. All analytes met linearity requirements unless noted in Appendix E.

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Semivolatile Petroleum Products

Project: Fargher Lake Grocery **Field ID: FLG-WT**

Work Order: 1907069
Project Officer: Marti, Pam
Initial Vol: 1000 mL
Final Vol: 3 mL

Lab ID #: 1907069-01
Collected: 7/24/2019
Prep Method: SW3535A
Analysis Method: NWTPH-DX

Batch ID: B19G174
Prepared: 7/29/2019
Analyzed: 7/31/2019
Matrix: Water
Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
68476-34-6	#2 Diesel	0.15	U	0.15	
NULL	Lube Oil	0.38	U	0.38	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	0.191	0.200	95	50-150

Authorized by: KB **Release Date:** 8/1/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Semivolatile Petroleum Products

Project: Fargher Lake Grocery **Field ID: FLG-WT2**

Work Order: 1907069	**Lab ID #: 1907069-02**	**Batch ID: B19G174**
Project Officer: Marti, Pam	**Collected: 7/24/2019**	**Prepared: 7/29/2019**
Initial Vol: 1040 mL	**Prep Method: SW3535A**	**Analyzed: 7/31/2019**
Final Vol: 3 mL	**Analysis Method: NWTPH-DX**	**Matrix: Water**
		Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
68476-34-6	#2 Diesel	0.14	U	0.14	
NULL	Lube Oil	0.36	U	0.36	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	0.185	0.192	96	50-150

Authorized by: KB **Release Date:** 8/1/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Semivolatile Petroleum Products

Project: Fargher Lake Grocery — **QC Type : Method Blank**

Work Order: Batch QC
Project Officer: Marti, Pam
Initial Vol: 1000 mL
Final Vol: 3 mL

Lab ID #: B19G174-BLK1
Prep Method: SW3535A
Analysis Method: NWTPH-DX
Source Field ID: B19G174-BLK1

Batch ID: B19G174
Prepared: 7/29/2019
Analyzed: 7/31/2019
Matrix: Water
Units: mg/L

CAS#	Analyte	Result	Qualifier	RL	MDL
68476-34-6	#2 Diesel	0.15	U	0.15	
NULL	Lube Oil	0.38	U	0.38	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	0.194	0.200	97	50-150

Authorized by: KB **Release Date:** 8/1/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Semivolatile Petroleum Products

Project: Fargher Lake Grocery **QC Type : LCS**

Work Order: Batch QC	**Lab ID #: B19G174-BS1**	**Batch ID: B19G174**
Project Officer: Marti, Pam	**Prep Method: SW3535A**	**Prepared: 7/29/2019**
Initial Vol: 1000 mL	**Analysis Method: NWTPH-DX**	**Analyzed: 7/31/2019**
Final Vol: 3 mL	**Source Field ID: B19G174-BS1**	**Matrix: Water**
		Units: %

Analyte	Result	Spike Level	RL	%Rec	%Rec Limits
#2 Diesel	2.75	3.00	0.15	92	70-130

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	0.194	0.200	97	50-150

Authorized by: KB **Release Date:** 8/1/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Semivolatile Petroleum Products

Project: Fargher Lake Grocery **QC Type : LCS Dup**

Work Order: Batch QC	**Lab ID #: B19G174-BSD1**	**Batch ID: B19G174**
Project Officer: Marti, Pam	**Prep Method: SW3535A**	**Prepared: 7/29/2019**
Initial Vol: 1000 mL	**Analysis Method: NWTPH-DX**	**Analyzed: 7/31/2019**
Final Vol: 3 mL	**Source Field ID: B19G174-BSD1**	**Matrix: Water**
		Units: %

Analyte	Sample Result	Spike Level	%Rec	RPD	%Rec Limits	RPD Limit
#2 Diesel	2.61	3.00	87	5	70-130	40

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	0.188	0.200	94	50-150

Authorized by: LB **Release Date:** 8/1/19

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Appendix A
Sample Correlation Table

Batch ID: B19G174 **Prep Method:** SW3535A

Prepared: 7/29/2019 **Analysis Method:** NWTPH-DX

Field ID	MEL ID
FLG-WT	1907069-01
FLG-WT2	1907069-02
Blank	B19G174-BLK1
LCS	B19G174-BS1
LCS Dup	B19G174-BSD1

Appendix B
Manual Qualification Table

WO: 1907069	**Analysis:** TPHD

No manual qualifiers were added to the samples or batch QC.

Appendix C
Data Qualifier Definitions

Code	Definition
E	Reported result is an estimate because it exceeds the calibration range.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the present of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
NAF	Not analyzed for.
NC	Not calculated.
REJ	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
U	The analyte was not detected at or above the reported sample quantitation limit.
UJ	The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately measure the analyte in the sample.
bold	The analyte was present in the sample. (Visual aid to locate detected compounds on the analytical report.)

