



Prepared For:

## Circle S Grocery

### Groundwater Monitoring Report

28 January 2020

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# Circle S Grocery

## Groundwater Monitoring Report



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Thomas Beckman  
Partner



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Lindsey Kenyon  
Staff Scientist



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Jeremy Stariwat  
Senior Scientist

ERM Alaska, Inc.  
900 E. Benson Blvd., Suite 480  
Anchorage, AK 99508

T: +1 907 258 4880  
F: +1 907 258 4033

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## Acronyms and Abbreviations

Name	Description
%	percent
°C	degrees Celsius
µS/cm	microseimens per centimeter
AAC	Alaska Administrative Code
AK	Alaska Method
AMSL	above mean sea level
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CSM	conceptual site model
DO	dissolved oxygen
DRO	diesel range organics
EMI	Environmental Management, Inc.
EPA	U.S. Environmental Protection Agency
ERM	ERM Alaska, Inc.
GAC	granulated activated carbon
GRO	gasoline range organics
IDW	investigation derived waste
MCLs	maximum contaminant levels
mg/kg	milligrams per kilogram
mg/L	milligrams per Liter
mV	millivolts
ORP	oxidation-reduction potential
pH	hydrogen potential
QA/QC	quality assurance/quality control
RRO	residual range organics
SGS	SGS North America, Inc.
Site	Circle S Grocery, 22189 Birchwood Loop Road, Chugiak, Alaska
TCLP	toxicity characteristic leaching procedure
UST	underground storage tank
ADEC	Alaska Department of Environmental Conservation

SCL	soil cleanup level
USEPA	United States Environmental Protection Agency
PAH	poly-cyclic aromatic hydrocarbon
VOC	volatile organic compound
IDW	investigative derived waste

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## 1. INTRODUCTION

ERM Alaska, Inc. (ERM) is submitting this report to the Alaska Department of Environmental Conservation (ADEC) on behalf of Ms. Pomposa Porterfield, which details the groundwater and drinking water sampling conducted in November 2018 at the former Circle S Grocery (the Site) located at 22189 Birchwood Loop Road, Chugiak, Alaska (Figure 1), ADEC File Number 2106.26.004, Hazard ID 24797. The current property owner is Ms. Pomposa Porterfield. Activities associated with this project also occurred on the adjacent property (22179 Birchwood Loop Road) that has the same owner.

Monitoring well sampling occurred in November 2018 as a request from ADEC for groundwater monitoring. ADEC also requested sampling of the on-site drinking water well in a letter dated 7 June 2017 (ADEC 2017a).

The purpose of this effort was to perform groundwater monitoring to assess the horizontal extent of impacts of historic releases. This report was prepared in accordance with requirements specified within Title 18 of the Alaska Administrative Code, Chapter 75 (18 AAC 75), Article 3, entitled Oil and Hazardous Substance Pollution Control, amended as of 27 October 2018 (ADEC 2018a).

### 1.1 Site Description

Chugiak is located in southcentral Alaska, approximately 20 miles north of Anchorage, as shown on Figure 1. Chugiak is part of the Municipality of Anchorage located between the communities of Eagle River and Eklutna. Chugiak was first settled in the 1950s, primarily by former military personnel who had served in Alaska during World War II and homesteaded in the area. There are approximately 8,300 year-round residents in Chugiak.

### 1.2 Site Background

Circle S Grocery previously operated a gas station and a small convenience store at the Site. In June 1995, two underground storage tanks (USTs) (one 10,000-gallon gasoline UST and one 5,000-gallon diesel UST) were removed from the Site. Some of the impacted soil beneath the USTs was excavated during the UST removals. According to the 1995 UST Permanent Closure Site Assessment Report (New Horizons Telecom, Inc. 1995), not all of the impacted soil was excavated and the excavation area was lined with a fuel resistant liner before the installation of a replacement UST. The closure report stated that the 5,000-gallon UST was used to store gasoline until 1994, when the product was switched to diesel. These tanks were replaced by an 11,000-gallon dual compartment tank in 1995, which held both gasoline and diesel fuel for the gas station's fuel sales until the store's closing. In August 2012, the dual compartment UST was removed (reported as 15,000 gallons in the UST removal report; Environmental Management, Inc. [EMI] 2012).

Soil sampling was performed during the 1995 and 2012 UST removal actions, and a limited site investigation was conducted in 1999 to characterize fuel releases from the USTs. The reports documenting these activities indicate that petroleum hydrocarbons remain in the soil at the Site at concentrations that exceeded the ADEC cleanup levels. In June 2013, the ADEC sent a letter to Ms. Porterfield that outlined the ADEC regulations concerning contaminated sites and responsibilities as a landowner (ADEC 2013a). The letter requested that a work plan be developed to define the nature and extent of the remaining contamination, and be submitted to ADEC.

Soils in the immediate vicinity of the UST were reportedly mostly pea gravel (EMI 2012). The soils surrounding the pea gravel consisted of brown sandy silt with gravel. No groundwater was encountered during either the 1995 or the 2012 UST removal actions. Groundwater level at the Site was approximately 100 to 120 feet below ground surface (bgs).

### 1.3 Previous Investigations

During UST removal action in 1995, the final excavation measured 22 feet long by 37 feet wide by 16 feet deep. Fuel-contaminated soil was encountered throughout the excavation to a depth of 15 feet bgs. Laboratory analysis of soil samples collected from the bottom of the excavation indicated that remaining soil was impacted above applicable ADEC-cleanup levels for petroleum hydrocarbons. It was determined that the owner at the time would have been placed in “severe economic hardship” if the new tank was not installed, so it was decided at the time that a fuel resistant liner would be placed in the excavation prior to the installation of a new UST and clean backfill (New Horizons Telecom, Inc. 1995).

The August 1999 limited site investigation was conducted to characterize the extent of petroleum hydrocarbon impacts remaining in the subsurface (TELLUS Ltd. 1999a). Two soil boreholes were advanced to a depth approximately 67 feet bgs. Laboratory results of soil samples collected from the boreholes indicated that benzene and gasoline range organics (GRO) concentrations exceeded the Table B1 Method Two, Migration to Groundwater ADEC soil cleanup levels (SCLs) (ADEC 2018a). Although groundwater was not encountered in the boreholes, monitoring wells were installed and checked in September 1999, groundwater was not detected (TELLUS Ltd. 1999b).

During UST removal action in 2012, the excavation did not extend past the fuel-resistant liner placed under the dual compartment UST during the 1995 installation. However, the liner was reportedly torn during this removal action and it was noted that fuel was seen dripping from the locations where the dispensers were removed. Laboratory results for soil samples collected from the areas below the dispensers indicated that benzene and diesel-range organics (DRO) exceeded the ADEC SCLs (EMI 2012). Soil removed from the excavation was stockpiled and sampled. Results for the soil stockpile samples indicated that this soil was not impacted above the ADEC SCLs. The closure report did not state what material was used to backfill the excavation.

In January 2014, ERM advanced three boreholes in the vicinity of the former USTs to delineate the extent of soil contamination present in the subsurface. Two boreholes were advanced to a depth of 26 feet bgs and the third borehole was advanced to 82 feet bgs. The analytical results from the soil boring samples indicated that petroleum hydrocarbons remained in the subsurface soil at concentrations exceeding applicable ADEC SCLs within the footprint of the former UST location as shallow as 14 feet bgs and as deep as 82 feet bgs. The data also indicated the UST removed in 2012 may have been the potential source for the DRO contamination remaining in soils within the lined excavation area. The USTs removed in 1995 are the likely source of GRO and benzene, toluene, ethylbenzene, and total xylenes (BTEX) contamination remaining in deeper (below the liner) soils at the Site.

A second investigation was conducted by ERM in November 2014. Local drinking water wells were assessed in order to evaluate potential exposure pathways. The closest drinking water well identified was Ms. Porterfield’s well, approximately 150 feet from the former UST basin. The details of these field activities are presented in a letter report to ADEC entitled Drinking Water Well Sampling Report, dated 30 December 2014 (ERM 2014). Analytical results from this drinking water well indicated that benzene was detected one order of magnitude below the maximum contaminant levels (MCLs) set forth in Title 40 Code of Federal Regulations Parts 141.61 (United States Environmental Protection Agency [USEPA] 2014), as adopted by reference in 18 AAC 80.010(a)(10)(A) (ADEC 2014).

In order to monitor the fluctuations of BTEX constituents, an on-site drinking water well (at 22179 Birchwood Loop Road) was sampled on a monthly basis from April 2015 until April 2016. The details of these monitoring events are presented in a letter report to ADEC entitled Circle S Quarterly Drinking Water Summary Report, dated 17 May 2016 (ERM 2016; Appendix I). Analytical results from these monitoring events indicate that low-level concentrations of toluene, ethylbenzene, and xylene constituents are present in the drinking water, though none of the analytes detected exceeded their applicable MCLs. Analytical results for benzene during the drinking water sampling events were typically below the applicable MCL. A

single sampling event of this well on 26 January 2016 showed an increase in the benzene concentration above MCLs. The three subsequent sampling events all show a return to benzene concentrations well below MCLs. The results from the monthly drinking water sampling are summarized in Table 5.

In addition, a neighboring well, located southwest of the Site at The Crossing (a local church and school) 22208 Birchwood Loop Road was sampled in April 2015. No target analytes were detected in that sample.

In a letter dated 7 April 2015, ADEC requested that Ms. Porterfield conduct monthly drinking water sampling of the well serving her property for benzene, toluene, ethylbenzene, and total xylenes (collectively referred to as BTEX), beginning in the month of April 2015. BTEX were consistently detected in the drinking water samples collected from the residence at the former Circle S Grocery site (22179 Birchwood Loop Road). Concentrations of benzene exceeded the Title 18 of the Alaska Administrative Code Chapter 75 (18 AAC 75) Table C groundwater cleanup level in the samples collected in January 2016. ADEC also requested that the closest community well, located at 22208 Birchwood Loop Road, be sampled in April 2015 for BTEX as well. ERM conducted this sampling on 29 April 2015 and concentrations of BTEX in this sample were non-detect with laboratory method detection limits below ADEC regulatory limits.

Three monitoring wells (MW-01, MW-02, and MW-03) were installed at the former Circle S Grocery site in October 2015 and were sampled on a quarterly basis from November 2015 through October 2016 (Figure 2). GRO, DRO, residual range organics, and BTEX were detected in samples collected from all monitoring wells during the quarterly monitoring events.

MW-01 was installed to a depth of 127 ft bgs, with a screened interval from 107 to 127 ft bgs. MW-02 was installed to a depth of 120 ft bgs, with a screened interval from 100 to 120 ft bgs. MW-03 was installed to a depth of 117 ft bgs, with a screened interval from 97 to 117 ft bgs. In a 7 June 2017 letter, the ADEC requested the following (ADEC 2017a):

- Need to discuss the current use of the on-property drinking water well. If it is currently in use or is used in the future it will need to be sampled on a monthly basis in accordance with past sampling and reporting requirements.
- The proposed two additional monitoring wells and monitoring well MW-02 need to be sampled on a quarterly basis, including depth to groundwater measurements on the monitoring wells and groundwater flow direction calculations for that monitoring event.
- ADEC approves, until further notice, a reduction in the collection of analytical samples from monitoring well MW-01 and MW-03 from quarterly to semi-annual and suspending residual range organic (RRO) analysis for soil and groundwater sampling.
- Analytical soil samples need to be collected at the soil/water interface for the two additional monitoring wells. If based on field readings / observations another depth appears to be contaminated, then additional analytical samples need to be collected. The soil samples need to be analyzed for full list of volatile organic compounds (VOCs) (USEPA Method 8260), gasoline range organics (GRO), DRO, and poly-cyclic aromatic hydrocarbons (PAHs).
- The next groundwater sampling event in each monitoring well is to be analyzed for full VOCs method (8260), GRO, DRO, and PAHs. Based on the results you may request a reduction in the list of analytes.
- The next drinking water well sampling event is to be analyzed for VOC (USEPA Method 524.2), GRO, DRO, and PAHs (method 525.2). Based on the results you may request a reduction in the list of analytes.
- Need a work plan for the installation and sampling of any replacement drinking water wells. The work plan needs to include proposed location(s) and applicable separation distances. Before use a drinking

water well source the well will need analytical sampling and a pump test needs to be conducted to evaluate any drawdown in the on-property monitoring wells and water wells.

- Need to provide more detail on the depth of the pump intake during the groundwater sampling to document that it was within the top foot of the water column at the time of sampling.

Investigation activities performed as a result of these requests are described in this report.

## 1.4 Regulatory Framework

The regulatory framework for this project was developed using the following regulations and guidance documents:

- 18 AAC 80, Drinking Water (ADEC 2019a);
- 18 AAC 78, Underground Storage Tanks (ADEC 2019b);
- 18 AAC 75, Oil and Other Hazardous Substances Pollution Control (ADEC 2018a);
- Title 40 of the Code of Federal Regulations (CFR), Protection of the Environment, Chapter 141 (USEPA 2014);
- ADEC Policy Guidance on Developing Conceptual Site Models (ADEC 2017b); and
- ADEC Field Sampling Guidance (ADEC 2019c).

The primary contaminants of concern at the Site are GRO, DRO, volatile organic compounds (VOCs) and poly-cyclic aromatic hydrocarbons (PAHs). All analytical results for groundwater samples collected were compared to groundwater cleanup levels found in 18 AAC 75, Table C (ADEC 2018a).

## 1.5 Project Objectives

The objectives for the investigation conducted in November 2018 were to comply with the ADEC letter requests dated 7 June 2017 (ADEC 2017a). Field activities included:

- Sampling monitoring wells MW-01, MW-02, and MW-03 for the analyses listed in Section 1.4 in accordance with the ADEC *Field Sampling Guidance* (ADEC 2019c);
- Sampling Ms. Porterfield's current drinking water well for the analyses listed in Section 1.4 in accordance with the ADEC *Field Sampling Guidance* (ADEC 2019c); and
- Surveying monitoring wells MW-01, MW-02, and MW-03 for relative elevation to access groundwater flow direction at the site.

## 1.6 Deviations from the Work Plan

The prescribed activities in the *Groundwater Monitoring and Drinking Water Well Sampling Work Plan* (ERM 2018) were completed satisfactorily and there were no deviations.

## 2. GROUNDWATER MONITORING ACTIVITIES AND RESULTS

This section describes the groundwater monitoring activities completed at the Site during the November monitoring event. All groundwater monitoring activities were performed in accordance with the ADEC Field Sampling Guidance (ADEC 2019c).

### 2.1 Groundwater Sampling Activities

Three on-site monitoring wells were sampled in November 2018 for:

- GRO using Alaska Method (AK) 101
- DRO using Alaska Method AK 102
- VOCs using USEPA Method 8260 for monitoring wells and USEPA Method 524.2 for the drinking water well
- PAHs using USEPA Method SW8270D SIM for the monitoring wells and USEPA Method 525.2 for the drinking water well.

ERM staff initially measured and recorded depth to water and checked for the presence of free-phase hydrocarbons with an oil/water interface probe during each sampling event. The oil/water interface probe was attached to the top of the submersible pump, approximately 6 inches above the top of the pump intake and then lowered down the well until the pump intake was in the top approximate 1 to 2 feet of the water column.

Monitoring wells were purged until field parameters were stabilized to within the criteria established in the ADEC-approved project work plan (ERM 2018). Standard field parameters (pH, temperature, specific conductance, dissolved oxygen [DO], and oxidation reduction potential [ORP]) were collected using a water quality meter equipped with a flow-through cell and recorded (Table 1). Draw down was not continuously monitored during purging due to the oil/water interface probe being attached to the pump; however, no loss of flow was noted during any of the sampling events indicating little to no draw down throughout purging and sampling.

Samples were collected using the low-flow sampling as described in the ADEC *Field Sampling Guidance* document (ADEC 2019) using a variable speed, centrifugal pump directly into laboratory supplied sample bottles containing preservatives, as required by the analytical method.

Each sample was given a unique identification and stored in an ice-chilled cooler containing a temperature blank and maintained at a temperature of  $4 \pm 2$  degrees Celsius ( $^{\circ}\text{C}$ ). Trip blanks were placed in the cooler that contained the vials for volatile analyses. A field duplicate was collected during this sampling event and submitted blind to the laboratory for the analyses listed above. No indication that the sample was a duplicate was made on the chain of custody form or in the sample numbering scheme. All samples were submitted to the laboratory using standard chain of custody procedure.

The field notes and sample collection data sheets for each monitoring well from each sampling event are provided in Appendix A.

### 2.2 Groundwater Field Observations

The following subsections summarize the findings of the groundwater field observations. Field measured water quality parameters for each sampling location are provided in Table 1.

### **2.2.1 Visual Observations**

All monitoring wells were tested for the presence of free-phase hydrocarbons using an oil/water interface probe prior to commencing sampling activities. Free phase hydrocarbons were not observed in any of the monitoring wells before or during purging or observed in the purge water.

### **2.2.2 Olfactory Observations**

No odors were observed at any of the monitoring wells before or during purging or observed in the purge water.

### **2.2.3 Dissolved Oxygen**

Dissolved oxygen (DO) concentrations at location MW-02 were considerably lower than seen at wells MW-01 and MW-03, suggesting that natural biodegradation of the source plume may be occurring. DO concentrations are provided in Table 1.

## **2.3 Groundwater Flow Direction, Gradient, and Elevations**

Groundwater elevations recorded during the November 2018 monitoring event is presented in Table 1.

Groundwater levels were initially collected at all three monitoring well locations prior to sampling. Water levels were additionally collected at all three monitoring wells and at the on-site drinking water well after the completion of survey activities. The monitoring wells were surveyed using an auto level during the November 2018 groundwater sampling event and have been surveyed in this manner during most past sampling events. An arbitrary back shot was surveyed and assigned a value of 100 ft. The monitoring wells were then surveyed relative to the 100 ft back shot.

Groundwater generally flowed to the west-northwest for the November 2018 sampling event, a significant change from previous groundwater gradients which generally flowed north-northeast. Calculated gradient of groundwater was 0.1128 feet/foot (Figures 3). The former north-northeasterly flow may have been present in the past at the Site due to the on-site drinking water well drawing water from the same aquifer. However, this change in gradient may be from the lack of use of the drinking water well. Visual representations of groundwater flow direction and gradient are provided on Figure 3.



### 3. HISTORICAL ANALYTICAL RESULTS

A summary of the analytical results for the groundwater monitoring well samples and drinking water well samples collected at the Site is provided in Tables 2 and 3. The following sections provide a summary of the groundwater sampling results for each of the historic sampling events.

#### 3.1 Monitoring Event 1 – November 2015

During the November 2015 sampling event one monitoring well, MW-02, contained elevated levels, above the 18 AAC 75 Table C cleanup levels, for the following petroleum constituents: benzene at 0.104 milligrams per liter (mg/L), exceeding the ADEC cleanup level of 0.0046 mg/L; Ethylbenzene at 0.119 mg/L, exceeding the ADEC cleanup level of 0.015 mg/L; and total xylenes at 0.444 mg/L, also exceeding the respective ADEC cleanup level of 0.190 mg/L. The analytical results for the November 2015 sampling event are included in Tables 3 and 4.

#### 3.2 Monitoring Event 2 – February 2016

Reported benzene concentration at MW-02 reduced by one order of magnitude from the November 2015 sampling event from 0.104 mg/L to 0.0110 mg/L; however, benzene concentration during this sampling event remained above the respective ADEC cleanup level. Reported ethylbenzene concentration also reduced by one order of magnitude during the February sampling event from 0.119 mg/L to 0.0322 mg/L, remaining above the respective ADEC cleanup level. Reported total xylenes concentration remained above the respective ADEC cleanup level showing only a slight reduction from the previous sampling event, 0.444 mg/L to 0.4130 mg/L. The analytical results for the February 2016 sampling event are included in Tables 3 and 4.

#### 3.3 Monitoring Event 3 – June 2016

Reported benzene and ethylbenzene concentrations at MW-02 increased slightly to 0.0208 mg/L and 0.0540 mg/L, respectively, during the June 2016 sampling event, remaining above their respective ADEC cleanup levels. Total xylenes concentration continued to decline slightly during the June sampling event from 0.413 mg/L to 0.284 mg/L, remaining above the ADEC cleanup level. The analytical results for the June 2016 sampling event are included in Tables 3 and 4.

#### 3.4 Monitoring Event 4 – October 2016

Reported benzene and ethylbenzene concentrations at MW-2 increased by one order of magnitude during the October 2016 sampling event to a historical high of 0.229 mg/L and 0.161 mg/L, respectively. Total xylenes also increased to their highest recorded concentration (0.545 mg/L). All reported concentrations of benzene, ethylbenzene, and total xylenes exceeded their applicable ADEC cleanup levels. The analytical results for the October 2016 sampling event are included in Tables 3 and 4.

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## 4. 2018 ANALYTICAL RESULTS AND FIELD PROGRAM

### 4.1 Groundwater Analytical Results

Three groundwater samples were submitted to the SGS North America (SGS) laboratory in Anchorage, Alaska, for analysis of VOCs, GRO, DRO, and PAH. The results for these samples are presented in Table 2.

Analytical groundwater sample results for samples collected at locations MW-01 and MW-03 indicate all constituents were either not detected or detected at concentrations below applicable 18 AAC 75, Table C (ADEC 2018a) cleanup levels during the November 2015, February 2016, June 2016, October 2016, and November 2019 sampling events.

Analytical results from the groundwater samples collected from monitoring well MW-02 during this same time period indicate that GRO, DRO, and toluene concentrations were present at concentrations below applicable ADEC cleanup levels.

The analytes that exceeded their applicable ADEC cleanup levels are as follows:

- Naphthalene;
- 1,2,4-Trimethylbenzene;
- 1,2-Dichloroethane;
- Benzene;
- Ethylbenzene; and
- Total xylenes.

Reported benzene ethylbenzene, and total xylenes concentrations reported in samples collected from MW-02 decreased from the October 2016 sampling event, and all three constituents were present at concentrations above their respective ADEC cleanup levels. Benzene decreased from 0.229 mg/L to 0.204 mg/L, ethylbenzene decreased from 0.229 to 0.0987 mg/L, and total xylenes decreased from 0.545 to 0.339 mg/L.

Further, the analytical results from MW-01 may be biased low, as the static water level is above the screened interval. Based on the well construction log of MW-01, the screened interval is from 107 to 127 ft BGS (ERM Alaska, Inc. , 2017). Static water elevation measured during the November 2019 sampling event was found to be at 105.95 ft BGS, and is therefore approximately one foot above the top of the screen.

A summary of the analytical results for the groundwater monitoring well samples collected at the Site is provided in Table 2, and the associated laboratory analytical reports are included in Appendix C. Figure 4 provides a summary of the groundwater sampling results for the November 2018 event.

### 4.2 Drinking Water Analytical Results

One drinking water well sample was submitted with the monitoring well samples to the SGS laboratory in Anchorage, Alaska. Analytical results for the drinking water sample indicate that the constituents of concern for the Site were either not detected, or were detected but at concentrations below applicable 18 AAC 75, Table C (ADEC 2018a) cleanup levels. Select VOCs and PAHs, including BTEX constituents and naphthalene, were detected. A summary of the analytical results for the drinking water well sample is found in Table 2. Figure 4 provides a summary of the drinking water sampling results for the November 2018 event.

### 4.3 Investigation-Derived Waste

Investigation Derived Waste (IDW) for this portion of the project consisted of solid and liquid waste, including personal protective equipment (i.e., sampling gloves), poly-tubing, paper towels, and purge water. Solid waste was placed into a garbage bag, taped shut, and disposed of in an on-site trash receptacle. Liquid waste from purge water was filtered through a granulated activated carbon (GAC) filter. Appendix D provides details regarding decontamination and purge-water treatment using GAC. Approximately nine gallons of treated water was discharged on the northern edge of the property, approximately 300 feet from, and downgradient of, the drinking water well located at the property. Further, no proximal drinking water wells are located within 100 feet of this location. This location was pre-approved with the ADEC in October 2018 before sampling commenced.

## 5. CONCEPTUAL SITE MODEL

The conceptual site model (CSM) for the Site was modified by ERM using the 2018 drinking water (Appendix E) and groundwater sampling results, and ADEC's *Guidance on Developing Conceptual Site Models* (ADEC 2017b).

