KWIGILLINGOK PIPELINE SPILL
Site Characterization Report
Kwigillingok, Alaska 99622
ADEC File No. 2425.38.003

Prepared For:

NATIVE VILLAGE OF KWIGILLINGOK
PO BOX 90
KWIGILLINGOK, AK 99622

Prepared By:

ENVIRONMENTAL MANAGEMENT, INC.
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July 17, 2017

ENVIRONMENTAL MANAGEMENT, INC.
Consulting, Engineering & Training

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ACRONYMS AND ABBREVIATIONS

ADEC	Alaska Department of Environmental Conservation
DRO	Diesel range organics
EMI	Environmental Management, Inc.
GRO	Gasoline Range Organics
IDW	Investigative Derived waste
ug/kg	Micrograms per kilogram
mg/kg	Milligrams per kilogram
PAH	Polyaromatic hydrocarbons
PID	photoionization detector
PPE	Personal Protective Equipment
ppmv	Parts per million by volume
RRO	Residual range organics
VOCs	Volatile Organic Carbons
SGS	SGS North America, Inc.

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1.0 INTRODUCTION

This report describes the site investigation activities conducted at the Kwigillingok Pipeline Spill area in Kwigillingok, Alaska. The site investigation was conducted by Environmental Management, Inc. (EMI) on in accordance with our May 7, 2017 work plan, which was approved by the Alaska Department of Environmental Conservation (ADEC) on May 23, 2017.

2.0 SITE DESCRIPTION AND BACKGROUND

The project site is located in Kwigillingok, Alaska. The project site is a fuel pipeline spill located roughly 500 feet west of the Kwigillingok School, approximately 500 feet south-east of the Kwigillingok Washeteria and also approximately a half mile from the Kwigillingok River. The project area is shown on Figure 1.

A Site Reconnaissance was conducted of the site by Bristol Environmental & Engineering Services Corporation (Bristol) between October 25 and 27, 2000. According to Bristol's January 2001 report *Kwigillingok Site Reconnaissance and Recommendation Report Kwigillingok, Alaska*, on September 10, 1999 the Central Alaska Response Team (CART) was notified of an estimated 1,000 gallon diesel fuel spill from the pipeline leading to the Washeteria's 8,000 gallon fuel tank. This was noticed by locals while diesel fuel was delivered by river barge during the night of September 9th. Fuel leaked from the pipeline while filling the fuel tank. The fuel soaked into nearby tundra and was contained in a low-lying area. On-site personnel noticed the spill mid-day on September 10th and began immediate cleanup. Based on the Washeteria fuel tank's readings before and after the barge delivery, the spill quantity was lowered from 1,000 gallons to 384 gallons. According to the report, 250 gallons were recovered and placed back into the tank.

During Bristol's 2000 Site Reconnaissance visit, they inspected the pipeline spill area and noticed heavy staining in the area where the spill had occurred. Bristol conducted six soil borings around an area roughly 18 feet by 24 feet to a depth from zero to six inches below ground surface (bgs). Photoionization Detector (PID) headspace readings from the borings ranged from 0 to 234 parts per million (ppm). The highest field screened reading location (Sample Number 5) was laboratory sampled and contained diesel range organics (DRO) at 90,700 milligrams per kilogram (mg/kg) and gasoline range organics (GRO) at 480 mg/kg. Both concentrations are above the ADEC migration to groundwater cleanup level. Based on the sample results, the visible staining left after the spill, visible sheens on surface water and the proximity to the Kwigillingok River, Bristol recommended additional site investigation activities at the site.

3.0 PURPOSE AND OBJECTIVES

The site is an active Alaska Department of Environmental Conservation (ADEC) Contaminated Site (Hazard ID 26437). The purpose of the project was to advance towards cleanup complete with institutional controls (CCIC). The project objectives were to delineate the vertical and horizontal extent of soil and/or groundwater contamination in the vicinity of the historical pipeline spill area by advancing soil borings and installing temporary monitoring wells in the pipeline spill area.

4.0 METHODOLOGY

Field activities were conducted in general accordance with the March 2016 *ADEC Field Sampling Guidance*, and our ADEC-approved work plan. Further details on the field screening methods, soil and groundwater sampling methods, and laboratory analysis are provided below.

4.1 Work Plan Variance

The following are variances from our ADEC-approved work plan and the ADEC's additional requests from May 23, 2017.

- Headspace samples were to be collected at 0.5-foot intervals. Due to the presence of shallow permafrost in each of the borings, many boring locations only had one headspace sample collected.
- Surface soil samples were to be collected a maximum depth of 2 feet bgs. Due to the presence of shallow permafrost in each of the borings, the surface soil samples were collected at a maximum depth of 0.5 feet bgs or 1 foot bgs.
- Up to three temporary monitoring wells were to be installed. Instead, only two wells were installed because of the presence of shallow permafrost.
- A survey of the monitoring wells to establish groundwater flow direction was not conducted because only two wells were able to be installed.
- The ADEC requested in their May 23, 2017 approval that a positive pressure pump be utilized. However, due to the small diameter of the temporary wells, the ADEC approved the use of a peristaltic pump in a May 30, 2017 email.
- Decontamination water and purgewater was to be processed through a granulated activated carbon (GAC) filter prior to discharge to the ground surface. Instead, the water was containerized and left on site for treatment and disposal by the client.

4.2 Field Screening Methods

EMI conducted field screening during the soil boring activities. Field headspace samples were collected from the soils borings in six inch increments or at soil lithology breaks. Headspace samples were collected by filling re-sealable quart size bags approximately 1/3 to 1/2 full with soil. The bags were then agitated before being allowed to develop for at least 10 minutes, but not longer than an hour. During this time the soils were warmed to a minimum temperature of 40°F. After the samples have been warmed and allowed to develop, the probe of the MiniRAE 3000 photoionization detector (PID) was inserted into the bag and the displayed reading was recorded

in the field notes along with other pertinent information such as the time of collection and reading, and the location of the sample.

4.3 Soil Sampling Methods

Soil analytical samples were collected using clean disposable spoons and placed directly into clean laboratory-provided containers. Samples for volatile analysis were collected before headspace readings to prevent volatilization of the sample. Volatile samples were collected first and preserved with 25-mL of methanol, per Alaska Method (AK 101).

4.4 Water Sampling Methods

The monitoring wells were purged using low-flow sampling methods per the Environmental Protection Agency's 2010 *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells*. Because the drive point tool only allows for narrow diameter samplers or tubing, EMI utilized a peristaltic pump and disposal tubing to purge and collect the groundwater monitoring wells. Purging was conducted in order to sustain a minimum drawdown (less than 0.1 meter) during purging. Field parameters were measured at 3 to 5 minute intervals to evaluate the effectiveness of removing stagnant casing water. Water quality parameters from each of the wells stabilized within the criteria outlined in the ADEC's March 2016 *Field Sampling Guidance* prior to collecting analytical samples. The analytical samples were collected directly from dedicated tubing into the laboratory containers. The purge water was containerized in a labeled 5-gallon bucket on site and sealed pending receipt of analysis. At the time of this report the water is still containerized on site.

4.5 Analytical Methods

The analytical samples were submitted to SGS North America, Inc. (SGS) of Anchorage, Alaska. Each sample was analyzed for diesel range organics (DRO); residual range organics (RRO); gasoline range organics (GRO); and benzene, toluene, ethylbenzene and xylenes (BTEX). One sample was also analyzed for polyaromatic hydrocarbon (PAH).

5.0 FIELD ACTIVITIES

Field activities were conducted on May 31, 2017. The sampling activities were conducted in accordance with our ADEC-approved work plan. Field activities included advancing soil borings and collecting soil samples, and installing and sampling temporary monitoring wells.

EMI provided an ADEC Qualified Environmental Professional to conduct the field sampling activities. SGS Laboratories in Anchorage was subcontracted to provide the analytical services. Field notes documenting the field activities are provided in Appendix A.

5.1 Soil Borings and Sampling

Once on site, EMI consulted with local personnel in order to locate the pipeline spill area. Historic photos were compared to the location along with hand sketches done during the previous site investigation. While on site, it was discovered that the location of the boardwalk has since moved. A newer boardwalk was installed parallel to the old one. A small

approximately 10 foot section of the older boardwalk ran parallel to the newer boardwalk, and the old historic pipeline had run on the north side of that.

While on site, no visible staining or odor was noted in the historical sample area. Surface water was visible in low lying area, and no sheen was noted in the water or when disturbing the ground in those areas. Two trash burn barrels were located in the low lying in proximity to the boardwalk where the historic spill was assumed to have been located. A used 5 gallon oil bucket with trash was also located close to the burn barrels.

Soils borings were then placed around the area where the historic spill was approximately located using old field notes and photos. Borings were advanced in higher topographic areas due to the low lying areas have surface water and groundwater less than six inches bgs.

Five of the borings were placed around the presumed historical spill area and one boring (Boring BH04) was placed in the area believed to be close to the center of the spill area based on historic photos and topography. The boring (Boring BH04) was also uphill from the burn barrels, close to the pipeline and boardwalk. The locations of these borings are shown on Figure 2.

Two temporary monitoring wells were also installed. Both wells were located in low-lying topographic areas where water was noted on the surface or there was evidence of saturation. Permafrost depths did not allow for sufficient advancement of the drive points down in higher topographic areas in order to install temporary monitoring wells. Because of this, only two wells were installed. One well was installed just north from the approximate location of the laboratory sample from Bristol's 2000 Site Reconnaissance, and another well was installed in the low lying area northeast of the spill where fuel would have drained towards the lagoon. A well was not installed further north of TMW01 due to proximity to the sewage lagoon. The locations of these temporary wells are shown on Figure 2.

5.2 Investigative Derived Waste

Investigative derived waste (IDW) generated during the field activities included soil cuttings, decon water, disposable sampling equipment, and personal protective equipment (PPE). Soils cuttings generated were placed back in the respective holes. Decon water was containerized, labeled and left on site. Both PPE and sampling equipment were generated in small quantities, and were disposed of as municipal solid waste. This included nitrile gloves, sample tubing and Ziploc bags.

6.0 RESULTS

A total of seven analytical soil samples including one duplicate were collected from six borings on the project site. Three water samples, including one duplicate were collected from two temporary wells.

6.1 Site Conditions

Generally, vegetation and peat was present anywhere from the surface to twelve inches bgs. In low lying areas, where surface and groundwater were encountered, peat was present until permafrost was reached at around one foot bgs. In areas with higher topography (i.e., all soil

boring locations), silty sandy soils were underneath or mixed in with the peat starting anywhere from six to twelve inches bgs until permafrost was reached. Permafrost was located approximately ten to eighteen inches bgs in all areas. In low lying areas, only peat was encountered before reaching permafrost so soil samples were not collected in low lying areas.

6.2 Soil Sampling Results

Headspace samples were collected during boring activities. Field headspace readings ranged from 0.6 parts per million by volume (ppmv) to 9.7 ppmv. No odors or staining were noted in any of the soil. The field headspace results from each boring are reflected in Table 1.

Seven soil laboratory samples, which included one from each borehole, and one duplicate, were analyzed. With the exception of the duplicate, each sample had detections for DRO above ADEC Method 2 Cleanup Levels. The duplicate sample had an estimated value (J-flag) at 231 mg/kg. RRO was detected in every sample; only one sample (17841-BH02) had RRO above Cleanup levels.

Due to the high concentration of peat in the soils, DRO and RRO were also analyzed after using a silica gel cleanup to determine if the elevated concentrations were a result of naturally occurring organics. DRO was not detected above the LOD in any sample, but one sample still had a LOD above the Cleanup Level (17841-BH02). Detectable levels of RRO were reported for the silica gel method; all, including Sample 17841-BH02, were less than the ADEC Method 2

Soil samples were also analyzed for BTEX and PAHs. Four samples had detections for toluene, but were well below the ADEC Method 2 Cleanup Levels. The benzene, ethylbenzene, and naphthalene LODs were above the Cleanup Level in one or more samples. See Table 1 for a summary of the soil sample analytical results.

6.3 Water Sampling Results

Three water laboratory samples, which included one from each temporary monitoring well and one duplicate, were analyzed. DRO and RRO were detected in all three samples. DRO was detected, but was below the ADEC Cleanup Level in all three samples. RRO was detected above the ADEC Cleanup Level in one samples and its duplicate (17841-TMW02 and 17841-TMW0A). Toluene was detected in all three samples but also below Cleanup Limits in all three samples. See Table 2 for a summary of the water sample analytical results. One sample (17841-TMW02 and its duplicate 17841-TMW02) had estimated values (J-flag) for GRO and xylene reported by the labs. All values were below Cleanup Levels. A summary of the results can be seen in Table 2.

7.0 QUALITY ASSURANCE

The ADEC Laboratory Data Review Checklist was completed for the analytical results. The completed checklists are included in Appendix C. The following potential issues affecting data usability are noted below:

- The GRO surrogate recovery for Sample 17841-BH01 did not meet QC criteria. The GRO sample result may be biased low.

- The LODs for several parameters (i.e., benzene, ethylebenzene, naphthalene, DRO Silica Gel) were greater than the cleanup levels for one or more samples. These elevated LODs are a result of the high organic content in the samples.

8.0 DISCUSSION

Soil samples collected on the site indicate that soil contamination associated with historic spill is limited in size and concentration. DRO results are also much lower than historic levels taken from the same depths during Bristol's 2000 site reconnaissance. Unlike the 2000 field activities, the there was no visual or olfactory indications of contamination during the 2017 field activities. Results indicate that with the exception of the elevated DRO LOD in the sample collected from BH02, each of the DRO and/or RRO concentrations that exceeded cleanup levels no longer exceeded using the silica gel method. These differences between the silica gel results and non-silica gel results indicate that the elevated concentrations are likely a result of the naturally occurring organics and much of the contamination from the 2000 spill is no longer present.

Groundwater may have been impacted by the spill, although refuse and debris present in the area may indicate other contamination pathways may be present. Concentrations exceeding cleanup levels were only encountered in the well closest to the boardwalk and historic pipeline location; it was in both the sample and its duplicate. Elevated DRO and RRO in the groundwater may be due to the sampling methods used for temporary wells. Although the wells were purged, the wells were only temporary and a high amount of natural organics was still present in the water when it was sampled. This may have affected the groundwater results and lead to elevated DRO and RRO. No sheen was seen in any of the surface water proximal to the temporary wells.

9.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the data collected from our 2017 field activities, concentrations reported to be greater than cleanup levels appear to be mostly attributed to naturally occurring organics and the lack of petroleum odor or sheen indicate that the contamination has largely naturally attenuated. Due to the presence of shallow permafrost, it is unknown whether contamination is present at further depths or if the permafrost is present at that depth is serving as a confining layer. Groundwater may have been impacted, but results may be biased high due to high organic content in the soils and since the well points were temporary and not properly developed. As a result, we recommend the site be closed with no further action required.

If you have any questions or wish to discuss this project further please do not hesitate to contact Shayla Marshall or the undersigned at (907) 272-9336.

Environmental Management, Inc.

FOR:
Aaron Acena
Environmental Scientist

Table 1 - Soil Analytical Results

Soil Boring Samples - Kwigillingok Pipeline Spill

Analyte	ADEC Cleanup Level*	Boreholes							Quality Control
		17841-BH01	17841-BH02	17841-BH03	17841-BH04	17841-BH0A ~	17841-BH05	17841-BH06	Trip Blank
Field Headspace - ppmv	-	0.6	0.7	9.7	1.3	1.3	1.2	1.1	
Depth - feet bgs	-	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0.5-1	
GRO - mg/kg	300	*11.4 U*	*37.4 U*	*29.4 U*	*32.4 U*	***22.1 J***	*30.3 U*	*25.7 U*	1.94 U
DRO - mg/kg	250	**461**	***1020 J***	**393**	**273**	***231 J***	**929**	**552**	-
DRO Silica Gel - mg/kg	250	***26.5 J***	*321 U*	*65.5 U*	***93.8 J***	*117 U*	*99.5 U*	*56.5 U*	-
RRO - mg/kg	11,000	**3840**	**13000**	**4190**	**1480**	**1150**	**7830**	**5630**	-
RRO Silica Gel - mg/kg	11,000	**290**	**1420**	**360**	**292**	***177 J***	**456**	**452**	-
VOC									
Benzene - ug/kg	22	*57.0 U*	*187 U*	*147 U*	*162 U*	*161 U*	*152 U*	*129 U*	9.68 U
Toluene - ug/kg	6,700	**246**	*374 U*	**1560**	*324 U*	*322 U*	**1670**	**1770**	19.4 U
Ethylbenzene - ug/kg	130	*114 U*	*374 U*	*294 U*	*324 U*	*322 U*	*303 U*	*257 U*	19.4 U
Xylenes - ug/kg	1,500	*228 U*	*750 U*	*590 U*	*645 U*	*645 U*	*605 U*	*515 U*	11.6 U
PAH	varies	-	-	-	*ND***	-	-	-	-

Notes:

*	= Table B1 or B2, Migration to Groundwater (MTG) Method Two Soil Cleanup Levels for "Under 40 inch Zone" (18 AAC 75, July 1, 2017)
**	= Napthalene has a LOQ of 61.5 ug/kg but the ADEC Cleanup Level is 38 ug/kg. All other PAH LOQ are below ADEC Cleanup Levels
GRO	= Gasoline Range Organics
DRO	= Diesel Range Organics
RRO	= Residual Range Organics
PAH	= Polyaromatic Hydrocarbons
bgs	= below ground surface
mg/kg	= milligrams per kilogram
ug/kg	= micrograms per kilogram
ND	= not detected
-	= not analyzed
~	= duplicate of preceeding sample
27.0 U	= analyte was not detected at a concentration above the laboratory limit of detection of 27.0 mg/kg
290	= detectable concentration reported in the project sample
13000	= detectable concentration above ADEC Cleanup Level
57.0 U	= analyte was not detected at a concentration above the laboratory limit of detection of 57.0 mg/kg but LOQ is above ADEC Cleanup Level
177 J	= reported estimated value by laboratory (below LOQ)

Table 2 - Groundwater Analytical Results

Groundwater Samples - Kwigillingok Pipeline Spill

Analyte	ADEC Cleanup Level***	Groundwater Samples			Quality Control
		17841-TMW01	17841-TMW02	17841-TMW0A~	Trip Blank
Water Depth - feet bgs	-	0.50	0.50	0.50	
GRO - mg/L	2.2	**0.205**	***0.0463 J***	***0.0468 J***	0.100 U
DRO - mg/L	1.5	**1.2**	**0.991**	**1.16**	-
RRO - mg/L	1.1	**1.00**	**1.71**	**2.46**	-
VOC					
Benzene - ug/L	4.6	0.25 U	0.25 U	0.25 U	0.500 U
Toluene	1,100	**47.5**	**7.47**	**8.4**	1.00 U
Ethylbenzene - ug/L	15	0.5 U	0.5 U	0.5 U	1.00 U
Xylenes - ug/L	190	**1.67**	***0.860 J***	***0.930 J***	2.00 U

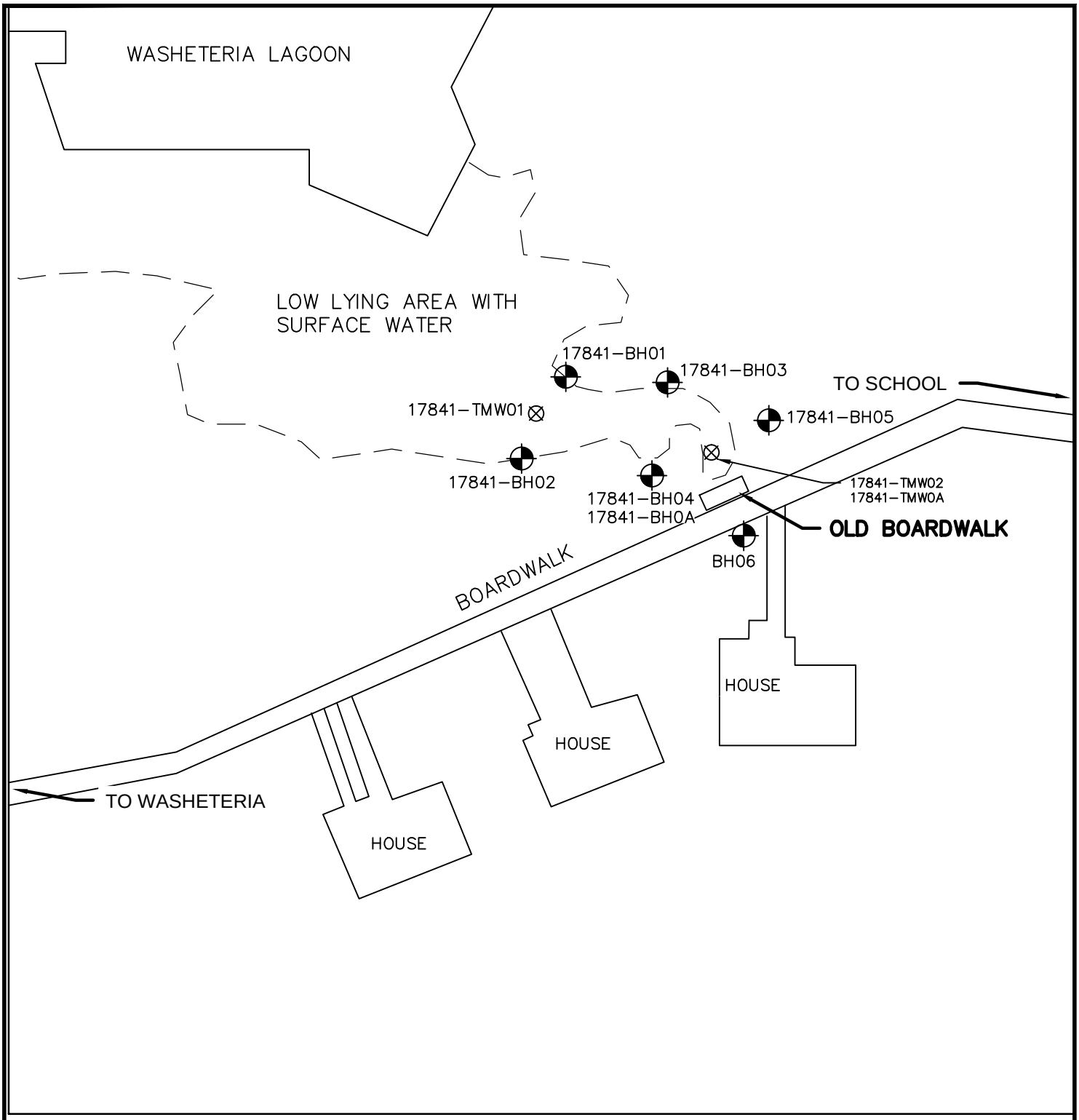
Notes:

***	= Table C, Groundwater Cleanup Levels (18 AAC 75, July 1, 2017)
GRO	= Gasoline Range Organics
DRO	= Diesel Range Organics
RRO	= Residual Range Organics
bgs	= below ground surface
mg/l	= milligrams per liter
ug/L	= micrograms per liter
~	= duplicate of preceeding sample
27.0 U	= analyte was not detected at a concentration above the laboratory limit of detection of 27.0 mg/kg
1.2	= detectable concentration reported in the project sample
2.46	= detectable concentration above ADEC Cleanup Level
0.930 J	= reported estimated value by laboratory (below LOQ)

0 250 500 Feet

North

SITE MAP	KWIGILLINGOK PIPELINE SPILL KWIGILLINGOK, AK	EMI Consulting, Engineering & Training	PREPARED: ADA DRAWN: ADA REVIEWED: SIM DATE: 7/12/17	FIGURE 1



0 60 120 Feet

North

LEGEND

⊕ – APPROXIMATE LOCATION OF SOIL HAND BORING.