Appendix D
QC Exceptions Report

Lab ID	Analyte	Exception

No QC exceptions reported.

QC Exceptions determined using unrounded QC results but are reported as integers throughout this analytical report.

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Appendix E
Initial Calibration Exceptions Report

Calibration ID: B9F2701 **Analysis:** TPHD

LabNumber	Analyte	QC Exception

No ICAL exceptions.

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DEPARTMENT OF ECOLOGY
Manchester Environmental Laboratory
7411 Beach Drive East • Port Orchard, Washington 98366-8204

Case Narrative

July 30, 2019

To: Marti, Pam

Project: Fargher Lake Grocery

Work Order: 1907069

Subject: BTEX

From: Dolores Montgomery

Sample Receipt

Enclosed are the BTEX results for the samples received by MEL on July 25, 2019. All samples were received in acceptable condition unless noted in Analyst Comments. All samples were prepared and analyzed within holding times unless noted in Analyst Comments.

Analytical Methods

These samples were prepared, analyzed, and verified by MEL according to the submitted chain-of-custody and MEL's procedures. A Sample Correlation Table with batch summary is located in Appendix A. The samples were:

- extracted following a modification of method SW5030B.
- analyzed following a modification of method SW8021B.

Analyst Comments

None noted.

Sample Qualification

The samples were qualified according to MEL's procedures. The table in Appendix B summarizes the manual qualifiers added by MEL. All results reported below the method reporting limit (RL) were automatically qualified as estimates, but not included in Appendix B. The qualifiers are defined in Appendix C.

Sample Verification

All analyses met QC acceptance criteria except as noted in Appendix D. All analytes met linearity requirements unless noted in Appendix E.

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
BTEX

Project: Fargher Lake Grocery **Field ID: FLG-WT**

Work Order: 1907069	**Lab ID #: 1907069-01**	**Batch ID: B19G173**
Project Officer: Marti, Pam	**Collected: 7/24/2019**	**Prepared: 7/29/2019**
Initial Vol: 5 mL	**Prep Method: SW5030B**	**Analyzed: 7/29/2019**
Final Vol: 5 mL	**Analysis Method: SW8021B**	**Matrix: Water**
		Units: ug/L

CAS#	Analyte	Result	Qualifier	RL	MDL
71-43-2	Benzene	1.00	U	1.00	0.258
100-41-4	Ethylbenzene	1.00	U	1.00	0.106
179601-23-1	m,p-Xylene	2.00	U	2.00	0.240
95-47-6	o-Xylene	1.00	U	1.00	0.177
108-88-3	Toluene	1.00	U	1.00	0.145

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	23.5	24.0	98	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	53.0	56.0	95	70-130

Authorized by: _____ **Release Date:** 07/30/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
BTEX

Project: Fargher Lake Grocery **Field ID: FLG-WT2**

Work Order: 1907069	**Lab ID #: 1907069-02**	**Batch ID: B19G173**
Project Officer: Marti, Pam	**Collected: 7/24/2019**	**Prepared: 7/29/2019**
Initial Vol: 5 mL	**Prep Method: SW5030B**	**Analyzed: 7/29/2019**
Final Vol: 5 mL	**Analysis Method: SW8021B**	**Matrix: Water**
		Units: ug/L

CAS#	Analyte	Result	Qualifier	RL	MDL
71-43-2	Benzene	1.00	U	1.00	0.258
100-41-4	Ethylbenzene	1.00	U	1.00	0.106
179601-23-1	m,p-Xylene	2.00	U	2.00	0.240
95-47-6	o-Xylene	1.00	U	1.00	0.177
108-88-3	Toluene	1.00	U	1.00	0.145

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	23.2	24.0	97	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	41.7	56.0	74	70-130

Authorized by: _____ **Release Date:** 07/30/19

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Project: Fargher Lake Grocery **QC Type : Method Blank**

Work Order: Batch QC	**Lab ID #: B19G173-BLK1**	**Batch ID: B19G173**
Project Officer: Marti, Pam	**Prep Method: SW5030B**	**Prepared: 7/29/2019**
Initial Vol: 5 mL	**Analysis Method: SW8021B**	**Analyzed: 7/29/2019**
Final Vol: 5 mL	**Source Field ID: B19G173-BLK1**	**Matrix: Water**
		Units: ug/L

CAS#	Analyte	Result	Qualifier	RL	MDL
71-43-2	Benzene	1.00	U	1.00	0.258
100-41-4	Ethylbenzene	1.00	U	1.00	0.106
179601-23-1	m,p-Xylene	2.00	U	2.00	0.240
95-47-6	o-Xylene	1.00	U	1.00	0.177
108-88-3	Toluene	1.00	U	1.00	0.145

