



SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

ALASKA
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November 26, 2014

Alaska Department of Environmental Conservation
555 Cordova Street
Anchorage, Alaska 99501

Attn: Mr. Joshua Barsis

**RE: GROUNDWATER SAMPLING AND FREE-PRODUCT RECOVERY, FORMER
MARKAIR FACILITY, KING SALMON, ALASKA**

This letter report presents the results of Shannon & Wilson, Inc.'s (Shannon & Wilson) groundwater sampling and free-product recovery activities conducted at the Former MarkAir Facility located in King Salmon, Alaska. The project purpose was to evaluate contaminant trends in the groundwater and reduce the amount of free-phase product on the water table. A vicinity map of the area is included as Figure 1 and a site plan is included as Figure 2.

Authorization to proceed with the project was provided by the Alaska Department of Environmental Conservation (ADEC) in the form of Notice to Proceed Numbers 18803603019 and 18803603019B, dated April 10 and May 27, 2014, respectively. The work was conducted in accordance with our *Groundwater Sampling and Free Product Recovery Work Plan, Former MarkAir Facility, King Salmon, Alaska*, dated May 2014. The work plan was approved by Mr. Bill O'Connell of the ADEC in the form of an email dated May 22, 2014.

BACKGROUND

The former MarkAir facility is located on Lot 2, Block 1 of the King Salmon Airport. The facility is located on the western side of the runway apron, near the northwest end of the airport's northwest/southeast runway as shown on Figure 1. A building formerly utilized by MarkAir as a cargo and terminal facility is located at the site. A fuel tank farm was previously located on the unpaved southeastern portion of the property. A former fuel cabinet was present northeast of the building and a decommissioned buried fuel pipeline extends towards the former fuel storage area. Additional aboveground storage tanks (ASTs) and underground storage tanks (USTs) were located south and east of the terminal building. An approximately 1,000-gallon heating oil AST is present near the north corner of the terminal building. A site plan showing relevant site features and monitoring well locations is included as Figure 2.

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Impacted soil and groundwater has been documented at the former MarkAir facility and extends off-property towards the west/southwest. Between 2004 and 2009, Shannon & Wilson installed 21 groundwater monitoring wells (B1MW through B21MW) on and off-property. Free-phase petroleum product has been observed in on-property Monitoring Wells B4MW, B5MW, and B9MW, and in off-property Monitoring Wells B10MW and B11MW.

In January 2008, Shannon & Wilson installed passive product collection bailers in Monitoring Wells B4MW and B5MW and a passive skimmer in Monitoring Well B9MW. During product monitoring and recovery efforts conducted between 2008 and 2013, approximately 160 gallons of petroleum product were recovered from Monitoring Wells B4MW, B5MW, and B9MW, with most of the product generated from Monitoring Well B9MW.

FIELD ACTIVITIES

The field activities for this project included collecting groundwater samples, monitoring well repairs, measuring free-phase product, and free-phase product recovery. Field notes are included in Attachment 1.

Groundwater Sampling

Groundwater sampling was conducted on June 11 through 13, 2014. Sampling activities were initiated by measuring groundwater and total well depths from Monitoring Wells B12MW through B21MW. A down-hole dual-phase probe was used to collect the depth measurements and check for the presence of free-phase product. The probe was decontaminated using aalconox/water mixture and a water rinse prior to insertion in each well. Product was not encountered in Monitoring Wells B12MW through B21MW. The depths to groundwater in the monitoring wells are listed on Table 1.

Monitoring Wells B12MW through B21MW were purged and sampled using a low-flow technique, with a submersible pump with disposable vinyl tubing. Sampling was initiated by purging each well to reduce the effect of stagnant well casing water on chemical concentrations and to obtain groundwater samples that are representative of the surrounding water-bearing formation. A submersible pump was placed approximately 2 feet below the groundwater interface to avoid sediment disturbance. The pump rate was set at 0.2 liter per minute (L/min) with a goal of limiting the sustained water drawdown to a maximum of 4 inches. The drawdown was determined using an electronic water probe that was checked regularly throughout the purging/sampling process.

During the purging process, field personnel monitored water quality parameters (pH, conductivity, temperature, oxygen reduction potential [ORP], and turbidity) and purge volume.

When water quality parameters stabilized over three successive readings (pH within 0.1 unit, conductivity within 3 percent, temperature within 3 percent [minimum 0.2 degree Celsius], ORP within 10 millivolts [mV], and turbidity within 10 percent or three consecutive readings of less than 10 Nephelometric Turbidity Units [NTUs]) groundwater samples were collected. Analytical samples were collected in decreasing order of volatility by transferring water directly from the pump tubing into laboratory-supplied containers. The pump was decontaminated in between each well. Approximately 25 gallons of purgewater was generated and stored in a 55-gallon drum on site, pending disposal. Final water quality parameters are listed on Table 1.

Free-Product Recovery

Free-phase product recovery activities were conducted five times between June 14, 2013 and October 10, 2014. During each product recovery event, an oil/water interface probe was used to measure the depth to product and water. Product was removed from the wells containing measurable product by emptying the passive bailers or skimmers and bailing remaining product in the wells with disposable bailers. An attempt was made to minimize the amount of water recovered with the product during bailing, but water was unavoidably recovered with the product as the product thickness decreased during bailing. Measureable product was not encountered in Monitoring Wells B10MW and B11MW during the 2014 monitoring events. The product and water measurement data and volume of product/water mixture removed from the Former MarkAir Facility monitoring wells in 2014 are summarized in Table 3.

A total of approximately 36 gallons of product/water mixture were recovered from the monitoring wells in 2014, with most of the product generated from Well B9MW (35 gallons). The generated product/water mixture was temporarily stored on site in one 55-gallon drum.

Monitoring Well Repair

During groundwater sampling activities, Monitoring Well B21MW was repaired. The well was cut down 1.5 inches and a well monument cover was installed. No other well repairs were deemed necessary. During previous groundwater sampling events, Shannon & Wilson observed that the monument for Well B16MW was located beneath surface water. Therefore, our work plan included provisions to remove the water and/or repair the well. Surface water was not encountered, therefore, the well was not repaired during out June 2014 sampling event.

INVESTIGATION DERIVED WASTE

The two drums containing purgewater and product were transported to Anchorage on October 13, 2014 by Northern Air Cargo (NAC). Emerald Alaska, Inc. picked up the two drums on

October 14, 2014 and the contents were disposed/treated. Copies of the purgewater and product disposal receipts are included as Attachment 2.

LABORATORY ANALYSES

Ten groundwater samples were submitted to SGS North America Inc. (SGS) of Anchorage, Alaska using chain-of-custody procedures. Each groundwater sample was analyzed for diesel range organics (DRO) by Alaska Method (AK) 102 and benzene, toluene, ethylbenzene, and xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8021B. A trip blank accompanied the groundwater samples and was analyzed for BTEX by EPA Method 8021B.

DISCUSSION OF ANALYTICAL RESULTS

The reported contaminant concentrations in the groundwater samples were compared to the ADEC's groundwater cleanup levels listed in Table C of 18 AAC 75.345 (April 2012). The 2014 groundwater analytical results and cleanup levels are provided in Table 2. A summary of the historical groundwater results is included in Table 4. The laboratory report and the ADEC Laboratory Data Review Checklist are provided in Attachment 3.

Groundwater Sample Results

The sample collected from Monitoring Well B18MW contained a DRO concentration exceeding ADEC cleanup levels. Concentrations of benzene, toluene, ethylbenzene, and xylenes were also detected in Monitoring Well B18MW but at concentrations less than ADEC Table C cleanup levels. DRO was also detected in Monitoring Wells B17MW and B20MW at concentrations less than ADEC Table C cleanup levels. All other samples had non-detect results except for B21MW which contained an estimated concentration of toluene below ADEC cleanup levels.

Quality Assurance Summary

The project laboratory follows on-going quality assurance/quality control procedures to evaluate conformance to ADEC data quality objectives (DQOs). Internal laboratory controls to assess data quality for this project include surrogates, method blanks, and laboratory control sample/laboratory control sample duplicates (LCS/LCSD) to assess precision, accuracy, and matrix bias. If a DQO was not met, the project laboratory provides a brief narrative concerning the problem in the case narrative of their laboratory reports (see Attachment 3).

One water trip blank (Sample TB) accompanied the sample bottles from the laboratory to the site during sampling activities and back again to SGS. The trip blank did not contain detectable concentrations of BTEX.

Shannon & Wilson conducted a limited data assessment to review the laboratory's compliance with precision, accuracy, sensitivity, and completeness to the data quality objectives. Shannon & Wilson reviewed the SGS data deliverables and completed the ADEC's Laboratory Data Review Checklist, which is included in Attachment 3. No non-conformances that would adversely affect data usability were noted.

CONCLUSIONS

The June 2014 groundwater sample results are within the range of historical contaminant concentrations in the site wells. The plume appears stable and is not currently expanding further downgradient, based on the continued non-detect contaminant concentrations downgradient of the source area at B9MW.

Measurable free-product continues to be documented in Monitoring Wells B4MW, B5MW, and B9MW. Product was removed monthly from the wells with a disposable bailer from June to October 2014. Based on the similar level of product measured in these wells at the start of each recovery event, the current product removal method does not appear to be resulting in a measurable decrease in the free-product at the site. Since product has not been observed in Monitoring Wells B10MW and B11MW since 2012, we recommend including these wells in the next groundwater sampling event to better evaluate contamination plumes and concentrations.

CLOSURE/LIMITATIONS

This report was prepared for the exclusive use of our clients and their representatives in the study of this site. The findings we have presented within this report are based on the limited sampling and analyses that we conducted. They should not be construed as a definite conclusion regarding the site's groundwater conditions. It is possible that our tests missed higher levels, although our intention was to sample in accordance with our ADEC-approved work plan. Therefore, the sampling and analyses performed can provide you with only our professional judgment as to the environmental characteristics of this site, and in no way guarantees that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. The data presented in this report should be considered representative of the time of our sampling activities. Changes in site conditions can occur over time, due to natural forces or human activity. In addition, changes in government codes, regulations, or laws may occur. Because of such changes beyond our control, our observations and interpretations may need to be revised.

Shannon & Wilson has prepared the documents in Attachment 4, "Important Information About Your Geotechnical/Environmental Report", to assist you and others in understanding the use and limitations of our reports. You are advised that various state and federal agencies (ADEC, EPA, etc.) may require the reporting of this information. Shannon & Wilson does not assume the responsibility for reporting these findings and therefore has not, and will not, disclose the results of this study except with your permission or as required by law.

Copies of documents that may be relied upon by our client are limited to the printed copies (also known as hard copies) that are signed or sealed by Shannon & Wilson with a wet, blue ink signature. Files provided in electronic media format are furnished solely for the convenience of the client. Any conclusion or information obtained or derived from such electronic files shall be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, or you question the authenticity of the report please contact the undersigned.

We appreciate the opportunity to be of service. Please call Dan P. McMahon or the undersigned at (907) 561-2120 with questions or comments concerning this report.

Sincerely,

SHANNON & WILSON, INC.

Prepared by:



Jacob Tracy, E.I.T.
Environmental Engineer

Reviewed by:



Matthew Henry, P.E.
Vice President

Encl: Tables 1 through 4, Figures 1 and 2, and Attachments 1 through 4

**TABLE 1
GROUNDWATER SAMPLING LOG**

	Monitoring Well Number				
	B12MW	B13MW	B14MW	B15MW	B16MW
Water Level Measurement Data					
Date Water Level Measured	6/11/2014	6/11/2014	6/11/2014	6/11/2014	6/11/2014
Time Water Level Measured	15:35	15:45	15:59	15:54	19:00
Depth to Water Below MP, Feet	10.41	8.85	11.12	11.00	14.05
Purging/Sampling Data					
Date Sampled	6/12/2014	6/12/2014	6/12/2014	6/12/2014	6/13/2014
Time Sampled	16:55	15:42	14:29	13:20	10:05
Depth to Water Below MP, Feet	10.41	8.85	11.12	11.00	14.05
Total Depth of Well Below MP, Feet	19.42	14.90	19.20	19.96	19.99
Water Column in Well, Feet	9.01	6.05	8.08	8.96	5.94
Gallons per Foot	0.16	0.16	0.16	0.16	0.16
Gallons in Well	1.44	0.97	1.29	1.43	0.95
Total Gallons Pumped	1.25	1.0	1.3	1.5	1.0
Purging/Sampling Method	Submersible Pump	Submersible Pump	Submersible Pump	Submersible Pump	Submersible Pump
Diameter of Well Casing	2-inch	2-inch	2-inch	2-inch	2-inch
Water Quality Data at Time of Sampling*					
Temperature, °C	4.10	5.05	4.78	3.50	5.00
Specific Conductance, µS/cm	94	83	141	103	178
pH, standard units	6.39	6.14	6.58	6.47	6.13
Oxidation Reduction Potential, mV	225	220	107	234	204
Turbidity, NTU	16.9	8.92	7.54	6.35	1.31
Remarks					

Notes:

Water quality parameters were measured with YSI-556 and turbidimeter field meters.