⊗ – APPROXIMATE LOCATION OF TEMPORARY MONITORING WELL.

SOIL BORINGS AND WELL LOCATION MAP	KWIGILLINGOK PIPELINE SPILL KWIGILLINGOK, AK	EMI Consulting, Engineering & Training	PREPARED: ADA DRAWN: ADA REVIEWED: SIM DATE: 7/12/17	FIGURE 2

Appendix A

Field Notes

EMI 17841

5/31/17 ADA

KWIG SITE INVESTIGATION

+ DEPART ANC for BETHEL → KWIG @ 945. Will ADVANCE ~6 BH + up to 3 TEMP wells. A. ALVANA of EMI only. PID cal in AM @ 100 ppm.

- Sunny ~70°F in Kwig, Wind <5 mph.
1320 - LAND in KWIG. MEET GARW + MOB OVER TO PIPELINE SPILL SITE. SITE HAS LITTER (BURN BARRELS), SNOW MACHINES + NO VISIBLE STAINING ON THE SURFACE. OLD BOARDWALK IS GONE, NO SPILL DRUMS + OLD PIPELINE IS GONE. FOUND ONLY OLD TOPOGRAPHIC MOUNDS. WILL DELINEATE BASED ON OLD SITE OF SPILL + LANDMARKS.

+ BH01 - @ END of TOPO POINT WHERE BOOM WAS MOST likely LOCATED. TRIED TO GET IN MARSHY AREA BUT GW @ 1" + GROUND IS PEAT for at LEAST 2" BGS. Soil @ BH1 is silt/sand, BROWN, NO ODOR. No AMBIENT H.S.
17841-BH1 → SAMPLED @ 1410 0-6"
HS = 0.6 ppmV
Very HEAVY w/ ORGANICS/PEAT.

5/31/17 ADA

BH02 - OTHER SIDE of MARSH, AREA WHERE BOOM WAS. GW @ 0-2" IN MARSH B/T BH1 + BH2. V. HEAVY ORGANICS + PEAT, H2O @ 6".
17841-BH02 @ 1425 HS 0.7 ppmV
0-6"

* Permafrost found @ 1' IN AREAS of HIGH TOPOGRAPHY. Is DEEPER IN MIDDLE of MARSH.

+ BH03 - SOUTH SIDE of N. TOPO FEATURE. NO ODOR. PF @ 1', sample @ 6-12". 0-6" is all moss/PEAT. Soil is RICH in ORGANICS. No POL ODOR.
17841-BH03 0-6" HS - 9.7 1438

+ BH04 - CENTER of HISTORIC STAIN? I THINK. No visible STAINING, NO SHEEN. 3 old BURN BARRELS IN AREA + 1 USED MOTOR oil 5 Gal. BUCKET. STEPPING SOUTH FROM BARRELS. (DUP)
0-6" HS - 1.3 ppmV
17841-BH04 1508
17841-BH0A 1510

5/31/17

ADD

BH05

No staining/odor, Peat from 0-2" or 0-4" mix w/ sandy soil. PF @ ~1' BGS. Samples @ 1521. * Subsurface conditions appear uniform in all BH's.

- 1521 0-6" HS - 1.2
  6

BH06 - South side of NEW boardwalk, No staining, in low are due south of BH01. Peat 0-6", no soil. Dirt/peat 6-12" then PF. soil is very wet. No odor or staining.

A - 0-6" HS = 0.9
* B - 6-12" HS = 1.1

17641 - BH06 1645

MW01

+ BT BH01 + BH02 in marsh. GW @ 1" BGS. (10-12") will have to install well @ ~45° angle into ground.
+ Used Drive point, Peri pump, YSI 556, + Piezometer tube for all wells. Disposable tubing.

5/31/17

ADD

TMW01 BT BH01 + BH02

DEPTH w 1' BGS WL @ ~0.1' BGS

	°C	PH	ORP	VS/cm
0	12.64	2.41	215.0	269
3'	12.62	2.42	214.5	268
6'	12.76	2.48	210.3	265
9'	12.80	2.49	209.0	265
12	12.95 ✓	2.60 ✓	202.0 ✓	268 ✓

+ No odor, moderate solids (organics). No sheen.
17641 - TMW01 16:00
* PF w @ ~45° angle. Screen too low w/ PF @ 10-12"

TMW02 East side of site w low marshy zone. PF @ 10". ___"
West of ~~MW~~ BH05.

	°C	PH	ORP	VS/cm
0	16.88	5.29	129	138
5'	16.34	5.27	123.5	137
8'	16.40	5.31	120.7	135
10	16.44	5.35	116.0	132
13'	16.45	5.43	112.0	130
15'	16.41	5.50	107	127
18	16.42 ✓	5.51 ✓	105.9 ✓	126 ✓

1632 - TMW2
1639 - TMW1

+ No odor, moderate organics. No sheen.

5/31/17 ADA

Elbow to

BH5	15'
MW2	8'
BH3	37'
BH1	69'
MW1	80'
BH2	77'
BH4	31'
BH6	45'

Stop Sign to

BH6	13'
BH4	45
BH2	79
MW1	94
BH1	89
BH3	70
MW2	43
BH5	52'

9' 35 72' 88' BH2-BH5

25' Boardwalk T to Pipe Elbow
21' to Stop Sign

BH1 - BH2 - 35'
BH1 - TMW01 - 15'
TMW01 - BH2 - 21'

5/31/17 N4 ADA

+ Done @ 1800, measured BH/MW & backed up. Gavin w/ Kwig will help mob back to Bunkhouse. Purge water left w bucket w/ Gavin of Village of Kwig. Taking the 1st flight out the next day (9 AM)

Appendix B

Site Photographs

KWIGILLINGOK PILELINE SPILL
Site Characterization Photo Log
Kwigillingok, Alaska 99622
ADEC File No. 2425.38.003

Photo 1: View of the pipeline spill area. Historic boardwalk is visible with equipment placed on top.

Photo 2: Looking North - View of historic boardwalk and pipeline spill area. BH06 (red arrow) was to the left of photo on the other side of the small boardwalk. The green arrow points to BH05.

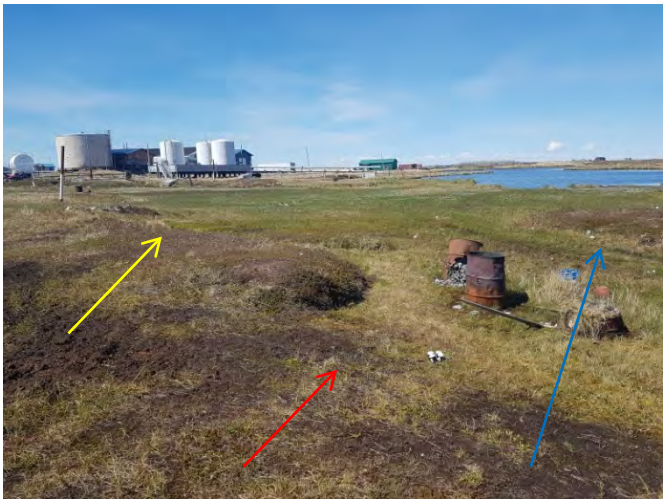


Photo 3: View of spill area looking northwest. Locations of BH01 (blue), BH02 (yellow) and BH04 (red).

Photo 4: Looking north, just north of the center of the historic spill location. Location of BH01 (blue) and BH03 (purple).

KWIGILLINGOK PILELINE SPILL
Site Characterization Photo Log
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Photo 5: Looking north, TMW01 location.

Photo 6: Looking east toward the school. Location of sample TMW02 (red) and BH05 (green).

Photo 6: Burn barrels and debris in the low lying area near the center of the historic spill. Barrels had rusted to the point lower halves were eroded away. Blue bucket proximal to the barrels was a used 5 gallon oil bucket with trash inside.

Appendix C

SGS *Laboratory Report of Analysis* and ADEC *Laboratory Data Review Checklist*

Laboratory Report of Analysis

To: Environmental Mgmt Inc (EMI)
206 E Fireweed Lane, Suite 201
Anchorage, AK 99503
(907)272-9336

Report Number: **1172880**

Amended to report "J" flags

Client Project: **17841 Kwig Pipeline Spill**

Dear Aaron Acena,

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 Victoria 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.

Victoria Pennick
2017.07.13
10:35:29 -08'00'

SGS North America Inc.
Environmental Services – Alaska Division
Project Manager

Victoria Pennick Date
Project Manager
Victoria.Pennick@sgs.com

Print Date: 07/13/2017 10:28:24AM

Case Narrative

SGS Client: **Environmental Mgmt Inc (EMI)**
SGS Project: **1172880**
Project Name/Site: **17841 Kwig Pipeline Spill**
Project Contact: **Aaron Acena**

Refer to sample receipt form for information on sample condition.

17841-BH01 (1172880001) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene (38.3%) does not meet QC criteria. Sample was analyzed twice for confirmation.

LCSD for HBN 1760377 [XXX/3748 (1388445) LCSD

AK102SG - DRO SG LCSD recovery (65%) does not meet QC criteria.
AK102SG - DRO SG LCSD surrogate recovery for 5a-androstane (62%) does not meet QC criteria.
AK103SG - RRO SG LCSD recovery (62%) does not meet QC criteria.
AK103SG - RRO SG LCSD surrogate recovery for n-triacontane (62%) does not meet QC criteria.
AK102/103SG - LCS/LCSD RPDs for DRO-SG and RRO-SG (40.6, 42.1, respectively) do not meet QC criteria. Insufficient volume to re-extract. No further action was taken.

1172925009MS (1388496) MS

8270D SIM - PAH MS recovery for acenaphthene (114%) does not meet QC criteria. Refer to the LCS for accuracy requirements.

1172925009MSD (1388497) MSD

8270D SIM - PAH MSD recovery for acenaphthene (116%) does not meet QC criteria. Refer to the LCS for accuracy requirements.

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

Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
8270D SIM (PAH)				
1388496	1172925009MS	XMS10087	Benzo[b]Fluoranthene	RP
1388497	1172925009MSD	XMS10087	Benzo[b]Fluoranthene	RP

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.

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Laboratory Qualifiers

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

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

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

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

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

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

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
17841-BH01	1172880001	05/31/2017	06/02/2017	Soil/Solid (dry weight)
17841-BH02	1172880002	05/31/2017	06/02/2017	Soil/Solid (dry weight)
17841-BH03	1172880003	05/31/2017	06/02/2017	Soil/Solid (dry weight)
17841-BH04	1172880004	05/31/2017	06/02/2017	Soil/Solid (dry weight)
17841-BH05	1172880005	05/31/2017	06/02/2017	Soil/Solid (dry weight)
17841-BH06	1172880006	05/31/2017	06/02/2017	Soil/Solid (dry weight)
17841-BH0A	1172880007	05/31/2017	06/02/2017	Soil/Solid (dry weight)
Trip Blank (S)	1172880008	05/31/2017	06/02/2017	Soil/Solid (dry weight)
17841-TMW01	1172880009	05/31/2017	06/02/2017	Water (Surface, Eff., Ground)
17841-TMW02	1172880010	05/31/2017	06/02/2017	Water (Surface, Eff., Ground)
17841-TMW0A	1172880011	05/31/2017	06/02/2017	Water (Surface, Eff., Ground)
Trip Blank (W)	1172880012	05/31/2017	06/02/2017	Water (Surface, Eff., Ground)

Method	Method Description
8270D SIM (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.
AK101	AK101/8021 Combo. (S)
SW8021B	AK101/8021 Combo. (S)
AK102	Diesel/Residual Range Organics
AK103	Diesel/Residual Range Organics
AK102	Diesel/Residual Range Organics w/ Silica
AK103	Diesel/Residual Range Organics w/ Silica
AK102	DRO/RRO Low Volume Water
AK103	DRO/RRO Low Volume Water
SM21 2540G	Percent Solids SM2540G

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Detectable Results Summary

Client Sample ID: **17841-BH01**
Lab Sample ID: 1172880001

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	461	mg/Kg
	Residual Range Organics	3840	mg/Kg
Semivolatile Organic Fuels Department, Silica	DRO Silica Gel	26.5J	mg/Kg
	RRO Silica Gel	290	mg/Kg
Volatile Fuels	Toluene	246	ug/Kg

Client Sample ID: **17841-BH02**
Lab Sample ID: 1172880002

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	1020J	mg/Kg
	Residual Range Organics	13000	mg/Kg
Semivolatile Organic Fuels Department, Silica	RRO Silica Gel	1420	mg/Kg

Client Sample ID: **17841-BH03**
Lab Sample ID: 1172880003

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	393	mg/Kg
	Residual Range Organics	4190	mg/Kg
Semivolatile Organic Fuels Department, Silica	RRO Silica Gel	360	mg/Kg
Volatile Fuels	Toluene	1560	ug/Kg

Client Sample ID: **17841-BH04**
Lab Sample ID: 1172880004

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	273	mg/Kg
	Residual Range Organics	1480	mg/Kg
Semivolatile Organic Fuels Department, Silica	DRO Silica Gel	93.8J	mg/Kg
	RRO Silica Gel	292	mg/Kg

Client Sample ID: **17841-BH05**
Lab Sample ID: 1172880005

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	929	mg/Kg
	Residual Range Organics	7830	mg/Kg
Semivolatile Organic Fuels Department, Silica	RRO Silica Gel	456	mg/Kg
Volatile Fuels	Toluene	1670	ug/Kg

Client Sample ID: **17841-BH06**
Lab Sample ID: 1172880006

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	552	mg/Kg
	Residual Range Organics	5630	mg/Kg
Semivolatile Organic Fuels Department, Silica	RRO Silica Gel	452	mg/Kg
Volatile Fuels	Toluene	1770	ug/Kg

Client Sample ID: **17841-BH0A**
Lab Sample ID: 1172880007

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	231J	mg/Kg
	Residual Range Organics	1150	mg/Kg
Semivolatile Organic Fuels Department, Silica	RRO Silica Gel	177J	mg/Kg
Volatile Fuels	Gasoline Range Organics	22.1J	mg/Kg

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Detectable Results Summary

Client Sample ID: **17841-TMW01**
Lab Sample ID: 1172880009

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	1.20	mg/L
	Residual Range Organics	1.00	mg/L
Volatile Fuels	Gasoline Range Organics	0.205	mg/L
	o-Xylene	1.67	ug/L
	P & M -Xylene	0.620J	ug/L
	Toluene	47.5	ug/L

Client Sample ID: **17841-TMW02**
Lab Sample ID: 1172880010

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.991	mg/L
	Residual Range Organics	1.71	mg/L
Volatile Fuels	Gasoline Range Organics	0.0463J	mg/L
	o-Xylene	0.860J	ug/L
	P & M -Xylene	0.720J	ug/L
	Toluene	7.47	ug/L

Client Sample ID: **17841-TMW0A**
Lab Sample ID: 1172880011

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	1.16	mg/L
	Residual Range Organics	2.46	mg/L
Volatile Fuels	Gasoline Range Organics	0.0468J	mg/L
	o-Xylene	0.930J	ug/L
	P & M -Xylene	0.720J	ug/L
	Toluene	8.40	ug/L

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Results of **17841-BH01**

Client Sample ID: **17841-BH01**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880001
Lab Project ID: 1172880

Collection Date: 05/31/17 14:10
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):28.1
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	461		141	43.9	mg/Kg	1		06/16/17 18:35
Surrogates								
5a Androstane (surr)	99.6		50-150		%	1		06/16/17 18:35

Batch Information

Analytical Batch: XFC13436
Analytical Method: AK102
Analyst: KMD
Analytical Date/Time: 06/16/17 18:35
Container ID: 1172880001-A

Prep Batch: XXX37562
Prep Method: SW3550C
Prep Date/Time: 06/13/17 10:23
Prep Initial Wt./Vol.: 30.164 g
Prep Extract Vol: 2 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	3840		141	43.9	mg/Kg	1		06/16/17 18:35
Surrogates								
n-Triacontane-d62 (surr)	74.1		50-150		%	1		06/16/17 18:35

Batch Information

Analytical Batch: XFC13436
Analytical Method: AK103
Analyst: KMD
Analytical Date/Time: 06/16/17 18:35
Container ID: 1172880001-A

Prep Batch: XXX37562
Prep Method: SW3550C
Prep Date/Time: 06/13/17 10:23
Prep Initial Wt./Vol.: 30.164 g
Prep Extract Vol: 2 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH01**

Client Sample ID: **17841-BH01**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880001
Lab Project ID: 1172880

Collection Date: 05/31/17 14:10
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):28.1
Location:

Results by **Semivolatile Organic Fuels Department, Silica G**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
DRO Silica Gel	26.5	J	70.7	21.9	mg/Kg	1		06/16/17 18:55
Surrogates								
5a Androstane (surr)	72.1		50-150		%	1		06/16/17 18:55

Batch Information

Analytical Batch: XFC13434
Analytical Method: AK102-
Analyst: FDR
Analytical Date/Time: 06/16/17 18:55
Container ID: 1172880001-A

Prep Batch: XXX37561
Prep Method: SW3550C w/SG Cleanup-SG
Prep Date/Time: 06/13/17 10:20
Prep Initial Wt./Vol.: 30.164 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
RRO Silica Gel	290		70.7	21.9	mg/Kg	1		06/16/17 18:55
Surrogates								
n-Triacontane-d62 (surr)	93.2		50-150		%	1		06/16/17 18:55

Batch Information

Analytical Batch: XFC13434
Analytical Method: AK103-
Analyst: FDR
Analytical Date/Time: 06/16/17 18:55
Container ID: 1172880001-A

Prep Batch: XXX37561
Prep Method: SW3550C w/SG Cleanup-SG
Prep Date/Time: 06/13/17 10:20
Prep Initial Wt./Vol.: 30.164 g
Prep Extract Vol: 1 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH01**

Client Sample ID: **17841-BH01**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880001
Lab Project ID: 1172880

Collection Date: 05/31/17 14:10
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):28.1
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	11.4	U	22.8	6.83	mg/Kg	1		06/12/17 23:32
Surrogates								
4-Bromofluorobenzene (surr)	38.3	*	50-150		%	1		06/12/17 23:32

Batch Information

Analytical Batch: VFC13673
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/12/17 23:32
Container ID: 1172880001-B

Prep Batch: VXX30647
Prep Method: SW5035A
Prep Date/Time: 05/31/17 14:10
Prep Initial Wt./Vol.: 44.496 g
Prep Extract Vol: 56.9824 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	57.0	U	114	36.4	ug/Kg	1		06/12/17 23:32
Ethylbenzene	114	U	228	71.0	ug/Kg	1		06/12/17 23:32
o-Xylene	114	U	228	71.0	ug/Kg	1		06/12/17 23:32
P & M -Xylene	228	U	455	137	ug/Kg	1		06/12/17 23:32
Toluene	246		228	71.0	ug/Kg	1		06/12/17 23:32
Surrogates								
1,4-Difluorobenzene (surr)	89.9		72-119		%	1		06/12/17 23:32

Batch Information

Analytical Batch: VFC13673
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/12/17 23:32
Container ID: 1172880001-B

Prep Batch: VXX30647
Prep Method: SW5035A
Prep Date/Time: 05/31/17 14:10
Prep Initial Wt./Vol.: 44.496 g
Prep Extract Vol: 56.9824 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH02**

Client Sample ID: **17841-BH02**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880002
Lab Project ID: 1172880