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	23.6	24.0	99	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	53.1	56.0	95	70-130

Authorized by: DLL **Release Date:** 07/30/19

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Project: Fargher Lake Grocery **QC Type : LCS**

Work Order: Batch QC
Project Officer: Marti, Pam
Initial Vol: 5 mL
Final Vol: 5 mL

Lab ID #: B19G173-BS1
Prep Method: SW5030B
Analysis Method: SW8021B
Source Field ID: B19G173-BS1

Batch ID: B19G173
Prepared: 7/29/2019
Analyzed: 7/29/2019
Matrix: Water
Units: %

Analyte	Result	Spike Level	RL	%Rec	%Rec Limits
Benzene	10.0	10.0	1.00	100	70-130
Ethylbenzene	9.5	10.0	1.00	95	70-130
m,p-Xylene	18.0	20.0	2.00	90	70-130
o-Xylene	9.1	10.0	1.00	91	70-130
Toluene	9.7	10.0	1.00	97	70-130

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	23.6	24.0	98	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	45.5	56.0	81	70-130

Authorized by: DEL **Release Date:** 07/30/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
BTEX

Project: Fargher Lake Grocery **QC Type : LCS Dup**

Work Order: Batch QC
Project Officer: Marti, Pam
Initial Vol: 5 mL
Final Vol: 5 mL

Lab ID #: B19G173-BSD1
Prep Method: SW5030B
Analysis Method: SW8021B
Source Field ID: B19G173-BSD1

Batch ID: B19G173
Prepared: 7/29/2019
Analyzed: 7/29/2019
Matrix: Water
Units: %

Analyte	Sample Result	Spike Level	%Rec	RPD	%Rec Limits	RPD Limit
Benzene	9.9	10.0	99	1	70-130	40
Ethylbenzene	9.2	10.0	92	3	70-130	40
m,p-Xylene	17.6	20.0	88	2	70-130	40
o-Xylene	8.9	10.0	89	2	70-130	40
Toluene	9.5	10.0	95	2	70-130	40

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	23.6	24.0	99	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	51.1	56.0	91	70-130

Authorized by: DR **Release Date:** 07/30/19

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
BTEX

Project: Fargher Lake Grocery **QC Type : Matrix Spike**

Work Order: Batch QC
Project Officer: Marti, Pam
Initial Vol: 5 mL
Final Vol: 5 mL

Lab ID #: B19G173-MS1
Prep Method: SW5030B
Analysis Method: SW8021B
Source Field ID: B19G173-MS1
Source Lab ID #: 1907069-01

Batch ID: B19G173
Prepared: 7/29/2019
Analyzed: 7/29/2019
Matrix: Water
Units: %

Analyte	Result	Spike Level	Source Result	%Rec	%Rec Limits
Benzene	11.1	10.0	0.0	111	70-130
Ethylbenzene	10.3	10.0	0.0	103	70-130
m,p-Xylene	19.4	20.0	0.0	97	70-130
o-Xylene	9.7	10.0	0.0	97	70-130
Toluene	10.3	10.0	0.0	103	70-130

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	23.5	24.0	98	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	49.4	56.0	88	70-130

Authorized by: _____ **Release Date:** 07/30/19

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Washington State Department of Ecology
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Final Report for
BTEX

Project: Fargher Lake Grocery — **QC Type : Matrix Spike Dup**

Work Order: Batch QC	**Lab ID #: B19G173-MSD1**	**Batch ID: B19G173**
Project Officer: Marti, Pam	**Prep Method: SW5030B**	**Prepared: 7/29/2019**
Initial Vol: 5 mL	**Analysis Method: SW8021B**	**Analyzed: 7/29/2019**
Final Vol: 5 mL	**Source Field ID: B19G173-MSD1**	**Matrix: Water**
	Source Lab ID #: 1907069-01	**Units: %**

Analyte	Sample Result	Spike Level	Source Result	%Rec	RPD	%Rec Limits	RPD Limit
Benzene	10.9	10.0	0.0	109	2	70-130	50
Ethylbenzene	10.1	10.0	0.0	101	2	70-130	50
m,p-Xylene	19.1	20.0	0.0	96	2	70-130	50
o-Xylene	9.6	10.0	0.0	96	1	70-130	50
Toluene	10.1	10.0	0.0	101	2	70-130	50

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
540-36-3	1,4-Difluorobenzene	23.5	24.0	98	70-130
615-59-8	Benzene, 1,4-dibromo-2-methyl	55.6	56.0	99	70-130