The CSM conservatively assumes that there are completed exposure pathways between remaining contamination identified in site soils and future site receptors through incidental soil ingestion and inhalation of outdoor air.

The results from the groundwater and drinking water sampling events demonstrate that the human exposure pathway to groundwater and drinking water is complete. A phone call with Ms. Porterfield on 7 June 2017 indicated that the residence at 22179 Birchwood Loop is currently being occupied by Ms. Porterfield's son-in-law and that the drinking water well at the Site is not being used as a drinking water source at this time, but water from the well was being used for bathing, laundry, and other household activities. The analytical results from the drinking water well sampling indicate that the human exposure pathway for inhalation of volatile compounds from tap water is complete since the water from the well is still being used for other activities besides consumption.

The CSM human health scoping form and graphical form are included in Appendix E.

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## 6. DATA USABILITY REPORT

Field and laboratory quality assurance/quality control (QA/QC) data associated with the analysis of project samples has been reviewed, and the usability of the analytical data generated from sampling from 13-14 November 2018 has been evaluated. An ADEC Laboratory Data Review Checklist was completed for the sampling event and is provided in Appendix F.

The data and usability review was performed using the USEPA National Functional Guidelines for Superfund Organic Methods Data Review (USEPA 2008) as a reference for qualification. The ADEC laboratory data checklists were completed for this project (ADEC 2017c). All data was reviewed in accordance with ADEC regulatory guidance documents (ADEC 2009; 2012). This data review focused on criteria for QA/QC parameters and their effect on the quality of data and usability.

All results are considered usable for project objectives. Some results are considered estimated due to quality control criteria not being met. The completeness for this project is 100%.

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## 7. CONCLUSIONS AND RECOMMENDATIONS

Three monitoring wells (MW-01, MW-02, and MW-03) were sampled in November 2018. The goal of this event was to evaluate horizontal delineation of the impacted groundwater in the vicinity of the former USTs, and at the on-site drinking water well. Monitoring also performed to determine if natural attenuation of the petroleum hydrocarbon impacts was occurring.

Groundwater elevation data gathered from the Site shows a general west-northwest flow trend at a gradient of 0.1128 feet/foot. This differs from previous year's north-northeast trending gradient. Although the cause of this change is unknown, it may have resulted from the lack of use of the drinking water well, which is located to the north-northeast of the monitoring wells.

GRO, DRO, PAHs, and VOCs were either not detected or were detected below the respective ADEC groundwater cleanup levels in monitoring wells MW-01 and MW-03; however, low concentrations of these constituents at MW-01 may be biased due to the top of the water column being above the screened interval at this location. A replacement of this monitoring well may be warranted.

Concentrations of benzene, ethylbenzene, and total xylenes in MW-02 samples were reported as high as 0.204 mg/L, 0.0987 mg/L, and 0.339 mg/L, respectively. 1,2,4-Trimethylbenzene and 1,2-dichloroethane also exceeded their respective ADEC groundwater cleanup levels. All other constituents detected in MW-02 were reported below their respective ADEC groundwater cleanup levels or were not detected.

Naphthalene was the only PAH constituent that exceeded ADEC groundwater cleanup levels in MW-02, with a reported concentration of 0.0161 mg/L. Naphthalene was detected in the drinking water well sample, but the reported concentration was well below ADEC groundwater cleanup level. 1-Methylnaphthalene and 2-methylnaphthalene were detected in the sample collected from MW-02 at concentrations well below their respective ADEC cleanup levels.

Due to the consistent exceedances of ADEC groundwater cleanup levels seen at MW-02 and detections of BTEX constituents seen in the drinking water well sample (Table 2 and 3), ERM recommends the development of a corrective action/annual sampling plan that will include the following elements:

- Install a new drinking water well for the residence at 22179 Birchwood. The new drinking water well should be installed into a deeper, confined aquifer (if possible) or placed deeper in the water column. The new drinking water well should be placed by a qualified engineer/geologist to avoid any potential future contamination by the existing plume.
- Remove the water pump from the existing drinking water well after the new well is installed for use as a water elevation gauge.
- Install two additional groundwater monitoring wells to the east of MW-02 and downgradient of MW-02 to determine the outer confines of the contamination plume due to the presence of BTEX constituents at monitoring well MW-02 and the on-site drinking water well.
- Decommission MW-01 and replace with a new monitoring well. The new monitoring well should be constructed to as the screen is at least two feet above the static water level at the time of drilling.
- Collect environmental samples in late fall/winter 2019 for nitrates/nitrites, sulfates, ferrous iron, iron manganese, methane, alkalinity, and petroleum hydrocarbons to determine if natural attenuation is occurring or if enhanced remediation is required to mitigate the plume.
- Perform quarterly environmental sampling for GRO, VOCs, DRO, and PAH constituents to evaluate the progress of natural attenuation or enhanced remediation (if applicable) at MW-02 and the two newly installed monitoring wells.

- Reduce the collection of analytical samples from MW-01 and MW-03 from quarterly to semi-annually. Continue to collect samples for GRO, VOCs, DRO, and PAH at these two locations.
- Perform monthly sampling of the drinking water at the faucet located nearest to the existing drinking water well for GRO and VOCS analysis until the new drinking water well is installed.
- Following installation of the new drinking water well, perform monthly sampling for GRO and VOCs analysis for a period of one year. Samples will be collected from the faucet located nearest to the newly installed drinking water well.



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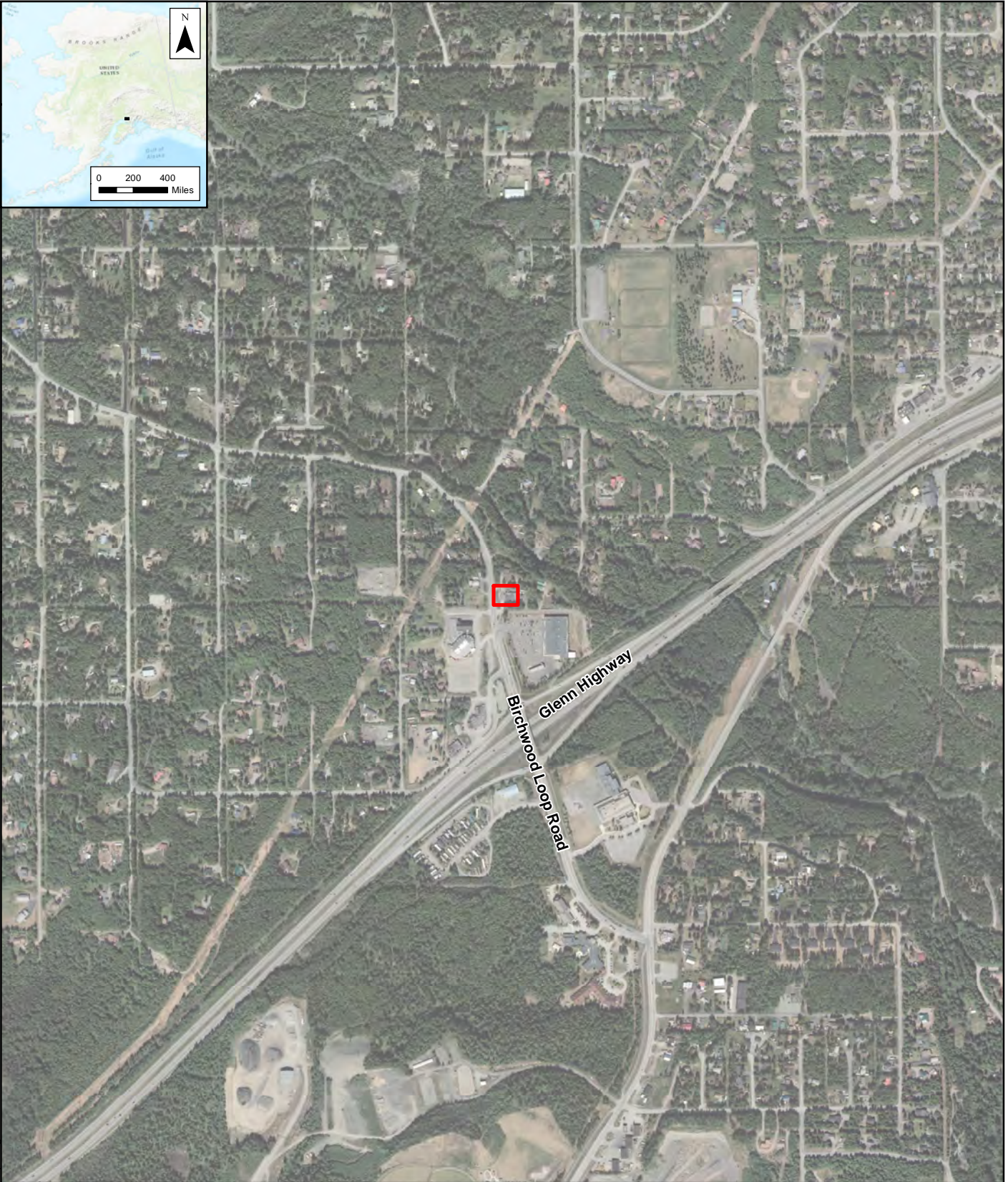
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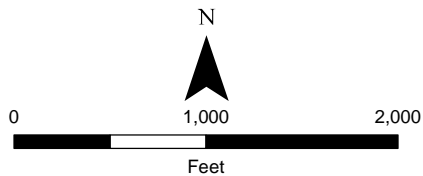
## FIGURES



DRAWN BY: Mike Appel



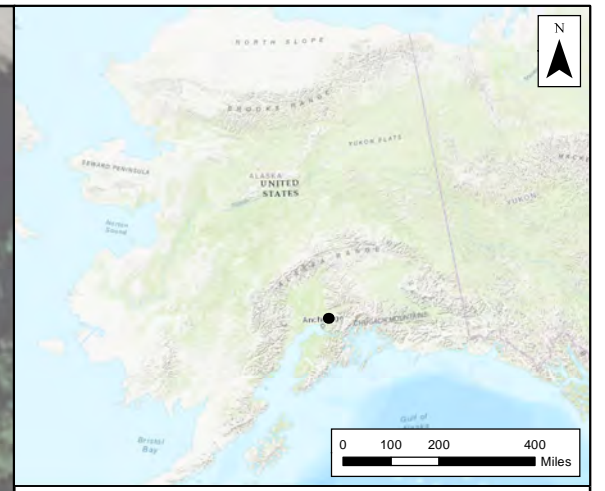
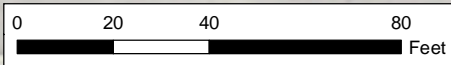
**Legend**  
 Site Location



**Figure 1**  
**Site Location Map**  
 Circle S Grocery Site Investigation  
 22189 Birchwood Loop Road  
 Chugiak, Alaska

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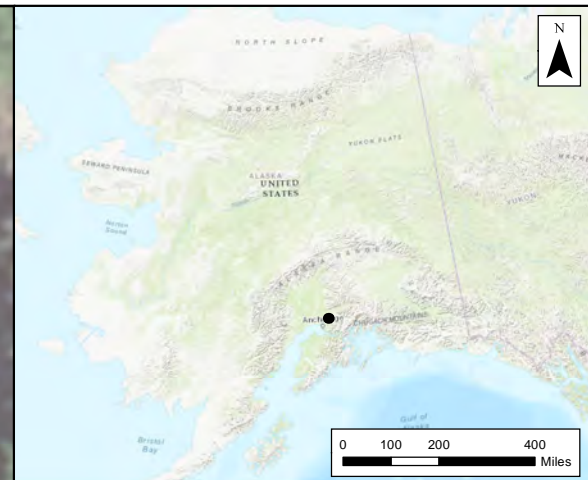


**Legend**



- Monitoring Well
- Drinking Water Well
- Granular Activated Carbon (GAC) Filter
- Approximate UST Location (Removed August 2012)

**Figure 2**  
**Site Layout**  
 Circle S Grocery Site Investigation  
 22189 Birchwood Loop Road  
 Chugiak, Alaska





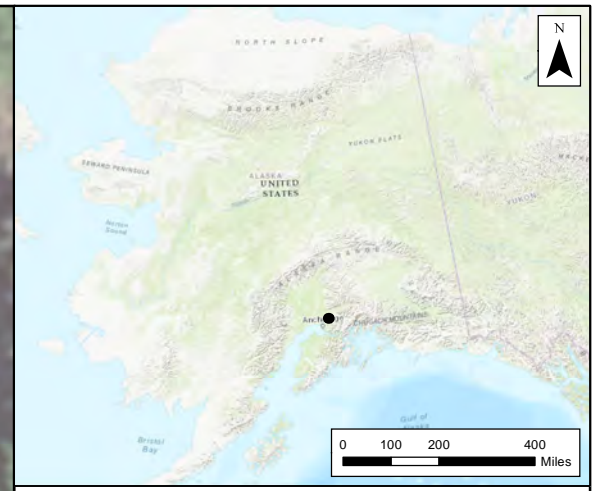
**Legend**

-  Monitoring Well
-  Drinking Water Well

Notes:  
 Groundwater measured on November 14, 2018.  
 Groundwater elevations are relative to an artificial well datum of 100 feet.

**Figure 3**  
**Groundwater Flow Direction and Gradient - November 2018**  
 Circle S Grocery Site Investigation  
 22189 Birchwood Loop Road  
 Chugiak, Alaska





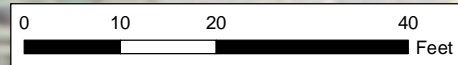
**Legend**

- Monitoring Well
- Drinking Water Well
- Approximate UST Location (Removed)
- August 2012)

**Notes:**  
 All results in milligrams per liter (mg/L).  
 Red results exceed the ADEC Table C Groundwater Cleanup Levels.  
 For the sampling event, field duplicates were collected from the drinking water well and from MW-02 (for DRO and GRO only). Analytical results for these wells are reflective of the highest of the two values reported for the primary and field duplicate samples.  
 ND: Analyte was not detect at or above the laboratory reporting limit.  
 DRO: Diesel-Range Organics  
 GRO: Gasoline-Range Organics  
 Naph: Naphthalene  
 1,2,4-TMB: 1,2,4-Trimethylbenzene  
 1,2-DCA: 1,2-Dichloroethane

J - Analyte detected above the minimum detection limit, but below the laboratory reporting limit, result is an estimate.

**Figure 4**  
**Groundwater and Drinking Water Analytical Results - November 2018**  
 Circle S Grocery Site Investigation  
 22189 Birchwood Loop Road  
 Chugiak, Alaska





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## TABLES

**Table 1: 2018 Groundwater Quality Field Parameters  
Circle S Water Quality Monitoring Report**

Location ID	Sample Date	Field Parameters												
		Temp (°C)	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	pH	Oxidation Reduction Potential (mV)	Sheen	Turbidity (NTU)	Color	Well Depth	Depth to Water	Water Column Height	Top of Casing Elevation	<sup>2</sup> Relative Groundwater Elevation
<b>AWQS Lowest - Fresh Water</b>		<15°C	NA	>5 mg/L	6.5-8.5	NA	No HC Sheen	NA	NA	Feet	Feet	Feet	Feet	Feet
MW-01	11/14/2018	6.97	363	<b>6.8</b>	7.49	158.9	None	Low	Cloudy	125.05	105.95	19.10	104.865	1.085
MW-02	11/13/2018	5.74	460	0.76	6.89	146.8	None	Clear	Clear	121.6	107.19	14.41	104.365	2.825
MW-03	11/14/2018	6.71	631	<b>6.82</b>	7.7	175.7	None	High	Brown	117.2	104.3	12.90	107.765	-3.465
Drinking water well	11/13/2018	5.87	414	<b>6.83</b>	<b>6.45</b>	269.7	None	None-Low	Clear	152	N/A	N/A	101.31	N/A

**Notes**

<sup>1</sup> Water quality standards were taken from Title 18 of the Alaska Administrative Code (AAC), Chapter 75, as amended October 27, 2018 (ADEC 2018).

<sup>2</sup> Relative elevations based on 100 ft backshot

µg/L = Micrograms per liter = parts per billion (ppb).

mg/L = milligrams per liter = parts per million (ppm).

**Bold** = analyte detected above the laboratory limit of detection

= The indicated concentration exceeds the Table C Groundwater Cleanup Level.

**Table 2: Detectable Analyte Summary**  
**Circle S Water Quality Monitoring Report**

Analyte		18 AAC 75 Groundwater Human Health Cleanup Level (mg/L)	Sample Location ID					
			18-CSG-01-DW	*18-CSG-02-DW	18-CSG-01-WG-MW01	18-CSG-03-WG-MW02	**18-CSG-04-WG-MWZ	18-CSG-02-WG-MW03
		Analytical Results (mg/L)						
DRO	Diesel Range Organics	1.5	ND	ND	ND	0.406J	0.345J	ND
GRO	Gasoline Range Organics	2.2	ND	ND	ND	1.26	1.55JS	ND
PAH	Naphthalene	0.0017	0.0000732 J	0.0000740 J	ND	0.0162	(a)	ND
	1-Methylnaphthalene	0.011	ND	ND	ND	0.000653	(a)	ND
	2-Methylnaphthalene	0.036	ND	ND	ND	0.000895	(a)	ND
VOC	1,2,4-Trimethylbenzene	0.015	0.000767 J	0.00112	ND	0.0616	(a)	ND
	1,2-Dichloroethane	0.0017	0.000652	0.000582	ND	0.0118	(a)	ND
	Benzene	0.0046	0.00367	0.00457	ND	0.204	(a)	ND
	Ethylbenzene	0.015	0.00292	0.00414	ND	0.0987	(a)	ND
	Isopropylbenzene	0.45	0.000623 J	0.000903 J	ND	ND	(a)	ND
	n-Propylbenzene	0.66	0.00105	0.00153	ND	0.0238	(a)	ND
	Xylenes (total)	0.19	0.00236	0.00323	ND	0.339	(a)	ND
	1,3,5-Trimethylbenzene	0.12	ND	ND	ND	0.0195	(a)	ND
	4-Isopropyltoluene	NR	ND	ND	ND	0.00320J	(a)	ND
	Toluene	1.1	ND	ND	ND	0.0644	(a)	ND
Chloromethane	0.19	ND	ND	0.000430J	ND	(a)	ND	

Detectable

**Notes:** concentrations reported  
above MDL

J = Laboratory estimate

■ = The indicated concentration exceeds the Table C Groundwater Cleanup Level

\* = Duplicate of 18-CSG-01-DW

\*\* = Partial Duplicate of 18-CSG-03-WG-MW02 collected for DRO and GRO

18-CSG-02-WG-MW03 was non detect (ND) for all analytes

(a) = Not analyzed

NR = Not Regulated under the 18 AAC 75

ND = Not detected

**TABLE 3: Historical Summary of Quarterly Groundwater Analytical Data  
Circle S Water Quality Monitoring Report**

Sample Location	Sample Date	Sample Time	Sample ID	Analytical Results (mg/L) <sup>1</sup>						
				DRO (AK102)	GRO (AK101)	RRO (AK103)	Benzene (EPA 8021B)	Toluene (EPA 8021B)	Ethylbenzene (EPA 8021B)	Total Xylenes (EPA 8021B)
				1.5	2.2	1.1	0.0046	1.1	0.015	0.19
MW-01	11/18/2015	13:30	15-CSG-01-WG-MW01	<b>0.997</b>	<b>0.0800 J</b>	<b>0.557</b>	<b>0.00107</b>	<b>0.00198</b>	ND (0.000500)	<b>0.00425 J</b>
MW-01	2/23/2016	10:15	15-CSG-02-WG-MW01	ND (0.288)	ND (0.0500)	ND (0.240)	ND (0.000250)	ND (0.000500)	ND (0.000500)	ND (0.00150)
MW-01	6/2/2016	11:00	16-CSG-01-WG-MW01	ND (0.300)	ND (0.0500)	<b>0.222 J</b>	ND (0.000250)	ND (0.000500)	ND (0.000500)	ND (0.00150)
MW-01	10/13/2016	10:45	16-CSG-04-WG-MW01	<b>0.380 J</b>	<b>0.0344 J</b>	<b>0.381 J</b>	ND (0.000250)	ND (0.000500)	ND (0.000500)	ND (0.00150)
MW-02	11/18/2015	15:30	15-CSG-01-WG-MW02	<b>1.29</b>	<b>1.91</b>	<b>0.234 J</b>	<b>0.104</b>	<b>0.0467</b>	<b>0.119</b>	<b>0.444</b>
MW-02	2/23/2016	13:25	15-CSG-02-WG-MW02	<b>0.260 J</b>	<b>0.986</b>	ND (0.256)	<b>0.0110</b>	<b>0.0421</b>	<b>0.0322</b>	<b>0.396</b>
FD-2 (Duplicate of MW-02)	2/23/2016	13:40	15-CSG-02-WG-FD	<b>0.286 J</b>	<b>1.02</b>	ND (0.250)	<b>0.0107</b>	<b>0.0452</b>	<b>0.0302</b>	<b>0.413</b>
MW-02	6/2/2016	16:00	16-CSG-03-WG-MW02	<b>0.278 J</b>	<b>0.696</b>	<b>0.187 J</b>	<b>0.0208</b>	<b>0.0450</b>	<b>0.0540</b>	<b>0.284</b>
FD-3 (Duplicate of MW-02)	6/2/2016	16:10	16-CSG-04-WG-MW04	<b>0.355 J</b>	<b>0.620</b>	<b>0.166 J</b>	<b>0.0199</b>	<b>0.0419</b>	<b>0.0485</b>	<b>0.254</b>
MW-02	10/13/2016	12:20	16-CSG-04-WG-MW02	<b>0.886</b>	<b>2.08</b>	ND (0.236)	<b>0.229</b>	<b>0.0918</b>	<b>0.161</b>	<b>0.545</b>
FD-4 (Duplicate of MW-02)	10/13/2016	12:30	16-CSG-04-WG-FD	<b>0.270 J</b>	<b>1.89</b>	ND (0.245)	<b>0.211</b>	<b>0.0875</b>	<b>0.142</b>	<b>0.504</b>
MW-03	11/19/2015	12:00	15-CSG-01-WG-MW03	<b>0.245 J</b>	ND (0.0500)	<b>0.152 J</b>	<b>0.000160 J</b>	ND (0.000500)	ND (0.000500)	<b>0.000310 J, J-D</b>
FD-1 (Duplicate of MW-03)	11/19/2015	12:30	15-CSG-01-WG-FD	<b>0.222 J</b>	<b>0.0319 J</b>	ND (0.245)	<b>0.000210 J</b>	<b>0.000430 J</b>	ND (0.000500)	<b>0.00137 J, J-D</b>
MW-03	2/23/2016	11:40	15-CSG-03-WG-MW-03	ND (0.300)	ND (0.0500)	ND (0.250)	ND (0.000250)	ND (0.000500)	ND (0.000500)	ND (0.00150)
MW-03	6/2/2016	14:00	16-CSG-02-WG-MW03	ND (0.315)	ND (0.0500)	<b>0.190 J</b>	ND (0.000250)	ND (0.000500)	<b>0.000320 J</b>	<b>0.00193 J</b>
MW-03	10/13/2016	9:35	16-CSG-04-WG-MW03	<b>0.337 J</b>	<b>0.0313 J</b>	<b>0.184 J</b>	ND (0.000250)	ND (0.000500)	ND (0.000500)	ND (0.00150)
Trip Blank	11/18/2015	14:00	15-CSG-01-TB-1	(a)	ND (0.0500)	(a)	ND (0.000250)	ND (0.000500)	ND (0.000500)	ND (0.00150)
Trip Blank	2/23/2016	8:00	15-CSG-02-TB	(a)	ND (0.0500)	(a)	ND (0.000250)	ND (0.000500)	ND (0.000500)	ND (0.00150)
Trip Blank	6/2/2016	11:00	Trip Blank	(a)	ND (0.0500)	(a)	ND (0.000250)	ND (0.000500)	ND (0.000500)	ND (0.00150)
Trip Blank	10/13/2016	8:00	16-CSG-04-WG-TB	(a)	ND (0.0500)	(a)	ND (0.000250)	ND (0.000500)	ND (0.000500)	ND (0.00150)

**Notes**

<sup>1</sup> Groundwater cleanup levels were taken from Title 18 of the Alaska Administrative Code (AAC), Chapter 75, as amended October 27, 2018 (ADEC 2018).

(a) = Not analyzed.

J = Analyte detected above the MDL and below the LOQ

J-D = Analytical result is considered estimated due to the relative percent difference exceeding ADEC criteria.

mg/L = milligrams per liter = parts per million (ppm).

**Bold** = analyte detected above the laboratory limit of detection

**0.000310 J, J-D** = The indicated concentration exceeds the Table C Groundwater Cleanup Level.

MDL = method detection limit

LOQ = limit of quantitation

ND (#) = Not detected (limit of detection)

**Table 4: Historical Drinking Water Sample Analytical Results**  
**APRIL 2015 - APRIL 2016**  
**Circle S Water Quality Monitoring Report**

Sample Location	Sample Date	Sample ID	QA/QC Sample (Y/N)?	Analytical Results (µg/L <sup>1</sup> )			
				Benzene (EPA 524.2)	Toluene (EPA 524.2)	Ethylbenzene (EPA 524.2)	Total Xylenes (EPA 524.2)
<b>ADEC Groundwater Cleanup Level (µg/L)</b>				<b>5</b>	<b>1000</b>	<b>700</b>	<b>10000</b>
22179 Birchwood	4/29/2015	15-CSG-01-WG	N	0.290 J	0.250 U	0.480 J	0.720 J
22179 Birchwood	4/29/2015	15-CSG-02-WG	Y	0.300 J	0.250 U	0.470 J	0.620 J
22208 Birchwood	4/29/2015	15-CSG-03-WG	N	0.250 U	0.250 U	0.250 U	5.00 U
NA	4/29/2015	15-TB-01	Y	0.250 U	0.250 U	0.250 U	5.00 U
22179 Birchwood	5/26/2015	15-CSG-04-WG	N	0.220 J	0.250 U	0.470 J	0.580 J
22179 Birchwood	5/26/2015	15-CSG-05-WG	Y	0.230 J	0.250 U	0.470 J	0.590 J
NA	5/26/2015	15-TB-02	Y	0.250 U	0.250 U	0.250 U	5.00 U
22179 Birchwood	6/23/2015	15-CSG-06-WG	N	0.250 U	0.250 U	0.250 U	5.00 U
22179 Birchwood	6/23/2015	15-CSG-07-WG	Y	0.250 U	0.250 U	0.210 J	0.190 J
NA	6/23/2015	15-TB-03	Y	0.250 U	0.250 U	0.250 U	5.00 U
22179 Birchwood	7/27/2015	15-CSG-08-WG	N	0.300 J	0.250 U	0.460 J	0.450 J
22179 Birchwood	7/27/2015	15-CSG-09-WG	Y	0.300 J	0.250 J	0.460 J	0.450 J
NA	7/27/2015	15-TB-04	Y	0.250 U	0.250 U	0.250 U	5.00 U
22179 Birchwood	8/25/2015	15-CSG-10-WG	N	0.240 J	0.250 U	0.290 J	0.260 J
22179 Birchwood	8/25/2015	15-CSG-11-WG	Y	0.300 J	0.250 U	0.350 J	0.300 J
NA	8/25/2015	15-TB-05	Y	0.250 U	0.250 U	0.250 U	5.00 U
22179 Birchwood	9/30/2015	15-CSG-12-WG	N	0.170 J	0.250 U	0.250 U	5.00 U
22179 Birchwood	9/30/2015	15-CSG-13-WG	Y	0.160 J	0.250 U	0.250 U	0.160 J
NA	9/30/2015	15-TB-06	Y	0.250 U	0.250 U	0.250 U	5.00 U
22179 Birchwood	11/18/2015	15-CSG-14-WG	N	0.200 J	0.250 U	0.250 U	5.00 U
22179 Birchwood	11/18/2015	15-CSG-15-WG	Y	0.210 J	0.250 U	0.250 U	5.00 U
NA	11/18/2015	15-CSG-01-TB-07	Y	0.250 U	0.250 U	0.250 U	5.00 U
22179 Birchwood	12/7/2015	15-CSG-16-WG	N	0.290 J	0.250 U	0.210 J	0.190 J
22179 Birchwood	12/7/2015	15-CSG-17-WG	Y	0.270 J	0.250 U	0.250 U	5.00 U
NA	12/7/2015	TRIP BLANK	Y	0.250 U	0.250 U	0.250 U	5.00 U
22179 Birchwood	1/26/2016	15-CSG-18-WG	N	19.3	0.980	18.3	77.3
22179 Birchwood	1/26/2016	15-CSG-19-WG	Y	19.4	0.900	18.7	79.2
NA	1/26/2016	TRIP BLANK	Y	0.250 U	0.250 U	0.250 U	5.00 U
22179 Birchwood	2/23/2016	16-CSG-23-WG	N	3.01	0.250 U	5.03	15.2
22179 Birchwood	2/23/2016	16-CSG-24-WG	Y	2.90	0.250 U	4.94	15.2
NA	2/23/2016	TRIP BLANK	Y	0.250 U	0.250 U	0.250 U	5.00 U
22179 Birchwood	3/18/2016	16-CSG-25-WG	N	1.48	0.250 U	2.74	4.79
22179 Birchwood	3/18/2016	16-CSG-26-WG	Y	1.39	0.250 U	2.61	4.46
NA	3/18/2016	16-CSG-TB	Y	0.250 U	0.250 U	0.250 U	5.00 U
22179 Birchwood	4/21/2016	16-CSG-27-WG	N	0.420 J	0.250 U	0.610	0.690
22179 Birchwood	4/21/2016	16-CSG-28-WG	Y	0.500	0.250 U	0.700	0.810
NA	4/21/2016	16-CSG-TB	Y	0.250 U	0.250 U	0.250 U	5.00 U

**Notes**

<sup>1</sup>: Groundwater cleanup levels were taken from Title 18 of the Alaska Administrative Code (AAC), Chapter 75, as amended October 27, 2018 (ADEC 2018).

J = Analyte detected above the MDL and below the MCL

U = Analytical result is not detected above the MDL

µg/L = Micrograms per liter = parts per billion (ppb).

The indicated concentration exceeds the 18 AAC 75 Table C Groundwater Cleanup Level.

---

**APPENDIX A      SAMPLE DATA SHEETS AND FIELD NOTES**

INCH

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ALL-WEATHER

**FIELD**

No 353N

Circle S Groundwater  
and drinking water  
Monitoring

11/2018 -

PN 0474463





Name ERM Alaska Inc.

PM: Jeremy Starawat

Address 825 W. 8<sup>th</sup> Ave  
Anchorage, AK 99501

Phone (907) 258-4880

Email \_\_\_\_\_

Projects Circle S Grocery  
GW & DW Sampling



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2 28°F Clear Circle S Grocery GW Sampling J. Cox L. Kenyon level D 11/13/18  
 1200 A. Cox & L. Kenyon run the spigot on the side of the house and fill up 5 gallons buckets to measure YSI parameters.  
 1223 Turn down spigot flow rate after letting the pressure tank drain for 23 minutes.  
 1223 Collect primary sample 18-CSG-01-DW.  
 1228 Collect duplicate sample 18-CSG-02-DW.  
 1300 Set up at MW-01, issues w/ pump/controller setup. removing tubing to assess functionality of setup, tubing may be cracked. Replace tubing, check that pump is working. Deploy pump/tubing. Purge approx 8 gallons. Pump failed. Controller will not provide steady voltage output - switch from external battery to vehicle. Similar issue. Called JT to troubleshoot. Swap controllers. Pump head won't work w/ either controller. Troubleshoot. Will try again tomorrow.  
 17:15 Demob, depart site.  
 17:30 Unload gear @ office, ice samples.  
 17:45 Close out day

*Angelo*  
 Page 2 of 3 *Angelo* 11/13/18

3 27°F Clear Circle S Grocery GW Sampling J. Cox L. Kenyon level D 11/13/18  
 Additional notes:  
 • Purge water was labeled & stored onsite, will be treated w/ all generated purge water tomorrow.  
 • JT recommended using a megamonsoon pro with an all-in-one controller for these particular wells. Issues may have been a result of silty water, controller malfunction, and/or pump failure.  
 \*Need to request this pump/controller in the future.

*Angelo* 11/13/18  
 Page 3 of 3 *Angelo* 11/13/18  
*Site in the Rain*



Circle S Grocery GW Sampling 11/14/18  
 19°F clear A. Cox, L. Kenyon Level D

- 0750 A. Cox @ office to load gear,  
 swap ice in DW sample cooler
- 0815 A. Cox to TTT to drop off/exchange  
 hurricane & controllers for  
Megamonsoon pro + All in one  
controller set up.
- 0800 L. Kenyan pump check & calibrate  
 TTT YSI.
- 0900 Dept ANC for site
- 0940 Arrive at site, Safety tailgate.
- 1000 Set up at MW01.
- 1110 Collect sample from MW01  
 (18-CSG-01-WG-mw01).  
 Poured ~2 gal into GAC & plugged  
 outlet to allow for appropriate  
 initial treatment. ~1 hour.  
 Poured remaining 6 gallons of purge  
 water through GAC
- 12:45 Set up at mw-03, begin purging.  
~~Collect s-~~ Thomas Beckman  
 onsite for ALAP audit.
- 1400 Collected sample at mw03  
 18-CSG-02-WG-MW03
- 1445 T. Beckman offsite.

Page 1 of 2 Angela 11/14/18

Circle S Grocery GW Sampling 11/14/18  
 20°F clear A. Cox, L. Kenyon Level D

- 1530 Set up at MW02
- 1547 Collect sample at MW02 + duplicate  
 for GRO & DRO (15:52)  
 18-CSG-03-WG-mw02 (primary)  
 18-CSG-04-WG-mwZ (dup) <sup>partial</sup>
- 1600 Surveyed well casings
- | Well | Relative Elev.<br>@ 100 ft. ATOC | LATOC = ABOVE TOP OF CASING) |
|------|----------------------------------|------------------------------|
| mw03 | 107.765                          |                              |
| mw01 | 104.865                          |                              |
| MW02 | 104.365                          |                              |
| DW   | 101.310                          |                              |
- 1645 Treat remaining <sup>and decon water</sup> purgewater  
 in GAC, decon equipment,  
 Photos + GPS for future DW  
 well location. Note total vol thru GAC = 17 gal
- 17:45 Depart Site for office.
- 18:00 Demob gear, ice samples.
- 18:20 Depart <sup>to</sup> Site Office, Close Out day.

Angela

Page 2 of 2 Angela 11/14/18

### Drinking Water Sampling Worksheet

Project #: <u>0474463</u>	Location: <u>Drinking Water Well Spigot</u>
Project Name: <u>Circle S Groundwater &amp; Drinking Water Monitoring</u>	Date: <u>11/13/18</u>
Field Team: <u>A. Cox, L. Kenyon</u>	Start Time: <u>1200</u>
Sample ID: <u>18-CSG-01-DW</u> Time: <u>1223</u> <input checked="" type="radio"/> primary <input type="radio"/> dup	End Time: <u>12:55</u>
Sample ID: Duplicate: <u>18-CSG-02-DW</u> Time: <u>1228</u> <input type="radio"/> primary <input checked="" type="radio"/> dup	
Weather Conditions: <u>SUNNY ~40°F</u>	

#### Sensory Observations (circle all that apply)

Color: <input checked="" type="radio"/> Clear, <input type="radio"/> Amber, <input type="radio"/> Tan, <input type="radio"/> Brown, <input type="radio"/> Grey, <input type="radio"/> Milky White, <input type="radio"/> Other:	Sheen: <input checked="" type="radio"/> No, <input type="radio"/> Petrogenic, <input type="radio"/> Biogenic
Odor: <input checked="" type="radio"/> None, <input type="radio"/> Low, <input type="radio"/> Medium, <input type="radio"/> High, <input type="radio"/> Very Strong, <input type="radio"/> H2S, <input type="radio"/> Fuel like, <input type="radio"/> Chemical ?, <input type="radio"/> Unknown	Debris: Yes, <input checked="" type="radio"/> No
Turbidity: <input checked="" type="radio"/> None, <input type="radio"/> Low, <input type="radio"/> Medium, <input type="radio"/> High, <input type="radio"/> Very Turbid, <input type="radio"/> Heavy Silts	

#### Instrument Observations

Temp (°C)	Spec. Cond. (mS/cm <sup>4</sup> )	Conductivity (µS/cm)	DO (mg/L)	pH	ORP (mV)
<u>5.87</u>	<u>414</u>	<u>0.653</u>	<u>0.83</u>	<u>6.45</u>	<u>269.7</u>
Velocity (ft/sec) <u>UK 11/13/18</u> <u>569</u> <u>228</u>	Turbidity (NTU) <u>NA (Low)</u>				

#### Location Diagram/Notes

Spigot on North end of house  
See Map.

Analyses	# of Bottles Collected	Bottle Type (preservative)	Comments:
VOC	3 + 3 ✓	40 mL w/ HCl	could not lower flow rate due to nozzle of spigot.
DRO	2 ✓	250 mL w/ HCl	
GRD	3 ✓	40 mL w/ HCl	
PAH	2 + 2 ✓	250 mL no pres.	

Signed: <u>AJG</u>	Date: <u>11/13/18</u>
Signed/reviewer: <u>AJG</u>	Date: <u>11/13/18</u>

# GROUNDWATER SAMPLING FORM

CLIENT: Berkley Specialty Underwriting Managers

SITE: Circle S MW-01

DATE: 11/13/18

MONITORING WELL ID:

SHEET 1 OF 1

SAMPLER(S) NAME: A. Cox, L. Kenyon

SAMPLE ID ON COC: n/a

YSI #/SN: TTT

Weather: 33°F Sunny

1 in = 0.083 ft; 2 in = 0.167 ft; 3 in = 0.25 ft; 4 in = 0.333 ft

PRODUCT PRESENT: None

DIAMETER OF WELL: 0.167 (FT)

PURGE AND SAMPLE METHOD: EPA Low Flow

RADIUS OF WELL (R): 0.083 (FT)

WATER LEVEL MEASURING DEVICE: Oil/Water Interface Probe (200')

TOTAL DEPTH OF WELL BELOW MEASURING POINT (D): 27.9 (FT)

TYPE OF PUMP: Hurricane submersible pump

DEPTH TO GW BELOW MEASURING POINT (d): 105.85 (FT)

WELL INTEGRITY: Good

LENGTH OF WATER COLUMN (L): (D-d)= 22.05 (FT)

REQUIRED REPAIRS: None

VOLUME OF WATER COLUMN (V): (3.14xRxRxL) 0.48 (CUBIC FT)

PUMP INTAKE DEPTH: 106.3

WELL VOLUME: (7.48xV)= 3.59 (GAL) X3= 10.8 (GAL)

Bottom of WLM to intake: 5.5 inches

Min Purge Volume Max Purge Volume

Note: Groundwater volumes above were calculated in the field and used for approximate purge volumes; rounded values are shown for informational purposes only.

TIME	VOLUME (GAL)	WATER LEVEL (ft BTOC)	TEMP (deg C)	Conductivity (µS/cm)	DO (mg/L)	pH	ORP (mV)	TURBIDITY (Visual)	APPEARANCE OF WATER (Visual)
1520	0	*	4.98	367	7.28	7.24	212.6	High	light brown/milky
1523	0.5	*	5.41	367	6.96	7.43	213.1	High	"
1526	1.0	*	6.45	378	7.10	7.62	213.2	High	"
1532	2.0	*	7.39	387	7.13	7.71	212.1	Med	Milky
1535	2.5	*	8.75	404	7.05	7.71	212.5	Low	clear
1538	Pump issues caused missed reading.								
1542	4.0	*	8.05	396	7.06	7.85	209.0	Low	clear
1545	4.5	x	6.37	377	7.11	7.83	210.4	"	"
1548	Pump issues caused missed reading.								
1551	5.0	*	6.46	378	7.50	7.86	209.8	Low	clear
1554	5.5	*	6.46	399	7.12	7.77	212.9	Low	clear
Pump/ Controller failed									

(1) STABILIZATION is achieved when three (3) consecutive readings of pH, conductivity, and DO collected in 3-5 minute intervals meet the following criteria:

- ±0.1 standard units for pH
- ±3% for temperature
- ±3% for conductivity
- ±10 mV for ORP or ±10% if between -100 mV and +100 mV
- ±10% for DO > 0.50 mg/L. Three DO readings < 0.50 mg/L can be considered stable.

PURGE UNTIL PARAMETER STABILIZATION or UNTIL 3 WELL VOLUMES ARE REMOVED

TOTAL VOLUME PURGED: (GAL) FLOW RATE (desired range is 100 to 500 mL/min): n/a

SAMPLE TIME: n/a QC SAMPLES COLLECTED: n/a

ANALYSIS (fill in number of bottles collected)

Groundwater Wells	PAH (2 250-ml ambers, HCl)	Drinking Water Well
GRO (3 40-mL vials, HCl) 3	2	PAH EPA625 (2 250-ml ambers, no pres)
VOCs (3 40-mL vials, HCl) 3		VOC EAP 524.2 (3 40-mL vials, HCl)
DRO (2 250-ml ambers, HCl) 2		Other:

COMMENTS: <sup>ac</sup> Pump is below  
 \* Water level approx: 105.85 throughout purging process. It is ziptied to top of pump (5.5" below wL meter)

Sampler Signature: *[Signature]* QC Check Signature: *[Signature]*

# GROUNDWATER SAMPLING FORM

CLIENT: Berkley Specialty Underwriting Managers

SITE: Circle S

DATE: 11/14/18

MONITORING WELL ID: MW01

SHEET 2 OF 2  
11/14/18 11/14/18

SAMPLER(S) NAME: A. Cox, L. Kenyon

SAMPLE ID ON COC: 18-CSG-01-WG-MW01

YSI #/SN: TIT

Weather: 19°F, clear, sunny

1 in = 0.083 ft; 2 in = 0.167 ft; 3 in = 0.25 ft; 4 in = 0.333 ft

PRODUCT PRESENT: None

DIAMETER OF WELL: 0.167 (FT)

PURGE AND SAMPLE METHOD: EPA Low Flow

RADIUS OF WELL (R): 0.083 (FT)

WATER LEVEL MEASURING DEVICE: Oil/Water Interface Probe (200')

TOTAL DEPTH OF WELL BELOW MEASURING POINT (D): 125.25 (FT)

TYPE OF PUMP: Hurricane submersible pump Mega Monsoon Pro

DEPTH TO GW BELOW MEASURING POINT (d): 105.95 (FT)

WELL INTEGRITY: Good

LENGTH OF WATER COLUMN (L): (D-d)= 19.10 (FT)

REQUIRED REPAIRS: None

VOLUME OF WATER COLUMN (V): (3.14xRxRxL) 0.413 (CUBIC FT)

PUMP INTAKE DEPTH: 100.45 ft

WELL VOLUME: (7.48xV)= 3.09 (GAL) X3= 9.27 (GAL)

Min Purge Volume

Max Purge Volume

Note: Groundwater volumes above were calculated in the field and used for approximate purge volumes; rounded values are shown for informational purposes only.

TIME	VOLUME (GAL)	WATER LEVEL (ft BTOC)	TEMP (deg C)	Conductivity (µS/cm)	DO (mg/L)	pH	ORP (mV)	TURBIDITY (Visual)	APPEARANCE OF WATER (Visual)
1050	1.0	*	5.52	343	7.65	6.27	160.9	Low	Clear
1056	2.0	*	5.83	347	7.20	7.16	148.3	"	"
1059	2.5	*	7.02	360	6.81	7.27	151.2	High	Brown
1102	3.0	*	7.76	370	6.90	7.39	154.6	Med	Cloudy
1105	3.5	*	6.97	363	6.80	7.49	158.9	Low	Cloudy
Conductivity, DO, & ORP stabilized.									
<i>Handwritten signature: Andrew Kenyon 11/14/18</i>									

(1) STABILIZATION is achieved when three (3) consecutive readings of pH, conductivity, and DO collected

in 3-5 minute intervals meet the following criteria:

- ±0.1 standard units for pH
- ±3% for temperature
- ±3% for conductivity
- ±10 mV for ORP or ±10% if between -100 mV and +100 mV
- ±10% for DO > 0.50 mg/L. Three DO readings < 0.50 mg/L can be considered stable.

PURGE UNTIL PARAMETER STABILIZATION or UNTIL 3 WELL VOLUMES ARE REMOVED

TOTAL VOLUME PURGED: 3.5 (GAL) FLOW RATE (desired range is 100 to 500 mL/min): 100, during sample collection

SAMPLE TIME: 1110 QC SAMPLES COLLECTED: N/A

ANALYSIS (fill in number of bottles collected)

Groundwater Wells	PAH (2 250-ml ambers, HCl)	Drinking Water Well
GRO (3 40-mL vials, HCl) <u>3</u>	<u>2</u>	PAH EPA625 (2 250-ml ambers, no pres)
VOCs (3 40-mL vials, HCl) <u>3</u>		VOC EAP 524.2 (3 40-mL vials, HCl)
DRO (2 250-ml ambers, HCl) <u>2</u>		Other:

COMMENTS: \*

- Flow rate was variable during purging (blw 100-500 mL/min), when collecting VOCs, pump turned down to 100 mL/min
- During pump set up, purged 1 gallon. Started recording stabilization parameters after that.

Sampler Signature Andrew Kenyon

QC Check Signature Andrew Kenyon



# GROUNDWATER SAMPLING FORM

CLIENT: Berkley Specialty Underwriting Managers

SITE: Circle S

DATE: 11/13/18

MONITORING WELL ID: MWO2

SHEET 1 OF 1

SAMPLER(S) NAME: A. Cox, V. Kempner

SAMPLE ID ON COC: 18-CSG-03-WG-MWO2 / 18-CSG-03-WG-MWZ

YSI #/SN: TTT

Weather: 19° F clear, sunny

1 in = 0.083 ft; 2 in = 0.167 ft; 3 in = 0.25 ft; 4 in = 0.333 ft

PRODUCT PRESENT: None

DIAMETER OF WELL: 0.167 ~~0.083~~ AC (FT)

PURGE AND SAMPLE METHOD: EPA Low Flow

RADIUS OF WELL (R): 0.083 (FT)

WATER LEVEL MEASURING DEVICE: Oil/Water Interface Probe (200')

TOTAL DEPTH OF WELL BELOW MEASURING POINT (D): 121.60 (FT) 21.9

TYPE OF PUMP: ~~Hurricane submersible pump~~ Mega Monsoon Pro

DEPTH TO GW BELOW MEASURING POINT (d): 107.19 (FT)

WELL INTEGRITY: Good

LENGTH OF WATER COLUMN (L): (D-d) = 17.71 (FT)

REQUIRED REPAIRS: None

VOLUME OF WATER COLUMN (V): (3.14xRxL) 0.38 (CUBIC FT)

PUMP INTAKE DEPTH: 101.7

WELL VOLUME: (7.48xV) = 2.87 (GAL) X3 = 8.60 (GAL)

Min Purge Volume

Max Purge Volume

Note: Groundwater volumes above were calculated in the field and used for approximate purge volumes; rounded values are shown for informational purposes only.

TIME	VOLUME (GAL)	WATER LEVEL (ft BTOC)	TEMP (deg C)	Conductivity (µS/cm)	DO (mg/L)	pH	ORP (mV)	TURBIDITY (Visual)	APPEARANCE OF WATER (Visual)
1530	0.9	*	4.32	432	2.26	6.87	189.5	Low	Clear
1533	1.5	*	5.72	452	1.03	6.84	174.4	Clear	Clear
1536	2.1	*	6.01	456	0.92	6.87	162.7	Clear	Clear
1539	3.0	*	5.73	455	0.77	6.89	154.4	"	"
1542	3.8	*	5.74	460	0.76	6.89	146.8	"	"
Three parameters stabilized									
<i>Randy Kempner 11/14/18</i>									

(1) STABILIZATION is achieved when three (3) consecutive readings of pH, conductivity, and DO collected

in 3-5 minute intervals meet the following criteria:

- ±0.1 standard units for pH
- ±3% for temperature
- ±3% for conductivity
- ±10 mV for ORP or ±10% if between -100 mV and +100 mV
- ±10% for DO > 0.50 mg/L. Three DO readings < 0.50 mg/L can be considered stable.

PURGE UNTIL PARAMETER STABILIZATION or UNTIL 3 WELL VOLUMES ARE REMOVED

TOTAL VOLUME PURGED: 3.8 (GAL) FLOW RATE (desired range is 100 to 500 mL/min): 330 mL/min

SAMPLE TIME: 15:47 (15:47 AC 15:52 Dup) QC SAMPLES COLLECTED: Yes for GRO & DRO.

ANALYSIS (fill in number of bottles collected)

Groundwater Wells	PAH (2 250-ml ambers, HCl)	Drinking Water Well
GRO (3 40-mL vials, HCl) 3 + 3	2	PAH EPA625 (2 250-ml ambers, no pres)
VOCs (3 40-mL vials, HCl) 3		VOC EAP 524.2 (3 40-mL vials, HCl)
DRO (2 250-ml ambers, HCl) 2 + 2		Other:

COMMENTS: \* Pump is 5.5 inches below groundwater, water level meter was attached to pump, water level remain at approx 107.19' BTOC while pumping.

Sampler Signature: *Andy Kempner*

QC Check Signature: *Andy Kempner*



**GROUNDWATER SAMPLING FORM**

CLIENT: Berkley Specialty Underwriting Managers

SITE: Circle S

DATE: 11/14/18

MONITORING WELL ID: MW03

SHEET 1 OF 1

SAMPLER(S) NAME: A. Cox, L. Kenyon

SAMPLE ID ON COC: 18-CSG-02-WG-MW03

YSI #/SN: TT1

Weather: 19°F Clear, sunny

1 in = 0.083 ft; 2 in = 0.167 ft; 3 in = 0.25 ft; 4 in = 0.333 ft

PRODUCT PRESENT: None

DIAMETER OF WELL: 0.167 (FT)

PURGE AND SAMPLE METHOD: EPA Low Flow

RADIUS OF WELL (R): 0.083 (FT)

WATER LEVEL MEASURING DEVICE: Oil/Water Interface Probe (200')

TOTAL DEPTH OF WELL BELOW MEASURING POINT (D): 117.20 (FT) 117.05

TYPE OF PUMP: Hurricane submersible pump Mega Monsoon Pro

DEPTH TO GW BELOW MEASURING POINT (d): 104.30 (FT)

WELL INTEGRITY: Good

LENGTH OF WATER COLUMN (L): (D-d)= 12.75 (FT)

REQUIRED REPAIRS: None

VOLUME OF WATER COLUMN (V): (3.14xRxRxL) 0.28 (CUBIC FT)

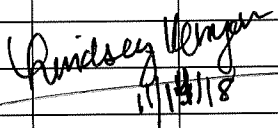
PUMP INTAKE DEPTH: 98.8 ft

WELL VOLUME: (7.48xV)= 2.09 (GAL) X3= 6.28 (GAL)

Min Purge Volume

Max Purge Volume

Note: Groundwater volumes above were calculated in the field and used for approximate purge volumes; rounded values are shown for informational purposes only.

TIME	VOLUME (GAL)	WATER LEVEL (ft BTOC)	TEMP (deg C)	Conductivity (µS/cm)	DO (mg/L)	pH	ORP (mV)	TURBIDITY (Visual)	APPEARANCE OF WATER (Visual)
1338	0	*	4.36	338	10.60	7.66	206.6	High	Milky
1341	0.06	*	4.51	340	7.65	7.58	181.5	"	"
1344	0.12	*	5.33	346	7.10	7.62	185.4	"	"
1347	0.18	*	5.59	350	6.89	7.69	179.1	"	"
1350	0.24	*	6.42	358	6.61	7.70	175.9	"	"
1353	0.30	*	6.71	361	6.82	7.70	175.7	"	"
Three parameters stabilized									
									

(1) STABILIZATION is achieved when three (3) consecutive readings of pH, conductivity, and DO collected

in 3-5 minute intervals meet the following criteria:

- ±0.1 standard units for pH
- ±3% for temperature
- ±3% for conductivity
- ±10 mV for ORP or ±10% if between -100 mV and +100 mV
- ±10% for DO > 0.50 mg/L. Three DO readings < 0.50 mg/L can be considered stable.

**PURGE UNTIL PARAMETER STABILIZATION or UNTIL 3 WELL VOLUMES ARE REMOVED**

TOTAL VOLUME PURGED: 0.30 (GAL)

FLOW RATE (desired range is 100 to 500 mL/min): 230 mL/min

SAMPLE TIME: 1400

QC SAMPLES COLLECTED: N/A

ANALYSIS (fill in number of bottles collected)

Groundwater Wells	PAH (2 250-ml ambers, HCl)	Drinking Water Well
GRO (3 40-mL vials, HCl) 3	2	PAH EPA625 (2 250-ml ambers, no pres)
VOCs (3 40-mL vials, HCl) 3		VOC EAP 524.2 (3 40-mL vials, HCl)
DRO (2 250-ml ambers, HCl) 2		Other:

COMMENTS: \* Pump is 5.5 inches below top of groundwater WL meter ~~attached~~ was attached to pump. WL remained at approx. 104.30' BTOC throughout purging process.

Sampler Signature Lindsey Kenyon

QC Check Signature Angela

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**APPENDIX B      PHOTOGRAPH LOG**



Photo 1: Drinking water well located at 22179 Birchwood Loop Road, Chugiak, Alaska. 11/15/2018 11:42.



Photo 2: Drinking water well located at 22179 Birchwood Loop Road, Chugiak, Alaska. Covered with an unsecured plywood board; facing southwest. 11/15/2018 11:42.

**Circle S Grocery Groundwater and Drinking Water Monitoring**  
**Chugiak, Alaska**  
**November 2018**





Photo 3: 22179 Birchwood Loop Road, Chugiak, Alaska; facing southwest. 11/14/2018 17:11.



Photo 4: Collecting groundwater samples from MW-01. 11/15/2018 11:42.



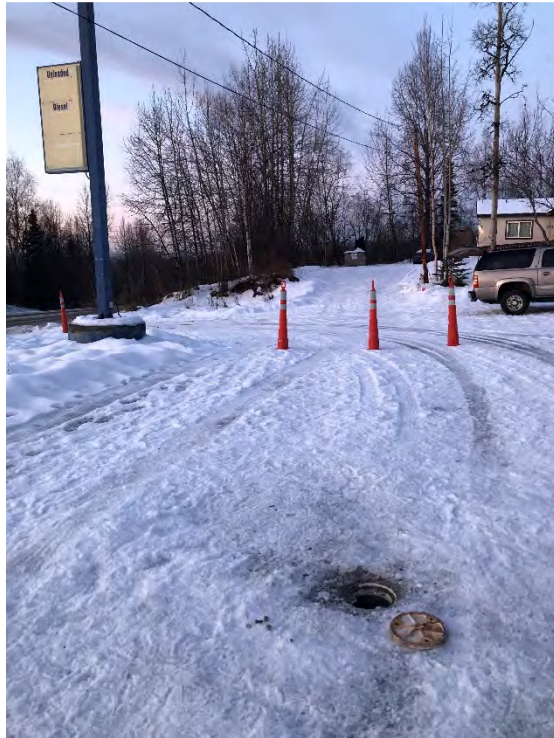


Photo 5: Collecting groundwater samples from MW-01; facing west. 11/15/2018 11:42.



Photo 6: Collecting groundwater samples from MW-02; facing west. 11/15/2018 11:42.



Photo 7: Collecting groundwater samples from MW-02; facing east. 11/15/2018 11:42.



Photo 8: Collecting groundwater samples from MW-03. 11/15/2018 11:43.





Photo 9: Collecting groundwater samples from MW-03; facing south. 11/15/2018 11:43.



Photo 10: Rust in drinking water well found on the oil-water interface probe 11/15/19 11:41.





Photo 11: Drinking water well sample from spigot located on the south side of the home at 22179 Birchwood Loop Road, Chugiak, Alaska.

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**APPENDIX C      LABORATORY ANALYTICAL RESULTS**

## Laboratory Report of Analysis

To: ERM-West, Inc.  
825 West 8th Ave  
Anchorage, AK 99501

Report Number: **1186505**

Client Project: **Circle S Grocery**

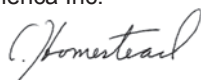
Dear Jeremy Stariwat,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Chuck at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,  
SGS North America Inc.



SGS North America  
Environmental Services - Alaska Division  
General Manager

**Charles Homestead**  
2018.11.28 16:24:44 -09'00'

Chuck Homestead  
Project Manager  
Charles.Homestead@sgs.com

Date

### Case Narrative

SGS Client: **ERM-West, Inc.**  
SGS Project: **1186505**  
Project Name/Site: **Circle S Grocery**  
Project Contact: **Jeremy Stariwat**

Refer to sample receipt form for information on sample condition.

**18-CSG-04-WG-MWZ (1186505006) PS**

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria. Sample was analyzed twice and results confirmed.

**LCS for HBN 1789131 [VXX/33555 (1488712) LCS**

524.2 - LCS recovery for bromochloromethane does not meet QC criteria. This analyte was not detected in associated samples.

**LCS for HBN 1789134 [VXX/33556 (1488718) LCS**

8260C - LCS recoveries for cis-1,2-dichloroethene and bromochloromethane do not meet QC criteria. These analytes were not detected in associated samples.

**LCS for HBN 1789317 [VXX/33578 (1489418) LCS**

8260C - LCS recovery for bromomethane does not meet QC criteria. This analyte was not detected above the LOQ in the associated samples.

**LCSD for HBN 1789134 [VXX/3355 (1488719) LCSD**

8260C - LCSD RPD for vinyl acetate does not meet QC criteria. This analyte was not detected in associated samples.

**LCSD for HBN 1789317 [VXX/3357 (1489419) LCSD**

8260C - LCSD recovery for 1,2-dibromo-3-chloropropane does not meet QC criteria. This analyte was not detected above the LOQ in the associated samples.

\*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 11/27/2018 12:25:39PM

## Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

### Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
18-CSG-01-DW	1186505001	11/13/2018	11/15/2018	Water (Surface, Eff., Ground)
18-CSG-02-DW	1186505002	11/13/2018	11/15/2018	Water (Surface, Eff., Ground)
18-CSG-01-WG-MW01	1186505003	11/14/2018	11/15/2018	Water (Surface, Eff., Ground)
18-CSG-02-WG-MW03	1186505004	11/14/2018	11/15/2018	Water (Surface, Eff., Ground)
18-CSG-03-WG-MW02	1186505005	11/14/2018	11/15/2018	Water (Surface, Eff., Ground)
18-CSG-04-WG-MWZ	1186505006	11/14/2018	11/15/2018	Water (Surface, Eff., Ground)
Trip Blank	1186505007	11/14/2018	11/15/2018	Water (Surface, Eff., Ground)

Method

EPA 625M SIM (PAH) LV  
 8270D SIM LV (PAH)  
 AK102  
 AK101  
 SW8260C  
 EPA 524.2

Method Description

625 PAH SIM GC/MS Low Volume  
 8270 PAH SIM GC/MS Liq/Liq ext. LV  
 DRO Low Volume (W)  
 Gasoline Range Organics (W)  
 Volatile Organic Compounds (W) FULL  
 Volatile Organics by 524.2 (DW)

### Detectable Results Summary

Client Sample ID: **18-CSG-01-DW**

Lab Sample ID: 1186505001

**Polynuclear Aromatics GC/MS**

**Volatile GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Naphthalene	0.0000732J	mg/L
1,2,4-Trimethylbenzene	0.000767J	mg/L
1,2-Dichloroethane	0.000652	mg/L
Benzene	0.00367	mg/L
Ethylbenzene	0.00292	mg/L
Isopropylbenzene (Cumene)	0.000623J	mg/L
n-Propylbenzene	0.00105	mg/L
P & M -Xylene	0.00236	mg/L
Xylenes (total)	0.00236	mg/L

Client Sample ID: **18-CSG-02-DW**

Lab Sample ID: 1186505002

**Polynuclear Aromatics GC/MS**

**Volatile GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Naphthalene	0.0000740J	mg/L
1,2,4-Trimethylbenzene	0.00112	mg/L
1,2-Dichloroethane	0.000582	mg/L
Benzene	0.00457	mg/L
Ethylbenzene	0.00414	mg/L
Isopropylbenzene (Cumene)	0.000903J	mg/L
n-Propylbenzene	0.00153	mg/L
P & M -Xylene	0.00323	mg/L
Xylenes (total)	0.00323	mg/L

Client Sample ID: **18-CSG-01-WG-MW01**

Lab Sample ID: 1186505003

**Volatile GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Chloromethane	0.000430J	mg/L

Client Sample ID: **18-CSG-03-WG-MW02**

Lab Sample ID: 1186505005

**Polynuclear Aromatics GC/MS**

**Semivolatile Organic Fuels**

**Volatile Fuels**

**Volatile GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	0.000653	mg/L
2-Methylnaphthalene	0.000895	mg/L
Naphthalene	0.0162	mg/L
Diesel Range Organics	0.406J	mg/L
Gasoline Range Organics	1.26	mg/L
1,2,4-Trimethylbenzene	0.0616	mg/L
1,2-Dichloroethane	0.0118	mg/L
1,3,5-Trimethylbenzene	0.0195	mg/L
4-Isopropyltoluene	0.00320J	mg/L
Benzene	0.204	mg/L
Ethylbenzene	0.0987	mg/L
Isopropylbenzene (Cumene)	0.0150	mg/L
Naphthalene	0.00920J	mg/L
n-Propylbenzene	0.0238	mg/L
o-Xylene	0.121	mg/L
P & M -Xylene	0.218	mg/L
Toluene	0.0644	mg/L
Xylenes (total)	0.339	mg/L

Print Date: 11/27/2018 12:25:43PM



## Detectable Results Summary

Client Sample ID: **18-CSG-04-WG-MWZ**

Lab Sample ID: 1186505006

**Semivolatile Organic Fuels**

**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	0.345J	mg/L
Gasoline Range Organics	1.55	mg/L



Results of 18-CSG-01-DW

Client Sample ID: 18-CSG-01-DW
Client Project ID: Circle S Grocery
Lab Sample ID: 1186505001
Lab Project ID: 1186505

Collection Date: 11/13/18 12:23
Received Date: 11/15/18 10:42
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their detection results.

Batch Information

Analytical Batch: XMS11228
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: DSD
Analytical Date/Time: 11/21/18 13:04
Container ID: 1186505001-I

Prep Batch: XXX40931
Prep Method: SW3520C
Prep Date/Time: 11/19/18 08:31
Prep Initial Wt./Vol.: 265 mL
Prep Extract Vol: 1 mL



Results of **18-CSG-01-DW**

Client Sample ID: **18-CSG-01-DW**  
Client Project ID: **Circle S Grocery**  
Lab Sample ID: 1186505001  
Lab Project ID: 1186505

Collection Date: 11/13/18 12:23  
Received Date: 11/15/18 10:42  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.288 U	0.577	0.173	mg/L	1		11/19/18 11:07
<b>Surrogates</b>							
5a Androstane (surr)	87.7	50-150		%	1		11/19/18 11:07

**Batch Information**

Analytical Batch: XFC14811  
Analytical Method: AK102  
Analyst: CMS  
Analytical Date/Time: 11/19/18 11:07  
Container ID: 1186505001-G

Prep Batch: XXX40923  
Prep Method: SW3520C  
Prep Date/Time: 11/16/18 08:03  
Prep Initial Wt./Vol.: 260 mL  
Prep Extract Vol: 1 mL



**Results of 18-CSG-01-DW**

Client Sample ID: **18-CSG-01-DW**  
Client Project ID: **Circle S Grocery**  
Lab Sample ID: 1186505001  
Lab Project ID: 1186505

Collection Date: 11/13/18 12:23  
Received Date: 11/15/18 10:42  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		11/19/18 22:36
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	84.3	50-150		%	1		11/19/18 22:36

**Batch Information**

Analytical Batch: VFC14578  
Analytical Method: AK101  
Analyst: ST  
Analytical Date/Time: 11/19/18 22:36  
Container ID: 1186505001-A

Prep Batch: VXX33568  
Prep Method: SW5030B  
Prep Date/Time: 11/19/18 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of 18-CSG-01-DW

Client Sample ID: 18-CSG-01-DW
Client Project ID: Circle S Grocery
Lab Sample ID: 1186505001
Lab Project ID: 1186505

Collection Date: 11/13/18 12:23
Received Date: 11/15/18 10:42
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.



**Results of 18-CSG-01-DW**

Client Sample ID: **18-CSG-01-DW**  
 Client Project ID: **Circle S Grocery**  
 Lab Sample ID: 1186505001  
 Lab Project ID: 1186505

Collection Date: 11/13/18 12:23  
 Received Date: 11/15/18 10:42  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

**Results by Volatile GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Dibromochloromethane	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 15:58
Dibromomethane	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 15:58
Dichlorodifluoromethane	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 15:58
Ethylbenzene	0.00292	0.000500	0.000200	mg/L	1	(<700)	11/21/18 14:08
Hexachlorobutadiene	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 15:58
Isopropylbenzene (Cumene)	0.000623 J	0.00100	0.000250	mg/L	1		11/21/18 14:08
Methylene chloride	0.000250 U	0.000500	0.000200	mg/L	1	(<5)	11/15/18 15:58
Methyl-t-butyl ether	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 15:58
Naphthalene	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 15:58
n-Butylbenzene	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 15:58
n-Propylbenzene	0.00105	0.00100	0.000250	mg/L	1		11/21/18 14:08
o-Xylene	0.000250 U	0.000500	0.000200	mg/L	1		11/21/18 14:08
P & M -Xylene	0.00236	0.000500	0.000400	mg/L	1		11/21/18 14:08
sec-Butylbenzene	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 15:58
Styrene	0.000250 U	0.000500	0.000200	mg/L	1	(<100)	11/15/18 15:58
tert-Butylbenzene	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 15:58
Tetrachloroethene	0.000250 U	0.000500	0.000150	mg/L	1	(<5)	11/15/18 15:58
Toluene	0.000250 U	0.000500	0.000200	mg/L	1	(<1000)	11/15/18 15:58
Total Trihalomethanes	0.00100 U	0.00200	0.000600	mg/L	1	(<80)	11/15/18 15:58
trans-1,2-Dichloroethene	0.000250 U	0.000500	0.000200	mg/L	1	(<100)	11/15/18 15:58
trans-1,3-Dichloropropene	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 15:58
Trichloroethene	0.000250 U	0.000500	0.000200	mg/L	1	(<5)	11/15/18 15:58
Trichlorofluoromethane	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 15:58
Vinyl chloride	0.000200 U	0.000400	0.000200	mg/L	1	(<2)	11/15/18 15:58
Xylenes (total)	0.00236	0.000500	0.000500	mg/L	1	(<10000)	11/21/18 14:08
<b>Surrogates</b>							
1,2-Dichloroethane-D4 (surr)	96.6	70-130		%	1		11/15/18 15:58
4-Bromofluorobenzene (surr)	90.6	70-130		%	1		11/15/18 15:58
Toluene-d8 (surr)	95.5	70-130		%	1		11/15/18 15:58



Results of **18-CSG-01-DW**

Client Sample ID: **18-CSG-01-DW**  
Client Project ID: **Circle S Grocery**  
Lab Sample ID: 1186505001  
Lab Project ID: 1186505

Collection Date: 11/13/18 12:23  
Received Date: 11/15/18 10:42  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Volatile GC/MS**

**Batch Information**

Analytical Batch: VMS18595  
Analytical Method: EPA 524.2  
Analyst: NRO  
Analytical Date/Time: 11/21/18 14:08  
Container ID: 1186505001-D

Prep Batch: VXX33578  
Prep Method: SW5030B  
Prep Date/Time: 11/21/18 06:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Analytical Batch: VMS18578  
Analytical Method: EPA 524.2  
Analyst: FDR  
Analytical Date/Time: 11/15/18 15:58  
Container ID: 1186505001-D

Prep Batch: VXX33555  
Prep Method: SW5030B  
Prep Date/Time: 11/15/18 00:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



### Results of 18-CSG-02-DW

Client Sample ID: **18-CSG-02-DW**  
 Client Project ID: **Circle S Grocery**  
 Lab Sample ID: 1186505002  
 Lab Project ID: 1186505

Collection Date: 11/13/18 12:28  
 Received Date: 11/15/18 10:42  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

### Results by Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Acenaphthene	0.0000245 U	0.0000490	0.0000147	mg/L	1		11/21/18 13:25
Acenaphthylene	0.0000245 U	0.0000490	0.0000147	mg/L	1		11/21/18 13:25
Anthracene	0.0000245 U	0.0000490	0.0000147	mg/L	1		11/21/18 13:25
Benzo(a)Anthracene	0.0000245 U	0.0000490	0.0000147	mg/L	1		11/21/18 13:25
Benzo[a]pyrene	0.00000980 U	0.0000196	0.00000608	mg/L	1		11/21/18 13:25
Benzo[b]Fluoranthene	0.0000245 U	0.0000490	0.0000147	mg/L	1		11/21/18 13:25
Benzo[g,h,i]perylene	0.0000245 U	0.0000490	0.0000147	mg/L	1		11/21/18 13:25
Benzo[k]fluoranthene	0.0000245 U	0.0000490	0.0000147	mg/L	1		11/21/18 13:25
Chrysene	0.0000245 U	0.0000490	0.0000147	mg/L	1		11/21/18 13:25
Dibenzo[a,h]anthracene	0.00000980 U	0.0000196	0.00000608	mg/L	1		11/21/18 13:25
Fluoranthene	0.0000245 U	0.0000490	0.0000147	mg/L	1		11/21/18 13:25
Fluorene	0.0000245 U	0.0000490	0.0000147	mg/L	1		11/21/18 13:25
Indeno[1,2,3-c,d] pyrene	0.0000245 U	0.0000490	0.0000147	mg/L	1		11/21/18 13:25
Naphthalene	0.0000740 J	0.0000980	0.0000304	mg/L	1		11/21/18 13:25
Phenanthrene	0.0000245 U	0.0000490	0.0000147	mg/L	1		11/21/18 13:25
Pyrene	0.0000245 U	0.0000490	0.0000147	mg/L	1		11/21/18 13:25
<b>Surrogates</b>							
2-Methylnaphthalene-d10 (surr)	80.2	47-106		%	1		11/21/18 13:25
Fluoranthene-d10 (surr)	84.7	24-116		%	1		11/21/18 13:25

### Batch Information

Analytical Batch: XMS11228  
 Analytical Method: EPA 625M SIM (PAH) LV  
 Analyst: DSD  
 Analytical Date/Time: 11/21/18 13:25  
 Container ID: 1186505002-D

Prep Batch: XXX40931  
 Prep Method: SW3520C  
 Prep Date/Time: 11/19/18 08:31  
 Prep Initial Wt./Vol.: 255 mL  
 Prep Extract Vol: 1 mL





Results of 18-CSG-02-DW

Client Sample ID: 18-CSG-02-DW
Client Project ID: Circle S Grocery
Lab Sample ID: 1186505002
Lab Project ID: 1186505

Collection Date: 11/13/18 12:28
Received Date: 11/15/18 10:42
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.