Collection Date: 05/31/17 14:25
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):13.0
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1020	J	1280	397	mg/Kg	1		06/16/17 18:45
Surrogates								
5a Androstane (surr)	106		50-150		%	1		06/16/17 18:45

Batch Information

Analytical Batch: XFC13436
Analytical Method: AK102
Analyst: KMD
Analytical Date/Time: 06/16/17 18:45
Container ID: 1172880002-A

Prep Batch: XXX37562
Prep Method: SW3550C
Prep Date/Time: 06/13/17 10:23
Prep Initial Wt./Vol.: 7.177 g
Prep Extract Vol: 2 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	13000		1280	397	mg/Kg	1		06/16/17 18:45
Surrogates								
n-Triacontane-d62 (surr)	102		50-150		%	1		06/16/17 18:45

Batch Information

Analytical Batch: XFC13436
Analytical Method: AK103
Analyst: KMD
Analytical Date/Time: 06/16/17 18:45
Container ID: 1172880002-A

Prep Batch: XXX37562
Prep Method: SW3550C
Prep Date/Time: 06/13/17 10:23
Prep Initial Wt./Vol.: 7.177 g
Prep Extract Vol: 2 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH02**

Client Sample ID: **17841-BH02**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880002
Lab Project ID: 1172880

Collection Date: 05/31/17 14:25
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):13.0
Location:

Results by **Semivolatile Organic Fuels Department, Silica G**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
DRO Silica Gel	321	U	641	199	mg/Kg	1		06/16/17 19:05
Surrogates								
5a Androstane (surr)	84.3		50-150		%	1		06/16/17 19:05

Batch Information

Analytical Batch: XFC13434
Analytical Method: AK102-
Analyst: FDR
Analytical Date/Time: 06/16/17 19:05
Container ID: 1172880002-A

Prep Batch: XXX37561
Prep Method: SW3550C w/SG Cleanup-SG
Prep Date/Time: 06/13/17 10:20
Prep Initial Wt./Vol.: 7.177 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
RRO Silica Gel	1420		641	199	mg/Kg	1		06/16/17 19:05
Surrogates								
n-Triacontane-d62 (surr)	93.8		50-150		%	1		06/16/17 19:05

Batch Information

Analytical Batch: XFC13434
Analytical Method: AK103-
Analyst: FDR
Analytical Date/Time: 06/16/17 19:05
Container ID: 1172880002-A

Prep Batch: XXX37561
Prep Method: SW3550C w/SG Cleanup-SG
Prep Date/Time: 06/13/17 10:20
Prep Initial Wt./Vol.: 7.177 g
Prep Extract Vol: 1 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH02**

Client Sample ID: **17841-BH02**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880002
Lab Project ID: 1172880

Collection Date: 05/31/17 14:25
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):13.0
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	37.4	U	74.8	22.5	mg/Kg	1		06/13/17 00:28
Surrogates								
4-Bromofluorobenzene (surr)	84.7		50-150		%	1		06/13/17 00:28

Batch Information

Analytical Batch: VFC13673
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/13/17 00:28
Container ID: 1172880002-B

Prep Batch: VXX30647
Prep Method: SW5035A 2X MeOH
Prep Date/Time: 05/31/17 14:25
Prep Initial Wt./Vol.: 46.198 g
Prep Extract Vol: 90.1734 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	187	U	374	120	ug/Kg	1		06/13/17 00:28
Ethylbenzene	374	U	748	233	ug/Kg	1		06/13/17 00:28
o-Xylene	374	U	748	233	ug/Kg	1		06/13/17 00:28
P & M -Xylene	750	U	1500	449	ug/Kg	1		06/13/17 00:28
Toluene	374	U	748	233	ug/Kg	1		06/13/17 00:28
Surrogates								
1,4-Difluorobenzene (surr)	92.4		72-119		%	1		06/13/17 00:28

Batch Information

Analytical Batch: VFC13673
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/13/17 00:28
Container ID: 1172880002-B

Prep Batch: VXX30647
Prep Method: SW5035A 2X MeOH
Prep Date/Time: 05/31/17 14:25
Prep Initial Wt./Vol.: 46.198 g
Prep Extract Vol: 90.1734 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH03**

Client Sample ID: **17841-BH03**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880003
Lab Project ID: 1172880

Collection Date: 05/31/17 14:35
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):17.4
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	393		261	80.9	mg/Kg	1		06/16/17 18:55
Surrogates								
5a Androstane (surr)	106		50-150		%	1		06/16/17 18:55

Batch Information

Analytical Batch: XFC13436
Analytical Method: AK102
Analyst: KMD
Analytical Date/Time: 06/16/17 18:55
Container ID: 1172880003-A

Prep Batch: XXX37562
Prep Method: SW3550C
Prep Date/Time: 06/13/17 10:23
Prep Initial Wt./Vol.: 26.401 g
Prep Extract Vol: 2 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	4190		261	80.9	mg/Kg	1		06/16/17 18:55
Surrogates								
n-Triacontane-d62 (surr)	93.6		50-150		%	1		06/16/17 18:55

Batch Information

Analytical Batch: XFC13436
Analytical Method: AK103
Analyst: KMD
Analytical Date/Time: 06/16/17 18:55
Container ID: 1172880003-A

Prep Batch: XXX37562
Prep Method: SW3550C
Prep Date/Time: 06/13/17 10:23
Prep Initial Wt./Vol.: 26.401 g
Prep Extract Vol: 2 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH03**

Client Sample ID: **17841-BH03**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880003
Lab Project ID: 1172880

Collection Date: 05/31/17 14:35
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):17.4
Location:

Results by **Semivolatile Organic Fuels Department, Silica G**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
DRO Silica Gel	65.5	U	131	40.5	mg/Kg	1		06/16/17 19:15
Surrogates								
5a Androstane (surr)	86.3		50-150		%	1		06/16/17 19:15

Batch Information

Analytical Batch: XFC13434
Analytical Method: AK102-
Analyst: FDR
Analytical Date/Time: 06/16/17 19:15
Container ID: 1172880003-A

Prep Batch: XXX37561
Prep Method: SW3550C w/SG Cleanup-SG
Prep Date/Time: 06/13/17 10:20
Prep Initial Wt./Vol.: 26.401 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
RRO Silica Gel	360		131	40.5	mg/Kg	1		06/16/17 19:15
Surrogates								
n-Triacontane-d62 (surr)	102		50-150		%	1		06/16/17 19:15

Batch Information

Analytical Batch: XFC13434
Analytical Method: AK103-
Analyst: FDR
Analytical Date/Time: 06/16/17 19:15
Container ID: 1172880003-A

Prep Batch: XXX37561
Prep Method: SW3550C w/SG Cleanup-SG
Prep Date/Time: 06/13/17 10:20
Prep Initial Wt./Vol.: 26.401 g
Prep Extract Vol: 1 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH03**

Client Sample ID: **17841-BH03**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880003
Lab Project ID: 1172880

Collection Date: 05/31/17 14:35
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):17.4
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	29.4	U	58.8	17.7	mg/Kg	1		06/13/17 00:46
Surrogates								
4-Bromofluorobenzene (surr)	94.7		50-150		%	1		06/13/17 00:46

Batch Information

Analytical Batch: VFC13673
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/13/17 00:46
Container ID: 1172880003-B

Prep Batch: VXX30647
Prep Method: SW5035A 2X MeOH
Prep Date/Time: 05/31/17 14:35
Prep Initial Wt./Vol.: 40.9 g
Prep Extract Vol: 83.7799 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	147	U	294	94.1	ug/Kg	1		06/13/17 00:46
Ethylbenzene	294	U	588	184	ug/Kg	1		06/13/17 00:46
o-Xylene	294	U	588	184	ug/Kg	1		06/13/17 00:46
P & M -Xylene	590	U	1180	353	ug/Kg	1		06/13/17 00:46
Toluene	1560		588	184	ug/Kg	1		06/13/17 00:46
Surrogates								
1,4-Difluorobenzene (surr)	93.2		72-119		%	1		06/13/17 00:46

Batch Information

Analytical Batch: VFC13673
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/13/17 00:46
Container ID: 1172880003-B

Prep Batch: VXX30647
Prep Method: SW5035A 2X MeOH
Prep Date/Time: 05/31/17 14:35
Prep Initial Wt./Vol.: 40.9 g
Prep Extract Vol: 83.7799 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH04**

Client Sample ID: **17841-BH04**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880004
Lab Project ID: 1172880

Collection Date: 05/31/17 15:05
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):16.1
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	76.5	U	153	46.0	ug/Kg	1		06/12/17 16:13
2-Methylnaphthalene	76.5	U	153	46.0	ug/Kg	1		06/12/17 16:13
Acenaphthene	76.5	U	153	46.0	ug/Kg	1		06/12/17 16:13
Acenaphthylene	76.5	U	153	46.0	ug/Kg	1		06/12/17 16:13
Anthracene	76.5	U	153	46.0	ug/Kg	1		06/12/17 16:13
Benzo(a)Anthracene	76.5	U	153	46.0	ug/Kg	1		06/12/17 16:13
Benzo[a]pyrene	76.5	U	153	46.0	ug/Kg	1		06/12/17 16:13
Benzo[b]Fluoranthene	76.5	U	153	46.0	ug/Kg	1		06/12/17 16:13
Benzo[g,h,i]perylene	76.5	U	153	46.0	ug/Kg	1		06/12/17 16:13
Benzo[k]fluoranthene	76.5	U	153	46.0	ug/Kg	1		06/12/17 16:13
Chrysene	76.5	U	153	46.0	ug/Kg	1		06/12/17 16:13
Dibenzo[a,h]anthracene	76.5	U	153	46.0	ug/Kg	1		06/12/17 16:13
Fluoranthene	76.5	U	153	46.0	ug/Kg	1		06/12/17 16:13
Fluorene	76.5	U	153	46.0	ug/Kg	1		06/12/17 16:13
Indeno[1,2,3-c,d] pyrene	76.5	U	153	46.0	ug/Kg	1		06/12/17 16:13
Naphthalene	61.5	U	123	36.8	ug/Kg	1		06/12/17 16:13
Phenanthrene	76.5	U	153	46.0	ug/Kg	1		06/12/17 16:13
Pyrene	76.5	U	153	46.0	ug/Kg	1		06/12/17 16:13
Surrogates								
2-Fluorobiphenyl (surr)	92.5		46-115		%	1		06/12/17 16:13
Terphenyl-d14 (surr)	95.2		58-133		%	1		06/12/17 16:13

Batch Information

Analytical Batch: XMS10113
Analytical Method: 8270D SIM (PAH)
Analyst: S.G
Analytical Date/Time: 06/12/17 16:13
Container ID: 1172880004-A

Prep Batch: XXX37487
Prep Method: SW3550C
Prep Date/Time: 06/05/17 13:25
Prep Initial Wt./Vol.: 22.784 g
Prep Extract Vol: 5 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH04**

Client Sample ID: **17841-BH04**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880004
Lab Project ID: 1172880

Collection Date: 05/31/17 15:05
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):16.1
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	273		246	76.4	mg/Kg	1		06/05/17 21:44
Surrogates								
5a Androstane (surr)	109		50-150		%	1		06/05/17 21:44

Batch Information

Analytical Batch: XFC13392
Analytical Method: AK102
Analyst: FDR
Analytical Date/Time: 06/05/17 21:44
Container ID: 1172880004-A

Prep Batch: XXX37483
Prep Method: SW3550C
Prep Date/Time: 06/05/17 11:33
Prep Initial Wt./Vol.: 30.271 g
Prep Extract Vol: 2 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	1480		246	76.4	mg/Kg	1		06/05/17 21:44
Surrogates								
n-Triacontane-d62 (surr)	106		50-150		%	1		06/05/17 21:44

Batch Information

Analytical Batch: XFC13392
Analytical Method: AK103
Analyst: FDR
Analytical Date/Time: 06/05/17 21:44
Container ID: 1172880004-A

Prep Batch: XXX37483
Prep Method: SW3550C
Prep Date/Time: 06/05/17 11:33
Prep Initial Wt./Vol.: 30.271 g
Prep Extract Vol: 2 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH04**

Client Sample ID: **17841-BH04**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880004
Lab Project ID: 1172880

Collection Date: 05/31/17 15:05
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):16.1
Location:

Results by **Semivolatile Organic Fuels Department, Silica G**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
DRO Silica Gel	93.8	J	246	76.4	mg/Kg	1		06/05/17 23:51
Surrogates								
5a Androstane (surr)	92.1		50-150		%	1		06/05/17 23:51

Batch Information

Analytical Batch: XFC13392
Analytical Method: AK102-
Analyst: FDR
Analytical Date/Time: 06/05/17 23:51
Container ID: 1172880004-A

Prep Batch: XXX37482
Prep Method: SW3550C w/SG Cleanup-SG
Prep Date/Time: 06/05/17 11:33
Prep Initial Wt./Vol.: 30.271 g
Prep Extract Vol: 2 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
RRO Silica Gel	292		246	76.4	mg/Kg	1		06/05/17 23:51
Surrogates								
n-Triacontane-d62 (surr)	90.3		50-150		%	1		06/05/17 23:51

Batch Information

Analytical Batch: XFC13392
Analytical Method: AK103-
Analyst: FDR
Analytical Date/Time: 06/05/17 23:51
Container ID: 1172880004-A

Prep Batch: XXX37482
Prep Method: SW3550C w/SG Cleanup-SG
Prep Date/Time: 06/05/17 11:33
Prep Initial Wt./Vol.: 30.271 g
Prep Extract Vol: 2 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH04**

Client Sample ID: **17841-BH04**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880004
Lab Project ID: 1172880

Collection Date: 05/31/17 15:05
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):16.1
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	32.4	U	64.7	19.4	mg/Kg	1		06/13/17 01:05
Surrogates								
4-Bromofluorobenzene (surr)	101		50-150		%	1		06/13/17 01:05

Batch Information

Analytical Batch: VFC13673
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/13/17 01:05
Container ID: 1172880004-B

Prep Batch: VXX30647
Prep Method: SW5035A 2X MeOH
Prep Date/Time: 05/31/17 15:05
Prep Initial Wt./Vol.: 40.287 g
Prep Extract Vol: 83.8073 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	162	U	323	103	ug/Kg	1		06/13/17 01:05
Ethylbenzene	324	U	647	202	ug/Kg	1		06/13/17 01:05
o-Xylene	324	U	647	202	ug/Kg	1		06/13/17 01:05
P & M -Xylene	645	U	1290	388	ug/Kg	1		06/13/17 01:05
Toluene	324	U	647	202	ug/Kg	1		06/13/17 01:05
Surrogates								
1,4-Difluorobenzene (surr)	91.7		72-119		%	1		06/13/17 01:05

Batch Information

Analytical Batch: VFC13673
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/13/17 01:05
Container ID: 1172880004-B

Prep Batch: VXX30647
Prep Method: SW5035A 2X MeOH
Prep Date/Time: 05/31/17 15:05
Prep Initial Wt./Vol.: 40.287 g
Prep Extract Vol: 83.8073 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH05**

Client Sample ID: **17841-BH05**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880005
Lab Project ID: 1172880

Collection Date: 05/31/17 15:21
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):19.1
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	929		398	123	mg/Kg	1		06/16/17 19:05
Surrogates								
5a Androstane (surr)	109		50-150		%	1		06/16/17 19:05

Batch Information

Analytical Batch: XFC13436
Analytical Method: AK102
Analyst: KMD
Analytical Date/Time: 06/16/17 19:05
Container ID: 1172880005-A

Prep Batch: XXX37562
Prep Method: SW3550C
Prep Date/Time: 06/13/17 10:23
Prep Initial Wt./Vol.: 15.804 g
Prep Extract Vol: 2 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	7830		398	123	mg/Kg	1		06/16/17 19:05
Surrogates								
n-Triacontane-d62 (surr)	95.1		50-150		%	1		06/16/17 19:05

Batch Information

Analytical Batch: XFC13436
Analytical Method: AK103
Analyst: KMD
Analytical Date/Time: 06/16/17 19:05
Container ID: 1172880005-A

Prep Batch: XXX37562
Prep Method: SW3550C
Prep Date/Time: 06/13/17 10:23
Prep Initial Wt./Vol.: 15.804 g
Prep Extract Vol: 2 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH05**

Client Sample ID: **17841-BH05**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880005
Lab Project ID: 1172880

Collection Date: 05/31/17 15:21
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):19.1
Location:

Results by **Semivolatile Organic Fuels Department, Silica G**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
DRO Silica Gel	99.5	U	199	61.6	mg/Kg	1		06/16/17 19:24
Surrogates								
5a Androstane (surr)	81.6		50-150		%	1		06/16/17 19:24

Batch Information

Analytical Batch: XFC13434
Analytical Method: AK102-
Analyst: FDR
Analytical Date/Time: 06/16/17 19:24
Container ID: 1172880005-A

Prep Batch: XXX37561
Prep Method: SW3550C w/SG Cleanup-SG
Prep Date/Time: 06/13/17 10:20
Prep Initial Wt./Vol.: 15.804 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
RRO Silica Gel	456		199	61.6	mg/Kg	1		06/16/17 19:24
Surrogates								
n-Triacontane-d62 (surr)	92.6		50-150		%	1		06/16/17 19:24

Batch Information

Analytical Batch: XFC13434
Analytical Method: AK103-
Analyst: FDR
Analytical Date/Time: 06/16/17 19:24
Container ID: 1172880005-A

Prep Batch: XXX37561
Prep Method: SW3550C w/SG Cleanup-SG
Prep Date/Time: 06/13/17 10:20
Prep Initial Wt./Vol.: 15.804 g
Prep Extract Vol: 1 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH05**

Client Sample ID: **17841-BH05**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880005
Lab Project ID: 1172880

Collection Date: 05/31/17 15:21
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):19.1
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	30.3	U	60.6	18.2	mg/Kg	1		06/13/17 01:23
Surrogates								
4-Bromofluorobenzene (surr)	87.2		50-150		%	1		06/13/17 01:23

Batch Information

Analytical Batch: VFC13673
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/13/17 01:23
Container ID: 1172880005-B

Prep Batch: VXX30647
Prep Method: SW5035A 2X MeOH
Prep Date/Time: 05/31/17 15:21
Prep Initial Wt./Vol.: 33.183 g
Prep Extract Vol: 76.8451 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	152	U	303	97.0	ug/Kg	1		06/13/17 01:23
Ethylbenzene	303	U	606	189	ug/Kg	1		06/13/17 01:23
o-Xylene	303	U	606	189	ug/Kg	1		06/13/17 01:23
P & M -Xylene	605	U	1210	364	ug/Kg	1		06/13/17 01:23
Toluene	1670		606	189	ug/Kg	1		06/13/17 01:23
Surrogates								
1,4-Difluorobenzene (surr)	92		72-119		%	1		06/13/17 01:23

Batch Information

Analytical Batch: VFC13673
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/13/17 01:23
Container ID: 1172880005-B

Prep Batch: VXX30647
Prep Method: SW5035A 2X MeOH
Prep Date/Time: 05/31/17 15:21
Prep Initial Wt./Vol.: 33.183 g
Prep Extract Vol: 76.8451 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH06**

Client Sample ID: **17841-BH06**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880006
Lab Project ID: 1172880

Collection Date: 05/31/17 15:45
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):17.6
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	552		226	70.2	mg/Kg	1		06/16/17 19:15
Surrogates								
5a Androstane (surr)	105		50-150		%	1		06/16/17 19:15

Batch Information

Analytical Batch: XFC13436
Analytical Method: AK102
Analyst: KMD
Analytical Date/Time: 06/16/17 19:15
Container ID: 1172880006-A

Prep Batch: XXX37562
Prep Method: SW3550C
Prep Date/Time: 06/13/17 10:23
Prep Initial Wt./Vol.: 30.094 g
Prep Extract Vol: 2 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	5630		226	70.2	mg/Kg	1		06/16/17 19:15
Surrogates								
n-Triacontane-d62 (surr)	90.1		50-150		%	1		06/16/17 19:15

Batch Information

Analytical Batch: XFC13436
Analytical Method: AK103
Analyst: KMD
Analytical Date/Time: 06/16/17 19:15
Container ID: 1172880006-A

Prep Batch: XXX37562
Prep Method: SW3550C
Prep Date/Time: 06/13/17 10:23
Prep Initial Wt./Vol.: 30.094 g
Prep Extract Vol: 2 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH06**

Client Sample ID: **17841-BH06**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880006
Lab Project ID: 1172880

Collection Date: 05/31/17 15:45
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):17.6
Location:

Results by **Semivolatile Organic Fuels Department, Silica G**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
DRO Silica Gel	56.5	U	113	35.1	mg/Kg	1		06/16/17 19:34
Surrogates								
5a Androstane (surr)	92.9		50-150		%	1		06/16/17 19:34

Batch Information

Analytical Batch: XFC13434
Analytical Method: AK102-
Analyst: FDR
Analytical Date/Time: 06/16/17 19:34
Container ID: 1172880006-A

Prep Batch: XXX37561
Prep Method: SW3550C w/SG Cleanup-SG
Prep Date/Time: 06/13/17 10:20
Prep Initial Wt./Vol.: 30.094 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
RRO Silica Gel	452		113	35.1	mg/Kg	1		06/16/17 19:34
Surrogates								
n-Triacontane-d62 (surr)	113		50-150		%	1		06/16/17 19:34

Batch Information

Analytical Batch: XFC13434
Analytical Method: AK103-
Analyst: FDR
Analytical Date/Time: 06/16/17 19:34
Container ID: 1172880006-A

Prep Batch: XXX37561
Prep Method: SW3550C w/SG Cleanup-SG
Prep Date/Time: 06/13/17 10:20
Prep Initial Wt./Vol.: 30.094 g
Prep Extract Vol: 1 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH06**

Client Sample ID: **17841-BH06**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880006
Lab Project ID: 1172880

Collection Date: 05/31/17 15:45
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):17.6
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	25.7	U	51.4	15.4	mg/Kg	1		06/13/17 01:42
Surrogates								
4-Bromofluorobenzene (surr)	110		50-150		%	1		06/13/17 01:42

Batch Information

Analytical Batch: VFC13673
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/13/17 01:42
Container ID: 1172880006-B

Prep Batch: VXX30647
Prep Method: SW5035A 2X MeOH
Prep Date/Time: 05/31/17 15:45
Prep Initial Wt./Vol.: 50.701 g
Prep Extract Vol: 91.7736 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	129	U	257	82.2	ug/Kg	1		06/13/17 01:42
Ethylbenzene	257	U	514	160	ug/Kg	1		06/13/17 01:42
o-Xylene	257	U	514	160	ug/Kg	1		06/13/17 01:42
P & M -Xylene	515	U	1030	308	ug/Kg	1		06/13/17 01:42
Toluene	1770		514	160	ug/Kg	1		06/13/17 01:42
Surrogates								
1,4-Difluorobenzene (surr)	92.7		72-119		%	1		06/13/17 01:42

Batch Information

Analytical Batch: VFC13673
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/13/17 01:42
Container ID: 1172880006-B

Prep Batch: VXX30647
Prep Method: SW5035A 2X MeOH
Prep Date/Time: 05/31/17 15:45
Prep Initial Wt./Vol.: 50.701 g
Prep Extract Vol: 91.7736 mL

Results of **17841-BH0A**

Client Sample ID: **17841-BH0A**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880007
Lab Project ID: 1172880

Collection Date: 05/31/17 15:10
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):17.0
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	231	J	234	72.4	mg/Kg	1		06/05/17 22:13
Surrogates								
5a Androstane (surr)	108		50-150		%	1		06/05/17 22:13

Batch Information

Analytical Batch: XFC13392
Analytical Method: AK102
Analyst: FDR
Analytical Date/Time: 06/05/17 22:13
Container ID: 1172880007-A

Prep Batch: XXX37483
Prep Method: SW3550C
Prep Date/Time: 06/05/17 11:33
Prep Initial Wt./Vol.: 30.141 g
Prep Extract Vol: 2 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	1150		234	72.4	mg/Kg	1		06/05/17 22:13
Surrogates								
n-Triacontane-d62 (surr)	103		50-150		%	1		06/05/17 22:13

Batch Information

Analytical Batch: XFC13392
Analytical Method: AK103
Analyst: FDR
Analytical Date/Time: 06/05/17 22:13
Container ID: 1172880007-A

Prep Batch: XXX37483
Prep Method: SW3550C
Prep Date/Time: 06/05/17 11:33
Prep Initial Wt./Vol.: 30.141 g
Prep Extract Vol: 2 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH0A**

Client Sample ID: **17841-BH0A**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880007
Lab Project ID: 1172880

Collection Date: 05/31/17 15:10
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):17.0
Location:

Results by **Semivolatile Organic Fuels Department, Silica G**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
DRO Silica Gel	117	U	234	72.4	mg/Kg	1		06/06/17 00:20
Surrogates								
5a Androstane (surr)	90.9		50-150		%	1		06/06/17 00:20

Batch Information

Analytical Batch: XFC13392
Analytical Method: AK102-
Analyst: FDR
Analytical Date/Time: 06/06/17 00:20
Container ID: 1172880007-A

Prep Batch: XXX37482
Prep Method: SW3550C w/SG Cleanup-SG
Prep Date/Time: 06/05/17 11:33
Prep Initial Wt./Vol.: 30.141 g
Prep Extract Vol: 2 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
RRO Silica Gel	177	J	234	72.4	mg/Kg	1		06/06/17 00:20
Surrogates								
n-Triacontane-d62 (surr)	92.1		50-150		%	1		06/06/17 00:20

Batch Information

Analytical Batch: XFC13392
Analytical Method: AK103-
Analyst: FDR
Analytical Date/Time: 06/06/17 00:20
Container ID: 1172880007-A

Prep Batch: XXX37482
Prep Method: SW3550C w/SG Cleanup-SG
Prep Date/Time: 06/05/17 11:33
Prep Initial Wt./Vol.: 30.141 g
Prep Extract Vol: 2 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-BH0A**

Client Sample ID: **17841-BH0A**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880007
Lab Project ID: 1172880

Collection Date: 05/31/17 15:10
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):17.0
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	22.1	J	64.3	19.3	mg/Kg	1		06/13/17 02:01
Surrogates								
4-Bromofluorobenzene (surr)	103		50-150		%	1		06/13/17 02:01

Batch Information

Analytical Batch: VFC13673
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/13/17 02:01
Container ID: 1172880007-B

Prep Batch: VXX30647
Prep Method: SW5035A 2X MeOH
Prep Date/Time: 05/31/17 15:10
Prep Initial Wt./Vol.: 36.641 g
Prep Extract Vol: 80.3941 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	161	U	322	103	ug/Kg	1		06/13/17 02:01
Ethylbenzene	322	U	643	201	ug/Kg	1		06/13/17 02:01
o-Xylene	322	U	643	201	ug/Kg	1		06/13/17 02:01
P & M -Xylene	645	U	1290	386	ug/Kg	1		06/13/17 02:01
Toluene	322	U	643	201	ug/Kg	1		06/13/17 02:01
Surrogates								
1,4-Difluorobenzene (surr)	93.1		72-119		%	1		06/13/17 02:01

Batch Information

Analytical Batch: VFC13673
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/13/17 02:01
Container ID: 1172880007-B

Prep Batch: VXX30647
Prep Method: SW5035A 2X MeOH
Prep Date/Time: 05/31/17 15:10
Prep Initial Wt./Vol.: 36.641 g
Prep Extract Vol: 80.3941 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **Trip Blank (S)**

Client Sample ID: **Trip Blank (S)**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880008
Lab Project ID: 1172880

Collection Date: 05/31/17 14:10
Received Date: 06/02/17 08:30
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.94	U	1.94	0.581	mg/Kg	1		06/12/17 23:13
Surrogates								
4-Bromofluorobenzene (surr)	92.9		50-150		%	1		06/12/17 23:13

Batch Information

Analytical Batch: VFC13673
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/12/17 23:13
Container ID: 1172880008-A

Prep Batch: VXX30647
Prep Method: SW5035A
Prep Date/Time: 05/31/17 14:10
Prep Initial Wt./Vol.: 64.58 g
Prep Extract Vol: 25 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	9.68	U	9.68	3.10	ug/Kg	1		06/12/17 23:13
Ethylbenzene	19.4	U	19.4	6.04	ug/Kg	1		06/12/17 23:13
o-Xylene	19.4	U	19.4	6.04	ug/Kg	1		06/12/17 23:13
P & M -Xylene	38.7	U	38.7	11.6	ug/Kg	1		06/12/17 23:13
Toluene	19.4	U	19.4	6.04	ug/Kg	1		06/12/17 23:13
Surrogates								
1,4-Difluorobenzene (surr)	94.2		72-119		%	1		06/12/17 23:13

Batch Information

Analytical Batch: VFC13673
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/12/17 23:13
Container ID: 1172880008-A

Prep Batch: VXX30647
Prep Method: SW5035A
Prep Date/Time: 05/31/17 14:10
Prep Initial Wt./Vol.: 64.58 g
Prep Extract Vol: 25 mL

Results of **17841-TMW01**

Client Sample ID: **17841-TMW01**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880009
Lab Project ID: 1172880

Collection Date: 05/31/17 16:00
Received Date: 06/02/17 08:30
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	1.20		0.588	0.176	mg/L	1		06/11/17 19:44
Surrogates								
5a Androstane (surr)	82.9		50-150		%	1		06/11/17 19:44

Batch Information

Analytical Batch: XFC13418
Analytical Method: AK102
Analyst: KMD
Analytical Date/Time: 06/11/17 19:44
Container ID: 1172880009-D

Prep Batch: XXX37521
Prep Method: SW3520C
Prep Date/Time: 06/08/17 08:57
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	1.00		0.490	0.147	mg/L	1		06/11/17 19:44
Surrogates								
n-Triacontane-d62 (surr)	87.1		50-150		%	1		06/11/17 19:44

Batch Information

Analytical Batch: XFC13418
Analytical Method: AK103
Analyst: KMD
Analytical Date/Time: 06/11/17 19:44
Container ID: 1172880009-D

Prep Batch: XXX37521
Prep Method: SW3520C
Prep Date/Time: 06/08/17 08:57
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-TMW01**

Client Sample ID: **17841-TMW01**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880009
Lab Project ID: 1172880

Collection Date: 05/31/17 16:00
Received Date: 06/02/17 08:30
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	0.205		0.100	0.0310	mg/L	1		06/09/17 20:06
Surrogates								
4-Bromofluorobenzene (surr)	116		50-150		%	1		06/09/17 20:06

Batch Information

Analytical Batch: VFC13668
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/09/17 20:06
Container ID: 1172880009-A

Prep Batch: VXX30634
Prep Method: SW5030B
Prep Date/Time: 06/09/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250 U		0.500	0.150	ug/L	1		06/09/17 20:06
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		06/09/17 20:06
o-Xylene	1.67		1.00	0.310	ug/L	1		06/09/17 20:06
P & M -Xylene	0.620 J		2.00	0.620	ug/L	1		06/09/17 20:06
Toluene	47.5		1.00	0.310	ug/L	1		06/09/17 20:06
Surrogates								
1,4-Difluorobenzene (surr)	91.9		77-115		%	1		06/09/17 20:06

Batch Information

Analytical Batch: VFC13668
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/09/17 20:06
Container ID: 1172880009-A

Prep Batch: VXX30634
Prep Method: SW5030B
Prep Date/Time: 06/09/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-TMW02**

Client Sample ID: **17841-TMW02**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880010
Lab Project ID: 1172880

Collection Date: 05/31/17 16:32
Received Date: 06/02/17 08:30
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	0.991		0.610	0.183	mg/L	1		06/11/17 19:54
Surrogates								
5a Androstane (surr)	62.1		50-150		%	1		06/11/17 19:54

Batch Information

Analytical Batch: XFC13418
Analytical Method: AK102
Analyst: KMD
Analytical Date/Time: 06/11/17 19:54
Container ID: 1172880010-D

Prep Batch: XXX37521
Prep Method: SW3520C
Prep Date/Time: 06/08/17 08:57
Prep Initial Wt./Vol.: 246 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	1.71		0.508	0.152	mg/L	1		06/11/17 19:54
Surrogates								
n-Triacontane-d62 (surr)	62.5		50-150		%	1		06/11/17 19:54

Batch Information

Analytical Batch: XFC13418
Analytical Method: AK103
Analyst: KMD
Analytical Date/Time: 06/11/17 19:54
Container ID: 1172880010-D

Prep Batch: XXX37521
Prep Method: SW3520C
Prep Date/Time: 06/08/17 08:57
Prep Initial Wt./Vol.: 246 mL
Prep Extract Vol: 1 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-TMW02**

Client Sample ID: **17841-TMW02**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880010
Lab Project ID: 1172880

Collection Date: 05/31/17 16:32
Received Date: 06/02/17 08:30
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	0.0463	J	0.100	0.0310	mg/L	1		06/12/17 18:31
Surrogates								
4-Bromofluorobenzene (surr)	110		50-150		%	1		06/12/17 18:31

Batch Information

Analytical Batch: VFC13671
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/12/17 18:31
Container ID: 1172880010-A

Prep Batch: VXX30646
Prep Method: SW5030B
Prep Date/Time: 06/12/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250	U	0.500	0.150	ug/L	1		06/12/17 18:31
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/12/17 18:31
o-Xylene	0.860	J	1.00	0.310	ug/L	1		06/12/17 18:31
P & M -Xylene	0.720	J	2.00	0.620	ug/L	1		06/12/17 18:31
Toluene	7.47		1.00	0.310	ug/L	1		06/12/17 18:31
Surrogates								
1,4-Difluorobenzene (surr)	91.6		77-115		%	1		06/12/17 18:31

Batch Information

Analytical Batch: VFC13671
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/12/17 18:31
Container ID: 1172880010-A

Prep Batch: VXX30646
Prep Method: SW5030B
Prep Date/Time: 06/12/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-TMW0A**

Client Sample ID: **17841-TMW0A**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880011
Lab Project ID: 1172880

Collection Date: 05/31/17 16:33
Received Date: 06/02/17 08:30
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	1.16		0.625	0.188	mg/L	1		06/11/17 20:04
Surrogates								
5a Androstane (surr)	71.4		50-150		%	1		06/11/17 20:04

Batch Information

Analytical Batch: XFC13418
Analytical Method: AK102
Analyst: KMD
Analytical Date/Time: 06/11/17 20:04
Container ID: 1172880011-D

Prep Batch: XXX37521
Prep Method: SW3520C
Prep Date/Time: 06/08/17 08:57
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	2.46		0.521	0.156	mg/L	1		06/11/17 20:04
Surrogates								
n-Triacontane-d62 (surr)	72		50-150		%	1		06/11/17 20:04

Batch Information

Analytical Batch: XFC13418
Analytical Method: AK103
Analyst: KMD
Analytical Date/Time: 06/11/17 20:04
Container ID: 1172880011-D

Prep Batch: XXX37521
Prep Method: SW3520C
Prep Date/Time: 06/08/17 08:57
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **17841-TMW0A**

Client Sample ID: **17841-TMW0A**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880011
Lab Project ID: 1172880

Collection Date: 05/31/17 16:33
Received Date: 06/02/17 08:30
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	0.0468	J	0.100	0.0310	mg/L	1		06/12/17 18:50
Surrogates								
4-Bromofluorobenzene (surr)	113		50-150		%	1		06/12/17 18:50

Batch Information

Analytical Batch: VFC13671
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/12/17 18:50
Container ID: 1172880011-A

Prep Batch: VXX30646
Prep Method: SW5030B
Prep Date/Time: 06/12/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250	U	0.500	0.150	ug/L	1		06/12/17 18:50
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/12/17 18:50
o-Xylene	0.930	J	1.00	0.310	ug/L	1		06/12/17 18:50
P & M -Xylene	0.720	J	2.00	0.620	ug/L	1		06/12/17 18:50
Toluene	8.40		1.00	0.310	ug/L	1		06/12/17 18:50
Surrogates								
1,4-Difluorobenzene (surr)	92.7		77-115		%	1		06/12/17 18:50

Batch Information

Analytical Batch: VFC13671
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/12/17 18:50
Container ID: 1172880011-A

Prep Batch: VXX30646
Prep Method: SW5030B
Prep Date/Time: 06/12/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 07/13/2017 10:28:33AM

J flagging is activated

Results of **Trip Blank (W)**

Client Sample ID: **Trip Blank (W)**
Client Project ID: **17841 Kwig Pipeline Spill**
Lab Sample ID: 1172880012
Lab Project ID: 1172880

Collection Date: 05/31/17 16:00
Received Date: 06/02/17 08:30
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	0.100	U	0.100	0.0310	mg/L	1		06/12/17 19:09
Surrogates								
4-Bromofluorobenzene (surr)	109		50-150		%	1		06/12/17 19:09

Batch Information

Analytical Batch: VFC13671
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/12/17 19:09
Container ID: 1172880012-A

Prep Batch: VXX30646
Prep Method: SW5030B
Prep Date/Time: 06/12/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.500	U	0.500	0.150	ug/L	1		06/12/17 19:09
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		06/12/17 19:09
o-Xylene	1.00	U	1.00	0.310	ug/L	1		06/12/17 19:09
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		06/12/17 19:09
Toluene	1.00	U	1.00	0.310	ug/L	1		06/12/17 19:09
Surrogates								
1,4-Difluorobenzene (surr)	93.5		77-115		%	1		06/12/17 19:09

Batch Information

Analytical Batch: VFC13671
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/12/17 19:09
Container ID: 1172880012-A

Prep Batch: VXX30646
Prep Method: SW5030B
Prep Date/Time: 06/12/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1760429 [SPT/10175]
Blank Lab ID: 1388661

Matrix: Soil/Solid (dry weight)

QC for Samples:
1172880001, 1172880002, 1172880003, 1172880004, 1172880005, 1172880006, 1172880007

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT10175
Analytical Method: SM21 2540G
Instrument:
Analyst: S.L
Analytical Date/Time: 6/5/2017 5:37:00PM

Print Date: 07/13/2017 10:28:38AM

Duplicate Sample Summary

Original Sample ID: 1172888011
Duplicate Sample ID: 1388662
Analysis Date: 06/05/2017 17:37
Matrix: Soil/Solid (dry weight)

QC for Samples:

1172880001, 1172880002, 1172880003, 1172880004, 1172880005, 1172880006, 1172880007

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	89.0	90.2	%	1.30	(< 15)

Batch Information

Analytical Batch: SPT10175
Analytical Method: SM21 2540G
Instrument:
Analyst: S.L

Print Date: 07/13/2017 10:28:40AM

Method Blank

Blank ID: MB for HBN 1760753 [VXX/30634]
Blank Lab ID: 1389881

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1172880009

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	103	50-150		%

Batch Information

Analytical Batch: VFC13668
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 6/9/2017 11:41:00AM

Prep Batch: VXX30634
Prep Method: SW5030B
Prep Date/Time: 6/9/2017 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172880 [VXX30634]
Blank Spike Lab ID: 1389884
Date Analyzed: 06/09/2017 12:37

Spike Duplicate ID: LCSD for HBN 1172880 [VXX30634]
Spike Duplicate Lab ID: 1389885
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1172880009

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	1.06	106	1.00	1.02	102	(60-120)	3.60	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	112	112	0.0500	111	111	(50-150)	0.55	

Batch Information

Analytical Batch: **VFC13668**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX30634**
Prep Method: **SW5030B**
Prep Date/Time: **06/09/2017 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

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

Method Blank

Blank ID: MB for HBN 1760753 [VXX/30634]
Blank Lab ID: 1389881

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1172880009

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	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
Toluene	0.500U	1.00	0.310	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	97	77-115		%

Batch Information

Analytical Batch: VFC13668
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 6/9/2017 11:41:00AM

Prep Batch: VXX30634
Prep Method: SW5030B
Prep Date/Time: 6/9/2017 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 1172880 [VXX30634]
Blank Spike Lab ID: 1389882
Date Analyzed: 06/09/2017 12:18

Spike Duplicate ID: LCSD for HBN 1172880 [VXX30634]
Spike Duplicate Lab ID: 1389883
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1172880009

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	96.5	97	100	99.4	99	(80-120)	2.90	(< 20)
Ethylbenzene	100	99.3	99	100	97.9	98	(75-125)	1.50	(< 20)
o-Xylene	100	96.6	97	100	95.3	95	(80-120)	1.40	(< 20)
P & M -Xylene	200	195	98	200	192	96	(75-130)	1.60	(< 20)
Toluene	100	92.1	92	100	92.4	92	(75-120)	0.33	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	97.4	97	50	98.8	99	(77-115)	1.40	

Batch Information

Analytical Batch: **VFC13668**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX30634**
Prep Method: **SW5030B**
Prep Date/Time: **06/09/2017 08:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 176053[VX/ / 4[06] 6L
Blank ba8 ID: 1[5036]

Matrix: Watpr (Curfacp2, ffE2. rounGd

9 Q for CaS mpe:
1173ss001021173ss001121173ss0013

) peulte 8R **AK101**

OaraS ptpr	) peulte	bU9 4Qb	Db	y nite
. aeolinp) anPp UrPanice	0EDg00y	0E100	0ED[10	S P4b
Surrogates				
] -BroS ofluoro8pnzpnp (eurrd	106	g0-1g0		%

Batch Information

AnalRtical Batch: XFQ1[671
AnalRtical MpthoG: AK101
InetruS pnt: APilpnt 7s50A OID4FID
AnalRet: CT
AnalRtical Datp4TiS p: 64134-3017 13:g] :00OM

OrpmBatch: X/ / [06] 6
OrpmMpthoG: CWg0[0B
OrpmDatp4TiS p: 64134-3017 s:00:00AM
OrpmInitial WtE2XolE g S b
Orpm, xtract Xol: g S b

Orint Datp: 0741[43017 10:3s:g3AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172880 [VXX30646]
Blank Spike Lab ID: 1390267
Date Analyzed: 06/12/2017 13:u0

Spike Dcpli5ate ID: LCSD for HBN 1172880 [VXX30646]
Spike Dcpli5ate Lab ID: 1390268
Matrix: Water (Scrfa5e, Eff., Grocnd)

QC for Samples: 1172880010, 1172880011, 1172880012

RescIts by **AK101**

	Blank Spike (mg/L)			Spike Dcpli5ate (mg/L)					
Parameter	Spike	RescIt	Re5 (%)	Spike	RescIt	Re5 (%)	CL	RPD (%)	RPD CL
Gasoline Range Organi5s	1.00	1.00	100	1.00	1.03	103	(60-120)	2.30	(< 20)
Surrogates									
4-Bromoflcorobenzene (scrr)	0.0u00	113	113	0.0u00	114	114	(u0-1u0)	1.30	

Batch Information

Analyti5al Bat5h: **VFC13681**
Analyti5al Method: **AK101**
Instrcment: **Agilent 8790A PID/FID**
Analyst: **ST**

Prep Bat5h: **VXX30646**
Prep Method: **SW5030B**
Prep Date/Time: **06/12/2018 07:00**
Spike Init Wt./Vol.: 1.00 mg/L Extra5t Vol: u mL
Dcpe Init Wt./Vol.: 1.00 mg/L Extra5t Vol: u mL