Authorized by: DLR **Release Date:** 07/30/19

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Appendix A
Sample Correlation Table

Batch ID: B19G173 **Prep Method:** SW5030B

Prepared: 7/29/2019 **Analysis Method:** SW8021B

Field ID	MEL ID
FLG-WT	1907069-01
FLG-WT2	1907069-02
Blank	B19G173-BLK1
LCS	B19G173-BS1
LCS Dup	B19G173-BSD1
Matrix Spike (FLG-WT)	B19G173-MS1
Matrix Spike Dup (FLG-WT)	B19G173-MSD1

Appendix B
Manual Qualification Table

WO: 1907069	**Analysis:** BTEX

No manual qualifiers were added to the samples or batch QC.

Appendix C
Data Qualifier Definitions

Code	Definition
E	Reported result is an estimate because it exceeds the calibration range.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the present of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
NAF	Not analyzed for.
NC	Not calculated.
REJ	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
U	The analyte was not detected at or above the reported sample quantitation limit.
UJ	The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately measure the analyte in the sample.
bold	The analyte was present in the sample. (Visual aid to locate detected compounds on the analytical report.)

Appendix D
QC Exceptions Report

Lab ID	Analyte	Exception

No QC exceptions reported.

QC Exceptions determined using unrounded QC results but are reported as integers throughout this analytical report.

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Appendix E
Initial Calibration Exceptions Report

Calibration ID: B8C2801 **Analysis:** TPHG

LabNumber	Analyte	QC Exception

No ICAL exceptions.

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Manchester Environmental Laboratory
7411 Beach Drive E, Port Orchard, Washington 98366

Case Narrative - Metals

July 30, 2019

Project: Fargher Lake Grocery

Work Order: 1907069

Project Manager: Marti, Pam

By: Dean Momohara

Summary

The laboratory followed EPA 200.8 for the preparation and analysis of trace metals.

The analysis requested was evaluated by established regulatory quality assurance guidelines.

Sample Information

The samples were received at the Manchester Laboratory on 7/25/2019. The samples were received in good condition and were properly preserved. Two samples were received and assigned laboratory identification numbers 01 and 02.

Holding Times

The laboratory performed the analysis within its hold time.

Calibration

The instrument was calibrated following the appropriate method. All initial and continuing calibration verification checks were within the acceptance limits. All initial and continuing calibration blank checks were within the acceptance limits. All standard residuals were within acceptance limits. The r-value was within acceptance limits. The instrument was calibrated with a NIST traceable standard and verified to be in calibration with a second source NIST traceable standard.

Method Blanks

No analytically significant level of analyte was detected in the method blank associated with these samples.

Laboratory Control Samples

The laboratory control sample recovery was within the acceptance limits.

Replicates

The associated duplicate relative percent difference of samples with concentrations greater than 5 times the reporting limit was within the acceptance limits.

Matrix Spikes

The matrix spike recovery was within the acceptance limits.

Internal Standards

All internal standard recoveries were within the acceptance limits.

Other Quality Assurance Measures and Issues

U - The analyte was not detected at or above the reported result.

bold - The analyte was present in the sample. (Visual Aid to locate detected compounds on report sheet.)

Please call Dean Momohara at (360) 871-8808 to further discuss this project.

cc: Project File

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Analysis Report for
Lead

Project Name: Fargher Lake Grocery

Project Officer: Marti, Pam
Work Order: 1907069
Analyte: Lead

Prep Method: EPA200.2
Prepared: 07/26/19
Batch ID: B19G154

Analysis Method: EPA200.8
Matrix: Water
Units: ug/L

Sample #	Sample ID	Result	Qualifier	RL	MDL	Collected	Analyzed
1907069-01	FLG-WT	0.10	U	0.10	0.02	07/24/19	07/29/19
1907069-02	FLG-WT2	0.10	U	0.10	0.02	07/24/19	07/29/19

QC Results for Batch ID: B19G154

Method Blank	Sample ID	Result	Qualifer	RL	MDL
B19G154-BLK1	Blank	0.10	U	0.10	0.02

Sample #	QC Sample	Result	Spike Level	Source Sample	Source Result	%Rec	%Rec Limits	RPD	RPD Limit
B19G154-BS1	LCS	25.0	25.0			100	85-115		
B19G154-BSD1	LCS Dup	24.8	25.0			99	85-115	0.5	20
B19G154-MS1	Matrix Spike	25.2	25.0	1907069-01	0.100 U	101	75-125		
B19G154-MSD1	Matrix Spike Dup	25.9	25.0	1907069-01	0.100 U	103	75-125	3	20

Authorized by: DM **Release Date:** 7/30/19 **Page 1 of 1**

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