January 28, 2020

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Subject: Letter Report for 2019 Groundwater Sampling at ARRC Former Mammoth Trucking Rev 5.0 1048 Whitney Road, Anchorage, Alaska 99501 ADEC File # 2100.26.202

Mr. Grandel:

Restoration Science & Engineering, LLC (RSE) is providing the following letter report for groundwater sampling of six (6) monitoring wells located at the Alaska Railroad Corporation (ARRC) Former Mammoth Trucking Facility located at 1048 Whitney Road in Anchorage, Alaska (Figure 1, Attachment A). This site is listed under file 2100.26.202 in the Alaska Department of Environmental Conservation (ADEC) contaminated sites database.

SITE OVERVIEW

In 1990, the following underground storage tanks (USTs) were removed from the Former Mammoth Trucking Facility:

One (1) 500-gallon gasoline UST;

One (1) 2,000-gallon diesel UST;

One (1) 12,000-gallon diesel UST;

One (1) 300-gallon used oil UST; and

One (1) 1,000-gallon used oil UST.

During UST removal, obvious impacts to the subsurface were noted. In 1994, Laidlaw Transit assumed the lease for the subject property and installed four groundwater monitoring wells. Groundwater sampling performed by EMCON Alaska, Inc. measured diesel range organics (DRO), gasoline range organics (GRO) and volatile organic compounds (VOCs), including

vinyl chloride and tetrachloroethene (PCE) above ADEC Table C Groundwater cleanup levels. These four wells were reportedly buried beneath new asphalt or destroyed between 1994 and 1997 (RSE, 2018b).

In 1997, CH2MHill began a groundwater study on an adjacent property to determine if up-gradient sources of petroleum free product hydrocarbons or solvents were migrating towards Ship Creek from north and east of Whitney Road. Free product was not detected during the CH2MHill investigation. However, PCE was detected in groundwater in 1997 and again in 1998 (RSE, 2018b).

In 1998, CH2MHill installed nine soil borings; five of which were completed as monitoring wells. In December 1998, CH2MHill collected groundwater samples from each well for DRO, residual range organics (RRO), benzene, toluene, ethylbenzene and total xylenes (collectively referred to as BTEX), as well a specific VOCs. The event measured DRO, benzene and PCE were detected above ADEC Table C cleanup levels (RSE, 2018b).

Numerous groundwater investigation efforts have occurred since the late 1990s, along with additional corrective actions to remediate the site. The most recent monitoring report, submitted in October 2016, reported five of the six wells exceeded ADEC Table C cleanup levels standards for DRO and multiple VOCs. Historically, the depth to groundwater has been reported between 4 feet and 9 feet below ground surface (bgs), with a southerly groundwater gradient (RSE, 2018b).

In September of 2017, RSE conducted field efforts including a groundwater sampling event and a groundwater elevation survey of all six (6) wells. Monitoring wells MW-7, CHMWE5 and CHMWE2 exceeded the ADEC Table C cleanup levels for DRO. CHMWE5, EMCONMW4, and CHMWE2 exceeded ADEC Table C cleanup levels for RRO. MW-7 exceeded the ADEC Table C cleanup levels for naphthalene. Monitoring wells MW-7, MW-6, CHMWE5, and CHMWE2 results for vinyl chloride exceeded the ADEC Table C cleanup levels. Groundwater was found to flow south towards Ship Creek during this field event (RSE, 2018b).

Based on a review of the ADEC contaminated sites database, Table A on the next page illustrates the historic highest target analyte concentrations from any one monitoring well located at the Former Mammoth Trucking Facility.

Table A. Historic Highest Concentrations for Contaminants of Potential Concern

COPCs	Historic Highest Concentration (mg/L)	Reference	ADEC Table C Cleanup Level (mg/L)
DRO	26.6	CH2MHill, 1999	1.5
RRO	11.9	CH2MHill, 1999	1.1
GRO	3.1	EMCON, 1994	2.2
Benzene	0.01	RSE. 2012	0.005
Vinyl chloride	0.0258	Clarus, 2010	0.002
PCE	0.044	CH2MHill, 1999	0.005
TCE	0.03	CH2MHill, 1999	0.005

Note: Database did not specify which wells were specific to the concentrations listed.

OBJECTIVES

This field event provides additional groundwater monitoring data for the wells located at the Former Mammoth Trucking site to support observed trends of natural attenuation, and determine whether additional monitoring or other actions may be required. Additionally, a groundwater elevation survey was performed of all six (6) wells to determine the groundwater gradient.

CONTAMINANTS OF POTENTIAL CONCERN

Based upon the results of previous investigations, RSE identified the following contaminants of potential concern (COPCs):

Table B. Contaminants of Potential Concern

COPC	Matrix	COPC Abbreviation	ADEC-Approved Lab Method	ADEC Table C Groundwater Cleanup
Gasoline Range Organics	Water	GRO	AK 101	2.2 mg/L
Diesel Range Organics	Water	DRO	AK 102	1.5 mg/L
Residual Range Organics	Water	RRO	AK 103	1.1 mg/L
Volatile Organic Compounds	Water	VOCs	EPA 8260	Varies
Polycyclic Aromatic Hydrocarbons*	Water	PAH SIMS	EPA 8270D	Varies

** PAHs reserved for well CHMWE2 as described below.*

FIELD EVENTS – GROUNDWATER SAMPLING

Two ADEC Qualified Samplers (QS) mobilized to the Mammoth trucking site on May 30, 2019. RSE personnel collected groundwater samples from monitoring wells MW-7, CHMWE1, MW-6, CHMWE5, EMCONMW-4, and CHMWE2.

RSE first examined the condition of each well and documented evidence of compromise. Monitoring wells MW-7, MW-6, and CHMWE2 were found in good condition. The monument for EMCONMW4 was missing all the bolts. CHMWE5 was found in poor condition. It had no

monument, the space between the housing and the polyvinyl chloride (PVC) was packed with dirt. The well plug present but did not appear to be effective in keeping dirt and debris out of the well. After sampling, RSE placed a new monument over CHMWE5 in attempts to keep dirt and debris from falling into the monitoring well. Monitoring well CHMWE1 was missing all the bolts and was easily pried up using a screwdriver.

RSE measured the depth to the bottom of each well, and the depth to groundwater. Following this observation, RSE then purged three (3) well volumes from each well using a submersible pump. Water quality parameters were monitored using a YSI 556 for stabilization when readings collected 3-5 minutes apart were within the following:

- pH ± 0.1
- Temperature ±3% (minimum of ± 0.2C)
- Conductivity ± 3%
- Specific Conductance ±10 mv
- Dissolved Oxygen ±10%

Tabulated field parameters for the 2019 groundwater sampling event can be found in Table 1 of Attachment B.

Monitoring well sampling was informed by EPA Low Flow (minimal draw down) Groundwater Sampling Procedures (EPA/540/S-95/504, April 1996). Water samples were collected using a positive-pressure submersible pump set to a low flow rate during sampling. RSE re-measured the depth to groundwater following purging and prior to sampling using a water level indicator.

One (1) sample was collected from each well for GRO, DRO, and VOCs. Additionally, well CHMWE2, the historically most impacted well, was analyzed for PAH SIMs. The sampling order was as follows: MW-7, CHMWE1, MW-6, CHMWE5, EMCONMW-4, and CHMWE2. A duplicate sample, CHMWE-X of CHMWE2, was submitted to the laboratory for quality control purposes. Groundwater monitoring well CHMWE2 was purged dry after one (1) gallon of water was removed. The well was allowed to recharge and was then sampled. The water samples were each collected using new, dedicated tubing. The water level indicator and any other equipment that is not disposable or dedicated was decontaminated with Alconox and distilled water.

As water samples were collected, care was taken to minimize volatile loss by excessive turbulence or air mixing. Field personnel avoided spilling or over-diluting acid sample preservatives. Water samples were placed directly into method-specific containers and stored in a clean, chilled sample cooler. The cooler was transported under chain-of-custody to ADEC-approved laboratory, SGS North America Inc. located in Anchorage, Alaska.

The submersible pump was decontaminated using Alconox and distilled water between sampling at each well. RSE sampled from the historically least-contaminated well to the most-contaminated well so as to minimize potential cross-contamination between sample sites.

GROUNDWATER ELEVATION SURVEY

RSE conducted the groundwater elevation survey for MW-6, MW-7, CHMWE1, CHMWE2, CHMWE5, and EMCONMW on May 30, 2019 using a Leica Rugby 620 and a Leica Rod Eye 160. RSE performed the survey two (2) times to ensure accuracy. The two (2) sets were within 0.02 feet of each other, indicating that the data gathered is accurate.

RSE reduced the groundwater elevation data and then uploaded it into Surfer, a gradient modeling software program. RSE used Surfer to create a groundwater gradient figure using this data and overlaid it onto the site map (Figure 2 in Attachment A). Groundwater was found to flow south towards Ship Creek during 2018 field efforts. The groundwater gradient was observed to flow southwest during the 2019 field event, indicating that the groundwater is still flowing towards Ship Creek.

RESULTS

Monitoring wells MW-7, CHMWE1, MW-6, EMCONMW4, CHMWE5, and CHMWE2 were analyzed for DRO, RRO, GRO and VOCs. Monitoring well CHMWE2 was also sampled for PAH SIMs, as it is historically the well with the highest contaminant concentrations.

GRO results for all samples were non-detect or below ADEC Table C Groundwater cleanup levels. DRO results for MW-7, CHMWE1, MW-6, and EMCONMW4 were non-detect or below ADEC Table C Groundwater cleanup levels. RRO results for MW-7, CHMWE1 and MW-6 were non-detect or below ADEC Table C Groundwater cleanup levels. DRO results for CHMWE5, CHMWE2 and CHMWE-X were 3.06J mg/L, 1.94 mg/L, and 2.94 mg/L, respectively, above the ADEC Table C groundwater cleanup level of 1.5 mg/L. RRO results for CHMWE5, EMCONMW4, and CHMWE-X, the duplicate of CHMWE-2 were 11.4 mg/L, 2.2 mg/L, and 1.72 mg/L, respectively, above the ADEC Table C cleanup level of 1.1 mg/L.

RRO and GRO results for MW-7 have been non-detect or below ADEC Table C Groundwater cleanup levels for the 2017 and 2019 monitoring events. 2019 RRO and GRO levels for MW-7 are 0.554 mg/L and 0.345 mg/L, respectively, below the ADEC Table C Groundwater cleanup levels for these analytes. In 2017, a DRO result of 1.6 mg/L was measured in MW-7, whereas DRO results were 1.31 mg/L during the 2019 sampling event. DRO, GRO, and RRO results for MW-7 are currently below ADEC Table C Groundwater cleanup levels. Trichloroethene (TCE) and PCE results for MW-7 are non-detect and below ADEC Table C Groundwater cleanup levels. Vinyl chloride results for MW-7 in 2019 are 0.0159 mg/L, above the ADEC Table C Groundwater cleanup level of 0.00019 mg/L. Additionally, vinyl chloride in MW-7 appears to trend upwards from 0.00167 mg/L in 2016 and 0.004 mg/L in 2017, to 0.0159 mg/L in 2019. 2019 naphthalene

results for MW-7 were 2.54 ug/L, above the ADEC Table C Groundwater cleanup level of 1.7 ug/L.

DRO and GRO results for CHMWE1 have been non-detect or below ADEC Table C Groundwater cleanup levels. 2019 DRO and GRO results for CHMWE1 are non-detect. Historically, RRO results for CHMWE1 have been non-detect or meet ADEC Table C Groundwater cleanup levels. 2019 RRO results for CHMWE1 are 0.347J mg/L, below the ADEC Table C Groundwater cleanup level. PCE has historically fluctuated slightly above and below the ADEC Table C Groundwater cleanup level of 0.041 mg/L. 2019 PCE results for CHMWE1 were 0.0394 mg/L, below the cleanup level. TCE and vinyl chloride results for CHMWE1 are non-detect and below the ADEC Table C Groundwater cleanup levels.

Historically, vinyl chloride has been the only analyte exceeding the ADEC Table C Groundwater cleanup levels in MW-6. All 2019 DRO, GRO, RRO, PCE and TCE results for MW-6 were non-detect or below the ADEC Table C Groundwater cleanup levels. 2019 vinyl chloride results for MW-6 were 0.00954 mg/L. MW-6 vinyl chloride levels has been observed since 2015 and appear relatively stable with the exception of 2016 which measured vinyl chloride at 0.0177 mg/L. 2019 naphthalene results for MW-6 were 11.5 ug/L, above the ADEC Table C Groundwater cleanup level of 1.7 ug/L.

CHMWE5 has exceeded ADEC Table C Groundwater cleanup levels for DRO, RRO, and vinyl chloride. 2019 DRO results for CHMWE5 are 3.06J mg/L, above the ADEC Table C Groundwater cleanup level of 1.5 mg/L. 2019 RRO results for CHMWE5 are 11.4 mg/L, significantly elevated above the ADEC Table C Cleanup level of 1.1 mg/L. 2017 DRO and RRO results for CHMWE5 were 2.36 mg/L, and 7.27 mg/L, respectively, indicating an increase in concentrations for these analytes. DRO and RRO results previous to those event were below cleanup levels indicating damage to the well integrity may allow stormwater intrusion. 2019 vinyl chloride results for CHMWE5 are 0.00863 mg/L, above the ADEC Table C Groundwater cleanup levels of 0.00019 mg/L. Historically, vinyl chloride results for CHMWE5 have fluctuated up and down and a clear trend has not been observed. TCE and PCE results for CHMWE5 have historically been and currently are non-detect and below ADEC Table C Groundwater cleanup levels.

DRO, GRO, TCE, PCE, and vinyl chloride results for EMCONMW-4 have been non-detect or below ADEC Table C Groundwater cleanup levels. 2019 results for these analytes are also non-detect or below ADEC Table C Groundwater cleanup levels. Historically, RRO results for EMCONMW4 have been above the ADEC Table C Groundwater cleanup level and appear to increase since 2016. In 2016, RRO results were 1.11 mg/L; in 2017 1.27 mg/L, and in 2019 2.2 mg/L.

CHMWE2 has historically measured ADEC Table C Groundwater cleanup level exceedances for

DRO, RRO, TCE and vinyl chloride since 1999. However, since 2016, DRO, RRO, and vinyl chloride results for CHMWE2 have seen continuous decreases in concentrations. TCE concentrations have remained relatively stable. PCE and GRO results for CHMWE2 have historically been and currently are non-detect or below ADEC Table C Groundwater cleanup levels. 2019 DRO results for CHMWE2 and its duplicate CHMWE-X were 1.94 mg/L and 2.94 mg/L, respectively above the ADEC Table C Groundwater cleanup level of 1.5 mg/L. RRO results for CHMWE2 and CHMWE-X are 1.06 mg/L and 1.72 mg/L, respectively. 1.72 mg/L is the reported RRO result for CHMWE2, which is above the ADEC Table C Groundwater cleanup level of 1.1 mg/L. TCE results for CHMWE2 and CHMWE-X are 0.0057mg/L and 0.00694 mg/L, respectively, above the ADEC Table C Groundwater cleanup level of 0.0028 mg/L. Vinyl chloride results for CHMWE2 and CHMWE-X are 0.00125 mg/L and 0.00118 mg/L, respectively. The reported vinyl chloride result for CHMWE2 is 0.00125 mg/L, above the ADEC Table C Groundwater cleanup level of 0.00019 mg/L.

Tabulated data results for all wells can be found in Tables 2-4 of Attachment B. Historic data for these wells can be found in Table 5 of Attachment B.

INVESTIGATIVE DERIVED WASTE

Consumables such as tubing and gloves were placed into a trash receptacle for disposal. Non-consumables such water level indicator and submersible pump were decontaminated using Alconox and water between sampling at each well. Tubing for water samples was dedicated to each well and disposed of following use.

Purge water from monitoring well CHMWE2 was containerized and stored onsite adjacent in the southwest corner of the property, as it had a sheen. Decontamination water was also temporarily stored on-site with the purge water from CHMWE2. The ADEC approved transportation of this stored purge and decontamination water to the ARRC Waste Facility before being picked up by US Ecology (formerly NRC Alaska) for treatment and disposal. The signed Approval to Transport Form, dated December 18, 2019, is provided in Attachment F. RSE filtered all purge water from the other wells through a granular activated carbon (GAC) filter and discharged the water on a vegetated, upland area where the water could not leave the site.

QUALITY ASSURANCE AND QUALITY CONTROL

RSE collected each sample in general accordance with applicable ADEC regulation and guidance documents. A single blind duplicate (CHMWE-X of CHMWE2) was submitted with the laboratory samples for quality control purposes. RSE submitted one (1) trip blank with the cooler containing volatile samples. RSE has completed the ADEC Laboratory Review checklist (Attachment E). The SGS laboratory report 192722 can be found as Attachment D.

Monitoring well CHMWE5 was not included in the groundwater elevation survey. The well was

found in poor condition. It had no monument, the space between the housing and the PVC was packed with dirt, and the well plug was present, but did not appear to be effective in keeping dirt and debris out of the well.

The ADEC-approved work plan dated August 20, 2018 indicated that there are piezometers located on the east side of the subject property that were to be included in the groundwater elevation survey. RSE was unable to locate these piezometers, and therefore did not include these in the groundwater elevation survey. The southwest groundwater gradient observed is representative of the relationship between MW-6, MW-7, CHMWE1, CHMWE2, and EMCONMW4.

Laboratory detection limits exceeded ADEC Table C Groundwater cleanup levels for 1,2,3-Trichloropropane, a chlorinated non-target analyte. All data quality and usability is unaffected. All data was determined to be usable for comparison with the ADEC Table C cleanup levels.

CONCLUSION

Results from the May 2019 sampling event yielded DRO exceedances above ADEC Table C Groundwater cleanup levels in monitoring wells CHMWE5 and CHMWE2; RRO exceedances above ADEC Table C Groundwater cleanup levels in monitoring wells CHMWE5, EMCONM4, and CHMWE2; TCE exceedances above ADEC Table C Groundwater cleanup levels in monitoring well CHMWE2; and vinyl chloride results above ADEC Table C Groundwater cleanup levels in monitoring wells MW-6, MW-7, CHMWE5 and CHMWE2. Additionally, naphthalene results above ADEC Table C Groundwater cleanup levels was detected in MW-6 and MW-7.

Vinyl chloride results in MW-7 appears to trend upwards, and is currently above the ADEC Table C Groundwater cleanup level of 0.00019 mg/L. All other results for MW-7 are non-detect or generally below ADEC Table C Groundwater

All DRO, GRO, RRO, and VOC results for CHMWE1 are non-detect or generally below ADEC Table C Groundwater cleanup levels with PCE results meeting the ADEC Table C Groundwater cleanup level in 2019.

Vinyl chloride results in MW-6 appear to be relatively stable. All other analytes are generally non-detect or below ADEC Table C Groundwater cleanup levels.

RRO results for EMCONMW4 appear to steadily increase since 2015, and are currently above the ADEC Table C Groundwater cleanup level of 1.1 mg/L. All other analytes for EMCONMW-4 are non-detect or generally under the ADEC Table C Groundwater cleanup levels.

DRO, RRO, and vinyl chloride concentrations in CHMWE2 appear to be decreasing, however TCE concentrations in CHMWE2 appear to fluctuate slightly up and down, and are consistently

above the ADEC Table C Groundwater cleanup level of 0.0028 mg/L.

The 2019 groundwater elevation survey indicates that the groundwater between the six (6) wells located at 1048 Whitney Road flows southwest towards Ship Creek.