- = not applicable or not measured

°C = degrees Celsius

µS/cm = microsiemens per centimeter

NTU = Nephthelometric Turbidity Unit

mV = millivolt

MP = measuring point

**TABLE 1
GROUNDWATER SAMPLING LOG**

	Monitoring Well Number				
	B17MW	B18MW	B19MW	B20MW	B21MW
Water Level Measurement Data					
Date Water Level Measured	6/11/2014	6/11/2014	6/11/2014	6/11/2014	6/11/2014
Time Water Level Measured	18:30	16:15	16:42	16:55	17:25
Depth to Water Below MP, Feet	11.35	13.55	16.85	13.98	10.33
Purging/Sampling Data					
Date Sampled	6/13/2014	6/13/2014	6/13/2014	6/13/2014	6/12/2014
Time Sampled	13:18	14:23	11:25	15:28	10:30
Depth to Water Below MP, Feet	11.35	13.55	16.85	13.98	10.33
Total Depth of Well Below MP, Feet	19.00	20.01	20.28	20.01	14.98
Water Column in Well, Feet	7.65	6.46	3.43	6.03	4.65
Gallons per Foot	0.16	0.16	0.16	0.16	0.16
Gallons in Well	1.22	1.03	0.55	0.96	0.74
Total Gallons Pumped	1.25	1.2	1.1	1.0	1.25
Purging/Sampling Method	Submersible	Submersible	Submersible	Submersible	Submersible
	Pump	Pump	Pump	Pump	Pump
Diameter of Well Casing	2-inch	2-inch	2-inch	2-inch	2-inch
Water Quality Data at Time of Sampling*					
Temperature, °C	4.96	6.01	6.07	6.29	3.90
Specific Conductance, µS/cm	498	1,160	205	123	213
pH, standard units	5.59	6.62	6.34	5.93	6.01
Oxidation Reduction Potential, mV	232	218	209	193	208
Turbidity, NTU	1.29	0.58	14.8	1.79	331
Remarks					

Notes:

Water quality parameters were measured with YSI-556 and turbidimeter field meters.

- = not applicable or not measured

mV = millivolt

°C = degrees Celsius

MP = measuring point

µS/cm = microsiemens per centimeter

NTU = Nephthelometric Turbidity Unit

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Parameter Tested	Method*	Cleanup Level (mg/L)**	Sample ID Number^ and Water Depth in Feet Below TOC (See Table 1 and Figure 2)					
			Monitoring Wells					
			B12MW 10.41	B13MW 8.85	B14MW 11.12	B15MW 11.00	B16MW 14.05	B17MW 11.35
Diesel Range Organics (DRO) - mg/L	AK 102	1.5	<0.625 B	<0.612 B	<1.01 B	<0.612 B	<0.310	1.36
Aromatic Volatile Organics (BTEX)								
Benzene - mg/L	EPA 8021B	0.005	<0.000250	<0.000250	<0.000250	<0.000250	<0.000250	<0.000250
Toluene - mg/L	EPA 8021B	1.0	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Ethylbenzene - mg/L	EPA 8021B	0.7	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Xylenes - mg/L	EPA 8021B	10	<0.00150	<0.00150	<0.00150	<0.00150	<0.00150	<0.00150

Notes:

- * = see Attachment 3 for compounds tested, methods, and laboratory reporting limits
- ** = groundwater cleanup levels are listed in Table C, 18 AAC 75.345 (April 2012)
- ^ = sample ID number preceded by "17490-" on the chain of custody form
- mg/L = milligrams per liter
- <0.000250 = analyte not detected; laboratory limit of detection of 0.000250 mg/L
- J = reported concentration is an estimate below the limit of quantitation. See laboratory report for more details.
- = not applicable or sample not tested for this analyte
- TOC = top of casing
- B = Analyte concentration potentially affected by method blank contamination.
See the ADEC Laboratory Data Review Checklist (LDRC) for details.

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Parameter Tested	Method*	Cleanup Level (mg/L)**	Sample ID Number^ and Water Depth in Feet Below TOC (See Table 1 and Figure 2)					Quality Control
			Monitoring Wells				TB Trip Blank	
			B18MW 13.55	B19MW 16.85	B20MW 13.98	B21MW 10.33		
Diesel Range Organics (DRO) - mg/L	AK 102	1.5	14.9	<0.313	0.412 J	<0.390	-	
Aromatic Volatile Organics (BTEX)								
Benzene - mg/L	EPA 8021B	0.005	0.00116	<0.000250	<0.000250	<0.000250	<0.000250	
Toluene - mg/L	EPA 8021B	1.0	0.000340 J	<0.000500	<0.000500	0.000350 J	<0.000500	
Ethylbenzene - mg/L	EPA 8021B	0.7	0.000510 J	<0.000500	<0.000500	<0.000500	<0.000500	
Xylenes - mg/L	EPA 8021B	10	0.00106 J	<0.00150	<0.00150	<0.00150	<0.00150	

Notes:

* = see Attachment 3 for compounds tested, methods, and laboratory reporting limits

** = groundwater cleanup levels are listed in Table C, 18 AAC 75.345 (April 2012)

^ = sample ID number preceded by "17490-" on the chain of custody form

mg/L = milligrams per liter

<0.000250 = analyte not detected; laboratory limit of detection of 0.000250 mg/L

14.9 = reported concentration exceeds the applicable ADEC cleanup level

J = reported concentration is an estimate below the limit of quantitation. See laboratory report for more details.

- = not applicable or sample not tested for this analyte

TOC = top of casing

**TABLE 3
SUMMARY OF 2012 AND 2014 PRODUCT RECOVERY DATA**

Monitoring Well Number	Date	Depth to Product below TOC (feet)	Depth to Water below TOC (feet)	Product Thickness (feet)	Product/Water Removed (gallons)	Remarks		
B4MW	5/14/2012	-	-	-	0	passive bailer frozen in well		
	5/25/2012	-	-	-	0			
	6/19/2012	17.21	20.66	3.45	3			
	7/5/2012	17.30	19.37	2.07	2			
	7/23/2012	16.86	17.30	0.44	1			
	8/6/2012	16.42	16.75	0.33	0.5			
	8/20/2012	16.17	16.21	0.04	0			
	9/6/2012	16.25	16.33	0.08	0			
	10/2/2012	15.12	15.20	0.08	0			
	10/25/2012	14.95	15.05	0.10	0.25			
	Total volume of product/water removed in 2012:						6.75	
	6/14/2014	16.65	17.09	0.44	0.25			
	7/9/2014	16.16	16.55	0.39	0.1			
	8/14/2014	16.01	16.15	0.14	0.1			
	9/17/2014	-	15.50	0.00	0.05			
	10/10/2014	-	15.45	0.00	0.05			
	Total volume of product/water removed in 2014:						0.55	
	B5MW	5/14/2012	16.98	18.44	1.46		1	
		5/25/2012	16.75	17.03	0.28		0.25	
6/19/2012		16.99	17.01	0.02	0.1			
7/5/2012		16.20	16.21	0.01	0.05			
7/23/2012		-	15.44	0.00	0			
8/6/2012		-	14.90	0.00	0			
8/20/2012		-	15.05	0.00	0			
9/6/2012		-	14.88	0.00	0			
10/2/2012		-	14.50	0.00	0			
10/25/2012		-	13.79	0.00	0			
Total volume of product/water removed in 2012:					1.4			
6/14/2014		15.90	15.97	0.07	0.2			
7/9/2014		15.92	16.00	0.08	0.1			
8/14/2014		15.95	16.00	0.05	0.1			
9/17/2014		13.75	13.78	0.03	0.1			
10/10/2014		13.80	13.82	0.02	0.05			
Total volume of product/water removed in 2014:					0.55			

Notes:

- TOC = top of casing
 - = not applicable or not measured

TABLE 3
SUMMARY OF 2012 AND 2014 PRODUCT RECOVERY DATA

Monitoring Well Number	Date	Depth to Product below TOC (feet)	Depth to Water below TOC (feet)	Product Thickness (feet)	Product/Water Removed (gallons)	Remarks	
B9MW	5/14/2012	26.33	30.80	4.47	7		
	5/25/2012	26.21	31.71	5.50	7.5		
	6/19/2012	26.45	31.71	5.26	6.5		
	7/5/2012	25.97	31.72	5.75	7.5		
	7/23/2012	25.82	31.72	5.90	8		
	8/6/2012	25.40	31.68	6.28	7.5		
	8/20/2012	25.60	31.70	6.10	7		
	9/6/2012	25.39	31.70	6.31	7.5		
	10/2/2012	24.68	31.66	6.98	7.5		
	10/25/2012	25.23	29.64	4.41	8		
	Total volume of product/water removed in 2012:					74	
	6/14/2014	26.31	31.85	5.54	7.5		
	7/9/2014	25.89	31.72	5.83	7		
	8/14/2014	25.91	31.72	5.81	7		
	9/17/2014	25.33	31.70	6.37	7		
	10/10/2014	25.22	31.55	6.33	7		
	Total volume of product/water removed in 2014:					35.5	
	B10MW	5/14/2012	-	17.29	0.00	0	
		5/25/2012	-	17.23	0.00	0	
6/19/2012		-	16.99	0.00	0		
7/5/2012		-	16.69	0.00	0		
7/23/2012		-	16.25	0.00	0		
8/6/2012		-	15.86	0.00	0		
8/20/2012		-	15.62	0.00	0		
9/6/2012		-	15.41	0.00	0		
10/2/2012		-	14.99	0.00	0		
10/25/2012		-	14.79	0.00	0		
Total volume of product/water removed in 2012:					0		
6/14/2014		-	16.49	0.00	0		
7/9/2014		-	16.03	0.00	0		
8/14/2014		-	15.89	0.00	0		
9/17/2014		-	15.40	0.00	0		
10/10/2014		-	15.19	0.00	0		
Total volume of product/water removed in 2014:					0		

Notes:

- TOC = top of casing
 - = not applicable or not measured

**TABLE 3
SUMMARY OF 2012 AND 2014 PRODUCT RECOVERY DATA**

Monitoring Well Number	Date	Depth to Product below TOC (feet)	Depth to Water below TOC (feet)	Product Thickness (feet)	Product/Water Removed (gallons)	Remarks	
B11MW	5/14/2012	14.43	15.71	1.28	1	installed passive bailer	
	5/25/2012	14.28	14.30	0.02	0.05		
	6/19/2012	13.90	13.92	0.02	0.05		
	7/5/2012	-	13.85	0.00	0		
	7/23/2012	-	13.04	0.00	0		
	8/6/2012	-	13.80	0.00	0		
	8/20/2012	-	-	-	-		passive bailer stuck in well
	9/6/2012	-	-	-	-		
	10/2/2012	-	12.90	0.00	0		passive bailer recovered
	10/25/2012	-	12.62	0.00	0		
	Total volume of product/water removed in 2012:					1.1	Possible thin layer of product on 6/14/2014
	6/14/2014	-	13.86	0.00	0		
	7/9/2014	-	14.36	0.00	0		
	8/14/2014	-	13.96	0.00	0		
	9/17/2014	-	13.54	0.00	0		
	10/10/2014	-	13.35	0.00	0		
Total volume of product/water removed in 2014:					0		

Notes:

- TOC = top of casing
 - = not applicable or not measured

TABLE 4
HISTORICAL GROUNDWATER ANALYTICAL RESULTS

Monitoring Well	Date	Depth to Water, Ft	Parameter Tested* and Cleanup Level** in mg/L				
			DRO 1.5	Benzene 0.005	Toluene 1.0	Ethylbenzene 0.7	Xylenes 10
B1MW	3/17/2004	21.19	9.85	0.00246	<0.00200	<0.00200	0.00331
	6/9/2004	22.06	15.2	0.000748	<0.00200	<0.00200	<0.00200
	5/18/2005	20.82	9.88	<0.00500	<0.0200	<0.0200	<0.0200
	10/6/2005	19.78	4.35	0.00271	<0.00200	<0.00200	<0.00200
	6/16/2006	21.25	7.09	0.00208	<0.00200	0.00287	<0.00200
	10/2/2006	20.83	9.70	0.00202	<0.00200	<0.00200	<0.00200
	8/19/2007	21.43	6.76	0.00292	<0.00200	<0.00200	<0.00200
B2MW	3/19/2004	28.15	19.9	0.155	<0.00200	0.00798	0.0111
	6/9/2004	28.34	32.3	0.229	0.00205	0.0518	0.0860
	5/17/2005	28.12	61.0	0.189	<0.0200	0.0322	0.0246
	10/6/2005	26.84	19.0	0.220	<0.00200	0.0351	0.0312
	6/16/2006	28.50	23.2	0.223	<0.0200	0.0398	0.0280
	10/2/2006	27.55	62.5	0.218	<0.00200	0.0439	0.0545
	8/15/2007	28.01	31.6	0.170	<0.0200	0.0393	0.0245
B3MW	3/19/2004	14.72	1.02	<0.000500	<0.00200	<0.00200	<0.00200
	6/9/2004	14.81	1.37	<0.000500	<0.00200	<0.00200	<0.00200
	5/17/2005	13.39	0.836	<0.000500	<0.00200	<0.00200	<0.00200
	10/6/2005	10.20	0.840	<0.000500	<0.00200	<0.00200	<0.00200
	6/17/2006	13.20	0.817	<0.000500	<0.00200	<0.00200	<0.00200
	10/2/2006	11.00	1.85	<0.000500	<0.00200	<0.00200	<0.00200
	8/17/2007	12.89	0.942	<0.000500	<0.00200	<0.00200	<0.00200
B6MW	3/20/2004	14.03	0.569	<0.000500	<0.00200	<0.00200	<0.00200
	6/9/2004	13.43	0.471	<0.000500	<0.00200	<0.00200	<0.00200
	5/17/2005	11.97	0.380	<0.000500	<0.00200	<0.00200	<0.00200
	10/6/2005	8.02	<0.330	<0.000500	<0.00200	<0.00200	<0.00200
	6/16/2006	11.69	2.22	<0.000500	<0.00200	<0.00200	<0.00200
	10/2/2006	9.30	<0.312	<0.000500	<0.00200	<0.00200	<0.00200
	8/17/2007	11.42	<0.300	<0.000500	<0.00200	<0.00200	<0.00200
B7MW	6/16/2006	17.25	6.43	0.00201	<0.00200	<0.00200	0.00807
	10/2/2006	16.53	19.5	0.00132	<0.00200	<0.00200	0.00417
	8/15/2007	17.60	9.24	0.000505	<0.00200	<0.00200	<0.00200
B8MW	6/16/2006	16.70	5.66	<0.000500	<0.00200	<0.00200	<0.00200
	10/2/2006	Could not locate					
B10MW	6/16/2006	16.79	21.0	0.0186	<0.00200	0.00749	0.00511
	10/2/2006	15.33	30.2	0.0116	<0.00200	0.0335	0.00273
B11MW	6/16/2006	13.29	1.10	0.0275	<0.00200	0.00936	0.00755
	10/2/2006	11.60	4.71	0.00536	<0.00200	0.0798	0.0628
B12MW	8/18/2007	9.63	<0.300	<0.000500	<0.00200	<0.00200	<0.00200
	8/18/2011	9.26	<0.376	<0.000300	<0.000620	<0.000620	<0.00186
	6/12/2014	10.41	<0.625 B	<0.000250	<0.000500	<0.000500	<0.00150