**Results of 18-CSG-02-DW**

Client Sample ID: **18-CSG-02-DW**  
 Client Project ID: **Circle S Grocery**  
 Lab Sample ID: 1186505002  
 Lab Project ID: 1186505

Collection Date: 11/13/18 12:28  
 Received Date: 11/15/18 10:42  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

**Results by Volatile GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Dibromochloromethane	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 16:15
Dibromomethane	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 16:15
Dichlorodifluoromethane	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 16:15
Ethylbenzene	0.00414	0.000500	0.000200	mg/L	1	(<700)	11/21/18 14:23
Hexachlorobutadiene	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 16:15
Isopropylbenzene (Cumene)	0.000903 J	0.00100	0.000250	mg/L	1		11/21/18 14:23
Methylene chloride	0.000250 U	0.000500	0.000200	mg/L	1	(<5)	11/15/18 16:15
Methyl-t-butyl ether	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:15
Naphthalene	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 16:15
n-Butylbenzene	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 16:15
n-Propylbenzene	0.00153	0.00100	0.000250	mg/L	1		11/21/18 14:23
o-Xylene	0.000250 U	0.000500	0.000200	mg/L	1		11/21/18 14:23
P & M -Xylene	0.00323	0.000500	0.000400	mg/L	1		11/21/18 14:23
sec-Butylbenzene	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 16:15
Styrene	0.000250 U	0.000500	0.000200	mg/L	1	(<100)	11/15/18 16:15
tert-Butylbenzene	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 16:15
Tetrachloroethene	0.000250 U	0.000500	0.000150	mg/L	1	(<5)	11/15/18 16:15
Toluene	0.000250 U	0.000500	0.000200	mg/L	1	(<1000)	11/15/18 16:15
Total Trihalomethanes	0.00100 U	0.00200	0.000600	mg/L	1	(<80)	11/15/18 16:15
trans-1,2-Dichloroethene	0.000250 U	0.000500	0.000200	mg/L	1	(<100)	11/15/18 16:15
trans-1,3-Dichloropropene	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 16:15
Trichloroethene	0.000250 U	0.000500	0.000200	mg/L	1	(<5)	11/15/18 16:15
Trichlorofluoromethane	0.000500 U	0.00100	0.000250	mg/L	1		11/15/18 16:15
Vinyl chloride	0.000200 U	0.000400	0.000200	mg/L	1	(<2)	11/15/18 16:15
Xylenes (total)	0.00323	0.000500	0.000500	mg/L	1	(<10000)	11/21/18 14:23
<b>Surrogates</b>							
1,2-Dichloroethane-D4 (surr)	87.2	70-130		%	1		11/15/18 16:15
4-Bromofluorobenzene (surr)	93.1	70-130		%	1		11/15/18 16:15
Toluene-d8 (surr)	90.3	70-130		%	1		11/15/18 16:15



Results of **18-CSG-02-DW**

Client Sample ID: **18-CSG-02-DW**  
Client Project ID: **Circle S Grocery**  
Lab Sample ID: 1186505002  
Lab Project ID: 1186505

Collection Date: 11/13/18 12:28  
Received Date: 11/15/18 10:42  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Volatile GC/MS**

**Batch Information**

Analytical Batch: VMS18595  
Analytical Method: EPA 524.2  
Analyst: NRO  
Analytical Date/Time: 11/21/18 14:23  
Container ID: 1186505002-A

Prep Batch: VXX33578  
Prep Method: SW5030B  
Prep Date/Time: 11/21/18 06:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Analytical Batch: VMS18578  
Analytical Method: EPA 524.2  
Analyst: FDR  
Analytical Date/Time: 11/15/18 16:15  
Container ID: 1186505002-A

Prep Batch: VXX33555  
Prep Method: SW5030B  
Prep Date/Time: 11/15/18 00:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of 18-CSG-01-WG-MW01

Client Sample ID: 18-CSG-01-WG-MW01
Client Project ID: Circle S Grocery
Lab Sample ID: 1186505003
Lab Project ID: 1186505

Collection Date: 11/14/18 11:10
Received Date: 11/15/18 10:42
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their surrogate compounds with associated quality and detection data.

Batch Information

Analytical Batch: XMS11228
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/21/18 13:45
Container ID: 1186505003-I

Prep Batch: XXX40931
Prep Method: SW3520C
Prep Date/Time: 11/19/18 08:31
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL



Results of **18-CSG-01-WG-MW01**

Client Sample ID: **18-CSG-01-WG-MW01**  
Client Project ID: **Circle S Grocery**  
Lab Sample ID: 1186505003  
Lab Project ID: 1186505

Collection Date: 11/14/18 11:10  
Received Date: 11/15/18 10:42  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.283 U	0.566	0.170	mg/L	1		11/19/18 11:18
<b>Surrogates</b>							
5a Androstane (surr)	87.9	50-150		%	1		11/19/18 11:18

**Batch Information**

Analytical Batch: XFC14811  
Analytical Method: AK102  
Analyst: CMS  
Analytical Date/Time: 11/19/18 11:18  
Container ID: 1186505003-G

Prep Batch: XXX40923  
Prep Method: SW3520C  
Prep Date/Time: 11/16/18 08:03  
Prep Initial Wt./Vol.: 265 mL  
Prep Extract Vol: 1 mL





Results of **18-CSG-01-WG-MW01**

Client Sample ID: **18-CSG-01-WG-MW01**  
Client Project ID: **Circle S Grocery**  
Lab Sample ID: 1186505003  
Lab Project ID: 1186505

Collection Date: 11/14/18 11:10  
Received Date: 11/15/18 10:42  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		11/19/18 22:54
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	82.6	50-150		%	1		11/19/18 22:54

**Batch Information**

Analytical Batch: VFC14578  
Analytical Method: AK101  
Analyst: ST  
Analytical Date/Time: 11/19/18 22:54  
Container ID: 1186505003-A

Prep Batch: VXX33568  
Prep Method: SW5030B  
Prep Date/Time: 11/19/18 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of 18-CSG-01-WG-MW01

Client Sample ID: 18-CSG-01-WG-MW01
Client Project ID: Circle S Grocery
Lab Sample ID: 1186505003
Lab Project ID: 1186505

Collection Date: 11/14/18 11:10
Received Date: 11/15/18 10:42
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.



Results of 18-CSG-01-WG-MW01

Client Sample ID: 18-CSG-01-WG-MW01
Client Project ID: Circle S Grocery
Lab Sample ID: 1186505003
Lab Project ID: 1186505

Collection Date: 11/14/18 11:10
Received Date: 11/15/18 10:42
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds like Chloroform, Chloromethane, etc., with their respective values and detection limits.



Results of **18-CSG-01-WG-MW01**

Client Sample ID: **18-CSG-01-WG-MW01**  
Client Project ID: **Circle S Grocery**  
Lab Sample ID: 1186505003  
Lab Project ID: 1186505

Collection Date: 11/14/18 11:10  
Received Date: 11/15/18 10:42  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Volatile GC/MS**

**Batch Information**

Analytical Batch: VMS18579  
Analytical Method: SW8260C  
Analyst: FDR  
Analytical Date/Time: 11/15/18 17:07  
Container ID: 1186505003-D

Prep Batch: VXX33556  
Prep Method: SW5030B  
Prep Date/Time: 11/15/18 00:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of 18-CSG-02-WG-MW03

Client Sample ID: 18-CSG-02-WG-MW03
Client Project ID: Circle S Grocery
Lab Sample ID: 1186505004
Lab Project ID: 1186505

Collection Date: 11/14/18 14:00
Received Date: 11/15/18 10:42
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their surrogate compounds with associated values.

Batch Information

Analytical Batch: XMS11228
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/21/18 14:06
Container ID: 1186505004-I

Prep Batch: XXX40931
Prep Method: SW3520C
Prep Date/Time: 11/19/18 08:31
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL





Results of **18-CSG-02-WG-MW03**

Client Sample ID: **18-CSG-02-WG-MW03**  
Client Project ID: **Circle S Grocery**  
Lab Sample ID: 1186505004  
Lab Project ID: 1186505

Collection Date: 11/14/18 14:00  
Received Date: 11/15/18 10:42  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.278 U	0.556	0.167	mg/L	1		11/19/18 11:28
<b>Surrogates</b>							
5a Androstane (surr)	88.9	50-150		%	1		11/19/18 11:28

**Batch Information**

Analytical Batch: XFC14811  
Analytical Method: AK102  
Analyst: CMS  
Analytical Date/Time: 11/19/18 11:28  
Container ID: 1186505004-G

Prep Batch: XXX40923  
Prep Method: SW3520C  
Prep Date/Time: 11/16/18 08:03  
Prep Initial Wt./Vol.: 270 mL  
Prep Extract Vol: 1 mL



Results of **18-CSG-02-WG-MW03**

Client Sample ID: **18-CSG-02-WG-MW03**  
Client Project ID: **Circle S Grocery**  
Lab Sample ID: 1186505004  
Lab Project ID: 1186505

Collection Date: 11/14/18 14:00  
Received Date: 11/15/18 10:42  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		11/19/18 23:12
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	86	50-150		%	1		11/19/18 23:12

**Batch Information**

Analytical Batch: VFC14578  
Analytical Method: AK101  
Analyst: ST  
Analytical Date/Time: 11/19/18 23:12  
Container ID: 1186505004-A

Prep Batch: VXX33568  
Prep Method: SW5030B  
Prep Date/Time: 11/19/18 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of 18-CSG-02-WG-MW03

Client Sample ID: 18-CSG-02-WG-MW03
Client Project ID: Circle S Grocery
Lab Sample ID: 1186505004
Lab Project ID: 1186505

Collection Date: 11/14/18 14:00
Received Date: 11/15/18 10:42
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.



Results of 18-CSG-02-WG-MW03

Client Sample ID: 18-CSG-02-WG-MW03
Client Project ID: Circle S Grocery
Lab Sample ID: 1186505004
Lab Project ID: 1186505

Collection Date: 11/14/18 14:00
Received Date: 11/15/18 10:42
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.



Results of **18-CSG-02-WG-MW03**

Client Sample ID: **18-CSG-02-WG-MW03**  
Client Project ID: **Circle S Grocery**  
Lab Sample ID: 1186505004  
Lab Project ID: 1186505

Collection Date: 11/14/18 14:00  
Received Date: 11/15/18 10:42  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Volatile GC/MS**

**Batch Information**

Analytical Batch: VMS18579  
Analytical Method: SW8260C  
Analyst: FDR  
Analytical Date/Time: 11/15/18 17:24  
Container ID: 1186505004-D

Prep Batch: VXX33556  
Prep Method: SW5030B  
Prep Date/Time: 11/15/18 00:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL





Results of 18-CSG-03-WG-MW02

Client Sample ID: 18-CSG-03-WG-MW02
Client Project ID: Circle S Grocery
Lab Sample ID: 1186505005
Lab Project ID: 1186505

Collection Date: 11/14/18 15:47
Received Date: 11/15/18 10:42
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their detection results.

Batch Information

Analytical Batch: XMS11230
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/26/18 13:41
Container ID: 1186505005-I

Prep Batch: XXX40931
Prep Method: SW3520C
Prep Date/Time: 11/19/18 08:31
Prep Initial Wt./Vol.: 270 mL
Prep Extract Vol: 1 mL

Analytical Batch: XMS11228
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/21/18 14:27
Container ID: 1186505005-I

Prep Batch: XXX40931
Prep Method: SW3520C
Prep Date/Time: 11/19/18 08:31
Prep Initial Wt./Vol.: 270 mL
Prep Extract Vol: 1 mL



Results of **18-CSG-03-WG-MW02**

Client Sample ID: **18-CSG-03-WG-MW02**  
Client Project ID: **Circle S Grocery**  
Lab Sample ID: 1186505005  
Lab Project ID: 1186505

Collection Date: 11/14/18 15:47  
Received Date: 11/15/18 10:42  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.406 J	0.566	0.170	mg/L	1		11/19/18 11:39
<b>Surrogates</b>							
5a Androstane (surr)	93.6	50-150		%	1		11/19/18 11:39

**Batch Information**

Analytical Batch: XFC14811  
Analytical Method: AK102  
Analyst: CMS  
Analytical Date/Time: 11/19/18 11:39  
Container ID: 1186505005-G

Prep Batch: XXX40923  
Prep Method: SW3520C  
Prep Date/Time: 11/16/18 08:03  
Prep Initial Wt./Vol.: 265 mL  
Prep Extract Vol: 1 mL



**Results of 18-CSG-03-WG-MW02**

Client Sample ID: **18-CSG-03-WG-MW02**  
Client Project ID: **Circle S Grocery**  
Lab Sample ID: 1186505005  
Lab Project ID: 1186505

Collection Date: 11/14/18 15:47  
Received Date: 11/15/18 10:42  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Volatile Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.26	0.100	0.0310	mg/L	1		11/19/18 23:30
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	140	50-150		%	1		11/19/18 23:30

**Batch Information**

Analytical Batch: VFC14578  
Analytical Method: AK101  
Analyst: ST  
Analytical Date/Time: 11/19/18 23:30  
Container ID: 1186505005-A

Prep Batch: VXX33568  
Prep Method: SW5030B  
Prep Date/Time: 11/19/18 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of 18-CSG-03-WG-MW02

Client Sample ID: 18-CSG-03-WG-MW02
Client Project ID: Circle S Grocery
Lab Sample ID: 1186505005
Lab Project ID: 1186505

Collection Date: 11/14/18 15:47
Received Date: 11/15/18 10:42
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.



Results of 18-CSG-03-WG-MW02

Client Sample ID: 18-CSG-03-WG-MW02
Client Project ID: Circle S Grocery
Lab Sample ID: 1186505005
Lab Project ID: 1186505

Collection Date: 11/14/18 15:47
Received Date: 11/15/18 10:42
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.





Results of **18-CSG-03-WG-MW02**

Client Sample ID: **18-CSG-03-WG-MW02**  
Client Project ID: **Circle S Grocery**  
Lab Sample ID: 1186505005  
Lab Project ID: 1186505

Collection Date: 11/14/18 15:47  
Received Date: 11/15/18 10:42  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Volatile GC/MS**

**Batch Information**

Analytical Batch: VMS18579  
Analytical Method: SW8260C  
Analyst: FDR  
Analytical Date/Time: 11/15/18 17:41  
Container ID: 1186505005-D

Prep Batch: VXX33556  
Prep Method: SW5030B  
Prep Date/Time: 11/15/18 00:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of **18-CSG-04-WG-MWZ**

Client Sample ID: **18-CSG-04-WG-MWZ**  
Client Project ID: **Circle S Grocery**  
Lab Sample ID: 1186505006  
Lab Project ID: 1186505

Collection Date: 11/14/18 15:52  
Received Date: 11/15/18 10:42  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.345 J	0.566	0.170	mg/L	1		11/19/18 11:49
<b>Surrogates</b>							
5a Androstane (surr)	87.9	50-150		%	1		11/19/18 11:49

**Batch Information**

Analytical Batch: XFC14811  
Analytical Method: AK102  
Analyst: CMS  
Analytical Date/Time: 11/19/18 11:49  
Container ID: 1186505006-D

Prep Batch: XXX40923  
Prep Method: SW3520C  
Prep Date/Time: 11/16/18 08:03  
Prep Initial Wt./Vol.: 265 mL  
Prep Extract Vol: 1 mL



Results of **18-CSG-04-WG-MWZ**

Client Sample ID: **18-CSG-04-WG-MWZ**  
Client Project ID: **Circle S Grocery**  
Lab Sample ID: 1186505006  
Lab Project ID: 1186505

Collection Date: 11/14/18 15:52  
Received Date: 11/15/18 10:42  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.55		0.100	0.0310	mg/L	1		11/19/18 23:48
<b>Surrogates</b>								
4-Bromofluorobenzene (surr)	151	*	50-150		%	1		11/19/18 23:48

**Batch Information**

Analytical Batch: VFC14578  
Analytical Method: AK101  
Analyst: ST  
Analytical Date/Time: 11/19/18 23:48  
Container ID: 1186505006-A

Prep Batch: VXX33568  
Prep Method: SW5030B  
Prep Date/Time: 11/19/18 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



### Results of Trip Blank

Client Sample ID: **Trip Blank**  
Client Project ID: **Circle S Grocery**  
Lab Sample ID: 1186505007  
Lab Project ID: 1186505

Collection Date: 11/14/18 00:00  
Received Date: 11/15/18 10:42  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

### Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		11/19/18 21:42
<b>Surrogates</b>							
4-Bromofluorobenzene (surr)	75.1	50-150		%	1		11/19/18 21:42

### Batch Information

Analytical Batch: VFC14578  
Analytical Method: AK101  
Analyst: ST  
Analytical Date/Time: 11/19/18 21:42  
Container ID: 1186505007-A

Prep Batch: VXX33568  
Prep Method: SW5030B  
Prep Date/Time: 11/19/18 08:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



### Results of Trip Blank

Client Sample ID: **Trip Blank**  
 Client Project ID: **Circle S Grocery**  
 Lab Sample ID: 1186505007  
 Lab Project ID: 1186505

Collection Date: 11/14/18 00:00  
 Received Date: 11/15/18 10:42  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

### Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,1,1,2-Tetrachloroethane	0.000250 U	0.000500	0.000150	mg/L	1		11/15/18 16:50
1,1,1-Trichloroethane	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
1,1,2,2-Tetrachloroethane	0.000250 U	0.000500	0.000150	mg/L	1		11/15/18 16:50
1,1,2-Trichloroethane	0.000200 U	0.000400	0.000120	mg/L	1		11/15/18 16:50
1,1-Dichloroethane	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
1,1-Dichloroethene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
1,1-Dichloropropene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
1,2,3-Trichlorobenzene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
1,2,3-Trichloropropane	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
1,2,4-Trichlorobenzene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
1,2,4-Trimethylbenzene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
1,2-Dibromo-3-chloropropane	0.00500 U	0.0100	0.00310	mg/L	1		11/15/18 16:50
1,2-Dibromoethane	0.0000375 U	0.0000750	0.0000180	mg/L	1		11/15/18 16:50
1,2-Dichlorobenzene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
1,2-Dichloroethane	0.000250 U	0.000500	0.000150	mg/L	1		11/15/18 16:50
1,2-Dichloropropane	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
1,3,5-Trimethylbenzene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
1,3-Dichlorobenzene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
1,3-Dichloropropane	0.000250 U	0.000500	0.000150	mg/L	1		11/15/18 16:50
1,4-Dichlorobenzene	0.000250 U	0.000500	0.000150	mg/L	1		11/15/18 16:50
2,2-Dichloropropane	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
2-Butanone (MEK)	0.00500 U	0.0100	0.00310	mg/L	1		11/15/18 16:50
2-Chlorotoluene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
2-Hexanone	0.00500 U	0.0100	0.00310	mg/L	1		11/15/18 16:50
4-Chlorotoluene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
4-Isopropyltoluene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
4-Methyl-2-pentanone (MIBK)	0.00500 U	0.0100	0.00310	mg/L	1		11/15/18 16:50
Benzene	0.000200 U	0.000400	0.000120	mg/L	1		11/15/18 16:50
Bromobenzene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
Bromochloromethane	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
Bromodichloromethane	0.000250 U	0.000500	0.000150	mg/L	1		11/15/18 16:50
Bromoform	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
Bromomethane	0.00250 U	0.00500	0.00150	mg/L	1		11/15/18 16:50
Carbon disulfide	0.00500 U	0.0100	0.00310	mg/L	1		11/15/18 16:50
Carbon tetrachloride	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
Chlorobenzene	0.000250 U	0.000500	0.000150	mg/L	1		11/15/18 16:50
Chloroethane	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50



### Results of Trip Blank

Client Sample ID: **Trip Blank**  
 Client Project ID: **Circle S Grocery**  
 Lab Sample ID: 1186505007  
 Lab Project ID: 1186505

Collection Date: 11/14/18 00:00  
 Received Date: 11/15/18 10:42  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

### Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Chloroform	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
Chloromethane	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
cis-1,2-Dichloroethene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
cis-1,3-Dichloropropene	0.000250 U	0.000500	0.000150	mg/L	1		11/15/18 16:50
Dibromochloromethane	0.000250 U	0.000500	0.000150	mg/L	1		11/15/18 16:50
Dibromomethane	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
Dichlorodifluoromethane	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
Ethylbenzene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
Freon-113	0.00500 U	0.0100	0.00310	mg/L	1		11/15/18 16:50
Hexachlorobutadiene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
Isopropylbenzene (Cumene)	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
Methylene chloride	0.00250 U	0.00500	0.00100	mg/L	1		11/15/18 16:50
Methyl-t-butyl ether	0.00500 U	0.0100	0.00310	mg/L	1		11/15/18 16:50
Naphthalene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
n-Butylbenzene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
n-Propylbenzene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
o-Xylene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
P & M -Xylene	0.00100 U	0.00200	0.000620	mg/L	1		11/15/18 16:50
sec-Butylbenzene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
Styrene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
tert-Butylbenzene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
Tetrachloroethene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
Toluene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
trans-1,2-Dichloroethene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
trans-1,3-Dichloropropene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
Trichloroethene	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
Trichlorofluoromethane	0.000500 U	0.00100	0.000310	mg/L	1		11/15/18 16:50
Vinyl acetate	0.00500 U	0.0100	0.00310	mg/L	1		11/15/18 16:50
Vinyl chloride	0.0000750 U	0.000150	0.0000500	mg/L	1		11/15/18 16:50
Xylenes (total)	0.00150 U	0.00300	0.00100	mg/L	1		11/15/18 16:50
<b>Surrogates</b>							
1,2-Dichloroethane-D4 (surr)	89.6	81-118		%	1		11/15/18 16:50
4-Bromofluorobenzene (surr)	92	85-114		%	1		11/15/18 16:50
Toluene-d8 (surr)	110	89-112		%	1		11/15/18 16:50





**Results of Trip Blank**

Client Sample ID: **Trip Blank**  
Client Project ID: **Circle S Grocery**  
Lab Sample ID: 1186505007  
Lab Project ID: 1186505

Collection Date: 11/14/18 00:00  
Received Date: 11/15/18 10:42  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Volatile GC/MS**

**Batch Information**

Analytical Batch: VMS18579  
Analytical Method: SW8260C  
Analyst: FDR  
Analytical Date/Time: 11/15/18 16:50  
Container ID: 1186505007-D

Prep Batch: VXX33556  
Prep Method: SW5030B  
Prep Date/Time: 11/15/18 00:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



### Method Blank

Blank ID: MB for HBN 1789131 [VXX/33555]

Blank Lab ID: 1488711

QC for Samples:

1186505001, 1186505002

Matrix: Drinking Water

### Results by EPA 524.2

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1,1,1,2-Tetrachloroethane	0.000500U	0.00100	0.000250	mg/L
1,1,1-Trichloroethane	0.000250U	0.000500	0.000150	mg/L
1,1,2,2-Tetrachloroethane	0.000500U	0.00100	0.000250	mg/L
1,1,2-Trichloroethane	0.000250U	0.000500	0.000150	mg/L
1,1-Dichloroethane	0.000500U	0.00100	0.000250	mg/L
1,1-Dichloroethene	0.000250U	0.000500	0.000150	mg/L
1,1-Dichloropropene	0.000500U	0.00100	0.000250	mg/L
1,2,3-Trichlorobenzene	0.000500U	0.00100	0.000250	mg/L
1,2,3-Trichloropropane	0.000500U	0.00100	0.000250	mg/L
1,2,4-Trichlorobenzene	0.000250U	0.000500	0.000150	mg/L
1,2-Dibromo-3-chloropropane	0.00100U	0.00200	0.000620	mg/L
1,2-Dibromoethane	0.000500U	0.00100	0.000250	mg/L
1,2-Dichlorobenzene	0.000250U	0.000500	0.000250	mg/L
1,2-Dichloropropane	0.000250U	0.000500	0.000200	mg/L
1,3,5-Trimethylbenzene	0.000500U	0.00100	0.000150	mg/L
1,3-Dichlorobenzene	0.000250U	0.000500	0.000150	mg/L
1,3-Dichloropropane	0.000500U	0.00100	0.000250	mg/L
1,4-Dichlorobenzene	0.000250U	0.000500	0.000150	mg/L
2,2-Dichloropropane	0.000500U	0.00100	0.000250	mg/L
2-Chlorotoluene	0.000500U	0.00100	0.000250	mg/L
4-Chlorotoluene	0.000500U	0.00100	0.000250	mg/L
4-Isopropyltoluene	0.000500U	0.00100	0.000250	mg/L
Bromobenzene	0.000500U	0.00100	0.000250	mg/L
Bromochloromethane	0.000500U	0.00100	0.000250	mg/L
Bromodichloromethane	0.000500U	0.00100	0.000250	mg/L
Bromoform	0.000250U	0.000500	0.000250	mg/L
Bromomethane	0.00100U	0.00200	0.000620	mg/L
Carbon tetrachloride	0.000250U	0.000500	0.000150	mg/L
Chlorobenzene	0.000250U	0.000500	0.000150	mg/L
Chloroethane	0.000500U	0.00100	0.000310	mg/L
Chloroform	0.000500U	0.00100	0.000250	mg/L
Chloromethane	0.00100U	0.00200	0.000600	mg/L
cis-1,2-Dichloroethene	0.000250U	0.000500	0.000200	mg/L
cis-1,3-Dichloropropene	0.000500U	0.00100	0.000250	mg/L
Dibromochloromethane	0.000500U	0.00100	0.000250	mg/L
Dibromomethane	0.000500U	0.00100	0.000250	mg/L
Dichlorodifluoromethane	0.000500U	0.00100	0.000250	mg/L
Hexachlorobutadiene	0.000500U	0.00100	0.000250	mg/L

Print Date: 11/27/2018 12:25:45PM



### Method Blank

Blank ID: MB for HBN 1789131 [VXX/33555]  
Blank Lab ID: 1488711

Matrix: Drinking Water

QC for Samples:  
1186505001, 1186505002

### Results by EPA 524.2

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Methylene chloride	0.000250U	0.000500	0.000200	mg/L
Methyl-t-butyl ether	0.000500U	0.00100	0.000310	mg/L
Naphthalene	0.000500U	0.00100	0.000250	mg/L
n-Butylbenzene	0.000500U	0.00100	0.000250	mg/L
sec-Butylbenzene	0.000500U	0.00100	0.000250	mg/L
Styrene	0.000250U	0.000500	0.000200	mg/L
tert-Butylbenzene	0.000500U	0.00100	0.000250	mg/L
Tetrachloroethene	0.000250U	0.000500	0.000150	mg/L
Toluene	0.000250U	0.000500	0.000200	mg/L
trans-1,2-Dichloroethene	0.000250U	0.000500	0.000200	mg/L
trans-1,3-Dichloropropene	0.000500U	0.00100	0.000250	mg/L
Trichloroethene	0.000250U	0.000500	0.000200	mg/L
Trichlorofluoromethane	0.000500U	0.00100	0.000250	mg/L
Vinyl chloride	0.000200U	0.000400	0.000200	mg/L
<b>Surrogates</b>				
1,2-Dichloroethane-D4 (surr)	91.3	70-130		%
4-Bromofluorobenzene (surr)	101	70-130		%
Toluene-d8 (surr)	98.5	70-130		%

### Batch Information

Analytical Batch: VMS18578  
Analytical Method: EPA 524.2  
Instrument: VPA 780/5975 GC/MS  
Analyst: FDR  
Analytical Date/Time: 11/15/2018 11:02:00AM

Prep Batch: VXX33555  
Prep Method: SW5030B  
Prep Date/Time: 11/15/2018 12:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 11/27/2018 12:25:45PM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1186505 [VXX33555]  
 Blank Spike Lab ID: 1488712  
 Date Analyzed: 11/15/2018 11:20

Spike Duplicate ID: LCSD for HBN 1186505 [VXX33555]  
 Spike Duplicate Lab ID: 1488713  
 Matrix: Drinking Water

QC for Samples: 1186505001, 1186505002

### Results by EPA 524.2

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,1,1,2-Tetrachloroethane	0.0300	0.0344	115	0.0300	0.0323	108	( 70-130 )	6.10	(< 30 )
1,1,1-Trichloroethane	0.0300	0.0360	120	0.0300	0.0303	101	( 70-130 )	17.20	(< 30 )
1,1,2,2-Tetrachloroethane	0.0300	0.0266	89	0.0300	0.0275	92	( 70-130 )	3.50	(< 30 )
1,1,2-Trichloroethane	0.0300	0.0302	101	0.0300	0.0292	97	( 70-130 )	3.60	(< 30 )
1,1-Dichloroethane	0.0300	0.0357	119	0.0300	0.0304	101	( 70-130 )	15.80	(< 30 )
1,1-Dichloroethene	0.0300	0.0363	121	0.0300	0.0334	111	( 70-130 )	8.30	(< 30 )
1,1-Dichloropropene	0.0300	0.0329	110	0.0300	0.0300	100	( 70-130 )	9.20	(< 30 )
1,2,3-Trichlorobenzene	0.0300	0.0302	101	0.0300	0.0259	86	( 70-130 )	15.30	(< 30 )
1,2,3-Trichloropropane	0.0300	0.0267	89	0.0300	0.0271	90	( 70-130 )	1.40	(< 30 )
1,2,4-Trichlorobenzene	0.0300	0.0314	105	0.0300	0.0283	94	( 70-130 )	10.50	(< 30 )
1,2-Dibromo-3-chloropropane	0.0300	0.0251	84	0.0300	0.0242	81	( 70-130 )	3.40	(< 30 )
1,2-Dibromoethane	0.0300	0.0315	105	0.0300	0.0315	105	( 70-130 )	0.16	(< 30 )
1,2-Dichlorobenzene	0.0300	0.0299	100	0.0300	0.0297	99	( 70-130 )	0.97	(< 30 )
1,2-Dichloropropane	0.0300	0.0300	100	0.0300	0.0320	107	( 70-130 )	6.40	(< 30 )
1,3,5-Trimethylbenzene	0.0300	0.0292	97	0.0300	0.0297	99	( 70-130 )	1.50	(< 30 )
1,3-Dichlorobenzene	0.0300	0.0309	103	0.0300	0.0305	102	( 70-130 )	1.40	(< 30 )
1,3-Dichloropropane	0.0300	0.0291	97	0.0300	0.0304	101	( 70-130 )	4.40	(< 30 )
1,4-Dichlorobenzene	0.0300	0.0311	104	0.0300	0.0306	102	( 70-130 )	1.40	(< 30 )
2,2-Dichloropropane	0.0300	0.0373	124	0.0300	0.0305	102	( 70-130 )	20.00	(< 30 )
2-Chlorotoluene	0.0300	0.0282	94	0.0300	0.0287	96	( 70-130 )	1.60	(< 30 )
4-Chlorotoluene	0.0300	0.0283	94	0.0300	0.0287	96	( 70-130 )	1.40	(< 30 )
4-Isopropyltoluene	0.0300	0.0306	102	0.0300	0.0308	103	( 70-130 )	0.65	(< 30 )
Bromobenzene	0.0300	0.0310	103	0.0300	0.0303	101	( 70-130 )	2.40	(< 30 )
Bromochloromethane	0.0300	0.0397	132	* 0.0300	0.0336	112	( 70-130 )	16.60	(< 30 )
Bromodichloromethane	0.0300	0.0327	109	0.0300	0.0333	111	( 70-130 )	1.90	(< 30 )
Bromoform	0.0300	0.0370	123	0.0300	0.0341	114	( 70-130 )	8.20	(< 30 )
Bromomethane	0.0300	0.0317	106	0.0300	0.0326	109	( 70-130 )	2.60	(< 30 )
Carbon tetrachloride	0.0300	0.0388	129	0.0300	0.0332	111	( 70-130 )	15.70	(< 30 )
Chlorobenzene	0.0300	0.0315	105	0.0300	0.0305	102	( 70-130 )	3.10	(< 30 )
Chloroethane	0.0300	0.0311	104	0.0300	0.0299	100	( 70-130 )	3.80	(< 30 )
Chloroform	0.0300	0.0343	114	0.0300	0.0282	94	( 70-130 )	19.40	(< 30 )
Chloromethane	0.0300	0.0254	85	0.0300	0.0240	80	( 70-130 )	5.40	(< 30 )
cis-1,2-Dichloroethene	0.0300	0.0385	128	0.0300	0.0323	108	( 70-130 )	17.60	(< 30 )
cis-1,3-Dichloropropene	0.0300	0.0339	113	0.0300	0.0354	118	( 70-130 )	4.50	(< 30 )

Print Date: 11/27/2018 12:25:46PM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1186505 [VXX33555]  
 Blank Spike Lab ID: 1488712  
 Date Analyzed: 11/15/2018 11:20

Spike Duplicate ID: LCSD for HBN 1186505  
 [VXX33555]  
 Spike Duplicate Lab ID: 1488713  
 Matrix: Drinking Water

QC for Samples: 1186505001, 1186505002

### Results by EPA 524.2

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Dibromochloromethane	0.0300	0.0339	113	0.0300	0.0334	111	( 70-130 )	1.30	(< 30 )
Dibromomethane	0.0300	0.0325	108	0.0300	0.0331	110	( 70-130 )	1.80	(< 30 )
Dichlorodifluoromethane	0.0300	0.0299	100	0.0300	0.0305	102	( 70-130 )	2.00	(< 30 )
Hexachlorobutadiene	0.0300	0.0314	105	0.0300	0.0305	102	( 70-130 )	3.10	(< 30 )
Methylene chloride	0.0300	0.0357	119	0.0300	0.0368	123	( 70-130 )	3.00	(< 30 )
Methyl-t-butyl ether	0.0450	0.0474	105	0.0450	0.0479	107	( 70-130 )	1.20	(< 30 )
Naphthalene	0.0300	0.0281	94	0.0300	0.0247	83	( 70-130 )	12.80	(< 30 )
n-Butylbenzene	0.0300	0.0277	92	0.0300	0.0291	97	( 70-130 )	4.90	(< 30 )
sec-Butylbenzene	0.0300	0.0296	99	0.0300	0.0299	100	( 70-130 )	1.10	(< 30 )
Styrene	0.0300	0.0338	113	0.0300	0.0325	108	( 70-130 )	3.80	(< 30 )
tert-Butylbenzene	0.0300	0.0302	101	0.0300	0.0302	101	( 70-130 )	0.00	(< 30 )
Tetrachloroethene	0.0300	0.0348	116	0.0300	0.0326	109	( 70-130 )	6.50	(< 30 )
Toluene	0.0300	0.0295	98	0.0300	0.0288	96	( 70-130 )	2.10	(< 30 )
trans-1,2-Dichloroethene	0.0300	0.0355	118	0.0300	0.0358	119	( 70-130 )	1.10	(< 30 )
trans-1,3-Dichloropropene	0.0300	0.0316	105	0.0300	0.0322	107	( 70-130 )	2.00	(< 30 )
Trichloroethene	0.0300	0.0337	112	0.0300	0.0356	119	( 70-130 )	5.40	(< 30 )
Trichlorofluoromethane	0.0300	0.0333	111	0.0300	0.0315	105	( 70-130 )	5.40	(< 30 )
Vinyl chloride	0.0300	0.0306	102	0.0300	0.0309	103	( 70-130 )	0.81	(< 30 )
<b>Surrogates</b>									
1,2-Dichloroethane-D4 (surr)	0.0300	87.2	87	0.0300	83.2	83	( 70-130 )	4.80	
4-Bromofluorobenzene (surr)	0.0300	91.1	91	0.0300	94.1	94	( 70-130 )	3.20	
Toluene-d8 (surr)	0.0300	97	97	0.0300	96.3	96	( 70-130 )	0.66	

### Batch Information

Analytical Batch: **VMS18578**  
 Analytical Method: **EPA 524.2**  
 Instrument: **VPA 780/5975 GC/MS**  
 Analyst: **FDR**

Prep Batch: **VXX33555**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **11/15/2018 00:00**  
 Spike Init Wt./Vol.: 0.0300 mg/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 0.0300 mg/L Extract Vol: 5 mL

Print Date: 11/27/2018 12:25:46PM



### Method Blank

Blank ID: MB for HBN 1789134 [VXX/33556]  
Blank Lab ID: 1488717

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1186505003, 1186505004, 1186505005, 1186505007

### Results by SW8260C

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1,1,1,2-Tetrachloroethane	0.000250U	0.000500	0.000150	mg/L
1,1,1-Trichloroethane	0.000500U	0.00100	0.000310	mg/L
1,1,2,2-Tetrachloroethane	0.000250U	0.000500	0.000150	mg/L
1,1,2-Trichloroethane	0.000200U	0.000400	0.000120	mg/L
1,1-Dichloroethane	0.000500U	0.00100	0.000310	mg/L
1,1-Dichloroethene	0.000500U	0.00100	0.000310	mg/L
1,1-Dichloropropene	0.000500U	0.00100	0.000310	mg/L
1,2,3-Trichlorobenzene	0.000500U	0.00100	0.000310	mg/L
1,2,3-Trichloropropane	0.000500U	0.00100	0.000310	mg/L
1,2,4-Trichlorobenzene	0.000500U	0.00100	0.000310	mg/L
1,2,4-Trimethylbenzene	0.000500U	0.00100	0.000310	mg/L
1,2-Dibromo-3-chloropropane	0.00500U	0.0100	0.00310	mg/L
1,2-Dibromoethane	0.0000375U	0.0000750	0.0000180	mg/L
1,2-Dichlorobenzene	0.000500U	0.00100	0.000310	mg/L
1,2-Dichloroethane	0.000250U	0.000500	0.000150	mg/L
1,2-Dichloropropane	0.000500U	0.00100	0.000310	mg/L
1,3,5-Trimethylbenzene	0.000500U	0.00100	0.000310	mg/L
1,3-Dichlorobenzene	0.000500U	0.00100	0.000310	mg/L
1,3-Dichloropropane	0.000250U	0.000500	0.000150	mg/L
1,4-Dichlorobenzene	0.000250U	0.000500	0.000150	mg/L
2,2-Dichloropropane	0.000500U	0.00100	0.000310	mg/L
2-Butanone (MEK)	0.00500U	0.0100	0.00310	mg/L
2-Chlorotoluene	0.000500U	0.00100	0.000310	mg/L
2-Hexanone	0.00500U	0.0100	0.00310	mg/L
4-Chlorotoluene	0.000500U	0.00100	0.000310	mg/L
4-Isopropyltoluene	0.000500U	0.00100	0.000310	mg/L
4-Methyl-2-pentanone (MIBK)	0.00500U	0.0100	0.00310	mg/L
Benzene	0.000200U	0.000400	0.000120	mg/L
Bromobenzene	0.000500U	0.00100	0.000310	mg/L
Bromochloromethane	0.000500U	0.00100	0.000310	mg/L
Bromodichloromethane	0.000250U	0.000500	0.000150	mg/L
Bromoform	0.000500U	0.00100	0.000310	mg/L
Bromomethane	0.00250U	0.00500	0.00150	mg/L
Carbon disulfide	0.00500U	0.0100	0.00310	mg/L
Carbon tetrachloride	0.000500U	0.00100	0.000310	mg/L
Chlorobenzene	0.000250U	0.000500	0.000150	mg/L
Chloroethane	0.000500U	0.00100	0.000310	mg/L
Chloroform	0.000500U	0.00100	0.000310	mg/L

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### Method Blank

Blank ID: MB for HBN 1789134 [VXX/33556]  
Blank Lab ID: 1488717

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1186505003, 1186505004, 1186505005, 1186505007

### Results by SW8260C

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Chloromethane	0.000500U	0.00100	0.000310	mg/L
cis-1,2-Dichloroethene	0.000500U	0.00100	0.000310	mg/L
cis-1,3-Dichloropropene	0.000250U	0.000500	0.000150	mg/L
Dibromochloromethane	0.000250U	0.000500	0.000150	mg/L
Dibromomethane	0.000500U	0.00100	0.000310	mg/L
Dichlorodifluoromethane	0.000500U	0.00100	0.000310	mg/L
Ethylbenzene	0.000500U	0.00100	0.000310	mg/L
Freon-113	0.00500U	0.0100	0.00310	mg/L
Hexachlorobutadiene	0.000500U	0.00100	0.000310	mg/L
Isopropylbenzene (Cumene)	0.000500U	0.00100	0.000310	mg/L
Methylene chloride	0.00250U	0.00500	0.00100	mg/L
Methyl-t-butyl ether	0.00500U	0.0100	0.00310	mg/L
Naphthalene	0.000500U	0.00100	0.000310	mg/L
n-Butylbenzene	0.000500U	0.00100	0.000310	mg/L
n-Propylbenzene	0.000500U	0.00100	0.000310	mg/L
o-Xylene	0.000500U	0.00100	0.000310	mg/L
P & M -Xylene	0.00100U	0.00200	0.000620	mg/L
sec-Butylbenzene	0.000500U	0.00100	0.000310	mg/L
Styrene	0.000500U	0.00100	0.000310	mg/L
tert-Butylbenzene	0.000500U	0.00100	0.000310	mg/L
Tetrachloroethene	0.000500U	0.00100	0.000310	mg/L
Toluene	0.000500U	0.00100	0.000310	mg/L
trans-1,2-Dichloroethene	0.000500U	0.00100	0.000310	mg/L
trans-1,3-Dichloropropene	0.000500U	0.00100	0.000310	mg/L
Trichloroethene	0.000500U	0.00100	0.000310	mg/L
Trichlorofluoromethane	0.000500U	0.00100	0.000310	mg/L
Vinyl acetate	0.00500U	0.0100	0.00310	mg/L
Vinyl chloride	0.0000750U	0.000150	0.0000500	mg/L
Xylenes (total)	0.00150U	0.00300	0.00100	mg/L
<b>Surrogates</b>				
1,2-Dichloroethane-D4 (surr)	90.8	81-118		%
4-Bromofluorobenzene (surr)	100	85-114		%
Toluene-d8 (surr)	98.5	89-112		%

Print Date: 11/27/2018 12:25:47PM



### Method Blank

Blank ID: MB for HBN 1789134 [VXX/33556]  
Blank Lab ID: 1488717

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1186505003, 1186505004, 1186505005, 1186505007

### Results by SW8260C

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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#### Batch Information

Analytical Batch: VMS18579  
Analytical Method: SW8260C  
Instrument: VPA 780/5975 GC/MS  
Analyst: FDR  
Analytical Date/Time: 11/15/2018 11:02:00AM

Prep Batch: VXX33556  
Prep Method: SW5030B  
Prep Date/Time: 11/15/2018 12:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 11/27/2018 12:25:47PM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1186505 [VXX33556]  
 Blank Spike Lab ID: 1488718  
 Date Analyzed: 11/15/2018 11:20

Spike Duplicate ID: LCSD for HBN 1186505 [VXX33556]  
 Spike Duplicate Lab ID: 1488719  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1186505003, 1186505004, 1186505005, 1186505007

### Results by SW8260C

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,1,1,2-Tetrachloroethane	0.0300	0.0344	115	0.0300	0.0323	108	( 78-124 )	6.10	(< 20 )
1,1,1-Trichloroethane	0.0300	0.0360	120	0.0300	0.0303	101	( 74-131 )	17.20	(< 20 )
1,1,2,2-Tetrachloroethane	0.0300	0.0266	89	0.0300	0.0275	92	( 71-121 )	3.50	(< 20 )
1,1,2-Trichloroethane	0.0300	0.0302	101	0.0300	0.0292	97	( 80-119 )	3.60	(< 20 )
1,1-Dichloroethane	0.0300	0.0357	119	0.0300	0.0304	101	( 77-125 )	15.80	(< 20 )
1,1-Dichloroethene	0.0300	0.0363	121	0.0300	0.0334	111	( 71-131 )	8.30	(< 20 )
1,1-Dichloropropene	0.0300	0.0329	110	0.0300	0.0300	100	( 79-125 )	9.20	(< 20 )
1,2,3-Trichlorobenzene	0.0300	0.0302	101	0.0300	0.0259	86	( 69-129 )	15.30	(< 20 )
1,2,3-Trichloropropane	0.0300	0.0267	89	0.0300	0.0271	90	( 73-122 )	1.40	(< 20 )
1,2,4-Trichlorobenzene	0.0300	0.0314	105	0.0300	0.0283	94	( 69-130 )	10.50	(< 20 )
1,2,4-Trimethylbenzene	0.0300	0.0296	99	0.0300	0.0300	100	( 79-124 )	1.40	(< 20 )
1,2-Dibromo-3-chloropropane	0.0300	0.0251	84	0.0300	0.0242	81	( 62-128 )	3.40	(< 20 )
1,2-Dibromoethane	0.0300	0.0317	106	0.0300	0.0316	105	( 77-121 )	0.16	(< 20 )
1,2-Dichlorobenzene	0.0300	0.0299	100	0.0300	0.0297	99	( 80-119 )	0.97	(< 20 )
1,2-Dichloroethane	0.0300	0.0284	95	0.0300	0.0305	102	( 73-128 )	7.10	(< 20 )
1,2-Dichloropropane	0.0300	0.0300	100	0.0300	0.0320	107	( 78-122 )	6.40	(< 20 )
1,3,5-Trimethylbenzene	0.0300	0.0292	97	0.0300	0.0297	99	( 75-124 )	1.50	(< 20 )
1,3-Dichlorobenzene	0.0300	0.0309	103	0.0300	0.0305	102	( 80-119 )	1.40	(< 20 )
1,3-Dichloropropane	0.0300	0.0291	97	0.0300	0.0304	101	( 80-119 )	4.40	(< 20 )
1,4-Dichlorobenzene	0.0300	0.0311	104	0.0300	0.0306	102	( 79-118 )	1.40	(< 20 )
2,2-Dichloropropane	0.0300	0.0373	124	0.0300	0.0305	102	( 60-139 )	20.00	(< 20 )
2-Butanone (MEK)	0.0900	0.0790	88	0.0900	0.0652	73	( 56-143 )	19.00	(< 20 )
2-Chlorotoluene	0.0300	0.0282	94	0.0300	0.0287	96	( 79-122 )	1.60	(< 20 )
2-Hexanone	0.0900	0.0750	83	0.0900	0.0784	87	( 57-139 )	4.40	(< 20 )
4-Chlorotoluene	0.0300	0.0283	94	0.0300	0.0287	96	( 78-122 )	1.40	(< 20 )
4-Isopropyltoluene	0.0300	0.0306	102	0.0300	0.0308	103	( 77-127 )	0.65	(< 20 )
4-Methyl-2-pentanone (MIBK)	0.0900	0.0918	102	0.0900	0.0998	111	( 67-130 )	8.30	(< 20 )
Benzene	0.0300	0.0318	106	0.0300	0.0302	101	( 79-120 )	5.00	(< 20 )
Bromobenzene	0.0300	0.0310	103	0.0300	0.0303	101	( 80-120 )	2.40	(< 20 )
Bromochloromethane	0.0300	0.0397	132	* 0.0300	0.0336	112	( 78-123 )	16.60	(< 20 )
Bromodichloromethane	0.0300	0.0327	109	0.0300	0.0333	111	( 79-125 )	1.90	(< 20 )
Bromoform	0.0300	0.0370	123	0.0300	0.0341	114	( 66-130 )	8.20	(< 20 )
Bromomethane	0.0300	0.0316	105	0.0300	0.0325	108	( 53-141 )	2.60	(< 20 )
Carbon disulfide	0.0450	0.0505	112	0.0450	0.0458	102	( 64-133 )	9.80	(< 20 )

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### Blank Spike Summary

Blank Spike ID: LCS for HBN 1186505 [VXX33556]  
 Blank Spike Lab ID: 1488718  
 Date Analyzed: 11/15/2018 11:20

Spike Duplicate ID: LCSD for HBN 1186505 [VXX33556]  
 Spike Duplicate Lab ID: 1488719  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1186505003, 1186505004, 1186505005, 1186505007

### Results by SW8260C

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Carbon tetrachloride	0.0300	0.0388	129	0.0300	0.0332	111	( 72-136 )	15.70	(< 20 )
Chlorobenzene	0.0300	0.0315	105	0.0300	0.0305	102	( 82-118 )	3.10	(< 20 )
Chloroethane	0.0300	0.0311	104	0.0300	0.0299	100	( 60-138 )	3.80	(< 20 )
Chloroform	0.0300	0.0343	114	0.0300	0.0282	94	( 79-124 )	19.40	(< 20 )
Chloromethane	0.0300	0.0273	91	0.0300	0.0258	86	( 50-139 )	5.50	(< 20 )
cis-1,2-Dichloroethene	0.0300	0.0385	128	* 0.0300	0.0323	108	( 78-123 )	17.60	(< 20 )
cis-1,3-Dichloropropene	0.0300	0.0339	113	0.0300	0.0354	118	( 75-124 )	4.50	(< 20 )
Dibromochloromethane	0.0300	0.0339	113	0.0300	0.0334	111	( 74-126 )	1.30	(< 20 )
Dibromomethane	0.0300	0.0325	108	0.0300	0.0331	110	( 79-123 )	1.80	(< 20 )
Dichlorodifluoromethane	0.0300	0.0299	100	0.0300	0.0305	102	( 32-152 )	2.00	(< 20 )
Ethylbenzene	0.0300	0.0323	108	0.0300	0.0315	105	( 79-121 )	2.40	(< 20 )
Freon-113	0.0450	0.0534	119	0.0450	0.0486	108	( 70-136 )	9.30	(< 20 )
Hexachlorobutadiene	0.0300	0.0314	105	0.0300	0.0305	102	( 66-134 )	3.10	(< 20 )
Isopropylbenzene (Cumene)	0.0300	0.0337	112	0.0300	0.0323	108	( 72-131 )	4.30	(< 20 )
Methylene chloride	0.0300	0.0357	119	0.0300	0.0368	123	( 74-124 )	3.00	(< 20 )
Methyl-t-butyl ether	0.0450	0.0474	105	0.0450	0.0479	107	( 71-124 )	1.20	(< 20 )
Naphthalene	0.0300	0.0281	94	0.0300	0.0247	83	( 61-128 )	12.80	(< 20 )
n-Butylbenzene	0.0300	0.0277	92	0.0300	0.0291	97	( 75-128 )	4.90	(< 20 )
n-Propylbenzene	0.0300	0.0283	94	0.0300	0.0292	97	( 76-126 )	3.30	(< 20 )
o-Xylene	0.0300	0.0323	108	0.0300	0.0317	106	( 78-122 )	2.00	(< 20 )
P & M -Xylene	0.0600	0.0648	108	0.0600	0.0636	106	( 80-121 )	1.90	(< 20 )
sec-Butylbenzene	0.0300	0.0296	99	0.0300	0.0299	100	( 77-126 )	1.10	(< 20 )
Styrene	0.0300	0.0338	113	0.0300	0.0325	108	( 78-123 )	3.80	(< 20 )
tert-Butylbenzene	0.0300	0.0302	101	0.0300	0.0302	101	( 78-124 )	0.00	(< 20 )
Tetrachloroethene	0.0300	0.0348	116	0.0300	0.0326	109	( 74-129 )	6.50	(< 20 )
Toluene	0.0300	0.0295	98	0.0300	0.0288	96	( 80-121 )	2.10	(< 20 )
trans-1,2-Dichloroethene	0.0300	0.0355	118	0.0300	0.0358	119	( 75-124 )	1.10	(< 20 )
trans-1,3-Dichloropropene	0.0300	0.0316	105	0.0300	0.0322	107	( 73-127 )	2.00	(< 20 )
Trichloroethene	0.0300	0.0337	112	0.0300	0.0356	119	( 79-123 )	5.40	(< 20 )
Trichlorofluoromethane	0.0300	0.0333	111	0.0300	0.0315	105	( 65-141 )	5.40	(< 20 )
Vinyl acetate	0.0300	0.0364	121	0.0300	0.0271	90	( 54-146 )	29.30	* (< 20 )
Vinyl chloride	0.0300	0.0306	102	0.0300	0.0308	103	( 58-137 )	0.85	(< 20 )
Xylenes (total)	0.0900	0.0971	108	0.0900	0.0952	106	( 79-121 )	1.90	(< 20 )

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### Blank Spike Summary

Blank Spike ID: LCS for HBN 1186505 [VXX33556]  
Blank Spike Lab ID: 1488718  
Date Analyzed: 11/15/2018 11:20

Spike Duplicate ID: LCSD for HBN 1186505 [VXX33556]  
Spike Duplicate Lab ID: 1488719  
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1186505003, 1186505004, 1186505005, 1186505007

### Results by SW8260C

Parameter	Blank Spike (%)			Spike Duplicate (%)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
<b>Surrogates</b>									
1,2-Dichloroethane-D4 (surr)	0.0300	86.8	87	0.0300	82.8	83	( 81-118 )	4.80	
4-Bromofluorobenzene (surr)	0.0300	91.1	91	0.0300	94	94	( 85-114 )	3.20	
Toluene-d8 (surr)	0.0300	97	97	0.0300	96.3	96	( 89-112 )	0.66	

### Batch Information

Analytical Batch: **VMS18579**  
Analytical Method: **SW8260C**  
Instrument: **VPA 780/5975 GC/MS**  
Analyst: **FDR**

Prep Batch: **VXX33556**  
Prep Method: **SW5030B**  
Prep Date/Time: **11/15/2018 00:00**  
Spike Init Wt./Vol.: 0.0300 mg/L Extract Vol: 5 mL  
Dupe Init Wt./Vol.: 0.0300 mg/L Extract Vol: 5 mL

Print Date: 11/27/2018 12:25:49PM



### Method Blank

Blank ID: MB for HBN 1789223 [VXX/33568]  
Blank Lab ID: 1489009

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1186505001, 1186505003, 1186505004, 1186505005, 1186505006, 1186505007

### Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
<b>Surrogates</b>				
4-Bromofluorobenzene (surr)	91.7	50-150		%

### Batch Information

Analytical Batch: VFC14578  
Analytical Method: AK101  
Instrument: Agilent 7890A PID/FID  
Analyst: ST  
Analytical Date/Time: 11/19/2018 2:47:00PM

Prep Batch: VXX33568  
Prep Method: SW5030B  
Prep Date/Time: 11/19/2018 8:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 11/27/2018 12:25:50PM





### Blank Spike Summary

Blank Spike ID: LCS for HBN 1186505 [VXX33568]  
Blank Spike Lab ID: 1489012  
Date Analyzed: 11/19/2018 15:41

Spike Duplicate ID: LCSD for HBN 1186505 [VXX33568]  
Spike Duplicate Lab ID: 1489013  
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1186505001, 1186505003, 1186505004, 1186505005, 1186505006, 1186505007

### Results by AK101

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	1.00	1.01	101	1.00	1.01	101	( 60-120 )	0.08	(< 20 )

### Surrogates

4-Bromofluorobenzene (surr)	0.0500	97.3	97	0.0500	98.9	99	( 50-150 )	1.70	
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### Batch Information

Analytical Batch: **VFC14578**  
Analytical Method: **AK101**  
Instrument: **Agilent 7890A PID/FID**  
Analyst: **ST**

Prep Batch: **VXX33568**  
Prep Method: **SW5030B**  
Prep Date/Time: **11/19/2018 08:00**  
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL  
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

Print Date: 11/27/2018 12:25:51PM



### Method Blank

Blank ID: MB for HBN 1789317 [VXX/33578]  
Blank Lab ID: 1489417

Matrix: Drinking Water

QC for Samples:  
1186505001, 1186505002

### Results by EPA 524.2

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1,2,4-Trimethylbenzene	0.000500U	0.00100	0.000250	mg/L
1,2-Dichloroethane	0.000250U	0.000500	0.000150	mg/L
Benzene	0.000250U	0.000500	0.000200	mg/L
Ethylbenzene	0.000250U	0.000500	0.000200	mg/L
Isopropylbenzene (Cumene)	0.000500U	0.00100	0.000250	mg/L
n-Propylbenzene	0.000500U	0.00100	0.000250	mg/L
o-Xylene	0.000250U	0.000500	0.000200	mg/L
P & M -Xylene	0.000250U	0.000500	0.000400	mg/L
<b>Surrogates</b>				
1,2-Dichloroethane-D4 (surr)	104	70-130		%
4-Bromofluorobenzene (surr)	104	70-130		%
Toluene-d8 (surr)	101	70-130		%

### Batch Information

Analytical Batch: VMS18595  
Analytical Method: EPA 524.2  
Instrument: Agilent 7890-75MS  
Analyst: NRO  
Analytical Date/Time: 11/21/2018 9:40:00AM

Prep Batch: VXX33578  
Prep Method: SW5030B  
Prep Date/Time: 11/21/2018 6:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 11/27/2018 12:25:53PM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1186505 [VXX33578]  
 Blank Spike Lab ID: 1489418  
 Date Analyzed: 11/21/2018 10:01

Spike Duplicate ID: LCSD for HBN 1186505  
 [VXX33578]  
 Spike Duplicate Lab ID: 1489419  
 Matrix: Drinking Water

QC for Samples: 1186505001, 1186505002

### Results by EPA 524.2

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,2,4-Trimethylbenzene	0.0300	0.0349	116	0.0300	0.0340	113	( 70-130 )	2.40	(< 30 )
1,2-Dichloroethane	0.0300	0.0328	109	0.0300	0.0324	108	( 70-130 )	1.30	(< 30 )
Benzene	0.0300	0.0330	110	0.0300	0.0318	106	( 70-130 )	3.70	(< 30 )
Ethylbenzene	0.0300	0.0336	112	0.0300	0.0326	109	( 70-130 )	2.80	(< 30 )
Isopropylbenzene (Cumene)	0.0300	0.0332	111	0.0300	0.0325	108	( 70-130 )	2.10	(< 30 )
n-Propylbenzene	0.0300	0.0347	116	0.0300	0.0339	113	( 70-130 )	2.30	(< 30 )
o-Xylene	0.0300	0.0332	111	0.0300	0.0321	107	( 70-130 )	3.50	(< 30 )
P & M -Xylene	0.0600	0.0657	110	0.0600	0.0646	108	( 70-130 )	1.70	(< 30 )
<b>Surrogates</b>									
1,2-Dichloroethane-D4 (surr)	0.0300	98	98	0.0300	98.5	99	( 70-130 )	0.50	
4-Bromofluorobenzene (surr)	0.0300	104	104	0.0300	104	104	( 70-130 )	0.42	
Toluene-d8 (surr)	0.0300	101	101	0.0300	101	101	( 70-130 )	0.00	

### Batch Information

Analytical Batch: **VMS18595**  
 Analytical Method: **EPA 524.2**  
 Instrument: **Agilent 7890-75MS**  
 Analyst: **NRO**

Prep Batch: **VXX33578**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **11/21/2018 06:00**  
 Spike Init Wt./Vol.: 0.0300 mg/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 0.0300 mg/L Extract Vol: 5 mL

Print Date: 11/27/2018 12:25:54PM



### Method Blank

Blank ID: MB for HBN 1789126 [XXX/40923]  
Blank Lab ID: 1488695

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1186505001, 1186505003, 1186505004, 1186505005, 1186505006

### Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	0.300U	0.600	0.180	mg/L
<b>Surrogates</b>				
5a Androstane (surr)	90.6	60-120		%

### Batch Information

Analytical Batch: XFC14811  
Analytical Method: AK102  
Instrument: Agilent 7890B R  
Analyst: CMS  
Analytical Date/Time: 11/19/2018 10:36:00AM

Prep Batch: XXX40923  
Prep Method: SW3520C  
Prep Date/Time: 11/16/2018 8:03:18AM  
Prep Initial Wt./Vol.: 250 mL  
Prep Extract Vol: 1 mL

Print Date: 11/27/2018 12:25:55PM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1186505 [XXX40923]  
Blank Spike Lab ID: 1488696  
Date Analyzed: 11/19/2018 10:47

Spike Duplicate ID: LCSD for HBN 1186505 [XXX40923]  
Spike Duplicate Lab ID: 1488697  
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1186505001, 1186505003, 1186505004, 1186505005, 1186505006

### Results by AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	20	18.6	93	20	18.6	93	( 75-125 )	0.10	(< 20 )

### Surrogates

5a Androstane (surr)	0.4	101	101	0.4	100	100	( 60-120 )	0.58	
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### Batch Information

Analytical Batch: **XFC14811**  
Analytical Method: **AK102**  
Instrument: **Agilent 7890B R**  
Analyst: **CMS**

Prep Batch: **XXX40923**  
Prep Method: **SW3520C**  
Prep Date/Time: **11/16/2018 08:03**  
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL  
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Print Date: 11/27/2018 12:25:57PM



### Method Blank

Blank ID: MB for HBN 1789166 [XXX/40931]  
Blank Lab ID: 1488858

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1186505001, 1186505002, 1186505003, 1186505004, 1186505005

### Results by 8270D SIM LV (PAH)

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1-Methylnaphthalene	0.0000250U	0.0000500	0.0000150	mg/L
2-Methylnaphthalene	0.0000250U	0.0000500	0.0000150	mg/L
Acenaphthene	0.0000250U	0.0000500	0.0000150	mg/L
Acenaphthylene	0.0000250U	0.0000500	0.0000150	mg/L
Anthracene	0.0000250U	0.0000500	0.0000150	mg/L
Benzo(a)Anthracene	0.0000250U	0.0000500	0.0000150	mg/L
Benzo[a]pyrene	0.0000100U	0.0000200	0.00000620	mg/L
Benzo[b]Fluoranthene	0.0000250U	0.0000500	0.0000150	mg/L
Benzo[g,h,i]perylene	0.0000250U	0.0000500	0.0000150	mg/L
Benzo[k]fluoranthene	0.0000250U	0.0000500	0.0000150	mg/L
Chrysene	0.0000250U	0.0000500	0.0000150	mg/L
Dibenzo[a,h]anthracene	0.0000100U	0.0000200	0.00000620	mg/L
Fluoranthene	0.0000250U	0.0000500	0.0000150	mg/L
Fluorene	0.0000250U	0.0000500	0.0000150	mg/L
Indeno[1,2,3-c,d] pyrene	0.0000250U	0.0000500	0.0000150	mg/L
Naphthalene	0.0000500U	0.000100	0.0000310	mg/L
Phenanthrene	0.0000250U	0.0000500	0.0000150	mg/L
Pyrene	0.0000250U	0.0000500	0.0000150	mg/L
<b>Surrogates</b>				
2-Methylnaphthalene-d10 (surr)	79.1	47-106		%
Fluoranthene-d10 (surr)	85.3	24-116		%

### Batch Information

Analytical Batch: XMS11228  
Analytical Method: 8270D SIM LV (PAH)  
Instrument: Agilent GC 7890B/5977A SWA  
Analyst: DSD  
Analytical Date/Time: 11/21/2018 12:23:00PM

Prep Batch: XXX40931  
Prep Method: SW3520C  
Prep Date/Time: 11/19/2018 8:31:55AM  
Prep Initial Wt./Vol.: 250 mL  
Prep Extract Vol: 1 mL

Print Date: 11/27/2018 12:25:58PM





### Blank Spike Summary

Blank Spike ID: LCS for HBN 1186505 [XXX40931]

Blank Spike Lab ID: 1488859

Date Analyzed: 11/21/2018 12:44

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1186505001, 1186505002, 1186505003, 1186505004, 1186505005

### Results by 8270D SIM LV (PAH)

#### Blank Spike (mg/L)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	0.00200	0.00153	77	( 41-115 )
2-Methylnaphthalene	0.00200	0.00157	78	( 39-114 )
Acenaphthene	0.00200	0.00152	76	( 48-114 )
Acenaphthylene	0.00200	0.00164	82	( 35-121 )
Anthracene	0.00200	0.00169	85	( 53-119 )
Benzo(a)Anthracene	0.00200	0.00169	85	( 59-120 )
Benzo[a]pyrene	0.00200	0.00153	77	( 53-120 )
Benzo[b]Fluoranthene	0.00200	0.00166	83	( 53-126 )
Benzo[g,h,i]perylene	0.00200	0.00146	73	( 44-128 )
Benzo[k]fluoranthene	0.00200	0.00162	81	( 54-125 )
Chrysene	0.00200	0.00172	86	( 57-120 )
Dibenzo[a,h]anthracene	0.00200	0.00129	65	( 44-131 )
Fluoranthene	0.00200	0.00175	87	( 58-120 )
Fluorene	0.00200	0.00162	81	( 50-118 )
Indeno[1,2,3-c,d] pyrene	0.00200	0.00158	79	( 48-130 )
Naphthalene	0.00200	0.00155	78	( 43-114 )
Phenanthrene	0.00200	0.00163	82	( 53-115 )
Pyrene	0.00200	0.00181	91	( 53-121 )

#### Surrogates

2-Methylnaphthalene-d10 (surr)	0.00200	85.1	85	( 47-106 )
Fluoranthene-d10 (surr)	0.00200	89.3	89	( 24-116 )

### Batch Information

Analytical Batch: XMS11228

Analytical Method: 8270D SIM LV (PAH)

Instrument: Agilent GC 7890B/5977A SWA

Analyst: DSD

Prep Batch: XXX40931

Prep Method: SW3520C

Prep Date/Time: 11/19/2018 08:31

Spike Init Wt./Vol.: 0.00200 mg/L Extract Vol: 1 mL

Dupe Init Wt./Vol.: Extract Vol:

Print Date: 11/27/2018 12:25:58PM



### Matrix Spike Summary

Original Sample ID: 1186516006  
 MS Sample ID: 1488860 MS  
 MSD Sample ID: 1488861 MSD

Analysis Date: 11/21/2018 14:47  
 Analysis Date: 11/21/2018 15:08  
 Analysis Date: 11/21/2018 15:29  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1186505001, 1186505002, 1186505003, 1186505004, 1186505005

### Results by 8270D SIM LV (PAH)

Parameter	Matrix Spike (mg/L)				Spike Duplicate (mg/L)				CL	RPD (%)	RPD CL
	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)				
1-Methylnaphthalene	0.0000240U	0.00192	0.00141	73	0.00196	0.00139	71	41-115	1.50	(< 20 )	
2-Methylnaphthalene	0.0000240U	0.00192	0.00143	75	0.00196	0.00140	71	39-114	2.40	(< 20 )	
Acenaphthene	0.0000240U	0.00192	0.00141	73	0.00196	0.00139	71	48-114	0.93	(< 20 )	
Acenaphthylene	0.0000240U	0.00192	0.00150	78	0.00196	0.00150	77	35-121	0.41	(< 20 )	
Anthracene	0.0000240U	0.00192	0.00145	76	0.00196	0.00146	74	53-119	0.32	(< 20 )	
Benzo(a)Anthracene	0.0000240U	0.00192	0.00139	72	0.00196	0.00140	72	59-120	0.96	(< 20 )	
Benzo(a)pyrene	0.00000960U	0.00192	0.00113	59	0.00196	0.00119	61	53-120	4.90	(< 20 )	
Benzo(b)Fluoranthene	0.0000240U	0.00192	0.00121	63	0.00196	0.00127	65	53-126	5.30	(< 20 )	
Benzo(g,h,i)perylene	0.0000240U	0.00192	0.000866	45	0.00196	0.000920	47	44-128	6.20	(< 20 )	
Benzo(k)fluoranthene	0.0000240U	0.00192	0.00120	62	0.00196	0.00124	63	54-125	3.30	(< 20 )	
Chrysene	0.0000240U	0.00192	0.00143	75	0.00196	0.00148	75	57-120	2.90	(< 20 )	
Dibenzo(a,h)anthracene	0.00000960U	0.00192	0.000772	40 *	0.00196	0.000811	41 *	44-131	5.00	(< 20 )	
Fluoranthene	0.0000240U	0.00192	0.00155	81	0.00196	0.00155	79	58-120	0.03	(< 20 )	
Fluorene	0.0000640	0.00192	0.00155	77	0.00196	0.00157	77	50-118	1.80	(< 20 )	
Indeno[1,2,3-c,d] pyrene	0.0000240U	0.00192	0.000884	46 *	0.00196	0.000956	49	48-130	7.90	(< 20 )	
Naphthalene	0.0000481U	0.00192	0.00147	76	0.00196	0.00145	74	43-114	1.40	(< 20 )	
Phenanthrene	0.0000368J	0.00192	0.00151	77	0.00196	0.00149	74	53-115	1.60	(< 20 )	
Pyrene	0.0000240U	0.00192	0.00159	83	0.00196	0.00161	82	53-121	1.30	(< 20 )	
<b>Surrogates</b>											
2-Methylnaphthalene-d10 (surr)		0.00192	0.00160	83	0.00196	0.00160	82	47-106	0.00		
Fluoranthene-d10 (surr)		0.00192	0.00164	85	0.00196	0.00165	84	24-116	0.92		

### Batch Information

Analytical Batch: XMS11228  
 Analytical Method: 8270D SIM LV (PAH)  
 Instrument: Agilent GC 7890B/5977A SWA  
 Analyst: DSD  
 Analytical Date/Time: 11/21/2018 3:08:00PM

Prep Batch: XXX40931  
 Prep Method: 3520 Liq/Liq Ext for 8270 PAH SIM LV  
 Prep Date/Time: 11/19/2018 8:31:55AM  
 Prep Initial Wt./Vol.: 260.00mL  
 Prep Extract Vol: 1.00mL

Print Date: 11/27/2018 12:25:59PM



### Method Blank

Blank ID: MB for HBN 1789166 [XXX/40931]  
Blank Lab ID: 1488858

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1186505001, 1186505002, 1186505003, 1186505004, 1186505005

### Results by EPA 625M SIM (PAH) LV

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1-Methylnaphthalene	0.0000250U	0.0000500	0.0000150	mg/L
2-Methylnaphthalene	0.0000250U	0.0000500	0.0000150	mg/L
Acenaphthene	0.0000250U	0.0000500	0.0000150	mg/L
Acenaphthylene	0.0000250U	0.0000500	0.0000150	mg/L
Anthracene	0.0000250U	0.0000500	0.0000150	mg/L
Benzo(a)Anthracene	0.0000250U	0.0000500	0.0000150	mg/L
Benzo[a]pyrene	0.0000100U	0.0000200	0.00000620	mg/L
Benzo[b]Fluoranthene	0.0000250U	0.0000500	0.0000150	mg/L
Benzo[g,h,i]perylene	0.0000250U	0.0000500	0.0000150	mg/L
Benzo[k]fluoranthene	0.0000250U	0.0000500	0.0000150	mg/L
Chrysene	0.0000250U	0.0000500	0.0000150	mg/L
Dibenzo[a,h]anthracene	0.0000100U	0.0000200	0.00000620	mg/L
Fluoranthene	0.0000250U	0.0000500	0.0000150	mg/L
Fluorene	0.0000250U	0.0000500	0.0000150	mg/L
Indeno[1,2,3-c,d] pyrene	0.0000250U	0.0000500	0.0000150	mg/L
Naphthalene	0.0000500U	0.000100	0.0000310	mg/L
Phenanthrene	0.0000250U	0.0000500	0.0000150	mg/L
Pyrene	0.0000250U	0.0000500	0.0000150	mg/L
<b>Surrogates</b>				
2-Methylnaphthalene-d10 (surr)	79.1	47-106		%
Fluoranthene-d10 (surr)	85.3	24-116		%

### Batch Information

Analytical Batch: XMS11228  
Analytical Method: EPA 625M SIM (PAH) LV  
Instrument: Agilent GC 7890B/5977A SWA  
Analyst: DSD  
Analytical Date/Time: 11/21/2018 12:23:00PM

Prep Batch: XXX40931  
Prep Method: SW3520C  
Prep Date/Time: 11/19/2018 8:31:55AM  
Prep Initial Wt./Vol.: 250 mL  
Prep Extract Vol: 1 mL

Print Date: 11/27/2018 12:26:00PM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1186505 [XXX40931]

Blank Spike Lab ID: 1488859

Date Analyzed: 11/21/2018 12:44

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1186505001, 1186505002, 1186505003, 1186505004, 1186505005

### Results by EPA 625M SIM (PAH) LV

#### Blank Spike (mg/L)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	0.00200	0.00153	77	( 41-115 )
2-Methylnaphthalene	0.00200	0.00157	78	( 39-114 )
Acenaphthene	0.00200	0.00152	76	( 48-114 )
Acenaphthylene	0.00200	0.00164	82	( 35-121 )
Anthracene	0.00200	0.00169	85	( 53-119 )
Benzo(a)Anthracene	0.00200	0.00169	85	( 59-120 )
Benzo[a]pyrene	0.00200	0.00153	77	( 53-120 )
Benzo[b]Fluoranthene	0.00200	0.00166	83	( 53-126 )
Benzo[g,h,i]perylene	0.00200	0.00146	73	( 44-128 )
Benzo[k]fluoranthene	0.00200	0.00162	81	( 54-125 )
Chrysene	0.00200	0.00172	86	( 57-120 )
Dibenzo[a,h]anthracene	0.00200	0.00129	65	( 44-131 )
Fluoranthene	0.00200	0.00175	87	( 58-120 )
Fluorene	0.00200	0.00162	81	( 50-118 )
Indeno[1,2,3-c,d] pyrene	0.00200	0.00158	79	( 48-130 )
Naphthalene	0.00200	0.00155	78	( 43-114 )
Phenanthrene	0.00200	0.00163	82	( 53-115 )
Pyrene	0.00200	0.00181	91	( 53-121 )

#### Surrogates

2-Methylnaphthalene-d10 (surr)	0.00200	85.1	85	( 47-106 )
Fluoranthene-d10 (surr)	0.00200	89.3	89	( 24-116 )

### Batch Information

Analytical Batch: XMS11228

Analytical Method: EPA 625M SIM (PAH) LV

Instrument: Agilent GC 7890B/5977A SWA

Analyst: DSD

Prep Batch: XXX40931

Prep Method: SW3520C

Prep Date/Time: 11/19/2018 08:31

Spike Init Wt./Vol.: 0.00200 mg/L Extract Vol: 1 mL

Dupe Init Wt./Vol.: Extract Vol:

Print Date: 11/27/2018 12:26:02PM



### Matrix Spike Summary

Original Sample ID: 1186516006  
 MS Sample ID: 1488860 MS  
 MSD Sample ID: 1488861 MSD

Analysis Date: 11/21/2018 14:47  
 Analysis Date: 11/21/2018 15:08  
 Analysis Date: 11/21/2018 15:29  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1186505001, 1186505002, 1186505003, 1186505004, 1186505005

### Results by EPA 625M SIM (PAH) LV

Parameter	Sample	Matrix Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1-Methylnaphthalene	0.0000240U	0.00192	0.00141	73	0.00196	0.00139	71	41-115	1.50	(< 20 )
2-Methylnaphthalene	0.0000240U	0.00192	0.00143	75	0.00196	0.00140	71	39-114	2.40	(< 20 )
Acenaphthene	0.0000240U	0.00192	0.00141	73	0.00196	0.00139	71	48-114	0.93	(< 20 )
Acenaphthylene	0.0000240U	0.00192	0.00150	78	0.00196	0.00150	77	35-121	0.41	(< 20 )
Anthracene	0.0000240U	0.00192	0.00145	76	0.00196	0.00146	74	53-119	0.32	(< 20 )
Benzo(a)Anthracene	0.0000240U	0.00192	0.00139	72	0.00196	0.00140	72	59-120	0.96	(< 20 )
Benzo(a)pyrene	0.00000960U	0.00192	0.00113	59	0.00196	0.00119	61	53-120	4.90	(< 20 )
Benzo(b)Fluoranthene	0.0000240U	0.00192	0.00121	63	0.00196	0.00127	65	53-126	5.30	(< 20 )
Benzo(g,h,i)perylene	0.0000240U	0.00192	0.000866	45	0.00196	0.000920	47	44-128	6.20	(< 20 )
Benzo(k)fluoranthene	0.0000240U	0.00192	0.00120	62	0.00196	0.00124	63	54-125	3.30	(< 20 )
Chrysene	0.0000240U	0.00192	0.00143	75	0.00196	0.00148	75	57-120	2.90	(< 20 )
Dibenzo(a,h)anthracene	0.00000960U	0.00192	0.000772	40 *	0.00196	0.000811	41 *	44-131	5.00	(< 20 )
Fluoranthene	0.0000240U	0.00192	0.00155	81	0.00196	0.00155	79	58-120	0.03	(< 20 )
Fluorene	0.0000640	0.00192	0.00155	77	0.00196	0.00157	77	50-118	1.80	(< 20 )
Indeno[1,2,3-c,d] pyrene	0.0000240U	0.00192	0.000884	46 *	0.00196	0.000956	49	48-130	7.90	(< 20 )
Naphthalene	0.0000481U	0.00192	0.00147	76	0.00196	0.00145	74	43-114	1.40	(< 20 )
Phenanthrene	0.0000368J	0.00192	0.00151	77	0.00196	0.00149	74	53-115	1.60	(< 20 )
Pyrene	0.0000240U	0.00192	0.00159	83	0.00196	0.00161	82	53-121	1.30	(< 20 )
<b>Surrogates</b>										
2-Methylnaphthalene-d10 (surr)		0.00192	0.00160	83	0.00196	0.00160	82	47-106	0.00	
Fluoranthene-d10 (surr)		0.00192	0.00164	85	0.00196	0.00165	84	24-116	0.92	

### Batch Information

Analytical Batch: XMS11228  
 Analytical Method: EPA 625M SIM (PAH) LV  
 Instrument: Agilent GC 7890B/5977A SWA  
 Analyst: DSD  
 Analytical Date/Time: 11/21/2018 3:08:00PM

Prep Batch: XXX40931  
 Prep Method: 3520 Liq/Liq Ext for 8270 PAH SIM LV  
 Prep Date/Time: 11/19/2018 8:31:55AM  
 Prep Initial Wt./Vol.: 260.00mL  
 Prep Extract Vol: 1.00mL

Print Date: 11/27/2018 12:26:02PM



1186505



SGS North America Inc. CHAIN OF CUSTODY RECORD

REVIEW COPY COMMENTS

Locations Nationwide: Maryland, New York, Indiana, Kentucky, New Jersey, North Carolina, West Virginia

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**CLIENT:** Berkeley Underwriters  
**CONTACT:** Jeremy Staiwatt  
**PHONE NO:** 907-258-4880  
**PROJECT PWSID/ PERMIT#:**  
**NAME:** Circle S Grocery  
**REPORTS TO:** Jeremy Staiwatt  
**E-MAIL:** jeremy.staiwatt@erm.com  
**INVOICE TO:** ERM  
**QUOTE #:**  
**P.O. #:** 0474463

**Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.**

Page 1 of 1

Section 1	Section 3				Preservative						REMARKS/ LOC ID																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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e-Sample Receipt Form

SGS Workorder #:

1186505



1 1 8 6 5 0 5

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
<b>Chain of Custody / Temperature Requirements</b>	<input checked="" type="checkbox"/>	Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	<input type="checkbox"/> N/A	ABSENT
COC accompanied samples?	<input checked="" type="checkbox"/> YES	
<input type="checkbox"/> N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	<input checked="" type="checkbox"/> YES	Cooler ID: 1 @ 3.7 °C Therm. ID: D11
	<input checked="" type="checkbox"/> YES	Cooler ID: 1 @ 1.6 °C Therm. ID: D25
	<input type="checkbox"/> N/A	Cooler ID: @ °C Therm. ID:
	<input type="checkbox"/> N/A	Cooler ID: @ °C Therm. ID:
	<input type="checkbox"/> N/A	Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	<input type="checkbox"/> N/A	
If <0°C, were sample containers ice free?	<input type="checkbox"/> N/A	
If samples received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "COOLER TEMP" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
<b>Holding Time / Documentation / Sample Condition Requirements</b>		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	<input checked="" type="checkbox"/> YES	
Do samples <b>match COC**</b> (i.e., sample IDs, dates/times collected)?	<input checked="" type="checkbox"/> YES	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	<input checked="" type="checkbox"/> YES	
Were proper containers (type/mass/volume/preservative***) used?	<input type="checkbox"/> N/A	***Exemption permitted for metals (e.g. 200.8/6020A).
<b>Volatile / LL-Hg Requirements</b>		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	<input checked="" type="checkbox"/> YES	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	<input checked="" type="checkbox"/> YES	
Were all soil VOAs field extracted with MeOH+BFB?	<input type="checkbox"/> N/A	
<b>Note to Client:</b> Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.		
Additional notes (if applicable):		



### Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1186505001-A	HCL to pH < 2	OK	1186505007-A	HCL to pH < 2	OK
1186505001-B	HCL to pH < 2	OK	1186505007-B	HCL to pH < 2	OK
1186505001-C	HCL to pH < 2	OK	1186505007-C	HCL to pH < 2	OK
1186505001-D	HCL to pH < 2	OK	1186505007-D	HCL to pH < 2	OK
1186505001-E	HCL to pH < 2	OK	1186505007-E	HCL to pH < 2	OK
1186505001-F	HCL to pH < 2	OK	1186505007-F	HCL to pH < 2	OK
1186505001-G	HCL to pH < 2	OK			
1186505001-H	HCL to pH < 2	OK			
1186505001-I	No Preservative Required	OK			
1186505001-J	No Preservative Required	OK			
1186505002-A	HCL to pH < 2	OK			
1186505002-B	HCL to pH < 2	OK			
1186505002-C	HCL to pH < 2	OK			
1186505002-D	No Preservative Required	OK			
1186505002-E	No Preservative Required	OK			
1186505003-A	HCL to pH < 2	OK			
1186505003-B	HCL to pH < 2	OK			
1186505003-C	HCL to pH < 2	OK			
1186505003-D	HCL to pH < 2	OK			
1186505003-E	HCL to pH < 2	OK			
1186505003-F	HCL to pH < 2	OK			
1186505003-G	HCL to pH < 2	OK			
1186505003-H	HCL to pH < 2	OK			
1186505003-I	No Preservative Required	OK			
1186505003-J	No Preservative Required	OK			
1186505004-A	HCL to pH < 2	OK			
1186505004-B	HCL to pH < 2	OK			
1186505004-C	HCL to pH < 2	OK			
1186505004-D	HCL to pH < 2	OK			
1186505004-E	HCL to pH < 2	OK			
1186505004-F	HCL to pH < 2	OK			
1186505004-G	HCL to pH < 2	OK			
1186505004-H	HCL to pH < 2	OK			
1186505004-I	No Preservative Required	OK			
1186505004-J	No Preservative Required	OK			
1186505005-A	HCL to pH < 2	OK			
1186505005-B	HCL to pH < 2	OK			
1186505005-C	HCL to pH < 2	OK			
1186505005-D	HCL to pH < 2	OK			
1186505005-E	HCL to pH < 2	OK			
1186505005-F	HCL to pH < 2	OK			
1186505005-G	HCL to pH < 2	OK			
1186505005-H	HCL to pH < 2	OK			
1186505005-I	No Preservative Required	OK			
1186505005-J	No Preservative Required	OK			
1186505006-A	HCL to pH < 2	OK			
1186505006-B	HCL to pH < 2	OK			
1186505006-C	HCL to pH < 2	OK			
1186505006-D	HCL to pH < 2	OK			
1186505006-E	HCL to pH < 2	OK			

Container Id

Preservative

Container  
Condition

Container Id

Preservative

Container  
Condition

#### Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates that an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

BU - The container was received with headspace greater than 6mm.

DM - The container was received damaged.

FR - The container was received frozen and not usable for Bacteria or BOD analyses.

IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

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**APPENDIX D      INVESTIGATIVE DERIVED WASTE DISPOSAL PROCEDURE**

## GRANULAR ACTIVATED CARBON (GAC) FILTER INFORMATION AND PROCEDURE

### Circle S Grocery Groundwater Monitoring

#### BACKGROUND

Site investigations of the Circle S Grocery (located at 22189 Birchwood Loop Road, Chugiak, Alaska) indicate soil and groundwater have been impacted as a result of historical underground storage tanks (USTs). Three monitoring wells were installed at the former Circle S Grocery site in October 2015 and were sampled on a quarterly basis from November 2015 through October 2016. Gasoline range organics (GRO), diesel range organics (DRO), residual range organics, and benzene, toluene, ethylbenzene and total xylenes (BTEX) were detected in samples collected from all monitoring wells during the quarterly monitoring events.

In a letter dated 7 June 2017, ADEC requested a continuation of groundwater monitoring among other investigation tasks. Monitoring wells MW-01, MW-02, and MW-03 were sampled in November 2018. Analytical samples will be analyzed for volatile organic compounds (VOCs), GRO, DRO, and polycyclic aromatic hydrocarbons (PAH).

Historical groundwater sampling data indicate one monitoring well (MW-02) contains concentrations of benzene, ethylbenzene, and total xylenes above 18 Alaska Administrative Code Chapter 75 (18 AAC 75) Table C Groundwater Cleanup Levels. Maximum concentrations of these constituents reported during the quarterly sampling conducted in 2015 and 2016 were as follows:

- Benzene: 0.229 milligrams per liter (mg/L)
- Ethylbenzene: 0.161 mg/L
- Total Xylenes: 0.545 mg/L

#### DECONTAMINATION AND PURGEWATER DISPOSAL

During the field effort, a granular activated carbon (GAC) was used to treat decontamination and purgewater generated while sampling the onsite monitoring wells, contingent on there being no visible sheen on the purgewater or decontamination water surface. If the purgewater or decontamination water had visible sheen, it would be containerized and scheduled for pickup and disposal by NRC, Alaska.

The typical construction of a GAC filter is as follows: Oxpure (or a similar) GAC material produced from a coconut shell char is placed in a 5 gallon bucket (see Oxpure Technical Specifications, attached). The 5 gallon bucket contains an inlet and outlet with standard garden hose connectors. Mesh material located in the bottom of the bucket prevents the GAC material from plugging the outlet.





According to the GAC supplier (TTT Environmental Inc.), approximately 500 gallons of water may be treated with a 5 gallon GAC bucket; however, this volume varies based on water turbidity and level of contamination. Water can be pumped through a 5 gallon GAC at a rate of approximately 1 gallon per minute.

Approximately 9 gallons of purgewater was generated from the three monitoring wells and approximately 1 gallon of decontamination water (consisting of deionized water,alconox, and tap water). Prior to treatment, approximately 2 gallons were poured into the GAC using a funnel. The GAC outlet was plugged to allow for the appropriate initial treatment. The first two gallons remained in the GAC for approximately one hour before the remaining 6 gallons of purgewater were poured into the GAC with the outlet opened. The GAC treatment system location is shown in Figure 2, at least 100 feet from and downgradient of the drinking water well located at the property. Following the purgewater treatment, the amount of water that was treated was written on the GAC bucket and the bucket was brought to NRC Alaska for disposal.

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**APPENDIX E      CONCEPTUAL SITE MODEL**

# Appendix A - Human Health Conceptual Site Model Scoping Form and Standardized Graphic

Site Name:

File Number:

Completed by:

## Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

*General Instructions: Follow the italicized instructions in each section below.*

## 1. General Information:

**Sources** (*check potential sources at the site*)

USTs

ASTs

Dispensers/fuel loading racks

Drums

Vehicles

Landfills

Transformers

Other:

**Release Mechanisms** (*check potential release mechanisms at the site*)

Spills

Leaks

Direct discharge

Burning

Other:

**Impacted Media** (*check potentially-impacted media at the site*)

Surface soil (0-2 feet bgs\*)

Subsurface soil (>2 feet bgs)

Air

Sediment

Groundwater

Surface water

Biota

Other:

**Receptors** (*check receptors that could be affected by contamination at the site*)

Residents (adult or child)

Commercial or industrial worker

Construction worker

Subsistence harvester (i.e. gathers wild foods)

Subsistence consumer (i.e. eats wild foods)

Site visitor

Trespasser

Recreational user

Farmer

Other:

\* bgs - below ground surface

**2. Exposure Pathways:** *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.)

*If the box is checked, label this pathway complete:*

Comments:

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)?

*If both boxes are checked, label this pathway complete:*

Comments:

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future?

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the groundwater is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350.

*If both boxes are checked, label this pathway complete:*

Comments:

## 2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future?

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities).

*If both boxes are checked, label this pathway complete:*

Comments:

## 3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods?

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)?

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.)

*If all of the boxes are checked, label this pathway complete:*

Comments:

### c) Inhalation-

#### 1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Are the contaminants in soil volatile (see Appendix D in the guidance document)?

*If both boxes are checked, label this pathway complete:*

Comments:



## 2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminated soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures)

Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)?

*If both boxes are checked, label this pathway complete:*

Comments:

**3. Additional Exposure Pathways:** *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

**Dermal Exposure to Contaminants in Groundwater and Surface Water**

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are deemed protective of this pathway because dermal absorption is incorporated into the groundwater exposure equation for residential uses.

*Check the box if further evaluation of this pathway is needed:*

Comments:

**Inhalation of Volatile Compounds in Tap Water**

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

DEC groundwater cleanup levels in 18 AAC 75, Table C are protective of this pathway because the inhalation of vapors during normal household activities is incorporated into the groundwater exposure equation.

*Check the box if further evaluation of this pathway is needed:*

Comments:

## Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM<sub>10</sub>). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.

DEC human health soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because the inhalation of particulates is incorporated into the soil exposure equation.

*Check the box if further evaluation of this pathway is needed:*

Comments:

## Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

*Check the box if further evaluation of this pathway is needed:*

Comments:

**4. Other Comments** (*Provide other comments as necessary to support the information provided in this form.*)

# HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: \_\_\_\_\_  
 \_\_\_\_\_

Completed By: \_\_\_\_\_  
 Date Completed: \_\_\_\_\_

**Instructions:** Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.

(1) Media	(2) Transport Mechanisms
<input type="checkbox"/> Surface Soil (0-2 ft bgs)	<input type="checkbox"/> Direct release to surface soil <i>check soil</i> <input type="checkbox"/> Migration to subsurface <i>check soil</i> <input type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Runoff or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Subsurface Soil (2-15 ft bgs)	<input type="checkbox"/> Direct release to subsurface soil <i>check soil</i> <input type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Ground-water	<input type="checkbox"/> Direct release to groundwater <i>check groundwater</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Flow to surface water body <i>check surface water</i> <input type="checkbox"/> Flow to sediment <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Surface Water	<input type="checkbox"/> Direct release to surface water <i>check surface water</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Sedimentation <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Sediment	<input type="checkbox"/> Direct release to sediment <i>check sediment</i> <input type="checkbox"/> Resuspension, runoff, or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____

(3) Check all exposure media identified in (2).

Exposure Media

soil

groundwater

air

surface water

sediment

biota

(4) Check all pathways that could be complete. The pathways identified in this column **must** agree with Sections 2 and 3 of the Human Health CSM Scoping Form.

Exposure Pathway/Route

Incidental Soil Ingestion

Dermal Absorption of Contaminants from Soil

Inhalation of Fugitive Dust

Ingestion of Groundwater

Dermal Absorption of Contaminants in Groundwater

Inhalation of Volatile Compounds in Tap Water

Inhalation of Outdoor Air

Inhalation of Indoor Air

Inhalation of Fugitive Dust

Ingestion of Surface Water

Dermal Absorption of Contaminants in Surface Water

Inhalation of Volatile Compounds in Tap Water

Direct Contact with Sediment

Ingestion of Wild or Farmed Foods

(5) Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.

**Current & Future Receptors**

	Residents (adults or children)	Commercial or Industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
<input type="checkbox"/> Incidental Soil Ingestion							
<input type="checkbox"/> Dermal Absorption of Contaminants from Soil							
<input type="checkbox"/> Inhalation of Fugitive Dust							
<input type="checkbox"/> Ingestion of Groundwater							
<input type="checkbox"/> Dermal Absorption of Contaminants in Groundwater							
<input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water							
<input type="checkbox"/> Inhalation of Outdoor Air							
<input type="checkbox"/> Inhalation of Indoor Air							
<input type="checkbox"/> Inhalation of Fugitive Dust							
<input type="checkbox"/> Ingestion of Surface Water							
<input type="checkbox"/> Dermal Absorption of Contaminants in Surface Water							
<input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water							
<input type="checkbox"/> Direct Contact with Sediment							
<input type="checkbox"/> Ingestion of Wild or Farmed Foods							

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**APPENDIX F      LABORATORY QUALITY ASSURANCE REVIEW AND CHECKLIST**

**Laboratory Data Review Checklist**

Completed By:

Nicole Beier

Title:

Project Chemist

Date:

November 18, 2019

CS Report Name:

Circle S Water Monitoring Report

Report Date:

November 2019

Consultant Firm:

ERM Alaska, Inc.

Laboratory Name:

SGS North America, Inc.

Laboratory Report Number:

1186505

ADEC File Number:

2106.26.004

Hazard Identification Number:

24797

1. Laboratory

- a. Did an ADEC CS approved laboratory receive and
- perform
- all of the submitted sample analyses?

 Yes  No

Comments:

- b. If the samples were transferred to another “network” laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

 Yes  No

Comments:

2. Chain of Custody (CoC)

- a. CoC information completed, signed, and dated (including released/received by)?

 Yes  No

Comments:

- b. Correct Analyses requested?

 Yes  No

Comments:

3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

 Yes  No

Comments:

- b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

 Yes  No

Comments:

- c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

 Yes  No

Comments:

- d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes  No

Comments:

N/A. There were no discrepancies to document.

- e. Data quality or usability affected?

Comments:

Data quality and usability is not affected with respect to the reported sample receipt documentation.

#### 4. Case Narrative

- a. Present and understandable?

Yes  No

Comments:

- b. Discrepancies, errors, or QC failures identified by the lab?

Yes  No

Comments:

For method EPA 524.2, LCS recovery for bromochloromethane does not meet QC criteria. This analyte was not detected in associated samples (18-CSG-01-DW and 18-CSG-02-DW). For method 8260C, LCS recoveries for cis-1,2-dichloroethene and bromochloromethane do not meet QC criteria. These analytes were not detected in associated samples (18-CSG-01-WG-MW01, 18-CSG-02-WG-MW03, 18-CSG-03-WG-MW02, and the Trip Blank). For method 8260C, LCSD RPD for vinyl acetate does not meet QC criteria. This analyte was not detected in associated samples. For method AK101, surrogate recovery for 4-bromofluorobenzene does not meet QC criteria for sample 18-CSG-04-WG-MWZ. For methods 8270D and 625M, MS/MSD for Dibenzo [a,h] anthracene and Indeno [1,2,3-c,d] pyrene does not meet QC criteria.

- c. Were all corrective actions documented?

Yes  No

Comments:

NA. There are no corrective actions.

- d. What is the effect on data quality/usability according to the case narrative?

Comments:

Data quality and usability is not affected with respect to the case narrative report.

#### 5. Samples Results

- a. Correct analyses performed/reported as requested on COC?

Yes  No

Comments:

b. All applicable holding times met?

Yes  No

Comments:

c. All soils reported on a dry weight basis?

Yes  No

Comments:

NA. There are no soil samples within this data package.

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes  No

Comments:

e. Data quality or usability affected?

Yes  No

Comments:

Data quality and usability is not affected with respect to the reported sample results.

## 6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes  No

Comments:

ii. All method blank results less than limit of quantitation (LOQ)?

Yes  No

Comments:

iii. If above LOQ, what samples are affected?

Comments:

NA. All method blank results were below LOQ.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes  No

Comments:

NA. All method blank results were below LOQ.

## v. Data quality or usability affected?

Comments:

Data quality and usability is not affected with respect to the reported method blank results.

## b. Laboratory Control Sample/Duplicate (LCS/LCSD)

- i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes  No

Comments:

- ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes  No

Comments:

NA. There are no metal or inorganic analyses.

- iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes  No

Comments:

For method EPA 524.2, LCS recovery for bromochloromethane does not meet QC criteria. This analyte was not detected in associated samples (18-CSG-01-DW and 18-CSG-02-DW). For method 8260C, LCS recoveries for cis-1,2-dichloroethene and bromochloromethane do not meet QC criteria. These analytes were not detected in associated samples (18-CSG-01-WG-MW01, 18-CSG-02-WG-MW03, 18-CSG-03-WG-MW02, and the Trip Blank).

- iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes  No

Comments:

For method 8260C, LCSD RPD for vinyl acetate does not meet QC criteria. This analyte was not detected in associated samples.

- v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

The affected samples are 18-CSG-01-WG-MW01, 18-CSG-02-WG-MW03, 18-CSG-03-WG-MW02, and the Trip Blank.

- vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes  No

Comments:

The affected samples were not flagged because the analytes were not detected.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality and usability is not affected with respect to the reported LCS/LCSD results.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

Yes  No

Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes  No

Comments:

For method AK101, surrogate recovery for 4-bromofluorobenzene does not meet QC criteria for sample 18-CSG-04-WG-MWZ.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

Yes  No

Comments:

Sample 18-CSG-04-WG-MWZ has been flagged JS.

iv. Data quality or usability affected?

Comments:

The results of sample 18-CSG-04-WG-MWZ for 4-bromofluornenzene are considered estimated.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes  No

Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes  No

Comments:



iii. All results less than LOQ?

Yes  No

Comments:

iv. If above LOQ, what samples are affected?

Comments:

NA. All results were less than the LOQ.

v. Data quality or usability affected?

Comments:

Data quality and usability is not affected with respect to the reported trip blank results.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes  No

Comments:

ii. Submitted blind to lab?

Yes  No

Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs?

(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where  $R_1$  = Sample Concentration

$R_2$  = Field Duplicate Concentration

Yes  No

Comments:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality and usability is not affected with regards to the RPD.

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below).

Yes  No  Not Applicable

NA. Decontamination or equipment blanks were not required. All sampling equipment was disposable.

i. All results less than LOQ?

Yes  No Comments:

NA. Decontamination or equipment blanks were not required. All sampling equipment was disposable.

ii. If above LOQ, what samples are affected?

Comments:

NA. Decontamination or equipment blanks were not required. All sampling equipment was disposable.

iii. Data quality or usability affected?

Comments:

NA. Decontamination or equipment blanks were not required. All sampling equipment was disposable.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes  No Comments:

Lab specific qualifiers are defined within the qualifier section of the laboratory report.

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