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200 West Potter Drive An5horage, AK 9uu18
t 907.u62.2343 **f** 907.u61.u301 www.cs.sgs.5om

Method Blank

Blank ID: MB for HBN 176053[VX/ / 4[06] 6L
Blank ba8 ID: 1[5036]

Matrix: Watpr (Curfacp2, ffE2. rounGd

9 Q for CaS mpe:
1173ss001021173ss001121173ss0013

) peulte 8R **SW8021B**

OaraS ptpr	) peulte	bU9 4Qb	Db	y nite
BpnPpnp	0E3z0y	0Ez00	0E1z0	ug4b
, thR8pnPpnp	0Ez00y	1E00	0E[10	ug4b
o-/ Rpnp	0Ez00y	1E00	0E[10	ug4b
O & M -/ Rpnp	1E00y	3E00	0E630	ug4b
Tolupnp	0Ez00y	1E00	0E[10	ug4b
Surrogates				
12] -Difluoro8pnPpnp (eurrd	5] E6	77-11z		%

Batch Information

AnalRtical Batch: XFQ1[671
AnalRtical MpthoG: CWs031B
InetruS pnt: Agilpnt 7s50A OID4FID
AnalRet: CT
AnalRtical Datp4TiS p: 64134 8017 13:z] :00OM

OrpmBatch: X/ / [06] 6
OrpmMpthoG: CWz0[0B
OrpmDatp4TiS p: 64134 8017 s:00:00AM
OrpmInitial WtE4XolE: z S b
Orpm, xtract Xol: z S b

Orint Datp: 074[8017 10:3s:zzAM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172880 [VXX30646]
Blank Spike Lab ID: 139026t
DaAe y nalzde/ : 06ul2u2017 13:31

Spike DcpliRaAe ID: LCSD for HBN 1172880 [VXX30646]
Spike DcpliRaAe Lab ID: 1390266
x aAiW (aAer ,ScrfaReE. ffGE) rocn/ P

- C for Sa%pleM 1172880010E1172880011E1172880012

s eMclAMbz **SW8021B**

	Blank Spike ,cQLP			Spike DcpliRaAe ,cQLP					
mara%eAer	Spike	s eMclA	s eR,g P	Spike	s eMclA	s eR,g P	CL	s mD ,g P	s mD CL
Bendene	100	94G9	9t	100	90G6	91	, 80<120 P	4G80	,5 20 P
. Anzlbendene	100	102	102	100	97G9	97	, 7t <12t P	t G10	,5 20 P
o>Xzlene	100	99G3	99	100	94G6	9t	, 80<120 P	4G70	,5 20 P
m & x >Xzlene	200	200	100	200	190	9t	, 7t <130 P	t G20	,5 20 P
Tolcene	100	93G6	94	100	89G3	89	, 7t <120 P	4G60	,5 20 P
Surrogates									
1E4>DiflcorobendeneMcrrP	t 0	101	101	t 0	99G6	100	, 77<11t P	1G60	

Batch Information

y nalzARal BaARh: **VFC136A1**
y nalzARal x eAno/ : **SW8021B**
InMkc%enA: **7 gilent A8907 PID/FID**
y nalzMA: **ST**

mrep BaARh: **VXX30646**
mrep x eAno/ : **SW5030B**
mrep DaAeuTi%e: **06/12/201A 08:00**
Spike IniA(AGVolG 100 cQLL . WkaRAVol: t %L
Dcpe IniA(AGVolG 100 cQLL . WkaRAVol: t %L

Method Blank

Blank ID: MB for HBN 176053[VX/ / 4306[7]
Blank Lab ID: 1350308

MairxW Coxk4ColX(u(rc , pxE. iG

9 Q for CaS mpe:
117s8800012117s88000s2117s8800032117s88000[2117s88000t 2117s8800062117s8800072117s880008

d pe) lie bc **AK101**

UaraS pipr	d pe) lie	Ly 9 4QL	DL	Rnxie
OaeolxnpdanEp y rEanxPe	1gst R	sg 0	0g7t 0	S E4- E
Surrogates				
[zBroS ofl) orobpn%pnp ue) rrG	106	t 0z1t 0		A

Batch Information

hnalcixPal BaiP. : XFQ13673
hnalcixPal Mpi. o(: h- 101
Ineir) S pni: hExtpni 7850h UID4FID
hnalcei: CK
hnalcixPal Daip4KxS p: 641s4s017 10:17:00UM

UrpmBaiP. : X/ / 306[7
UrpmMpi. o(: CT t 03t h
UrpmDaip4KxS p: 641s4s017 8:00:00hM
UrpmInxxal T ig4Xolg t 0 E
Urpmv WraPi Xol: st S L

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172880 [VXX30647]
Blank Spike Lab ID: 1390311
Date Analyzed: 06/12/2017 21:20

Spike Duplicate ID: LCSD for HBN 1172880 [VXX30647]
Spike Duplicate Lab ID: 1390312
s atriM Soil/Solid xdry Wei(, tE

mC for SaGpleR 1172880001%1172880002%1172880003%1172880004%117288000g%1172880006%1172880007%1172880008

5eRultR by **AK101**

	Blank Spike xG(/P(E			Spike Duplicate xG(/P(E					
. araGeter	Spike	5eRult	5ecx) E	Spike	5eRult	5ecx) E	CL	5. Dx) E	5. D CL
QaRoline 5an(e Or(anicR	12-g	13-3	106	12-g	13-g	108	x60<120 E	1-70	xh 20 E
Surrogates									
4<BroGofluorobenzene xRurrE	1-2g	110	110	1-2g	111	111	xg0<1g0 E	1-00	

Batch Information

Analytical Batc, : **VFC13683**
Analytical s et, od: **AK101**
InRtruGent: **Agilent 8790A PID/FID**
AnalyRt: **ST**

. rep Batc, : **VXX30648**
. rep s et, od: **SW5035A**
. rep Date/TiGe: **06/12/2018 07:00**
Spike Init v t-/Vol-: 12-g G(/P(KMract Vol: 2g GL
Dupe Init v t-/Vol-: 12-g G(/P(KMract Vol: 2g GL

Method Blank

Blank ID: MB for HBN 176053[VX/ / 4306[7]
Blank Lab ID: 1350308

MairxW Coxk4ColX(u(rc , pxE. iG

9 Q for CaS mpe:
117s8800012117s88000s2117s8800032117s88000[2117s88000t 2117s8800062117s8800072117s880008

d pe) lie bc **SW8021B**

UaraS pipr	d pe) lie	Ly 9 4QL	DL	Rnxie
BpnQpnp	6R3t R	1sR?	[R?0	) E4z E
gi. clbpnQpnp	1sR? R	st R?0	7R?30	) E4z E
oh/ clpnp	1sR? R	st R?0	7R?30	) E4z E
U - M h/ clpnp	st R?0R	t 0R?0	1t R?0	) E4z E
&ol) pnp	1sR? R	st R?0	7R?30	) E4z E
Surrogates				
12[hDxfl) orobpnQpnp ue) rrG	5[R?8	7sh115		T

Batch Information

%nalcixAal BaiA : XFQ13673
%nalcixAal Mpi. o(: Cv 80s1B
Ineir) S pni: %Extpni 7850%UID4FID
%nalcei: C&
%nalcixAal Daip4&xS p: 641s4s017 10:17:00UM

UrpmBaiA : X/ / 306[7
UrpmMpi. o(: Cv t 03t %
UrpmDaip4&xS p: 641s4s017 8:00:00%M
UrpmInxixal v iP4XolP? t 0 E
UrpmgVraAi Xol: st S L

Urxni Daip: 074134s017 10:s5:03%M

CKC Nori. %S prxAa InAP

s00 v pei Uoiipr Drxwp %nA oraEp2%z 5t t 18
t 507R?6sR?3[3 f 507R?61R?301 , , , P) eReEeRAoS

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172880 [VXX30647]
Blank Spike Lab ID: 1390309
Date Analyzed: 06/12/2017 20:43

Spike Duplicate ID: LCSD for HBN 1172880 [VXX30647]
Spike Duplicate Lab ID: 1390310
Matrix: Soil/Solid Wdry (ei, Et.

%C for Sa) ples: 1172880001g1172880002g1172880003g1172880004g117288000Qg1172880006g1172880007g 1172880008

Results by **SW8021B**

	Blank Spike W, /m, .			Spike Duplicate W, /m, .					
Gara) eter	Spike	Result	Rec W.	Spike	Result	Rec W.	CL	RGD W.	RGD CL
Benzene	12Q0	1190	9Q	12Q0	11Q0	92	W7Q-12Q.	35Q0	W 20 .
htEylbenzene	12Q0	1260	101	12Q0	1220	97	W7Q-12Q.	3570	W 20 .
o-Xylene	12Q0	1220	98	12Q0	1180	9Q	W7Q-12Q.	3530	W 20 .
G & M -Xylene	2Q00	2480	99	2Q00	2390	96	W80-12Q.	3570	W 20 .
Toluene	12Q0	1170	93	12Q0	1130	90	W70-12Q.	35Q0	W 20 .
Surrogates									
1g4-Difluorobenzene WSurr.	12Q0	975B	98	12Q0	975B	98	W72-119 .	0502	

Batch Information

Analytical BatcE: **VFC136A3**
Analytical MetEod: **SW8021B**
Instru) ent: **7 gilent A8907 PID/FID**
Analyst: **ST**

Grep BatcE: **VXX3064A**
Grep MetEod: **SW50357**
Grep Date/Ti) e: **06/12/201A 08:00**
Spike Init v t5Vol5 12Q0 u, /m, hxtract Vol: 2Q) L
Dupe Init v t5Vol5 12Q0 u, /m, hxtract Vol: 2Q) L

SKS NortE A) erica Inc5
200 v est Gotter Driwe AncEora, egAm 9QQ18
t 9075Q625 2343 f 9075Q615Q301 (((5us5s, s5co)
Me) ber of SKS Kroup

Matrix Spike Summary

Original Sample ID: 1172880001
MS Sample ID: 1390313 MS
MSD Sample ID: 1390314 MSD

Analysis Date: 06/12/2017 23:32
Analysis Date: 06/12/2017 23:50
Analysis Date: 06/13/2017 0:09
Matrix: Soil/Solid (dry weight)

QC for Samples: 1172880001, 1172880002, 1172880003, 1172880004, 1172880005, 1172880006, 1172880007, 1172880008

Results by **SW8021B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	57.0U	4982	4911	98	4982	4982	100	75-125	1.60	(< 20)
Ethylbenzene	114U	4982	4662	93	4982	4733	95	75-125	1.50	(< 20)
o-Xylene	114U	4982	4555	91	4982	4626	92	75-125	1.20	(< 20)
P & M -Xylene	228U	10000	9181	92	10000	9324	93	80-125	1.40	(< 20)
Toluene	246	4982	4555	86	4982	4626	87	70-125	1.60	(< 20)
Surrogates										
1,4-Difluorobenzene (surr)		4982	4662	93	4982	4626	92	72-119	1.20	

Batch Information

Analytical Batch: VFC13673
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 6/12/2017 11:50:00PM

Prep Batch: VXX30647
Prep Method: AK101 Extraction (S)
Prep Date/Time: 6/12/2017 8:00:00AM
Prep Initial Wt./Vol.: 44.50g
Prep Extract Vol: 25.00mL

Print Date: 07/13/2017 10:29:06AM

Method Blank

Blank ID: MB for HBN 1760377 [XXX/37482]
Blank Lab ID: 1388443

Matrix: Soil/Solid (dry weight)

QC for Samples:
1172880004, 1172880007

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
DRO Silica Gel	20.0U	40.0	12.4	mg/Kg
Surrogates				
5a Androstane (surr)	88.3	70-125		%

Batch Information

Analytical Batch: XFC13392
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: FDR
Analytical Date/Time: 6/5/2017 10:42:00PM

Prep Batch: XXX37482
Prep Method: SW3550C w/SG Cleanup
Prep Date/Time: 6/5/2017 11:33:13AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 2 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172880 [XXX37482]
Blank Spike Lab ID: 1388444
Date Analyzed: 06/05/2017 22:52

Spike Duplicate ID: LCSD for HBN 1172880 [XXX37482]
Spike Duplicate Lab ID: 1388445
Matrix: Soil/Solid (dry weight)

QC for Samples: 1172880004, 1172880007

Results by **AK102**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
DRO Silica Gel	333	329	99	333	218	65	* (70-125)	40.60	* (< 20)
Surrogates									
5a Androstane (surr)	6.67	93.6	94	6.67	61.6	62	* (70-125)	41.30	

Batch Information

Analytical Batch: **XFC13392**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **FDR**

Prep Batch: **XXX37482**
Prep Method: **SW3550C w/SG Cleanup**
Prep Date/Time: **06/05/2017 11:33**
Spike Init Wt./Vol.: 333 mg/Kg Extract Vol: 2 mL
Dupe Init Wt./Vol.: 333 mg/Kg Extract Vol: 2 mL

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Method Blank

Blank ID: MB for HBN 1760377 [XXX/37482]
Blank Lab ID: 1388443

Matrix: Soil/Solid (dry weight)

QC for Samples:
1172880004, 1172880007

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
RRO Silica Gel	19.2J	40.0	12.4	mg/Kg
Surrogates				
n-Triacontane-d62 (surr)	90.5	70-125		%

Batch Information

Analytical Batch: XFC13392
Analytical Method: AK103
Instrument: Agilent 7890B F
Analyst: FDR
Analytical Date/Time: 6/5/2017 10:42:00PM

Prep Batch: XXX37482
Prep Method: SW3550C w/SG Cleanup
Prep Date/Time: 6/5/2017 11:33:13AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 2 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172880 [XXX37482]
Blank Spike Lab ID: 1388444
Date Analyzed: 06/05/2017 22:52

Spike Duplicate ID: LCSD for HBN 1172880 [XXX37482]
Spike Duplicate Lab ID: 1388445
Matrix: Soil/Solid (dry weight)

QC for Samples: 1172880004, 1172880007

Results by **AK102**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
RRO Silica Gel	333	316	95	333	206	62	* (70-125)	42.10	* (< 20)
Surrogates									
n-Triacontane-d62 (surr)	6.67	93	93	6.67	61.7	62	* (70-125)	40.40	

Batch Information

Analytical Batch: **XFC12239**
Analytical Method: **AK102**
Instrument: **Agilent 7830B F**
Analyst: **FDR**

Prep Batch: **XXX27489**
Prep Method: **SW2550C w/SG Cleanup**
Prep Date/Time: **06/05/9017 11:22**
Spike Init Wt./Vol.: 333 mg/Kg Extract Vol: 2 mL
Dupe Init Wt./Vol.: 333 mg/Kg Extract Vol: 2 mL

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Method Blank

Blank ID: MB for HBN 176037[X / / 4378[32
Blank] aL ID: 13[[8bb

QC for Samples:
117, [[0008t 117, [[0007

Mairxd: Sox4SolX(y(rwg exh) iR

uesUlis Lw **AK102**

carameier	uesUlis	] PQ4C]	D]	Onxis
Dxesel u anhe PrhanxGs	, 6.6O	b3.3	16.b	mh4Kh
Surrogates				
ba 5n(rosiane ysUrrR	10,	60A1, 0		-

Batch Information

5nalwixGal BaiG) : / %C133F,
5nalwixGal Mei) o(: 5K10,
InsirUmeni: 5hxleni 7[F0B %
5nalwsi: %Du
5nalwixGal Daie49xme: 64b4 017 [:3b:00c M

crep BaiG) : / / / 378[3
crep Mei) o(: ST 3bb0C
crep Daie49xme: 64b4 017 11:33:b75 M
crep InxixaI T i.4Wol.: , , .b h
crep VdiraG Wol: , m]

crxni Daie: 0741 34 017 10:, F:165 M

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172880 [VVVX738X6
Blank Spike La4 ID: 1X883] b
Da9e t nalAyez: 0bd0] d2017 20:3]

Spike D/ pliua9e ID: LCSD for HBN 1172880 [VVVX738X6
Spike D/ pliua9e La4 ID: 1X883] 7
Ra9is: SoildSoliz M4rAx eiW(9,

PC for Sa. ple5: 1172880003m1172880007

c e5/ l95 4A **AK102**

Eara. e9er	Blank Spike M Wd W, Spike	Blank Spike M Wd W, c e5/ l9	Blank Spike M Wd W, c eu MG,	Spike D/ pliua9e M Wd W, Spike	Spike D/ pliua9e M Wd W, c e5/ l9	Spike D/ pliua9e M Wd W, c eu MG,	CL	c ED MG,	c ED CL
Die5el c anWe %rW4aniu5	333	378	108	333	] 0-	11]	M7] g12] ,	bOX0	M020 ,
Surrogates									
] a t nzro59ane M5/ rr,	803-	- - O	100	803-	10b	10b	Mb0g120 ,	] O70	

Batch Information

t nalA9ual Ba9u(: **XFC13392**
t nalA9ual Re9(oz: **AK102**
In59/ . en9 **Agilent 7890B F**
t nalA59 **FDR**

Erep Ba9u(: **XXX37483**
Erep Re9(oz: **SW3550C**
Erep Da9ed<i. e: **06/05/2017 11:33**
Spike Ini9h 9dTolO 333 . Wd W vs9rau9Tol: 2 . L
D/ pe Ini9h 9dTolO 333 . Wd W vs9rau9Tol: 2 . L

Method Blank

Blank ID: MB for HBN 176037[X / / 4378[32
Blank] aL ID: 13[[8bb

Mairxd: Sox4SolX(y(rwg exh) iR

QC for Samples:
117, [[0008t 117, [[0007

uesUlis Lw **AK103**

carameier	uesUlis	] PQ4C]	D]	Onxis
uesx(Ual uanhe PrhanxGs	, 6.6O	b3.3	16.b	mh4Kh
Surrogates				
n5ArxaGoniane5(6, ysUrrR	101	6051, 0		-

Batch Information

%nalwixGal BaiG) : / FC1339,
%nalwixGal Mei) o(: %K103
InsirUmeni: %hxleni 7[90B F
%nalwsi: FDu
%nalwixGal Daie4Axme: 64b4 017 [:3b:00c M

crep BaiG) : / / / 378[3
crep Mei) o(: ST 3bb0C
crep Daie4Axme: 64b4 017 11:33:b7%M
crep Inxixal T i.4Wbl.: , , .b h
crep VdiraG Wbl: , m]

crxni Daie: 0741 34 017 10:, 9:, 0%M

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172880 [VVVX738X6
Blank Spike La4 ID: 1X883] b
Da9e t nalAyez: 0bd0] d2017 20:3]

Spike D/ pliua9e ID: LCSD for HBN 1172880 [VVVX738X6
Spike D/ pliua9e La4 ID: 1X883] 7
Ra9is: SoildSoliz M1rAx eiW(9,

PC for Sa. ple5: 1172880003m1172880007

c e5/ l95 4A **AK102**

	Blank Spike M W0 W,			Spike D/ pliua9e M W0 W,					
Eara. e9er	Spike	c e5/ l9	c eu M6,	Spike	c e5/ l9	c eu M6,	CL	c ED M6,	c ED CL
c e5iz/ al c anWe %rWaniu5	333	323	g]	333	3Xg	gg	Mb0C120 ,	X-] 0	M020 ,
Surrogates									
nG riauon9aneG2b2 M5/ rr,	8-8g	gg-7	100	8-8g	11X	11X	Mb0C120 ,	12-20	

Batch Information

t nalA9ual Ba9u(: **XFC12239**
t nalA9ual Re9(oz: **AK102**
In59/ . en9 **Agilent 7830B F**
t nalA59 **FDR**

Erep Ba9u(: **XXX27482**
Erep Re9(oz: **SW2550C**
Erep Da9ed<i. e: **06/05/9017 11:22**
Spike Ini9h 9dTol-: 333 . W0 W vs9rau9Tol: 2 . L
D/ pe Ini9h 9dTol-: 333 . W0 W vs9rau9Tol: 2 . L

SGS

Method Blank

Blank ID: MB for HBN 1760533 [VVVX57/ 374

Mas r2 : Qo2XQol2 xi rW(m2ucs

Blank] aL ID: 1533/ b/

8 9 for QaC Slmp:
117e33000/

Emp. lsp LW 8270D SIM (PAH)

) araC msmr	Emp. lsp	] d 8 X9]	D]	Gn2sp
1RMmscWhaScscalmm	1elyG	eyl0	7ly0	. uXOu
eRMmscWhaScscalmm	1elyG	eyl0	7ly0	. uXOu
PgmaScscmm	1elyG	eyl0	7ly0	. uXOu
PgmaScscWmm	1elyG	eyl0	7ly0	. uXOu
Pnscragmm	1elyG	eyl0	7ly0	. uXOu
Bm-oxa,Pnscragmm	1elyG	eyl0	7ly0	. uXOu
Bm-o[a4SWmm	1elyG	eyl0	7ly0	. uXOu
Bm-o[L4zl. oranscmm	1elyG	eyl0	7ly0	. uXOu
Bm-o[u%2SmWmm	1elyG	eyl0	7ly0	. uXOu
Bm-o[k4l. oranscmm	1elyG	eyl0	7ly0	. uXOu
9 crWpmm	1elyG	eyl0	7ly0	. uXOu
D2Lm-o[a%4anscragmm	1elyG	eyl0	7ly0	. uXOu
zl. oranscmm	1elyG	eyl0	7ly0	. uXOu
zl. ormm	1elyG	eyl0	7ly0	. uXOu
Ini mo[1%%Rg%4SWmm	1elyG	eyl0	7ly0	. uXOu
NaScscalmm	10l0G	e0l0	6l00	. uXOu
) cmanscrmm	1elyG	eyl0	7ly0	. uXOu
) Wmm	1elyG	eyl0	7ly0	. uXOu

Surrogates

eRzl. oroL2ScmnWxp. rr,	b1ly	/ 6R1y	A
hmrScmWR 1/ xp. rr,	10e	y3R55	A

Batch Information

PnalWs2gal Basgc: VMQ1003y
PnalWs2gal Mmscoi : 3e70D QIM x) PH,
Inpsr. Cmns QFP Pu2mns730Xyb7y K9 XMQ
PnalWps QUK
PnalWs2gal Dasmh2Cm 6Xyx017 3:y5:00) M

) rmS Basgc: VVV57/ 37
) rmS Mmscoi : QT 5yy09
) rmS Dasmh2Cm 6XyX017 1:ey:0b) M
) rmS In22al T sUFolU eely u
) rmS v t sragsFol: y C]

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172880 [XXX37487]
Blank Spike Lab ID: 1388495
Date Analyzed: 06/05/2017 21:14

Matrix: Soil/Solid (dry weight)

QC for Samples: 1172880004

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

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	111	91.2	82	(43-111)
2-Methylnaphthalene	111	84.6	76	(39-114)
Acenaphthene	111	118	106	(44-111)
Acenaphthylene	111	95.1	86	(39-116)
Anthracene	111	107	96	(50-114)
Benzo(a)Anthracene	111	97.2	87	(54-122)
Benzo[a]pyrene	111	98.9	89	(50-125)
Benzo[b]Fluoranthene	111	98.7	89	(53-128)
Benzo[g,h,i]perylene	111	100	90	(49-127)
Benzo[k]fluoranthene	111	96.7	87	(56-123)
Chrysene	111	100	90	(57-118)
Dibenzo[a,h]anthracene	111	105	94	(50-129)
Fluoranthene	111	94.0	85	(55-119)
Fluorene	111	98.7	89	(47-114)
Indeno[1,2,3-c,d] pyrene	111	102	92	(49-130)
Naphthalene	111	82.5	74	(38-111)
Phenanthrene	111	98.5	89	(49-113)
Pyrene	111	97.1	87	(55-117)
Surrogates				
2-Fluorobiphenyl (surr)	22.2	94.5	95	(46-115)
Terphenyl-d14 (surr)	22.2	104	104	(58-133)

Batch Information

Analytical Batch: **XMS10085**
Analytical Method: **8270D SIM (PAH)**
Instrument: **SVA Agilent 780/5975 GC/MS**
Analyst: **S.G**

Prep Batch: **XXX37487**
Prep Method: **SW3550C**
Prep Date/Time: **06/05/2017 13:25**
Spike Init Wt./Vol.: 111 ug/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

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

Matrix Spike Summary

Original Sample ID: 1172925009
MS Sample ID: 1388496 MS
MSD Sample ID: 1388497 MSD

Analysis Date: 06/06/2017 3:45
Analysis Date: 06/06/2017 4:06
Analysis Date: 06/06/2017 4:26
Matrix: Soil/Solid (dry weight)

QC for Samples: 1172880004

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

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	28.0U	125	116	93	125	116	92	43-111	0.09	(< 20)
2-Methylnaphthalene	28.0U	125	109	87	125	111	88	39-114	1.80	(< 20)
Acenaphthene	28.0U	125	144	114 *	125	145	116 *	44-111	1.50	(< 20)
Acenaphthylene	28.0U	125	115	92	125	115	92	39-116	0.04	(< 20)
Anthracene	28.0U	125	118	94	125	119	95	50-114	0.74	(< 20)
Benzo(a)Anthracene	28.0U	125	120	95	125	122	97	54-122	1.80	(< 20)
Benzo[a]pyrene	28.0U	125	99.1	79	125	99.3	79	50-125	0.19	(< 20)
Benzo[b]Fluoranthene	28.0U	125	109	87	125	115	92	53-128	5.10	(< 20)
Benzo[g,h,i]perylene	28.0U	125	62.8	50	125	64.2	51	49-127	2.20	(< 20)
Benzo[k]fluoranthene	28.0U	125	99.3	79	125	99.1	79	56-123	0.23	(< 20)
Chrysene	28.0U	125	130	104	125	136	108	57-118	3.70	(< 20)
Dibenzo[a,h]anthracene	28.0U	125	73.1	58	125	73.8	59	50-129	0.88	(< 20)
Fluoranthene	28.0U	125	123	99	125	128	101	55-119	2.90	(< 20)
Fluorene	28.0U	125	119	95	125	122	98	47-114	3.10	(< 20)
Indeno[1,2,3-c,d] pyrene	28.0U	125	66.6	53	125	67.5	54	49-130	1.20	(< 20)
Naphthalene	22.4U	125	103	82	125	104	83	38-111	0.68	(< 20)
Phenanthrene	28.0U	125	122	98	125	124	99	49-113	1.70	(< 20)
Pyrene	28.0U	125	130	104	125	134	107	55-117	3.20	(< 20)
Surrogates										
2-Fluorobiphenyl (surr)		125	120	96	125	121	96	46-115	0.66	
Terphenyl-d14 (surr)		125	131	105	125	133	107	58-133	2.00	

Batch Information

Analytical Batch: XMS10087
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: S.G
Analytical Date/Time: 6/6/2017 4:06:00AM

Prep Batch: XXX37487
Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
Prep Date/Time: 6/5/2017 1:25:09PM
Prep Initial Wt./Vol.: 22.53g
Prep Extract Vol: 5.00mL

Print Date: 07/13/2017 10:29:27AM

Method Blank

Blank ID: MB for HBN 1760376 [XXX/473812
Blank] aL ID: 14bQ864

Mairxd: (aisr ymwrfagst hff)t RrownuU

CS for map els, :
1178bb000Qt 1178bb0010t 1178bb0011

Os, wli, LP **AK102**

. arap sisr	Os, wli,	] GC/S]	D]	c nxi,
Dxs, sl OanKs GrKanxg,	0)400c	0)600	0)1b0	p K/]
Surrogates				
3a 5nuro, ians y, wrrU	Q0)3	60A180		-

Batch Information

5nalPrxgal Baig% XFS1491b
5nalPrxgal Msi%ou: 5T108
In, irwp sni: 5Kxtsni 7bQDB O
5nalP, i: TMD
5nalPrxgal Dais/Wp s: 6/11/8017 9:40:00. M

. rse Baig% XXX47381
. rse Msi%ou: m(4380S
. rse Dais/Wp s: 6/b/8017 b:37:135M
. rse Inxixal (i)/Vol): 830 p]
. rse hdiragi Vol: 1 p]

. rxni Dais: 07/14/8017 10:8Q8b5M

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172880 [VVVX73216
Blank Spike La4 ID: 1X8] 2b9
Date Analyzed: 0b/11/2017 1b:X]

Spike Duplicate ID: LCSD for HBN 1172880 [VVVX73216
Spike Duplicate La4 ID: 1X8] 2b3
s atriM x ater WSurface(, ffE . roundG

g C for SaP pleR 117288000] (1172880010(1172880011

5 eRultR4y **AK102**

		Blank Spike WP %LG			Spike Duplicate WP %LG				
) araP eter	Spike	5 eRult	5 ec WhG	Spike	5 eRult	5 ec WhG	CL	5) D WhG	5) D CL
DieRel 5 an%e Qr%anicR	20	17E	83	20	17E	87	W73C123 G	1E70	W 20 G
Surrogates									
3a AndroRtane WRurrG	0E9	]] E5	100	0E9	10X	10X	Wb0C120 G	XE50	

Batch Information

Analytical Batc<: **XFC13418**
Analytical s et<od: **AK102**
InRtruP ent: **Agilent 7890B R**
AnalyRt: **KMD**

) rep Batc<: **XXX37521**
) rep s et<od: **SW3520C**
) rep Date/hiP e: **06/08/2017 08:57**
Spike Init x tE TolE 20 P %L , Mract Tol: 1 P L
Dupe Init x tE TolE 20 P %L , Mract Tol: 1 P L

Method Blank

Blank ID: MB for HBN 1760376 [XXX/473812
Blank] aL ID: 14bQ864

Mairxd: (aisr ymwrfagst hff)t RrownuU

CS for map els, :
1178bb000Qt 1178bb0010t 1178bb0011

Os, wli, LP **AK103**

. arap sisr	Os, wli,	] GC/S]	D]	c nxi,
Os, xuwal OanKs GrKanxg,	0)830c	0)300	0)130	p K/]
Surrogates				
n5Anxagonians5u68 y, wrrU	Q7)8	605180		-

Batch Information

%nalPrxgal BaigF: X9S14T1b
%nalPrxgal MsiFou: %WI04
In, irwp sni: %Kxtsni 7bQDB O
%nalP, i: WMD
%nalPrxgal Dais/Axp s: 6/11/8017 T:40:00. M

. rse BaigF: XXX47381
. rse MsiFou: m(4380S
. rse Dais/Axp s: 6/b/8017 b:37:13%M
. rse Inxixal (i)/Vol): 830 p]
. rse hdiragi Vol: 1 p]

. rxni Dais: 07/14/8017 10:8Q41%M

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172880 [VVVX73216
Blank Spike La4 ID: 1X8] 2b9
Date Analyzed: 0b/11/2017 1b:X]

Spike Duplicate ID: LCSD for HBN 1172880 [VVVX73216
Spike Duplicate La4 ID: 1X8] 2b3
s atriM x ater WSurface(, ffE(. roundG

g C for SaP pleR 117288000] (1172880010(1172880011

5 eRultR4y **AK102**

	Blank Spike WP %LG			Spike Duplicate WP %LG					
) araP eter	Spike	5 eRult	5 ec WhG	Spike	5 eRult	5 ec WhG	CL	5) D WhG	5) D CL
5 eRdual 5 an%e Qr%anicR	20	18E7	] X	20	1] E0	] 3	Wb0C120 G	2E00	W 20 G
Surrogates									
nC<riacontaneOdb2 WRurrG	0E9	] 3E	] 3	0E9	] 9E	] 9	Wb0C120 G	1E00	

Batch Information

Analytical Batch: **XFC12314**
Analytical s ethod: **AK102**
InRtruP ent: **Agilent 8470B 9**
AnalyRt: **KRM**

) rep Batch: **XXX28D51**
) rep s ethod: **SW2D50C**
) rep Date/<iP e: **06/04/5018 04:D8**
Spike Init x tE/ToIE 20 P %L , Mract Tol: 1 P L
Dupe Init x tE/ToIE 20 P %L , Mract Tol: 1 P L

) rint Date: 07/1X/2017 10:2] :X2As

Method Blank

Blank ID: MB for HBN 17603[6 X / / 4[78612
Blank] aL ID: 1[30[b[

Mairxd: Soxl4SolX(y(rwg exh) iR

QC for Samples:
117b, , 0001t 117b, , 000bt 117b, , 000[t 117b, , 0008t 117b, , 0006

uesUlis Lw **AK102**

carameier	uesUlis	]PQ4C]	D]	Onxis
DuP SxbGa . el	10k0O	b0k0	6kb0	mh45h
Surrogates				
8a An(rosiane ysUrrR	, b	70-1b8		%

Batch Information

AnalwixGal BaiG) : / FC1[9[9
AnalwixGal Mei) o(: A510b
InsirUmeni: Ahxleni 7, 30B F
Analwsi: FDu
AnalwixGal Daie4Txme: 64164b017 6:b6:00cM

crep BaiG) : / / / [7861
crep Mei) o(: SW[880C g4S. CleanUp
crep Daie4Txme: 641[4b017 10:b0:09AM
crep Inxixal Wik4VolK [0 h
crep EdiraG Vol: 1 m]

crxni Daie: 0741[4b017 10:b3:[9AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172880 [VVVX73614
Blank Spike La] ID: 1Xb0X29
Date Analyzed: 06/16/2017 18:X3

Spike Duplicate ID: LCSD for HBN 1172880 [VVVX73614
Spike Duplicate La] ID: 1Xb0X23
s atriM Soil/Solid xdry Wei(, tE

mC for SaGpleR 1172880001%1172880002%117288000X%1172880003%1172880006

5eRultR] y **AK102**

	Blank Spike xG(/P(E			Spike Duplicate xG(/P(E					
. araGeter	Spike	5eRult	5ecx) E	Spike	5eRult	5ecx) E	CL	5. Dx) E	5. D CL
D5g Silica Qel	167	192	83	167	1X3	81	x70C123 E	3<20	x- 20 E
Surrogates									
3a AndroRtane xRurrE	X<XX	bb<7	100	X<XX	bb<3	100	x70C123 E	0<13	

Batch Information

Analytical Batc, : **XFC13939**
Analytical s et, od: **AK102**
InRtruGent: **Agilent 78D0B F**
AnalyRt: **FR4**

. rep Batc, : **XXX37W51**
. rep s et, od: **Sw3WW0C / GS6 Cleanup**
. rep Date/hiGe: **05C13C2017 10:20**
Spike Init T t<vol< 167 G(/P(KMract vol: 1 GL
Dupe Init T t<vol< 167 G(/P(KMract vol: 1 GL

Method Blank

Blank ID: MB for HBN 17603[6 X / / 4[78612
Blank] aL ID: 1[30[b[

Mairxd: Soxl4SolX(y(rwg exh) iR

QC for Samples:
117b, , 0001t 117b, , 000bt 117b, , 000[t 117b, , 0008t 117b, , 0006

uesUlis Lw**AK103**

carameier	uesUlis	]PQ4C]	D]	Onxis
uuP SxbGa . el	10K0O	b0K0	6Kb0	mh45h
Surrogates				
nA rxaGonianeA(6b ysUrrR	38	70A1b8		%

Batch Information

FnalwixGal BaiG) : / 9C1[T[T
FnalwixGal Mei) o(: F510[
InsirUmeni: Fhxleni 7, 30B 9
Fnalwsi: 9Du
FnalwixGal Daie4 xme: 64164b017 6:b6:00cM

crep BaiG) : / / / [7861
crep Mei) o(: SW[880C g 4S. CleanUp
crep Daie4 xme: 641[4b017 10:b0:0TFM
crep Inxixal WiK4VolK [0 h
crep EdiraG Vol: 1 m]

crxni Daie: 0741[4b017 10:b3:[7FM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172880 [VVVX73614
Blank Spike La] ID: 1Xb0X29
Date Analyzed: 06/16/2017 18:X3

Spike Duplicate ID: LCSD for HBN 1172880 [VVVX73614
Spike Duplicate La] ID: 1Xb0X23
s atriM Soil/Solid xdry Wei(, tE

mC for SaGpleR 1172880001%1172880002%1728800X%1172880003%1172880006

5eRultR] y **AK102**

	Blank Spike xG(/P(E			Spike Duplicate xG(/P(E					
. araGeter	Spike	5eRult	5ecx) E	Spike	5eRult	5ecx) E	CL	5. Dx) E	5. D CL
55g Silica Qel	167	130	b0	167	196	88	x70C123 E	2<X0	x- 20 E
Surrogates									
n0riacontaneQ162 xRurrE	X<XX	106	106	X<XX	b0<9	b0	x70C123 E	13<b0	

Batch Information

Analytical Batc, : **XFC12323**
Analytical s et, od: **AK102**
InRtruGent: **Agilent 9780B F**
AnalyRt: **FDR**

. rep Batc, : **XXX294Wl**
. rep s et, od: **S5 2440C w/SG Cleanup**
. rep Date/hiGe: **0W12/6019 10:60**
Spike Init T t<vol< 167 G(/P(KMract vol: 1 GL
Dupe Init T t<vol< 167 G(/P(KMract vol: 1 GL

Method Blank

Blank ID: MB for HBN 17603[7 X / / 4[7862]
Blank Lab ID: 1[30[26

Mairxd: Soxl4SolX(y(rwg exh) iR

QC for Samples:
1172, , 0001t 1172, , 0002t 1172, , 000[t 1172, , 0008t 1172, , 0006

u esUlis bw **AK102**

carameier	uesUlis	LPQ4CL	DL	Onxis
Dxesel u anhe PrhanxGs	20k0O	. 0k0	12K.	mh45h
Surrogates				
8a An(rosiane ysUrrR	101	60-120		%

Batch Information

AnalwixGal BaiG) : / FC1[. [6
AnalwixGal Mei) o(: A5102
InsirUmeni: Ahxleni 7, 30B u
Analwsi: 5MD
AnalwixGal Daie49xme: 64164 2017 6:06:00c M

crep BaiG) : / / / [7862
crep Mei) o(: ST [880C
crep Daie49xme: 641[42017 10:2[:[. AM
crep Inxixal T ik4WolK. [0 h
crep VdiraG- Wol: 2 mL

crxni Daie: 0741[42017 10:23:. 0AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172880 [VVVX73624
Blank Spike La] ID: 1Xb0X27
Da9e t nalAyez: 06d16d2017 18:16

Spike D/ pliua9e ID: LCSD for HBN 1172880 [VVVX73624
Spike D/ pliua9e La] ID: 1Xb0X28
Ra9is: SoildSoliz M1rAx eiW(9)

PC for Sa. ple5: 1172880001m1172880002m117288000Xm1172880003m1172880006

c e5/ l95] A AK102

Eara. e9er	Blank Spike M W0 W			Spike D/ pliua9e M W0 W					
	Spike	c e5/ l9	c eu M6,	Spike	c e5/ l9	c eu M6,	CL	c ED M6,	c ED CL
Die5el c anWe %rWaniu5	XXX	X66	110	XXX	X86	116	M73g123 ,	3C30	M020 ,
Surrogates									
3a t nzro59ane M5/ rr,	6C37	106	106	6C37	11X	11X	M60g120 ,	7C10	

Batch Information

t nalA9ual Ba9u(: **XFC13438**
t nalA9ual Re9(oz: **AK102**
In59/ . en9 **Agilent 79R0B M**
t nalA59 **KD5**

Erep Ba9u(: **XXX37W62**
Erep Re9(oz: **S6 3WW0C**
Erep Da9ed i. e: **08/13/2017 10:23**
Spike Ini9< 9Cnol: XXX . W0 W Ts9au9hol: 2 . L
D/ pe Ini9< 9Cnol: XXX . W0 W Ts9au9hol: 2 . L

Method Blank

Blank ID: MB for HBN 17603[7 X / / 4[7862]
Blank Lab ID: 1[30[26

Mairxd: Sox4SolX(y(rwg exh) iR

QC for Samples:
1172, , 0001t 1172, , 0002t 1172, , 000[t 1172, , 0008t 1172, , 0006

uesUlis bw **AK103**

carameier	uesUlis	LPQ4CL	DL	Onxis
uesx(Ual uanhe Prhanx Gs	20K0O	. 0K0	12K.	mh45h
Surrogates				
nA rxaGonianeA(62 ysUrrR	108	60A120		%

Batch Information

FnalwixGal BaiG) : / 9C1[. [6
FnalwixGal Mei) o(: F510[
InsirUmeni: Fhxleni 7, 30B u
Fnalwsi: 5MD
FnalwixGal Daie4 xme: 64164 2017 6:06:00c M

crep BaiG) : / / / [7862
crep Mei) o(: ST [880C
crep Daie4 xme: 641[4 2017 10:2[:[. FM
crep Inxixal T ik4WolK. [0 h
crep VdiraG Wol: 2 mL

crxni Daie: 0741[4 2017 10:23:. 8FM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172880 [VVVX73624
Blank Spike La] ID: 1Xb0X27
Da9e t nalAyez: 06d16d2017 18:16

Spike D/ pliua9e ID: LCSD for HBN 1172880 [VVVX73624
Spike D/ pliua9e La] ID: 1Xb0X28
Ra9ris: SoildSoliz MrAx eiW(9

PC for Sa. ple5: 1172880001m1172880002m117288000Xm1172880003m1172880006

c e5/ l95] A AK102

	Blank Spike M W) W			Spike D/ pliua9e M W) W					
Eara. e9er	Spike	c e5/ l9	c eu MG,	Spike	c e5/ l9	c eu MG,	CL	c ED MG,	c ED CL
c e5iz/ al c anWe %rWaniu5	XXX	X6X	10b	XXX	X83	116	M60g120 ,	30b0	MQ20 ,
Surrogates									
ng riauon9anegz62 M5/ rr,	6G7	102	102	6G7	112	112	M60g120 ,	8G70	

Batch Information

t nalA9ual Ba9u(: **XFC12324**
t nalA9ual Re9(oz: **AK102**
In59/ . en9 **Agilent 8790B R**
t nalA59 **KMD**

Erep Ba9u(: **XXX2854W**
Erep Re9(oz: **S6 2550C**
Erep Da9ed i. e: **04/12/W018 10:W2**
Spike Ini9< 9GholO XXX . W) W Ts9rau9hol: 2 . L
D/ pe Ini9< 9GholO XXX . W) W Ts9rau9hol: 2 . L

SGS

SGS North America Inc.
CHAIN OF CUSTODY RECORD

1172880

Locations Nationwide
laska Maryland
ew Jersey New York
orth Carolina Indiana
est 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: EMI

CONTACT: Aaron Acena PHONE #: 272-9336

PROJECT NAME: KWIG PIPELINE SPILL PROJECT #: 17841

REPORTS TO: aaron acena E-MAIL: aacena@emi-alaska.com

INVOICE TO: EMI QUOTE #: open P.O. #:

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Pres: Type: Comp Grab MI (Multi-incremental)	DRO/RRO (AK102/AK103)	PAH (8270D-SIM)	GRO/BTEX (AK101/8021B)	GRO/BTEX (AK101/8021B)	DRO/RRO (AK102/AK103) LV	REMARKS/ LOC ID
					Section 3	Preservative	None	None	MeOH+BFB	HCl	HCl	
(1) A-B	17841-BH01	5/31/17	1410	S	2	G	X		X			
(2) A-B	17841-BH02	5/31/17	1425	S	2	G	X		X			
(3) A-B	17841-BH03	5/31/17	1435	S	2	G	X		X			
(4) A-B	17841-BH04	5/31/17	1500	S	2	G	X	X	X			
(5) A-B	17841-BH05	5/31/17	1521	S	2	G	X		X			
(6) A-B	17841-BH06	5/31/17	1545	S	2	G	X		X			
(9) A-E	17841-TMW01	5/31/17	1600	GW	5	G				X	X	
(10) A-E	17841-TMW02	5/31/17	1632	GW	5	G				X	X	
(11) A-E	17841-TMW04	5/31/17	1633	GW	5	G				X	X	
(7) A-B	17841-BH04A	5/31/17	1510	S	2	G	X		X			

TB
(8) A
(12) A-C

Section 5

	Date	Time	
Relinquished By: (1)	6/2/17	811	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	6/2/17	08:30	Received For Laboratory By:

Section 4

DOD Project? Yes No

Data Deliverable Requirements:

Cooler ID:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 0.0 #130
or Ambient [ ]
(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)
INTACT BROKEN IF 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

http://www.sgs.com/terms-and-conditions

Hand Delivered

e-Sample Receipt Form

SGS Workorder #: 1172880

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	No	1F
COC accompanied samples?	Yes	
N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 0.0 °C Therm. ID: D30
		Cooler ID: @ °C Therm. ID:
		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	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
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)?	No	**Sample 3 time 14:38 on jar lid, 14:35 on COC. Sample 4 time 15:08 on lid, 15:05 on COC. Logged in following COC times.**
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	Yes	
	No	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	No	**Additional MeOH added to 2B-7B**
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)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	Yes	

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

Additional notes (if applicable):

Samples 2-7 consist of light vegetative matrix which soaked up most of the methanol. An additional vial of methanol was added at receipt, and logged in accordingly. VLP 6/2/17

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1172880001-A	No Preservative Required	OK			
1172880001-B	Methanol field pres. 4 C	OK			
1172880002-A	No Preservative Required	OK			
1172880002-B	2x Methanol field pres. 4 C	OK			
1172880003-A	No Preservative Required	OK			
1172880003-B	2x Methanol field pres. 4 C	OK			
1172880004-A	No Preservative Required	OK			
1172880004-B	2x Methanol field pres. 4 C	OK			
1172880005-A	No Preservative Required	OK			
1172880005-B	2x Methanol field pres. 4 C	OK			
1172880006-A	No Preservative Required	OK			
1172880006-B	2x Methanol field pres. 4 C	OK			
1172880007-A	No Preservative Required	OK			
1172880007-B	2x Methanol field pres. 4 C	OK			
1172880008-A	Methanol field pres. 4 C	OK			
1172880009-A	HCL to pH < 2	OK			
1172880009-B	HCL to pH < 2	OK			
1172880009-C	HCL to pH < 2	OK			
1172880009-D	HCL to pH < 2	OK			
1172880009-E	HCL to pH < 2	OK			
1172880010-A	HCL to pH < 2	OK			
1172880010-B	HCL to pH < 2	OK			
1172880010-C	HCL to pH < 2	OK			
1172880010-D	HCL to pH < 2	OK			
1172880010-E	HCL to pH < 2	OK			
1172880011-A	HCL to pH < 2	OK			
1172880011-B	HCL to pH < 2	OK			
1172880011-C	HCL to pH < 2	OK			
1172880011-D	HCL to pH < 2	OK			
1172880011-E	HCL to pH < 2	OK			
1172880012-A	HCL to pH < 2	OK			
1172880012-B	HCL to pH < 2	OK			
1172880012-C	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.

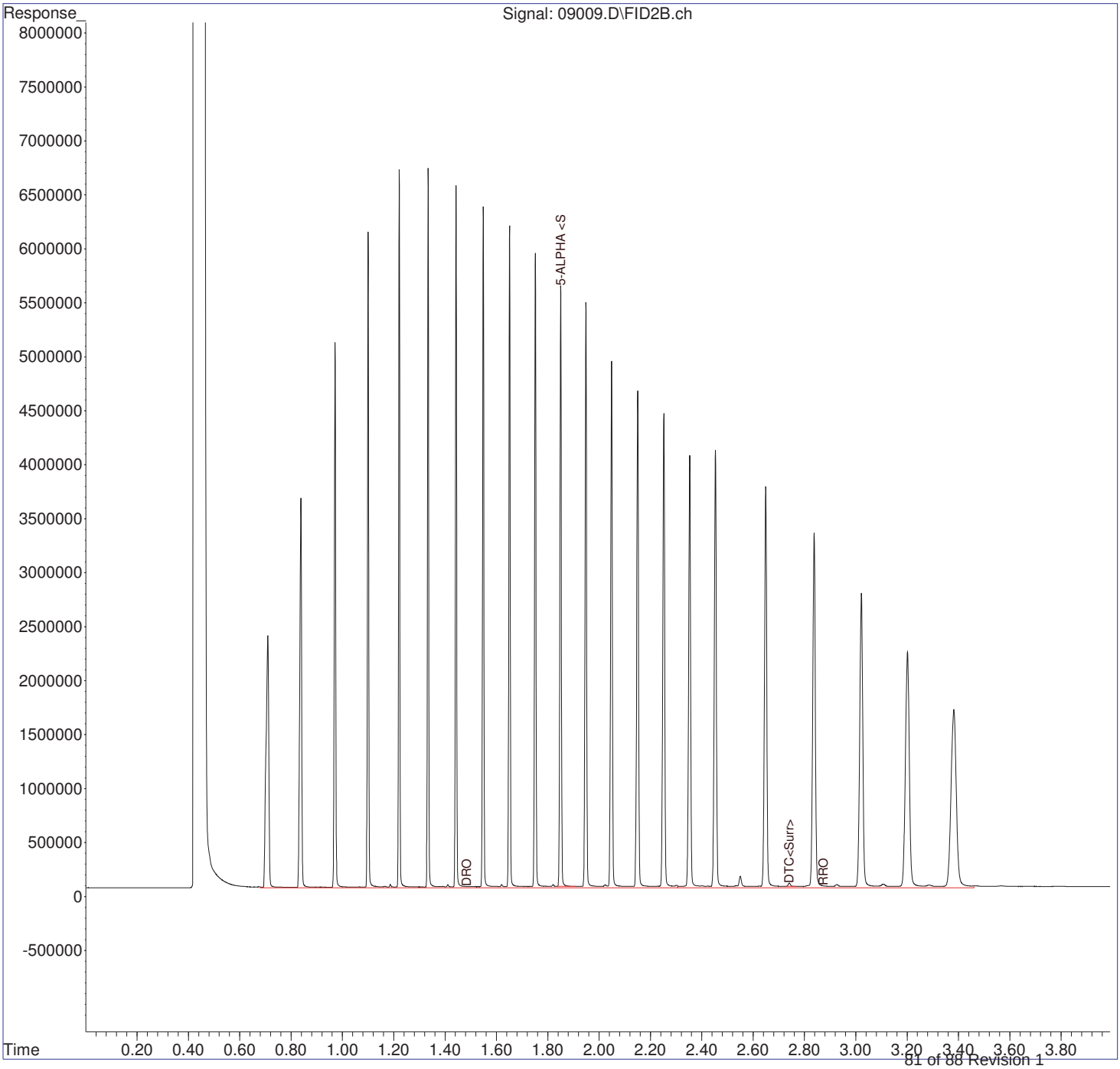
OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM- The container was received damaged.
FR- The container was received frozen and not usable for Bacteria or BOD analyses.
PA - The container was received outside 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.

CHROMATOGRAMS

Data Path : Z:\05\SF\DATA\050917.SEC\
Data File : 09009.D
Signal(s) : FID2B.ch
Acq On : 9 May 2017 10:30 am
Operator : FDR
Sample : NAS
Misc :
ALS Vial : 2 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: May 10 16:18:27 2017
Quant Method : Z:\05\SF\METHOD\SFR2017-0503A.M
Quant Title : DRO/RRO by Method AK 102/103
QLast Update : Wed May 03 16:37:44 2017
Response via : Initial Calibration
Integrator: ChemStation

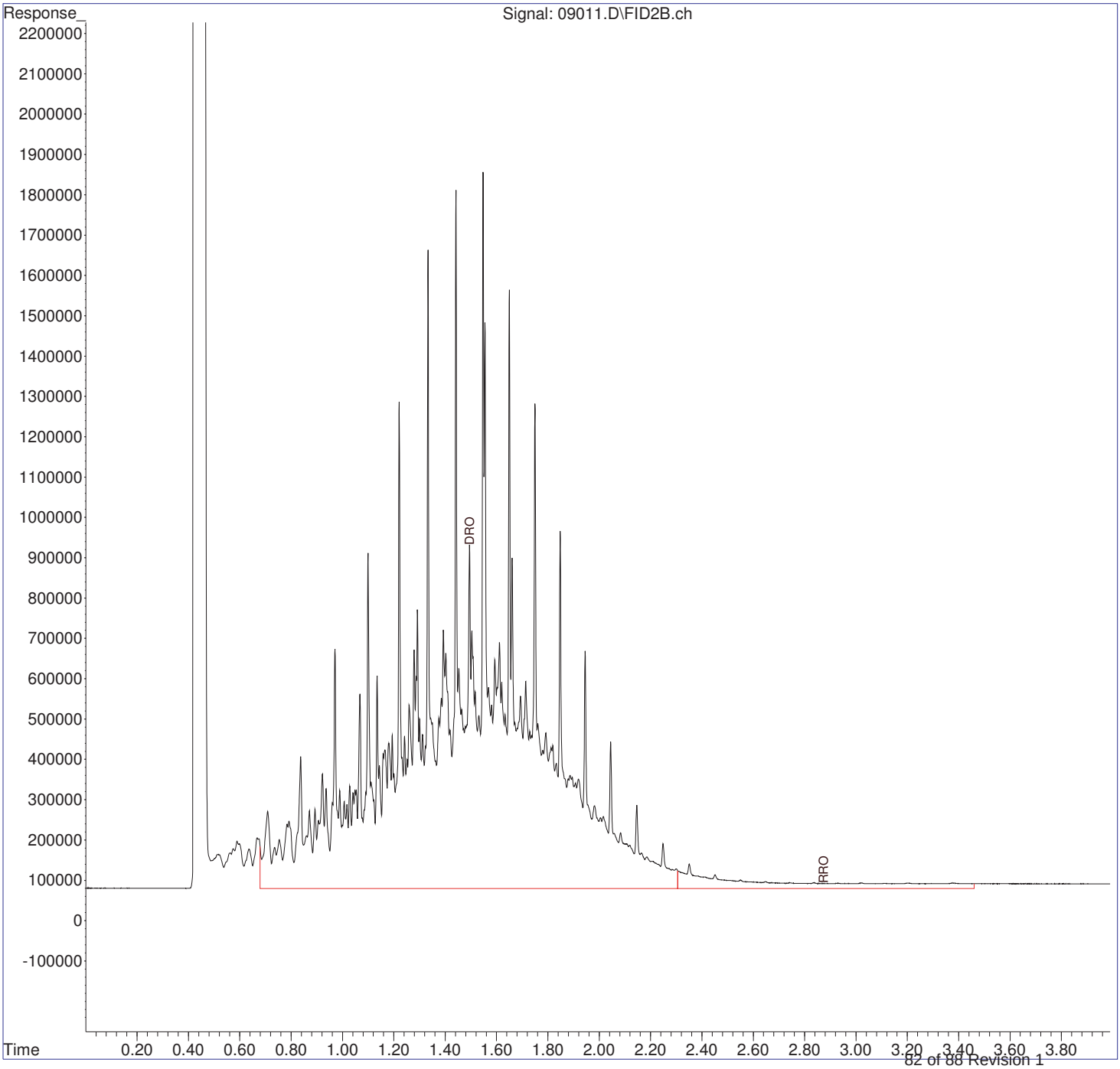
Volume Inj. :
Signal Phase :
Signal Info :



Data Path : Z:\05\SF\DATA\050917.SEC\
Data File : 09011.D
Signal(s) : FID2B.ch
Acq On : 9 May 2017 10:39 am
Operator : FDR
Sample : CCVB
Misc :
ALS Vial : 3 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: May 10 16:21:15 2017
Quant Method : Z:\05\SF\METHOD\SFR2017-0503A.M
Quant Title : DRO/RRO by Method AK 102/103
QLast Update : Wed May 03 16:37:44 2017
Response via : Initial Calibration
Integrator: ChemStation

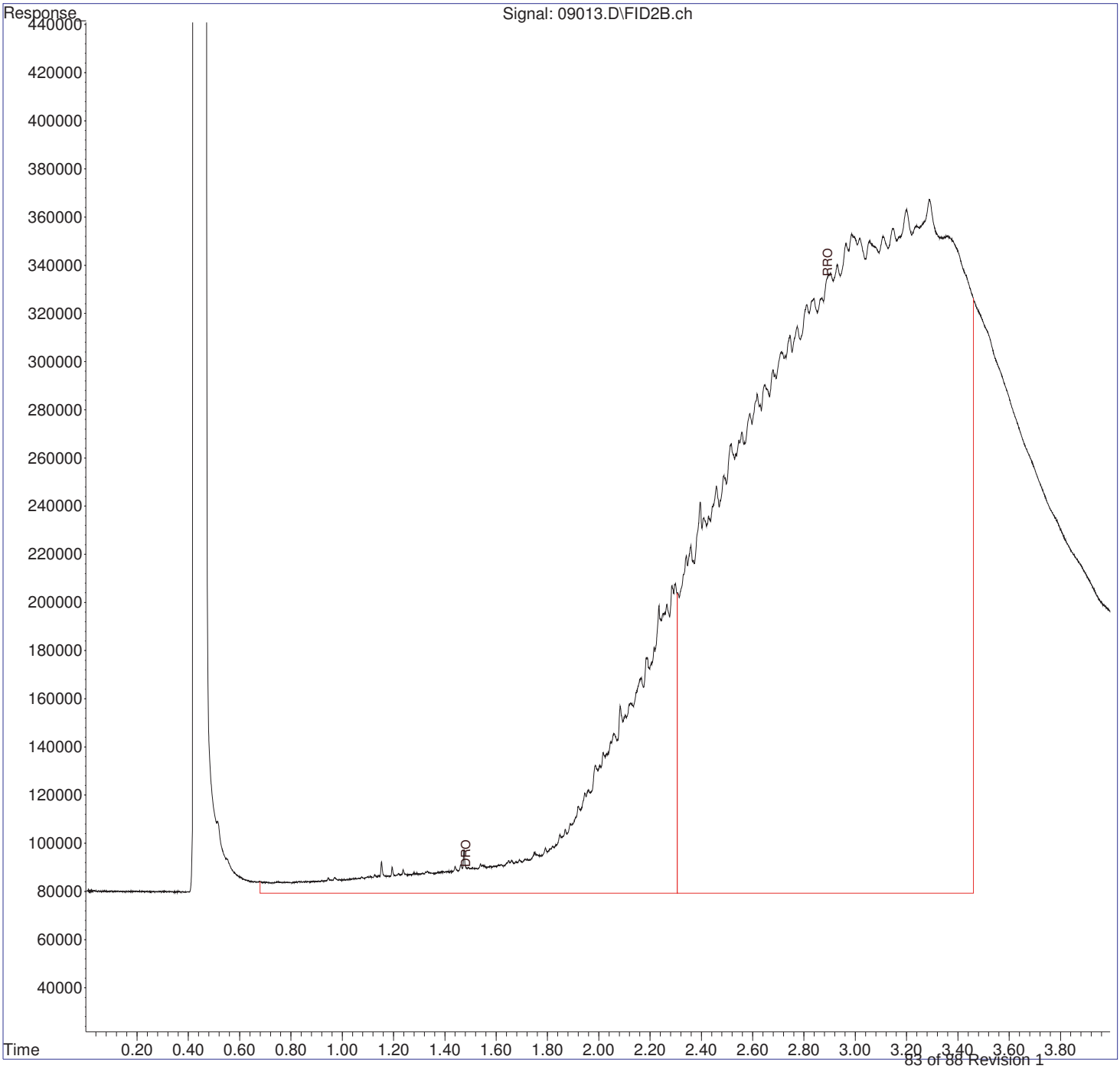
Volume Inj. :
Signal Phase :
Signal Info :



Data Path : Z:\05\SF\DATA\050917.SEC\
Data File : 09013.D
Signal(s) : FID2B.ch
Acq On : 9 May 2017 10:49 am
Operator : FDR
Sample : CCVR
Misc :
ALS Vial : 4 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: May 10 16:21:55 2017
Quant Method : Z:\05\SF\METHOD\SFR2017-0503A.M
Quant Title : DRO/RRO by Method AK 102/103
QLast Update : Wed May 03 16:37:44 2017
Response via : Initial Calibration
Integrator: ChemStation

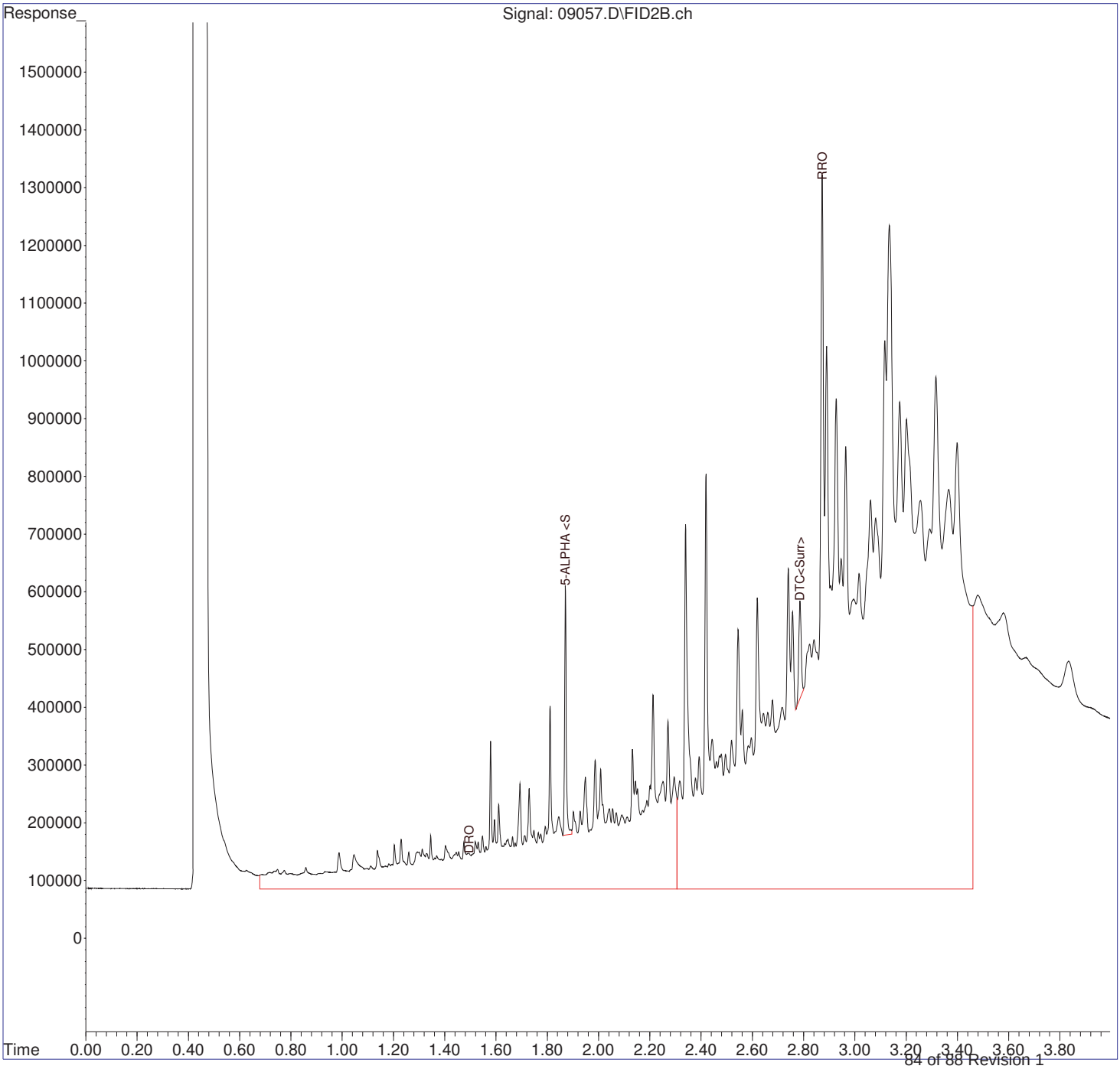
Volume Inj. :
Signal Phase :
Signal Info :



Data Path : Z:\05\SF\DATA\050917.SEC\
Data File : 09057.D
Signal(s) : FID2B.ch
Acq On : 9 May 2017 2:22 pm
Operator : FDR
Sample : 1172088001
Misc :
ALS Vial : 24 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: May 11 11:32:52 2017
Quant Method : Z:\05\SF\METHOD\SFR2017-0503A.M
Quant Title : DRO/RRO by Method AK 102/103
QLast Update : Wed May 03 16:37:44 2017
Response via : Initial Calibration
Integrator: ChemStation

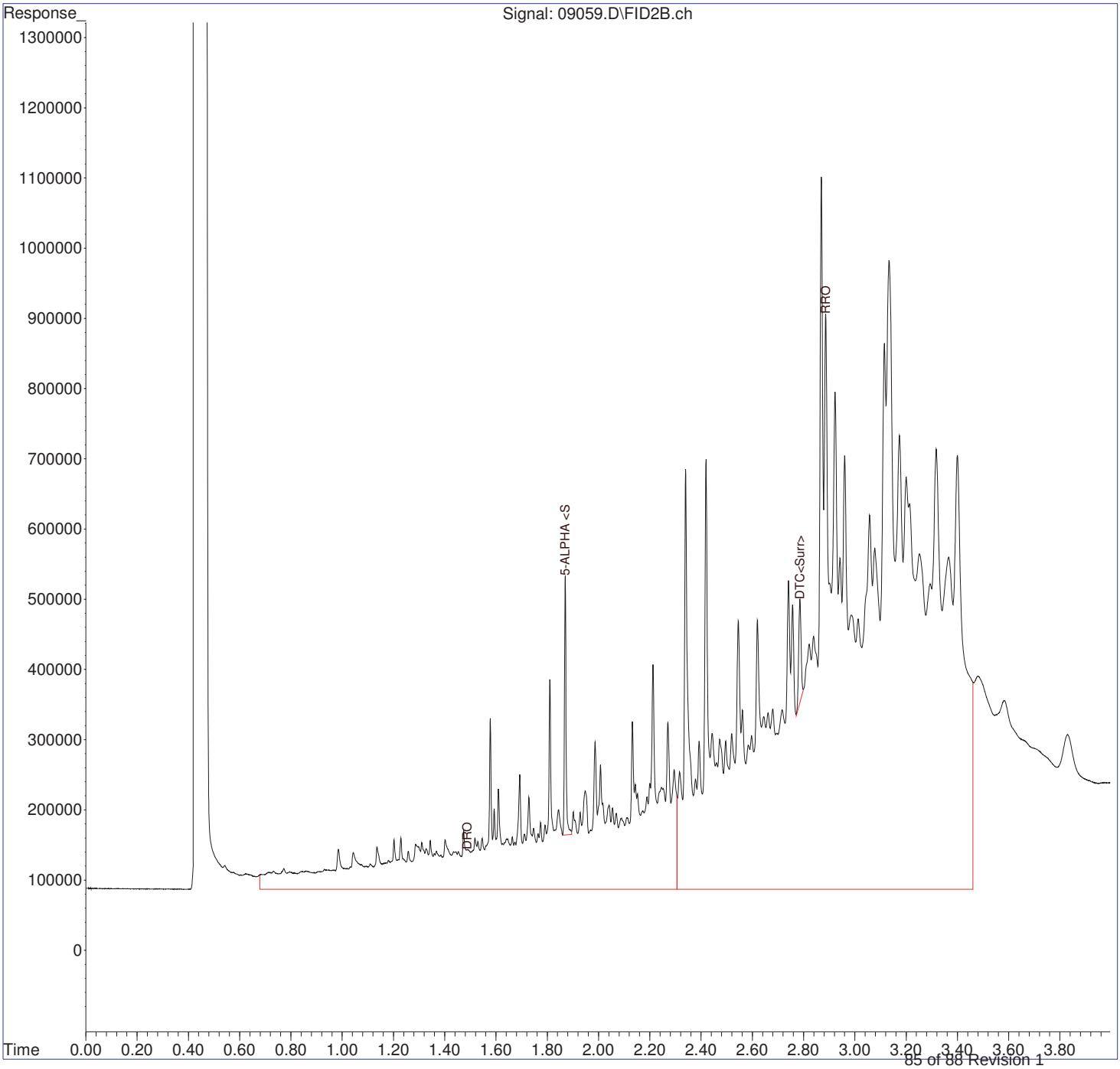
Volume Inj. :
Signal Phase :
Signal Info :



Data Path : Z:\05\SF\DATA\050917.SEC\
Data File : 09059.D
Signal(s) : FID2B.ch
Acq On : 9 May 2017 2:32 pm
Operator : FDR
Sample : 1172088002
Misc :
ALS Vial : 25 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: May 11 11:34:42 2017
Quant Method : Z:\05\SF\METHOD\SFR2017-0503A.M
Quant Title : DRO/RRO by Method AK 102/103
QLast Update : Wed May 03 16:37:44 2017
Response via : Initial Calibration
Integrator: ChemStation

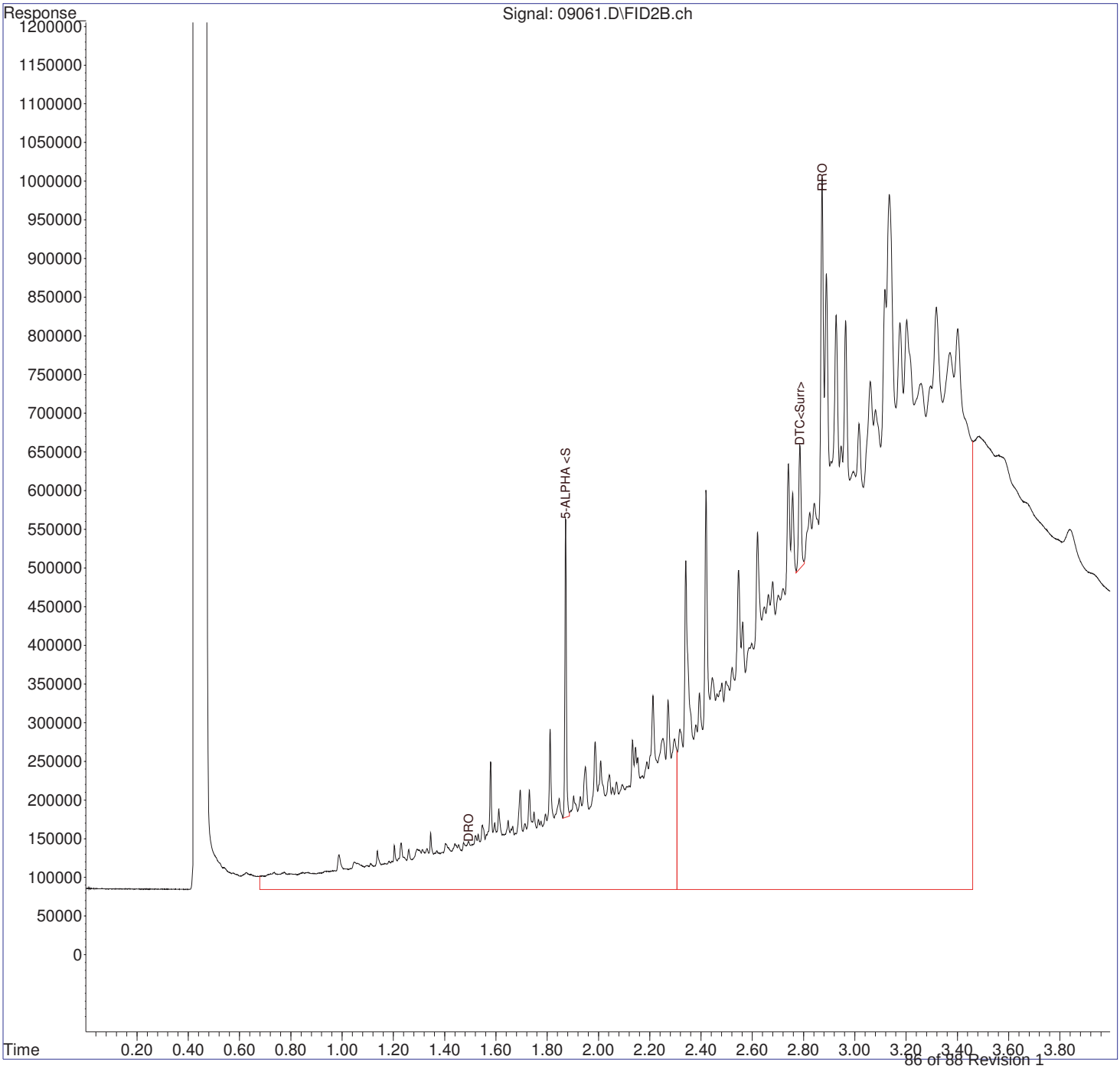
Volume Inj. :
Signal Phase :
Signal Info :



Data Path : Z:\05\SF\DATA\050917.SEC\
Data File : 09061.D
Signal(s) : FID2B.ch
Acq On : 9 May 2017 2:42 pm
Operator : FDR
Sample : 1172088003
Misc :
ALS Vial : 26 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: May 11 11:37:37 2017
Quant Method : Z:\05\SF\METHOD\SFR2017-0503A.M
Quant Title : DRO/RRO by Method AK 102/103
QLast Update : Wed May 03 16:37:44 2017
Response via : Initial Calibration
Integrator: ChemStation

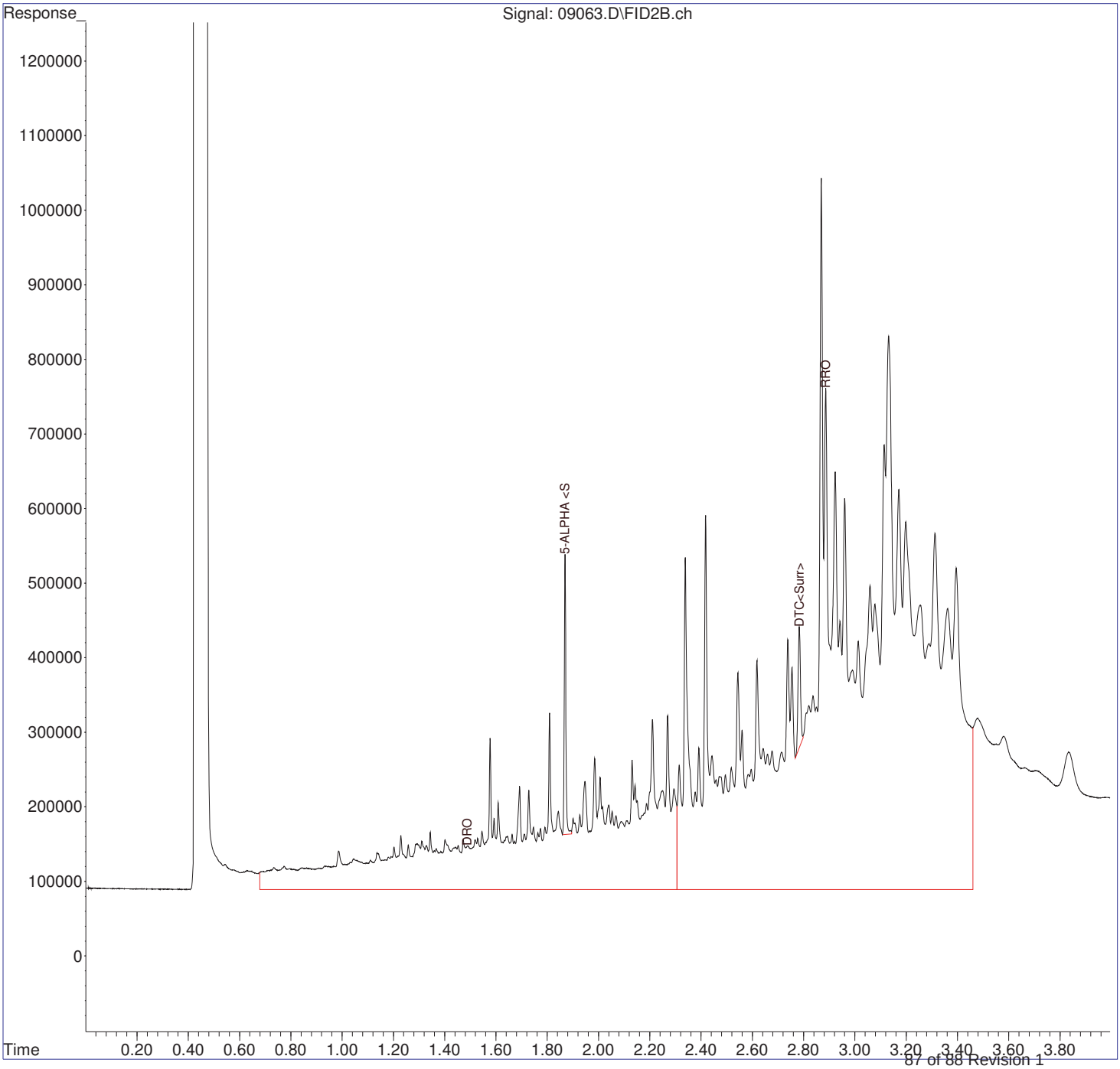
Volume Inj. :
Signal Phase :
Signal Info :



Data Path : Z:\05\SF\DATA\050917.SEC\
Data File : 09063.D
Signal(s) : FID2B.ch
Acq On : 9 May 2017 2:51 pm
Operator : FDR
Sample : 1172088004
Misc :
ALS Vial : 27 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: May 11 11:38:59 2017
Quant Method : Z:\05\SF\METHOD\SFR2017-0503A.M
Quant Title : DRO/RRO by Method AK 102/103
QLast Update : Wed May 03 16:37:44 2017
Response via : Initial Calibration
Integrator: ChemStation

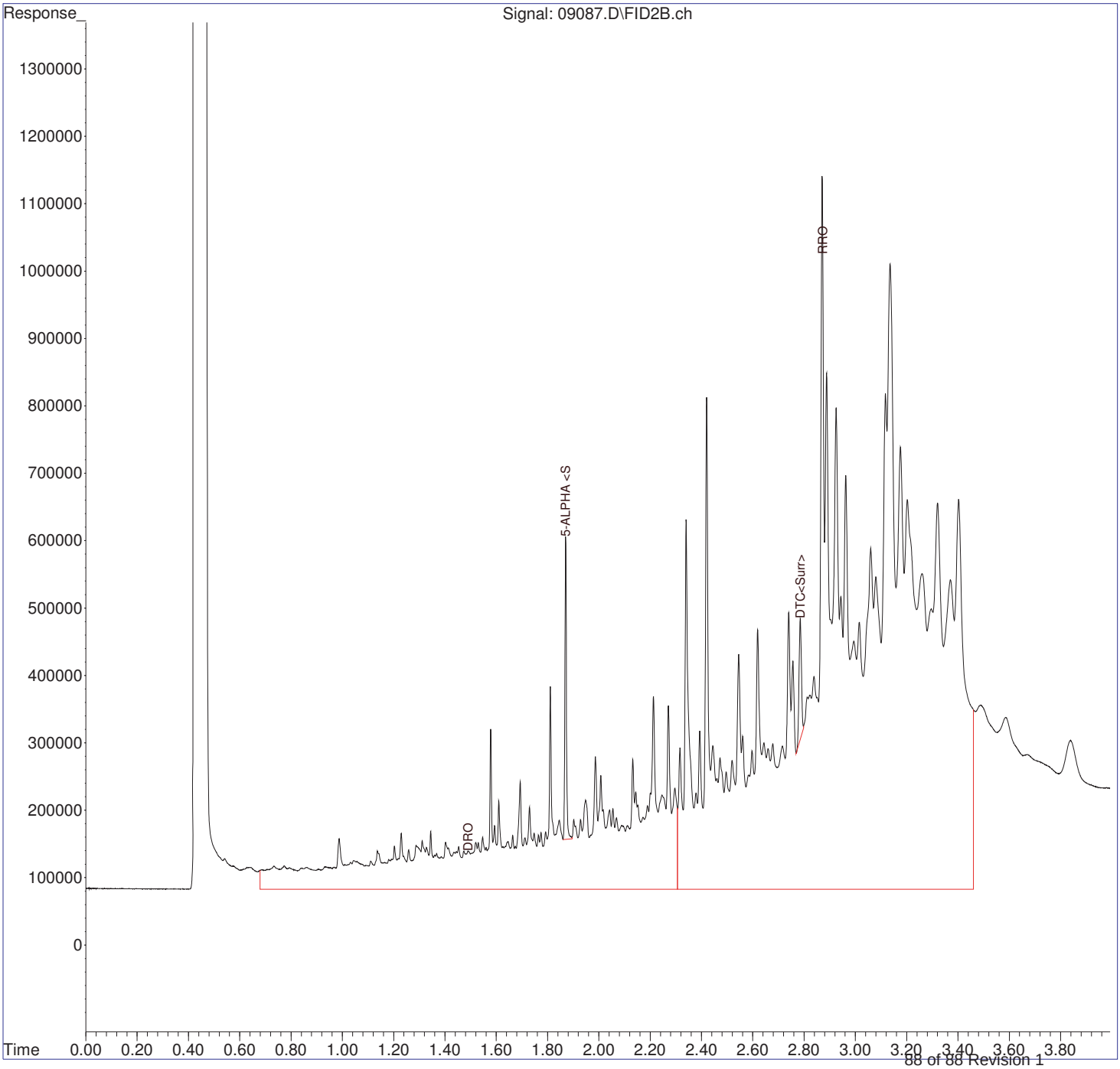
Volume Inj. :
Signal Phase :
Signal Info :



Data Path : Z:\05\SF\DATA\050917.SEC\
Data File : 09087.D
Signal(s) : FID2B.ch
Acq On : 9 May 2017 4:47 pm
Operator : FDR
Sample : 1172088005 4X
Misc :
ALS Vial : 37 Sample Multiplier: 4

Integration File: autoint1.e
Quant Time: May 11 11:51:26 2017
Quant Method : Z:\05\SF\METHOD\SFR2017-0503A.M
Quant Title : DRO/RRO by Method AK 102/103
QLast Update : Wed May 03 16:37:44 2017
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Laboratory Data Review Checklist

Completed By:

Aaron Acena

Title:

Environmental Scientist

Date:

7/13/17

CS Report Name:

Kwigillingok Pipeline Spill

Report Date:

7/13/17

Consultant Firm:

Environmental Management, Inc.

Laboratory Name:

SGS Laboratories

Laboratory Report Number:

1172880

ADEC File Number:

2425.38.003

Hazard Identification Number:

3381

1172880

1. Laboratory

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

   ◉ Yes ○ No Comments:

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

   ○ Yes ○ No Comments:

   NA samples not transferred.

2. Chain of Custody (CoC)

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

   ◉ Yes ○ No Comments:

   b. Correct Analyses requested?

   ◉ Yes ○ No Comments:

3. Laboratory Sample Receipt Documentation

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

   ◉ Yes ○ No Comments:

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

   ◉ Yes ○ No Comments:

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

   ◉ Yes ○ No Comments:

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

(•) Yes ( ) No Comments:

Additional MeOH added to soil samples due to high concentration of organics.

e. Data quality or usability affected?

Comments:

None.

4. Case Narrative

a. Present and understandable?

(•) Yes ( ) No Comments:

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

(•) Yes ( ) No Comments:

c. Were all corrective actions documented?

(•) Yes ( ) No Comments:

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

Comments:

The lab did not indicate the effect on data quality or usability.

5. Samples Results

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

(•) Yes ( ) No Comments:

b. All applicable holding times met?

(•) Yes ( ) No Comments:

c. All soils reported on a dry weight basis?

(•) Yes ( ) No Comments:

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

( ) Yes (•) No Comments:

LOQs are above cleanup levels for benzene in all soils samples and for DRO/DRO SG in one soil sample. This may be due to the high organic content in the samples.

e. Data quality or usability affected?

( ) Yes (•) No Comments:

Data is usable for characterization purposes.

6. QC Samples

a. Method Blank

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

(•) Yes ( ) No Comments:

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

(•) Yes ( ) No Comments:

iii. If above LOQ, what samples are affected?

Comments:

NA

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

( ) Yes ( ) No Comments:

NA

v. Data quality or usability affected?

Comments:

No.

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

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

(●) Yes ( ) No Comments:

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

( ) Yes ( ) No Comments:

NA, no metals/inorganics.

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

( ) Yes (●) No Comments:

Recovery is low for surrogates for DRO SG and RRO SG (62%). DRO SG and RRO SG results may be biased low.

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

( ) Yes (●) No Comments:

RPD for DRO SG and RRO SG do not meet lab QC criteria..

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

Comments:

All soils samples BH01 – BH06 and BH0A.

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

(●) Yes ( ) No Comments:

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

Comments:

No, data should be usable for characterization purposes.

c. Surrogates – Organics Only

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

(•) Yes ( ) No Comments:

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

( ) Yes (•) No Comments:

Recovery is low for BH01 AKA101. Results for that sample maybe biased low for GRO.

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

(•) Yes ( ) No Comments:

iv. Data quality or usability affected?

Comments:

No, data is usable for characterization purposes.

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

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

(•) Yes ( ) No Comments:

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

( ) Yes (•) No Comments:

Trip blank accompanied the cooler during the duration of the project but was left off the CoC.

iii. All results less than LOQ?

(•) Yes ( ) No Comments:

iv. If above LOQ, what samples are affected?

Comments:

NA

v. Data quality or usability affected?

Comments:

No.

e. Field Duplicate

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

(●) Yes ( ) No Comments:

ii. Submitted blind to lab?

(●) Yes ( ) No Comments:

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

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 Comments:

RPD for RRO, the only detectable analyte is 16%. DRO was detected in the sample and not the duplicate, although the LOC for the duplicate was close to the level DRO was detected at in the sample. (BH04: DRO = 273mg/kg BH0A (DUP): DRO = 234U)

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

Comments:

No, data appears valid.

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

( ) Yes ( ) No (●) Not Applicable

No decon/equipment blank.

1172880

i. All results less than LOQ?

○ Yes ○ No Comments:

NA

ii. If above LOQ, what samples are affected?

Comments:

NA

iii. Data quality or usability affected?

Comments:

No.

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

a. Defined and appropriate?

◉ Yes ○ No Comments: