CEPOA-EN-GES-CIH (200-1d) 28 July 2011

MEMORANDUM FOR CEPOA-ESP (Peterson)

SUBJECT: Chemical Data Report, Eek Barge Landing Sediment Study, Eek, Alaska (11-067)

1. Reference Email, CEPOA-ESP-PM (Peterson), 8 March 2011, Subject: Eek Barge Landing PMP

2. Attached is the Chemical Data Report for this project.

3. Questions should be directed to Amanda Whittier, x5582.

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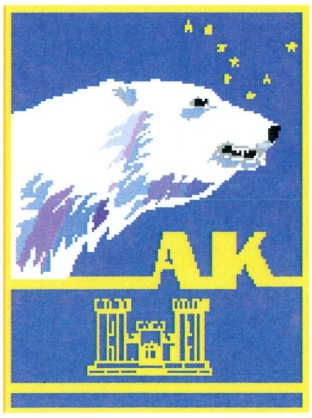
Chemical Data Report

Eek Barge Landing Sediment Study

Eek Barge Landing
Eek, Alaska
PN: 326553
Project Number: 11-067



Chemistry and Industrial Hygiene Section
Geotechnical and Engineering Services Branch

July 2011

Executive Summary

Five primary sediment samples were taken in the Eek River on 7 June 2011. The results were screened against State of Alaska soil cleanup criteria under 18 AAC 75. Sediment was also tested for physical characteristics to determine grain size and other parameters. For sample locations see Figures 1 and 2.

Based on the data, dredged sediments from the proposed dredge site are suitable for landfill disposal with State of Alaska Department of Environmental Conservation (ADEC) approval. The Denali Commission and ADEC should coordinate with the successful dredging contractor on the location for the dredged sediment disposal.

Table of Contents

Chemical Data Report

1. Introduction

This report presents the analytical results of sediment samples collected during an investigation of the shoal in Eek River in Eek, Alaska. Sediment samples were collected to assess the physical and chemical characteristics of the deposited sediments making the shoal. Chemical testing was completed to determine the suitability of the dredged sediments for disposal in the local area. Six samples (including one duplicate) were taken from different areas of the shoal. These sediment samples were collected on 7 June 2011. The U.S. Army Corps of Engineers Alaska District, Geotechnical and Engineering Services Branch, Chemistry and Industrial Hygiene Section (CEPOA-EN-GES-CIH) prepared this report at the request of the Environmental and Special Projects Project Management (CEPOA-ESP-PM) branch.

2. Site Background Information

2.1 Location

Eek is on the south bank of the Eek River in the Yukon-Kuskokwim Delta, 12 miles east of the Kuskokwim River mouth. It is 35 miles south of Bethel and 420 miles west of Anchorage (Figure 1).

2.2 Site History and Known Contamination

The community of Eek was originally on the Apokok River and was moved to its present location on the Eek River in the 1930s. An erosion survey described Eek as being subject to erosion along the banks of the Eek River. For erosion concerns, the airport was moved to a safe distance from the river.

Eek has a short history of diesel contamination from aboveground storage tanks (ASTs) from the school tank farm. One soil sample resulted in a diesel range organics (DRO) concentration of 46,600 mg/kg (ref. 7.7). All other samples were below ADEC cleanup criteria.

2.3 Limitations

This project is not intended to be a comprehensive environmental investigation of the site and changes in the condition of the site may occur with time due to natural processes or human activities. The findings presented in this report are based on site conditions existing at the time of the investigation.

3. Field Activities and Observations

3.1 Summary of Field Activities

Six sediment samples (including one duplicate) were taken during the sediment investigation of the shoal in the Eek River in Eek on 7 June 2011. Sampling was intended to characterize the physical and chemical characteristics of the shoal sediments. Sample locations were chosen to be widely dispersed across the entire shoal. All sample locations were accessed using a skiff. All samples were taken using a decontaminated Ekman grab sampling device to collect the top 6 inches of sediment at each site. A handheld global positioning service (GPS) unit was used to mark the sample locations. After filling chemical sampling containers, the remaining sediment was bagged and submitted for testing of physical characteristics.

The field crew over the course of the study consisted of chemists Amanda Whittier (CEPOA-EN-GES-CIH) and biologist Guy McConnell (CEPOA-EN-CW-ER).

3.2 Sampling Activities

Chemical sampling was performed in a manner consistent with the project Sampling and Analysis Plan (SAP, ref 7.5). Six sediment samples were taken for analysis (see Table 3-1 and Figure 2 for sample locations).

Table 3-1 Sample Locations		
Location	**Degrees N**	**Degrees W**
Sample -01SE/-10SE	60°13.266'	162°01.913'
Sample -02SE	60°13.349'	162°02.192'
Sample -03SE	60°13.328'	162°02.134'
Sample -04SE	60°13.306'	162°02.085'
Sample -05SE	60°13.287'	162°02.002'

3.3 Observations

Samples 11EEK01SE, 02SE and 03SE were silty sand and sample 11EEK04SE was sandy silt (see Appendix E, Physical Sediment Data). Vegetation was removed prior to containerization. Odor or sheen was not observed in any sample.

3.4 Scope of Analytical Methods

Table 3-2 summarizes the analytical methods that were performed on sediment samples submitted for chemical analysis.

Table 3-1 Scope of Sampling			
Parameter	**Analytical Method**	**Target Contaminant**	**Number of Samples Submitted[1]**
Gasoline Range Organics (GRO)	AK101	Gasoline and other light-weight fuels	6
Diesel Range Organics (DRO)	AK102	Diesel and other medium-weight fuels	6
Residual Range Organics (RRO)	AK103	Lubricant oils, asphalts, tars	6
Volatile Organic Compounds (VOCs)	SW846 8260B	Fuel constituent and solvent compounds	6
Polycyclic Aromatic Hydrocarbons (PAHs)	SW846 8270C SIM	Fuel constituent compounds and various additional non-volatile chemicals	6
Polychlorinated Biphenyls (PCBs)	SW846 8082	PCBs from electrical equipment or waste oil	6
Chlorinated Pesticides	SW846 8081A	Pesticides (e.g., DDT) residues from previous pest control activities	6
RCRA Metals + Copper and Zinc: arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver and zinc	SW846 6020 & 7471A	Regulated metals from fuels, paints, batteries, etc.	6

Table 3-1 Scope of Sampling			
Parameter	**Analytical Method**	**Target Contaminant**	**Number of Samples Submitted[1]**
Total Organic Carbon (TOC)	SW846 9060	Used in interpretation of organic chemical data	6
1. Numbers include duplicate samples.			

3.5 Investigation Derived Waste

Investigation derived waste generated during this sampling event consisted primarily of disposable sampling equipment (sampling spoons, plastic bags, paper towels, etc.). These items were brushed clean of sediment on site, bagged and were disposed as ordinary solid waste. The reusable sampling equipment was cleaned between samples by scrubbing it free of any adhering sediments with a brush and fresh water.

4. Results of Chemical Analyses

4.1 Overview

The samples collected from the project site were analyzed by TestAmerica Laboratories of Tacoma, Washington. The laboratory work is compliant with the Department of Defense Quality System Manual (QSM, ref 7.3). The results of the chemical analyses are summarized in the sections below. Tables of comprehensive data are presented in Appendix B.

4.2 Chemicals Detected

The results of the chemical analyses were screened against State of Alaska soil cleanup criteria under 18 AAC 75, Oil and Hazardous Substances Pollution Control (ref 7.2). The most stringent Method Two cleanup criteria for the Under 40 Inch Zone were used as evaluation criteria. These cleanup criteria are those that would be applied by default to excavated soils in accordance with the Alaska Department of Environmental Conservation (ADEC) guidance (ref. 7.1). In addition to the chemicals on the following table, numerous compounds were detected in trace amounts well below the cleanup criteria.

4.2.1 Fuels and POL (AK101/102/103): GRO was not detected in any sample. DRO and RRO were detected in all samples in low concentrations well below ADEC cleanup criteria.

4.2.2 Volatile Organic Compounds (VOCs): VOC compound methylene chloride was detected in two samples, 11EEK04SE and 10SE in low concentrations due to trip contamination. However, results are well below ADEC cleanup criteria (see Section 5.1.3).

4.2.3 Polynuclear Aromatic Hydrocarbons (PAHs): PAHs were not detected in any sample.

4.2.4 Pesticides: Pesticide compound endosulfan II was detected in two samples, 11EEK04SE and 10SE in low concentrations well below ADEC cleanup criteria.

4.2.5 Polychlorinated Biphenyls (PCBs): PCBs were not detected in any sample.

4.2.6 RCRA Metals plus copper and zinc: Metals were detected in samples well below ADEC cleanup criteria, with the exception of arsenic. Arsenic was well above ADEC cleanup criteria in all samples.

5. Data Quality Review and Usability Assessment

After analysis at the project laboratory, the project data was reviewed for deviations to the requirements presented in the SAP (ref 7.5), the ADEC Technical Memo 06-002 (ref 7.1) and the Department of Defense (DoD) Quality Systems Manual (QSM, ref 7.3) in the following areas – precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS). Elements reviewed include sample handling, holding times, method and trip blanks, laboratory control sample (LCS/LCSD) recoveries and relative percent differences (RPDs), matrix spikes and matrix spike duplicates (MS/MSD) recoveries and RPDs and surrogate recovery. Calibration curves and continuing calibration standard recoveries were not reviewed. Quality control deviations which do not impact data quality (e.g. a high LCS recovery associated with a nondetect result) are not discussed.

The following qualifiers, listed below in order of increasing severity, are used in the data tables to indicate quality control deficiencies:

Qualifier	Definition
J	Analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL
MH, ML, MN	Analyte result is considered an estimated value biased (high, low, uncertain) due to matrix effects
B	Analyte result is considered a high estimated value due to contamination present in the method blank.
QH, QL, QN	Analyte result is considered an estimated value biased (high, low, uncertain) due to a quality control failure
R	Analyte result is rejected - result is not usable.

All samples were sent to TestAmerica Laboratories in one Sample Delivery Group (SDG). This lab is validated by the State of Alaska through the Contaminated Sites Program and is approved through the DOD Environmental Laboratory Accreditation Program (ELAP). Details of the data review are presented by SDG below:

5.1 SDG 580-26701

5.1.1 Sample Handling: Six sediment samples (including one duplicate) were received in sample delivery group 580-26701 by the laboratory (ref 7.4). All sample receiving criteria were met.

5.1.2 Holding Times: All samples were analyzed within the method specified holding times.

5.1.3 Blanks: Method blanks and trip blanks were analyzed at the proper frequency. Target analytes were not detected in any method or trip blank with the exception of the following:

- Methylene chloride was detected in the trip blank at a concentration greater than the LOD, but less than the LOQ. The affected results are flagged "B"; however, all results are well below the ADEC cleanup criteria and data usability is not impacted.