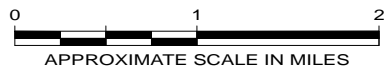
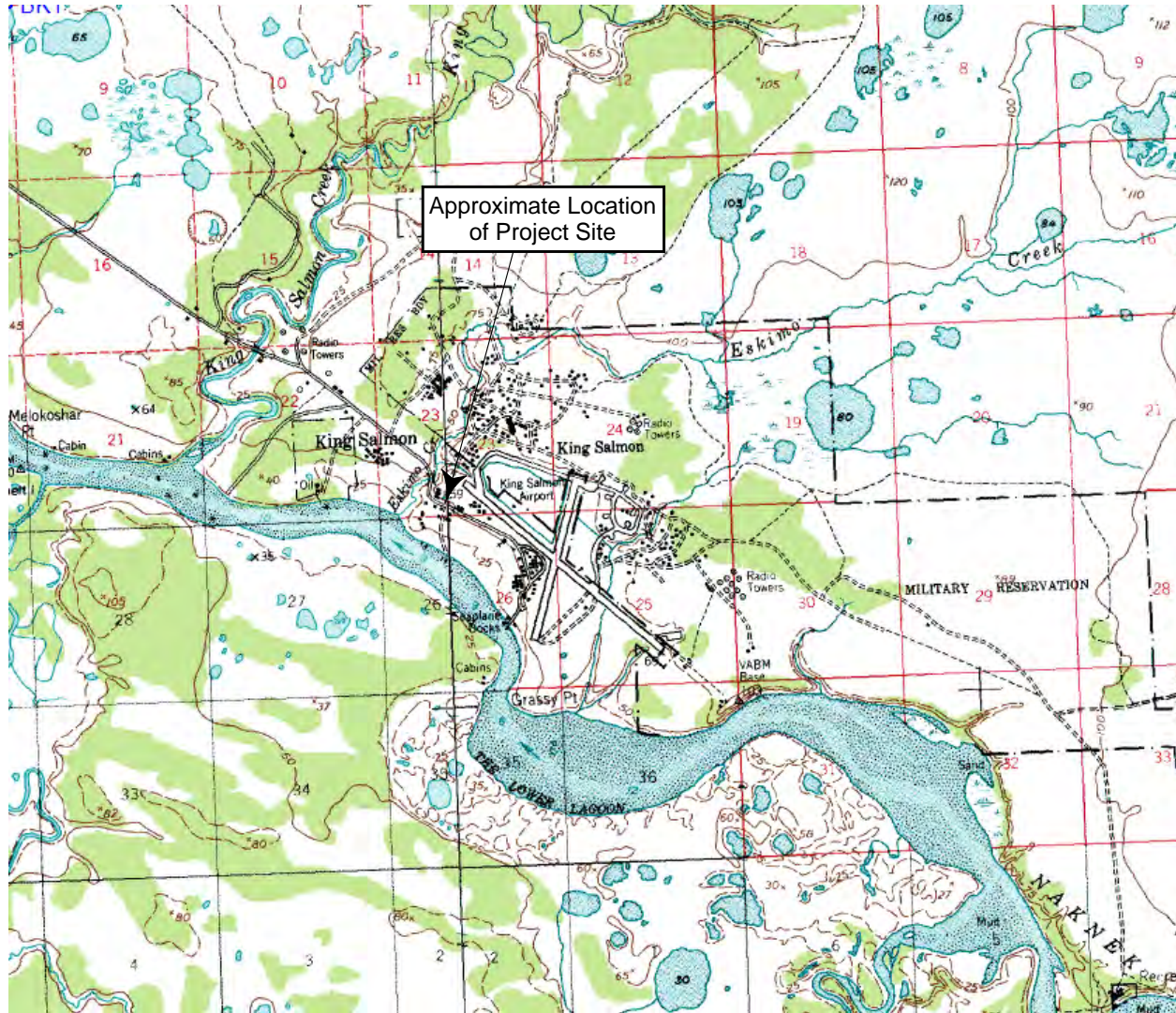
Symbol key and descriptions located at end of table.

TABLE 4
HISTORICAL GROUNDWATER ANALYTICAL RESULTS

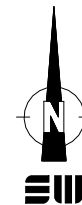
Monitoring Well	Date	Depth to Water, Ft	Parameter Tested* and Cleanup Level** in mg/L				
			DRO 1.5	Benzene 0.005	Toluene 1.0	Ethylbenzene 0.7	Xylenes 10
B13MW	8/18/2007	9.11	<0.317	<0.000500	<0.00200	<0.00200	<0.00200
	8/18/2011	7.65	0.639	<0.000300	<0.000620	<0.000620	<0.00186
	6/12/2014	8.85	<0.612 B	<0.000250	<0.000500	<0.000500	<0.00150
B14MW	8/18/2007	10.84	1.58	<0.000500	<0.00200	<0.00200	<0.00200
	6/19/2009	12.05	<0.800	<0.000500	<0.00200	<0.00200	<0.00200
	8/19/2011	9.33	0.743	<0.000300	<0.000620	<0.000620	<0.00186
	6/12/2014	11.12	<1.01 B	<0.000250	<0.000500	<0.000500	<0.00150
B15MW	8/18/2007	11.31	0.351	<0.000500	<0.00200	<0.00200	<0.00200
	6/18/2009	11.04	<0.800	<0.000500	<0.00200	<0.00200	<0.00200
	8/18/2011	10.59	0.477 J	<0.000300	<0.000620	<0.000620	<0.00186
	6/12/2014	11.00	<0.612 B	<0.000250	<0.000500	<0.000500	<0.00150
B16MW	8/19/2007	14.51	0.484	<0.000500	<0.00200	<0.00200	<0.00200
	6/18/2009	14.88	<0.800	<0.000500	<0.00200	<0.00200	<0.00200
	8/18/2011	13.64	-	-	-	-	-
	6/13/2014	14.05	<0.310	<0.000250	<0.000500	<0.000500	<0.00150
B17MW	8/19/2007	11.54	1.00	<0.000500	<0.00200	<0.00200	<0.00200
	6/18/2009	12.69	2.89	<0.000500	<0.00200	<0.00200	<0.00200
	8/19/2011	10.18	0.585 J	<0.000300	<0.000620	<0.000620	<0.00186
	6/13/2014	11.35	1.36	<0.000250	<0.000500	<0.000500	<0.00150
B18MW	8/19/2007	14.01	12.8	0.0103	<0.00200	<0.00200	0.00419
	6/19/2009	15.02	13.8	0.00526	<0.00200	<0.00200	<0.00200
	8/19/2011	13.12	11.9	0.00252	<0.000620	0.000840 J	0.00164 J
	6/13/2014	13.55	14.9	0.00116	0.000340 J	0.000510 J	0.00106 J
B19MW	6/19/2009	17.90	<0.833	<0.000500	<0.00200	<0.00200	<0.00200
	8/18/2011	13.47	0.237 J	<0.000300	<0.000620	<0.000620	<0.00186
	6/13/2014	16.85	<0.313	<0.000250	<0.000500	<0.000500	<0.00150
B20MW	6/19/2009	17.30	<0.800	<0.000500	<0.00200	<0.00200	<0.00200
	8/18/2011	9.80	0.219 J	<0.000300	<0.000620	<0.000620	<0.00186
	6/13/2014	13.98	0.412 J	<0.000250	<0.000500	<0.000500	<0.00150
B21MW	6/20/2009	11.35	<0.769	<0.000500	<0.00200	<0.00200	<0.00200
	8/18/2011	7.92	0.302 J	<0.000300	<0.000620	<0.000620	<0.00186
	6/12/2014	10.33	<0.390	<0.000250	0.000350 J	<0.000500	<0.00150

KEY DESCRIPTION

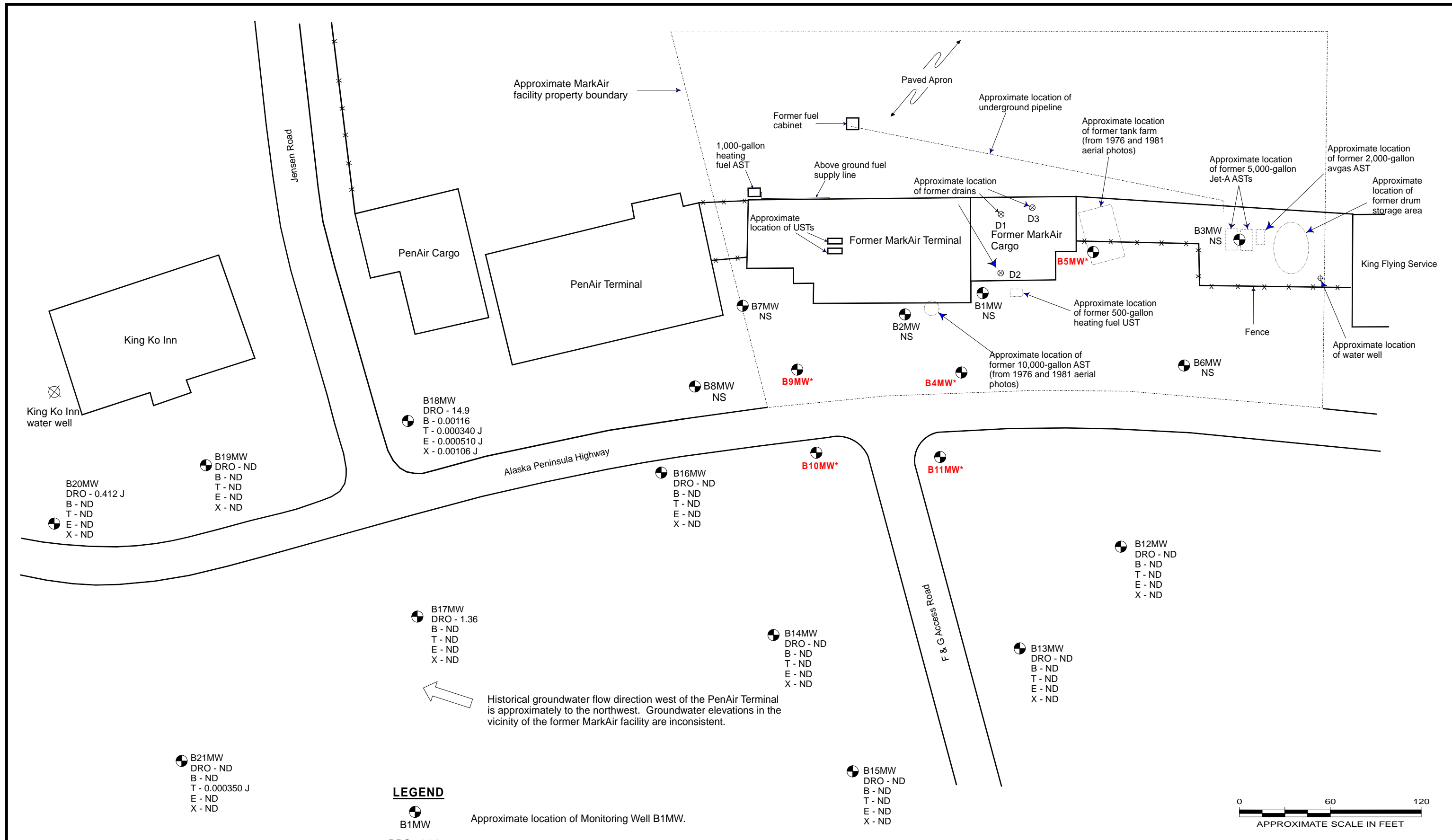
*	Higher result of field duplicate samples is listed
**	Groundwater cleanup levels are from Table C, 18 AAC 75.345 (April 2012)
DRO	Diesel Range Organics
Ft	Feet
mg/L	Milligrams per liter
0.00419	Analyte detected
<0.000500	Analyte not detected; laboratory reporting limit is 0.000500 mg/L
13.8	Concentration exceeds cleanup level
J	Analyte detected at an estimated concentration less than the limit of quantitation
B	Analyte concentration potentially affected by method blank contamination.
-	Not tested for this parameter



Taken from Naknek C-2 and C-3
 U.S. Geological Survey Quadrangles
 50 Foot Contour Interval



Former MarkAir Facility King Salmon, Alaska	
VICINITY MAP	
November 2014	32-1-17490-004
 SHANNON & WILSON, INC. Geotechnical & Environmental Consultants	Fig. 1



Historical groundwater flow direction west of the PenAir Terminal is approximately to the northwest. Groundwater elevations in the vicinity of the former MarkAir facility are inconsistent.

LEGEND

	B1MW	Approximate location of Monitoring Well B1MW.
DRO - 14.9	Diesel Range Organics (mg/L)	
B - 0.00116	Benzene (mg/L)	
T - 0.000340 J	Toluene (mg/L)	
E - 0.000510 J	Ethylbenzene (mg/L)	
X - 0.00106 J	Total Xylenes (mg/L)	
NS	Not Sampled	
B9MW*	Well that historically contains product.	

Former MarkAir Facility King Salmon, Alaska	
SITE PLAN	
November 2014	32-1-17490-004
SHANNON & WILSON, INC. Geotechnical & Environmental Consultants	Fig. 2

ATTACHMENT 1

FIELD NOTES



Shannon & Wilson, Inc.