RSE believes the data indicates the site contamination is relatively stable or decreasing with downgradient wells MW-6 and MW-7 meeting ADEC Table C Groundwater cleanup levels for all analytes except naphthalene and vinyl chloride. An exception is well CHMWE-5, which shows increasing DRO and RRO likely as a result of surface water intrusion occurring. RSE recommends that all wells on-site be sampled again in 2020 to collect additional data and that monitoring well CHMWE5 be subjected to repairs or be decommissioned if required.

Please contact Lisa Koeneman at ext. 110, if you have any questions or comments. It is our pleasure to work with the ADEC on this project. This report was prepared an ADEC qualified environmental professional (QEP) in accordance with 18 AAC 75/78.

Lisa Koeneman *Lucus Gamble*

Lisa Koeneman, QEP Lucus Gamble, QEP, MSEM

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ATTACHMENTS:

Attachment A – Figures
Attachment B – Tabulated Laboratory Results
Attachment C – Select Site Photographs
Attachment D – SGS Laboratory Report 1192722
Attachment E – ADEC Laboratory Data Review Checklist
Attachment F – ADEC Approval to Transport Form

REFERENCES:

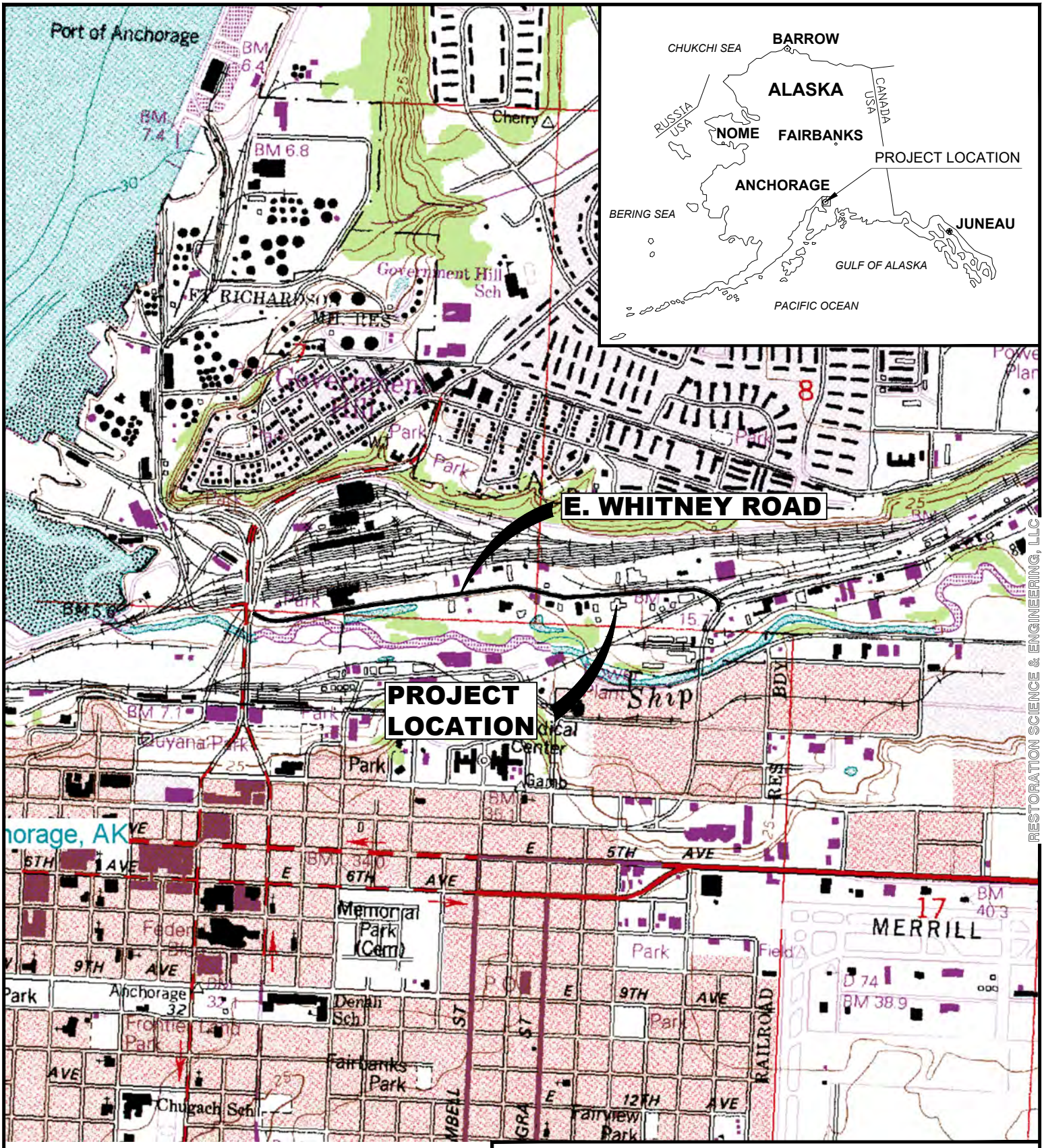
Fairbanks Environmental Services (FES). 2016. 2016 Groundwater Monitoring Report, Rev 1. Former Mammoth Trucking Site Anchorage, Alaska ADEC Hazard – 23887/File ID – 2100.26.202. September 8, 2016

Restoration Science & Engineering, LLC (RSE). 2018a. Work Plan for Groundwater Sampling at ARRC Former Mammoth Trucking 1048 Whitney Road, Anchorage, Alaska ADEC File # 2100.26.202 Rev 1.0. August 20, 2018.

Restoration Science & Engineering, LLC (RSE). 2018b. Letter Report for Groundwater Sampling at ARRC Former Mammoth Trucking 1048 Whitney Road, Anchorage, Alaska ADEC File # 2100.26.202 Rev 1.0. January 10, 2018.

Attachment A:

Figures



N.T.S.

ARRC
MAMMOTH TRUCKING GROUNDWATER SAMPLING
1048 E. WHITNEY ROAD

VICINITY MAP

ANCHORAGE, ALASKA

JOB NO: 18.1910	DRAWN: MSB
DATE: 6.20.2019	CHECKED: LK

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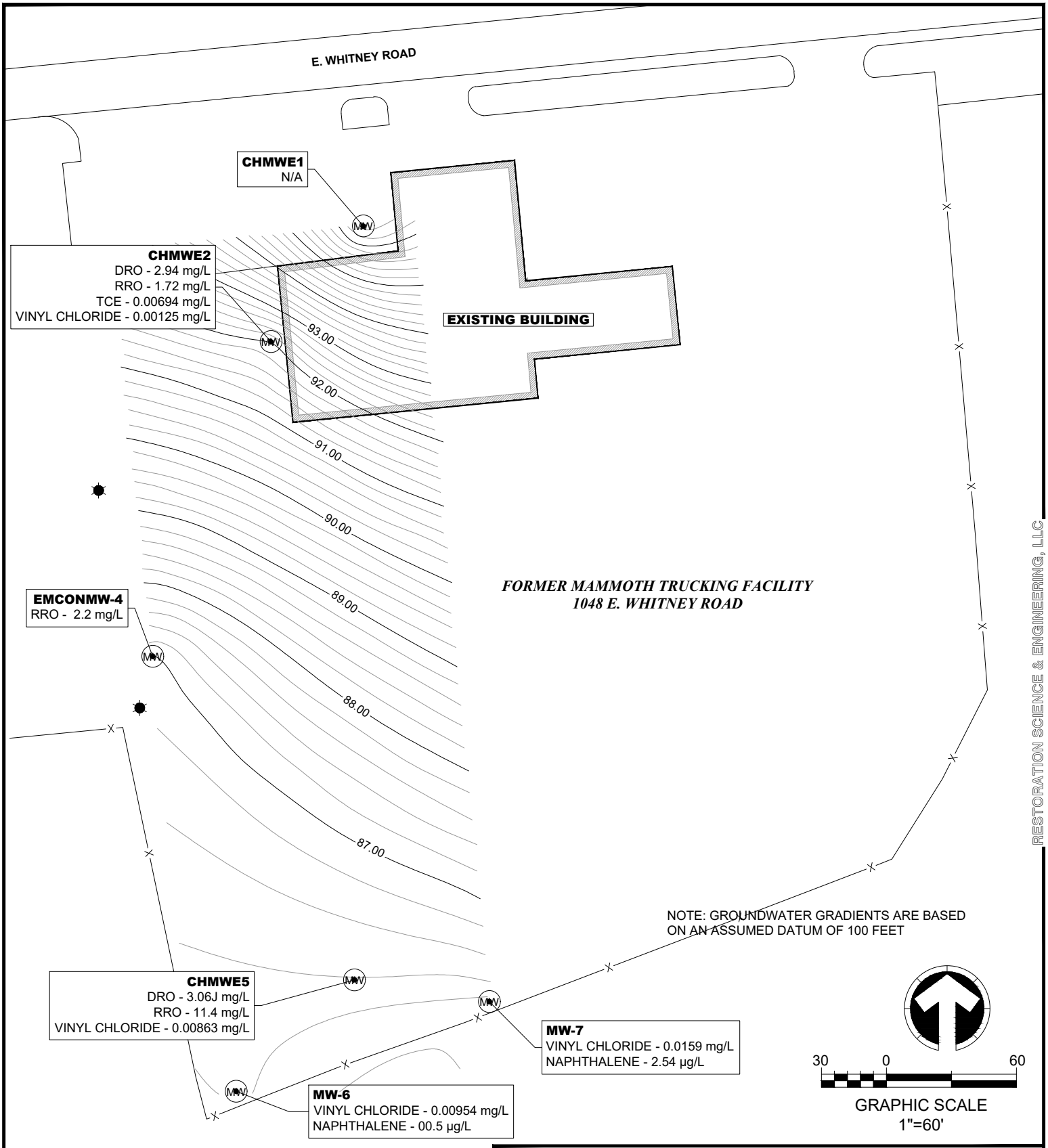
FIGURE 1



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ARRC
MAMMOTH TRUCKING GROUNDWATER SAMPLING
1048 E. WHITNEY ROAD

MONITORING WELL RESULTS AND GROUNDWATER GRADIENT MAP

ANCHORAGE, ALASKA

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JOB NO: 18.1910	DRAWN: MSB
DATE: 6.20.2019	CHECKED: LK

FIGURE 2

Attachment B:

Tabulated Laboratory Results

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TABLE 1
ALASKA RAILROAD CORPORATION
MAMMOTH TRUCKING GROUNDWATER SAMPLING
GROUNDWATER QUALITY FIELD PARAMETERS

GROUNDWATER QUALITY FIELD PARAMETERS										
SAMPLE ID	DATE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	VOLUME PURGED (GAL)	TEMP (°C)	pH (pH Units)	CONDUCTIVITY (mS/cm)	SPECIFIC CONDUCTANCE (µS/cm)	DISSOLVED OXYGEN %	OBSERVATIONS
MW-7	5/30/2019	8.69	14.79	3	4.23 3.90 3.77	6.87 6.97 7.01	0.970 0.881 0.824	585 526 490	6.9 6.9 8.0	no sheen or odor; light gray, cloudy water
CHMWE1	5/30/2019	4.85	14.51	2.5	5.89 5.52 5.41	6.87 7.00 7.03	0.419 0.418 0.419	266 262 262	41.9 40.4 39.5	no sheen or odor; brown, turbid, cloudy water
MW-6	5/30/2019	6.98	14.48	3.75	4.82 4.34 4.08 3.92	6.83 6.87 6.88 6.89	0.906 0.949 0.977 0.995	557 575 587 594	4.1 9.1 13.0 10.0	no sheen or odor; dark brown to black
CHMWE5	5/30/2019	8.03	11.21	1.5	4.98 4.42 4.33	6.45 6.52 6.75	0.200 0.425 0.530	123 258 323	37.2 28.0 52.4	no odor or sheen; dark brown to black, cloudy
EMCONMW4	5/30/2019	8.10	13.89	3	4.56 5.30 6.17	6.07 6.24 6.43	0.592 0.607 0.916	361 379 588	23.1 25.5 53.8	mostly clear; light gray; no sheen
CHMWE2	5/30/2019	7.32	10.24	1.5	9.58 10.33	6.72 7.03	0.934 0.784	659 564	29.6 64.2	orange; sheen; no odor

NOTES:

1) Water quality measurements performed using a YSI Model 556 Water Quality Meter.

2) Purging of well was done with a submersible pump.

3) "mS/cm" means "millisiemens per centimeter"; "µS/cm" means "micro Siemens per centimeter"; "ppt" means "parts per thousand"; "mV" means "millivolts"; "mg/L" means "milligram per liter"; "gal" means "gallon"; "°C " means "degrees Celsius".

TABLE 2
ALASKA RAILROAD CORPORATION
MAMMOTH TRUCKING GROUNDWATER SAMPLING
HYDROCARBONS CONCENTRATIONS IN GROUNDWATER

HYDROCARBON CONCENTRATIONS IN GROUNDWATER					
SAMPLE ID	**DATE**	**DIESEL RANGE ORGANICS (mg/L)**	**RESIDUAL RANGE ORGANICS mg/L**	**GASOLINE RANGE ORGANICS (mg/L)**	**SGS WORK ORDER**
MW-7	5/30/2019	**1.31**	**0.554**	**0.345**	
CHMWE1	5/30/2019	*0.300 U*	**0.347 J**	*0.0500 U*	
MW-6	5/30/2019	**1.22**	**1.03**	**0.0726 J**	
CHMWE5	5/30/2019	**3.06 J**	**11.4**	*0.0500 U*	1192722
EMCONMW4	5/30/2019	**1.06**	**2.2**	*0.0500 U*	
CHMWE2	5/30/2019	**1.94**	**1.06**	**0.0643 J**	
CHMWE-X	5/30/2019	**2.94**	**1.72**	**0.0658 J**	
ADEC GROUNDWATER TABLE C CLEANUP LEVELS (mg/L)		**1.5**	**1.1**	**2.2**	

NOTES:

1) Diesel Range Organics (DRO) samples analyzed by AK Method 102;
Residual Range Organics (RRO) samples analyzed by AK Method 103;
Gasoline Range Organics (GRO) samples analyzed by AK Method 101
2) "mg/L" means "milligrams per liter".
3) **Bold** font indicates the analyte was detected above the detection limit (DL).
4) *Italicized* font with a U-flag indicates the analyte was not detected at the DL; the value presented is the limit of detection.
5) J flag indicates the result is an estimated value.
6) Yellow highlighting indicates the analyte was detected above the ADEC Table C Groundwater Cleanup Level.
7) CHMWE-X is a blind duplicate of CHMWE2.

TABLE 3
ALASKA RAILROAD CORPORATION
MAMMOTH TRUCKING GROUNDWATER SAMPLING
VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER

VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER								
SAMPLE ID	**MW-7**	**CHMWE1**	**MW-6**	**CHMWE5**	**EMCONMW4**	**CHMWE2**	**CHMWE-X**	**ADEC TABLE C**
DATE	5/30/2019	5/30/2019	5/30/2019	5/30/2019	5/30/2019	5/30/2019	5/30/2019	**GROUNDWATER**
SGS WORK ORDER	1192722	1192722	1192722	1192722	1192722	1192722	1192722	**CLEANUP LEVELS**
UNITS	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	**(ug/L)**
1,1,1,2-Tetrachloroethane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	5.7
1,1,1-Trichloroethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	8,000
1,1,2,2-Tetrachloroethane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	0.76
1,1,2-Trichloroethane	*0.200 U*	*0.200 U*	*0.200 U*	*0.200 U*	*0.200 U*	*0.200 U*	*0.200 U*	0.41
1,1-Dichloroethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	28
1,1-Dichloroethene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	280
1,1-Dichloropropene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	--
1,2,3-Trichlorobenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	7.0
1,2,3-Trichloropropane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	0.0075
1,2,4-Trichlorobenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	4.0
1,2,4-Trimethylbenzene	**0.590 J**	*0.500 U*	**19.6**	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	56
1,2-Dibromo-3-chloropropane	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	--
1,2-Dibromoethane	*0.0375 U*	*0.0375 U*	*0.0375 U*	*0.0375 U*	*0.0375 U*	*0.0375 U*	*0.0375 U*	0.075
1,2-Dichlorobenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	300
1,2-Dichloroethane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	1.7
1,2-Dichloropropane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	8.2
1,3,5-Trimethylbenzene	**0.680 J**	*0.500 U*	**3.51**	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	60
1,3-Dichlorobenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	300
1,3-Dichloropropane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	4.4
1,4-Dichlorobenzene	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	4.8
2,2-Dichloropropane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	--
2-Butanone (MEK)	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	5,600
2-Chlorotoluene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	--
2-Hexanone	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	38
4-Chlorotoluene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	--
4-Isopropyltoluene	*0.500 U*	*0.500 U*	**2.36**	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	--
4-Methyl-2-pentanone (MIBK)	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	6,300
Benzene	**1.07**	*0.200 U*	**3.45**	**0.920**	*0.200 U*	**0.270 J**	**0.260 J**	4.6
Bromobenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	62
Bromochloromethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	--
Bromodichloromethane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	1.3
Bromoform	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	33
Bromomethane	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	7.5
Carbon disulfide	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	810
Carbon tetrachloride	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	4.6
Chlorobenzene	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	78
Chloroethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	--
Chloroform	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	2.2
Chloromethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	**0.350 J**	190
cis-1,2-Dichloroethene	**0.320 J**	*0.500 U*	**0.670 J**	**0.420 J**	*0.500 U*	**2.28**	**2.55**	36
cis-1,3-Dichloropropene	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	--
Dibromochloromethane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	8.7
Dibromomethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	8.3
Dichlorodifluoromethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	200
Ethylbenzene	*0.500 U*	*0.500 U*	**0.620 J**	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	15
Freon-113	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	55000
Hexachlorobutadiene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1.4
Isopropylbenzene (Cumene)	**1.89**	*0.500 U*	**2.38**	*0.500 U*	*0.500 U*	**0.320 J**	*0.500 U*	450
Methylene chloride	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	110
Methyl-t-butyl ether	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	140
Naphthalene	**2.54**	*0.500 U*	**11.5**	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1.7
n-Butylbenzene	*0.500 U*	*0.500 U*	**0.770 J**	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1,000
n-Propylbenzene	**0.630 J**	*0.500 U*	**2.26**	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	660
o-Xylene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	See Total Xylenes
P & M -Xylene	**1.77 J**	*1.00 U*	**1.68 J**	*1.00 U*	*1.00 U*	*1.00 U*	*1.00 U*	See Total Xylenes
sec-Butylbenzene	**0.330 J**	*0.500 U*	**2.05**	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	2,000
Styrene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1,200
tert-Butylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	690
Tetrachloroethene	*0.500 U*	**39.4**	*0.500 U*	*0.500 U*	*0.500 U*	**0.890 J**	**1.07**	41
Toluene	*0.500 U*	*0.500 U*	**1.15**	**2**	**0.440 J**	*0.500 U*	*0.500 U*	1,100
trans-1,2-Dichloroethene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	360
trans-1,3-Dichloropropene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	4.7
Trichloroethene	*0.500 U*	*0.870 J*	*0.500 U*	*0.500 U*	*0.500 U*	**5.57**	**6.94**	2.8
Trichlorofluoromethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	5,200
Vinyl acetate	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	410
Vinyl chloride	**15.9**	*0.0750 U*	**9.54**	**8.63**	*0.0750 U*	**1.25**	**1.18**	0.19
Xylenes (total)	**1.77 J**	*1.50 U*	**1.68 J**	*1.50 U*	*1.50 U*	*1.50 U*	*1.50 U*	190

NOTES:

1) Volatile organic compounds (VOC) analyses by Method EPA SW8260C.
2) "ug/L" means "micrograms per liter".
3) **Bold** font indicates the analyte was detected above the laboratory Detection Limit (DL).
4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the DL; the value presented is the limit of detection.
5) J flag indicates the result is an estimated value.
6) Light blue highlighting indicates that the DL is elevated above the cleanup level.
7) Yellow highlighting indicates the analyte was detected above the ADEC Table C Groundwater Cleanup Level.
8) CHMWE-X is a blind duplicate of CHMWE2.