5.1.4 Laboratory Control Samples: LCS/LCSDs were analyzed at the required frequency. Recoveries were within the QSM acceptance limits or any deviations do not impact data quality with the exception of the following:

- Total organic carbon (TOC) was above limits for all samples

5.1.5 Laboratory Control Sample Precision: The LCS precision as measured by relative percent difference (RPD) was within QSM acceptance limits.

5.1.6 Surrogates: Surrogate recoveries for all samples were within the QSM acceptance limits or deviations do not impact data quality with the exception of the following:

- GRO surrogate a,a,a-trifluorotoluene was low in samples 11EEK02SE, 03SE and 04SE. GRO data for these samples has been flagged "QL" and are qualified to be biased low. Data usability is not impacted as all results are well below ADEC cleanup criteria.
- Pesticide surrogate tetrachloro-m-xylene was low in samples 11EEK03SE and 04SE. Pesticide data for these samples has been flagged "QL" and are qualified to be biased low. Data usability is not impacted as all results are well below ADEC cleanup criteria.
- Volatile Organic Compounds (VOCs) surrogate a,a,a-trifluorotoluene was low in samples 11EEK01SE, 02SE, 03SE and 04SE. VOCs data for these samples has been flagged "QL" and are qualified to be biased low. Data usability is not impacted as all results are well below ADEC cleanup criteria.

5.1.7 Matrix spikes: MS/MSD samples were analyzed at the required frequency and recoveries were within QSM acceptance limits or deviations do not impact data with the following exceptions:

- The matrix spike and/or matrix spike duplicate recoveries for 1,2-dibromo-3-chloropropane, 2-hexanone, acetone and chloroethane in the MS/MSD associated with sample 11EEK01SE were above QSM acceptance limits. Results for these analytes in the primary sample are flagged "MH".
- The matrix spike and/or matrix spike duplicate recoveries for delta-BHC and heptachlor epoxide in the MS/MSD associated with sample 11EEK01SE were below QSM acceptance limits. Results for these analytes in the primary sample are flagged "ML". Data usability is not impacted since all results are below ADEC cleanup criteria.

5.1.8 Matrix Spike precision: The reported MS/MSD precision was within QSM acceptance limits or deviations do not impact data quality

5.1.9 Field duplicates: A total of one field duplicate was collected and submitted to the laboratory during all field efforts. A total of five primary samples were submitted, thus the required 10% duplicate frequency was met. All results are compliant with the criteria specified in ADEC Tech Memo 06-002 except as noted below.

- For duplicate pair 11EEK01SE/10SE, the RPD for TOC was high (greater than 50%) likely due to the heterogeneity of the sample. The RPDs for endosulfan II and methylene chloride were high (greater than 50%) because low concentrations were detected in one-half of the duplicate pair, but not the other Data usability is not impacted as all results are well below ADEC cleanup criteria.

5.2 Reporting Limit Assessment:

Reporting/detection limits are defined by the QSM as follows: the Limit of Quantification (LOQ) is the lowest concentration that produces a quantitative result within specified limits of precision and bias. For DoD projects, the LOQ shall be set at or above the concentration of the lowest initial calibration standard corrected for sample preparation, dilution and moisture (if applicable). Laboratories can often detect analytes at levels less than the LOQ, albeit less quantitatively; therefore, the Limit of Detection (LOD) is defined as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false positive rate is 1%. Consequently, any nondetect result with an LOD greater than the associated cleanup limit cannot be used to prove the absence of that analyte at that limit. The following analytes have LODs greater than the applicable ADEC cleanup criteria in one or more samples: 1,2,3-trichloropropane, 1,2-dibromoethane, 1,2-dichloroethane, chloromethane and methylene chloride.

5.3 Overall Assessment:

All data is usable as flagged. ADEC laboratory data checklists were prepared in conjunction with the data review and are presented in Appendix C.

6. Summary and Recommendations:

6.1 Summary

The laboratory results indicate sediment contamination outside the project limits as follows:

- Arsenic was detected at levels above ADEC cleanup criteria in all samples. These levels are above the direct contact limit of 4.5 mg/kg specified in 18 AAC 75.341, Table B-1.

6.2 Recommendations

Based on the data, dredged sediments from the proposed dredge site are suitable for landfill disposal with State of Alaska Department of Environmental Conservation (ADEC) approval. The Denali Commission and ADEC should coordinate with the successful dredging contractor on the location for the dredged sediment disposal.

7. References

7.1 Alaska Department of Environmental Conservation, Technical Memorandum 06-002, Environmental Laboratory Data and Quality Assurance Requirements, March 2009.

7.2 Alaska Department of Environmental Conservation (ADEC), 18 AAC 75 Oil and Other Hazardous Substances Pollution Control, October 2008.

7.3 Department of Defense, Quality Systems Manual for Environmental Laboratories, Final Version 4.2, October 2010.

7.4 TestAmerica, Inc. Laboratory Analytical Report SDG # 580-26701, (11-067) Eek Barge Landing, July 2011.

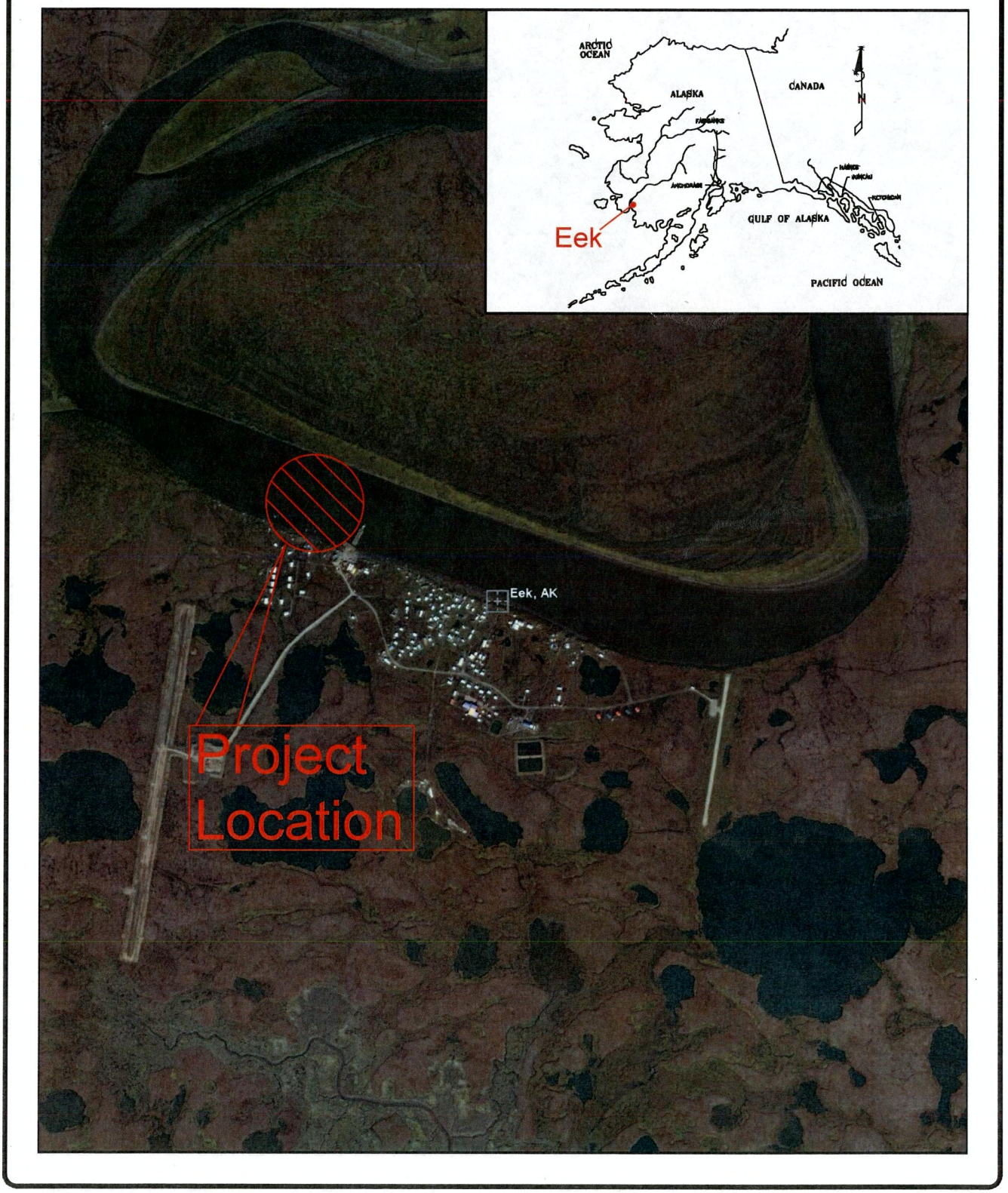
7.5 U.S. Army Corps of Engineers, Sampling and Analysis Plan, Sediment Sampling and Analysis, Eek Barge Landing, June 2011.

7.6 U.S. Army Corps of Engineers, Alaska Community Erosion Survey, OMB approved number 07100001, 2007.

7.7 Alaska Department of Environmental Conservation Contaminated Sites Database, File # 2412.57.001, 01DEC2010.

Appendix A

Figures

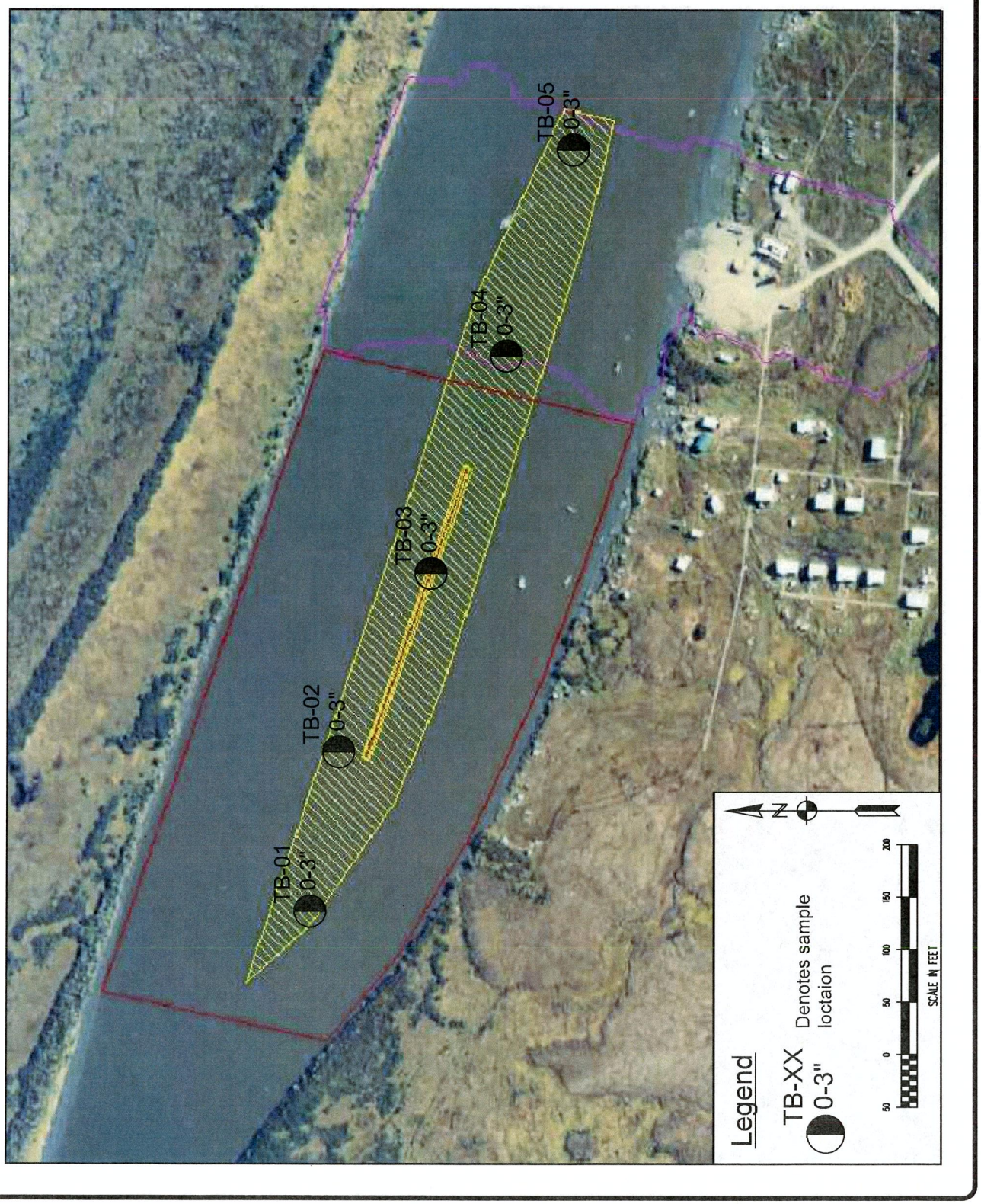


ALASKA DISTRICT
CORPS OF ENGINEERS
CIH Section

SITE LOCATION MAP
Eek Barge Landing
Eek, Alaska

SCALE: GRAPHICAL
DATE: May 2011
DRAWN/RVW: ALW
FIGURE 1

CORPS OF ENGINEERS U.S. ARMY



ALASKA DISTRICT
CORPS OF ENGINEERS
CIH Section

TEST BORING LOCATION MAP
Eek Barge Landing
Eek, Alaska

SCALE: GRAPHICAL
DATE: July 2011
DRAWN/RVW: ALW
FIGURE 2

Figure 3: Photo of sediment with limited water.

Figure 4: View of current barge landing, facing S.

Figure 5: View of the shoal at the beginning of sampling, facing SW.

Figure 6: View of the shoal at the end of sampling, facing S.

Figure 7: view of disposed of ASTs and gravel pile, facing SE.

Figure 8: view of barge landing from TB-2, facing SE.

Figure 9: photo of sediment sample from TB-3.

Figure 10: photo of sediment sample from TB-4.

Appendix B

Data Tables

Eek Barge Landing Data Table

				11EEK01SE 1 580-26701-1 6/7/2011	11EEK10SE 10 580-26701-1 6/7/2011	11EEK02SE 2 580-26701-1 6/7/2011	11EEK03SE 3 580-26701-1 6/7/2011
Method	Analyte	Units	ADEC	**MS/MSD**	**Duplicate of -01SE**		
8270SIM	2-Methylnaphthalene	mg/kg	6.1	ND [0.0062]	ND [0.0062]	ND [0.0064]	ND [0.0069]
8270SIM	Acenaphthene	mg/kg	180	ND [0.0062]	ND [0.0062]	ND [0.0064]	ND [0.0069]
8270SIM	Acenaphthylene	mg/kg	180	ND [0.0062]	ND [0.0062]	ND [0.0064]	ND [0.0069]
8270SIM	Anthracene	mg/kg	3000	ND [0.0062]	ND [0.0062]	ND [0.0064]	ND [0.0069]
8270SIM	Benzo(a)anthracene	mg/kg	3.6	ND [0.0062]	ND [0.0062]	ND [0.0064]	ND [0.0069]
8270SIM	Benzo(a)pyrene	mg/kg	0.49	ND [0.0062]	ND [0.0062]	ND [0.0064]	ND [0.0069]
8270SIM	Benzo(b)fluoranthene	mg/kg	4.9	ND [0.0062]	ND [0.0062]	ND [0.0064]	ND [0.0069]
8270SIM	Benzo(g,h,i)perylene	mg/kg	1400	ND [0.0062]	ND [0.0062]	ND [0.0064]	ND [0.0069]
8270SIM	Benzo(k)fluoranthene	mg/kg	49	ND [0.0062]	ND [0.0062]	ND [0.0064]	ND [0.0069]
8270SIM	Chrysene	mg/kg	360	ND [0.0062]	ND [0.0062]	ND [0.0064]	ND [0.0069]
8270SIM	Dibenzo(a,h)anthracene	mg/kg	0.49	ND [0.0062]	ND [0.0062]	ND [0.0064]	ND [0.0069]
8270SIM	Fluoranthene	mg/kg	1400	ND [0.0062]	ND [0.0062]	ND [0.0064]	ND [0.0069]
8270SIM	Fluorene	mg/kg	220	ND [0.0062]	ND [0.0062]	ND [0.0064]	ND [0.0069]
8270SIM	Indeno(1,2,3-cd)pyrene	mg/kg	4.9	ND [0.0062]	ND [0.0062]	ND [0.0064]	ND [0.0069]
8270SIM	Naphthalene	mg/kg	20	ND [0.0062]	ND [0.0062]	ND [0.0064]	ND [0.0069]
8270SIM	Phenanthrene	mg/kg	3000	ND [0.0062]	ND [0.0062]	ND [0.0064]	ND [0.0069]
8270SIM	Pyrene	mg/kg	1000	ND [0.0062]	ND [0.0062]	ND [0.0064]	ND [0.0069]
AK101	Gasoline Range Organics (C6-C10)	mg/kg	300	ND [2.1]	ND [2.3]	ND [2.2] QL	ND [2.2] QL
AK102	Diesel Range Organics (C10-C25)	mg/kg	250	14 [25] J	11 [24] J	13 [26] J	18 [28] J
AK103	Residual Range Organics (C25-C36)	mg/kg	10000	90 [62]	77 [60]	94 [65]	150 [69]
E160.3M	Percent Moisture	Percent	NA	21 [0.1]	21 [0.1]	24 [0.1]	29 [0.1]
E160.3M	Solids, Percent	Percent	NA	79 [0.1]	79 [0.1]	76 [0.1]	71 [0.1]
SW6020	Arsenic	mg/kg	3.9	**9.4 [0.52]**	**7.5 [0.47]**	**7 [0.44]**	**7.5 [0.45]**
SW6020	Barium	mg/kg	1100	82 [0.21]	70 [0.19]	78 [0.18]	91 [0.18]
SW6020	Cadmium	mg/kg	5	0.031 [0.21] J	0.043 [0.19] J	0.11 [0.18] J	0.12 [0.18] J
SW6020	Chromium	mg/kg	25	16 [0.21]	15 [0.19]	15 [0.18]	17 [0.18]
SW6020	Copper	mg/kg	460	11 [0.21]	9.9 [0.19]	16 [0.18]	15 [0.18]
SW6020	Lead	mg/kg	400	3.7 [0.21]	3.3 [0.19]	4.1 [0.18]	4.1 [0.18]
SW6020	Selenium	mg/kg	3.4	ND [0.73] J	ND [0.66]	0.26 [0.62] J	0.21 [0.63] J
SW6020	Silver	mg/kg	11.2	0.046 [0.21] J	0.047 [0.19] J	0.08 [0.18] J	0.085 [0.18] J

Eek Barge Landing Data Table

				11EEK01SE 1 580-26701-1 6/7/2011	11EEK10SE 10 580-26701-1 6/7/2011	11EEK02SE 2 580-26701-1 6/7/2011	11EEK03SE 3 580-26701-1 6/7/2011
Method	Analyte	Units	ADEC	**MS/MSD**	**Duplicate of -01SE**		
SW6020	Zinc	mg/kg	4100	53 [0.73]	48 [0.66]	48 [0.62]	54 [0.63]
SW7471A	Mercury	mg/kg	1.4	0.044 [0.02]	0.031 [0.02]	0.042 [0.017]	0.051 [0.02]
SW8081	4,4'-DDD	mg/kg	7.2	ND [0.0024]	ND [0.0024]	ND [0.0025]	ND [0.0027] QL
SW8081	4,4'-DDE	mg/kg	5.1	ND [0.0024]	ND [0.0024]	ND [0.0025]	ND [0.0027] QL
SW8081	4,4'-DDT	mg/kg	7.3	ND [0.0024]	ND [0.0024]	ND [0.0025]	ND [0.0027] QL
SW8081	Aldrin	mg/kg	0.07	ND [0.0012]	ND [0.0012]	ND [0.0013]	ND [0.0013] QL
SW8081	alpha-BHC	mg/kg	0.0064	ND [0.0012]	ND [0.0012]	ND [0.0013]	ND [0.0013] QL
SW8081	alpha-Chlordane	mg/kg	2.3	ND [0.0012]	ND [0.0012]	ND [0.0013]	ND [0.0013] QL
SW8081	beta-BHC	mg/kg	0.022	ND [0.0012]	ND [0.0012]	ND [0.0013]	ND [0.0013] QL
SW8081	Chlordane	mg/kg	2.3	ND [0.012]	ND [0.012]	ND [0.013]	ND [0.013] QL
SW8081	delta-BHC	mg/kg	NA	ND [0.0012] ML	ND [0.0012]	ND [0.0013]	ND [0.0013] QL
SW8081	Dieldrin	mg/kg	0.0076	ND [0.0024]	ND [0.0024]	ND [0.0025]	ND [0.0027] QL
SW8081	Endosulfan I	mg/kg	64	ND [0.0012]	ND [0.0012]	ND [0.0013]	ND [0.0013] QL
SW8081	Endosulfan II	mg/kg	64	ND [0.0024]	0.00047 [0.0024] J	ND [0.0025]	ND [0.0027] QL
SW8081	Endosulfan sulfate	mg/kg	64	ND [0.0024]	ND [0.0024]	ND [0.0025]	ND [0.0027] QL
SW8081	Endrin	mg/kg	0.29	ND [0.0024]	ND [0.0024]	ND [0.0025]	ND [0.0027] QL
SW8081	Endrin aldehyde	mg/kg	NA	ND [0.0024]	ND [0.0024]	ND [0.0025]	ND [0.0027] QL
SW8081	Endrin ketone	mg/kg	NA	ND [0.0024]	ND [0.0024]	ND [0.0025]	ND [0.0027] QL
SW8081	gamma-BHC (Lindane)	mg/kg	0.0095	ND [0.0012]	ND [0.0012]	ND [0.0013]	ND [0.0013] QL
SW8081	gamma-Chlordane	mg/kg	2.3	ND [0.0012]	ND [0.0012]	ND [0.0013]	ND [0.0013] QL
SW8081	Heptachlor	mg/kg	0.28	ND [0.0012]	ND [0.0012]	ND [0.0013]	ND [0.0013] QL
SW8081	Heptachlor epoxide	mg/kg	0.014	ND [0.0012] ML	ND [0.0012]	ND [0.0013]	ND [0.0013] QL
SW8081	Methoxychlor	mg/kg	23	ND [0.012]	ND [0.012]	ND [0.013]	ND [0.013] QL
SW8081	Toxaphene	mg/kg	3.9	ND [0.12]	ND [0.12]	ND [0.13]	ND [0.13] QL
SW8082	PCB-1016 (Aroclor 1016)	mg/kg	1	ND [0.012]	ND [0.012]	ND [0.013]	ND [0.013]
SW8082	PCB-1221 (Aroclor 1221)	mg/kg	1	ND [0.012]	ND [0.012]	ND [0.013]	ND [0.013]
SW8082	PCB-1232 (Aroclor 1232)	mg/kg	1	ND [0.012]	ND [0.012]	ND [0.013]	ND [0.013]
SW8082	PCB-1242 (Aroclor 1242)	mg/kg	1	ND [0.012]	ND [0.012]	ND [0.013]	ND [0.013]
SW8082	PCB-1248 (Aroclor 1248)	mg/kg	1	ND [0.012]	ND [0.012]	ND [0.013]	ND [0.013]
SW8082	PCB-1254 (Aroclor 1254)	mg/kg	1	ND [0.012]	ND [0.012]	ND [0.013]	ND [0.013]
SW8082	PCB-1260 (Aroclor 1260)	mg/kg	1	ND [0.012]	ND [0.012]	ND [0.013]	ND [0.013]
SW8260	1,1,1,2-Tetrachloroethane	mg/kg	NA	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL

Eek Barge Landing Data Table

				11EEK01SE 1 580-26701-1 6/7/2011	11EEK10SE 10 580-26701-1 6/7/2011	11EEK02SE 2 580-26701-1 6/7/2011	11EEK03SE 3 580-26701-1 6/7/2011
Method	Analyte	Units	ADEC	**MS/MSD**	**Duplicate of -01SE**		
SW8260	1,1,1-Trichloroethane	mg/kg	0.82	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	1,1,2,2-Tetrachloroethane	mg/kg	0.017	ND [0.0052] QL	ND [0.0059]	ND [0.0056] QL	ND [0.0054] QL
SW8260	1,1,2-Trichloroethane	mg/kg	0.018	ND [0.0062] QL	ND [0.007]	ND [0.0067] QL	ND [0.0065] QL
SW8260	1,1-Dichloroethane	mg/kg	25	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	1,1-Dichloroethene	mg/kg	0.03	ND [0.01] QL	ND [0.012]	ND [0.011] QL	ND [0.011] QL
SW8260	1,1-Dichloropropene	mg/kg	NA	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	1,2,3-Trichlorobenzene	mg/kg	NA	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	1,2,3-Trichloropropane	mg/kg	0.00053	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	1,2,4-Trichlorobenzene	mg/kg	0.85	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	1,2,4-Trimethylbenzene	mg/kg	23	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	1,2-Dibromo-3-chloropropane	mg/kg	NA	ND [0.1] QL	ND [0.12]	ND [0.11] QL	ND [0.11] QL
SW8260	1,2-Dibromoethane	mg/kg	0.00016	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	1,2-Dichlorobenzene	mg/kg	5.1	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	1,2-Dichloroethane	mg/kg	0.016	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	1,2-Dichloropropane	mg/kg	0.018	ND [0.0062] QL	ND [0.007]	ND [0.0067] QL	ND [0.0065] QL
SW8260	1,3,5-Trimethylbenzene	mg/kg	23	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	1,3-Dichlorobenzene	mg/kg	28	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	1,3-Dichloropropane	mg/kg	NA	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	1,4-Dichlorobenzene	mg/kg	0.64	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	2,2-Dichloropropane	mg/kg	NA	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	2-Butanone	mg/kg	59	ND [0.21] QL	ND [0.23]	ND [0.22] QL	ND [0.22] QL
SW8260	2-Chlorotoluene	mg/kg	NA	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	2-Hexanone	mg/kg	NA	ND [0.1] QL	ND [0.12]	ND [0.11] QL	ND [0.11] QL
SW8260	4-Chlorotoluene	mg/kg	NA	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	4-Methyl-2-pentanone	mg/kg	8.1	ND [0.1] QL	ND [0.12]	ND [0.11] QL	ND [0.11] QL
SW8260	Acetone	mg/kg	88	ND [0.21] QL	ND [0.23]	ND [0.22] QL	ND [0.22] QL
SW8260	Benzene	mg/kg	0.025	ND [0.0083] QL	ND [0.0094]	ND [0.0089] QL	ND [0.0087] QL
SW8260	Benzene, 1-methyl-4-(1-methylethyl)-	mg/kg		ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	Bromobenzene	mg/kg	NA	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	Bromochloromethane	mg/kg	NA	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	Bromodichloromethane	mg/kg	0.044	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	Bromoform	mg/kg	0.34	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	Bromomethane	mg/kg	0.16	ND [0.072] QL	ND [0.082]	ND [0.078] QL	ND [0.076] QL
SW8260	Carbon disulfide	mg/kg	12	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	Carbon tetrachloride	mg/kg	0.023	ND [0.01] QL	ND [0.012]	ND [0.011] QL	ND [0.011] QL
SW8260	Chlorobenzene	mg/kg	0.63	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL

Eek Barge Landing Data Table

				11EEK01SE 1 580-26701-1 6/7/2011	11EEK10SE 10 580-26701-1 6/7/2011	11EEK02SE 2 580-26701-1 6/7/2011	11EEK03SE 3 580-26701-1 6/7/2011
Method	Analyte	Units	ADEC	**MS/MSD**	**Duplicate of -01SE**		
SW8260	Chloroethane	mg/kg	23	ND [0.21] QL	ND [0.23]	ND [0.22] QL	ND [0.22] QL
SW8260	Chloroform	mg/kg	0.46	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	Chloromethane	mg/kg	0.21	ND [0.21] QL	ND [0.23]	ND [0.22] QL	ND [0.22] QL
SW8260	cis-1,2-Dichloroethene	mg/kg	0.24	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	cis-1,3-Dichloropropene	mg/kg	0.033	ND [0.0083] QL	ND [0.0094]	ND [0.0089] QL	ND [0.0087] QL
SW8260	Dibromochloromethane	mg/kg	0.032	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	Dibromomethane	mg/kg	1.1	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	Dichlorodifluoromethane	mg/kg	140	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	Ethylbenzene	mg/kg	6.9	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	Hexachlorobutadiene	mg/kg	0.12	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	Isopropylbenzene	mg/kg	51	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	Methylene chloride	mg/kg	0.016	ND [0.021] QL	0.0064 [0.023] J, B	ND [0.022] QL	ND [0.022] QL
SW8260	Methyl-tert-butyl ether (MTBE)	mg/kg	1.3	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	Naphthalene	mg/kg	20	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	n-Butylbenzene	mg/kg	15	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	n-Propylbenzene	mg/kg	15	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	o-Xylene	mg/kg	63	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	sec-Butylbenzene	mg/kg	12	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	Styrene	mg/kg	0.96	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	tert-Butylbenzene	mg/kg	12	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	Tetrachloroethene (PCE)	mg/kg	0.024	ND [0.01] QL	ND [0.012]	ND [0.011] QL	ND [0.011] QL
SW8260	Toluene	mg/kg	6.5	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	trans-1,2-Dichloroethene	mg/kg	0.37	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	trans-1,3-Dichloropropene	mg/kg	0.033	ND [0.0083] QL	ND [0.0094]	ND [0.0089] QL	ND [0.0087] QL
SW8260	Trichloroethene (TCE)	mg/kg	0.02	ND [0.0083] QL	ND [0.0094]	ND [0.0089] QL	ND [0.0087] QL
SW8260	Trichlorofluoromethane	mg/kg	86	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW8260	Vinyl chloride	mg/kg	0.0085	ND [0.0041] QL	ND [0.0047]	ND [0.0045] QL	ND [0.0044] QL
SW8260	Xylene, Isomers m & p	mg/kg	63	ND [0.021] QL	ND [0.023]	ND [0.022] QL	ND [0.022] QL
SW9060	Total Organic Carbon (TOC)	mg/kg		9700 [2000] QH	4900 [2000] QH	6300 [2000] QH	14000 [2000] QH

ADEC - most stringent of 18 AAC 75 Method 2 Table B1 and B2 Cleanup Level for Under 40 Inches
[ ] - Laboratory LOQ
Solid shade indicateds ADEC exceedance
Data Flags are defined at the end of the table

Eek Barge Landing Data Table

				11EEK04SE 4 580-26701-1 6/7/2011	11EEK05SE 5 580-26701-1 6/7/2011	11EEK99TB Trip Blk 580-26701-1 6/7/2011
Method	Analyte	Units	ADEC			
8270SIM	2-Methylnaphthalene	mg/kg	6.1	ND [0.0065]	ND [0.0066]	
8270SIM	Acenaphthene	mg/kg	180	ND [0.0065]	ND [0.0066]	
8270SIM	Acenaphthylene	mg/kg	180	ND [0.0065]	ND [0.0066]	
8270SIM	Anthracene	mg/kg	3000	ND [0.0065]	ND [0.0066]	
8270SIM	Benzo(a)anthracene	mg/kg	3.6	ND [0.0065]	ND [0.0066]	
8270SIM	Benzo(a)pyrene	mg/kg	0.49	ND [0.0065]	ND [0.0066]	
8270SIM	Benzo(b)fluoranthene	mg/kg	4.9	ND [0.0065]	ND [0.0066]	
8270SIM	Benzo(g,h,i)perylene	mg/kg	1400	ND [0.0065]	ND [0.0066]	
8270SIM	Benzo(k)fluoranthene	mg/kg	49	ND [0.0065]	ND [0.0066]	
8270SIM	Chrysene	mg/kg	360	ND [0.0065]	ND [0.0066]	
8270SIM	Dibenzo(a,h)anthracene	mg/kg	0.49	ND [0.0065]	ND [0.0066]	
8270SIM	Fluoranthene	mg/kg	1400	ND [0.0065]	ND [0.0066]	
8270SIM	Fluorene	mg/kg	220	ND [0.0065]	ND [0.0066]	
8270SIM	Indeno(1,2,3-cd)pyrene	mg/kg	4.9	ND [0.0065]	ND [0.0066]	
8270SIM	Naphthalene	mg/kg	20	ND [0.0065]	ND [0.0066]	
8270SIM	Phenanthrene	mg/kg	3000	ND [0.0065]	ND [0.0066]	
8270SIM	Pyrene	mg/kg	1000	ND [0.0065]	ND [0.0066]	
AK101	Gasoline Range Organics (C6-C10)	mg/kg	300	ND [2.1] QL	ND [2.2]	ND [4]
AK102	Diesel Range Organics (C10-C25)	mg/kg	250	21 [26] J	15 [26] J	
AK103	Residual Range Organics (C25-C36)	mg/kg	10000	130 [66]	100 [65]	
E160.3M	Percent Moisture	Percent	NA	29 [0.1]	25 [0.1]	
E160.3M	Solids, Percent	Percent	NA	71 [0.1]	75 [0.1]	
SW6020	Arsenic	mg/kg	3.9	**6.8 [0.55]**	**9.1 [0.49]**	
SW6020	Barium	mg/kg	1100	83 [0.22]	91 [0.2]	
SW6020	Cadmium	mg/kg	5	0.09 [0.22] J	0.074 [0.2] J	
SW6020	Chromium	mg/kg	25	15 [0.22]	16 [0.2]	
SW6020	Copper	mg/kg	460	13 [0.22]	14 [0.2]	
SW6020	Lead	mg/kg	400	3.5 [0.22]	3.7 [0.2]	
SW6020	Selenium	mg/kg	3.4	0.22 [0.77] J	ND [0.69]	
SW6020	Silver	mg/kg	11.2	0.068 [0.22] J	0.067 [0.2] J	

Eek Barge Landing Data Table

				11EEK04SE 4 580-26701-1 6/7/2011	11EEK05SE 5 580-26701-1 6/7/2011	11EEK99TB Trip Blk 580-26701-1 6/7/2011
Method	Analyte	Units	ADEC			
SW6020	Zinc	mg/kg	4100	49 [0.77]	51 [0.69]	
SW7471A	Mercury	mg/kg	1.4	0.092 [0.02]	0.037 [0.018]	
SW8081	4,4'-DDD	mg/kg	7.2	ND [0.0027] QL	ND [0.0026]	
SW8081	4,4'-DDE	mg/kg	5.1	ND [0.0027] QL	ND [0.0026]	
SW8081	4,4'-DDT	mg/kg	7.3	ND [0.0027] QL	ND [0.0026]	
SW8081	Aldrin	mg/kg	0.07	ND [0.0013] QL	ND [0.0013]	
SW8081	alpha-BHC	mg/kg	0.0064	ND [0.0013] QL	ND [0.0013]	
SW8081	alpha-Chlordane	mg/kg	2.3	ND [0.0013] QL	ND [0.0013]	
SW8081	beta-BHC	mg/kg	0.022	ND [0.0013] QL	ND [0.0013]	
SW8081	Chlordane	mg/kg	2.3	ND [0.013] QL	ND [0.013]	
SW8081	delta-BHC	mg/kg	NA	ND [0.0013] QL	ND [0.0013]	
SW8081	Dieldrin	mg/kg	0.0076	ND [0.0027] QL	ND [0.0026]	
SW8081	Endosulfan I	mg/kg	64	ND [0.0013] QL	ND [0.0013]	
SW8081	Endosulfan II	mg/kg	64	0.00039 [0.0027] J, QL	ND [0.0026]	
SW8081	Endosulfan sulfate	mg/kg	64	ND [0.0027] QL	ND [0.0026]	
SW8081	Endrin	mg/kg	0.29	ND [0.0027] QL	ND [0.0026]	
SW8081	Endrin aldehyde	mg/kg	NA	ND [0.0027] QL	ND [0.0026]	
SW8081	Endrin ketone	mg/kg	NA	ND [0.0027] QL	ND [0.0026]	
SW8081	gamma-BHC (Lindane)	mg/kg	0.0095	ND [0.0013] QL	ND [0.0013]	
SW8081	gamma-Chlordane	mg/kg	2.3	ND [0.0013] QL	ND [0.0013]	
SW8081	Heptachlor	mg/kg	0.28	ND [0.0013] QL	ND [0.0013]	
SW8081	Heptachlor epoxide	mg/kg	0.014	ND [0.0013] QL	ND [0.0013]	
SW8081	Methoxychlor	mg/kg	23	ND [0.013] QL	ND [0.013]	
SW8081	Toxaphene	mg/kg	3.9	ND [0.13] QL	ND [0.13]	
SW8082	PCB-1016 (Aroclor 1016)	mg/kg	1	ND [0.013]	ND [0.013]	
SW8082	PCB-1221 (Aroclor 1221)	mg/kg	1	ND [0.013]	ND [0.013]	
SW8082	PCB-1232 (Aroclor 1232)	mg/kg	1	ND [0.013]	ND [0.013]	
SW8082	PCB-1242 (Aroclor 1242)	mg/kg	1	ND [0.013]	ND [0.013]	
SW8082	PCB-1248 (Aroclor 1248)	mg/kg	1	ND [0.013]	ND [0.013]	
SW8082	PCB-1254 (Aroclor 1254)	mg/kg	1	ND [0.013]	ND [0.013]	
SW8082	PCB-1260 (Aroclor 1260)	mg/kg	1	ND [0.013]	ND [0.013]	
SW8260	1,1,1,2-Tetrachloroethane	mg/kg	NA	ND [0.021] QL	ND [0.022]	ND [0.04]

Eek Barge Landing Data Table

				11EEK04SE 4 580-26701-1 6/7/2011	11EEK05SE 5 580-26701-1 6/7/2011	11EEK99TB Trip Blk 580-26701-1 6/7/2011
Method	Analyte	Units	ADEC			
SW8260	1,1,1-Trichloroethane	mg/kg	0.82	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	1,1,2,2-Tetrachloroethane	mg/kg	0.017	ND [0.0052] QL	ND [0.0055]	ND [0.01]
SW8260	1,1,2-Trichloroethane	mg/kg	0.018	ND [0.0062] QL	ND [0.0066]	ND [0.012]
SW8260	1,1-Dichloroethane	mg/kg	25	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	1,1-Dichloroethene	mg/kg	0.03	ND [0.01] QL	ND [0.011]	ND [0.02]
SW8260	1,1-Dichloropropene	mg/kg	NA	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	1,2,3-Trichlorobenzene	mg/kg	NA	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	1,2,3-Trichloropropane	mg/kg	0.00053	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	1,2,4-Trichlorobenzene	mg/kg	0.85	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	1,2,4-Trimethylbenzene	mg/kg	23	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	1,2-Dibromo-3-chloropropane	mg/kg	NA	ND [0.1] QL	ND [0.11]	ND [0.2]
SW8260	1,2-Dibromoethane	mg/kg	0.00016	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	1,2-Dichlorobenzene	mg/kg	5.1	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	1,2-Dichloroethane	mg/kg	0.016	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	1,2-Dichloropropane	mg/kg	0.018	ND [0.0062] QL	ND [0.0066]	ND [0.012]
SW8260	1,3,5-Trimethylbenzene	mg/kg	23	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	1,3-Dichlorobenzene	mg/kg	28	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	1,3-Dichloropropane	mg/kg	NA	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	1,4-Dichlorobenzene	mg/kg	0.64	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	2,2-Dichloropropane	mg/kg	NA	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	2-Butanone	mg/kg	59	ND [0.21] QL	ND [0.22]	ND [0.4]
SW8260	2-Chlorotoluene	mg/kg	NA	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	2-Hexanone	mg/kg	NA	ND [0.1] QL	ND [0.11]	ND [0.2]
SW8260	4-Chlorotoluene	mg/kg	NA	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	4-Methyl-2-pentanone	mg/kg	8.1	ND [0.1] QL	ND [0.11]	ND [0.2]
SW8260	Acetone	mg/kg	88	ND [0.21] QL	ND [0.22]	ND [0.4]
SW8260	Benzene	mg/kg	0.025	ND [0.0083] QL	ND [0.0088]	ND [0.016]
SW8260	Benzene, 1-methyl-4-(1-methylethyl)-	mg/kg		ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	Bromobenzene	mg/kg	NA	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	Bromochloromethane	mg/kg	NA	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	Bromodichloromethane	mg/kg	0.044	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	Bromoform	mg/kg	0.34	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	Bromomethane	mg/kg	0.16	ND [0.072] QL	ND [0.077]	ND [0.14]
SW8260	Carbon disulfide	mg/kg	12	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	Carbon tetrachloride	mg/kg	0.023	ND [0.01] QL	ND [0.011]	ND [0.02]
SW8260	Chlorobenzene	mg/kg	0.63	ND [0.021] QL	ND [0.022]	ND [0.04]

Eek Barge Landing Data Table

				11EEK04SE 4 580-26701-1 6/7/2011	11EEK05SE 5 580-26701-1 6/7/2011	11EEK99TB Trip Blk 580-26701-1 6/7/2011
Method	Analyte	Units	ADEC			
SW8260	Chloroethane	mg/kg	23	ND [0.21] QL	ND [0.22]	ND [0.4]
SW8260	Chloroform	mg/kg	0.46	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	Chloromethane	mg/kg	0.21	ND [0.21] QL	ND [0.22]	ND [0.4]
SW8260	cis-1,2-Dichloroethene	mg/kg	0.24	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	cis-1,3-Dichloropropene	mg/kg	0.033	ND [0.0083] QL	ND [0.0088]	ND [0.016]
SW8260	Dibromochloromethane	mg/kg	0.032	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	Dibromomethane	mg/kg	1.1	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	Dichlorodifluoromethane	mg/kg	140	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	Ethylbenzene	mg/kg	6.9	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	Hexachlorobutadiene	mg/kg	0.12	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	Isopropylbenzene	mg/kg	51	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	Methylene chloride	mg/kg	0.016	0.0062 [0.021] J, B, QL	ND [0.022]	0.012 [0.04] J
SW8260	Methyl-tert-butyl ether (MTBE)	mg/kg	1.3	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	Naphthalene	mg/kg	20	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	n-Butylbenzene	mg/kg	15	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	n-Propylbenzene	mg/kg	15	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	o-Xylene	mg/kg	63	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	sec-Butylbenzene	mg/kg	12	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	Styrene	mg/kg	0.96	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	tert-Butylbenzene	mg/kg	12	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	Tetrachloroethene (PCE)	mg/kg	0.024	ND [0.01] QL	ND [0.011]	ND [0.02]
SW8260	Toluene	mg/kg	6.5	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	trans-1,2-Dichloroethene	mg/kg	0.37	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	trans-1,3-Dichloropropene	mg/kg	0.033	ND [0.0083] QL	ND [0.0088]	ND [0.016]
SW8260	Trichloroethene (TCE)	mg/kg	0.02	ND [0.0083] QL	ND [0.0088]	ND [0.016]
SW8260	Trichlorofluoromethane	mg/kg	86	ND [0.021] QL	ND [0.022]	ND [0.04]
SW8260	Vinyl chloride	mg/kg	0.0085	ND [0.0041] QL	ND [0.0044]	ND [0.008]
SW8260	Xylene, Isomers m & p	mg/kg	63	ND [0.021] QL	ND [0.022]	ND [0.04]
SW9060	Total Organic Carbon (TOC)	mg/kg		10000 [2000] QH	6100 [2000] QH	

ADEC - most stringent of 18 AAC 75 Method 2 Table B1 and B2 Cleanup Level for Under 40 Inches
[ ] - Laboratory LOQ
Solid shade indicateds ADEC exceedance
Data Flags are defined at the end of the table

Data Flag Explanations

ND - Analyte is not detected; [ ] - Laboratory Practical Quantification Limit

Qualifier	Definition
J	Analyte result is considered an estimated value because the level is below the laboratory PQL but above the MDL
MH, ML	Analyte result is considered an estimated value biased high,low due to matrix effects
B	Analyte result is considered a high estimated value due to contamination present in the method blank.
QH, QL	Analyte result is considered an estimated value biased high, low due to a quality control failure
R	Analyte result is rejected - result is not usable.

Appendix C

ADEC Data Quality Checklists

Laboratory Data Review Checklist

Completed by: Amanda Whittier

Title: Chemist Date: 19 July 2011

CS Report Name: Eek Barge Landing Report Date:

Consultant Firm: U.S. Army Corps of Engineers

Laboratory Name: Test America Laboratory Report Number: 580-26701

ADEC File Number: ADEC RecKey Number:

1. Laboratory
   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
      ☑Yes ☐ No ☐NA (Please explain.) Comments:

      Test America, Inc. completed all the submitted analyses.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?
      ☐Yes ☑No ☐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° ± 2° C)?
      ☐Yes ☑ No ☐NA (Please explain.) Comments:

      Temperature blank was 2.4 degrees C. Cooler blank was 1.2 degrees C. The samples were received in good condition with no other issues.

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:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☑Yes ☐ No ☐NA (Please explain.) Comments:

e. Data quality or usability affected? (Please explain.)
Comments:

Data quality/usability not affected.

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 all 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 only describes qualifications made to the data based on problems encountered during the sample analysis.

5. Samples 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:

c. All soils reported on a dry weight basis?
☑Yes ☐No ☐NA (Please explain.) Comments:

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?
☑Yes ☐ No ☐NA (Please explain.) Comments:

The following analytes have LOQs above their respective ADEC cleanup levels: 1,2,3-trichloropropane, 1,2-dibromoethane, 1,2-dichloroethane, chloromethane, dibromochloromethane and methylene chloride.

The following analytes have DLs above their respective ADEC cleanup levels: 1,2,3-trichloropropane, 1,2-dibromoethane, 1,2-dichloroethane, chloromethane and methylene chloride.

e. Data quality or usability affected?
Comments:

Data quality/usability is adequate for project DQO's.

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 PQL?
☑ Yes ☐ No ☐NA (Please explain.) Comments:

iii. If above PQL, what samples are affected?
Comments:

N/A

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
☑Yes ☐ No ☐NA (Please explain.) Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

Data quality/usability not affected.

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

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

☑Yes ☐ No ☐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:

Total Organic Carbon (TOC) was high in all samples.

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

☑Yes ☐ No ☐NA (Please explain.) Comments:

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

Comments:

N/A

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

☑Yes ☐ No ☐NA (Please explain.) Comments:

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

Comments:

Data quality/usability not affected because there is no ADEC criteria for TOC.

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:

GRO surrogate a,a,a-trifluorotoluene was low in samples 11EEK02SE, 03SE and 04SE. Pesticide surrogate tetrachloro-m-xylene was low in samples 11EEK03SE and 04SE. Volatile Organic Compounds (VOCs) surrogate a,a,a-trifluorotoluene was low in samples 11EEK01SE, 02SE, 03SE and 04SE.

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? (Use the comment box to explain.)
Comments:

Data quality/usability not affected because all analytes were well below ADEC criteria or the analytes were not detected.

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

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)
☑Yes ☐ No ☐ NA (Please explain.) Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)
☑Yes ☐ No ☐ NA (Please explain.) Comments:

iii. All results less than PQL?
☐Yes ☑ No ☐ NA (Please explain.) Comments:

Methylene chloride was detected.

iv. If above PQL, what samples are affected?

Comments:

Samples 11EEK04SE and 10SE were affected and flagged "B" due to trip blank contamination.

v. Data quality or usability affected? (Please explain.)

Comments:

Data quality/usability not affected.

e. Field Duplicate

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

☑Yes ☐ No ☐NA (Please explain.) Comments:

ii. Submitted blind to lab?

☑Yes ☐ No ☐NA (Please explain.) Comments:

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

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

☐Yes ☑ No ☐NA (Please explain.) Comments:

The RPD for TOC was high (greater than 50%) in duplicate pair 11EEK01SE/10SE likely due to the heterogeneity of the sample. The RPDs for endosulfan II and methylene chloride were high (greater than 50%) because low concentrations were detected in one-half of the duplicate pair, but not the other.

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

Comments:

Data quality/usability not affected.

f. Decontamination or Equipment Blank (If not used explain why).

No decontamination or equipment blank was submitted.

☐Yes ☐ No ☑NA (Please explain.) Comments:

i. All results less than PQL?

☐Yes ☑ No ☐NA (Please explain.) Comments:

No decontamination or equipment blank was submitted.

ii. If above PQL, what samples are affected?

Comments:

N/A

iii. Data quality or usability affected? (Please explain.)

Comments:

N/A

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
   a. Defined and appropriate?
      ☑Yes ☐ No ☐NA (Please explain.) Comments:

Appendix D

Field Notebook

NPDL #
11-067

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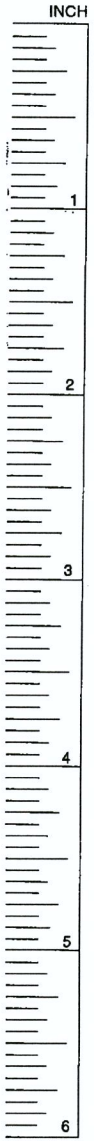

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CONTENTS

PAGE	REFERENCE	DATE
	PM: Melanie Peterson.	
	Sampling Team: Amanda Whittier, Guy McConnell	
	Eck POC: Nick Carter	

6 June

1300 - arrived at Eek airport
unloaded gear from plane & loaded on local ATV ($5/ea for ride)

1330 - walked around village to get eyes on shoal location, landing & possible areas to hold or dredge spoils.

1575 - met w/ Nick Carter (in meeting earlier in day).

7 June
50°F / Sunny w/ dive

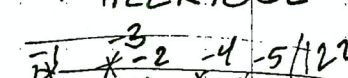
815 - we arrived @ city office to arrange for transport to shoal. Gear prepared for sampling.

1040 - Adolf came to take us to the shoal Hale was hiding out.

1050 - we set up on NW end of shoal.
~~bottom boat's NW~~
top of shoal to top of boat w/ 5 Scot.
- first samples are sandy (fine) silt may have passed thru sampler.

7 June
50°F / cloudy

1113 - first sample & geotech sample
11EEK01SE & MS/MSD
& 11EEK10SE (Dup)



N 60° 18.266'
W 122° 01.913'

1137 - sec. sample & geotech sample
11EEK02SE

1152 - third sample & geotech sample
11EEK03SE

1159 - 4th sample & geotech sample
11EEK04SE

1221 - 5th sample
11EEK05SE
no geotech

7 June 50°F/cloudy

1230 - 1st pt
N 60° 18.349
W 162° 02.192

- 2nd pt
N 60° 18.328
W 162° 02.134

- 3rd pt
N 60° 18.306
W 162° 02.085

- 4th pt. ?
N 60° 18.287
W 162° 02.002

1200 - back to city building took lunch.

1310 - packed samples & gear.
- all samples are fine sandy material samples were very consistant with each other.

7 June

Five samples were taken instead of 9 due to the size of the shoal & "material" consistancy of soil.

Appendix E

Physical Sediment Data

U.S. ARMY CORPS OF ENGINEERS
SOILS AND GEOLOGY SECTION, ALASKA DISTRICT
Eek Barge Landing
Eek, Alaska

Permanent I.D (Field)	Sample Number	Depth Interval Top	Depth Interval Bottom	Moisture Content (%)	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI	Particle Size Analysis Gravel	Particle Size Analysis Sand	Particle Size Analysis Silt	Passing -#200 (%)	Passing 0.02mm (%)	Frost Class.	Unified Soil Classification
	01-1113	0.0	2.0	**32.3**				**0.0**	**69.2**	**30.8**		**5.4**	**S2**	**(SM) Silty Sand**
	02-1137	0.0	2.0	**32.9**		**NP**		**0.0**	**55.4**	**44.6**		**8.7**	**F2**	**(SM) Silty Sand**
	03-1152	0.0	2.0	**46.0**				**0.0**	**50.3**	**49.7**		**12.0**	**F2**	**(SM) Silty Sand**
	04-1159	0.0	2.0	**59.4**				**0.0**	**38.7**	**61.3**		**13.9**	**F2**	**(ML) Sandy silt**

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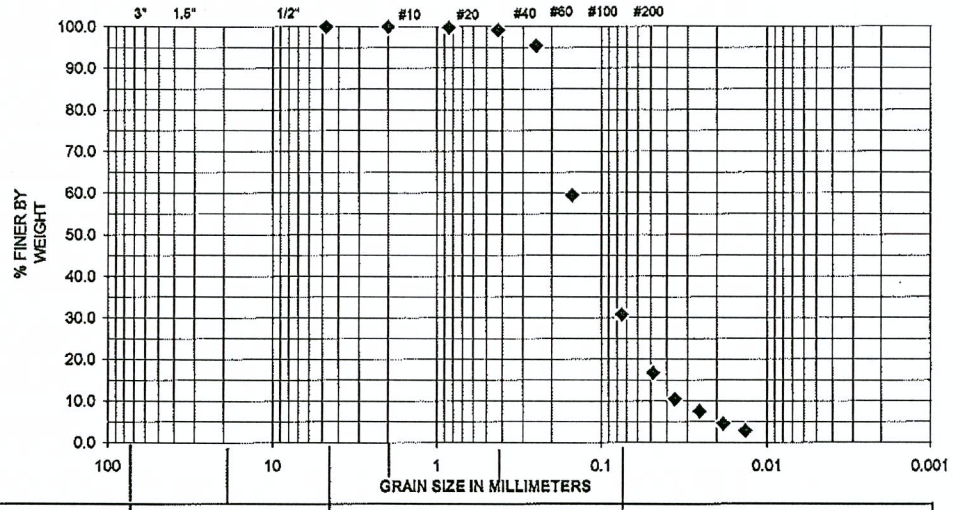
PROJECT CLIENT:	Corp of Engineers, AK District
PROJECT NAME:	Eek Barge Landing
PROJECT NO.:	2769-11
SAMPLE LOCATION:	01-1113
SAMPLE NO/ DEPTH	Depth (0.0' - 2.0')
DESCRIPTION:	Silty sand.
DATE TESTED:	6/17/2011
TESTED BY:	EB
REVIEWED BY:	Ron Caron C.E.T.

% GRAVEL:	0.0	USC:	SM
% SAND:	69.2	FC:	S2
% SILT/CLAY:	30.8	.02 mm:	5.4

ASTM D1557(uncorrected)	pcf
ASTM D4718 (corrected)	pcf
OPTIMUM M.C.% (corrected)	
NATURAL M.C. %	32.3

PARTICLE SIZE ANALYSIS

ASTM D422/ C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

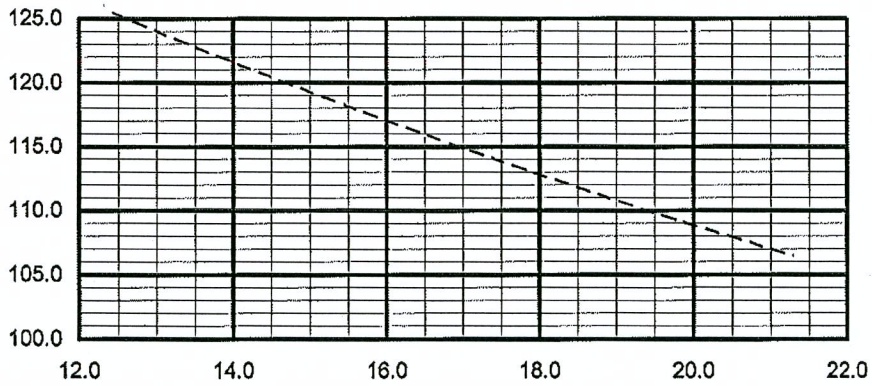
SIEVE SIZE (mm)	SIEVE SIZE (in.)	TOTAL % PASSING	SPEC
152.4	6"		
76.2	3"		
38.1	1.5"		
19.05	3/4"		
12.7	1/2"		
9.5	3/8"		
4.75	# 4	100	
2	#10	100	
0.85	#20	100	
0.425	#40	99	
0.25	# 60	95	
0.15	#100	60	
0.075	#200	30.8	

HYDROMETER RESULT

ELAPSED TIME	DIAMETER (mm)	TOTAL % PASSING
0		
0.5		
1	0.0485	16.8
2	0.0357	10.5
4	0.0254	7.5
8	0.0183	4.6
15	0.0135	2.9
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP

ASTM D1557



Hyd. Conductivity ASTM D2438	
Organic % ASTM D2974	
Atterberg Limit ASTM 4318	

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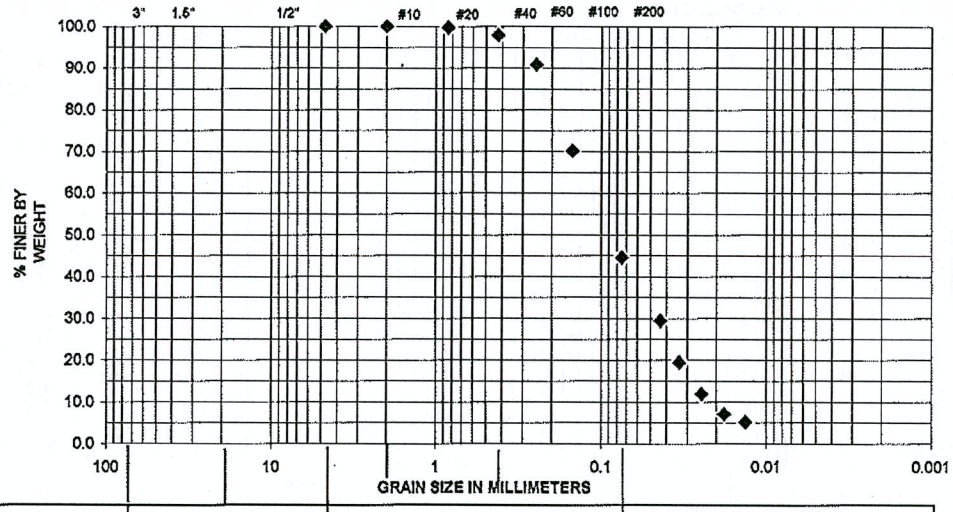
PROJECT CLIENT:	Corp of Engineers, AK District
PROJECT NAME:	Eek Barge Landing
PROJECT NO.:	2769-11
SAMPLE LOCATION:	02-1137
SAMPLE NO/ DEPTH	Depth (0.0' - 2.0')
DESCRIPTION:	Silty sand.
DATE TESTED:	6/17/2011
TESTED BY:	EB
REVIEWED BY:	Ron Caron C.E.T.

% GRAVEL:	0.0	USC:	SM
% SAND:	55.4	FC:	F2
% SILT/CLAY:	44.6	.02 mm:	8.7

ASTM D1557(uncorrected)	pcf
ASTM D4718 (corrected)	pcf
OPTIMUM M.C.% (corrected)	
NATURAL M.C. %	32.9

PARTICLE SIZE ANALYSIS

ASTM D422/ C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

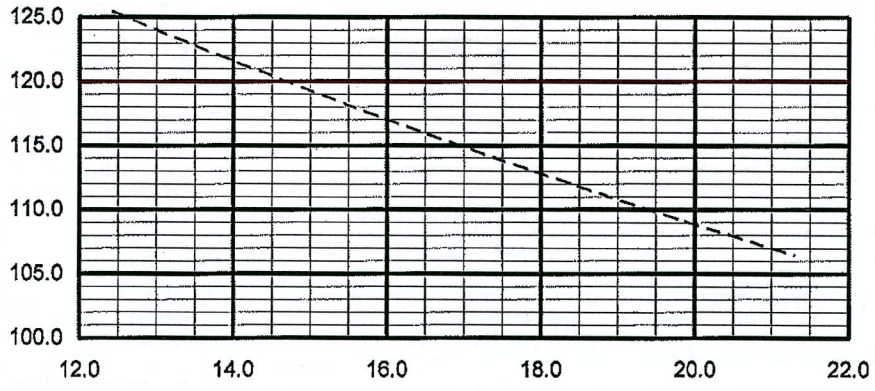
SIEVE SIZE (mm)	SIEVE SIZE (In.)	TOTAL % PASSING	SPEC
152.4	6"		
76.2	3"		
38.1	1.5"		
19.05	3/4"		
12.7	1/2"		
9.5	3/8"		
4.75	# 4	100	
2	#10	100	
0.85	#20	100	
0.425	#40	98	
0.25	# 60	91	
0.15	#100	70	
0.075	#200	44.6	

HYDROMETER RESULT

ELAPSED TIME	DIAMETER (mm)	TOTAL % PASSING
0		
0.5		
1	0.0436	29.4
2	0.0336	19.5
4	0.0247	11.9
8	0.0180	7.1
15	0.0134	5.1
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP

ASTM D1557



Hyd. Conductivity ASTM D2438	
Organic % ASTM D2974	
Atterberg Limit ASTM 4318	Non Plastic

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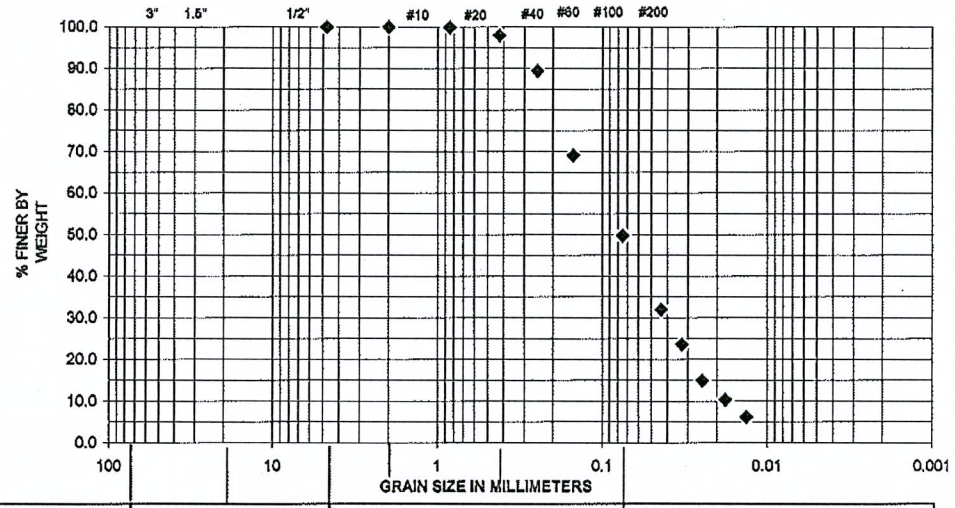
PROJECT CLIENT:	Corp of Engineers, AK District
PROJECT NAME:	Eek Barge Landing
PROJECT NO.:	2769-11
SAMPLE LOCATION:	03-1152
SAMPLE NO/ DEPTH	Depth (0.0' - 2.0')
DESCRIPTION:	Silty sand.
DATE TESTED:	6/17/2011
TESTED BY:	EB
REVIEWED BY:	Ron Caron C.E.T.

% GRAVEL:	0.0	USC:	SM
% SAND:	50.3	FC:	F2
% SILT/CLAY:	49.7	.02 mm:	12.0

ASTM D1557(uncorrected)	pcf
ASTM D4718 (corrected)	pcf
OPTIMUM M.C.% (corrected)	
NATURAL M.C. %	46.0

PARTICLE SIZE ANALYSIS

ASTM D422/ C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

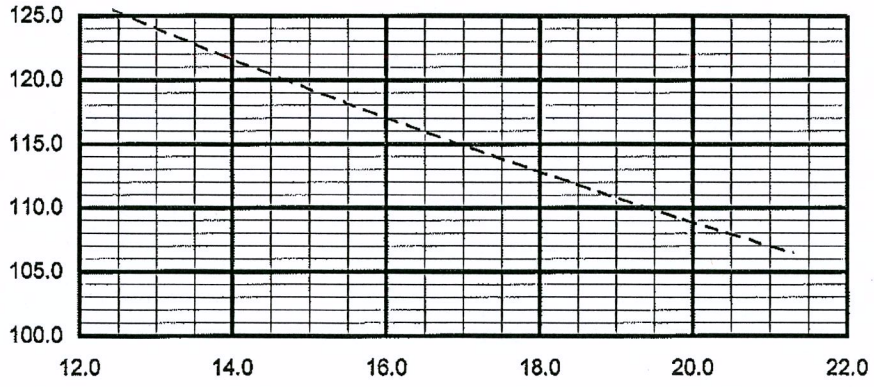
SIEVE SIZE (mm)	SIEVE SIZE (In.)	TOTAL % PASSING	SPEC
152.4	6"		
76.2	3"		
38.1	1.5"		
19.05	3/4"		
12.7	1/2"		
9.5	3/8"		
4.75	# 4	100	
2	#10	100	
0.85	#20	100	
0.425	#40	98	
0.25	# 60	89	
0.15	#100	69	
0.075	#200	49.7	

HYDROMETER RESULT

ELAPSED TIME	DIAMETER (mm)	TOTAL % PASSING
0		
0.5		
1	0.0436	32.0
2	0.0327	23.7
4	0.0245	14.9
8	0.0179	10.4
15	0.0133	6.2
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP

ASTM D1557



Hyd. Conductivity ASTM D2434	
Organic % ASTM D2974	
Atterberg Limit ASTM 4318	

11301 Olive Lane
Anchorage, AK 99515

TERRA FIRMA TESTING

Laboratory Testing / Construction Monitoring

Telephone: (907) 344-5934
Fax: (907) 344-5993
www.nge-tft.com

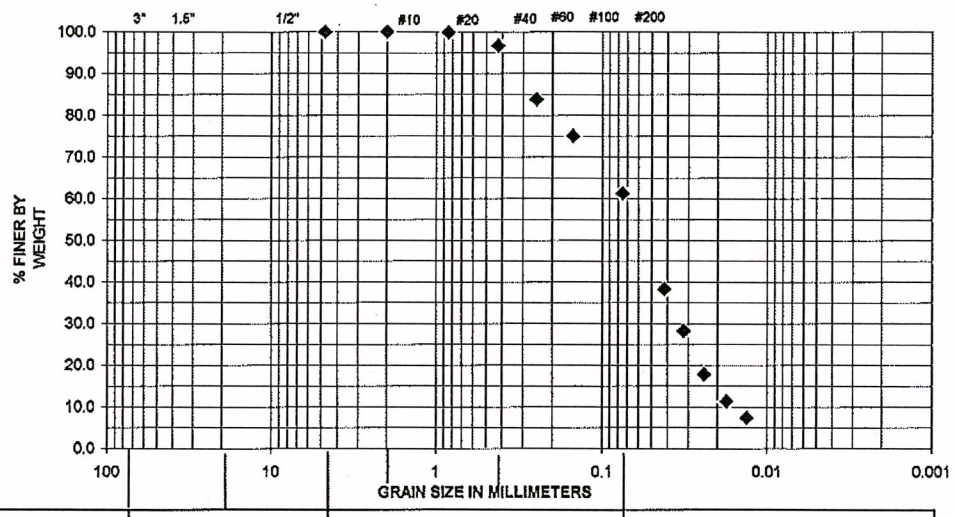
PROJECT CLIENT:	Corp of Engineers, AK District
PROJECT NAME:	Eek Barge Landing
PROJECT NO.:	2769-11
SAMPLE LOCATION:	04-1159
SAMPLE NO/ DEPTH	Depth (0.0' - 2.0')
DESCRIPTION:	Sandy silt
DATE TESTED:	6/17/2011
TESTED BY:	EB
REVIEWED BY:	Ron Caron C.E.T.

% GRAVEL:	0.0	USC:	ML
% SAND:	38.7	FC:	F2
% SILT/CLAY:	61.3	.02 mm:	13.9

ASTM D1557(uncorrected)	pcf
ASTM D4718 (corrected)	pcf
OPTIMUM M.C.% (corrected)	
NATURAL M.C. %	59.4

PARTICLE SIZE ANALYSIS

ASTM D422/ C136



COBBLES	GRAVEL		SAND			SILT or CLAY
	Coarse	Fine	Coarse	Medium	Fine	

SIEVE ANALYSIS RESULT

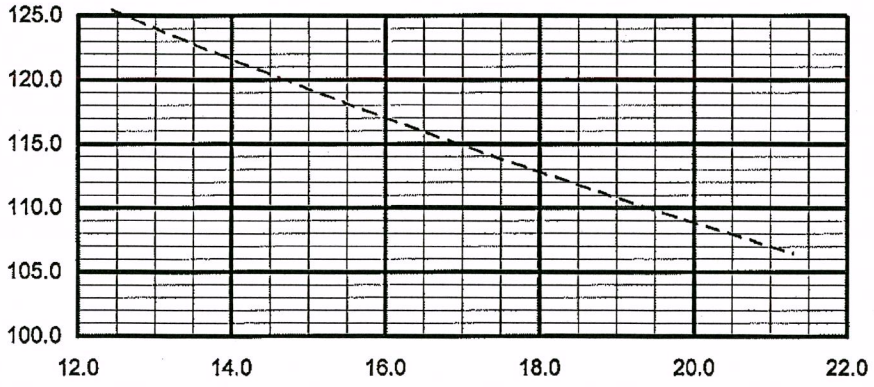
SIEVE SIZE (mm)	SIEVE SIZE (In.)	TOTAL % PASSING	SPEC
152.4	6"		
76.2	3"		
38.1	1.5"		
19.05	3/4"		
12.7	1/2"		
9.5	3/8"		
4.75	# 4	100	
2	#10	100	
0.85	#20	100	
0.425	#40	97	
0.25	# 60	84	
0.15	#100	75	
0.075	#200	61.3	

HYDROMETER RESULT

ELAPSED TIME	DIAMETER (mm)	TOTAL % PASSING
0		
0.5		
1	0.0419	38.3
2	0.0320	28.3
4	0.0242	17.8
8	0.0177	11.3
15	0.0133	7.4
30		
60		
250		
1440		

MOISTURE-DENSITY RELATIONSHIP

ASTM D1557



Hyd. Conductivity ASTM D2438	
Organic % ASTM D2974	
Atterberg Limit ASTM 4318	

Document Quality Control Checklist
Chemical Data Report

Project Name: Eels Barge Landing
EN-ES-M Project #: 11-067 UPC #: NA.
Project Chemist: Whittier Date: 21 July 2011
Senior Technical Reviewer: Benjamin Date:
Date/Revision No.
Due Date on Gantt Chart:

☐ = author
O = reviewer

1. Transmittal Letter:
   - 1.1. ☑ Ø Are the heading and signature blocks of the letter in the correct format?
   - 1.2. ☑ Ø Is the letter addressed to the appropriate project management section and includes the project manager's last name?
   - 1.3. ☑ Ø Is the project adequately identified in the SUBJECT line, with UPC and/or CEPOA file number?
   - 1.4. ☑ Ø Is the project name consistent with that used in the rest of the Chemical Data Report?

2. Cover sheet:
   - 2.1. ☑ Ø Is an appropriate format used for the cover sheet?
   - 2.2. ☑ Ø Is the section, branch and month/year identified in a page-centered footer?

3. Executive Summary:
   - 3.1. ☑ Ø Is the Executive Summary less than one page long?
   - 3.2. ☑ Ø Does the Executive Summary provide a clear summary of the overall conclusions of the report and how data findings affect the project?

4. Table of Contents:
   - 4.1. ☑ Ø Is the Table of Contents neatly formatted, with right-justified page numbers?
   - 4.2. ☑ Ø Are values in the Table of Contents in order?
   - 4.3. ☑ Ø Is a list of appendices/attachments included at the end of the Table of Contents?

5. Introduction:
   - 5.1. ☑ Ø Is CEPOA-EN-ES-M identified as the office preparing the report?
   - 5.2. ☑ Ø Is the office for which the report is being prepared (i.e., CEPOA-PM-?) identified?
   - 5.3. ☑ Ø Is the project very briefly described?

6. Project Background Information:
   - 6.1. ☑ Ø Is the project location adequately described, with references to appropriate figures/maps?
   - 6.2. ☑ Ø Is there a concise but complete description of the previous use of the site, types and sources of known contamination and the results of previous investigations at the site?

7. Field Activities and Observations:
   - 7.1. ☑ Ø Is there a summary of the personnel and dates involved in the field activity?
   - 7.2. ☑ Ø Is there a summary of the field sample collection methods used?
   - 7.3. ☑ Ø Is there a summary of the analytical methods actually used?
   - 7.4. ☑ Ø Is there a summary of actual field sampling locations, with references to appropriate figures/maps?
   - 7.5. ☐ Ø Is the sampling and analysis plan referenced?
   - 7.6. ☑ Ø Is there a summary and explanation of deviations from the sampling and analysis plan?
   - 7.7. ☑ Ø Is there a summary of relevant field observations?
   - 7.8. ☑ Ø Is there a discussion of the disposal of investigation-derived waste, including solid waste?

8. Results of Chemical Analyses:
   - 8.1. ☑ Ø Does the report direct the reader to the appropriate appendices to view the tables of comprehensive data?
   - 8.2. ☑ Ø Is the most significant data presented primarily in well-formatted tables?
   - 8.3. ☐ Ø Is the data presented in a way that makes it simple to correlate chemical concentrations with sample locations and depths (where appropriate)?
   - 8.4. ☑ Ø Is the data presented along with appropriate regulatory or risk-based data objectives to aid in the interpretation of the data?

9. Data Quality Review:
   - 9.1. ☑ Ø Does this section summarize quality limitations of the data that may affect its use (e.g., data estimated or rejected due to holding time or temperature exceedances, laboratory internal quality control discrepancies), trip blank and method blank issues and other significant issues noted in the chemical data quality review (CDQR)?
   - 9.2. ☑ Ø Is the reader directed to an appendix containing a copy of the full CDQR?

10. Conclusions and Recommendations:
   - 10.1. ☑ Ø Does this section provide a summary of how the data should be interpreted in relation to the regulatory and/or risk-based data objectives established for the project?

11. Attachments: Are the following materials provided in appendices/attachments, where appropriate:
   - ☑ Ø Maps, historical photographs and site photographs
   - ☑ Ø Chemical data tables
   - ☑ Ø CDQR/ADEC Checklist
   - ☑ Ø Field Notebook

12. ☐ O Project specifications

Senior Technical Reviewer (signature) _____
Chief, Materials Section/Geotechnical Services (signature) _____ 27JUL11