LOW-FLOW WATER SAMPLING LOG

Job No: 17490-003 Location: Former Mark Av King Salmon Weather: 50°F Overcast
 Well No.: B12MW
 Date: 6/11-6/12 Time Started: — Time Completed: —
 Develop Date: — Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1535 Date of Depth Measurement: 6/11/14
 Measuring Point (MP) Top of PVC Casing / Top of Steel Protective Casing / Other:
 Diameter of Casing: 2" Well Screen Interval: —
 Total Depth of Well Below MP: 19.42 Product Thickness, if noted: No product
 Depth-to-Water (DTW) Below MP: 10.41
 Water Column in Well: 9.01 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: 0.16
 Gallons in Well: 1.44 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 6/12/14 Time Started: 1615 Time Completed: 1650
 Three Well Volumes: 4.32 (Gallons in Well x 3)
 Gallons Purged: 1.25 Depth of Pump (generally 2 ft from bottom): 12'
 Max. Drawdown (generally 0.3 ft): 0.85' Pump Rate: ~0.12

Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
<u>1620</u>	<u>0.25</u>	<u>0.2</u>	<u>—</u>	<u>—</u>	<u>4.02</u>	<u>95</u>	<u>—</u>	<u>6.54</u>	<u>222.3</u>	<u>19.65</u>
<u>1623</u>	<u>0.35</u>	<u>0.2</u>	<u>—</u>	<u>—</u>	<u>3.71</u>	<u>93</u>	<u>—</u>	<u>6.45</u>	<u>221.9</u>	<u>41.29</u>
<u>1626</u>	<u>0.45</u>	<u>0.2</u>	<u>10.81</u>	<u>0.4</u>	<u>3.67</u>	<u>92</u>	<u>—</u>	<u>6.31</u>	<u>226.8</u>	<u>41.02</u>
<u>1629</u>	<u>0.55</u>	<u>0.2</u>	<u>—</u>	<u>—</u>	<u>3.66</u>	<u>92</u>	<u>—</u>	<u>6.32</u>	<u>226.4</u>	<u>37.89</u>
<u>1632</u>	<u>0.65</u>	<u>0.2</u>	<u>—</u>	<u>—</u>	<u>3.61</u>	<u>93</u>	<u>—</u>	<u>6.32</u>	<u>226.1</u>	<u>31.20</u>
<u>1635</u>	<u>0.75</u>	<u>0.2</u>	<u>11.15</u>	<u>—</u>	<u>3.75</u>	<u>93</u>	<u>—</u>	<u>6.34</u>	<u>225.2</u>	<u>25.11</u>

SAMPLING DATA

Odor: None Color: Clear
 Sample Designation: 17490-B12MW Time / Date: 1655 6/12/14
 QC Sample Designation: — Time / Date: —
 QA Sample Designation: — Time / Date: —

Evacuation Method: Bladder Pump / Submersible Pump / Other: —
 Sampling Method: Bladder Pump / Submersible Pump / Other: —
 Water Quality Instruments Used/Manufacturer/Model Number YSI 556, turbidimeter
 Calibration Info (Time, Ranges, etc) YSI 556

Remarks: —

Sampling Personnel: Take Tracy
 WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
 ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23



LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 17490-003 Location: Former Mark Air King Salmon Weather: 50°F Overcast
 Well No.: B13MW
 Date: 6/11-6/12 Time Started: — Time Completed: —
 Develop Date: — Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1545 Date of Depth Measurement: 6/11/14
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
 Diameter of Casing: 2" Well Screen Interval: —
 Total Depth of Well Below MP: 14.90 Product Thickness, if noted: No product
 Depth-to-Water (DTW) Below MP: 8.85
 Water Column in Well: 6.05 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: 0.97 0.16
 Gallons in Well: 0.97 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 6/12/14 Time Started: 1515 Time Completed: 1540
 Three Well Volumes: 2.91 (Gallons in Well x 3)
 Gallons Purged: 1.0 Depth of Pump (generally 2 ft from bottom): 10'
 Max. Drawdown (generally 0.3 ft): 1.0' Pump Rate: ~0.2

Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1520	0.2	0.2	—	—	6.26	82	—	6.40	210.3	15.26
1525	0.4	0.2	—	—	5.81	79	—	6.24	216.8	19.34
1528	0.5	0.2	9.55	—	4.93	78	—	6.16	213.8	23.47
1531	0.65	0.2	—	—	4.97	81	—	6.10	215.3	14.24
1534	0.75	0.2	—	—	5.02	82	—	6.09	214.7	9.62
1537	0.85	0.2	9.95	1	5.11	82	—	6.12	217.1	9.80

SAMPLING DATA

Odor: None Color: Clear
 Sample Designation: 17490-B13MW Time / Date: 1542 6/12/14
 QC Sample Designation: — Time / Date: —
 QA Sample Designation: — Time / Date: —

Evacuation Method: Bladder Pump / Submersible Pump / Other: —

Sampling Method: Bladder Pump / Submersible Pump / Other: —

Water Quality Instruments Used/Manufacturer/Model Number YSI 556, Turbidimeter

Calibration Info (Time, Ranges, etc) YSI 556 on 6/12 at 900

Remarks: —

Sampling Personnel: Take Tracy

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65

ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23



Shannon & Wilson, Inc.

LOW-FLOW WATER SAMPLING LOG

Job No: 17490-003 Location: Former Mark Air King Salmon Weather: 50°F Overcast
 Well No.: B14MW
 Date: 6/11-6/12 Time Started: — Time Completed: —
 Develop Date: — Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1559 Date of Depth Measurement: 6/11/14
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
 Diameter of Casing: 2" Well Screen Interval: —
 Total Depth of Well Below MP: 19.20 Product Thickness, if noted: No product
 Depth-to-Water (DTW) Below MP: 11.12
 Water Column in Well: 8.08 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: 0.16
 Gallons in Well: 1.29 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 6/12/14 Time Started: 1400 Time Completed: 1426
 Three Well Volumes: 3.7 (Gallons in Well x 3)
 Gallons Purged: 1.3 Depth of Pump (generally 2 ft from bottom): 13'
 Max. Drawdown (generally 0.3 ft): 0.73 Pump Rate: 40.2

Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1405	0.25	0.2	—	—	4.63	142	—	6.57	237.5	214.8
1410	0.4	0.2	—	—	4.56	142	—	6.57	221.2	47.75
1415	0.6	0.2	11.52	0.4	4.58	142	—	6.57	155.4	11.11
1420	0.75	0.2	—	—	4.70	140	—	6.57	113.8	7.33
1423	0.95	0.2	—	—	4.75	141	—	6.57	108.2	9.12
1426	0.13	0.2	11.85	0.73	4.78	141	—	6.58	106.9	7.54

SAMPLING DATA

Odor: None Color: Clear
 Sample Designation: 17490-B14MW Time / Date: 1429 6/12/14
 QC Sample Designation: — Time / Date: —
 QA Sample Designation: — Time / Date: —

Evacuation Method: Bladder Pump / Submersible Pump / Other: —

Sampling Method: Bladder Pump / Submersible Pump / Other: —

Water Quality Instruments Used/Manufacturer/Model Number YSI 556, Turbidimeter

Calibration Info (Time, Ranges, etc) YSI 556 1000 cm

Remarks: —

Sampling Personnel: Jake Tracy

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65

ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23



LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 17490-003 Location: Former Mark Air King Salmon Weather: 50°F Overcast
 Well No.: B15MW
 Date: 6/11-6/12 Time Started: — Time Completed: —
 Develop Date: — Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1554 Date of Depth Measurement: 6/11/14
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
 Diameter of Casing: 2" Well Screen Interval: —
 Total Depth of Well Below MP: 19.96 Product Thickness, if noted: No product
 Depth-to-Water (DTW) Below MP: 11.00
 Water Column in Well: 8.96 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: 0.16
 Gallons in Well: 1.43 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 6/12/14 Time Started: 1300 Time Completed: 1320
 Three Well Volumes: 4.3 (Gallons in Well x 3)
 Gallons Purged: 1.5 Depth of Pump (generally 2 ft from bottom): 13.0'
 Max. Drawdown (generally 0.3 ft): 0.80 Pump Rate: —

Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
<u>1305</u>	<u>0.7</u>	<u>0.2</u>	<u>—</u>	<u>—</u>	<u>3.74</u>	<u>99</u>	<u>—</u>	<u>6.58</u>	<u>245.2</u>	<u>81.51</u>
<u>1308</u>	<u>0.9</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>3.55</u>	<u>100</u>	<u>—</u>	<u>6.53</u>	<u>223.4</u>	<u>17.94</u>
<u>1311</u>	<u>1.1</u>	<u>—</u>	<u>11.8</u>	<u>0.8</u>	<u>3.53</u>	<u>101</u>	<u>—</u>	<u>6.50</u>	<u>233.1</u>	<u>7.86</u>
<u>1314</u>	<u>1.3</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>3.47</u>	<u>103</u>	<u>—</u>	<u>6.47</u>	<u>234.7</u>	<u>7.02</u>
<u>1317</u>	<u>1.5</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>3.50</u>	<u>103</u>	<u>—</u>	<u>6.47</u>	<u>233.5</u>	<u>6.35</u>
<u>1320</u>	<u>Sample</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>

SAMPLING DATA

Odor: None Color: Clear
 Sample Designation: 17490-B15MW Time / Date: 1320 6/12/14
 QC Sample Designation: — Time / Date: —
 QA Sample Designation: — Time / Date: —

Evacuation Method: Bladder Pump / Submersible Pump / Other: —

Sampling Method: Bladder Pump / Submersible Pump / Other: —

Water Quality Instruments Used/Manufacturer/Model Number YSI 556

Calibration Info (Time, Ranges, etc) YSI 556

Remarks: —

Sampling Personnel: Jake Tracy

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65

ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23



Shannon & Wilson, Inc.

LOW-FLOW WATER SAMPLING LOG

Job No: 17490-003 Location: Former Alak Air King Salmon Weather: 50°F overcast
 Well No.: B16 MW
 Date: 6/11-11/13 Time Started: Time Completed:
 Develop Date: Develop End Time: (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1900 Date of Depth Measurement: 6/11/14
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
 Diameter of Casing: 2" Well Screen Interval:
 Total Depth of Well Below MP: 19.99 Product Thickness, if noted: No product
 Depth-to-Water (DTW) Below MP: 14.05
 Water Column in Well: 5.94 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: 0.16
 Gallons in Well: 0.95 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 6/13/14 Time Started: 945 Time Completed: 1005
 Three Well Volumes: 2.85 (Gallons in Well x 3)
 Gallons Purged: ~1.0 Depth of Pump (generally 2 ft from bottom): 15.5'
 Max. Drawdown (generally 0.3 ft): 0.4 Pump Rate: 20.2

Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
950	0.5	0.2	-	-	5.45	188	-	6.17	228.6	2.23
953	0.6	0.2	-	-	5.52	176	-	6.11	223.9	2.71
956	0.7	0.2	14.65	0.6	5.48	176	-	6.09	212.2	3.01
959	0.8	0.2	-	-	5.55	177	-	6.11	207.3	1.12
1002	0.95	0.2	-	-	5.00	178	-	6.13	203.6	1.31
1005	Sample									

SAMPLING DATA

Odor: None Color: Clear
 Sample Designation: 17490-B16 MW Time / Date: 1005 6/13/14
 QC Sample Designation: Time / Date:
 QA Sample Designation: Time / Date:

Evacuation Method: Bladder Pump / Submersible Pump / Other:

Sampling Method: Bladder Pump / Submersible Pump / Other:

Water Quality Instruments Used/Manufacturer/Model Number YSI 556, turbidimeter

Calibration Info (Time, Ranges, etc) YSI 556

Remarks: Not under water at this time, might get destroyed from road construction this summer

Sampling Personnel: Jake Tracy

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
 ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23



LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 17490-003 Location: Former Walk Av King Salmon Weather: 50°F Overcast
 Well No.: B17MW
 Date: 6/11 Time Started: - Time Completed: -
 Develop Date: - Develop End Time: - (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1830 Date of Depth Measurement: 6/11/14
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
 Diameter of Casing: 2" Well Screen Interval: -
 Total Depth of Well Below MP: 19.00 Product Thickness, if noted: No product
 Depth-to-Water (DTW) Below MP: 11.35
 Water Column in Well: 7.65 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: 0.16
 Gallons in Well: 1.22 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 6/13/14 Time Started: 1300 Time Completed: 1315
 Three Well Volumes: 3.66 (Gallons in Well x 3)
 Gallons Purged: 1.25 Depth of Pump (generally 2 ft from bottom): 12.5'
 Max. Drawdown (generally 0.3 ft): 0.37 Pump Rate: 0.2

Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1305	0.5	0.2	-	-	5.01	493	-	5.66	237.9	3.67
1308	0.7	0.2	-	-	4.95	490	-	5.64	236.6	3.12
1311	0.9	0.2	11.72	0.37	4.99	492	-	5.61	235.5	2.28
1314	0.25	0.2	-	-	4.96	488	-	5.59	231.8	1.29
1318	Sample									

SAMPLING DATA

Odor: None Color: Clear
 Sample Designation: 17490 - one B17MW Time / Date: 1318 6/13/14
 QC Sample Designation: - Time / Date: -
 QA Sample Designation: - Time / Date: -

Evacuation Method: Bladder Pump / ~~Submersible Pump~~ / Other: -

Sampling Method: Bladder Pump / ~~Submersible Pump~~ / Other: -

Water Quality Instruments Used/Manufacturer/Model Number YSI 556, turbidimeter

Calibration Info (Time, Ranges, etc) YSI 556

Remarks: Well is next to pallet in grass.

Sampling Personnel: Take Tracy

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
 ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23



Shannon & Wilson, Inc.