TABLE 4
ALASKA RAILROAD CORPORATION
MAMMOTH TRUCKING GROUNDWATER SAMPLING
POLYAROMATIC HYDROCARBON CONCENTRATIONS IN GROUNDWATER

POLYAROMATIC HYDROCARBON CONCENTRATIONS IN GROUNDWATER			
SAMPLE NUMBER **DATE** **SGS WORK ORDER** **UNITS**	**CHMWE2** 5/30/2019 1192722 ug/L	**CHMWE-X** 5/30/2019 1192722 ug/L	**ADEC TABLE C CLEANUP LEVELS (ug/L)**
1-Methylnaphthalene	*0.232 U*	*0.232 U*	11
2-Methylnaphthalene	*0.232 U*	*0.0232 U*	36
Acenaphthene	*0.232 U*	*0.0565*	530
Acenaphthylene	*0.232 U*	*0.0232 U*	260
Anthracene	*0.232 U*	*0.0232 U*	43(1800)[4]
Benzo(a)Anthracene	*0.0232 U*	*0.0232 U*	--
Benzo[a]pyrene	*0.00925 U*	*0.00925 U*	0.25
Benzo[b]Fluoranthene	*0.0232 U*	*0.0232 U*	2.5
Benzo[g,h,i]perylene	*0.0232 U*	*0.0232 U*	0.26(600)[4]
Benzo[k]fluoranthene	*0.0232 U*	*0.0232 U*	0.80(25)[4]
Chrysene	*0.0232 U*	*0.0232 U*	2.0(250)[4]
Dibenzo[a,h]anthracene	*0.00925 U*	*0.00925 U*	0.25
Fluoranthene	*0.0232 U*	*0.0232 U*	260(800)[4]
Fluorene	**0.242**	**0.200**	290
Indeno[1,2,3-c,d] pyrene	*0.232 U*	*0.232 U*	0.19
Naphthalene	*0.0463 U*	*0.0463 U*	1.7
Phenanthrene	*0.0232 U*	*0.0232 U*	170
Pyrene	*0.0232 U*	*0.0232 U*	120

NOTES:

1) Polyaromatic Hydrocarbon (PAH) by Select Ion Monitoring (SIM) analyses by Method EPA SW8270D.
2) "ug/L" means "micrograms per liter".
3) Bold font indicates the analyte was detected above the laboratory Detection Limit (DL).
4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the detection limit; the value presented is the limit of detection.
5) J flag indicates the result is an estimated value.
6) CHMWE-X is a blind duplicate of CHMWE2.

TABLE 5
ALASKA RAILROAD CORPORATION
MAMMOTH TRUCKING GROUNDWATER SAMPLING
HISTORIC CONCENTRATIONS IN GROUNDWATER

HISTORIC CONCENTRATIONS IN GROUNDWATER							
SAMPLE ID	**DATE**	**DIESEL RANGE ORGANICS (mg/L)**	**RESIDUAL RANGE ORGANICS mg/L**	**GASOLINE RANGE ORGANICS (mg/L)**	**TETRACHLOROETHENE (PCE) (mg/L)**	**TRICHLOROETHENE (TCE) (mg/L)**	**Vinyl Chloride (mg/L)**
CHMWE1							
CHMWE1	12/1998	**0.2**	**2**	--	--	--	--
CHMWE1	8/1999	**0.25**	**1.1**	--	**0.044**	**0.0024**	*ND*
CHMWE1	10/2010	*ND*	*ND*	--	**0.0307**	**0.00141**	*ND*
CHMWE1	9/2012	*ND*	**0.116 J**	--	**0.0405**	**0.00122**	*ND*
CHMWE1	10/2015	**0.332 J**	**0.2118 J**	--	**0.0521 J**	**0.00142**	*ND*
CHMWE1	6/2016	*ND*	*ND*	--	**0.0496**	**0.00135**	*ND*
CHMWE1	9/5/2017	*0.278 U*	0.232 U	**0.0325 J**	**0.0422**	**0.00109**	*0.0000750 U*
CHMWE1	5/30/2019	*0.300 U*	**0.347 J**	*0.0500 U*	**0.0394**	*0.000500 U*	*0.0000750 U*
CHMWE2							
CHMWE2	12/1998	**4.87**	*ND*	--	--	--	--
CHMWE2	8/1999	**26.6**	**11.9**	--	*ND*	**0.0016**	**0.001**
CHMWE2	10/2010	**5.72**	**2.39**	--	*ND*	**0.00949**	**0.00395**
CHMWE2	9/2012	**4.5**	**1.24**	--	**0.00062**	**0.00963**	**0.00677**
CHMWE2	10/2015	**2.45**	**0.832**	--	*ND*	**0.00579**	**0.00467**
CHMWE2	6/2016	**7.18**	**4.49**	--	*ND*	**0.00917**	**0.00231**
CHMWE2	9/5/2017	**5.7**	**3.59**	**0.0347 J**	*0.000500 U*	**0.00416**	**0.00185**
CHMWE2	5/30/2019	**2.94**	**1.72**	**0.0658 J**	**0.00107**	**0.00694**	**0.00125**
CHMWE5							
CHMWE5	12/1998	**1.49**	**1.0**	--	--	--	--
CHMWE5	8/1999	**3.08**	**6.6**	--	*ND*	*ND*	**0.0064**
CHMWE5	10/2010	**0.588**	ND	--	*ND*	*ND*	**0.0179**
CHMWE5	9/2012	**1.11**	**0.445 J**	--	*ND*	*ND*	**0.00258**
CHMWE5	10/2015	**0.521 J**	**0.333 J**	--	*ND*	*ND*	**0.00585**
CHMWE5	6/2016	**0.539 J**	**0.644**	--	*ND*	*ND*	**0.0224**
CHMWE5	9/5/2017	**2.36**	**7.27**	**0.0397 J**	*0.000500 U*	*0.000500 U*	**0.0172**
CHMWE5	5/30/2019	**3.06 J**	**11.4**	*0.0500 U*	*0.000500 U*	*0.000500 U*	**0.00863**
EMCONMW-4							
EMCONMW-4	10/2015	**0.276 J**	*ND*	--	*ND*	*ND*	*ND*
EMCONMW-4	6/2016	**1.36**	**1.11**	--	*ND*	*ND*	*ND*
EMCONMW-4	9/5/2017	**0.689**	**1.27**	*0.0500 U*	*0.000500 U*	*0.000500 U*	*0.0000750 U*
EMCONMW4	5/30/2019	**1.06**	**2.2**	*0.0500 U*	*0.000500 U*	*0.000500 U*	*0.0000750 U*
MW-6							
MW-6	10/2015	**1.3**	**0.637**	--	*ND*	*ND*	**0.0076**
MW-6	6/2016	**0.823**	**0.491 J**	--	*ND*	*ND*	**0.0177**
MW-6	9/5/2017	**0.613**	**0.445 J**	**0.0502 J**	*0.000500 U*	*0.000500 U*	**0.00730**
MW-6	5/30/2019	**1.22**	**1.03**	**0.0726 J**	*0.000500 U*	*0.000500 U*	**0.00954**
MW-7							
MW-7	10/2015	**1.42**	**0.447 J**	--	*ND*	*ND*	*ND*
MW-7	6/2016	**0.369 J**	**0.285 J**	--	*ND*	*ND*	**0.00167**
MW-7	9/5/2017	**1.6**	**0.763**	**0.629**	*0.000500 U*	*0.000500 U*	**0.00400**
MW-7	5/30/2019	**1.31**	**0.554**	**0.345**	*0.000500 U*	*0.000500 U*	**0.0159**
ADEC GROUNDWATER CLEANUP LEVELS TABLE C		**1.5**	**1.1**	**2.2**	**0.041**	**0.0028**	**0.00019**

NOTES:

1) Diesel Range Organics (DRO) samples analyzed by AK Method 102; Residual Range Organics (RRO) samples analyzed by AK Method
Volatile organic compounds (VOC) analyses by Method EPA 8260D

2) "mg/L" means "milligrams per liter"; "ug/L" means "micrograms per liter".

3) **Bold** font indicates the analyte was detected above the Laboratory Limit of Detection (LOD).

4) *Italicized* font with a U-flag indicates the analyte was not detected at the LOD; the value presented is the LOD

5) J flag indicates the result is an estimated value

6) Yellow highlighting indicates the analyte was detected above the ADEC Groundwater Cleanup Level

7) ND indicates non-detect from previous reports

Attachment C:

Select Site Photographs

Sampling at MW-7

Sampling at CHMWE1; looking northeast.

Sampling at MW-6.

Sampling at CHMWE5; looking north.

Sampling at CHMWE4; looking northwest.

Sampling at CHMWE2; looking southeast.

Purge and decontamination water stored in the southwest corner of subject property pending ADEC approval to dispose/treat/transport; looking southwest.

Attachment D:
SGS North America Laboratory Report 1192722

RESTORATION
Science & Engineering, LLC

Laboratory Report of Analysis

To: Restoration Science & Eng
911 West 8th Ave Suite 100
Anchorage, AK 99501
(907)278-1023

Report Number: **1192722**

Client Project: **ARRC Mammoth GW**

Dear Lisa Koeneman,

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.

Chuck Homestead Date
Project Manager
Charles.Homestead@sgs.com

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Case Narrative

SGS Client: **Restoration Science & Eng**
SGS Project: **1192722**
Project Name/Site: **ARRC Mammoth GW**
Project Contact: **Lisa Koeneman**
NPDES/APDES#: **18-1910**

Refer to sample receipt form for information on sample condition.

LCSD for HBN 1794599 [VXX/3418 (1511249) LCSD

AK101 – LCSD recovery for Gasoline Range Organics 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.

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
SW8260C				
1192722005	MW-6	VMS18994	n-Butylbenzene	SP

Manual Integration Reason Code Descriptions

Code	Description
O	Original Chromatogram
M	Modified Chromatogram
SS	Skimmed surrogate
BLG	Closed baseline gap
RP	Reassign peak name
PIR	Pattern integration required
IT	Included tail
SP	Split peak
RSP	Removed split peak
FPS	Forced peak start/stop
BLC	Baseline correction
PNF	Peak not found by software

All DRO/RRO analysis are integrated per SOP.

Print Date: 06/11/2019 11:18:49AM

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. 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, indenmification and jurisdiction issues defined therein.

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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.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
CHMWE1	1192722001	05/30/2019	05/31/2019	Water (Surface, Eff., Ground)
CHMWE2	1192722002	05/30/2019	05/31/2019	Water (Surface, Eff., Ground)
EMCONMW4	1192722003	05/30/2019	05/31/2019	Water (Surface, Eff., Ground)
CHMWE5	1192722004	05/30/2019	05/31/2019	Water (Surface, Eff., Ground)
MW-6	1192722005	05/30/2019	05/31/2019	Water (Surface, Eff., Ground)
MW-7	1192722006	05/30/2019	05/31/2019	Water (Surface, Eff., Ground)
CHMW-X	1192722007	05/30/2019	05/31/2019	Water (Surface, Eff., Ground)
Trip Blank	1192722008	05/30/2019	05/31/2019	Water (Surface, Eff., Ground)

Method	Method Description
8270D SIM LV (PAH)	8270 PAH SIM GC/MS Liq/Liq ext. LV
AK102	DRO/RRO Low Volume Water
AK103	DRO/RRO Low Volume Water
AK101	Gasoline Range Organics (W)
SW8260C	Volatile Organic Compounds (W) FULL

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Detectable Results Summary

Client Sample ID: **CHMWE1**
Lab Sample ID: 1192722001

Semivolatile Organic Fuels
Volatile GC/MS

Parameter	Result	Units
Residual Range Organics	0.347J	mg/L
Tetrachloroethene	39.4	ug/L
Trichloroethene	0.870J	ug/L

Client Sample ID: **CHMWE2**
Lab Sample ID: 1192722002

Polynuclear Aromatics GC/MS
Semivolatile Organic Fuels
Volatile Fuels
Volatile GC/MS

Parameter	Result	Units
Fluorene	0.242	ug/L
Diesel Range Organics	1.94	mg/L
Residual Range Organics	1.06	mg/L
Gasoline Range Organics	0.0643J	mg/L
Benzene	0.270J	ug/L
cis-1,2-Dichloroethene	2.28	ug/L
Isopropylbenzene (Cumene)	0.320J	ug/L
Tetrachloroethene	0.890J	ug/L
Trichloroethene	5.57	ug/L
Vinyl chloride	1.25	ug/L

Client Sample ID: **EMCONMW4**
Lab Sample ID: 1192722003

Semivolatile Organic Fuels
Volatile GC/MS

Parameter	Result	Units
Diesel Range Organics	1.06	mg/L
Residual Range Organics	2.20	mg/L
Toluene	0.440J	ug/L

Client Sample ID: **CHMWE5**
Lab Sample ID: 1192722004

Semivolatile Organic Fuels
Volatile GC/MS

Parameter	Result	Units
Diesel Range Organics	3.06J	mg/L
Residual Range Organics	11.4	mg/L
Benzene	0.920	ug/L
cis-1,2-Dichloroethene	0.420J	ug/L
Toluene	2.00	ug/L
Vinyl chloride	8.63	ug/L

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Detectable Results Summary

Client Sample ID: **MW-6**
Lab Sample ID: 1192722005

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	1.22	mg/L
	Residual Range Organics	1.03	mg/L
Volatile Fuels	Gasoline Range Organics	0.0726J	mg/L
Volatile GC/MS	1,2,4-Trimethylbenzene	19.6	ug/L
	1,3,5-Trimethylbenzene	3.51	ug/L
	4-Isopropyltoluene	2.36	ug/L
	Benzene	3.45	ug/L
	cis-1,2-Dichloroethene	0.670J	ug/L
	Ethylbenzene	0.620J	ug/L
	Isopropylbenzene (Cumene)	2.38	ug/L
	Naphthalene	11.5	ug/L
	n-Butylbenzene	0.770J	ug/L
	n-Propylbenzene	2.26	ug/L
	P & M -Xylene	1.68J	ug/L
	sec-Butylbenzene	2.05	ug/L
	Toluene	1.15	ug/L
	Vinyl chloride	9.54	ug/L
	Xylenes (total)	1.68J	ug/L

Client Sample ID: **MW-7**
Lab Sample ID: 1192722006

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	1.31	mg/L
	Residual Range Organics	0.554	mg/L
Volatile Fuels	Gasoline Range Organics	0.345	mg/L
Volatile GC/MS	1,2,4-Trimethylbenzene	0.590J	ug/L
	1,3,5-Trimethylbenzene	0.680J	ug/L
	Benzene	1.07	ug/L
	cis-1,2-Dichloroethene	0.320J	ug/L
	Isopropylbenzene (Cumene)	1.89	ug/L
	Naphthalene	2.54	ug/L
	n-Propylbenzene	0.630J	ug/L
	P & M -Xylene	1.77J	ug/L
	sec-Butylbenzene	0.330J	ug/L
	Vinyl chloride	15.9	ug/L
	Xylenes (total)	1.77J	ug/L

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Detectable Results Summary

Client Sample ID: **CHMW-X**
Lab Sample ID: 1192722007

Parameter	Result	Units
Polynuclear Aromatics GC/MS		
Semivolatile Organic Fuels		
Fluorene	0.200	ug/L
Diesel Range Organics	2.94	mg/L
Residual Range Organics	1.72	mg/L
Volatile Fuels		
Gasoline Range Organics	0.0658J	mg/L
Volatile GC/MS		
Benzene	0.260J	ug/L
Chloromethane	0.350J	ug/L
cis-1,2-Dichloroethene	2.55	ug/L
Tetrachloroethene	1.07	ug/L
Trichloroethene	6.94	ug/L
Vinyl chloride	1.18	ug/L

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Results of **CHMWE1**

Client Sample ID: **CHMWE1**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722001
Lab Project ID: 1192722

Collection Date: 05/30/19 10:10
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.300	U	0.600	0.180	mg/L	1		06/11/19 08:18
Surrogates								
5a Androstane (surr)	78.2		50-150		%	1		06/11/19 08:18

Batch Information

Analytical Batch: XFC15040
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 06/11/19 08:18
Container ID: 1192722001-G

Prep Batch: XXX41548
Prep Method: SW3520C
Prep Date/Time: 06/10/19 10:02
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.347	J	0.500	0.150	mg/L	1		06/11/19 08:18
Surrogates								
n-Triacontane-d62 (surr)	94.5		50-150		%	1		06/11/19 08:18

Batch Information

Analytical Batch: XFC15040
Analytical Method: AK103
Analyst: VDL
Analytical Date/Time: 06/11/19 08:18
Container ID: 1192722001-G

Prep Batch: XXX41548
Prep Method: SW3520C
Prep Date/Time: 06/10/19 10:02
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 06/11/2019 11:18:53AM

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Results of **CHMWE1**

Client Sample ID: **CHMWE1**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722001
Lab Project ID: 1192722

Collection Date: 05/30/19 10:10
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		06/02/19 20:35
Surrogates								
4-Bromofluorobenzene (surr)	98.9		50-150		%	1		06/02/19 20:35

Batch Information

Analytical Batch: VFC14752
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/02/19 20:35
Container ID: 1192722001-A

Prep Batch: VXX34171
Prep Method: SW5030B
Prep Date/Time: 06/02/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **CHMWE1**

Client Sample ID: **CHMWE1**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722001
Lab Project ID: 1192722

Collection Date: 05/30/19 10:10
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:01
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:01
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		06/04/19 16:01
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:01
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		06/04/19 16:01
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:01
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:01
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:01
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:01
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:01
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:01
Benzene	0.200	U	0.400	0.120	ug/L	1		06/04/19 16:01
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:01
Bromoform	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
Bromomethane	2.50	U	5.00	1.50	ug/L	1		06/04/19 16:01
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:01
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:01
Chloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01

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Results of **CHMWE1**

Client Sample ID: **CHMWE1**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722001
Lab Project ID: 1192722

Collection Date: 05/30/19 10:10
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
Chloromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:01
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:01
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
Freon-113	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:01
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		06/04/19 16:01
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:01
Naphthalene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
o-Xylene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		06/04/19 16:01
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
Styrene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
Tetrachloroethene	39.4		1.00	0.310	ug/L	1		06/04/19 16:01
Toluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
Trichloroethene	0.870	J	1.00	0.310	ug/L	1		06/04/19 16:01
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:01
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:01
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		06/04/19 16:01
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		06/04/19 16:01
Surrogates								
1,2-Dichloroethane-D4 (surr)	104		81-118		%	1		06/04/19 16:01
4-Bromofluorobenzene (surr)	101		85-114		%	1		06/04/19 16:01
Toluene-d8 (surr)	101		89-112		%	1		06/04/19 16:01

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Results of **CHMWE1**

Client Sample ID: **CHMWE1**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722001
Lab Project ID: 1192722

Collection Date: 05/30/19 10:10
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS18994
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 06/04/19 16:01
Container ID: 1192722001-D

Prep Batch: VXX34190
Prep Method: SW5030B
Prep Date/Time: 06/04/19 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **CHMWE2**

Client Sample ID: **CHMWE2**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722002
Lab Project ID: 1192722

Collection Date: 05/30/19 14:00
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0232	U	0.0463	0.0139	ug/L	1		06/04/19 20:26
2-Methylnaphthalene	0.0232	U	0.0463	0.0139	ug/L	1		06/04/19 20:26
Acenaphthene	0.0232	U	0.0463	0.0139	ug/L	1		06/04/19 20:26
Acenaphthylene	0.0232	U	0.0463	0.0139	ug/L	1		06/04/19 20:26
Anthracene	0.0232	U	0.0463	0.0139	ug/L	1		06/04/19 20:26
Benzo(a)Anthracene	0.0232	U	0.0463	0.0139	ug/L	1		06/04/19 20:26
Benzo[a]pyrene	0.00925	U	0.0185	0.00574	ug/L	1		06/04/19 20:26
Benzo[b]Fluoranthene	0.0232	U	0.0463	0.0139	ug/L	1		06/04/19 20:26
Benzo[g,h,i]perylene	0.0232	U	0.0463	0.0139	ug/L	1		06/04/19 20:26
Benzo[k]fluoranthene	0.0232	U	0.0463	0.0139	ug/L	1		06/04/19 20:26
Chrysene	0.0232	U	0.0463	0.0139	ug/L	1		06/04/19 20:26
Dibenzo[a,h]anthracene	0.00925	U	0.0185	0.00574	ug/L	1		06/04/19 20:26
Fluoranthene	0.0232	U	0.0463	0.0139	ug/L	1		06/04/19 20:26
Fluorene	0.242		0.0463	0.0139	ug/L	1		06/04/19 20:26
Indeno[1,2,3-c,d] pyrene	0.0232	U	0.0463	0.0139	ug/L	1		06/04/19 20:26
Naphthalene	0.0463	U	0.0926	0.0287	ug/L	1		06/04/19 20:26
Phenanthrene	0.0232	U	0.0463	0.0139	ug/L	1		06/04/19 20:26
Pyrene	0.0232	U	0.0463	0.0139	ug/L	1		06/04/19 20:26
Surrogates								
2-Methylnaphthalene-d10 (surr)	67.5		47-106		%	1		06/04/19 20:26
Fluoranthene-d10 (surr)	59.4		24-116		%	1		06/04/19 20:26

Batch Information

Analytical Batch: XMS11433
Analytical Method: 8270D SIM LV (PAH)
Analyst: BMZ
Analytical Date/Time: 06/04/19 20:26
Container ID: 1192722002-I

Prep Batch: XXX41512
Prep Method: SW3520C
Prep Date/Time: 06/04/19 09:46
Prep Initial Wt./Vol.: 270 mL
Prep Extract Vol: 1 mL

Print Date: 06/11/2019 11:18:53AM

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Results of **CHMWE2**

Client Sample ID: **CHMWE2**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722002
Lab Project ID: 1192722

Collection Date: 05/30/19 14:00
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.94		0.577	0.173	mg/L	1		06/11/19 08:28
Surrogates								
5a Androstane (surr)	74.9		50-150		%	1		06/11/19 08:28

Batch Information

Analytical Batch: XFC15040
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 06/11/19 08:28
Container ID: 1192722002-G

Prep Batch: XXX41548
Prep Method: SW3520C
Prep Date/Time: 06/10/19 10:02
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	1.06		0.481	0.144	mg/L	1		06/11/19 08:28
Surrogates								
n-Triacontane-d62 (surr)	88.2		50-150		%	1		06/11/19 08:28

Batch Information

Analytical Batch: XFC15040
Analytical Method: AK103
Analyst: VDL
Analytical Date/Time: 06/11/19 08:28
Container ID: 1192722002-G

Prep Batch: XXX41548
Prep Method: SW3520C
Prep Date/Time: 06/10/19 10:02
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Print Date: 06/11/2019 11:18:53AM

J flagging is activated

Results of **CHMWE2**

Client Sample ID: **CHMWE2**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722002
Lab Project ID: 1192722

Collection Date: 05/30/19 14:00
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0643	J	0.100	0.0310	mg/L	1		06/02/19 20:52
Surrogates								
4-Bromofluorobenzene (surr)	101		50-150		%	1		06/02/19 20:52

Batch Information

Analytical Batch: VFC14752
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/02/19 20:52
Container ID: 1192722002-A

Prep Batch: VXX34171
Prep Method: SW5030B
Prep Date/Time: 06/02/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **CHMWE2**

Client Sample ID: **CHMWE2**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722002
Lab Project ID: 1192722

Collection Date: 05/30/19 14:00
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:16
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:16
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		06/04/19 16:16
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:16
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		06/04/19 16:16
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:16
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:16
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:16
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:16
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:16
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:16
Benzene	0.270	J	0.400	0.120	ug/L	1		06/04/19 16:16
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:16
Bromoform	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
Bromomethane	2.50	U	5.00	1.50	ug/L	1		06/04/19 16:16
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:16
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:16
Chloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:16

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Results of **CHMWE2**

Client Sample ID: **CHMWE2**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722002
Lab Project ID: 1192722

Collection Date: 05/30/19 14:00
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:16
Chloromethane	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:16
cis-1,2-Dichloroethene	2.28		1.00	0.310	ug/L	1		06/04/19 16:16
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		06/04/19 16:16
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		06/04/19 16:16
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:16
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:16
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:16
Freon-113	5.00 U		10.0	3.10	ug/L	1		06/04/19 16:16
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:16
Isopropylbenzene (Cumene)	0.320 J		1.00	0.310	ug/L	1		06/04/19 16:16
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		06/04/19 16:16
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		06/04/19 16:16
Naphthalene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:16
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:16
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:16
o-Xylene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:16
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		06/04/19 16:16
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:16
Styrene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:16
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:16
Tetrachloroethene	0.890 J		1.00	0.310	ug/L	1		06/04/19 16:16
Toluene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:16
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:16
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:16
Trichloroethene	5.57		1.00	0.310	ug/L	1		06/04/19 16:16
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:16
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		06/04/19 16:16
Vinyl chloride	1.25		0.150	0.0500	ug/L	1		06/04/19 16:16
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		06/04/19 16:16
Surrogates								
1,2-Dichloroethane-D4 (surr)	103		81-118		%	1		06/04/19 16:16
4-Bromofluorobenzene (surr)	102		85-114		%	1		06/04/19 16:16
Toluene-d8 (surr)	100		89-112		%	1		06/04/19 16:16

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Results of **CHMWE2**

Client Sample ID: **CHMWE2**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722002
Lab Project ID: 1192722

Collection Date: 05/30/19 14:00
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS18994
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 06/04/19 16:16
Container ID: 1192722002-D

Prep Batch: VXX34190
Prep Method: SW5030B
Prep Date/Time: 06/04/19 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **EMCONMW4**

Client Sample ID: **EMCONMW4**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722003
Lab Project ID: 1192722

Collection Date: 05/30/19 12:35
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.06		0.647	0.194	mg/L	1		06/11/19 08:38
Surrogates								
5a Androstane (surr)	82.4		50-150		%	1		06/11/19 08:38

Batch Information

Analytical Batch: XFC15040
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 06/11/19 08:38
Container ID: 1192722003-G

Prep Batch: XXX41548
Prep Method: SW3520C
Prep Date/Time: 06/10/19 10:02
Prep Initial Wt./Vol.: 232 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	2.20		0.539	0.162	mg/L	1		06/11/19 08:38
Surrogates								
n-Triacontane-d62 (surr)	95.5		50-150		%	1		06/11/19 08:38

Batch Information

Analytical Batch: XFC15040
Analytical Method: AK103
Analyst: VDL
Analytical Date/Time: 06/11/19 08:38
Container ID: 1192722003-G

Prep Batch: XXX41548
Prep Method: SW3520C
Prep Date/Time: 06/10/19 10:02
Prep Initial Wt./Vol.: 232 mL
Prep Extract Vol: 1 mL

Print Date: 06/11/2019 11:18:53AM

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Results of **EMCONMW4**

Client Sample ID: **EMCONMW4**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722003
Lab Project ID: 1192722

Collection Date: 05/30/19 12:35
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		06/02/19 21:10
Surrogates								
4-Bromofluorobenzene (surr)	95.2		50-150		%	1		06/02/19 21:10

Batch Information

Analytical Batch: VFC14752
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/02/19 21:10
Container ID: 1192722003-A

Prep Batch: VXX34171
Prep Method: SW5030B
Prep Date/Time: 06/02/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **EMCONMW4**

Client Sample ID: **EMCONMW4**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722003
Lab Project ID: 1192722

Collection Date: 05/30/19 12:35
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:31
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:31
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		06/04/19 16:31
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:31
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		06/04/19 16:31
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:31
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:31
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:31
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:31
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:31
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:31
Benzene	0.200	U	0.400	0.120	ug/L	1		06/04/19 16:31
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:31
Bromoform	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
Bromomethane	2.50	U	5.00	1.50	ug/L	1		06/04/19 16:31
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:31
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:31
Chloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:31

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Results of **EMCONMW4**

Client Sample ID: **EMCONMW4**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722003
Lab Project ID: 1192722

Collection Date: 05/30/19 12:35
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
Chloromethane	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
cis-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		06/04/19 16:31
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		06/04/19 16:31
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
Freon-113	5.00 U		10.0	3.10	ug/L	1		06/04/19 16:31
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		06/04/19 16:31
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		06/04/19 16:31
Naphthalene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
o-Xylene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		06/04/19 16:31
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
Styrene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
Toluene	0.440 J		1.00	0.310	ug/L	1		06/04/19 16:31
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		06/04/19 16:31
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		06/04/19 16:31
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		06/04/19 16:31
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		06/04/19 16:31
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		81-118		%	1		06/04/19 16:31
4-Bromofluorobenzene (surr)	101		85-114		%	1		06/04/19 16:31
Toluene-d8 (surr)	101		89-112		%	1		06/04/19 16:31

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Results of **EMCONMW4**

Client Sample ID: **EMCONMW4**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722003
Lab Project ID: 1192722

Collection Date: 05/30/19 12:35
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS18994
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 06/04/19 16:31
Container ID: 1192722003-D

Prep Batch: VXX34190
Prep Method: SW5030B
Prep Date/Time: 06/04/19 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **CHMWE5**

Client Sample ID: **CHMWE5**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722004
Lab Project ID: 1192722

Collection Date: 05/30/19 11:40
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	3.06	J	3.32	0.996	mg/L	1		06/11/19 08:48
Surrogates								
5a Androstane (surr)	79.1		50-150		%	1		06/11/19 08:48

Batch Information

Analytical Batch: XFC15040
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 06/11/19 08:48
Container ID: 1192722004-G

Prep Batch: XXX41548
Prep Method: SW3520C
Prep Date/Time: 06/10/19 10:02
Prep Initial Wt./Vol.: 226 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	11.4		2.77	0.830	mg/L	1		06/11/19 08:48
Surrogates								
n-Triacontane-d62 (surr)	88.8		50-150		%	1		06/11/19 08:48

Batch Information

Analytical Batch: XFC15040
Analytical Method: AK103
Analyst: VDL
Analytical Date/Time: 06/11/19 08:48
Container ID: 1192722004-G

Prep Batch: XXX41548
Prep Method: SW3520C
Prep Date/Time: 06/10/19 10:02
Prep Initial Wt./Vol.: 226 mL
Prep Extract Vol: 5 mL

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Results of **CHMWE5**

Client Sample ID: **CHMWE5**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722004
Lab Project ID: 1192722

Collection Date: 05/30/19 11:40
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		06/02/19 21:27
Surrogates								
4-Bromofluorobenzene (surr)	99.3		50-150		%	1		06/02/19 21:27

Batch Information

Analytical Batch: VFC14752
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/02/19 21:27
Container ID: 1192722004-A

Prep Batch: VXX34171
Prep Method: SW5030B
Prep Date/Time: 06/02/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **CHMWE5**

Client Sample ID: **CHMWE5**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722004
Lab Project ID: 1192722

Collection Date: 05/30/19 11:40
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:47
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:47
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		06/04/19 16:47
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:47
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		06/04/19 16:47
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:47
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:47
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:47
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:47
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:47
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:47
Benzene	0.920		0.400	0.120	ug/L	1		06/04/19 16:47
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:47
Bromoform	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
Bromomethane	2.50	U	5.00	1.50	ug/L	1		06/04/19 16:47
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:47
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:47
Chloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47

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Results of **CHMWE5**

Client Sample ID: **CHMWE5**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722004
Lab Project ID: 1192722

Collection Date: 05/30/19 11:40
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
Chloromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
cis-1,2-Dichloroethene	0.420	J	1.00	0.310	ug/L	1		06/04/19 16:47
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:47
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 16:47
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
Freon-113	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:47
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		06/04/19 16:47
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:47
Naphthalene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
o-Xylene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		06/04/19 16:47
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
Styrene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
Toluene	2.00		1.00	0.310	ug/L	1		06/04/19 16:47
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 16:47
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		06/04/19 16:47
Vinyl chloride	8.63		0.150	0.0500	ug/L	1		06/04/19 16:47
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		06/04/19 16:47
Surrogates								
1,2-Dichloroethane-D4 (surr)	104		81-118		%	1		06/04/19 16:47
4-Bromofluorobenzene (surr)	100		85-114		%	1		06/04/19 16:47
Toluene-d8 (surr)	101		89-112		%	1		06/04/19 16:47

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Results of **CHMWE5**

Client Sample ID: **CHMWE5**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722004
Lab Project ID: 1192722

Collection Date: 05/30/19 11:40
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS18994
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 06/04/19 16:47
Container ID: 1192722004-D

Prep Batch: VXX34190
Prep Method: SW5030B
Prep Date/Time: 06/04/19 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW-6**

Client Sample ID: **MW-6**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722005
Lab Project ID: 1192722

Collection Date: 05/30/19 10:55
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.22		0.577	0.173	mg/L	1		06/11/19 08:58
Surrogates								
5a Androstane (surr)	75		50-150		%	1		06/11/19 08:58

Batch Information

Analytical Batch: XFC15040
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 06/11/19 08:58
Container ID: 1192722005-G

Prep Batch: XXX41548
Prep Method: SW3520C
Prep Date/Time: 06/10/19 10:02
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	1.03		0.481	0.144	mg/L	1		06/11/19 08:58
Surrogates								
n-Triacontane-d62 (surr)	88.3		50-150		%	1		06/11/19 08:58

Batch Information

Analytical Batch: XFC15040
Analytical Method: AK103
Analyst: VDL
Analytical Date/Time: 06/11/19 08:58
Container ID: 1192722005-G

Prep Batch: XXX41548
Prep Method: SW3520C
Prep Date/Time: 06/10/19 10:02
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

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Results of **MW-6**

Client Sample ID: **MW-6**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722005
Lab Project ID: 1192722

Collection Date: 05/30/19 10:55
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0726	J	0.100	0.0310	mg/L	1		06/02/19 21:45
Surrogates								
4-Bromofluorobenzene (surr)	113		50-150		%	1		06/02/19 21:45

Batch Information

Analytical Batch: VFC14752
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/02/19 21:45
Container ID: 1192722005-A

Prep Batch: VXX34171
Prep Method: SW5030B
Prep Date/Time: 06/02/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW-6**

Client Sample ID: **MW-6**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722005
Lab Project ID: 1192722

Collection Date: 05/30/19 10:55
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:02
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:02
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		06/04/19 17:02
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
1,2,4-Trimethylbenzene	19.6		1.00	0.310	ug/L	1		06/04/19 17:02
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:02
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		06/04/19 17:02
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:02
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
1,3,5-Trimethylbenzene	3.51		1.00	0.310	ug/L	1		06/04/19 17:02
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:02
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:02
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:02
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:02
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
4-Isopropyltoluene	2.36		1.00	0.310	ug/L	1		06/04/19 17:02
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:02
Benzene	3.45		0.400	0.120	ug/L	1		06/04/19 17:02
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:02
Bromoform	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
Bromomethane	2.50	U	5.00	1.50	ug/L	1		06/04/19 17:02
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:02
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:02
Chloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02

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Results of **MW-6**

Client Sample ID: **MW-6**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722005
Lab Project ID: 1192722

Collection Date: 05/30/19 10:55
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
Chloromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
cis-1,2-Dichloroethene	0.670	J	1.00	0.310	ug/L	1		06/04/19 17:02
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:02
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:02
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
Ethylbenzene	0.620	J	1.00	0.310	ug/L	1		06/04/19 17:02
Freon-113	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:02
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
Isopropylbenzene (Cumene)	2.38		1.00	0.310	ug/L	1		06/04/19 17:02
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		06/04/19 17:02
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:02
Naphthalene	11.5		1.00	0.310	ug/L	1		06/04/19 17:02
n-Butylbenzene	0.770	J	1.00	0.310	ug/L	1		06/04/19 17:02
n-Propylbenzene	2.26		1.00	0.310	ug/L	1		06/04/19 17:02
o-Xylene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
P & M -Xylene	1.68	J	2.00	0.620	ug/L	1		06/04/19 17:02
sec-Butylbenzene	2.05		1.00	0.310	ug/L	1		06/04/19 17:02
Styrene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
Toluene	1.15		1.00	0.310	ug/L	1		06/04/19 17:02
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:02
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:02
Vinyl chloride	9.54		0.150	0.0500	ug/L	1		06/04/19 17:02
Xylenes (total)	1.68	J	3.00	1.00	ug/L	1		06/04/19 17:02
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		81-118		%	1		06/04/19 17:02
4-Bromofluorobenzene (surr)	102		85-114		%	1		06/04/19 17:02
Toluene-d8 (surr)	101		89-112		%	1		06/04/19 17:02

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Results of **MW-6**

Client Sample ID: **MW-6**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722005
Lab Project ID: 1192722

Collection Date: 05/30/19 10:55
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS18994
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 06/04/19 17:02
Container ID: 1192722005-D

Prep Batch: VXX34190
Prep Method: SW5030B
Prep Date/Time: 06/04/19 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW-7**

Client Sample ID: **MW-7**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722006
Lab Project ID: 1192722

Collection Date: 05/30/19 09:15
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.31		0.588	0.176	mg/L	1		06/11/19 09:08
Surrogates								
5a Androstane (surr)	76.2		50-150		%	1		06/11/19 09:08

Batch Information

Analytical Batch: XFC15040
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 06/11/19 09:08
Container ID: 1192722006-G

Prep Batch: XXX41548
Prep Method: SW3520C
Prep Date/Time: 06/10/19 10:02
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.554		0.490	0.147	mg/L	1		06/11/19 09:08
Surrogates								
n-Triacontane-d62 (surr)	95.3		50-150		%	1		06/11/19 09:08

Batch Information

Analytical Batch: XFC15040
Analytical Method: AK103
Analyst: VDL
Analytical Date/Time: 06/11/19 09:08
Container ID: 1192722006-G

Prep Batch: XXX41548
Prep Method: SW3520C
Prep Date/Time: 06/10/19 10:02
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

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J flagging is activated

Results of **MW-7**

Client Sample ID: **MW-7**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722006
Lab Project ID: 1192722

Collection Date: 05/30/19 09:15
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.345		0.100	0.0310	mg/L	1		06/02/19 22:02
Surrogates								
4-Bromofluorobenzene (surr)	119		50-150		%	1		06/02/19 22:02

Batch Information

Analytical Batch: VFC14752
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/02/19 22:02
Container ID: 1192722006-A

Prep Batch: VXX34171
Prep Method: SW5030B
Prep Date/Time: 06/02/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW-7**

Client Sample ID: **MW-7**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722006
Lab Project ID: 1192722

Collection Date: 05/30/19 09:15
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:17
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:17
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		06/04/19 17:17
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
1,2,4-Trimethylbenzene	0.590	J	1.00	0.310	ug/L	1		06/04/19 17:17
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:17
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		06/04/19 17:17
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:17
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
1,3,5-Trimethylbenzene	0.680	J	1.00	0.310	ug/L	1		06/04/19 17:17
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:17
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:17
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:17
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:17
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:17
Benzene	1.07		0.400	0.120	ug/L	1		06/04/19 17:17
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:17
Bromoform	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
Bromomethane	2.50	U	5.00	1.50	ug/L	1		06/04/19 17:17
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:17
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:17
Chloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17

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Results of **MW-7**

Client Sample ID: **MW-7**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722006
Lab Project ID: 1192722

Collection Date: 05/30/19 09:15
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
Chloromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
cis-1,2-Dichloroethene	0.320	J	1.00	0.310	ug/L	1		06/04/19 17:17
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:17
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:17
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
Freon-113	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:17
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
Isopropylbenzene (Cumene)	1.89		1.00	0.310	ug/L	1		06/04/19 17:17
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		06/04/19 17:17
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:17
Naphthalene	2.54		1.00	0.310	ug/L	1		06/04/19 17:17
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
n-Propylbenzene	0.630	J	1.00	0.310	ug/L	1		06/04/19 17:17
o-Xylene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
P & M -Xylene	1.77	J	2.00	0.620	ug/L	1		06/04/19 17:17
sec-Butylbenzene	0.330	J	1.00	0.310	ug/L	1		06/04/19 17:17
Styrene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
Toluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:17
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:17
Vinyl chloride	15.9		0.150	0.0500	ug/L	1		06/04/19 17:17
Xylenes (total)	1.77	J	3.00	1.00	ug/L	1		06/04/19 17:17
Surrogates								
1,2-Dichloroethane-D4 (surr)	102		81-118		%	1		06/04/19 17:17
4-Bromofluorobenzene (surr)	101		85-114		%	1		06/04/19 17:17
Toluene-d8 (surr)	102		89-112		%	1		06/04/19 17:17

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Results of **MW-7**

Client Sample ID: **MW-7**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722006
Lab Project ID: 1192722

Collection Date: 05/30/19 09:15
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS18994
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 06/04/19 17:17
Container ID: 1192722006-D

Prep Batch: VXX34190
Prep Method: SW5030B
Prep Date/Time: 06/04/19 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **CHMW-X**

Client Sample ID: **CHMW-X**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722007
Lab Project ID: 1192722

Collection Date: 05/30/19 16:00
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0232 U		0.0463	0.0139	ug/L	1		06/04/19 20:46
2-Methylnaphthalene	0.0232 U		0.0463	0.0139	ug/L	1		06/04/19 20:46
Acenaphthene	0.0232 U		0.0463	0.0139	ug/L	1		06/04/19 20:46
Acenaphthylene	0.0232 U		0.0463	0.0139	ug/L	1		06/04/19 20:46
Anthracene	0.0232 U		0.0463	0.0139	ug/L	1		06/04/19 20:46
Benzo(a)Anthracene	0.0232 U		0.0463	0.0139	ug/L	1		06/04/19 20:46
Benzo[a]pyrene	0.00925 U		0.0185	0.00574	ug/L	1		06/04/19 20:46
Benzo[b]Fluoranthene	0.0232 U		0.0463	0.0139	ug/L	1		06/04/19 20:46
Benzo[g,h,i]perylene	0.0232 U		0.0463	0.0139	ug/L	1		06/04/19 20:46
Benzo[k]fluoranthene	0.0232 U		0.0463	0.0139	ug/L	1		06/04/19 20:46
Chrysene	0.0232 U		0.0463	0.0139	ug/L	1		06/04/19 20:46
Dibenzo[a,h]anthracene	0.00925 U		0.0185	0.00574	ug/L	1		06/04/19 20:46
Fluoranthene	0.0232 U		0.0463	0.0139	ug/L	1		06/04/19 20:46
Fluorene	0.200		0.0463	0.0139	ug/L	1		06/04/19 20:46
Indeno[1,2,3-c,d] pyrene	0.0232 U		0.0463	0.0139	ug/L	1		06/04/19 20:46
Naphthalene	0.0463 U		0.0926	0.0287	ug/L	1		06/04/19 20:46
Phenanthrene	0.0232 U		0.0463	0.0139	ug/L	1		06/04/19 20:46
Pyrene	0.0232 U		0.0463	0.0139	ug/L	1		06/04/19 20:46
Surrogates								
2-Methylnaphthalene-d10 (surr)	46.8	*	47-106		%	1		06/04/19 20:46
Fluoranthene-d10 (surr)	44.9		24-116		%	1		06/04/19 20:46

Batch Information

Analytical Batch: XMS11433
Analytical Method: 8270D SIM LV (PAH)
Analyst: BMZ
Analytical Date/Time: 06/04/19 20:46
Container ID: 1192722007-I

Prep Batch: XXX41512
Prep Method: SW3520C
Prep Date/Time: 06/04/19 09:46
Prep Initial Wt./Vol.: 270 mL
Prep Extract Vol: 1 mL

Print Date: 06/11/2019 11:18:53AM

J flagging is activated

Results of **CHMW-X**

Client Sample ID: **CHMW-X**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722007
Lab Project ID: 1192722

Collection Date: 05/30/19 16:00
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	2.94		0.630	0.189	mg/L	1		06/11/19 09:18
Surrogates								
5a Androstane (surr)	78.2		50-150		%	1		06/11/19 09:18

Batch Information

Analytical Batch: XFC15040
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 06/11/19 09:18
Container ID: 1192722007-G

Prep Batch: XXX41548
Prep Method: SW3520C
Prep Date/Time: 06/10/19 10:02
Prep Initial Wt./Vol.: 238 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	1.72		0.525	0.158	mg/L	1		06/11/19 09:18
Surrogates								
n-Triacontane-d62 (surr)	91.8		50-150		%	1		06/11/19 09:18

Batch Information

Analytical Batch: XFC15040
Analytical Method: AK103
Analyst: VDL
Analytical Date/Time: 06/11/19 09:18
Container ID: 1192722007-G

Prep Batch: XXX41548
Prep Method: SW3520C
Prep Date/Time: 06/10/19 10:02
Prep Initial Wt./Vol.: 238 mL
Prep Extract Vol: 1 mL

Print Date: 06/11/2019 11:18:53AM

J flagging is activated

Results of **CHMW-X**

Client Sample ID: **CHMW-X**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722007
Lab Project ID: 1192722

Collection Date: 05/30/19 16:00
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0658	J	0.100	0.0310	mg/L	1		06/05/19 16:11
Surrogates								
4-Bromofluorobenzene (surr)	109		50-150		%	1		06/05/19 16:11

Batch Information

Analytical Batch: VFC14757
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/05/19 16:11
Container ID: 1192722007-E

Prep Batch: VXX34186
Prep Method: SW5030B
Prep Date/Time: 06/05/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 06/11/2019 11:18:53AM

J flagging is activated

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Results of **CHMW-X**

Client Sample ID: **CHMW-X**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722007
Lab Project ID: 1192722

Collection Date: 05/30/19 16:00
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:32
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:32
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		06/04/19 17:32
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:32
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		06/04/19 17:32
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:32
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:32
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:32
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:32
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:32
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:32
Benzene	0.260	J	0.400	0.120	ug/L	1		06/04/19 17:32
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:32
Bromoform	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
Bromomethane	2.50	U	5.00	1.50	ug/L	1		06/04/19 17:32
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:32
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:32
Chloroethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32

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Results of **CHMW-X**

Client Sample ID: **CHMW-X**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722007
Lab Project ID: 1192722

Collection Date: 05/30/19 16:00
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
Chloromethane	0.350	J	1.00	0.310	ug/L	1		06/04/19 17:32
cis-1,2-Dichloroethene	2.55		1.00	0.310	ug/L	1		06/04/19 17:32
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:32
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		06/04/19 17:32
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
Freon-113	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:32
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		06/04/19 17:32
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:32
Naphthalene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
o-Xylene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		06/04/19 17:32
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
Styrene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
Tetrachloroethene	1.07		1.00	0.310	ug/L	1		06/04/19 17:32
Toluene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
Trichloroethene	6.94		1.00	0.310	ug/L	1		06/04/19 17:32
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		06/04/19 17:32
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		06/04/19 17:32
Vinyl chloride	1.18		0.150	0.0500	ug/L	1		06/04/19 17:32
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		06/04/19 17:32
Surrogates								
1,2-Dichloroethane-D4 (surr)	103		81-118		%	1		06/04/19 17:32
4-Bromofluorobenzene (surr)	101		85-114		%	1		06/04/19 17:32
Toluene-d8 (surr)	102		89-112		%	1		06/04/19 17:32

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Results of **CHMW-X**

Client Sample ID: **CHMW-X**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722007
Lab Project ID: 1192722

Collection Date: 05/30/19 16:00
Received Date: 05/31/19 13:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS18994
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 06/04/19 17:32
Container ID: 1192722007-D

Prep Batch: VXX34190
Prep Method: SW5030B
Prep Date/Time: 06/04/19 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722008
Lab Project ID: 1192722

Collection Date: 05/30/19 09:15
Received Date: 05/31/19 18:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		06/03/19 01:52
Surrogates								
4-Bromofluorobenzene (surr)	91.5		50-150		%	1		06/03/19 01:52

Batch Information

Analytical Batch: VFC14751
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/03/19 01:52
Container ID: 1192722008-A

Prep Batch: VXX34169
Prep Method: SW5030B
Prep Date/Time: 06/02/19 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722008
Lab Project ID: 1192722

Collection Date: 05/30/19 09:15
Received Date: 05/31/19 18:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/06/19 12:37
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/06/19 12:37
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		06/06/19 12:37
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		06/06/19 12:37
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		06/06/19 12:37
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		06/06/19 12:37
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		06/06/19 12:37
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/06/19 12:37
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		06/06/19 12:37
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		06/06/19 12:37
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		06/06/19 12:37
Benzene	0.200	U	0.400	0.120	ug/L	1		06/06/19 12:37
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		06/06/19 12:37
Bromoform	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
Bromomethane	2.50	U	5.00	1.50	ug/L	1		06/06/19 12:37
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		06/06/19 12:37
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/06/19 12:37
Chloroethane	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37

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Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722008
Lab Project ID: 1192722

Collection Date: 05/30/19 09:15
Received Date: 05/31/19 18:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
Chloromethane	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		06/06/19 12:37
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		06/06/19 12:37
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
Freon-113	5.00	U	10.0	3.10	ug/L	1		06/06/19 12:37
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		06/06/19 12:37
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		06/06/19 12:37
Naphthalene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
o-Xylene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		06/06/19 12:37
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
Styrene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
Toluene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		06/06/19 12:37
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		06/06/19 12:37
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		06/06/19 12:37
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		06/06/19 12:37
Surrogates								
1,2-Dichloroethane-D4 (surr)	108		81-118		%	1		06/06/19 12:37
4-Bromofluorobenzene (surr)	102		85-114		%	1		06/06/19 12:37
Toluene-d8 (surr)	102		89-112		%	1		06/06/19 12:37

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Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **ARRC Mammoth GW**
Lab Sample ID: 1192722008
Lab Project ID: 1192722

Collection Date: 05/30/19 09:15
Received Date: 05/31/19 18:41
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS18998
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 06/06/19 12:37
Container ID: 1192722008-D

Prep Batch: VXX34194
Prep Method: SW5030B
Prep Date/Time: 06/06/19 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1794461 [VXX/34169]
Blank Lab ID: 1510614

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192722008

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	98.1	50-150		%

Batch Information

Analytical Batch: VFC14751
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 6/2/2019 6:54:00PM

Prep Batch: VXX34169
Prep Method: SW5030B
Prep Date/Time: 6/2/2019 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1192722 [VXX34169]
Blank Spike Lab ID: 1510617
Date Analyzed: 06/03/2019 00:03

Spike Duplicate ID: LCSD for HBN 1192722 [VXX34169]
Spike Duplicate Lab ID: 1510618
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192722008

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.02	102	1.00	1.02	102	(60-120)	0.13	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	101	101	0.0500	104	104	(50-150)	2.60	

Batch Information

Analytical Batch: **VFC14751**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX34169**
Prep Method: **SW5030B**
Prep Date/Time: **06/02/2019 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

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Method Blank

Blank ID: MB for HBN 1794480 [VXX/34171]
Blank Lab ID: 1510696

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192722001, 1192722002, 1192722003, 1192722004, 1192722005, 1192722006

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	99	50-150		%

Batch Information

Analytical Batch: VFC14752
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 6/2/2019 12:58:00PM

Prep Batch: VXX34171
Prep Method: SW5030B
Prep Date/Time: 6/2/2019 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1192722 [VXX34171]
Blank Spike Lab ID: 1510697
Date Analyzed: 06/02/2019 13:33

Spike Duplicate ID: LCSD for HBN 1192722 [VXX34171]
Spike Duplicate Lab ID: 1510698
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192722001, 1192722002, 1192722003, 1192722004, 1192722005, 1192722006

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.03	103	1.00	0.974	97	(60-120)	5.40	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	100	100	0.0500	99.5	100	(50-150)	0.52	

Batch Information

Analytical Batch: **VFC14752**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX34171**
Prep Method: **SW5030B**
Prep Date/Time: **06/02/2019 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

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Method Blank

Blank ID: MB for HBN 1794599 [VXX/34186]
Blank Lab ID: 1511245

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192722007

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	98.6	50-150		%

Batch Information

Analytical Batch: VFC14757
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 6/5/2019 11:01:00AM

Prep Batch: VXX34186
Prep Method: SW5030B
Prep Date/Time: 6/5/2019 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1192722 [VXX34186]
Blank Spike Lab ID: 1511248
Date Analyzed: 06/05/2019 11:53

Spike Duplicate ID: LCSD for HBN 1192722 [VXX34186]
Spike Duplicate Lab ID: 1511249
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192722007

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.15	115	1.00	1.21	121	* (60-120)	5.40	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	103	103	0.0500	108	108	(50-150)	4.20	

Batch Information

Analytical Batch: **VFC14757**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX34186**
Prep Method: **SW5030B**
Prep Date/Time: **06/05/2019 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

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Method Blank

Blank ID: MB for HBN 1794613 [VXX/34190]
Blank Lab ID: 1511285

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192722001, 1192722002, 1192722003, 1192722004, 1192722005, 1192722006, 1192722007

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,1-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1,2,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,2-Trichloroethane	0.200U	0.400	0.120	ug/L
1,1-Dichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethene	0.500U	1.00	0.310	ug/L
1,1-Dichloropropene	0.500U	1.00	0.310	ug/L
1,2,3-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,3-Trichloropropane	0.500U	1.00	0.310	ug/L
1,2,4-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromo-3-chloropropane	5.00U	10.0	3.10	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,2-Dichloropropane	0.500U	1.00	0.310	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichloropropane	0.250U	0.500	0.150	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
2,2-Dichloropropane	0.500U	1.00	0.310	ug/L
2-Butanone (MEK)	5.00U	10.0	3.10	ug/L
2-Chlorotoluene	0.500U	1.00	0.310	ug/L
2-Hexanone	5.00U	10.0	3.10	ug/L
4-Chlorotoluene	0.500U	1.00	0.310	ug/L
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L
4-Methyl-2-pentanone (MIBK)	5.00U	10.0	3.10	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Bromobenzene	0.500U	1.00	0.310	ug/L
Bromochloromethane	0.500U	1.00	0.310	ug/L
Bromodichloromethane	0.250U	0.500	0.150	ug/L
Bromoform	0.500U	1.00	0.310	ug/L
Bromomethane	2.50U	5.00	1.50	ug/L
Carbon disulfide	5.00U	10.0	3.10	ug/L
Carbon tetrachloride	0.500U	1.00	0.310	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Chloroethane	0.500U	1.00	0.310	ug/L
Chloroform	0.500U	1.00	0.310	ug/L

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Method Blank

Blank ID: MB for HBN 1794613 [VXX/34190]
Blank Lab ID: 1511285

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192722001, 1192722002, 1192722003, 1192722004, 1192722005, 1192722006, 1192722007

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	2.50U	5.00	1.00	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.0750U	0.150	0.0500	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	103	81-118		%
4-Bromofluorobenzene (surr)	103	85-114		%
Toluene-d8 (surr)	100	89-112		%

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Method Blank

Blank ID: MB for HBN 1794613 [VXX/34190]
Blank Lab ID: 1511285

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192722001, 1192722002, 1192722003, 1192722004, 1192722005, 1192722006, 1192722007

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS18994
Analytical Method: SW8260C
Instrument: Agilent 7890-75MS
Analyst: FDR
Analytical Date/Time: 6/4/2019 10:06:00AM

Prep Batch: VXX34190
Prep Method: SW5030B
Prep Date/Time: 6/4/2019 12:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1192722 [VXX34190]
Blank Spike Lab ID: 1511286
Date Analyzed: 06/04/2019 10:21

Spike Duplicate ID: LCSD for HBN 1192722 [VXX34190]
Spike Duplicate Lab ID: 1511287
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192722001, 1192722002, 1192722003, 1192722004, 1192722005, 1192722006, 1192722007

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	30	31.3	104	30	32.7	109	(78-124)	4.30	(< 20)
1,1,1-Trichloroethane	30	30.7	102	30	31.3	104	(74-131)	2.20	(< 20)
1,1,2,2-Tetrachloroethane	30	30.7	102	30	31.5	105	(71-121)	2.60	(< 20)
1,1,2-Trichloroethane	30	31.2	104	30	32.0	107	(80-119)	2.60	(< 20)
1,1-Dichloroethane	30	30.4	101	30	30.8	103	(77-125)	1.10	(< 20)
1,1-Dichloroethene	30	29.4	98	30	29.6	99	(71-131)	0.58	(< 20)
1,1-Dichloropropene	30	30.8	103	30	31.5	105	(79-125)	2.20	(< 20)
1,2,3-Trichlorobenzene	30	27.0	90	30	28.1	94	(69-129)	4.10	(< 20)
1,2,3-Trichloropropane	30	30.3	101	30	30.9	103	(73-122)	2.00	(< 20)
1,2,4-Trichlorobenzene	30	30.9	103	30	32.2	107	(69-130)	4.10	(< 20)
1,2,4-Trimethylbenzene	30	32.4	108	30	33.2	111	(79-124)	2.70	(< 20)
1,2-Dibromo-3-chloropropane	30	29.7	99	30	31.4	105	(62-128)	5.50	(< 20)
1,2-Dibromoethane	30	31.0	103	30	31.9	106	(77-121)	2.90	(< 20)
1,2-Dichlorobenzene	30	30.9	103	30	31.8	106	(80-119)	2.70	(< 20)
1,2-Dichloroethane	30	30.7	102	30	31.2	104	(73-128)	1.60	(< 20)
1,2-Dichloropropane	30	31.4	105	30	31.8	106	(78-122)	1.30	(< 20)
1,3,5-Trimethylbenzene	30	32.8	109	30	33.2	111	(75-124)	1.30	(< 20)
1,3-Dichlorobenzene	30	32.1	107	30	32.6	109	(80-119)	1.40	(< 20)
1,3-Dichloropropane	30	31.0	103	30	31.9	106	(80-119)	2.90	(< 20)
1,4-Dichlorobenzene	30	32.4	108	30	32.3	108	(79-118)	0.59	(< 20)
2,2-Dichloropropane	30	36.2	121	30	37.1	124	(60-139)	2.40	(< 20)
2-Butanone (MEK)	90	84.7	94	90	87.4	97	(56-143)	3.00	(< 20)
2-Chlorotoluene	30	33.1	110	30	31.9	106	(79-122)	3.60	(< 20)
2-Hexanone	90	90.1	100	90	94.5	105	(57-139)	4.80	(< 20)
4-Chlorotoluene	30	32.6	109	30	33.1	110	(78-122)	1.50	(< 20)
4-Isopropyltoluene	30	33.4	111	30	33.6	112	(77-127)	0.54	(< 20)
4-Methyl-2-pentanone (MIBK)	90	90.5	101	90	93.0	103	(67-130)	2.70	(< 20)
Benzene	30	30.5	102	30	30.3	101	(79-120)	0.56	(< 20)
Bromobenzene	30	30.9	103	30	31.6	105	(80-120)	2.30	(< 20)
Bromochloromethane	30	30.0	100	30	30.5	102	(78-123)	1.60	(< 20)
Bromodichloromethane	30	31.4	105	30	31.9	106	(79-125)	1.50	(< 20)
Bromoform	30	32.5	108	30	33.4	111	(66-130)	2.70	(< 20)
Bromomethane	30	30.2	101	30	29.8	99	(53-141)	1.50	(< 20)
Carbon disulfide	45	44.0	98	45	43.7	97	(64-133)	0.50	(< 20)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1192722 [VXX34190]
Blank Spike Lab ID: 1511286
Date Analyzed: 06/04/2019 10:21

Spike Duplicate ID: LCSD for HBN 1192722 [VXX34190]
Spike Duplicate Lab ID: 1511287
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192722001, 1192722002, 1192722003, 1192722004, 1192722005, 1192722006, 1192722007

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon tetrachloride	30	30.4	101	30	31.2	104	(72-136)	2.50	(< 20)
Chlorobenzene	30	29.3	98	30	30.1	100	(82-118)	2.60	(< 20)
Chloroethane	30	26.8	89	30	28.2	94	(60-138)	5.00	(< 20)
Chloroform	30	29.7	99	30	30.1	100	(79-124)	1.60	(< 20)
Chloromethane	30	29.0	97	30	29.8	100	(50-139)	2.80	(< 20)
cis-1,2-Dichloroethene	30	30.1	100	30	30.9	103	(78-123)	2.60	(< 20)
cis-1,3-Dichloropropene	30	33.0	110	30	33.5	112	(75-124)	1.50	(< 20)
Dibromochloromethane	30	32.0	107	30	33.1	110	(74-126)	3.60	(< 20)
Dibromomethane	30	30.5	102	30	30.9	103	(79-123)	1.30	(< 20)
Dichlorodifluoromethane	30	29.6	99	30	29.2	97	(32-152)	1.20	(< 20)
Ethylbenzene	30	30.7	102	30	31.8	106	(79-121)	3.40	(< 20)
Freon-113	45	43.8	97	45	44.0	98	(70-136)	0.50	(< 20)
Hexachlorobutadiene	30	32.7	109	30	33.8	113	(66-134)	3.40	(< 20)
Isopropylbenzene (Cumene)	30	31.8	106	30	32.5	108	(72-131)	2.30	(< 20)
Methylene chloride	30	30.9	103	30	31.1	104	(74-124)	0.56	(< 20)
Methyl-t-butyl ether	45	46.3	103	45	47.1	105	(71-124)	1.70	(< 20)
Naphthalene	30	28.1	94	30	30.2	101	(61-128)	6.90	(< 20)
n-Butylbenzene	30	34.2	114	30	34.5	115	(75-128)	0.72	(< 20)
n-Propylbenzene	30	32.8	109	30	33.4	111	(76-126)	1.70	(< 20)
o-Xylene	30	31.0	103	30	32.3	108	(78-122)	4.20	(< 20)
P & M -Xylene	60	62.2	104	60	63.5	106	(80-121)	2.00	(< 20)
sec-Butylbenzene	30	33.4	111	30	33.8	113	(77-126)	0.95	(< 20)
Styrene	30	31.3	104	30	32.3	108	(78-123)	2.90	(< 20)
tert-Butylbenzene	30	32.1	107	30	33.4	111	(78-124)	3.70	(< 20)
Tetrachloroethene	30	30.5	102	30	31.7	106	(74-129)	3.60	(< 20)
Toluene	30	28.9	96	30	29.6	99	(80-121)	2.50	(< 20)
trans-1,2-Dichloroethene	30	30.2	101	30	30.6	102	(75-124)	1.30	(< 20)
trans-1,3-Dichloropropene	30	32.1	107	30	33.1	110	(73-127)	2.90	(< 20)
Trichloroethene	30	30.4	101	30	30.7	102	(79-123)	1.10	(< 20)
Trichlorofluoromethane	30	28.9	96	30	29.2	97	(65-141)	0.85	(< 20)
Vinyl acetate	30	34.5	115	30	35.6	119	(54-146)	3.00	(< 20)
Vinyl chloride	30	29.4	98	30	28.9	96	(58-137)	1.60	(< 20)
Xylenes (total)	90	93.2	104	90	95.8	106	(79-121)	2.80	(< 20)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1192722 [VXX34190]
Blank Spike Lab ID: 1511286
Date Analyzed: 06/04/2019 10:21

Spike Duplicate ID: LCSD for HBN 1192722 [VXX34190]
Spike Duplicate Lab ID: 1511287
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192722001, 1192722002, 1192722003, 1192722004, 1192722005, 1192722006, 1192722007

Results by **SW8260C**

	Blank Spike (%)			Spike Duplicate (%)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	98.5	99	30	98.4	98	(81-118)	0.13	
4-Bromofluorobenzene (surr)	30	101	101	30	101	101	(85-114)	0.07	
Toluene-d8 (surr)	30	101	101	30	102	102	(89-112)	1.00	

Batch Information

Analytical Batch: **VMS18994**
Analytical Method: **SW8260C**
Instrument: **Agilent 7890-75MS**
Analyst: **FDR**

Prep Batch: **VXX34190**
Prep Method: **SW5030B**
Prep Date/Time: **06/04/2019 00:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Matrix Spike Summary

Original Sample ID: 1511288
MS Sample ID: 1511289 MS
MSD Sample ID: 1511290 MSD

Analysis Date: 06/04/2019 12:58
Analysis Date: 06/04/2019 17:47
Analysis Date: 06/04/2019 18:03
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192722001, 1192722002, 1192722003, 1192722004, 1192722005, 1192722006, 1192722007

Results by **SW8260C**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	0.250U	30.0	35	117	30.0	34.2	114	78-124	2.30	(< 20)
1,1,1-Trichloroethane	0.500U	30.0	32.7	109	30.0	32.6	109	74-131	0.46	(< 20)
1,1,2,2-Tetrachloroethane	0.250U	30.0	33.9	113	30.0	33.3	111	71-121	1.60	(< 20)
1,1,2-Trichloroethane	0.200U	30.0	35.1	117	30.0	34.2	114	80-119	2.70	(< 20)
1,1-Dichloroethane	0.500U	30.0	32.1	107	30.0	31.7	106	77-125	1.10	(< 20)
1,1-Dichloroethene	0.500U	30.0	31.9	106	30.0	31.1	104	71-131	2.30	(< 20)
1,1-Dichloropropene	0.500U	30.0	33.1	110	30.0	32.8	109	79-125	0.91	(< 20)
1,2,3-Trichlorobenzene	0.500U	30.0	30.2	101	30.0	28.6	95	69-129	5.50	(< 20)
1,2,3-Trichloropropane	0.500U	30.0	34.2	114	30.0	33.5	112	73-122	2.10	(< 20)
1,2,4-Trichlorobenzene	0.500U	30.0	32.5	108	30.0	32.0	107	69-130	1.70	(< 20)
1,2,4-Trimethylbenzene	0.500U	30.0	39.1	130 *	30.0	37.3	124	79-124	4.70	(< 20)
1,2-Dibromo-3-chloropropane	5.00U	30.0	34.2	114	30.0	33.6	112	62-128	1.80	(< 20)
1,2-Dibromoethane	0.0375U	30.0	34.6	115	30.0	33.9	113	77-121	2.20	(< 20)
1,2-Dichlorobenzene	0.500U	30.0	33.9	113	30.0	32.6	109	80-119	3.80	(< 20)
1,2-Dichloroethane	0.250U	30.0	32.9	110	30.0	32.7	109	73-128	0.61	(< 20)
1,2-Dichloropropane	0.500U	30.0	33.2	111	30.0	33.0	110	78-122	0.63	(< 20)
1,3,5-Trimethylbenzene	0.500U	30.0	37.9	126 *	30.0	36.5	122	75-124	3.80	(< 20)
1,3-Dichlorobenzene	0.500U	30.0	34.4	115	30.0	33.2	111	80-119	3.60	(< 20)
1,3-Dichloropropane	0.250U	30.0	34.5	115	30.0	33.6	112	80-119	2.50	(< 20)
1,4-Dichlorobenzene	0.250U	30.0	34.5	115	30.0	33.6	112	79-118	2.50	(< 20)
2,2-Dichloropropane	0.500U	30.0	33.6	112	30.0	33.8	113	60-139	0.68	(< 20)
2-Butanone (MEK)	5.00U	90.0	105	117	90.0	103	115	56-143	1.50	(< 20)
2-Chlorotoluene	0.500U	30.0	33.6	112	30.0	33.0	110	79-122	1.80	(< 20)
2-Hexanone	5.00U	90.0	107	119	90.0	104	116	57-139	2.90	(< 20)
4-Chlorotoluene	0.500U	30.0	34.8	116	30.0	33.5	112	78-122	3.80	(< 20)
4-Isopropyltoluene	0.500U	30.0	35.9	120	30.0	34.4	115	77-127	4.20	(< 20)
4-Methyl-2-pentanone (MIBK)	5.00U	90.0	103	114	90.0	103	114	67-130	0.38	(< 20)
Benzene	0.200U	30.0	32.3	108	30.0	31.6	105	79-120	2.30	(< 20)
Bromobenzene	0.500U	30.0	34.1	114	30.0	32.9	110	80-120	3.60	(< 20)
Bromochloromethane	0.500U	30.0	32.5	108	30.0	32.2	107	78-123	0.83	(< 20)
Bromodichloromethane	0.250U	30.0	33.7	112	30.0	33.3	111	79-125	1.00	(< 20)
Bromoform	0.500U	30.0	34.8	116	30.0	34.5	115	66-130	0.81	(< 20)
Bromomethane	2.50U	30.0	24	80	30.0	26.6	89	53-141	10.40	(< 20)
Carbon disulfide	5.00U	45.0	46.2	103	45.0	45.2	100	64-133	2.20	(< 20)
Carbon tetrachloride	0.500U	30.0	32.5	108	30.0	32.8	109	72-136	0.80	(< 20)
Chlorobenzene	0.250U	30.0	32	107	30.0	31.7	106	82-118	0.88	(< 20)
Chloroethane	0.500U	30.0	28.5	95	30.0	28.9	96	60-138	1.20	(< 20)

Print Date: 06/11/2019 11:19:09AM

Matrix Spike Summary

Original Sample ID: 1511288
MS Sample ID: 1511289 MS
MSD Sample ID: 1511290 MSD

Analysis Date: 06/04/2019 12:58
Analysis Date: 06/04/2019 17:47
Analysis Date: 06/04/2019 18:03
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192722001, 1192722002, 1192722003, 1192722004, 1192722005, 1192722006, 1192722007

Results by **SW8260C**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Chloroform	0.500U	30.0	31.9	106	30.0	31.6	105	79-124	1.00	(< 20)
Chloromethane	0.500U	30.0	30.1	100	30.0	30.4	101	50-139	0.79	(< 20)
cis-1,2-Dichloroethene	0.500U	30.0	32.3	108	30.0	32.0	107	78-123	1.00	(< 20)
cis-1,3-Dichloropropene	0.250U	30.0	34.1	114	30.0	34.0	113	75-124	0.35	(< 20)
Dibromochloromethane	0.250U	30.0	35.2	117	30.0	34.4	115	74-126	2.40	(< 20)
Dibromomethane	0.500U	30.0	33.3	111	30.0	32.8	109	79-123	1.60	(< 20)
Dichlorodifluoromethane	0.500U	30.0	30.8	103	30.0	30.6	102	32-152	0.85	(< 20)
Ethylbenzene	0.500U	30.0	34.3	114	30.0	33.3	111	79-121	2.90	(< 20)
Freon-113	5.00U	45.0	47.6	106	45.0	46.5	103	70-136	2.30	(< 20)
Hexachlorobutadiene	0.500U	30.0	31.3	104	30.0	30.7	102	66-134	2.10	(< 20)
Isopropylbenzene (Cumene)	0.500U	30.0	35.1	117	30.0	33.7	112	72-131	4.10	(< 20)
Methylene chloride	2.50U	30.0	32.9	110	30.0	32.4	108	74-124	1.40	(< 20)
Methyl-t-butyl ether	5.00U	45.0	49.6	110	45.0	48.7	108	71-124	1.90	(< 20)
Naphthalene	0.500U	30.0	33.2	111	30.0	32.0	107	61-128	3.60	(< 20)
n-Butylbenzene	0.500U	30.0	34.2	114	30.0	33.3	111	75-128	2.60	(< 20)
n-Propylbenzene	0.500U	30.0	35.2	117	30.0	34.1	114	76-126	3.10	(< 20)
o-Xylene	0.500U	30.0	35.6	119	30.0	34.6	115	78-122	3.00	(< 20)
P & M -Xylene	1.00U	60.0	71.7	120	60.0	68.2	114	80-121	5.00	(< 20)
sec-Butylbenzene	0.500U	30.0	35.3	118	30.0	33.6	112	77-126	5.00	(< 20)
Styrene	0.500U	30.0	34.7	116	30.0	33.5	112	78-123	3.30	(< 20)
tert-Butylbenzene	0.500U	30.0	35.3	118	30.0	34.0	113	78-124	3.80	(< 20)
Tetrachloroethene	0.500U	30.0	34.7	116	30.0	33.4	111	74-129	3.70	(< 20)
Toluene	0.500U	30.0	31.6	105	30.0	30.5	102	80-121	3.40	(< 20)
trans-1,2-Dichloroethene	0.500U	30.0	32.3	108	30.0	31.9	106	75-124	1.20	(< 20)
trans-1,3-Dichloropropene	0.500U	30.0	32.7	109	30.0	32.6	109	73-127	0.09	(< 20)
Trichloroethene	0.500U	30.0	33	110	30.0	32.6	109	79-123	1.30	(< 20)
Trichlorofluoromethane	0.500U	30.0	31.1	104	30.0	30.6	102	65-141	1.60	(< 20)
Vinyl acetate	5.00U	30.0	32.9	110	30.0	32.9	110	54-146	0.12	(< 20)
Vinyl chloride	0.0750U	30.0	30.6	102	30.0	30.2	101	58-137	1.10	(< 20)
Xylenes (total)	1.50U	90.0	107	119	90.0	103	114	79-121	4.30	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	29.4	98	30.0	29.6	99	81-118	0.54	
4-Bromofluorobenzene (surr)		30.0	30.2	101	30.0	29.7	99	85-114	1.60	
Toluene-d8 (surr)		30.0	30.2	101	30.0	30.4	101	89-112	0.66	

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Matrix Spike Summary

Original Sample ID: 1511288
MS Sample ID: 1511289 MS
MSD Sample ID: 1511290 MSD

Analysis Date:
Analysis Date: 06/04/2019 17:47
Analysis Date: 06/04/2019 18:03
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192722001, 1192722002, 1192722003, 1192722004, 1192722005, 1192722006, 1192722007

Results by **SW8260C**

		Matrix Spike (%)			Spike Duplicate (%)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL

Batch Information

Analytical Batch: VMS18994
Analytical Method: SW8260C
Instrument: Agilent 7890-75MS
Analyst: FDR
Analytical Date/Time: 6/4/2019 5:47:00PM

Prep Batch: VXX34190
Prep Method: Volatiles Extraction 8240/8260 FULL
Prep Date/Time: 6/4/2019 12:00:00AM
Prep Initial Wt./Vol.: 5.00mL
Prep Extract Vol: 5.00mL

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Method Blank

Blank ID: MB for HBN 1794641 [VXX/34194]
Blank Lab ID: 1511410

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192722008

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,1-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1,2,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,2-Trichloroethane	0.200U	0.400	0.120	ug/L
1,1-Dichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethene	0.500U	1.00	0.310	ug/L
1,1-Dichloropropene	0.500U	1.00	0.310	ug/L
1,2,3-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,3-Trichloropropane	0.500U	1.00	0.310	ug/L
1,2,4-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromo-3-chloropropane	5.00U	10.0	3.10	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,2-Dichloropropane	0.500U	1.00	0.310	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichloropropane	0.250U	0.500	0.150	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
2,2-Dichloropropane	0.500U	1.00	0.310	ug/L
2-Butanone (MEK)	5.00U	10.0	3.10	ug/L
2-Chlorotoluene	0.500U	1.00	0.310	ug/L
2-Hexanone	5.00U	10.0	3.10	ug/L
4-Chlorotoluene	0.500U	1.00	0.310	ug/L
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L
4-Methyl-2-pentanone (MIBK)	5.00U	10.0	3.10	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Bromobenzene	0.500U	1.00	0.310	ug/L
Bromochloromethane	0.500U	1.00	0.310	ug/L
Bromodichloromethane	0.250U	0.500	0.150	ug/L
Bromoform	0.500U	1.00	0.310	ug/L
Bromomethane	2.50U	5.00	1.50	ug/L
Carbon disulfide	5.00U	10.0	3.10	ug/L
Carbon tetrachloride	0.500U	1.00	0.310	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Chloroethane	0.500U	1.00	0.310	ug/L
Chloroform	0.500U	1.00	0.310	ug/L

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Blank ID: MB for HBN 1794641 [VXX/34194]
Blank Lab ID: 1511410

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192722008

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	2.50U	5.00	1.00	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.0750U	0.150	0.0500	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	109	81-118		%
4-Bromofluorobenzene (surr)	103	85-114		%
Toluene-d8 (surr)	99.6	89-112		%

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Method Blank

Blank ID: MB for HBN 1794641 [VXX/34194]
Blank Lab ID: 1511410

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192722008

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS18998
Analytical Method: SW8260C
Instrument: Agilent 7890-75MS
Analyst: FDR
Analytical Date/Time: 6/6/2019 10:32:00AM

Prep Batch: VXX34194
Prep Method: SW5030B
Prep Date/Time: 6/6/2019 12:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1192722 [VXX34194]
Blank Spike Lab ID: 1511411
Date Analyzed: 06/06/2019 10:47

Spike Duplicate ID: LCSD for HBN 1192722 [VXX34194]
Spike Duplicate Lab ID: 1511412
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192722008

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	30	30.9	103	30	31.4	105	(78-124)	1.70	(< 20)
1,1,1-Trichloroethane	30	30.5	102	30	30.6	102	(74-131)	0.26	(< 20)
1,1,2,2-Tetrachloroethane	30	30.1	100	30	31.0	103	(71-121)	3.10	(< 20)
1,1,2-Trichloroethane	30	30.9	103	30	31.0	103	(80-119)	0.07	(< 20)
1,1-Dichloroethane	30	29.7	99	30	29.7	99	(77-125)	0.03	(< 20)
1,1-Dichloroethene	30	29.3	98	30	29.0	97	(71-131)	1.20	(< 20)
1,1-Dichloropropene	30	30.5	102	30	30.4	101	(79-125)	0.49	(< 20)
1,2,3-Trichlorobenzene	30	26.0	87	30	27.3	91	(69-129)	5.10	(< 20)
1,2,3-Trichloropropane	30	29.7	99	30	30.7	102	(73-122)	3.40	(< 20)
1,2,4-Trichlorobenzene	30	29.0	97	30	30.4	101	(69-130)	4.80	(< 20)
1,2,4-Trimethylbenzene	30	31.9	106	30	32.1	107	(79-124)	0.69	(< 20)
1,2-Dibromo-3-chloropropane	30	31.2	104	30	32.2	107	(62-128)	3.30	(< 20)
1,2-Dibromoethane	30	30.8	103	30	31.4	105	(77-121)	1.80	(< 20)
1,2-Dichlorobenzene	30	29.8	99	30	30.6	102	(80-119)	2.70	(< 20)
1,2-Dichloroethane	30	29.6	99	30	30.1	100	(73-128)	1.40	(< 20)
1,2-Dichloropropane	30	30.5	102	30	30.9	103	(78-122)	1.40	(< 20)
1,3,5-Trimethylbenzene	30	31.9	106	30	32.8	109	(75-124)	2.60	(< 20)
1,3-Dichlorobenzene	30	30.5	102	30	31.5	105	(80-119)	3.00	(< 20)
1,3-Dichloropropane	30	30.8	103	30	30.7	102	(80-119)	0.26	(< 20)
1,4-Dichlorobenzene	30	30.8	103	30	32.2	107	(79-118)	4.40	(< 20)
2,2-Dichloropropane	30	36.7	122	30	36.6	122	(60-139)	0.33	(< 20)
2-Butanone (MEK)	90	89.8	100	90	93.3	104	(56-143)	3.70	(< 20)
2-Chlorotoluene	30	30.5	102	30	30.8	103	(79-122)	0.95	(< 20)
2-Hexanone	90	93.3	104	90	95.8	106	(57-139)	2.60	(< 20)
4-Chlorotoluene	30	31.6	105	30	32.1	107	(78-122)	1.40	(< 20)
4-Isopropyltoluene	30	31.5	105	30	33.2	111	(77-127)	5.30	(< 20)
4-Methyl-2-pentanone (MIBK)	90	92.0	102	90	92.6	103	(67-130)	0.67	(< 20)
Benzene	30	29.1	97	30	29.3	98	(79-120)	0.48	(< 20)
Bromobenzene	30	29.7	99	30	30.5	102	(80-120)	2.80	(< 20)
Bromochloromethane	30	28.7	96	30	28.9	97	(78-123)	0.76	(< 20)
Bromodichloromethane	30	30.1	100	30	30.7	102	(79-125)	2.00	(< 20)
Bromoform	30	32.2	107	30	32.6	109	(66-130)	1.20	(< 20)
Bromomethane	30	28.8	96	30	28.3	95	(53-141)	1.60	(< 20)
Carbon disulfide	45	44.0	98	45	43.4	96	(64-133)	1.60	(< 20)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1192722 [VXX34194]
Blank Spike Lab ID: 1511411
Date Analyzed: 06/06/2019 10:47

Spike Duplicate ID: LCSD for HBN 1192722 [VXX34194]
Spike Duplicate Lab ID: 1511412
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192722008

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon tetrachloride	30	30.1	100	30	30.3	101	(72-136)	0.56	(< 20)
Chlorobenzene	30	28.9	96	30	29.0	97	(82-118)	0.66	(< 20)
Chloroethane	30	26.0	87	30	28.4	95	(60-138)	8.70	(< 20)
Chloroform	30	28.8	96	30	28.8	96	(79-124)	0.14	(< 20)
Chloromethane	30	28.5	95	30	28.4	95	(50-139)	0.18	(< 20)
cis-1,2-Dichloroethene	30	29.2	97	30	29.3	98	(78-123)	0.24	(< 20)
cis-1,3-Dichloropropene	30	32.3	108	30	32.7	109	(75-124)	1.30	(< 20)
Dibromochloromethane	30	31.4	105	30	31.9	106	(74-126)	1.80	(< 20)
Dibromomethane	30	29.3	98	30	29.9	100	(79-123)	2.00	(< 20)
Dichlorodifluoromethane	30	31.3	104	30	31.1	104	(32-152)	0.83	(< 20)
Ethylbenzene	30	30.2	101	30	30.9	103	(79-121)	2.30	(< 20)
Freon-113	45	44.0	98	45	43.5	97	(70-136)	1.20	(< 20)
Hexachlorobutadiene	30	30.3	101	30	31.1	104	(66-134)	2.70	(< 20)
Isopropylbenzene (Cumene)	30	31.9	106	30	31.9	106	(72-131)	0.06	(< 20)
Methylene chloride	30	29.8	99	30	29.9	100	(74-124)	0.57	(< 20)
Methyl-t-butyl ether	45	45.7	102	45	46.1	102	(71-124)	0.89	(< 20)
Naphthalene	30	27.9	93	30	29.5	98	(61-128)	5.60	(< 20)
n-Butylbenzene	30	32.9	110	30	33.6	112	(75-128)	2.20	(< 20)
n-Propylbenzene	30	32.7	109	30	33.2	111	(76-126)	1.70	(< 20)
o-Xylene	30	30.6	102	30	31.0	103	(78-122)	1.30	(< 20)
P & M -Xylene	60	61.2	102	60	61.7	103	(80-121)	0.85	(< 20)
sec-Butylbenzene	30	32.7	109	30	33.5	112	(77-126)	2.30	(< 20)
Styrene	30	30.6	102	30	30.4	101	(78-123)	0.46	(< 20)
tert-Butylbenzene	30	32.5	108	30	32.3	108	(78-124)	0.65	(< 20)
Tetrachloroethene	30	30.7	102	30	30.7	102	(74-129)	0.16	(< 20)
Toluene	30	28.1	94	30	28.4	95	(80-121)	0.85	(< 20)
trans-1,2-Dichloroethene	30	29.5	98	30	29.5	98	(75-124)	0.10	(< 20)
trans-1,3-Dichloropropene	30	32.5	108	30	32.4	108	(73-127)	0.18	(< 20)
Trichloroethene	30	29.9	100	30	29.7	99	(79-123)	0.44	(< 20)
Trichlorofluoromethane	30	28.1	94	30	29.2	97	(65-141)	3.60	(< 20)
Vinyl acetate	30	34.9	116	30	35.1	117	(54-146)	0.51	(< 20)
Vinyl chloride	30	28.8	96	30	28.3	94	(58-137)	1.80	(< 20)
Xylenes (total)	90	91.7	102	90	92.6	103	(79-121)	1.00	(< 20)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1192722 [VXX34194]
Blank Spike Lab ID: 1511411
Date Analyzed: 06/06/2019 10:47

Spike Duplicate ID: LCSD for HBN 1192722 [VXX34194]
Spike Duplicate Lab ID: 1511412
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192722008

Results by **SW8260C**

	Blank Spike (%)			Spike Duplicate (%)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	97.5	98	30	98.2	98	(81-118)	0.75	
4-Bromofluorobenzene (surr)	30	101	101	30	104	104	(85-114)	2.50	
Toluene-d8 (surr)	30	100	100	30	101	101	(89-112)	0.46	

Batch Information

Analytical Batch: **VMS18998**
Analytical Method: **SW8260C**
Instrument: **Agilent 7890-75MS**
Analyst: **FDR**

Prep Batch: **VXX34194**
Prep Method: **SW5030B**
Prep Date/Time: **06/06/2019 00:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Matrix Spike Summary

Original Sample ID: 1511413
MS Sample ID: 1511414 MS
MSD Sample ID: 1511415 MSD

QC for Samples: 1192722008

Analysis Date: 06/06/2019 14:38
Analysis Date: 06/06/2019 17:26
Analysis Date: 06/06/2019 17:41
Matrix: Water (Surface, Eff., Ground)

Results by **SW8260C**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	0.250U	30.0	32.5	108	30.0	31.4	105	78-124	3.50	(< 20)
1,1,1-Trichloroethane	0.500U	30.0	32.2	107	30.0	31.9	106	74-131	0.84	(< 20)
1,1,2,2-Tetrachloroethane	0.250U	30.0	31	103	30.0	31.3	104	71-121	1.00	(< 20)
1,1,2-Trichloroethane	0.200U	30.0	32.1	107	30.0	31.7	106	80-119	1.20	(< 20)
1,1-Dichloroethane	0.500U	30.0	31.2	104	30.0	31.0	103	77-125	0.51	(< 20)
1,1-Dichloroethene	0.500U	30.0	31.5	105	30.0	31.1	104	71-131	1.10	(< 20)
1,1-Dichloropropene	0.500U	30.0	31.8	106	30.0	31.5	105	79-125	0.79	(< 20)
1,2,3-Trichlorobenzene	0.500U	30.0	27.4	91	30.0	28.6	95	69-129	4.20	(< 20)
1,2,3-Trichloropropane	0.500U	30.0	30.8	103	30.0	30.9	103	73-122	0.52	(< 20)
1,2,4-Trichlorobenzene	0.500U	30.0	30.6	102	30.0	31.2	104	69-130	1.80	(< 20)
1,2,4-Trimethylbenzene	0.500U	30.0	33.3	111	30.0	33.3	111	79-124	0.12	(< 20)
1,2-Dibromo-3-chloropropane	5.00U	30.0	30	100	30.0	30.9	103	62-128	2.90	(< 20)
1,2-Dibromoethane	0.0375U	30.0	31.6	105	30.0	31.3	104	77-121	0.95	(< 20)
1,2-Dichlorobenzene	0.500U	30.0	31.7	106	30.0	31.7	106	80-119	0.03	(< 20)
1,2-Dichloroethane	0.250U	30.0	31.4	105	30.0	31.4	105	73-128	0.00	(< 20)
1,2-Dichloropropane	0.500U	30.0	31.7	106	30.0	31.5	105	78-122	0.60	(< 20)
1,3,5-Trimethylbenzene	0.500U	30.0	33.5	112	30.0	33.4	111	75-124	0.21	(< 20)
1,3-Dichlorobenzene	0.500U	30.0	32.8	109	30.0	32.7	109	80-119	0.43	(< 20)
1,3-Dichloropropane	0.250U	30.0	31.7	106	30.0	31.4	105	80-119	1.10	(< 20)
1,4-Dichlorobenzene	0.250U	30.0	32.7	109	30.0	32.9	110	79-118	0.64	(< 20)
2,2-Dichloropropane	0.500U	30.0	32.7	109	30.0	32.7	109	60-139	0.03	(< 20)
2-Butanone (MEK)	5.00U	90.0	88.1	98	90.0	90.4	100	56-143	2.60	(< 20)
2-Chlorotoluene	0.500U	30.0	33.7	112	30.0	33.7	112	79-122	0.06	(< 20)
2-Hexanone	5.00U	90.0	93.7	104	90.0	94.9	105	57-139	1.30	(< 20)
4-Chlorotoluene	0.500U	30.0	33.3	111	30.0	33.3	111	78-122	0.00	(< 20)
4-Isopropyltoluene	0.500U	30.0	33.3	111	30.0	33.0	110	77-127	1.10	(< 20)
4-Methyl-2-pentanone (MIBK)	5.00U	90.0	93.2	104	90.0	93.5	104	67-130	0.29	(< 20)
Benzene	0.200U	30.0	31	103	30.0	31.0	103	79-120	0.19	(< 20)
Bromobenzene	0.500U	30.0	31.8	106	30.0	32.3	108	80-120	1.70	(< 20)
Bromochloromethane	0.500U	30.0	31.4	105	30.0	31.2	104	78-123	0.77	(< 20)
Bromodichloromethane	0.250U	30.0	32.1	107	30.0	32.0	107	79-125	0.44	(< 20)
Bromoform	0.500U	30.0	32	107	30.0	31.8	106	66-130	0.88	(< 20)
Bromomethane	2.50U	30.0	27.4	91	30.0	28.1	94	53-141	2.60	(< 20)
Carbon disulfide	5.00U	45.0	45.8	102	45.0	44.9	100	64-133	2.00	(< 20)
Carbon tetrachloride	0.500U	30.0	32.3	108	30.0	32.4	108	72-136	0.15	(< 20)
Chlorobenzene	0.250U	30.0	30.4	101	30.0	29.6	99	82-118	2.60	(< 20)
Chloroethane	0.500U	30.0	27.6	92	30.0	28.0	93	60-138	1.30	(< 20)

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Matrix Spike Summary

Original Sample ID: 1511413
MS Sample ID: 1511414 MS
MSD Sample ID: 1511415 MSD

Analysis Date: 06/06/2019 14:38
Analysis Date: 06/06/2019 17:26
Analysis Date: 06/06/2019 17:41
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192722008

Results by **SW8260C**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Chloroform	0.510J	30.0	31.2	102	30.0	31.1	102	79-124	0.29	(< 20)
Chloromethane	0.500U	30.0	30.5	102	30.0	30.0	100	50-139	1.70	(< 20)
cis-1,2-Dichloroethene	0.500U	30.0	31.2	104	30.0	31.4	105	78-123	0.51	(< 20)
cis-1,3-Dichloropropene	0.250U	30.0	32.2	107	30.0	32.3	108	75-124	0.50	(< 20)
Dibromochloromethane	0.250U	30.0	32.5	108	30.0	32.0	107	74-126	1.60	(< 20)
Dibromomethane	0.500U	30.0	31.5	105	30.0	31.3	104	79-123	0.70	(< 20)
Dichlorodifluoromethane	0.500U	30.0	33.1	110	30.0	31.8	106	32-152	4.20	(< 20)
Ethylbenzene	0.500U	30.0	32.6	109	30.0	31.7	106	79-121	3.00	(< 20)
Freon-113	5.00U	45.0	47.1	105	45.0	46.4	103	70-136	1.50	(< 20)
Hexachlorobutadiene	0.500U	30.0	30.2	101	30.0	30.5	102	66-134	1.10	(< 20)
Isopropylbenzene (Cumene)	0.500U	30.0	33.5	112	30.0	33.3	111	72-131	0.84	(< 20)
Methylene chloride	2.50U	30.0	31.7	106	30.0	31.4	105	74-124	0.89	(< 20)
Methyl-t-butyl ether	5.00U	45.0	46.9	104	45.0	46.9	104	71-124	0.11	(< 20)
Naphthalene	0.500U	30.0	28.9	96	30.0	30.8	103	61-128	6.60	(< 20)
n-Butylbenzene	0.500U	30.0	32.9	110	30.0	32.7	109	75-128	0.67	(< 20)
n-Propylbenzene	0.500U	30.0	33.9	113	30.0	33.3	111	76-126	1.80	(< 20)
o-Xylene	0.500U	30.0	33	110	30.0	32.1	107	78-122	2.70	(< 20)
P & M -Xylene	1.00U	60.0	65.6	109	60.0	63.9	106	80-121	2.60	(< 20)
sec-Butylbenzene	0.500U	30.0	33.3	111	30.0	33.2	111	77-126	0.48	(< 20)
Styrene	0.500U	30.0	32.4	108	30.0	31.2	104	78-123	3.90	(< 20)
tert-Butylbenzene	0.500U	30.0	33.9	113	30.0	33.1	110	78-124	2.40	(< 20)
Tetrachloroethene	0.500U	30.0	32.8	109	30.0	31.7	106	74-129	3.30	(< 20)
Toluene	0.500U	30.0	29.8	100	30.0	29.2	97	80-121	2.30	(< 20)
trans-1,2-Dichloroethene	0.500U	30.0	31.6	105	30.0	31.1	104	75-124	1.50	(< 20)
trans-1,3-Dichloropropene	0.500U	30.0	30.7	102	30.0	30.7	102	73-127	0.16	(< 20)
Trichloroethene	0.500U	30.0	31.7	106	30.0	31.5	105	79-123	0.54	(< 20)
Trichlorofluoromethane	0.500U	30.0	30.6	102	30.0	30.0	100	65-141	1.90	(< 20)
Vinyl acetate	5.00U	30.0	31.3	104	30.0	31.2	104	54-146	0.19	(< 20)
Vinyl chloride	0.0750U	30.0	30.6	102	30.0	29.6	99	58-137	3.30	(< 20)
Xylenes (total)	1.50U	90.0	98.5	109	90.0	96.0	107	79-121	2.60	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	29.5	98	30.0	29.9	100	81-118	1.30	
4-Bromofluorobenzene (surr)		30.0	30.2	101	30.0	30.6	102	85-114	1.20	
Toluene-d8 (surr)		30.0	30.4	101	30.0	29.9	100	89-112	1.60	

Print Date: 06/11/2019 11:19:12AM

Matrix Spike Summary

Original Sample ID: 1511413
MS Sample ID: 1511414 MS
MSD Sample ID: 1511415 MSD

QC for Samples: 1192722008

Analysis Date:
Analysis Date: 06/06/2019 17:26
Analysis Date: 06/06/2019 17:41
Matrix: Water (Surface, Eff., Ground)

Results by **SW8260C**

		Matrix Spike (%)			Spike Duplicate (%)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL

Batch Information

Analytical Batch: VMS18998
Analytical Method: SW8260C
Instrument: Agilent 7890-75MS
Analyst: FDR
Analytical Date/Time: 6/6/2019 5:26:00PM

Prep Batch: VXX34194
Prep Method: Volatiles Extraction 8240/8260 FULL
Prep Date/Time: 6/6/2019 12:00:00AM
Prep Initial Wt./Vol.: 5.00mL
Prep Extract Vol: 5.00mL

Print Date: 06/11/2019 11:19:12AM

Method Blank

Blank ID: MB for HBN 1794473 [XXX/41512]
Blank Lab ID: 1510670

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192722002, 1192722007

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

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
2-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0250U	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	72	47-106		%
Fluoranthene-d10 (surr)	71	24-116		%

Batch Information

Analytical Batch: XMS11433
Analytical Method: 8270D SIM LV (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: BMZ
Analytical Date/Time: 6/4/2019 6:43:00PM

Prep Batch: XXX41512
Prep Method: SW3520C
Prep Date/Time: 6/4/2019 9:46:21AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1192722 [XXX41512]
Blank Spike Lab ID: 1510671
Date Analyzed: 06/04/2019 19:03

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192722002, 1192722007

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

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	2	1.39	70	(41-115)
2-Methylnaphthalene	2	1.42	71	(39-114)
Acenaphthene	2	1.39	70	(48-114)
Acenaphthylene	2	1.50	75	(35-121)
Anthracene	2	1.48	74	(53-119)
Benzo(a)Anthracene	2	1.52	76	(59-120)
Benzo[a]pyrene	2	1.44	72	(53-120)
Benzo[b]Fluoranthene	2	1.56	78	(53-126)
Benzo[g,h,i]perylene	2	1.43	71	(44-128)
Benzo[k]fluoranthene	2	1.55	78	(54-125)
Chrysene	2	1.50	75	(57-120)
Dibenzo[a,h]anthracene	2	1.35	68	(44-131)
Fluoranthene	2	1.49	75	(58-120)
Fluorene	2	1.49	75	(50-118)
Indeno[1,2,3-c,d] pyrene	2	1.53	76	(48-130)
Naphthalene	2	1.42	71	(43-114)
Phenanthrene	2	1.42	71	(53-115)
Pyrene	2	1.56	78	(53-121)
Surrogates				
2-Methylnaphthalene-d10 (surr)	2	70.5	71	(47-106)
Fluoranthene-d10 (surr)	2	69.2	69	(24-116)

Batch Information

Analytical Batch: **XMS11433**
Analytical Method: **8270D SIM LV (PAH)**
Instrument: **SVA Agilent 780/5975 GC/MS**
Analyst: **BMZ**

Prep Batch: **XXX41512**
Prep Method: **SW3520C**
Prep Date/Time: **06/04/2019 09:46**
Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1192756001
MS Sample ID: 1510672 MS
MSD Sample ID: 1510673 MSD

Analysis Date: 06/04/2019 21:48
Analysis Date: 06/04/2019 22:08
Analysis Date: 06/04/2019 22:29
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192722002, 1192722007

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

		Matrix Spike (ug/L)				Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Acenaphthene	0.0558U	2.29	1.2	53		2.14	1.32	62	48-114	8.90	(< 20)
Acenaphthylene	0.0558U	2.29	1.31	57		2.14	1.42	66	35-121	7.60	(< 20)
Anthracene	0.0558U	2.29	1.24	54		2.14	1.36	64	53-119	9.50	(< 20)
Benzo(a)Anthracene	0.0558U	2.29	1.2	53	*	2.14	1.29	60	59-120	6.90	(< 20)
Benzo[a]pyrene	0.0223U	2.29	1.07	47	*	2.14	1.15	54	53-120	7.30	(< 20)
Benzo[b]Fluoranthene	0.0558U	2.29	1.14	50	*	2.14	1.24	58	53-126	8.90	(< 20)
Benzo[g,h,i]perylene	0.0558U	2.29	.96	42	*	2.14	1.01	47	44-128	5.20	(< 20)
Benzo[k]fluoranthene	0.0558U	2.29	1.09	48	*	2.14	1.18	55	54-125	7.70	(< 20)
Chrysene	0.0558U	2.29	1.21	53	*	2.14	1.31	61	57-120	7.80	(< 20)
Dibenzo[a,h]anthracene	0.0223U	2.29	.946	41	*	2.14	1.00	47	44-131	5.60	(< 20)
Fluoranthene	0.0558U	2.29	1.24	54	*	2.14	1.34	63	58-120	7.90	(< 20)
Fluorene	0.0696	2.29	1.33	55		2.14	1.45	65	50-118	8.60	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0558U	2.29	1.01	44	*	2.14	1.08	51	48-130	6.50	(< 20)
Naphthalene	0.112U	2.29	1.24	54		2.14	1.32	62	43-114	6.70	(< 20)
Phenanthrene	0.0790	2.29	1.26	52	*	2.14	1.38	61	53-115	8.70	(< 20)
Pyrene	0.0558U	2.29	1.3	57		2.14	1.41	66	53-121	8.20	(< 20)
Surrogates											
2-Methylnaphthalene-d10 (surr)		2.29	1.22	53		2.14	1.30	61	47-106	6.20	
Fluoranthene-d10 (surr)		2.29	1.18	51		2.14	1.30	61	24-116	9.70	

Batch Information

Analytical Batch: XMS11433
Analytical Method: 8270D SIM LV (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: BMZ
Analytical Date/Time: 6/4/2019 10:08:00PM

Prep Batch: XXX41512
Prep Method: 3520 Liq/Liq Ext for 8270 PAH SIM LV
Prep Date/Time: 6/4/2019 9:46:21AM
Prep Initial Wt./Vol.: 218.00mL
Prep Extract Vol: 1.00mL

Print Date: 06/11/2019 11:19:17AM

Method Blank

Blank ID: MB for HBN 1794714 [XXX/41548]
Blank Lab ID: 1511704

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192722001, 1192722002, 1192722003, 1192722004, 1192722005, 1192722006, 1192722007

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	83.6	60-120		%

Batch Information

Analytical Batch: XFC15040
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: VDL
Analytical Date/Time: 6/11/2019 7:47:00AM

Prep Batch: XXX41548
Prep Method: SW3520C
Prep Date/Time: 6/10/2019 10:02:32AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1192722 [XXX41548]
Blank Spike Lab ID: 1511705
Date Analyzed: 06/11/2019 07:57

Spike Duplicate ID: LCSD for HBN 1192722 [XXX41548]
Spike Duplicate Lab ID: 1511706
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192722001, 1192722002, 1192722003, 1192722004, 1192722005, 1192722006, 1192722007

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	20.4	102	20	19.5	98	(75-125)	4.60	(< 20)
Surrogates									
5a Androstane (surr)	0.4	96.4	96	0.4	93.6	94	(60-120)	2.90	

Batch Information

Analytical Batch: **XFC15040**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **VDL**

Prep Batch: **XXX41548**
Prep Method: **SW3520C**
Prep Date/Time: **06/10/2019 10:02**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1794714 [XXX/41548]
Blank Lab ID: 1511704

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1192722001, 1192722002, 1192722003, 1192722004, 1192722005, 1192722006, 1192722007

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	0.239J	0.500	0.150	mg/L
Surrogates				
n-Triacontane-d62 (surr)	102	60-120		%

Batch Information

Analytical Batch: XFC15040
Analytical Method: AK103
Instrument: Agilent 7890B R
Analyst: VDL
Analytical Date/Time: 6/11/2019 7:47:00AM

Prep Batch: XXX41548
Prep Method: SW3520C
Prep Date/Time: 6/10/2019 10:02:32AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1192722 [XXX41548]
Blank Spike Lab ID: 1511705
Date Analyzed: 06/11/2019 07:57

Spike Duplicate ID: LCSD for HBN 1192722 [XXX41548]
Spike Duplicate Lab ID: 1511706
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1192722001, 1192722002, 1192722003, 1192722004, 1192722005, 1192722006, 1192722007

Results by **AK103**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	20	18.6	93	20	18.0	90	(60-120)	3.20	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	0.4	108	108	0.4	103	103	(60-120)	4.30	

Batch Information

Analytical Batch: **XFC15040**
Analytical Method: **AK103**
Instrument: **Agilent 7890B R**
Analyst: **VDL**

Prep Batch: **XXX41548**
Prep Method: **SW3520C**
Prep Date/Time: **06/10/2019 10:02**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

SGS

SGS North America Inc.
CHAIN OF CUSTODY RECO

1192722

Locations Nationwide

Alaska	Maryland
New Jersey	New York
North Carolina	Indiana
West Virgina	Kentucky

www.us.sgs.com

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

Page 1 of 1

Section 1

CLIENT: Restoration Science & Engineering

CONTACT: Lisa Koeneman PHONE NO: 907-278-1023

PROJECT NAME: ARRC Mammoth GW PROJECT/ PWSID/ PERMIT#: 18-1910

REPORTS TO: RSE E-MAIL: lkoeneman@restorsci.com

INVOICE TO: RSE QUOTE #: P.O. #:

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	Section 3 # CONTAINERS	Type C = COMP G = GRAB MI = Multi Incremental Soils	Preservative: HCl	HCl	HCl	HCl	Zinc Acetate					REMARKS/ LOC ID
							GRO - AK 101	DRO - AK102	RRO - AK103	VOC - 8260 EPA	PAH SIM - 8270D EPA					
1AH	~~EA~~ CHMWE1	5/30/19	10:10	W	8	G	X	X	X	X						
2AJ	CHMWE2	5/30/19	14:00	W	10	G	X	X	X	X	X					
3AH	EMCONMW4	5/30/19	12:35	W	8	G	X	X	X	X						
4AH	CHMWE5	5/30/19	11:40	W	8	G	X	X	X	X						
5AH	MW-6	5/30/19	10:55	W	8	G	X	X	X	X						
6AH	MW-7	5/30/19	9:15	W	8	G	X	X	X	X						
7AJ	CHMW-X	5/30/19	16:00	W	10	G	X	X	X	X	X					

Section 5

	Date	Time	
Relinquished By: (1)			Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	5/31/19	0911	Received For Laboratory By:

Section 4

DOD Project? Yes No

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Profile #362788

Temp Blank °C: 0.6/0.30

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)

INTACT BROKEN ABSENT

(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

e-Sample Receipt Form

SGS Workorder #: **1192722**

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		Yes — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	HD
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?		
**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)?	Yes	Cooler ID: 1 @ 0.6 °C Therm. ID: D30
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	Yes	
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC informatic		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
		***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition
1192722001-A	HCL to pH < 2	OK
1192722001-B	HCL to pH < 2	OK
1192722001-C	HCL to pH < 2	OK
1192722001-D	HCL to pH < 2	OK
1192722001-E	HCL to pH < 2	OK
1192722001-F	HCL to pH < 2	OK
1192722001-G	HCL to pH < 2	OK
1192722001-H	HCL to pH < 2	OK
1192722002-A	HCL to pH < 2	OK
1192722002-B	HCL to pH < 2	OK
1192722002-C	HCL to pH < 2	OK
1192722002-D	HCL to pH < 2	OK
1192722002-E	HCL to pH < 2	OK
1192722002-F	HCL to pH < 2	OK
1192722002-G	HCL to pH < 2	OK
1192722002-H	HCL to pH < 2	OK
1192722002-I	No Preservative Required	OK
1192722002-J	No Preservative Required	OK
1192722003-A	HCL to pH < 2	OK
1192722003-B	HCL to pH < 2	OK
1192722003-C	HCL to pH < 2	OK
1192722003-D	HCL to pH < 2	OK
1192722003-E	HCL to pH < 2	OK
1192722003-F	HCL to pH < 2	OK
1192722003-G	HCL to pH < 2	OK
1192722003-H	HCL to pH < 2	OK
1192722004-A	HCL to pH < 2	OK
1192722004-B	HCL to pH < 2	OK
1192722004-C	HCL to pH < 2	OK
1192722004-D	HCL to pH < 2	OK
1192722004-E	HCL to pH < 2	OK
1192722004-F	HCL to pH < 2	OK
1192722004-G	HCL to pH < 2	OK
1192722004-H	HCL to pH < 2	OK
1192722005-A	HCL to pH < 2	OK
1192722005-B	HCL to pH < 2	OK
1192722005-C	HCL to pH < 2	OK
1192722005-D	HCL to pH < 2	OK
1192722005-E	HCL to pH < 2	OK
1192722005-F	HCL to pH < 2	OK
1192722005-G	HCL to pH < 2	OK
1192722005-H	HCL to pH < 2	OK
1192722006-A	HCL to pH < 2	OK
1192722006-B	HCL to pH < 2	OK
1192722006-C	HCL to pH < 2	OK
1192722006-D	HCL to pH < 2	OK
1192722006-E	HCL to pH < 2	OK
1192722006-F	HCL to pH < 2	OK
1192722006-G	HCL to pH < 2	OK
1192722006-H	HCL to pH < 2	OK
1192722007-A	HCL to pH < 2	OK
1192722007-B	HCL to pH < 2	OK
1192722007-C	HCL to pH < 2	OK
1192722007-D	HCL to pH < 2	OK
1192722007-E	HCL to pH < 2	OK
1192722007-F	HCL to pH < 2	OK
1192722007-G	HCL to pH < 2	OK
1192722007-H	HCL to pH < 2	OK
1192722007-I	No Preservative Required	OK
1192722007-J	No Preservative Required	OK
1192722008-A	HCL to pH < 2	OK
1192722008-B	HCL to pH < 2	OK
1192722008-C	HCL to pH < 2	OK
1192722008-D	HCL to pH < 2	OK
1192722008-E	HCL to pH < 2	OK
1192722008-F	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 than 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.

Attachment E:
ADEC Laboratory Data Quality Review Checklist

RESTORATION
Science & Engineering, LLC

Laboratory Data Review Checklist

Completed By:

Lisa Koeneman

Title:

Qualified Environmental Professional

Date:

12/4/2019

Consultant Firm:

Restoration Science & Engineering, LLC

Laboratory Name:

SGS North America Inc.

Laboratory Report Number:

1192722

Laboratory Report Date:

6/11/2019

CS Site Name:

ARRC Mammoth Alaska

ADEC File Number:

2100.26.202

Hazard Identification Number:

23887

1192722

Laboratory Report Date:

6/11/2019

CS Site Name:

ARRC Mammoth Alaska

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

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

   Yes☒ No☐ N/A☐ Comments:

SGS received all the samples and performed all the analyses.

   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☐ N/A☒ Comments:

The samples were not transferred.

2. Chain of Custody (CoC)

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

   Yes☒ No☐ N/A☐ Comments:

The completed, signed and dated COC is provided with the lab report.

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

GRO, DRO, RRO, VOCs and PAH SIMs were requested.

3. Laboratory Sample Receipt Documentation

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

   Yes☒ No☐ N/A☐ Comments:

The sample cooler was delivered at 0.6°C.

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

   Yes☒ No☐ N/A☐ Comments:

All sample preservation methods were acceptable.

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

Yes☒ No☐ N/A☐ Comments:

All samples were found to be in good condition.

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☐ N/A☒ Comments:

No discrepancies were reported.

e. Data quality or usability affected?

Comments:

The samples were preserved the compliance and delivered in good condition, indicating that the data quality and usability are not affected.

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

The case narrative is present and understandable.

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

Yes☒ No☐ N/A☐ Comments:

The LCSD recovery for GRO does not meet the lab QC criteria.

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective actions were taken.

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

Comments:

The case narrative indicates that GRO was not detected above the LOQ in the associated samples, and therefore the data quality and usability are not affected.

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5. Samples Results

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

Yes☒ No☐ N/A☐ Comments:

The requested analyses were performed.

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

All samples were delivered and extracted within the applicate holding times.

c. All soils reported on a dry weight basis?

Yes☐ No☐ N/A☒ Comments:

All the samples in this report are water samples.

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

Yes☐ No☒ N/A☐ Comments:

The LOQ for 1,2,3-trichloropropane is elevated above the ADEC cleanup level.

e. Data quality or usability affected?

This is not a COPC for this site, indicating that the data quality and usability are not affected.

6. QC Samples

a. Method Blank

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

Yes☒ No☐ N/A☐ Comments:

One Method Blank is reported for the 7 water samples.

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

All Method Blank LOQs are less than the ADEC cleanup levels.

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iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

N/A – All Method Blank LOQs are below the ADEC cleanup levels.

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

Yes☐ No☐ N/A☒ Comments:

No samples are affected.

v. Data quality or usability affected?

Comments:

All Method Blank results are less than the LOQs, indicating that the data quality and usability are not affected.

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☐ N/A☐ Comments:

One LCS/LCSD is reported for the organic analyses in 7 water samples.

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

Yes☐ No☐ N/A☒ Comments:

No metals or inorganics were analyzed.

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

Yes☐ No☒ N/A☐ Comments:

The percent recovery for GRO in the LCSD was outside of lab limits.

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

Yes☒ No☐ N/A☐ Comments:

All RPDs in the LCS and LCSD were within lab limits.

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

Comments:

1192722007

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

Yes☒ No☐ N/A☐ Comments:

The affected sample is listed at the top of the page. The failed GRO LCSD percent recovery is marked with an asterisk (*).

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

Comments:

GRO in the associated sample was not detected above the LOQ, indicating that the data quality and usability are not affected.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

One MS/MSD are reported for the 7 water samples.

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

No metals or inorganics were analyzed.

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

Yes☐ No☒ N/A☐ Comments:

Percent recoveries for 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene in the MS and percent recoveries for several 8270D analytes in the MS were outside of lab limits.

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

Yes☒ No☐ N/A☐ Comments:

All MS/MSD RPDs were within lab limits.

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

Comments:

1192722001, 1192722002, 1192722003, 1192722004, 1192722005, 1192722006, 1192722007

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

Yes☒ No☐ N/A☐ Comments:

The affected samples are listed at the top of each page containing a failed percent recovery, which are marked with an asterisk (*).

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

Comments:

These failed analytes are not COPCs for this site, so the data quality and usability are not affected.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

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

Yes☒ No☐ N/A☐ Comments:

Surrogate recoveries for the organic analyses are reported.

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

Yes☒ No☒ N/A☐ Comments:

The lab report marked the percent recovery for 2-mthylnaphthalene-d10 as being outside of the lab limits of 47%-106%. The result was 46.8%. The lab rounds the result to the nearest whole number for analysis, so the result marked as failing the QC criteria is actually inside the lab limits.

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

Yes☒ No☐ N/A☐ Comments:

The "failed" surrogate is marked with an asterisk (*).

iv. Data quality or usability affected?

Comments:

The 46.8% result is rounded to 47%, indicating that the result marked as failed is within the lab limits. Therefore, the data quality and usability are not affected.

e. Trip Blanks

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

Yes☒ No☐ N/A☐ Comments:

One Trip Blank is reported for one cooler and 7 water samples.

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☐ N/A☐ Comments:

The cooler is clearly indicated on the COC.

iii. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☐ Comments:

All Trip Blank results are less than their LOQs.

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

N/A - All Trip Blank results are less than their LOQs.

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v. Data quality or usability affected?

Comments:

The Trip Blank results do not indicate that the data quality and usability are affected.

f. Field Duplicate

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

Yes☒ No☐ N/A☐ Comments:

CHMWE-X, a blind duplicate of CHMWE2, was submitted for a total of 7 water samples.

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

CHMWE-X was submitted for quality control purposes.

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = 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☒ N/A☐ Comments:

RPDs for some COPCs are outside of the 30% limit for water allowed by the lab.

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

Comments:

The data quality and usability are not affected because this site has had several sampling events, providing adequate supplementary data for this particular well. Additionally, this site is not being considered for closure at this time, so this data is part of an ongoing monitoring effort and should be treated as such.

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

Yes☐ No☐ N/A☒ Comments:

No decontamination or equipment blank was submitted. When possible, RSE used new, dedicated sampling equipment for collecting each sample. When non-dedicated sampling equipment was used, it was thoroughly decontaminated between collecting each sample using a distilled water and Alcanox wash.

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No decontamination or equipment blank was submitted

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

N/A - No decontamination or equipment blank was submitted

iii. Data quality or usability affected?

Comments:

The data quality and usability are not affected because when possible, RSE used new, dedicated sampling equipment for collecting each sample. When non-dedicated sampling equipment was used, it was thoroughly decontaminated between collecting each sample using a distilled water and Alcanox wash.

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

a. Defined and appropriate?

Yes☐ No☐ N/A☒ Comments:

No other data flags or qualifiers were reported by the lab.

Attachment F:

ADEC Approval to Transport Form

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites and Prevention and Emergency Response Programs

Transport, Treatment, & Disposal Approval Form for Contaminated Media

DEC HAZARD/SPILL ID #	NAME OF SPILL OR CONTAMINATED SITE	
2100.26.202	ARRC Mammoth Alaska (Mammoth Trucking)	
SITE OR SPILL LOCATION		
1048 Whitney Road, Anchorage, Alaska 99501		
CURRENT LOCATION AND TYPE OF CONTAMINATED MEDIA		**SOURCE OF THE CONTAMINATION**
southwest corner of lot, impacted groundwater		historic USTs
COMPOUNDS OF CONCERN	**ESTIMATED VOLUME**	**DATE(S) GENERATED**
DRO, RRO, TCE, VC	5 gallons	5/30/19
POST TREATMENT ANALYSIS REQUIRED *(such as GRO, DRO, RRO, BTEX, and/or Chlorinated Solvents)*		
DRO, GRO, PAH SIM, VOC, Chlorinated Compounds		
COMMENTS		
Groundwater is from approximately 7.3 feet below ground surface from monitoring well CHMWE2. A sheen was noted in the purge water from this well, so it was stored on site. Historically, this site contained five (5) USTs that were removed in 1990. These 5 gallons of stored purge water will be transported to ARRC Hazardous Waste Facility for temporary storage. ARRC will contract US Ecology (formerly NRC) to pick up the 5 gallons of water from the ARRC Waste Facility. US Ecology will treat the water and dispose of it.		

Facility Accepting the Contaminated Media

NAME OF THE FACILITY	PHYSICAL ADDRESS/PHONE NUMBER
US Ecology (formerly NRC Alaska)	619 E Ship Creek Ave. #309, Anchorage, Alaska 99501 (907) 258-1558

Responsible Party and Contractor Information

BUSINESS/NAME	ADDRESS/PHONE NUMBER
Alaska Railroad Corporation - Russell Grandel	327 West Ship Creek Ave., Anchorage, Alaska 99501 (907) 982-4898
Restoration Science & Engineering, LLC - Lisa Koeneman	911 West 8th Ave., Suite 100, Anchorage, Alaska 99501 (907) 278-1023

Russell Grandel
Name of the Person Requesting Approval (printed)

Russell Grandel
Signature

Alaska Railroad Corporation
Title/Association

12/18/19
Date

(907) 982-4898
Phone Number

----------DEC USE ONLY----------

Based on the information provided, ADEC approves transport of the above-described media for treatment in accordance with the approved facility operations plan. The Responsible Party or their consultant must submit to the DEC Project Manager a copy of weight/volume receipts of the loads transported to the facility and a post treatment analytical report. If the media is contaminated soil, it shall be transported as a covered load in compliance with 18 AAC 60.015.

Grant Lidren
DEC Project Manager Name (printed)

Grant Lidren
Signature

EPS IV
Project Manager Title

12/18/2018
Date

269-8685
Phone Number