LOW-FLOW WATER SAMPLING LOG

Job No: 17490-003 Location: Former Mack Air King Salmon Weather: 50°F Overcast
 Well No.: B18MW
 Date: 6/11-6/13 Time Started: Time Completed:
 Develop Date: Develop End Time: (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1615 Date of Depth Measurement: 6/11/14
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
 Diameter of Casing: 2" Well Screen Interval:
 Total Depth of Well Below MP: 20.01 Product Thickness, if noted: No product
 Depth-to-Water (DTW) Below MP: 13.55
 Water Column in Well: 6.46 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: 0.16
 Gallons in Well: 1.03 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 6/13/14 Time Started: 1352 Time Completed: 1420
 Three Well Volumes: 3.1 (Gallons in Well x 3)
 Gallons Purged: 1.2 Depth of Pump (generally 2 ft from bottom): 15'
 Max. Drawdown (generally 0.3 ft): 0.27 Pump Rate: ~0.2

Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1400	0.25	0.2	-	-	6.65	1097	-	6.65	241.5	2.40
1405	0.5	0.2	-	-	6.04	1119	-	6.65	237.3	1.56
1410	0.75	0.2	13.82	0.27	5.98	1141	-	6.63	226.8	0.69
1415	1.0	0.2	-	-	5.96	1154	-	6.62	219.3	0.61
1420	1.2	0.2	-	-	6.01	1160	-	6.62	217.5	0.58
1423	Sample									

SAMPLING DATA

Odor: None Color: Clear
 Sample Designation: 17490-B18MW Time / Date: 1423 6/13/14
 QC Sample Designation: Time / Date:
 QA Sample Designation: Time / Date:

Evacuation Method: Bladder Pump / Submersible Pump / Other:

Sampling Method: Bladder Pump / Submersible Pump / Other:

Water Quality Instruments Used/Manufacturer/Model Number YSI 556, Turbidimeter

Calibration Info (Time, Ranges, etc) YSI 556

Remarks:

Sampling Personnel: Take Tracy

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
 ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23



Shannon & Wilson, Inc.

LOW-FLOW WATER SAMPLING LOG

Job No: 17490-003 Location: Former Milk Air Ring Salmon Weather: 50°F Overcast
 Well No.: B1911W
 Date: 6/11-6/13 Time Started: - Time Completed: -
 Develop Date: - Develop End Time: - (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1642 Date of Depth Measurement: 6/11/14
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: -
 Diameter of Casing: 2" Well Screen Interval: -
 Total Depth of Well Below MP: 20.25 Product Thickness, if noted: No product
 Depth-to-Water (DTW) Below MP: 16.85
 Water Column in Well: 3.43 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: 0.16
 Gallons in Well: 0.55 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 6/13/14 Time Started: 1050 Time Completed: 1122
 Three Well Volumes: 1.65 (Gallons in Well x 3)
 Gallons Purged: 1.1 Depth of Pump (generally 2 ft from bottom): 17'
 Max. Drawdown (generally 0.3 ft): 0.7 Pump Rate: 20.2

Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1055	0.2	0.2	-	-	7.32	166	-	6.38	228.3	17.92
1058	0.3	0.2	-	-	6.71	175	-	6.37	231.0	17.90
1101	0.4	0.2	17.85	-	6.23	182	-	6.37	219.7	12.67
1104	0.5	0.2	-	-	6.07	187	-	6.36	216.5	12.07
1107	0.6	0.2	-	-	6.12	195	-	6.36	209.6	13.15
1110	0.7	0.2	-	-	6.07	200	-	6.36	206.9	11.17

SAMPLING DATA

Odor: None Color: Clear
 Sample Designation: 17490-B1911W Time / Date: 1125 6/13/14
 QC Sample Designation: - Time / Date: -
 QA Sample Designation: - Time / Date: -

Evacuation Method: Bladder Pump / Submersible Pump / Other: -

Sampling Method: Bladder Pump / Submersible Pump / Other: -

Water Quality Instruments Used/Manufacturer/Model Number YSI 556, turbidimeter

Calibration Info (Time, Ranges, etc) YSI 556

Remarks: -

Sampling Personnel: Jake Traub

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
 ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23



LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 17490-003 Location: Former Mack Ave King Salmon Weather: 50°F Overcast
 Well No.: B20MW
 Date: 6/11-6/13 Time Started: — Time Completed: —
 Develop Date: — Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1655 Date of Depth Measurement: 6/11/14
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
 Diameter of Casing: 2" Well Screen Interval: —
 Total Depth of Well Below MP: 20.01 Product Thickness, if noted: No product
 Depth-to-Water (DTW) Below MP: 13.98
 Water Column in Well: 6.03 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: 0.16
 Gallons in Well: 0.96 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 6/13/14 Time Started: 1500 Time Completed: 1525
 Three Well Volumes: 2.9 (Gallons in Well x 3)
 Gallons Purged: ~1.0 Depth of Pump (generally 2 ft from bottom): 15'
 Max. Drawdown (generally 0.3 ft): 0.31 Pump Rate: ~0.2

Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
1505	0.25	0.2	—	—	6.52	146	—	6.32	182.0	1.85
1510	0.4	0.2	—	—	6.24	133	—	6.04	183.4	2.40
1515	0.6	0.2	14.29	0.31	6.31	125	—	5.96	190.4	3.11
1520	0.75	0.2	—	—	6.33	124	—	5.94	189.4	1.71
1525	0.96	0.2	—	—	6.29	123	—	5.93	192.7	1.79
1528	Sample	—	—	—	—	—	—	—	—	—

SAMPLING DATA

Odor: None Color: Clear
 Sample Designation: 17490-B20MW Time / Date: 1528 6/13/14
 QC Sample Designation: — Time / Date: —
 QA Sample Designation: — Time / Date: —

Evacuation Method: Bladder Pump Submersible Pump / Other: —

Sampling Method: Bladder Pump Submersible Pump / Other: —

Water Quality Instruments Used/Manufacturer/Model Number YSI 556; Turbidimeter

Calibration Info (Time, Ranges, etc) YSI 556

Remarks: —

Sampling Personnel: Jack Tracy

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
 ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23



LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 17490-003 Location: Former Milk Air King Salmon Weather: 50°F Overcast
 Well No.: B21MW
 Date: 6/11 Time Started: — Time Completed: —
 Develop Date: — Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1725 Date of Depth Measurement: 6/11/14
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
 Diameter of Casing: 2" Well Screen Interval: —
 Total Depth of Well Below MP: 14.98 Product Thickness, if noted: Na product
 Depth-to-Water (DTW) Below MP: 10.33 10.19
 Water Column in Well: 4.65 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: 0.16 3.72 @ 85%
 Gallons in Well: 4.49 0.74 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 6/12/14 Time Started: 930 Time Completed: 1050 1100
 Three Well Volumes: 2.23 (Gallons in Well x 3)
 Gallons Purged: 1.25 Depth of Pump (generally 2 ft from bottom): 11.5'
 Max. Drawdown (generally 0.3 ft): Below pump Pump Rate: ~0.2

Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
935	0.25	0.2	—	—	3.57	259	—	5.44	223.0	471.3
940	0.35	0.2	—	—	3.83	209	—	5.55	217.2	241.9
945	0.5	0.2	—	—	3.78	201	—	5.78	214.2	199.4
950	0.7	0.2	—	—	3.75	202	—	5.82	212.9	280.4
955	0.9	0.2	—	—	3.81	207	—	5.90	211.3	327.2
1000	1.1	0.2	—	—	3.85	211	—	5.98	208.3	302.4

SAMPLING DATA

Odor: None Color: Silty
 Sample Designation: 17490-B21MW Time / Date: 1030 6/12/14
 QC Sample Designation: — Time / Date: —
 QA Sample Designation: — Time / Date: —

Evacuation Method: Bladder Pump / Submersible Pump / Other: —
 Sampling Method: Bladder Pump / Submersible Pump / Other: —

Water Quality Instruments Used/Manufacturer/Model Number Ysi 550, Turbidimeter

Calibration Info (Time, Ranges, etc) Ysi 550, 900 on 6/12

Remarks: Monument repair. Cut down 1.5". Put new lid on
Hard to control pump rates.

Sampling Personnel: Jake Tracy

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
 ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

Free-Phase Product Recovery and Monitoring Log

Date/Time	B10MW			PT (ft)
	Vol. (gal.)	DTP (ft)	DTW (ft)	
6/14/14 1015	0	-	16.49	0
7/9/14 1120	0	-	16.03	0
8/14/14 1300	-	-	15.89	-
9/17/14 1100	0	-	15.40	-
10/16/14 1200	0	-	15.19	-

Date/Time	B11MW				PT (ft)
	Vol. (gal.)	DTP (ft)	DTW (ft)	DTW (ft)	
6/14/14 1030	0	-	9.86	0	0
7/9/14 1135	0	-	14.36	0	0
8/14/14 1315	-	-	13.96	-	-
9/17/14 1115	0	-	13.54	0	0
10/16/14 1215	0	-	13.35	-	-

Notes

Possible thin layer of product in B11MW, 6/14/14

Notes:

- Vol. = Volume of product removed from well
- gal. = gallons
- ft = feet
- DTP = Depth to product
- DTW = Depth to water
- PT = Product thickness (DTW - DTP)

ATTACHMENT 2
DISPOSAL RECEIPTS

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. E X E M P T	Manifest Document No. 2 3 2 6 4	2. Page 1 of 1
3. Generator's Name and Mailing Address SHANNON & WILSON, INC. 5430 FAIRBANKS STREET ANCHORAGE, AK 99518-1263		Site Address ADEC - MARK AIR KING SALMON, AK 99613		NICK PROTOS
4. Generator's Phone (907) 561-2120				
5. Transporter 1 Company Name NORTHERN AIR CARGO, INC.	6. US EPA ID Number AKD003845526	A. State Transporter's ID		
		B. Transporter 1 Phone (800) 478-3330		
7. Transporter 2 Company Name EMERALD ALASKA, INC	8. US EPA ID Number AKR000004184	C. State Transporter's ID		
		D. Transporter 2 Phone (907) 258-1558		
9. Designated Facility Name and Site Address EMERALD ALASKA, INC. 2020 VIKING DRIVE ANCHORAGE, AK 99501		10. US EPA ID Number AKR000004184	E. State Facility's ID	
		F. Facility's Phone (907) 258-1558		

11. WASTE DESCRIPTION	Containers		13. Total Quantity	14. Unit Wt./Vol.
	No.	Type		
a. NA1993, DIESEL FUEL, 3, PGIII, ERG#128	1	DM	36	G
b. MATERIAL NOT REGULATED BY D.O.T.	1	DM	25	G
c.				
d.				

G. Additional Descriptions for Materials Listed Above 1)EA0202 DIESEL FUEL 2)EA0302 IDW DECON WATER	H. Handling Codes for Wastes Listed Above 1)H050
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15. Special Handling Instructions and Additional Information
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

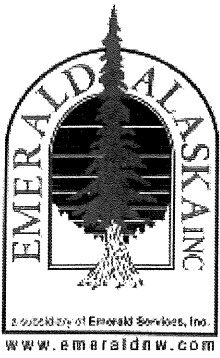
16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name Jacob Tracy	Signature <i>Jacob Tracy</i>	Date 10/10/14
17. Transporter 1 Acknowledgement of Receipt of Materials		
Printed/Typed Name <i>Roy C Trisdale Jr</i>	Signature <i>Roy C Trisdale Jr</i>	Date 10/16/14
18. Transporter 2 Acknowledgement of Receipt of Materials		
Printed/Typed Name	Signature	Date

19. Discrepancy Indication Space		
20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.		
Printed/Typed Name Patricia L. Beasley	Signature <i>Patricia L Beasley</i>	Date 10/21/14

NON-HAZARDOUS WASTE





CERTIFICATE OF DISPOSAL/RECYCLE

GENERATOR: ADEC - MARK AIR

KING SALMON AK 99613

DISPOSAL FACILITY: EMERALD ALASKA, INC.
2020 VIKING DRIVE
ANCHORAGE AK 99501

EPA ID NUMBER: EXEMPT
MANIFEST/DOCUMENT #: 23264
DATE OF DISPOSAL/RECYCLE: 10/20/2014

<u>LINE</u>	<u>WASTE DESCRIPTION</u>	<u>CONTAINERS</u>	<u>TYPE</u>	<u>QUANTITY</u>	<u>UOM</u>
1	DIESEL FUEL	1	DM	36	G
2	IDW DECON WATER	1	DM	25	G

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above described waste was managed in compliance with all applicable laws, regulations, permits, and licenses on the date listed above.

PREPARED BY: PATRICIA BEASLEY

SIGNATURE:

Patricia Beasley

DATE: 10/24/2014

Your Local Partner for Recycling Environmental Services

425 Outer Springer Loop Road - Palmer, AK 99645 - (907) 258-1558 - Fax (907) 746-3651 - Toll Free (877) 375-504

ATTACHMENT 3
RESULTS OF ANALYTICAL TESTING BY
SGS NORTH AMERICA INC. OF ANCHORAGE, ALASKA
AND
ADEC LABORATORY DATA REVIEW CHECKLIST

Laboratory Report of Analysis

To: Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
907-433-3221

Report Number: **1142516**

Client Project: **17490-003 Former Mark Air**

Dear Jacob Tracy,

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 five 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.



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

Victoria Pennick

2014.06.26

15:28:31 -08'00'

Victoria Pennick
Project Manager
Victoria.Pennick@sgs.com

Date

Print Date: 06/26/2014 1:42:47PM

Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1142516**
Project Name/Site: **17490-003 Former Mark Air**
Project Contact: **Jacob Tracy**

Refer to sample receipt form for information on sample condition.

17490-B14MW (1142516003) PS

AK102 - The pattern is consistent with a weathered middle distillate.

17490-B17MW (1142516006) PS

AK102 - The pattern is consistent with a weathered middle distillate.

17490-B18MW (1142516007) PS

AK102 - The pattern is consistent with a weathered middle distillate.

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

Print Date: 06/26/2014 1:42:48PM

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. If you have any questions regarding this report, or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343. All work is provided under SGS general terms and conditions (<http://www.sgs.com/terms_and_conditions.htm>), unless other written agreements have been accepted by both parties.

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: 1020A, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035B, 6020, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040B, 9045C, 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	Continuing Calibration Verification
CL	Control Limit
D	The analyte concentration is the result of a dilution.
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
F	Indicates value that is greater than or equal to the DL
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
JL	The analyte was positively identified, but the quantitation is a low estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
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
M	A matrix effect was present.
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
Q	QC parameter out of acceptance range.
R	Rejected
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

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

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
17490-B12MW	1142516001	06/12/2014	06/17/2014	Water (Surface, Eff., Ground)
17490-B13MW	1142516002	06/12/2014	06/17/2014	Water (Surface, Eff., Ground)
17490-B14MW	1142516003	06/12/2014	06/17/2014	Water (Surface, Eff., Ground)
17490-B15MW	1142516004	06/12/2014	06/17/2014	Water (Surface, Eff., Ground)
17490-B16MW	1142516005	06/13/2014	06/17/2014	Water (Surface, Eff., Ground)
17490-B17MW	1142516006	06/13/2014	06/17/2014	Water (Surface, Eff., Ground)
17490-B18MW	1142516007	06/13/2014	06/17/2014	Water (Surface, Eff., Ground)
17490-B19MW	1142516008	06/13/2014	06/17/2014	Water (Surface, Eff., Ground)
17490-B20MW	1142516009	06/13/2014	06/17/2014	Water (Surface, Eff., Ground)
17490-B21MW	1142516010	06/12/2014	06/17/2014	Water (Surface, Eff., Ground)
Trip Blank	1142516011	06/12/2014	06/17/2014	Water (Surface, Eff., Ground)

<u>Method</u>	<u>Method Description</u>
SW8021B	BTEX 8021
AK102	Diesel Range Organics (W)

Print Date: 06/26/2014 1:42:49PM

Detectable Results Summary

Client Sample ID: 17490-B12MW			
Lab Sample ID: 1142516001	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Semivolatile Organic Fuels	Diesel Range Organics	0.360J	mg/L
Client Sample ID: 17490-B13MW			
Lab Sample ID: 1142516002	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Semivolatile Organic Fuels	Diesel Range Organics	0.495J	mg/L
Client Sample ID: 17490-B14MW			
Lab Sample ID: 1142516003	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Semivolatile Organic Fuels	Diesel Range Organics	1.01	mg/L
Client Sample ID: 17490-B15MW			
Lab Sample ID: 1142516004	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Semivolatile Organic Fuels	Diesel Range Organics	0.395J	mg/L
Client Sample ID: 17490-B17MW			
Lab Sample ID: 1142516006	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Semivolatile Organic Fuels	Diesel Range Organics	1.36	mg/L
Client Sample ID: 17490-B18MW			
Lab Sample ID: 1142516007	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Semivolatile Organic Fuels	Diesel Range Organics	14.9	mg/L
Volatile Fuels	Benzene	1.16	ug/L
	Ethylbenzene	0.510J	ug/L
	P & M -Xylene	1.06J	ug/L
	Toluene	0.340J	ug/L
Client Sample ID: 17490-B20MW			
Lab Sample ID: 1142516009	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Semivolatile Organic Fuels	Diesel Range Organics	0.412J	mg/L
Client Sample ID: 17490-B21MW			
Lab Sample ID: 1142516010	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Volatile Fuels	Toluene	0.350J	ug/L

Print Date: 06/26/2014 1:42:49PM

Results of 17490-B12MW

Client Sample ID: **17490-B12MW**
 Client Project ID: **17490-003 Former Mark Air**
 Lab Sample ID: 1142516001
 Lab Project ID: 1142516

Collection Date: 06/12/14 16:55
 Received Date: 06/17/14 15:23
 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	0.360 J	0.625	0.188	mg/L	1		06/19/14 20:20
Surrogates							
5a Androstane	82.6	50-150		%	1		06/19/14 20:20

Batch Information

Analytical Batch: XFC11368
 Analytical Method: AK102
 Analyst: AYC
 Analytical Date/Time: 06/19/14 20:20
 Container ID: 1142516001-A

Prep Batch: XXX31208
 Prep Method: SW3520C
 Prep Date/Time: 06/18/14 09:50
 Prep Initial Wt./Vol.: 960 mL
 Prep Extract Vol: 1 mL



Results of 17490-B12MW

Client Sample ID: **17490-B12MW**
Client Project ID: **17490-003 Former Mark Air**
Lab Sample ID: 1142516001
Lab Project ID: 1142516

Collection Date: 06/12/14 16:55
Received Date: 06/17/14 15:23
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		06/19/14 00:10
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		06/19/14 00:10
o-Xylene	0.500 U	1.00	0.310	ug/L	1		06/19/14 00:10
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		06/19/14 00:10
Toluene	0.500 U	1.00	0.310	ug/L	1		06/19/14 00:10
Surrogates							
1,4-Difluorobenzene	101	77-115		%	1		06/19/14 00:10

Batch Information

Analytical Batch: VFC11942
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/19/14 00:10
Container ID: 1142516001-C

Prep Batch: VXX26005
Prep Method: SW5030B
Prep Date/Time: 06/18/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 06/26/2014 1:42:49PM



Results of 17490-B13MW

Client Sample ID: **17490-B13MW**
Client Project ID: **17490-003 Former Mark Air**
Lab Sample ID: 1142516002
Lab Project ID: 1142516

Collection Date: 06/12/14 15:42
Received Date: 06/17/14 15:23
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.495 J	0.612	0.184	mg/L	1		06/19/14 20:30
Surrogates							
5a Androstane	88.1	50-150		%	1		06/19/14 20:30

Batch Information

Analytical Batch: XFC11368
Analytical Method: AK102
Analyst: AYC
Analytical Date/Time: 06/19/14 20:30
Container ID: 1142516002-A

Prep Batch: XXX31208
Prep Method: SW3520C
Prep Date/Time: 06/18/14 09:50
Prep Initial Wt./Vol.: 980 mL
Prep Extract Vol: 1 mL

Print Date: 06/26/2014 1:42:49PM



Results of 17490-B13MW

Client Sample ID: **17490-B13MW**
Client Project ID: **17490-003 Former Mark Air**
Lab Sample ID: 1142516002
Lab Project ID: 1142516

Collection Date: 06/12/14 15:42
Received Date: 06/17/14 15:23
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		06/19/14 00:29
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		06/19/14 00:29
o-Xylene	0.500 U	1.00	0.310	ug/L	1		06/19/14 00:29
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		06/19/14 00:29
Toluene	0.500 U	1.00	0.310	ug/L	1		06/19/14 00:29
Surrogates							
1,4-Difluorobenzene	99.4	77-115		%	1		06/19/14 00:29

Batch Information

Analytical Batch: VFC11942
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/19/14 00:29
Container ID: 1142516002-C

Prep Batch: VXX26005
Prep Method: SW5030B
Prep Date/Time: 06/18/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 06/26/2014 1:42:49PM

Results of 17490-B14MW

Client Sample ID: **17490-B14MW**
 Client Project ID: **17490-003 Former Mark Air**
 Lab Sample ID: 1142516003
 Lab Project ID: 1142516

Collection Date: 06/12/14 14:29
 Received Date: 06/17/14 15:23
 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	1.01		0.619	0.186	mg/L	1		06/19/14 20:40
Surrogates								
5a Androstane	82.1		50-150		%	1		06/19/14 20:40

Batch Information

Analytical Batch: XFC11368
 Analytical Method: AK102
 Analyst: AYC
 Analytical Date/Time: 06/19/14 20:40
 Container ID: 1142516003-A

Prep Batch: XXX31208
 Prep Method: SW3520C
 Prep Date/Time: 06/18/14 09:50
 Prep Initial Wt./Vol.: 970 mL
 Prep Extract Vol: 1 mL



Results of 17490-B14MW

Client Sample ID: **17490-B14MW**
Client Project ID: **17490-003 Former Mark Air**
Lab Sample ID: 1142516003
Lab Project ID: 1142516

Collection Date: 06/12/14 14:29
Received Date: 06/17/14 15:23
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		06/19/14 00:49
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		06/19/14 00:49
o-Xylene	0.500 U	1.00	0.310	ug/L	1		06/19/14 00:49
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		06/19/14 00:49
Toluene	0.500 U	1.00	0.310	ug/L	1		06/19/14 00:49
Surrogates							
1,4-Difluorobenzene	101	77-115		%	1		06/19/14 00:49

Batch Information

Analytical Batch: VFC11942
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/19/14 00:49
Container ID: 1142516003-C

Prep Batch: VXX26005
Prep Method: SW5030B
Prep Date/Time: 06/18/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 06/26/2014 1:42:49PM

Results of 17490-B15MW

Client Sample ID: **17490-B15MW**
 Client Project ID: **17490-003 Former Mark Air**
 Lab Sample ID: 1142516004
 Lab Project ID: 1142516

Collection Date: 06/12/14 13:20
 Received Date: 06/17/14 15:23
 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	0.395 J	0.612	0.184	mg/L	1		06/19/14 20:50
Surrogates							
5a Androstane	85.5	50-150		%	1		06/19/14 20:50

Batch Information

Analytical Batch: XFC11368
 Analytical Method: AK102
 Analyst: AYC
 Analytical Date/Time: 06/19/14 20:50
 Container ID: 1142516004-A

Prep Batch: XXX31208
 Prep Method: SW3520C
 Prep Date/Time: 06/18/14 09:50
 Prep Initial Wt./Vol.: 980 mL
 Prep Extract Vol: 1 mL



Results of 17490-B15MW

Client Sample ID: **17490-B15MW**
Client Project ID: **17490-003 Former Mark Air**
Lab Sample ID: 1142516004
Lab Project ID: 1142516

Collection Date: 06/12/14 13:20
Received Date: 06/17/14 15:23
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		06/19/14 01:08
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		06/19/14 01:08
o-Xylene	0.500 U	1.00	0.310	ug/L	1		06/19/14 01:08
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		06/19/14 01:08
Toluene	0.500 U	1.00	0.310	ug/L	1		06/19/14 01:08
Surrogates							
1,4-Difluorobenzene	100	77-115		%	1		06/19/14 01:08

Batch Information

Analytical Batch: VFC11942
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/19/14 01:08
Container ID: 1142516004-C

Prep Batch: VXX26005
Prep Method: SW5030B
Prep Date/Time: 06/18/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 06/26/2014 1:42:49PM

Results of 17490-B16MW

Client Sample ID: **17490-B16MW**
 Client Project ID: **17490-003 Former Mark Air**
 Lab Sample ID: 1142516005
 Lab Project ID: 1142516

Collection Date: 06/13/14 10:05
 Received Date: 06/17/14 15:23
 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	0.310 U	0.619	0.186	mg/L	1		06/24/14 18:07
Surrogates							
5a Androstane	74.9	50-150		%	1		06/24/14 18:07

Batch Information

Analytical Batch: XFC11378
 Analytical Method: AK102
 Analyst: HM
 Analytical Date/Time: 06/24/14 18:07
 Container ID: 1142516005-A

Prep Batch: XXX31232
 Prep Method: SW3520C
 Prep Date/Time: 06/21/14 09:45
 Prep Initial Wt./Vol.: 970 mL
 Prep Extract Vol: 1 mL



Results of 17490-B16MW

Client Sample ID: **17490-B16MW**
Client Project ID: **17490-003 Former Mark Air**
Lab Sample ID: 1142516005
Lab Project ID: 1142516

Collection Date: 06/13/14 10:05
Received Date: 06/17/14 15:23
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		06/19/14 01:27
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		06/19/14 01:27
o-Xylene	0.500 U	1.00	0.310	ug/L	1		06/19/14 01:27
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		06/19/14 01:27
Toluene	0.500 U	1.00	0.310	ug/L	1		06/19/14 01:27
Surrogates							
1,4-Difluorobenzene	99.3	77-115		%	1		06/19/14 01:27

Batch Information

Analytical Batch: VFC11942
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/19/14 01:27
Container ID: 1142516005-C

Prep Batch: VXX26005
Prep Method: SW5030B
Prep Date/Time: 06/18/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 06/26/2014 1:42:49PM



Results of 17490-B17MW

Client Sample ID: **17490-B17MW**
Client Project ID: **17490-003 Former Mark Air**
Lab Sample ID: 1142516006
Lab Project ID: 1142516

Collection Date: 06/13/14 13:18
Received Date: 06/17/14 15:23
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	1.36	0.600	0.180	mg/L	1		06/24/14 18:27
Surrogates							
5a Androstane	71.9	50-150		%	1		06/24/14 18:27

Batch Information

Analytical Batch: XFC11378
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 06/24/14 18:27
Container ID: 1142516006-A

Prep Batch: XXX31232
Prep Method: SW3520C
Prep Date/Time: 06/21/14 09:45
Prep Initial Wt./Vol.: 1000 mL
Prep Extract Vol: 1 mL

Print Date: 06/26/2014 1:42:49PM



Results of 17490-B17MW

Client Sample ID: **17490-B17MW**
Client Project ID: **17490-003 Former Mark Air**
Lab Sample ID: 1142516006
Lab Project ID: 1142516

Collection Date: 06/13/14 13:18
Received Date: 06/17/14 15:23
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		06/19/14 01:46
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		06/19/14 01:46
o-Xylene	0.500 U	1.00	0.310	ug/L	1		06/19/14 01:46
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		06/19/14 01:46
Toluene	0.500 U	1.00	0.310	ug/L	1		06/19/14 01:46
Surrogates							
1,4-Difluorobenzene	101	77-115		%	1		06/19/14 01:46

Batch Information

Analytical Batch: VFC11942
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/19/14 01:46
Container ID: 1142516006-C

Prep Batch: VXX26005
Prep Method: SW5030B
Prep Date/Time: 06/18/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 06/26/2014 1:42:49PM



Results of 17490-B18MW

Client Sample ID: **17490-B18MW**
Client Project ID: **17490-003 Former Mark Air**
Lab Sample ID: 1142516007
Lab Project ID: 1142516

Collection Date: 06/13/14 14:23
Received Date: 06/17/14 15:23
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	14.9	0.600	0.180	mg/L	1		06/24/14 18:48
Surrogates							
5a Androstane	68.7	50-150		%	1		06/24/14 18:48

Batch Information

Analytical Batch: XFC11378
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 06/24/14 18:48
Container ID: 1142516007-A

Prep Batch: XXX31232
Prep Method: SW3520C
Prep Date/Time: 06/21/14 09:45
Prep Initial Wt./Vol.: 1000 mL
Prep Extract Vol: 1 mL

Print Date: 06/26/2014 1:42:49PM



Results of 17490-B18MW

Client Sample ID: **17490-B18MW**
Client Project ID: **17490-003 Former Mark Air**
Lab Sample ID: 1142516007
Lab Project ID: 1142516

Collection Date: 06/13/14 14:23
Received Date: 06/17/14 15:23
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	1.16	0.500	0.150	ug/L	1		06/19/14 02:05
Ethylbenzene	0.510 J	1.00	0.310	ug/L	1		06/19/14 02:05
o-Xylene	0.500 U	1.00	0.310	ug/L	1		06/19/14 02:05
P & M -Xylene	1.06 J	2.00	0.620	ug/L	1		06/19/14 02:05
Toluene	0.340 J	1.00	0.310	ug/L	1		06/19/14 02:05
Surrogates							
1,4-Difluorobenzene	100	77-115		%	1		06/19/14 02:05

Batch Information

Analytical Batch: VFC11942
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/19/14 02:05
Container ID: 1142516007-C

Prep Batch: VXX26005
Prep Method: SW5030B
Prep Date/Time: 06/18/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 06/26/2014 1:42:49PM

Results of 17490-B19MW

Client Sample ID: **17490-B19MW**
 Client Project ID: **17490-003 Former Mark Air**
 Lab Sample ID: 1142516008
 Lab Project ID: 1142516

Collection Date: 06/13/14 11:25
 Received Date: 06/17/14 15:23
 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	0.313 U	0.625	0.188	mg/L	1		06/24/14 19:09
Surrogates							
5a Androstane	78.9	50-150		%	1		06/24/14 19:09

Batch Information

Analytical Batch: XFC11378
 Analytical Method: AK102
 Analyst: HM
 Analytical Date/Time: 06/24/14 19:09
 Container ID: 1142516008-A

Prep Batch: XXX31232
 Prep Method: SW3520C
 Prep Date/Time: 06/21/14 09:45
 Prep Initial Wt./Vol.: 960 mL
 Prep Extract Vol: 1 mL



Results of 17490-B19MW

Client Sample ID: **17490-B19MW**
Client Project ID: **17490-003 Former Mark Air**
Lab Sample ID: 1142516008
Lab Project ID: 1142516

Collection Date: 06/13/14 11:25
Received Date: 06/17/14 15:23
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		06/19/14 02:25
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		06/19/14 02:25
o-Xylene	0.500 U	1.00	0.310	ug/L	1		06/19/14 02:25
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		06/19/14 02:25
Toluene	0.500 U	1.00	0.310	ug/L	1		06/19/14 02:25
Surrogates							
1,4-Difluorobenzene	101	77-115		%	1		06/19/14 02:25

Batch Information

Analytical Batch: VFC11942
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/19/14 02:25
Container ID: 1142516008-C

Prep Batch: VXX26005
Prep Method: SW5030B
Prep Date/Time: 06/18/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 06/26/2014 1:42:49PM

Results of 17490-B20MW

Client Sample ID: **17490-B20MW**
 Client Project ID: **17490-003 Former Mark Air**
 Lab Sample ID: 1142516009
 Lab Project ID: 1142516

Collection Date: 06/13/14 15:28
 Received Date: 06/17/14 15:23
 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	0.412 J	0.619	0.186	mg/L	1		06/24/14 19:30
Surrogates							
5a Androstane	75.6	50-150		%	1		06/24/14 19:30

Batch Information

Analytical Batch: XFC11378
 Analytical Method: AK102
 Analyst: HM
 Analytical Date/Time: 06/24/14 19:30
 Container ID: 1142516009-A

Prep Batch: XXX31232
 Prep Method: SW3520C
 Prep Date/Time: 06/21/14 09:45
 Prep Initial Wt./Vol.: 970 mL
 Prep Extract Vol: 1 mL



Results of 17490-B20MW

Client Sample ID: **17490-B20MW**
Client Project ID: **17490-003 Former Mark Air**
Lab Sample ID: 1142516009
Lab Project ID: 1142516

Collection Date: 06/13/14 15:28
Received Date: 06/17/14 15:23
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		06/19/14 02:44
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		06/19/14 02:44
o-Xylene	0.500 U	1.00	0.310	ug/L	1		06/19/14 02:44
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		06/19/14 02:44
Toluene	0.500 U	1.00	0.310	ug/L	1		06/19/14 02:44
Surrogates							
1,4-Difluorobenzene	100	77-115		%	1		06/19/14 02:44

Batch Information

Analytical Batch: VFC11942
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/19/14 02:44
Container ID: 1142516009-C

Prep Batch: VXX26005
Prep Method: SW5030B
Prep Date/Time: 06/18/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 06/26/2014 1:42:49PM



Results of 17490-B21MW

Client Sample ID: **17490-B21MW**
Client Project ID: **17490-003 Former Mark Air**
Lab Sample ID: 1142516010
Lab Project ID: 1142516

Collection Date: 06/12/14 10:30
Received Date: 06/17/14 15:23
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.390 U	0.779	0.234	mg/L	1		06/24/14 19:50
Surrogates							
5a Androstane	67.6	50-150		%	1		06/24/14 19:50

Batch Information

Analytical Batch: XFC11378
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 06/24/14 19:50
Container ID: 1142516010-A

Prep Batch: XXX31232
Prep Method: SW3520C
Prep Date/Time: 06/21/14 09:45
Prep Initial Wt./Vol.: 770 mL
Prep Extract Vol: 1 mL

Print Date: 06/26/2014 1:42:49PM



Results of 17490-B21MW

Client Sample ID: **17490-B21MW**
Client Project ID: **17490-003 Former Mark Air**
Lab Sample ID: 1142516010
Lab Project ID: 1142516

Collection Date: 06/12/14 10:30
Received Date: 06/17/14 15:23
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		06/19/14 03:03
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		06/19/14 03:03
o-Xylene	0.500 U	1.00	0.310	ug/L	1		06/19/14 03:03
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		06/19/14 03:03
Toluene	0.350 J	1.00	0.310	ug/L	1		06/19/14 03:03
Surrogates							
1,4-Difluorobenzene	97.1	77-115		%	1		06/19/14 03:03

Batch Information

Analytical Batch: VFC11942
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/19/14 03:03
Container ID: 1142516010-C

Prep Batch: VXX26005
Prep Method: SW5030B
Prep Date/Time: 06/18/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 06/26/2014 1:42:49PM



Results of Trip Blank

Client Sample ID: **Trip Blank**
Client Project ID: **17490-003 Former Mark Air**
Lab Sample ID: 1142516011
Lab Project ID: 1142516

Collection Date: 06/12/14 08:00
Received Date: 06/17/14 15:23
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		06/18/14 16:58
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		06/18/14 16:58
o-Xylene	0.500 U	1.00	0.310	ug/L	1		06/18/14 16:58
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		06/18/14 16:58
Toluene	0.500 U	1.00	0.310	ug/L	1		06/18/14 16:58
Surrogates							
1,4-Difluorobenzene	101	77-115		%	1		06/18/14 16:58

Batch Information

Analytical Batch: VFC11942
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 06/18/14 16:58
Container ID: 1142516011-A

Prep Batch: VXX26005
Prep Method: SW5030B
Prep Date/Time: 06/18/14 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 06/26/2014 1:42:49PM



Method Blank

Blank ID: MB for HBN 1581383 [VXX/26005]
Blank Lab ID: 1215633

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1142516001, 1142516002, 1142516003, 1142516004, 1142516005, 1142516006, 1142516007, 1142516008, 1142516009, 1142516010, 1142516011

Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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	100	77-115		%
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Batch Information

Analytical Batch: VFC11942
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 6/18/2014 3:21:00PM

Prep Batch: VXX26005
Prep Method: SW5030B
Prep Date/Time: 6/18/2014 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 06/26/2014 1:42:51PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1142516 [VXX26005]
 Blank Spike Lab ID: 1215634
 Date Analyzed: 06/18/2014 16:00

Spike Duplicate ID: LCSD for HBN 1142516 [VXX26005]
 Spike Duplicate Lab ID: 1215635
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1142516001, 1142516002, 1142516003, 1142516004, 1142516005, 1142516006, 1142516007, 1142516008, 1142516009, 1142516010, 1142516011

Results by SW8021B

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	100	114	114	100	115	115	(80-120)	0.20	(< 20)
Ethylbenzene	100	106	106	100	105	105	(75-125)	1.30	(< 20)
o-Xylene	100	97.9	98	100	96.4	96	(80-120)	1.50	(< 20)
P & M -Xylene	200	199	99	200	197	98	(75-130)	1.10	(< 20)
Toluene	100	111	111	100	110	110	(75-120)	0.35	(< 20)
Surrogates									
1,4-Difluorobenzene	50		107	50		108	(77-115)	1.40	

Batch Information

Analytical Batch: **VFC11942**
 Analytical Method: **SW8021B**
 Instrument: **Agilent 7890A PID/FID**
 Analyst: **ST**

Prep Batch: **VXX26005**
 Prep Method: **SW5030B**
 Prep Date/Time: **06/18/2014 08:00**
 Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
 Dup Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL



Method Blank

Blank ID: MB for HBN 1580567 [XXX/31208]

Blank Lab ID: 1215164

QC for Samples:

1142516001, 1142516002, 1142516003, 1142516004

Matrix: Water (Surface, Eff., Ground)

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	0.237J	0.600	0.180	mg/L
Surrogates				
5a Androstane	81.3	60-120		%

Batch Information

Analytical Batch: XFC11368

Analytical Method: AK102

Instrument: HP 6890 Series II FID SV D R

Analyst: AYC

Analytical Date/Time: 6/19/2014 4:23:00PM

Prep Batch: XXX31208

Prep Method: SW3520C

Prep Date/Time: 6/18/2014 9:50:44AM

Prep Initial Wt./Vol.: 1000 mL

Prep Extract Vol: 1 mL

Print Date: 06/26/2014 1:42:52PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1142516 [XXX31208]
 Blank Spike Lab ID: 1215165
 Date Analyzed: 06/19/2014 16:33

Spike Duplicate ID: LCSD for HBN 1142516
 [XXX31208]
 Spike Duplicate Lab ID: 1215166
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1142516001, 1142516002, 1142516003, 1142516004

Results by AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	5	3.99	80	5	4.36	87	(75-125)	9.00	(< 20)
Surrogates									
5a Androstane	0.1		86	0.1		92	(60-120)	7.20	

Batch Information

Analytical Batch: **XFC11368**
 Analytical Method: **AK102**
 Instrument: **HP 6890 Series II FID SV D R**
 Analyst: **AYC**

Prep Batch: **XXX31208**
 Prep Method: **SW3520C**
 Prep Date/Time: **06/18/2014 09:50**
 Spike Init Wt./Vol.: 5 mg/L Extract Vol: 1 mL
 Dup Init Wt./Vol.: 5 mg/L Extract Vol: 1 mL



Method Blank

Blank ID: MB for HBN 1581862 [XXX/31232]
Blank Lab ID: 1215834

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1142516005, 1142516006, 1142516007, 1142516008, 1142516009, 1142516010

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane	75.6	60-120		%

Batch Information

Analytical Batch: XFC11378
Analytical Method: AK102
Instrument: HP 7890A FID SV E F
Analyst: HM
Analytical Date/Time: 6/24/2014 5:05:00PM

Prep Batch: XXX31232
Prep Method: SW3520C
Prep Date/Time: 6/21/2014 9:45:44AM
Prep Initial Wt./Vol.: 1000 mL
Prep Extract Vol: 1 mL

Print Date: 06/26/2014 1:42:53PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1142516 [XXX31232]
 Blank Spike Lab ID: 1215835
 Date Analyzed: 06/24/2014 17:25

Spike Duplicate ID: LCSD for HBN 1142516 [XXX31232]
 Spike Duplicate Lab ID: 1215836
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1142516005, 1142516006, 1142516007, 1142516008, 1142516009, 1142516010

Results by AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	5	4.14	83	5	4.28	86	(75-125)	3.50	(< 20)
Surrogates									
5a Androstane	0.1		94	0.1		86	(60-120)	8.30	

Batch Information

Analytical Batch: **XFC11378**
 Analytical Method: **AK102**
 Instrument: **HP 7890A FID SV E F**
 Analyst: **HM**

Prep Batch: **XXX31232**
 Prep Method: **SW3520C**
 Prep Date/Time: **06/21/2014 09:45**
 Spike Init Wt./Vol.: 5 mg/L Extract Vol: 1 mL
 Dup Init Wt./Vol.: 5 mg/L Extract Vol: 1 mL

1142516



SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY RECORD

Laboratory SGS Page 1 of 1
Attn: Tori

400 N. 34th Street, Suite 100 Seattle, WA 98103 (206) 632-8020
2043 Westport Center Drive St. Louis, MO 63146-3564 (314) 699-8660
303 Wellspring Way Richland, WA 99352 (509) 946-6309

2355 Hill Road Fairbanks, AK 99709 (907) 479-0600
5430 Fairbanks Street, Suite 3 Anchorage, AK 99518 (907) 561-2120

2255 S.W. Canyon Road Portland, OR 97201-2498 (503) 223-6147
1200 17th Street, Suite 1024 Denver, Co 80202 (303) 825-3800

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	BTEX	80218	8210	8211	8212	Total Number of Containers	Remarks/Matrix
17490-B12MW	① A-E	1655	6/12/14	X	X	X					5	Groundwater
B13MW	② A-E	1542	6/12/14	X	X	X				5		
B14MW	③ A-E	1429	6/12/14	X	X	X				5		
B15MW	④ A-E	1320	6/12/14	X	X	X				5		
B16MW	⑤ A-E	1005	6/13/14	X	X	X				5		
B17MW	⑥ A-E	1318	6/13/14	X	X	X				5		
B18MW	⑦ A-E	1423	6/13/14	X	X	X				5		
B19MW	⑧ A-E	1125	6/13/14	X	X	X				5		
B20MW	⑨ A-E	1528	6/13/14	X	X	X				5		
B21MW	⑩ A-E	1030	6/12/14	X	X	X				5		
TB	⑪ A-C	800	6/12/14		X					1	Trip Blank	

Project Information	Sample Receipt
Project Number: <u>17490-003</u>	Total Number of Containers
Project Name: <u>Former Mail A1</u>	COC Seals/Intact? Y/N/NA
Contact: <u>JCT</u>	Received Good Cond./Cold
Ongoing Project? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Delivery Method:
Sampler: <u>JCT</u>	(attach shipping bill, if any)

Instructions
Requested Turnaround Time: <u>Standard</u>
Special Instructions: <u>Level II Deliverables</u>

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: <u>Jake Traub</u> Time: <u>1522</u>	Signature: _____ Time: _____	Signature: _____ Time: _____
Printed Name: <u>Jake Traub</u> Date: <u>6/17/14</u>	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____
Company: <u>SEW</u>	Company: _____	Company: _____
Received By: 1.	Received By: 2.	Received By: 3.
Signature: _____ Time: _____	Signature: _____ Time: _____	Signature: _____ Time: <u>15:23</u>
Printed Name: _____ Date: _____	Printed Name: _____ Date: _____	Printed Name: <u>Emma Furlong</u> Date: <u>6/17/14</u>
Company: _____	Company: _____	Company: <u>SEW</u>

SAMPLE RECEIPT FORM



Review Criteria:	Condition:	Comments/Action
Were custody seals intact? Note # & location, if applicable. COC accompanied samples?	Yes No <u>N/A</u> Yes No <u>N/A</u>	
Temperature blank compliant* (i.e., 0-6°C after CF)? <i>* Note: Exemption permitted for chilled samples collected less than 8 hours ago.</i> Cooler ID: <u>1</u> @ <u>6.6</u> w/ Therm.ID: <u>242</u> Cooler ID: <u>2</u> @ <u>7.1</u> w/ Therm.ID: <u>241</u> Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ <i>Note: If non-compliant, use form FS-0029 to document affected samples/analyses.</i> If samples are received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "COOLER TEMP" will be noted to the right. In cases where neither a temp blank <u>nor</u> cooler temp can be obtained, note "ambient" or "chilled." If temperature(s) <0°C, were all sample containers ice free?	Yes No <u>N/A</u> Yes No <u>N/A</u>	X Run anyway per PM Instruction
Delivery method (specify all that apply): <u>Client</u> USPS Alert Courier C&D Delivery AK Air Lynden Carlile ERA PenAir FedEx UPS NAC Other: → For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?	Note ABN/ tracking # See Attached or N/A Yes No <u>N/A</u>	
→ For samples received with payment, note amount (\$) and cash / check / CC (circle one) or note: → For samples received in FBKS, ANCH staff will verify all criteria are reviewed.		SRF Initiated by: <u>N/A</u> <u>N/A</u>
Were samples received within hold time? <i>Note: Refer to form F-083 "Sample Guide" for hold time information.</i> Do samples match COC* (i.e., sample IDs, dates/times collected)? <i>* Note: Exemption permitted if times differ <1hr; in that case, use times on COC.</i> Were analyses requested unambiguous?	<u>Yes</u> No N/A <u>Yes</u> No N/A <u>Yes</u> No N/A	
Were samples in good condition (no leaks/cracks/breakage)? Packing material used (specify all that apply): <u>Bubble Wrap</u> Separate plastic bags Vermiculite Other:	<u>Yes</u> No N/A	
Were all VOA vials free of headspace (i.e., bubbles ≤6 mm)? Were all soil VOAs field extracted with MeOH+BFB?	Yes <u>No</u> N/A Yes No <u>N/A</u>	<u>18E</u> Bubble larger than 6 mm
Were proper containers (type/mass/volume/preservative*) used? <i>* Note: Exemption permitted for waters to be analyzed for metals.</i> Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	<u>Yes</u> No N/A <u>Yes</u> No N/A	<u>18E</u> <u>17/14</u>
For special handling (e.g., "MI" or foreign soils, lab filter, limited volume, Ref Lab), were bottles/paperwork flagged (e.g., sticker)?	Yes No <u>N/A</u>	
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was pH verified and compliant? If pH was adjusted, were bottles flagged (i.e., stickers)?	Yes <u>No</u> N/A <u>Yes</u> No N/A	<u>2A</u> added 4ml HCl from lot # LW09-0463-005-14 and OK.
For RUSH/SHORT Hold Time, were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	Yes No <u>N/A</u>	
For SITE-SPECIFIC QC, e.g. BMS/BMSD/BDUP, were containers / paperwork flagged accordingly?	Yes No <u>N/A</u>	
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	Yes No <u>N/A</u>	SRF Completed by: <u>EMT</u> PM = <u>CRD</u> N/A
Was PEER REVIEW of sample numbering/labeling completed?	<u>Yes</u> No N/A	Peer Reviewed by: <u>CRD</u> N/A
Additional notes (if applicable):		

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



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1142516001-A	HCL to pH < 2	OK	1142516009-C	HCL to pH < 2	OK
1142516001-B	HCL to pH < 2	OK	1142516009-D	HCL to pH < 2	OK
1142516001-C	HCL to pH < 2	OK	1142516009-E	HCL to pH < 2	OK
1142516001-D	HCL to pH < 2	OK	1142516010-A	HCL to pH < 2	OK
1142516001-E	HCL to pH < 2	OK	1142516010-B	HCL to pH < 2	OK
1142516002-A	HCL to pH < 2	PA	1142516010-C	HCL to pH < 2	OK
1142516002-B	HCL to pH < 2	OK	1142516010-D	HCL to pH < 2	OK
1142516002-C	HCL to pH < 2	OK	1142516010-E	HCL to pH < 2	OK
1142516002-D	HCL to pH < 2	OK	1142516011-A	HCL to pH < 2	OK
1142516002-E	HCL to pH < 2	OK	1142516011-B	HCL to pH < 2	OK
1142516003-A	HCL to pH < 2	OK	1142516011-C	HCL to pH < 2	OK
1142516003-B	HCL to pH < 2	OK			
1142516003-C	HCL to pH < 2	OK			
1142516003-D	HCL to pH < 2	OK			
1142516003-E	HCL to pH < 2	OK			
1142516004-A	HCL to pH < 2	OK			
1142516004-B	HCL to pH < 2	OK			
1142516004-C	HCL to pH < 2	OK			
1142516004-D	HCL to pH < 2	OK			
1142516004-E	HCL to pH < 2	OK			
1142516005-A	HCL to pH < 2	OK			
1142516005-B	HCL to pH < 2	OK			
1142516005-C	HCL to pH < 2	OK			
1142516005-D	HCL to pH < 2	OK			
1142516005-E	HCL to pH < 2	OK			
1142516006-A	HCL to pH < 2	OK			
1142516006-B	HCL to pH < 2	OK			
1142516006-C	HCL to pH < 2	OK			
1142516006-D	HCL to pH < 2	OK			
1142516006-E	HCL to pH < 2	OK			
1142516007-A	HCL to pH < 2	OK			
1142516007-B	HCL to pH < 2	OK			
1142516007-C	HCL to pH < 2	OK			
1142516007-D	HCL to pH < 2	OK			
1142516007-E	HCL to pH < 2	BU			
1142516008-A	HCL to pH < 2	OK			
1142516008-B	HCL to pH < 2	OK			
1142516008-C	HCL to pH < 2	OK			
1142516008-D	HCL to pH < 2	OK			
1142516008-E	HCL to pH < 2	OK			
1142516009-A	HCL to pH < 2	OK			
1142516009-B	HCL to pH < 2	OK			

Container Id

Preservative

Container Condition

Container Id

Preservative

Container Condition

Container Condition Glossary

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

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.

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

LABORATORY DATA REVIEW CHECKLIST

Completed by: Jake Tracy
Title: Environmental Engineer
Date: November 2014

CS Report Name: Former MarkAir Facility, King Salmon, Alaska

Laboratory Report Date: June 26, 2014

Consultant Firm: Shannon & Wilson, Inc.

Laboratory Name: SGS North America Inc.

Laboratory Report Number: 1142516

ADEC File Number:

ADEC RecKey Number: NA

(NOTE: NA = not applicable; Text in *italics* added by Shannon & Wilson, Inc.)

1. Laboratory

- a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? **Yes** / No / NA (please explain)

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 / **NA** (please explain)

Comments:

2. Chain of Custody (COC)

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

Yes / No / NA (please explain)

Comments:

- b. Correct analyses requested? **Yes** / No / NA (please explain)

Comments:

3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt ($4^{\circ} \pm 2^{\circ} \text{C}$)?

Yes / **No** / NA (please explain)

Comments: *The temperature blank was 6.6° C for cooler 1 and 7.1° C for cooler 2.*

- b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)? **Yes** / No / NA (please explain)

Comments:

- c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)? Yes / No / NA (please explain)

Comments: *The laboratory noted that the sample containers were in good condition.*

- d. If there were any discrepancies, were they documented? – For example, incorrect sample containers/preservation, sample temperature outside acceptance range, insufficient or missing samples, etc.? Yes / No / NA (please explain)

Comments: *The temperature blanks of coolers 1 and 2 were noted to be 6.6 °C and 7.1 °C, respectively, which is outside of the compliant temperature of 0-6 °C as noted by the laboratory. The laboratory also noted that there was a bubble larger than 6 millimeters in one of the three VOA vials associated with Sample B18MW.*

- e. Data quality or usability affected? Please explain.

Comments: *It is our opinion that the slight exceedance of the cooler temperatures does not affect the data quality or usability.*

One of the two VOA vials without a bubble from Sample B18MW was used for analysis according to the laboratory. Therefore, the one VOA vial with a bubble did not affect the data usability.

4. Case Narrative

- a. Present and understandable? Yes / No / NA (please explain)

Comments:

- b. Discrepancies, errors or QC failures identified by the lab? Yes / No / NA (please explain)

Comments:

- c. Were corrective actions documented? Yes / No / NA (please explain)

Comments:

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

Comments: *The case narrative does not comment on data quality/usability.*

5. Sample Results

- a. Correct analyses performed/reported as requested on COC? Yes / No / NA (please explain)

Comments:

- b. All applicable holding times met? Yes / No / NA (please explain)

Comments:

All soils reported on a dry weight basis? Yes / No / NA (please explain)

Comments:

- c. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project? **Yes** / No / NA (please explain)

Comments:

- d. Data quality or usability affected? **NA** Please explain.

Comments: *No discrepancies noted.*

6. QC Samples

a. Method Blank

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

Yes / No / NA (please explain)

Comments:

- ii. All method blank results less than LOQ? **Yes** / No / NA (please explain)

Comments: *However, an estimated concentration of DRO was detected in the method blank associated with Samples B12MW through B15MW at a level less than the LOQ.*

- iii. If above LOQ, what samples are affected? **NA**

Comments: *Although the reported DRO concentration in the above groundwater method blank is less than its LOQ, the samples associated with this method blank are "B" flagged when the reported sample concentration is within 10x the reported method blank concentration. If both the sample and method blank concentrations are reported at levels less than the LOQ, the sample concentration is reported as non-detect at the LOQ. If the reported sample concentration is greater than the LOQ and less than 5x the method blank concentration, the sample concentration is reported as non-detect at the detected sample concentration.*

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

Yes / No / NA (please explain)

Comments: *The affected samples are "B" flagged on Table 2.*

- v. Data quality or usability affected? Please explain.

Comments: *The DRO concentrations reported at levels above the LOQ may be biased high. Each of the samples affected had DRO concentrations less than the ADEC cleanup level therefore the affected data is acceptable for the purposes of this report.*

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 / NA (please explain)

Comments:

- ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples? **Yes / No / NA** (please explain)

Comments:

- 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 / NA** (please explain)

Comments:

- iv. Precision – All relative percent differences (RPDs) 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%, VOCs 20%; all other analyses see the laboratory QC pages) **Yes / No / NA** (please explain)

Comments:

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

Comments:

- vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined? **Yes / No / NA** (please explain)

Comments:

- vii. Data quality or usability affected? Please explain. **NA**

Comments:

c. Surrogates - Organics Only

- i. Are surrogate recoveries reported for organic analyses, field, QC and laboratory samples? **Yes / No / NA** (please explain)

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 / NA** (please explain)

Comments:

- iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined? **Yes / No / NA** (please explain)

Comments:

- iv. Data quality or usability affected? Please explain. **NA**

Comments:

d. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.)
Water and Soil

- i. One trip blank reported per matrix, analysis, and cooler? (If not, enter explanation below.) **Yes** / No / NA (please explain)

Comments: *Only one cooler was submitted to the laboratory.*

- ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment stating why must be entered below.) Yes / **No** / NA (please explain)

Comments: *Only one cooler was submitted to the laboratory.*

- iii. All results less than LOQ? **Yes** / No / NA (please explain)

Comments:

- iv. If above LOQ, what samples are affected? **NA**

Comments:

- v. Data quality or usability affected? Please explain. *NA*

Comments: *One water trip blank accompanied all of the VOA vials at all times so samples are usable.*

e. Field Duplicate

- i. One field duplicate submitted per matrix, analysis and 10 project samples? Yes / **No** / NA (please explain)

Comments: *A field duplicate was not included in our ADEC-approved work plan.*

- ii. Submitted blind to the lab? Yes / No / **NA** (please explain)

Comments:

- iii. Precision – All relative percent differences (RPDs) less than specified DQOs? (Recommended: 30% for water, 50% for soil) Yes / No / **NA** (please explain)

Comments:

- iv. Data quality or usability affected? Please explain.

Comments:

Work Order Number: 1142516

f. Decontamination or Equipment Blank (if not applicable)

Yes / **No** / NA (please explain)

Comments: *The use of a decontamination or equipment blank was beyond the scope of the ADEC-approved work plan for this project.*

i. All results less than LOQ? Yes / No / **NA** (please explain)

Comments:

If above LOQ, what samples are affected? **NA**

Comments:

ii. Data quality or usability affected? Please explain. **NA**

Comments:

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

a. Defined and appropriate? **Yes** / No / NA (please explain)

Comments: *A key is provided on page 3 of the laboratory report.*

ATTACHMENT 4
IMPORTANT INFORMATION ABOUT YOUR
GEOTECHNICAL/ENVIRONMENTAL REPORT



Date: November 2014
To: ADEC
Re: Former MarkAir Facility, King Salmon,
Alaska

Important Information About Your Geotechnical/Environmental Report

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors, which were considered in the development of the report, have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland