Alaska Department of Environmental Conservation

Reuse & Redevelopment Initiative

Brownfield Assessment

Property Assessment and Cleanup Plan

Selawik Area-Wide

Selawik, Alaska

Submitted to:
Department of Environmental Conservation
Reuse and Redevelopment Program

By:
Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, Alaska 99518

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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EXECUTIVE SUMMARY

This Property Assessment and Cleanup Plan (PACP) was prepared for four sites in Selawik, Alaska, by Shannon & Wilson, Inc. under contract to the Alaska Department of Environmental Conservation (DEC). The overall purpose of this PACP project is to prepare one document that presents site backgrounds; known, suspected, or potential environmental conditions that could pose risks to human health and/or the environment; and estimated costs for options to mitigate potential risks. This document is intended to support the planning and corrective actions that may be necessary to return each property to beneficial use. A shareholders teleconference; background and database research; a site visit; and laboratory analysis of field samples were performed to gather the data used to prepare this document.

Based on Shannon & Wilson's research, field observations, limited sampling, and laboratory analysis, the four sites included in this PACP have both potential and confirmed environmental conditions that could pose a risk to human health and the environment.

We identified the following environmental conditions at the IRA Fuel Project Former Tank Farm:

- The Property is listed on the DEC contaminated sites data base due to previous leaks and spills at the Former Tank Farm;
- Gasoline range organics (GRO); diesel range organics (DRO); benzene, toluene, ethylbenzene, and xylenes (BTEX); and naphthalene were measured in soil samples at concentrations that exceed the DEC Method Two Arctic Zone cleanup levels;
- GRO and/or DRO concentrations at three locations also exceed the DEC's maximum allowable concentrations;
- The benzene concentrations measured at one location have the potential to fail the Resource Conservation and Recovery Act (RCRA) toxicity characteristic, which would require handling removed soil as a hazardous waste;
- Surface stains were observed on the property; and
- Three 55-gallon drums and a burn barrel were located near the northern edge of the property. It is not known if the drums were empty or on the Property.

We have recommended performing additional characterization and investigation to better define contaminant extent and exposure pathways, and evaluate the leaching potential of the benzene-impacted soil, prior to selecting a remedial alternative.

The following environmental conditions were identified at the Barge landing Area:

- Burned construction trailers and other debris, including welding rods, were observed in a wet swale along the southwestern side of the gravel storage pad. Results from a soil sample collected beneath the welding rods did not suggest elevated levels of eight metals.
- Broken florescent light tubes were observed on the ground surface. A sample from 6 inches below the ground surface suggests that mercury has not leached into the soil at this location;
- Paint buckets stored outside, including one which had spilled what appeared to be latex paint on the ground surface;
- One horizontal above ground storage tank that did not appear to be cut and cleaned; and
- A surface soil stain at the marine header for a fuel pipeline. The results for a soil sample collected 1 foot beneath the stain suggest that a large fuel release had not occurred at the location of the stain.

We have recommended that additional characterization be performed to investigate the possibility of surface water contamination from the burned debris. We have also recommended more secure storage of materials staged for transportation and removal of the debris located within the swale.

We identified the following environmental conditions at the Former AVEC Facility:

- Soil staining was observed at several locations;
- Concentrations of DRO, RRO, arsenic, and lead in soil that exceed the DEC Method Two Arctic Zone cleanup levels; the results suggest that diesel fuel, lubricating oil, and metals have been released to the site's soil;
- DRO and RRO also exceed the DEC's maximum allowable concentrations;
- The lead concentration measured at one location has the potential to fail the RCRA toxicity characteristic, which would require handling removed soil as a hazardous waste;
- A report of a used oil spill was filed with the Emergency Response Notification System in 1998;
- Two diesel engines for electrical generators remain on site and appear to contain fluids;
- Five electrical boxes, three which may have been electrical transformers, remain on site and in contact with the ground surface, and potential transformers remain on platforms;
- Creosote-treated wood support timbers are in contact with the ground;
- Decommissioned fuel storage and transfer equipment remains on site.

We have recommended performing additional characterization and investigation to better define contaminant extent and exposure pathways. Based on the contaminants and soil types encountered, soil removal and disposal may be the most effective remedial action, although a complete assessment of remedial options cannot be properly conducted until further characterization is completed. It will likely be necessary to remove the remaining equipment and structures prior to performing remedial actions.

We identified the following environmental conditions at the Former School Tank Farm and Storage Pad:

- The Property is currently listed on the DEC contaminated sites data base as active;
- Limited sampling and analysis at the former tank farm suggest that DRO and BTEX remain in the soil, but at concentrations less than the DEC Arctic Zone cleanup levels;
- Visual observations suggest that petroleum hydrocarbons have impacted pore water in the soil and surface water to the south of the Former School Tank Farm;
- Fuel handling and 55-gallon drums (not examined for contents) at the adjacent water treatment facility have the potential to impact the school property; and
- Steel 55-gallon drums and a vehicle located around the Storage Pad, and a foundation cooling system for the steel pad suggest that materials that could impact the environment have been present.

We have recommended that additional characterization be performed to investigate to surface water exposure pathway.

A rough order of magnitude (ROM) cost estimate has been completed that included separate estimates for the recommended actions at each site. Presently these recommendations are limited to additional site characterization. The total ROM cost estimate for the recommended actions at the four sites is $190,000.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ACD	Alaska Community Database Online
ADOT&PF	Alaska Department of Transportation and Public Facilities
AK	Alaska laboratory method
AST	aboveground storage tank
ASTM	ASTM International
AVEC	Alaska Village Electrical Cooperative
B.S.	Bachelor of Science degree
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CCLR	Center for Creative Land Recycling
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
DBA	DEC Brownfields Assessment Request
DEC	Alaska Department of Environmental Conservation
DQO	data qualitative objective
DRO	diesel range organics
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
°F	degrees Fahrenheit
FSP	field sampling plan
GPS	global positioning system
GRO	gasoline range organics
IC	interim conveyance
IRA	Indian Reorganization Act
LCS/LCSD	laboratory control sample/laboratory control sample duplicate
LUST	leaking underground storage tank
M.S.	Master of Science degree
mg/kg	milligrams per kilogram
MS/MSD	matrix spike/matrix spike duplicate
µg/L	micrograms per liter
NANA	NANA Regional Corporation, Inc.

NPL	National Priorities List
NTP	notice to proceed
PACP	property assessment and cleanup plan
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PID	photo-ionization detector
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
ROM	Rough Order of Magnitude
RFP	request for proposal
RRO	residual range organics
SGS	SGS North America, Inc.
SIM	selected ion monitoring
SPAR	DEC Division of Spill Prevention and Response
SW	EPA solid waste method
TAH	total aromatic hydrocarbons
TAqH	total aqueous hydrocarbons
TCLP	toxicity characteristic leachate procedure
TSD	treatment, storage, or disposal
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
VOCs	volatile organic compounds

SELAWIK AREA-WIDE
PROPERTY ASSESSMENT AND CLEANUP PLAN
SELAWIK, ALASKA

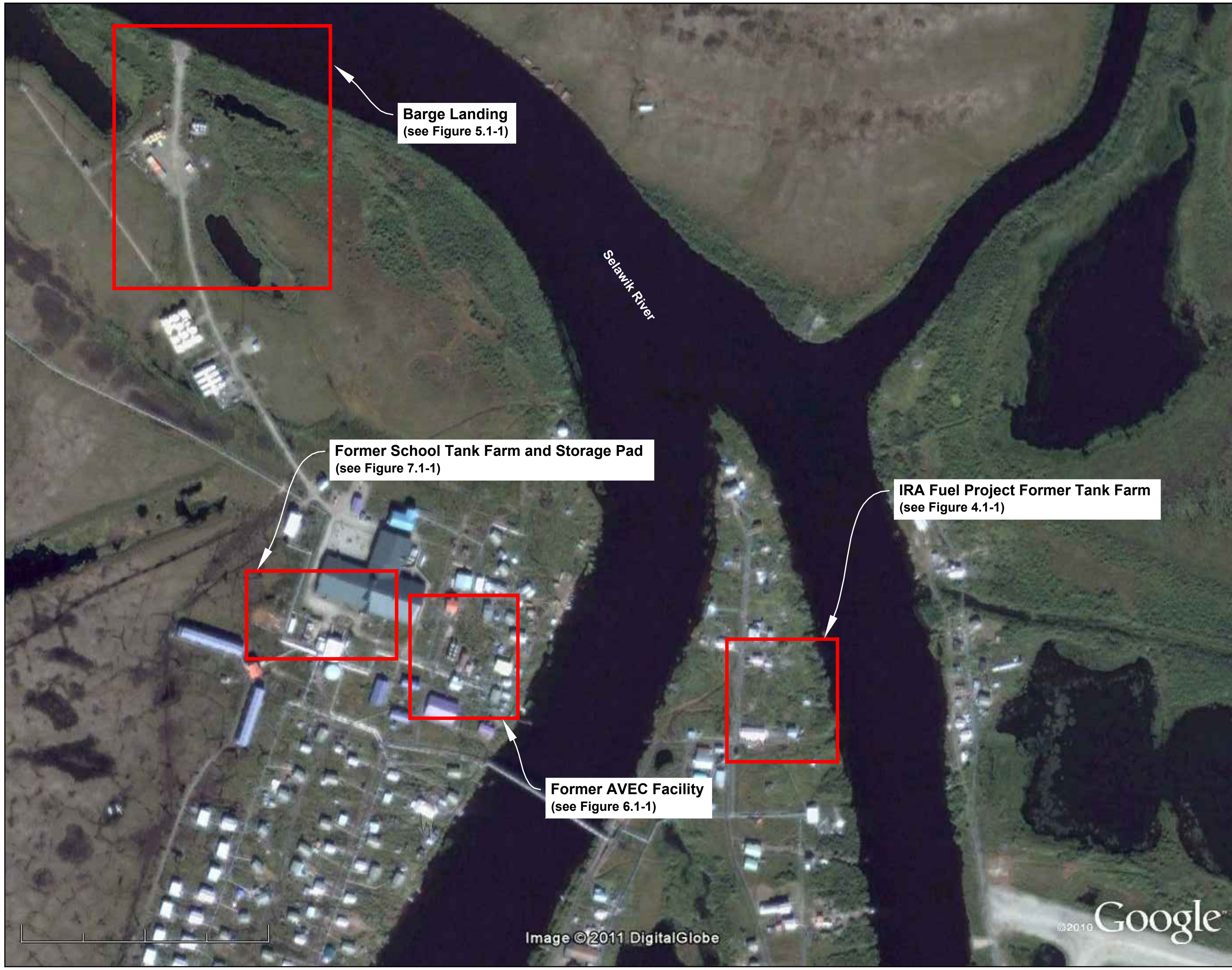
1.0 INTRODUCTION

This report presents the results of Shannon & Wilson, Inc.'s (Shannon & Wilson's) property assessment and cleanup planning (PACP) activities conducted for four sites in Selawik, Alaska. Selawik is an incorporated Second Class City located approximately 90 miles east of Kotzebue and 670 miles northwest of Anchorage in northwestern Alaska. The Native Village of Selawik, a federally recognized tribe, teamed with the City of Selawik to submit a Brownfields Assessment Request to the Alaska Department of Environmental Conservation (DEC). The DEC Brownfields Assessment Request (DBA) was submitted in the Spring of 2010, and requested assessment of three sites. The DEC added a fourth site to the area-wide project, and prepared a request for proposal (RFP) in the summer of 2010. The original three sites include the Indian Reorganization Act (IRA) Fuel Project Former Tank Farm, the Selawik Barge Landing Area, and the Former Alaska Village Electrical Cooperative (AVEC) Facility. The fourth site is the Former School Tank Farm and Storage Pad. The DBA Request Form is included in Appendix A. A map showing an overview of the Selawik area is included as Figure 1.0-1.

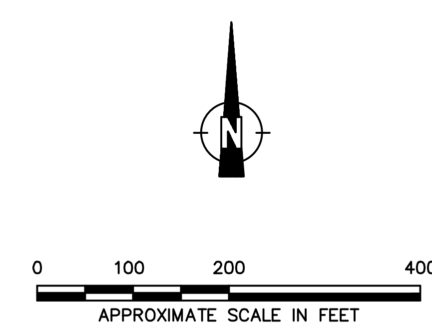
1.1 Purpose and Objectives

The overall purpose of this PACP project is to prepare one document that presents site backgrounds; known, suspected, or potential environmental conditions that could pose risks to human health and the environment; and estimated costs for options to mitigate potential risks. This document is intended to be used to support the planning and corrective actions that may be necessary to return each property to beneficial use.

Specific objectives for this PACP vary at each of the four sites based on the current use status and community goals for the site. For the IRA Fuel Project Former Tank Farm and the Barge Landing Area, specific development projects are in the planning and design phase and the objective is to provide environmental data for the planned development. Specific plans have not been made for the Former AVEC Facility or the Storage Pad portion of the school site, and the objective of this PACP is to provide environmental information that may form the basis for future land use decisions. The Former School Tank Farm portion of the school site has been developed and put to beneficial use, and the objective is to gather information on current environmental conditions to assist in evaluating potential risks.



MAP ADAPTED FROM AERIAL IMAGERY PROVIDED BY GOOGLE EARTH PRO, REPRODUCED BY PERMISSION GRANTED BY GOOGLE EARTH™ MAPPING SERVICE.



Selawik Area-Wide PACP
Selawik, Alaska

SELAWIK OVERVIEW

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SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 1.0-1
Page 2

1.2 Scope of Services

The work for this project included conducting a stakeholder scoping and planning meeting, preparing a field sampling plan/quality assurance project plan, performing field investigations, subcontracting laboratory analysis of soil samples, and preparing this PACP document. The work was performed for the DEC Division of Spill Prevention and Response (SPAR) under Term Contract 18-4002-12. Authorization to proceed with the PACP effort was provided by the DEC in the form of Notice to Proceed (NTP) 18-4002-12-17, dated August 23, 2010. Modifications to the NTP to provide for additional services were approved with NTP 18-4002-12-17B.

2.0 COMMUNITY OVERVIEW

According to the Alaska Community Database Online (ACD) (http://www.commerce.state.ak.us/dca/commdb/CF_BLOCK.htm), Selawik had a population of 849 people as of 2009, and approximately 95 percent of the population is Alaska Native, primarily Inupiat Eskimo. The City lies within the boundaries of the Selawik National Wildlife Refuge, and the residents are active in subsistence fishing and hunting. The largest employers include the school, local government, native organizations, and two grocery stores.

Transportation within the village is by foot, four-wheeler, snowmachine, or skiff. The travel ways are typically boardwalks, and the broader boardwalks and bridges are constructed to allow two four-wheelers to pass. The primary transportation link to the rest of Alaska is by air. Kotzebue is the regional air hub, and several commercial air carriers serve the community. The airport includes a gravel-surfaced primary runway, a cross-wind runway, a parking/staging area, and an airfield maintenance building.

Based on the ACD and the Selawik Community Comprehensive Development Plan (2007), the village was reported by the Imperial Russian Navy in 1840, and a Russian census in 1880 counted 100 residents. The community had a small wooden schoolhouse and church around 1908. Selawik was first established under the 1926 Alaska Native Town Site Act. In 1940, the Inupiaq people of Selawik voted to reorganize its traditional form of tribal government to an IRA Council. The City was first incorporated in 1974. The Selawik Community Comprehensive Development Plan (2007) contains a more in depth overview of the community and is available through the internet at http://www.nwabor.org/forms/selawikplan07.pdf.

2.1 Location, Climate, Geological Setting

The City of Selawik is located to the east of Kotzebue Sound and Selawik Lake along the Selawik River, at approximately 66.604° North Latitude and 160.010° West Longitude. It lies primarily within Section 20, Township 14 North, Range 6 West, Kateel River Meridian. Selawik is located in a low-lying river delta, and the village has grown and developed on what has been described as three banks of the river. Although the Selawik River flows to the north through the village, the primary flow direction of the river is to the west. Most of the development within the village has occurred on the south bank. Bridges connect the south bank of the river to the north end of a developed island and connect the island to the north bank of the river. The airport is located east of the island on the north bank of the Selawik River. The Selawik River is typically navigable from early June to mid-October. The Selawik vicinity is depicted in Figure 1.0-1.

Selawik lies a few miles north of the Arctic Circle. The climate around Selawik is classified as transitional between sub-arctic and arctic. Temperatures average -10 degrees Fahrenheit (°F) to 15°F during the winter and 40°F to 65°F during the summer. Selawik averages approximately 10 inches of total annual precipitation, including 35 to 40 inches of snow.

Selawik is located within the active flood plain of the Selawik River, and the area is punctuated with numerous lakes, ponds, and waterways. The U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory map has not been completed for the Selawik area, however the majority of the area has been classified as wetlands by others. Lacustrine, palustrine, and riverine wetlands are present within the city (CH2MHill 1998). Permafrost is reported to be continuous across the area, and the seasonal active thaw layer has been reported to average approximately two feet. It is not clear if the thaw bulb of the river is underlain by permafrost. Alluvial river delta deposits of silts and sands typically underlie the mantling layer of vegetation and peat. Ice-rich silt lenses and buried peat layers have been encountered in the area. Although layers of gravelly sand can be observed around Selawik, known gravel deposits viable for construction purposes are located 15 or more miles from the village. Reportedly, unsuccessful attempts have been made to install groundwater wells for domestic water. One reference was specific about a 1965 well to 315 feet that was abandoned as dry. The original sources of these reports were not found.

2.2 Community Resources and Infrastructure

2.2.1 Water and Sewer

A municipal circulating water system (DEC Permit 340379) provides water to the majority of residences in Selawik. Water is pumped from the Selawik River to a central filtration and chlorination facility located south of the school. Aboveground utilidors distribute treated water through the community. According to the DEC's Drinking Water Watch, the Selawik water system has regular sampling and analysis requirements. A testing requirement for lead was not listed. Reportedly, not all residents receive water from the municipal system, and some get their water from surface water sources including the Selawik River.

A DEC-permitted (AKG-57-0034**)** vacuum sewer system collects domestic wastewater in a collection tank located in the water treatment plant. The wastewater is pumped from the collection tank to a 178 acre tundra lake/settling pond located approximately 2,500 feet west of the water treatment plant. Outflow from the settling pond flows northward through a series of natural channels and ponds roughly 3.6 miles to the Selawik River. Discharge to the river is approximately 7.2 miles downstream of the water inlet facility.

2.2.2 Energy Supply

Fuel is delivered to Selawik by barge during the summer months. The majority of dwellings in Selawik are heated with fuel oil. There is no natural gas service in Selawik. Fuel oil and gasoline may be purchased from the IRA Fuel Project tank farm dispensers. There are no commercial fuel haulers, and home heating oil is typically transported in drums on four-wheeler trailers. A separate tank farm located alongside the road to the Barge Landing Area supplies fuel to the AVEC electrical generators and the school. Other locations with bulk fuel storage include the Army National Guard and Rotman Stores on the island, Northwest Inupiat Housing Authority southwest of the school, and the Alaska Department of Transportation and Public Facilities (ADOT&PF) at the airport.

Electrical service to the city is provided by AVEC. Diesel generators supply the bulk of the power, and four wind turbines provide supplementary power. The wind turbines and current diesel generator facility, located alongside the road to the barge landing area were energized in 2003. Electrical power is distributed through overhead power lines. According to AVEC, transformers containing polychlorinated biphenyls (PCBs) have been removed throughout their service area.

2.2.3 Solid Waste

Selawik does not have a permitted landfill, or commercial garbage haulers. Household garbage is hauled by individuals to an area of tundra to the west-southwest of the village and deposited on the land surface. A boardwalk leads to the landfill. A new gravel road was constructed and permitted incinerators were brought in to handle the village solid waste. The incinerator pad is located almost one mile west of the village near the sewage lagoon. As of October 2010, the incinerators have not been brought into service, and a portion of the access road has been removed to restrict travel to the incinerator site.

2.2.4 Projects

A potential infrastructure project managed by the ADOT&PF through the State Transportation Improvement Program includes rehabilitation of the barge landing access road, barge staging pad, and replacing 2,780 feet of boardwalk. According to the Department of

Commerce and Economic Development, this project is in the design stage. According to Raven Sheldon (the Native Village of Selawik), the Village is hoping for construction in 2012. With the exception of a city-owned Bobcat, there is no heavy equipment based in Selawik. Earth moving equipment may be temporarily available when the above referenced project enters the construction phase.

2.3 Community Involvement

This section discusses the interaction between the community of Selawik and Shannon & Wilson during the preparation of this PACP.

2.3.1 Stakeholder Meeting Summary

A telephonic stakeholder scoping and planning meeting was held on August 26, 2010. The Native Village of Selawik was represented by Raven Sheldon and Lenora Foxglove of the IRA Fuel Project board of directors, and Lucy Snyder and Susan Clark of the Environmental Program. Mark Teitzel represented AVEC as Vice President and Manager of Engineering. DEC representatives John Carnahan, Deborah Williams, and Sonja Benson facilitated the meeting, and Shannon & Wilson was represented by Haydar Turker and Randy Hessong.

John Carnahan provided an overview of the DEC Re-use and Redevelopment Program, and an introduction to this PACP project. Raven Sheldon described the background, status, and goals of the IRA New Store project and the proposed expansion of the Barge Landing Area. According to Mr. Sheldon, the IRA Council's priorities are the IRA Fuel Project Former Tank Farm (planned future location of the IRA New Store project) first, followed by the Barge Landing Area. The Former AVEC Facility is a lower priority to be incorporated into future plans. Mark Teitzel described the historical background and status of the Former AVEC Facility. AVEC is looking for funding to remove the remaining equipment and tanks from the decommissioned power generation facility. Randy Hessong reviewed Shannon & Wilson's understanding of site backgrounds and outlined the planned scope of work for this PACP plan. The teleconference minutes are included in Appendix B.

2.3.2 Interviews and Input

Several stakeholders provided invaluable input and information during preparation of this PACP. While preparing for the site visit, Mark Teitzel provided permission for site access, additional information about the Former AVEC Facility, and Selawik contacts via e-mail and telephone. Raven Sheldon suggested contacts, and shared what he could find of property ownership records.

Personal interviews in the field were limited due to available resources, individual schedules, and weather. Joe and Doris McCoy took the time to share community layout, infrastructure, and observations of activities at each site while setting up lodging and transportation for Shannon & Wilson's field representative. Raven Sheldon provided a brief welcome to the village, and arranged for employees of the IRA store to assist with the field sampling. Vida Coaltrain, as the IRA store manager, organized the field assistance from Robert Skin and, as a past manager of the former IRA tank farm, provided insight into the general layout of the fuel handling system and its operation. Eddie Campbell, principal of the Davis-Ramoth K-12 School, provided access to the school facilities to assist in the sampling effort.

3.0 PROPERTY ASSESSMENT ELEMENTS

This PACP is unique in that it includes four sites in one report. We have deviated from the report outline suggested in the DEC PACP Guidelines in order to keep the elements of the property assessment work for each site together. This section describes assessment elements common to the four sites, including records review, field investigation methodology, and cleanup criteria. The four sites within the City of Selawik; the IRA Fuel Project Former Tank Farm, the Barge Landing Area, the Former AVEC Facility, and the Former School Tank Farm and Storage Pad; each have their own property assessment sections. The individual site sections (Sections 4 through 7) are subdivided into a site overview, a description of site reconnaissance and sampling, and an environmental overview. Tables, figures, and field photographs pertaining to each site are included in the pages at the end of the section for that site. The cleanup planning portion of this PACP is presented in Section 8: Recommended Actions/Opinions. Subsections within Section 8 describe the recommended remedial actions for each of the four individual sites. Sections 9 through 13 contain the conclusions, personnel qualifications, limitations and exceptions, closure/limitations, and references, respectively.

3.1 Records Review

The scope of work for this PACP includes meeting the requirements of an ASTM International (ASTM) Phase 1 Environmental Assessment per method ASTM E 1527-05 for the IRA Fuel Project Former Tank Farm only. Additional subsections are included in Section 4.1.5 to address regulatory database search requirements. Much of the database and records review performed is applicable to the other three sites assessed. A full outline of the research is not included in the subsections for the other three sites. However, information specific to the other sites is included in subsections for the respective sites.

3.2 Field Investigation

Shannon & Wilson's field representative, Randy Hessong, conducted the visit to Selawik from September 30 to October 3, 2010. Randy meets the definition of "Environmental Professional" as defined in 40 Code of Federal Regulations (CFR) 312.10. Regularly scheduled flights were used for transportation from Anchorage to Selawik and back. The visit consisted of site visits and soil sampling at each of the four sites scoped for this Selawik PACP. The field investigation and sample analysis methodologies used for the four sites are summarized below.

3.2.1 Site Visit

The general methodology was to walk through each site, become familiar with the layout, and identify potential areas of environmental concern. Once a general feel for the site was obtained, a narrated video recording of the site was made. Soil screening was then performed at selected locations of concern, and the locations for analytical samples were selected. Finally, analytical samples were collected, and still photographs were taken. The September 2010 *Field Sampling Plan/Quality Assurance Project Plan, Selawik Area-Wide Preliminary Assessment and Cleanup Plan* (FSP) was prepared by Shannon & Wilson to describe the details of sample collection and laboratory analyses.

3.2.2 Site Sampling

Limited soil sampling was performed at each of the four assessment areas. A total of 57 screening samples were collected to assist in selecting 24 locations for analytical soil sampling. Water samples were not collected for this PACP. The horizontal coordinates of sample locations were measured with a hand-held global positioning system (GPS) unit, and are tabulated in Appendix I. A summary of sample locations and descriptions for each site is included in a table provided at the end of the associated section. For example, the sample locations and descriptions table for the IRA Fuel Project Former Tank Farm (discussed in Section 4.0) is included at the end of the Section 4 text as Table 4.2-1.

3.2.2.1 Sampling Methodology

Sampling locations were selected based on field observations, historic site layout, and accessibility. A pick-mattock, hand shovel, and stainless-steel hand auger were used to recover soil samples from depths of 0.2 to 4.6 feet below ground surface (bgs). The hand auger was decontaminated after each use. New, disposable nitrile gloves were worn by the sampler, and the exposed soil was placed into containers using clean stainless steel spoons.

Soil was screened for volatile organic compounds using a Thermo-Environmental Organic Vapor Monitor 580B photo-ionization detector (PID) following DEC's Underground

Storage Tank (UST) Procedures Manual semi-quantitative headspace screening protocol. Analytical samples were collected by exposing fresh soil with a stainless steel spoon, then filling laboratory-supplied containers in general order of volatility. Field duplicates were collected to maintain a ratio of at least one duplicate per ten samples of a given analysis. The samples were stored in polyethylene coolers and transported by commercial air carrier. The samples were delivered to the laboratory, SGS North America, Inc. of Anchorage, Alaska (SGS), by the sampler following chain-of-custody procedures.

3.2.2.2 Analytical Testing Methods

Laboratory analyses were selected by site based on potential contaminants of concern. The laboratory results are presented in summary of analytical results tables included for each site. Analytical methods included one or more of the following:

- Gasoline range organics (GRO) by Alaska Method (AK) 101,
- Diesel range organics (DRO) by AK102,
- Residual range organics (RRO) by AK103,
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by Environmental Protection Agency (EPA) Solid Waste Method (SW) 8021B,
- Volatile organic compounds (VOCs) by SW8260B,
- Polynuclear aromatic hydrocarbons (PAHs) by SW8270D selected ion monitoring (SIM),
- Metals: arsenic, barium, cadmium, chromium, lead, nickel, selenium, silver, and/or vanadium, by SW6020,
- Mercury by SW7471B, and
- PCBs by SW8082A.

3.2.3 Quality Assurance Summary

The analytical samples collected for this project were submitted to SGS. In addition to providing the analytical data for our project samples, SGS follows on-going quality assurance/quality control procedures to evaluate conformance to applicable DEC and EPA data quality objectives (DQO). Internal laboratory quality controls for this project include surrogates, method blanks, laboratory control sample/laboratory control sample duplicates (LSC/LSCD), and matrix spike/matrix spike duplicates (MS/MSD). If a DQO for one of the controls is not met, the laboratory provides a brief explanation in the case narrative of their report. Shannon & Wilson reviewed the SGS data deliverables for the soil samples included in Work Order 1005368, and completed the DEC Laboratory Data Review Checklist. The laboratory report and data review checklist are included in Appendix C.

External quality controls include field records, two trip blanks, and three field duplicate sample pairs. Field logs and records were checked for completeness and accuracy. The trip blank results were reviewed to determine if they contained detectable concentrations of analytes for which they were tested. For the most conservative assessment of laboratory data quality, the Migration to Groundwater cleanup criteria were used to assess reporting limits in the data quality review. No discrepancies were identified that would impact the reliability of the data. Note that the PAH analysis of two samples from the IRA Fuel Project Former Tank Farm was conducted 19 days past the recommended maximum hold time. Other non-conformities that may affect the usability of the sample results and the results of the primary/duplicate sample sets are discussed in the quality control portion included in the sections of this report pertaining to the individual sites.

3.3 Conceptual Site Model

Preparing conceptual site models for each site was not included in the project scope; however, a discussion of the analytical results will be provided in the context of potential exposure pathways identified at each site. Exposure pathways are simply ways that people, plants, or animals may come in contact with contaminants that may be present. Ingestion and inhalation cleanup levels are provided in each of the tables containing analytical results. The ingestion cleanup level is considered protective of incidental ingestion of soil, dermal (skin) exposure to soil, and inhalation of fugitive dust. The inhalation cleanup level is considered to be protective of the inhalation of chemicals volatizing from soil to outdoor air.

3.4 Cleanup Criteria

For soil contamination, the risk-based DEC soil cleanup levels of Method Two for the Arctic Zone are thought to be the most applicable to the Selawik sites. The Method Two Cleanup levels are contained in the Alaska Administrative Code (AAC) under 18 AAC 75.341. 18 AAC 75.990 defines “Arctic zone” as “areas north of latitude 68° North; and areas south of that latitude will be considered an ‘Arctic zone’ on a site-specific basis, based on a demonstration that the site is underlain by continuous permafrost.” Selawik is located at approximately 66.6° north, several references noted that the area is underlain by continuous permafrost, and that attempts to install groundwater wells were unsuccessful. It is beyond the prevue of this report to demonstrate that the sites are underlain by continuous permafrost, although permafrost was encountered in test pits at the IRA Fuel Project Former Tank Farm, the Former AVEC Facility, and the Former School Tank Farm. For purposes of this report, the analytical results are compared to the Arctic Zone soil cleanup levels.

For surface water, the water quality standards of 18 AAC 70 for fresh water uses are applicable. For petroleum hydrocarbons, the standards are 15 micrograms per liter (µg/L) total aqueous hydrocarbons (TAqH), and 10 µg/L total aromatic hydrocarbons (TAH). During the field activities, free water was observed in the soils above the permafrost layer at several locations. This seasonal water layer has the potential to be hydraulically connected to surface water, and potential contaminants in the water may migrate off site. Although the Method Two soil cleanup levels for Migration to Groundwater in 18 AAC 75.341 are not thought to be applicable to the Selawik sites, the criteria may be useful for estimating whether contaminant concentrations in soil have the potential to impact water that comes in contact with the soil.

Disposal of materials generated during cleanup actions, such as the contents of drums and tanks, soil, building debris, or other solid wastes are regulated under the Resource Conservation and Recovery Act (RCRA) and the Toxic Substances Control Act, both administered by the EPA.

4.0 IRA FUEL PROJECT FORMER TANK FARM

Based on the information provided in the DBA, the IRA Fuel Project Former Tank Farm location is the site of a proposed new grocery store. The IRA Fuel Project Former Tank Farm was included in this PACP to provide environmental data for the planned development and address potential risks associated with environmental conditions at this site.

4.1 Site Overview

The property on which the IRA Fuel Project Former Tank Farm was located is Lot 6, Block 1, Tract A, of U.S. Survey No. 4492; Selawik Townsite, and has an area of approximately 0.62 acres. As shown on Figure 1.0-1, the property is located on the northern portion of an island in the Selawik River, within the City of Selawik. The site is situated on the east side of Ballot Street, north of Community Avenue. The Community Hall is also located on this parcel. The approximate locations of the tank farm and proposed store building footprint are shown in Figure 4.1-1.

4.1.1 Current Use

The area of the former tank farm is not currently in use. Forty-six steel piles, the majority of which are refrigerated, were present on the site in October 2010. The IRA Fuel Board reports that the piles were installed in 2007, and the piles are visible in a 2008 aerial photograph (Figure D-4 in Appendix D). The Community Hall is present at the southern edge of the property, and appears to remain in use.

4.1.2 Historical Use

Based on information supplied in the DBA request, the former tank farm was active between 1972 and 1996. Based on aerial photographs the tank farm was not present in June 1972, but was present in 1976 and 1986 photographs. The tanks do not appear to be present in the 1999 and 2000 aerial photographs. In June 1972 the community hall was present, but boardwalks and other developments were not. A small outbuilding, likely an outhouse, is present between the community hall and the future location of the tank farm in the June 1972 photo. The tanks and outhouse are not visible, but the containment walls of the tank farm are visible in the 1999 and 2000 aerial photographs. In the 2000 aerial photograph, it appears that soil is being spread across the base of the tank farm over what may have been cribbing to support the tanks. The tank farm consisted of a dispenser shed and 7 cylindrical above-ground tanks, five placed with their axis horizontal and two placed vertically. The storage capacity was estimated to be 100,000 gallons of diesel/heating oil, and 20,000 gallons of gasoline. Aerial photographs from 1972, 1986, 2000, and 2008 are included in Appendix D as Figures D-1 through D-4.

4.1.3 Proposed Community Development and Land Reuse

The IRA Council initiated a project to construct a new grocery store at the IRA Fuel Project Former Tank Farm location. The project was initiated with the installation of refrigerated piles to support a new building. Plans to continue construction of the store have been put on hold due to the threat of potential contamination remaining from the former tank farm.

4.1.4 Ownership

The property was transferred from the City of Selawik to the Native Village of Selawik with a Statutory Warranty Deed on June 6, 2005. Earlier ownership documents were not found. Based on the ACD 1999 Community Map, an airport aviation and hazard easement has been granted to the ADOT&PF for this property. The Kotzebue Recorders office was not able to supply a copy of the easement. Ownership records are included in Appendix E.

4.1.5 Records Review

Federal and state database records were researched for pertinent information regarding the environmental condition of the Property and adjacent parcels. Local agencies were also contacted. This database search complies with ASTM E 1527-05, with the exceptions noted in Section 11.

4.1.5.1 Federal Records Sources

The National Priorities List (NPL) specifies those properties assigned the EPAs highest cleanup priority. The EPA web site was reviewed for NPL sites in Alaska. There are currently no listed NPL sites in the Selawik area.

The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) is also compiled by the EPA and includes sites the EPA has investigated or is currently investigating for potential hazardous substance contamination for possible inclusion on the NPL. According to the CERCLIS list, viewed on the EPA website September 13, 2010, there are no CERCLIS sites located in the Selawik area.

According to the EPA Region 10 report, there are no active RCRA treatment, storage, or disposal (TSD) facilities subject to corrective action (CORRACTS) within Selawik. TSD facilities that are not subject to corrective action (NONCORRACTS) are not located within Selawik. There are no listed hazardous materials TSD facilities in the Selawik area.

The Emergency Response Notification System (ERNS) lists reported hazardous substance releases in quantities greater than the reportable quantity. One spill was reported in Selawik at the AVEC site. See Section 6.1.5 for additional details regarding this spill.

The Brownfields list does not contain EPA Brownfield Assessment, Cleanup, and Revolving Loan Fund Grantees in Selawik.

The National Register of Historic Places is the Nation's official list of cultural resources worthy of preservation. This register does not list any cultural resource sites or cultural resource districts located on the assessment sites.

According to USFWS, 15 threatened and/or endangered animal species and one endangered plant species exist in Alaska. Five animal species are considered endangered by the Alaska Department of Fish and Game, Division of Wildlife Conservation. These federal and state listed species are not found in the Selawik area.

4.1.5.2 State Records Sources

The DEC Spills List was reviewed for information regarding spills on or adjacent to the IRA Fuel Project Former Tank Farm. According to the database, there are no reported spills on the IRA Fuel Project Former Tank Farm property.

The State Landfill/Solid Waste Disposal Site List was reviewed on November 29, 2010. According to the DEC's list, no registered active landfills or solid waste disposal sites are identified within Selawik.

Registered Underground Storage Tank Database

The DEC registered UST records, available on the DEC website, were viewed on September 25, 2010. The DEC records indicate that the IRA Fuel Project Former Tank Farm is not listed as a UST site. The DEC records indicate there are no registered USTs in Selawik.

Leaking Underground Storage Tank Database

The DEC's Leaking Underground Storage Tank (LUST) database was reviewed on September 25, 2010, for information regarding LUST sites within 0.5 mile of the IRA Fuel Project Former Tank Farm. The DEC records indicate there are no registered LUSTs in Selawik.

Contaminated Sites Database

The DEC Contaminated Sites database was reviewed on September 25, 2010, for sites within 1 mile of the Property. This list is assumed to be equivalent to a State Hazardous Waste Sites list, as required by ASTM E 1527-05. Four active contaminated sites in Selawik are listed on the database, including the IRA Fuel Project Former Tank Farm, the Old AVEC Tank Farm, and the Former School Tank Farm. The fourth site is located at the airport.

On January 13, 2011, Mr. Grant Lidren, a Project Manager at the DEC Division of Contaminated Sites, was contacted. Mr. Lidren verified that the IRA Fuel Project Former Tank Farm is listed as "active" on the DEC database. Mr. Lidren noted that the extent of contamination at this site has not been defined. Due to the fact that the IRA Fuel Project Former Tank Farm is located on an island with no other "active" sites, Mr. Lidren stated that the documented contamination at the three other "active" contaminated sites in Selawik would not impact the IRA Fuel Project Former Tank Farm.

The IRA Fuel Project Former Tank Farm site was added to the DEC Contaminated Sites database in 1991 after an inspection of the tank farm revealed evidence of previous leaks and spills. Based on the DEC Contaminated Sites Database, an oil spill of 1,000 gallons was reported at the site in 1984, and evidence of leaks and previous spills was observed in a 1991 survey. The report from an October 8, 1992, inspection by the DEC and U.S. Coast Guard describes a steel containment dike with a floor and open drains. Leaks along the approximately 100-foot long pipeline to the Selawik River were evident, and a fuel odor was noted in the dispensing shed. It is not clear from the inspection report on which reach of the river the pipeline terminated, but a marine header is presumed. The inspection report noted that heating oil and gasoline were stored at the IRA Tank Farm.

4.1.5.3 Local Agency Sources

The City of Selawik, the Native Village of Selawik, and AVEC are the most relevant local agencies for this environmental assessment. Each has been involved with this PACP, and their input has been incorporated in the body of text.

4.1.6 Adjoining Properties

The parcel to the east of the former tank farm includes a residential dwelling in the southwest corner. The land directly to the east of the tank farm is undeveloped, although portions of the area appear to have been used as a dog lot in the past. The eastern channel of the Selawik River is beyond the eastern boundary of that parcel. Three residential dwellings are located adjacent to the northern boundary of the property. The western edge of the property is bounded by the boardwalk and utilidor of Ballot Street. Residential properties are to the west of Ballot Street, but the eastern portion of those properties, closest to Ballot Street, is undeveloped. The Community Hall is on the same parcel as the former tank farm, along the southern edge, but the Community Hall was not included in this assessment. The utilidor serving the Community Hall and the residence to the southeast runs on the north side of the buildings and was taken as an unofficial boundary for the former tank farm assessment. South of Community Hall is the boardwalk of Community Avenue, and the new clinic south of Community Avenue.

4.2 Site Reconnaissance and Sampling

The field activities for this site included a site reconnaissance, advancing test pits, and collecting screening and analytical soil samples. Following an orientation tour of the site with Joe McCoy on the morning of September 30, 2010, Shannon & Wilson's field representative spent the afternoon of September 30 and most of October 1, 2010 advancing test pits and collecting soil samples at the IRA Former Tank Farm. The weather was clear, calm, and in the 20's °F when our field representative arrived in Selawik. Ice was on calm bodies of water and the ground was frozen from 1 to 5 inches in depth, with just a dusting of snow. The snow had melted and temperatures were above freezing later in the afternoon of September 30. October 1 was mostly cloudy with variable to gusty east winds and temperatures in the low to mid 30°F range.

4.2.1 Field Observations

The IRA Former Tank Farm property is relatively high and well drained, with dense vegetative cover consisting primarily of tall grasses. The site generally slopes to the east toward the branch of the Selawik River. An estimated 46 white-painted steel piles stick up roughly 4 feet vertically from the ground surface of the property, as shown in Photo 4.2-1. The piles were marked with Arctic Foundations, Inc. labels, and the larger 8-inch and 10-inch piles appeared to be refrigerated based on the capped ports on the sides. The estimated 1-inch diameter PVC pipes along the side of some piles are likely for monitoring subsurface temperatures. Access to the IRA Former Tank Farm is available using a wooden bridge extending over a utilidor from the Ballot Street boardwalk to the property. The vegetation is broken by two double-tracked dirt paths that curve from the bridge and run between the piles to properties north of the former tank farm.

Photograph 4.2-1: Looking north across the IRA Fuel Project Former Tank Farm area, with Test Pit I9 location in foreground. (10/1/2010)

Two utilidors are present in the vicinity of IRA Former Tank Farm property. An aboveground sewer and water utilidor is located to the west of the site and runs along the east side of Ballot Street. A second utilidor runs west to east across the southern portion of the site creating a partial barrier between the Community Hall and the location of the former tank farm.

Photograph 4.2-2: Looking south across former IRA tank farm dispenser area to Community Hall during sampling of Test Pit I1. (9/30/2010)

An area of stained, bare soil was observed just to the northeast of the bridge ramp, as shown in Photo 4.2-2, and appears to correlate with the former location of the fuel dispenser shed. This area is visible in Figure 4.1-1 as the lighter coloration immediately south and east of Test Pit I1. The only other observed evidence of the former tank farm was a tangled piece of steel on the ground between the piles and a small pond. The steel appeared to be part of the low steel wall or containment that once surrounded the tank farm. The footprint of the former tank farm was inferred from aerial photographs.

A small pond, estimated to be around 150 square feet, is on the lot to the east of the Property. The pond water was frozen, and sheens or other evidence of petroleum impacts were not observed. A break in the bushes and rotting pallets on organic, muddy ground suggested a location where barges might connect a line to refuel the tank farm (See Photo 4.2-3). The area is well vegetated, and evidence of a pipeline was not found. Three 55-gallon drums and a burn barrel were located near the northern edge of the property, and appear to belong to the eastern residence. The location of the property line was not apparent in the field, and the drums were not inspected for contents.

Photograph 4.2-3: Looking east to the Test Pit I8 location, the eastern channel of the Selawik River, and the Selawik airport. (10/1/2010)

4.2.2 Site Sampling

Ten test pits were advanced by shovel and hand auger at the IRA Fuel Project Former Tank Farm. A representative test pit is shown in Photo 4.2-4. Test Pit I1 was placed at the location of the visible surface stain near the access bridge. Test Pits I2, I3, I4, and I6 were collected from within the footprint of the proposed store. Test Pits I3 and I4 were placed within the estimated former tank farm footprint with the intention of investigating the nature and extent of potential fill placed after tank farm decommissioning. Test Pit I5 was placed to test soil below the likely entrance area to the proposed store. Test Pits I7 and I8 were placed along a brush-free line extending from the former dispenser area to the river, which was considered the most likely supply-pipeline route from the river. Test Pit I9 was advanced near the southern boundary of the proposed store footprint between smaller piles likely installed to support mechanical equipment. Test Pit I10 was selected to be beyond the lower corner of the tank farm (based on potential water in the 2000 aerial photograph). The test pit locations are shown on Figure 4.1-1.

Photograph 4.2-4: Looking down at Test Pit I1 advanced by hand using a shovel and hand auger at the IRA Fuel Project Former Tank Farm. Stained soil associated with the former dispenser shed visible to left. (9/30/2010)

Three to four screening samples were collected from various depths in each test pit, resulting in 34 screening samples. PID readings ranged from 2.2 to 670 parts per million (ppm) in the screening samples. The highest screening results were measured in screening samples from Test Pits I1, I2, I3, I4, I6, and I7 starting at approximately 2 feet bgs and extending to the depth of the test pit (2.8 to 4.6 feet bgs). Based on screening, the highest concentrations of hydrocarbons were typically encountered near the boundary between the thawed and frozen soil.

Soil conditions encountered in the test pits generally consisted of a vegetation mat at the ground surface underlain by brown to gray sandy and organic silts. Frozen silts were generally encountered between 2.5 to 4 feet bgs. We were not able to extend the test pits more than a few tenths of a foot into the frozen soil. Petroleum odors were noted in six (Test Pits I1, I2, I3, I4, I6, and I7) of the ten test pits. Liquid water did not enter the test pits during the period they were open. Table 4.2-1 contains a summary of soil descriptions and screening results for each test pit.

Eleven analytical samples, including one duplicate soil sample, were selected from the test pits based on the headspace screening readings, locations in relationship to the proposed store, and visual and olfactory evidence of contamination. In general, one depth interval per test pit was selected for analytical sample collection; however, two analytical samples were obtained from different depths in Test Pit I6. Field observations and screening did not suggest the presence of petroleum hydrocarbons in Test Pit I8, and no analytical samples were collected.

The samples were collected in accordance with the FSP with the following considerations:

- Samples I2S1 and I6S1, collected from Test Pits I2 and I6 respectively, were collected from the top 6 inches of soil beneath the vegetation mat, within the footprint of the proposed store.
- Samples I1S4, I3S3, I4S3, I5S3, and I6S3, collected from Test Pits I1, I3, I4, I5, and I6 respectively, were collected from the interface between frozen and thawed soil.
- Samples I3S3 and I4S3, collected from Test Pits I3 and I4 respectively, were collected from within the former tank farm footprint with the intention of characterizing soil beneath potential fill placed after tank farm decommissioning. It was not clear from an examination of the test pit side walls if or how much fill had been placed.
- Sample I7S2, collected from Test Pit I7, was selected to target the most likely supply pipeline route from the river.

The analytical samples collected from the test pits were analyzed for GRO, DRO, and BTEX. The duplicate sample set was also analyzed for PAHs. The laboratory methods are described in Section 3.2.1.1. Two deviations from the FSP occurred. The PAH analyses were performed outside of the recommended 14 day holding time and total lead analysis was not performed on the sample with the highest screening result.

4.2.3 Discussion of Sampling Results

Concentrations of target analytes exceeding the most stringent Arctic Zone cleanup levels (either direct contact/ingestion or inhalation) were detected in the project samples from Test Pits I2, I3, I4, I6, and I7. Impacted soil exceeding the applicable cleanup levels was encountered in the shallow soil (top 6 inches beneath the vegetation mat) within the footprint of the proposed store as represented by Sample I2S1, in soil beneath the proposed building footprint and suspected to be beneath fill potentially placed at the former tank farm – represented by Samples I3S3 and I4S3, and from samples representing the bottom of the active layer at the top of the permafrost as represented by Sample Set I6S3/I6S12, and Sample I7S2. The analytical results are summarized in Table 4.2-2.

The GRO concentrations exceeding the applicable cleanup level ranged from 1,530 milligrams per kilogram (mg/kg) in Test Pit I3, to 21,200 mg/kg in Test Pit I6. The DRO concentrations which exceeded the cleanup criterion ranged from 17,200 mg/kg in Test Pit I7 to 37,300 mg/kg in Test Pit I2. The DRO and GRO concentrations also exceed DEC's maximum allowable concentrations for these compounds. According to the laboratory case narrative, all of the samples which contained GRO or DRO in concentrations exceeding the cleanup levels exhibited chromatogram patterns consistent with either weathered gasoline or weathered middle distillate fuels.

The highest BTEX constituent concentrations were identified in Test Pit I6. In particular, the highest benzene concentration reported for the duplicate pair I6S3/I6S12, collected from Test Pit I6, was 1,270 mg/kg. This benzene concentration has the potential to fail EPA's toxicity characteristic leaching procedure (TCLP), which would require excavated soil to be handled as a characteristic hazardous waste under RCRA.

One PAH compound, naphthalene, was measured at a concentration that exceeds the applicable clean levels. The Naphthalene concentration measured in duplicate Sample I6S12 is 67.4 mg/kg. Note that the PAH analysis of Samples I6S3 and I6S12 was conducted 19 days past the recommended maximum hold time. Performing the analysis after the recommended holding time has potential to bias the sample results low.

4.3 Environmental Review

The environmental conditions identified for this site include information gathered during the document and records review, from on-site observations, and from the results of limited analytical samples collected from test pits.

4.3.1 Historical Environmental Review

Based on the DEC Contaminated Sites Database, an oil spill of 1,000 gallons was reported at the site in 1984, and evidence of leaks and previous spills was observed in a 1991 survey. An October 1992 inspection describes a steel containment dike with a floor and open drains. Leaks along the approximately 100-foot long pipeline to the Selawik River were evident, and a fuel odor was noted in the dispensing shed. It is not clear from the inspection report on which reach of the river the pipeline terminated. The inspection report noted that heating oil and gasoline were stored at the IRA tank farm. We were not able to obtain records of the tank farm decommissioning efforts.

4.3.2 Identified or Potential Source Areas

The former tank farm, dispenser shed, and pipeline used to fill the tanks represent potential sources of petroleum contaminants at the site. The fuel handling facilities have been removed from the site; however, this former site use remains an environmental concern due to historical drips, leaks, and/or unknown spills. Analytical samples obtained from ten test pits advanced across the site indicate that fuel was released into the soil beneath portions of the tank farm, the dispenser area, and the fuel pipeline. The contamination in the soil remains a secondary contaminant source. The laboratory results suggest that both gasoline and diesel (heating oil) were released. Three 55-gallon drums and a burn barrel located near the northern edge of the property have the potential to be sources of contaminants. Based on the installation date and style of piles, the refrigerant is likely to be carbon dioxide. A release of carbon dioxide would disperse into the atmosphere.

4.3.3 Data Gaps

The depth to which petroleum contamination has penetrated the permafrost, and the horizontal boundaries of contaminated soil have not been determined. The eastern extent of soil contamination in particular is not delineated. Test Pit I7 contained DRO and xylene contamination near the eastern property boundary. The leachable benzene concentrations need to be measured by TCLP analysis to determine if the soil could be a hazardous waste under RCRA. Lead additives to gasoline were phased out in 1978. The tank farm was likely active in 1976. Additional soil sampling could be performed to delineate the extent of contamination and investigate the potential for elevated lead levels in the soil.

The concentrations of petroleum contaminants detected in the soil samples suggest that surface water that comes in contact with the contaminated soil may potentially become impacted; however, the small pond observed on the lot to the east of the site was frozen at the time of the field efforts and sheens or other evidence of petroleum impacts were not observed. It has not been determined if precipitation infiltration and runoff follows horizontal migration pathways that could impact surface water. The water in the small pond east of the IRA Fuel Project Former Tank Farm could be sampled and analyzed for petroleum hydrocarbons.

Volatile hydrocarbon concentrations that exceed the Outdoor Inhalation cleanup levels were measured in soil samples. The rates of transport or concentrations of volatile hydrocarbons in the atmosphere above the soil are not known. Air quality monitoring at the site could be performed to assess this potential exposure pathway

4.3.4 Exposure Pathways

Based on the analytical results, concentrations of GRO, DRO, BTEX, and naphthalene are present at the IRA Fuel Project Former Tank Farm site at concentrations that may potentially pose a risk to human health and the environment. The potentially complete exposure pathways for this site include direct contact with contaminated soil (through either incidental ingestion or dermal exposure), inhalation of fugitive dust, inhalation of outdoor air, and dermal exposure to and/or ingestion of surface water. Inhalation of indoor air may become a potentially complete pathway if a building is constructed on the site. Potential receptors include current and future site visitors and/or trespassers, and future construction workers and commercial workers.

Contact with and consumption of contaminated surface water by humans, plants, and animals is a potential exposure pathway. Water samples were not collected as part of this effort; however, the impacted soil identified at the site has the potential to impact surface water. Because groundwater is not used for drinking, and groundwater is not believed to be present for a few hundred feet beneath the permafrost, the groundwater exposure pathway is not considered complete.

4.3.5 Environmental Overview

As part of this PACP plan we have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527 of the IRA Fuel Project Former Tank Farm located at Lot 6, Block 1, Tract A, of U.S. Survey No. 4492; Selawik Townsite. Any exceptions to, or deletions from, this practice are described in Section 11.0 of this report. This assessment revealed no evidence of recognized environmental conditions in connection with the Property except for the following:

- The Property is listed on the DEC contaminated sites data base due to previous leaks and spills at the Former Tank Farm;
- GRO; DRO; BTEX; and naphthalene were measured in soil samples at concentrations that exceed the DEC Method Two Arctic Zone cleanup levels;

- The benzene concentrations measured at one location have the potential to fail the RCRA toxicity characteristic, which would require handling removed soil as a hazardous waste;
- Surface stains were observed on the property; and
- Three 55-gallon drums and a burn barrel were located near the northern edge of the property. It is not known if the drums were empty or on the Property.

Inhalation, dermal contact, and ingestion are potentially complete exposure pathways for the IRA Fuel Project Former Tank Farm. Concentrations of GRO and DRO in excess of the DEC Method Two maximum allowable concentration were measured in the near-surface soil. BTEX and naphthalene concentrations exceed the Method Two outdoor inhalation standards, and benzene concentrations also exceed the direct contact standards. The presence of volatile compounds near the ground surface suggests a potential inhalation exposure for humans or animals that spend significant periods of time on the site. The extent of soil contamination and the possibility of surface water contamination have not been fully investigated.

Remedial actions will likely be required for the site due to the presence of GRO and DRO in excess of the DEC maximum allow concentrations. Proper assessment of remedial alternatives is not practicable given the remaining data gaps.

LEGEND

I2 Approximate location of Test Pit I2 by Shannon & Wilson, Inc., 2010, with sample results greater than the ADEC cleanup levels. Concentrations of analytes with exceedences shown in mg/kg. For other analytes see Table 4.2-2.

I1 Approximate location of Test Pit I1 by Shannon & Wilson, Inc., 2010, with sample results less than the ADEC cleanup level, or not analyzed (I8).

0 25 50 100

APPROXIMATE SCALE IN FEET

Notes:
1) Figure based on June 26, 2008 and June 15, 1986 aerial photographs from AeroMetric, Inc. - Alaska Division and the Alaska DCRA 1999 Community Map, Selawik.

2) Lot Identifiers are for U.S. Survey No. 4492 Tract B.

3) Property boundaries are approximate.

N

Selawik Area-Wide PACP
Selawik, Alaska

IRA FUEL PROJECT FORMER TANK FARM

May 2011 32-1-17385

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 4.1-1

TABLE 4.2-1 - SAMPLE LOCATIONS AND DESCRIPTIONS, IRA FUEL PROJECT FORMER TANK FARM

Sample Number	Date	Sample Location (See Figure 4.1-1)	Depth (feet)	Headspace (ppm) ^	Sample Classification
Test Pit Samples					
Test Pit I1 - South edge of former dispenser shed					
I1S1	9/30/2010	IRA Test Pit 1, Sample 1	0.6-0.7	230	Dark brownish gray, sandy SILT; moist; petroleum odor
I1S2	9/30/2010	IRA Test Pit 1, Sample 2	2.0-2.1	370	Gray, sandy SILT; moist; petroleum odor
I1S3	9/30/2010	IRA Test Pit 1, Sample 3	3.6-3.8	410	Gray, sandy SILT; moist; petroleum odor
* I1S4	9/30/2010	IRA Test Pit 1, Sample 4	4.4-4.6	420	Light gray, fine sandy SILT; wet to frozen
Test Pit I2 - Northeast corner of dispenser shed					
* I2S1	9/30/2010	IRA Test Pit 2, Sample 1	0.5-0.6	290	Mixed brown organic SILT and grayish brown sandy SILT; moist
I2S2	9/30/2010	IRA Test Pit 2, Sample 2	2.0-2.1	88	Mixed brown organic SILT and grayish brown sandy SILT; moist
I2S3	9/30/2010	IRA Test Pit 2, Sample 3	3.1-3.2	180	Grayish brown, sandy SILT; moist
I2S4	9/30/2010	IRA Test Pit 2, Sample 4	3.8-4.1	520	Gray, sandy SILT; very moist to frozen; petroleum odor
Test Pit I3 - Center of old tank farm					
I3S1	9/30/2010	IRA Test Pit 3, Sample 1	0.5-0.6	70	Brownish gray, fine sandy SILT with organics; moist
I3S2	9/30/2010	IRA Test Pit 3, Sample 2	2.0-2.1	380	Reddish brown and gray, fine sandy SILT; moist
* I3S3	9/30/2010	IRA Test Pit 3, Sample 3	2.8-3.2	470	Gray fine sandy SILT with some roots and organics; moist to frozen; petroleum odor
I3S4	9/30/2010	IRA Test Pit 3, Sample 4	3.4-3.6	380	Gray fine sandy SILT with some roots and organics; frozen; petroleum odor
Test Pit I4 - East side of old tank farm					
I4S1	9/30/2010	IRA Test Pit 4, Sample 1	0.5-0.6	24	Brownish gray, sandy SILT; moist
I4S2	9/30/2010	IRA Test Pit 4, Sample 2	2.0-2.2	560	Gray, fine sandy SILT; moist; petroleum odor
* I4S3	9/30/2010	IRA Test Pit 4, Sample 3	2.9-3.3	590	Gray, fine sandy SILT; moist to frozen; sewage odor
Test Pit I5 - West edge of old tank farm					
I5S1	10/1/2010	IRA Test Pit 5, Sample 1	0.4-0.6	1.4	Mottled brown and gray, fine sandy SILT with roots and organics; moist
I5S2	10/1/2010	IRA Test Pit 5, Sample 2	1.9-2.0	25	Mottled brown and gray, fine sandy SILT with roots and organics; moist
* I5S3	10/1/2010	IRA Test Pit 5, Sample 3	3.4-3.7	45	Dark brownish gray, fine sandy SILT; moist to frozen (frozen at 3.55 feet)
Test Pit I6 - Southeast corner of old tank farm					
* I6S1	10/1/2010	IRA Test Pit 6, Sample 1	0.4-0.6	220	Gray, fine sandy SILT; moist; petroleum odor
I6S2	10/1/2010	IRA Test Pit 6, Sample 2	2.0-2.1	270	Gray, fine sandy SILT; moist; petroleum odor
* I6S3	10/1/2010	IRA Test Pit 6, Sample 3	3.3-3.7	670	Dark brownish-gray, fine sandy SILT; moist to frozen; petroleum odor
* I6S12	10/1/2010	Duplicate of Sample I6S3	3.3-3.7	670	Dark brownish-gray, fine sandy SILT; moist to frozen; petroleum odor

KEY	DESCRIPTION
*	Sample analyzed by the project laboratory (See Table 4.2-2)
^	Field screening instrument was a ThermoInstruments 580B photoionization detector (PID)
-	Measurement not recorded or not applicable
ppm	parts per million

TABLE 4.2-1 - SAMPLE LOCATIONS AND DESCRIPTIONS, IRA FUEL PROJECT FORMER TANK FARM

Sample Number	Date	Sample Location (See Figure 4.1-1)	Depth (feet)	Headspace (ppm) ^	Sample Classification
Test Pit Samples (cont.)					
Test Pit I7 - Possible old pipeline run					
I7S1	10/1/2010	IRA Test Pit 7, Sample 1	0.5-0.6	31	Dark brownish gray, fine sandy SILT; moist; petroleum odor
* I7S2	10/1/2010	IRA Test Pit 7, Sample 2	1.9-2.1	610	Dark brownish gray, fine sandy SILT; moist; petroleum odor
I7S3	10/1/2010	IRA Test Pit 7, Sample 3	2.4-2.8	560	Gray, fine sandy SILT; frozen
Test Pit I8 - Possible old pipeline run, near river					
I8S1	10/1/2010	IRA Test Pit 8, Sample 1	0.5-0.6	4.9	Dark brown, organic SILT with roots; moist to wet
I8S2	10/1/2010	IRA Test Pit 8, Sample 2	1.8-2.0	6.6	Dark brown SILT with organics; wet
I8S3	10/1/2010	IRA Test Pit 8, Sample 3	2.5-3.0	4.9	Dark brown SILT with organics; wet
I8S4	10/1/2010	IRA Test Pit 8, Sample 4	3.4-3.6	5.1	Brown SILT with organics; moist to wet
Test Pit I9 - South edge of new building footprint					
I9S1	10/1/2010	IRA Test Pit 9, Sample 1	0.5-0.6	4.2	Brown PEAT and dark brown organic SILT; moist
* I9S2	10/1/2010	IRA Test Pit 9, Sample 2	1.9-2.1	21	Brown, fine sandy SILT with roots; moist
I9S3	10/1/2010	IRA Test Pit 9, Sample 3	2.5-3.0	17	Dark brown, fine sandy SILT with roots; frozen
Test Pit I10 - Northeast corner of old tank farm					
I10S1	10/1/2010	IRA Test Pit 10, Sample 1	0.4-0.6	5.1	Mottled brown, fine sandy SILT with organics; moist
I10S2	10/1/2010	IRA Test Pit 10, Sample 2	1.9-2.1	5.5	Dark brown, fine sandy SILT; moist; trace organics
* I10S3	10/1/2010	IRA Test Pit 10, Sample 3	2.7-3.0	2.2	Brown, fine sandy SILT; frozen
Quality Control Samples					
TB1	9/30/2010	Soil Trip Blank	-	-	Ottawa sand with methanol added in the laboratory

KEY	DESCRIPTION
*	Sample analyzed by the project laboratory (See Table 4.2-2)
^	Field screening instrument was a ThermoInstruments 580B photoionization detector (PID)
-	Measurement not recorded or not applicable
ppm	parts per million

TABLE 4.2-2 - SUMMARY OF ANALYTICAL RESULTS, IRA FUEL PROJECT FORMER TANK FARM

		Cleanup Levels (mg/kg)**		Sample Source, ID Number^, and Collection Depth in Feet (See Table 4.2-1, Figure 4.1-1, and Appendix C)					
				IRA Fuel Project Former Tank Farm					
Parameter Tested	**Method***	Direct Contact / Ingestion	Outdoor Inhalation	I1S4 4.4-4.6	I2S1 0.5-0.6	I3S3 2.8-3.2	I4S3 2.9-3.3	I5S3 3.4-3.65	I6S1 0.4-0.6
PID Headspace Reading - ppm	580B PID	-	-	420	290	470	590	45	220
Percent Solids	SM20 2540G	-	-	69.9	64.4	66.1	63.2	68.9	68.9
Gasoline Range Organics (GRO) - mg/kg	AK 101	1,400	1,400	258	**4,930**	**1,530**	1,350	<6.84	69.4
Diesel Range Organics (DRO) - mg/kg	AK 102	12,500	12,500	11,400	**37,300**	615	**26,800**	60.5	3,010
Aromatic Volatile Organics (BTEX)									
Benzene - mg/kg	EPA 8021B	200	17	2.64	**23.6**	**77.1**	2.92	0.419	0.176
Toluene - mg/kg	EPA 8021B	11,000	220	6.32	**301**	**233**	6.96	<0.137	<0.146
Ethylbenzene - mg/kg	EPA 8021B	13,700	110	0.956	10.6	48.9	45.0	<0.137	<0.146
Xylenes - mg/kg	EPA 8021B	27,400	63	53.0	**1,476**	**238**	**146**	<0.137	2.41

KEY	DESCRIPTION
*	See Appendix C for compounds tested, methods, and laboratory reporting limits
**	Soil cleanup levels are the arctic zone levels from Tables B1 and B2 of 18 AAC 75.341 (October 2008)
^	Sample ID No. preceded by "17385-" on the chain of custody form
ppm	Parts per million
mg/kg	Milligrams per kilogram
<6.84	Analyte not detected; laboratory reporting limit of 6.84 mg/kg
-	Not applicable or sample not tested for this analyte
4,930	Reported concentration exceeds the most stringent of the Arctic Zone cleanup levels

TABLE 4.2-2 - SUMMARY OF ANALYTICAL RESULTS, IRA FUEL PROJECT FORMER TANK FARM

Parameter Tested	Method*	Cleanup Levels (mg/kg)** Direct Contact / Ingestion	Outdoor Inhalation	IRA Fuel Project Former Tank Farm I6S3 3.3-3.65	I6S12~ 3.3-3.65	I7S2 1.9-2.1	I9S2 1.9-2.1	I10S3 2.7-3.0	QC TB1 9/30/2010
				Sample Source, ID Number^, and Collection Depth in Feet (See Table 4.2-1, Figure 4.1-1, and Appendix C)					
PID Headspace Reading - ppm	580B PID	-	-	670	670	610	21.0	2.2	-
Percent Solids	SM20 2540G	-	-	68.6	68.4	68.4	66.5	69.7	-
Gasoline Range Organics (GRO) - mg/kg	AK 101	1,400	1,400	**21,200**	**17,300**	654	14.9	<8.17	<2.53
Diesel Range Organics (DRO) - mg/kg	AK 102	12,500	12,500	**20,900**	**20,100**	**17,200**	131	48.0	-
Aromatic Volatile Organics (BTEX)									
Benzene - mg/kg	EPA 8021B	200	17	**1,270**	**1,210**	<0.153	<0.0357	<0.0408	<0.0127
Toluene - mg/kg	EPA 8021B	11,000	220	**3,690**	**3,240**	<0.611	<0.143	<0.163	<0.0506
Ethylbenzene - mg/kg	EPA 8021B	13,700	110	**761**	**615**	3.34	<0.143	<0.163	<0.0506
Xylenes - mg/kg	EPA 8021B	27,400	63	**3,630**	**2,910**	**79.3**	0.426	<0.163	<0.0506
Polynuclear Aromatic Hydrocarbons (PAHs)									
1-Methylnaphthalene - mg/kg	EPA 8270D SIMS	380	1,100	22.9	45.4	-	-	-	-
2-Methylnaphthalene - mg/kg	EPA 8270D SIMS	380	1,100	33.2	64.7	-	-	-	-
Fluorene - mg/kg	EPA 8270D SIMS	3,200	-	1.75	1.77	-	-	-	-
Naphthalene - mg/kg	EPA 8270D SIMS	1,900	42	33.3	**67.4**	-	-	-	-
Pyrene - mg/kg	EPA 8270D SIMS	1,900	-	0.085	0.097	-	-	-	-
Other PAHs - mg/kg	EPA 8270D SIMS	various	various	ND	ND	-	-	-	-

KEY	DESCRIPTION
*	See Appendix C for compounds tested, methods, and laboratory reporting limits
**	Soil cleanup levels are the arctic zone levels from Tables B1 and B2 of 18 AAC 75.341 (October 2008)
^	Sample ID No. preceded by "17385-" on the chain of custody form
~	Duplicate of the preceding sample
ppm	Parts per million
mg/kg	Milligrams per kilogram
<0.153	Analyte not detected; laboratory reporting limit of 0.153 mg/kg
ND	Individual analytes not detected
-	Not applicable or sample not tested for this analyte
21,200	Reported concentration exceeds the most stringent of the Arctic Zone cleanup levels
QC	Quality Control

5.0 BARGE LANDING AREA

The Barge Landing Area is the second site included under this PACP. The site is currently used for staging and transferring materials transported by barge. The space available at the facility has been found inadequate and plans are being made to upgrade the facility. The objective of the PACP work at this site is to provide environmental data for the planned development

5.1 Site Overview

The active barge landing area is located approximately 1,400 feet north-northwest of the Davis-Ramoth School along the south bank of the Selawik River, as shown in Figure 1.0-1. The gravel road between the school and the barge landing is one of the few roads constructed for full sized vehicles in Selawik. The barge landing area features a gravel pad of about 100 feet by 200 feet for staging materials. A 300-foot-long gravel-surfaced access ramp leads from the pad north to the Selawik River. A steel fuel pipeline roughly parallels the north side of the pad and west side of the ramp, terminating at a marine header near the river edge. The barge landing area is shown in Figure 5.1-1.

5.1.1 Current Use

The Barge Landing Area is currently used to stage materials and equipment for transportation into and out of Selawik. A marine header is used to transfer fuel from barges to the active AVEC and School tank farm.

5.1.2 Historical Use

The Barge Landing Area was likely developed in the early to mid 1990s, and was used during construction of the new school. Based on aerial photographs, the site was undeveloped in 1986, in use in 1999, and has been used to stage decommissioned fuel tanks and electrical generation equipment since around 2003. The marine header was installed between 2000 and 2003. Piping in aerial photographs suggests that the pond to the southeast of the gravel pad was used for a sewage lagoon in the 1980s. Historical aerial photographs from 1972, 2000, and 2008 were chosen to print and are included in Appendix D, as Figures D-5, D-6, and D-7.

5.1.3 Proposed Community Development and Land Reuse

The community proposes to expand the Barge Landing Area because the space available has been found inadequate for storing materials and supplies, particularly when larger construction projects are underway. Plans are in progress to upgrade the facility in 2012 with

State Transportation Improvement Program funding and a grant for design work has been awarded.

5.1.4 Ownership

The area falls within NANA Regional Corporation, Inc. (NANA) Interim Conveyance (IC) 552. According to the Assistant Director of Lands at NANA, the site is leased from NANA by the City of Selawik. A legal description or survey of the lease area was requested, but not provided.

5.1.5 Records Review

The barge landing area was not listed in the regulatory databases reviewed (See Section 4.1.3). The nearest listed active contaminated site is the Former School Tank Farm described in Section 7.0 of this report.

5.1.6 Adjoining Properties

The Selawik River flows westward along the northern edge of the barge landing. Four wind turbines operated by AVEC lie to the west and southwest of the area. A boardwalk connects the barge landing storage pad to the wind generation facilities. To the south, the combined AVEC/school fuel tank farm sits on the west side of the barge landing road, and the OTZ telecommunications facility sits on the east side of the road.

5.2 Site Reconnaissance and Sampling

The field activities for this site included site reconnaissance and collecting screening and analytical soil samples. Following an orientation tour of the site with Joe McCoy on the morning of September 30, 2010, Shannon & Wilson's field representative spent the evening of October 1, 2010 completing the visual reconnaissance and sampling at the Barge Landing Area.

Photograph 5.2-1: Looking south-southeast up ramp from Selawik River to Barge Landing storage area. (10/1/2010)

5.2.1 Field Observations

The gravel road is used to access the Barge Landing Area. About twenty-four 20-foot shipping containers, a variety of construction materials, storage tanks, two diesel generators, and various scrap were present on or near the gravel storage pad at the time of our site visit, as shown in Photo 5.2-1. Burned trailers and scrap were present off the western edge of the storage pad. A shipping platform, a bundle of building materials, the fuel line header, and some scrap were located closer to the beach along the barge landing access ramp.

The decommissioned aboveground storage tanks (ASTs), stored vertically in two groups, are the most obvious feature of the area. Fourteen tanks are stored at the northern end of the gravel pad. Ten of these tanks are painted a yellow color that appears to match the color of tanks in a photograph of the old school tank farm. Another group of 14 vertical tanks and sub-group of three tanks are located northeast of the storage pad and ramp on the tundra. Eleven of these tanks are painted silver and appear to match the color and style of the tanks remaining on the former AVEC facility. Inspection of the tanks found that the vertical tanks had holes cut near the bottom, and various ports were left open, as shown in Photo 5.2-2. Fuel odors and/or soil staining were not encountered in and around the decommissioned tanks.

Photograph 5.2-2: ASTs stored at the Barge Landing Area, showing holes cut in tanks and a removed cover. These tanks are thought to be from the Former AVEC Facility. (10/1/2010)

A skid-mounted horizontal AST was present along the ramp to the river. The tank resembles the one between the southwest corner of the Davis-Ramoth School and the water treatment plant in the June 26, 2000 aerial photograph (Figure D-6 in Appendix D). The AST did not appear to be cut open, and the ports were closed. It was not determined if the tank had been cleaned. Soil staining was not observed around the horizontal AST.

The shipping containers appeared to be securely closed. Soil staining from potential releases within the containers was not found. The construction materials stored outside did not appear to contain liquids or hazardous materials. Three 55-gallon drums were observed. Each moved as if empty, and staining was not noted in the soil beneath the drums.

The scrap included a variety of discarded packaging material, plastic pipe, and

Photograph 5.2-3: Looking north at broken fluorescent bulbs and the Sample BLS2 location at the base of shipping containers on the Barge Landing storage pad. (10/1/2010)

unidentified steel items. It also included plastic bins with bagged aluminum cans, one lead-acid battery contained in a plastic tote, fluorescent light bulbs, a partially burned refrigerator, a chest freezer, and 5-gallon plastic buckets labeled as latex paint. The majority of the florescent bulbs had been pulled out and broken against the south faces of the northern row of shipping containers as shown in Photo 5.2-3. The paint buckets were not in secondary containers, and one of the buckets had spilled at the northwestern edge of the gravel pad, as shown in Photo 5.2-4. A stain in the soil from the spilled paint bucket extended 6 to 8 feet down the gravel embankment toward the western swale.

Photograph 5.2-4: Soil staining from spilled paint and debris observed at Barge Landing storage pad, looking east. (10/1/2010)

The two diesel powered electrical generators located north of the gravel pad and west of the access ramp were next to mobile heat plant (as used on construction projects). An examination of these items found that the crank cases and radiators had been drained of fluids. The fuel tank for the heat plant was dry. Stains or distressed vegetation were not observed on the underlying tundra.

Photograph 5.2-5: Looking southeast up the swale on the west side of the Barge Landing storage pad at a burned trailer, debris, and discarded welding rods. (10/1/2010)

The burned trailers and debris, as shown in Photo 5.2-5, on west side of gravel pad lie in a wet swale that appears to drain toward a pond 50 to 60 feet northwest of the gravel pad. The swale was not actively flowing at the time of the site visit. The burned debris appears to be the remnants of a construction camp, and includes a large pile of welding rods. Fuel or chemical containers were not noted in the burned debris.

The steel pipeline connected to the marine header appeared to be solid and in good condition. A drip-catch tub beneath the header fittings was missing its lid. The tub contained frozen water and sorbent pads, and had a slight diesel odor. A potentially oily stain roughly 1.5-foot diameter was in soil beyond the north end of the tub. The marine header, drip-catch tub, and stained soil at the end of the tub are shown in Photo 5.2-6.

Photograph 5.2-6: Looking northwest toward the marine header, drip tub, and Sample BLS1 location. (10/1/2010)

5.2.2 Site Sampling

Four locations at the Barge Landing area were selected for sampling. Based on field screening results and field observations, three of these locations were selected for analytical testing. Sample depths ranged from 0.3 to 1 foot bgs. Materials encountered were fibrous peat, silt, or silty, gravelly sand. Petroleum odors were not noted in the sampled soil. The sample depths, soil descriptions, and field screening results are summarized on Table 5.2-1. The sample locations are shown on Figure 5.1-1.

The sample locations were selected based on field observations and analytical testing was selected based on the expected contaminant source.

- Sample BLS1, collected from beneath stained soil at the marine header, was analyzed for DRO and BTEX. The sample was collected at approximately 1 foot below the surface to evaluate whether the small surface stain was indicative of a significant release.
- Sample BLS2 was collected from approximately 0.5 foot beneath the thickest accumulation of broken fluorescent bulbs to evaluate whether mercury had leached into the soil.
- Samples BLS3 and its duplicate BLS13, collected from immediately east of a pile of welding rods, was analyzed for the eight RCRA metals.
- Sample BLS4 was collected from a soil stain that appeared to be from spilled latex paint. The field screening result of 3.5 ppm did not suggest that the material was oil based or contained volatile solvents, and a sample was not submitted for laboratory analysis.

5.2.3 Discussion of Sampling Results

Four analytical samples, including one duplicate sample, were collected from the screening locations. With the exception of DRO in Sample BLS1 and barium, chromium, and lead in BLS3, concentrations of target analytes were not detected in the analytical samples. The detectable concentrations reported in Samples BLS1 and BLS3 do not exceed the applicable cleanup levels. The results of the analytical testing are summarized on Table 5.2-2.

Note that the laboratory detection limits for arsenic in Sample Set BLS3/BLS13 are greater than the applicable cleanup level. However, based on Table 3 in "Element Concentrations In Surficial Materials Of Alaska," (USGS Professional Paper 1458, 1988), the reported detection limits for arsenic are less than the typical background concentrations for soil in Alaska. It is likely that the arsenic concentrations, if any, present in Samples BLS3/BLS13 are within the naturally occurring levels found in Alaska soils.

5.3 Environmental Review

The environmental conditions identified for this site include information gathered during the document and records review, from field observations, and from the results of limited analytical testing of soil samples collected from the site.

5.3.1 Historical Environmental Review

Based on aerial photographs, the barge landing was developed after 1986, and was in use in 2000. Records of environmental concerns were not found. Staging of decommissioned fuel tanks appears to have taken place after 2000 and before 2008.

5.3.2 Identified or Potential Source Areas

While limited screening and sampling did not suggest that large releases of contaminants have occurred, several potential sources of contaminants were present at the Barge Landing Area. Potential source areas are items staged at the site, including motorized equipment, supplies, solid waste, and decommissioned fuel tanks. The motorized equipment observed during the October 2010 site visit appeared to be drained of fluids. With the exception of one horizontal AST, the decommissioned fuel tanks stored at the site appeared to have been cut open and cleaned before being placed on site. Many of the decommissioned ASTs are old enough that the exterior paint may contain lead. The paint generally appeared sound and was not assessed for lead content, but as the paint weathers lead may be released. Solid waste, including fluorescent light bulbs, latex paint, and lead-acid batteries could be stored more securely to prevent releases to the environment. Leaks from shipping containers were not observed.

The active marine header is a potential source of petroleum contamination. The pipeline and marine header appeared to be sound with the exception of the cover for the drip catch basin at the marine header. Precipitation allowed to accumulate in the catch basin may become impacted with fuel and require proper handling and disposal. Unwanted items from a construction camp appear to have been burned at the site. Potentially hazardous products of incomplete combustion may have been released to the environment, and oxidized metals may release hazardous metal components. Sample BLS3 was collected in the swale containing the burned equipment, and elevated levels of metals were not detected. The sample was not analyzed for potential products of incomplete combustion.

5.3.3 Data Gaps

The assessment performed at the Barge Landing Area was primarily visual with limited hand excavation and sampling. Items such as tanks, shipping containers, and equipment were not moved to observe the soil beneath. If a project that includes removing scrap and relocating containers is initiated we recommend having environmental personnel on hand to perform additional assessment as needed. Runoff passing through the swale along the west side of the storage pad enters a pond to the northwest. The surface water in the pond could be sampled and analyzed for compounds of concern.

5.3.4 Exposure Pathways

Direct contact, ingestion, inhalation, and migration to surface water are potentially complete exposure pathways for contaminants that could be released at the barge landing area.

5.3.5 Environmental Overview

Stained soil was observed at the marine header, broken florescent lighting tubes and spilled paint were observed on the gravel storage pad, and burned debris and welding rods were observed in the drainage swale. Limited sampling and laboratory analyses suggest that the staining at the marine header is confined to the soil surface. The limited sampling and analyses also suggest that potential mercury in the florescent tubes or RCRA metals in the welding rods had not leached into the subsurface soil. There is potential for contaminants to be released from materials stored on site. Proper handling and disposal of the existing and future scrap, recyclables, and solid waste is recommended.

LEGEND

BLSI — Approximate location of near-surface Soil Sample BLS1 by Shannon & Wilson, Inc., 2010, with sample results less than the ADEC cleanup levels, or not analyzed (BLS4).

Notes:
1) Figure based on June 28, 2008 aerial photograph from AeroMetric, Inc. - Alaska Division.

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Selawik Area-Wide PACP
Selawik, Alaska

BARGE LANDING AREA

May 2011

32-1-17385

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 5.1-1

TABLE 5.2-1 - SAMPLE LOCATIONS AND DESCRIPTIONS, BARGE LANDING AREA

Sample Number	Date	Sample Location (See Figure 5.1-1)	Depth (feet)	Headspace (ppm) ^	Sample Classification
Soil Samples					
* BLS1	10/1/2010	Below marine header catch basin	1.0	4.9	Grayish-brown SILT with roots and organics; moist
* BLS2	10/1/2010	Beneath broken fluorescent bulbs	0.5	-	Brown, slightly silty, gravelly SAND; moist
* BLS3	10/1/2010	East of welding rods pile	0.3-0.4	-	Brown, fibrous PEAT; wet
* BLS13	10/1/2010	Duplicate of Sample BLS3	0.3-0.4	-	Brown, fibrous PEAT; wet
BLS4	10/1/2010	Beneath (likely latex) paint spill	0.3-0.4	3.5	Brown, slightly silty, gravelly SAND; moist
Quality Control Samples					
TB2	10/1/2010	Soil Trip Blank	-	-	Ottawa sand with methanol added in the laboratory

KEY	DESCRIPTION
*	Sample analyzed by the project laboratory (See Table 5.2-2)
^	Field screening instrument was a ThermoInstruments 580B photoionization detector (PID)
-	Measurement not recorded or not applicable
ppm	parts per million

TABLE 5.2-2 - SUMMARY OF ANALYTICAL RESULTS, BARGE LANDING AREA

Parameter Tested	Method*	Cleanup Levels (mg/kg)** Direct Contact / Ingestion	Outdoor Inhalation	Sample Source, ID Number^, and Collection Depth in Feet (See Table 5.2-1, Figure 5.1-1, and Appendix C) Barge Landing BLS1 1.0	BLS2 0.5	BLS3 0.3-0.4	BLS13~ 0.3-0.4	QC TB2 10/1/2010
PID Headspace Reading - ppm	580B PID	-	-	4.9	-	-	-	-
Percent Solids	SM20 2540G	-	-	60.1	92.8	7.45	5.30	-
Diesel Range Organics (DRO) - mg/kg	AK 102	12,500	12,500	45.9	-	-	-	-
Aromatic Volatile Organics (BTEX)								
Benzene - mg/kg	EPA 8021B	200	17	<0.0435	-	-	-	<0.0127
Toluene - mg/kg	EPA 8021B	11,000	220	<0.174	-	-	-	<0.0509
Ethylbenzene - mg/kg	EPA 8021B	13,700	110	<0.174	-	-	-	<0.0254
Xylenes - mg/kg	EPA 8021B	27,400	63	<0.174	-	-	-	<0.102
Metals								
Arsenic - mg/kg	SW6020	6.1	-	-	-	**<12.7**	**<17.4**	-
Barium - mg/kg	SW6020	27,400	-	-	-	46.2	47.8	-
Cadmium - mg/kg	SW6020	110	-	-	-	<2.53	<3.49	-
Chromium - mg/kg	SW6020	410	-	-	-	7.62	<6.97	-
Lead - mg/kg	SW6020	400	-	-	-	3.77	3.49	-
Mercury - mg/kg	SW7471B	41	26	-	<0.0423	<0.524	<0.756	-
Selenium- mg/kg	SW6020	680	-	-	-	<6.34	<8.72	-
Silver- mg/kg	SW6020	680	-	-	-	<1.27	<1.74	-
Volatile Organic Compounds (VOCs)	SW8260B	-	-	-	-	-	-	ND

KEY	DESCRIPTION
*	See Appendix C for compounds tested, methods, and laboratory reporting limits
**	Soil cleanup levels are the arctic zone levels from Tables B1 and B2 of 18 AAC 75.341 (October 2008)
^	Sample ID No. preceded by "17385-" on the chain of custody form
~	Duplicate of the preceding sample
ppm	Parts per million
mg/kg	Milligrams per kilogram
<0.174	Analyte not detected; laboratory reporting limit of 0.174 mg/kg
ND	Individual analytes not detected
-	Not applicable or sample not tested for this analyte
<12.7	Laboratory reporting limit for analyte exceeds the regulated cleanup level
QC	Quality Control

6.0 FORMER AVEC FACILITY

The Former AVEC Facility is the third property included in this PACP. The Former AVEC Facility is not currently in use but was used to generate electricity for Selawik between 1970 and 2003. Specific plans have not been made for the Former AVEC Facility and the objective of this PACP is to provide environmental information that may affect potential land uses available to the city.

6.1 Site Overview

The former AVEC power generation facility is located east of the school and west of the river, as shown on Figure 1.0-1. The new power plant and tank farm located between the school and the Barge Landing Area were brought on line in 2003, replacing the Former AVEC Facility. The property includes Lot 1 of Block 5 and Lot 5 of Block 3, Tract B, US Survey 4492 as well as the easement for 3rd Avenue. The general layout of the facility is shown in Figure 6.1-1.

6.1.1 Current Use

The Former AVEC Facility is out of use, but structures and equipment remain on site.

6.1.2 Historical Use

According to AVEC, the facility generated electricity between March 1970 and June 2003. Based on aerial photographs, the site was undeveloped in 1963, and what appears to the existing generator building and six ASTs are present in 1972. In the 1986 aerial photograph (Figure D-10) 16 ASTs were present. The former electrical generation facility included up to 22 ASTs, the main generator building, a generator module, a heat recovery structure, storage structures, and associated power distribution equipment by the year 2000 (see Figure D-11 in Appendix D and the 1999 drawing in Appendix E). Aerial photographs of the Former AVEC Facility chosen to print include photos from 1963, 1972, 1986, 2000, and 2008 which are included as Figures D-8 through D-12.

6.1.3 Proposed Community Development and Land Reuse

The community has expressed interest in placing a recreational area and/or housing at the site of the Former AVEC Facility. The site is not known to have been incorporated into formal development planning.

6.1.4 Ownership

As of December 2010, Lot 1 of Block 5 and Lot 5 of Block 3 were owned by AVEC. AVEC and the City of Selawik have expressed interest in transferring ownership of the property to the City. The latest trustee deeds found for the two parcels show conveyance from the U.S. Bureau of Land Management to AVEC on August 5, 1985. Portions of the facility appear to encroach on Lot 2, Block 5 of U.S. Survey 4492. A trustee deed conveying Lot 2 from the U.S. Bureau of Land Management to the City of Selawik on August 17, 1988, is included with the 1985 trustee deeds in Appendix E. A 1999 survey drawing for AVEC that shows property boundaries and ownership notes is also included in Appendix E. Based on the 1999 drawing, acquisition of the 3rd Avenue easement was not formally completed.

6.1.5 Records Review

According to the ERNS database, on February 4, 1998, a 55-gallon drum of motor oil fell over during transport at the AVEC site. The database states that approximately three square feet of soil was impacted. Sorbent pads were used to recover the spilled motor oil. It was estimated that 98 percent of the material was recovered.

The AVEC site was included in an October 8, 1992, inspection by DEC and U.S. Coast Guard representatives. The October 13, 1992, inspection memorandum states that there were 16 fuel oil ASTs with a total capacity of approximately 130,000 gallons. The tanks and appurtenances were noted to be in generally good condition. The tanks were contained within a plywood berm and synthetic liner. Inadequately sealed pipe penetrations in the liner were noted. Refilling of the tanks was observed to be through a common cargo line with a marine header located adjacent to the community water intake at the river.

6.1.6 Adjoining Properties

The Davis-Ramoth School is located beyond a boardwalk and utilidor about 120 feet west of the AVEC assessment area. The Former School Tank Farm is a listed contaminated site that is located on the School parcel. The old city office building adjoins the northwest corner of the Former AVEC Facility. Three residences adjoin the northeast corner of the site, and a church is located east of the site. The south side of the site is bounded by a boardwalk, utilidor, and an out-of-use residential unit.

6.2 Site Reconnaissance and Sampling

Visual Reconnaissance and sampling of the Former AVEC Facility were performed on October 2, 2010.

6.2.1 Field Observations

The former AVEC electrical generation facility is located near the school and the tribal offices in the northern part of Selawik. Boardwalks bound the southern and western edges of the property. It appears that structures were set on the tundra and little or no earthwork was performed to develop the site. The northeastern portion of the site was found to be wetland with standing water or ice between tussocks of vegetation, as shown in Photo 6.2-1. At the southwestern corner of the site eight vertically-oriented ASTs remain within a weathered secondary containment area. Staining was observed in the material around the eight ASTs, as shown in Photo 6.2-2. A steel pipe led from the tanks into the ground just south of the existing containment area at the time of our site visit. There appeared to be light staining of the dark peat exposed where the pipe entered the ground. While an additional 14 above ground fuel storage tanks are visible in the 2000 aerial photograph, included as Figure D-11 in Appendix D, little evidence of the northern group of tanks could be found during our site visit. The western four tanks may have been located on the small gravel pad adjacent to the Tundra Street boardwalk. Blue insulating foam was embedded within the gravel pad.

Photograph 6.2-1: Wetland near Sample AVS2 at the Former AVEC Facility. (10/2/2010)

Photograph 6.2-2: Decommissioned ASTs remaining at the Former AVEC Facility, and stained soil at the Sample AVS4 location, looking north. (10/2/2010)

An approximately 14-foot by 34-foot building with galvanized steel siding (Butler building) sits on creosote-treated wooden supports near the center of the southern site boundary. Two diesel powered generator units remain in the building, a typical generator is shown in Photo 6.2-3. The generator motors did not appear to be drained of fluids. A

Photograph 6.2-3: One of two diesel engines for electrical generation in the Butler building at the Former AVEC Facility, looking south. (10/2/2010)

wooden platform on the south side of the building held four transformer boxes. Stains on the platform or the soil beneath were not observed. Disconnected pipe flanges, and piping secured to the platform beneath the Butler building suggested the route of fuel supply for the generators. Under the Butler building a soil stain was observed in the peat approximately beneath the southern generator, as shown in Photo 6.2-4.


Photograph 6.2-4: Soil staining and the Sample AVS6 location beneath the southwestern corner of the AVEC Butler building, and transformer platform along right edge of photo, looking east. (10/2/2010)

Two 20-foot shipping containers were elevated on wooden stands to the east of the Butler building. These were apparently used for storage and were mostly empty, but some scraps remained. An oil filter element and pieces of an electric motor were located within a dark soil stain on the north side of the western storage container. A wooden platform connected to a boardwalk was on the east side of the storage containers.

Photograph 6.2-5: Electrical boxes near the southeast corner of the Former AVEC Facility, and the Sample AVS8 location next to the upturned box, looking west-southwest. (10/2/10)

Five green electrical boxes were on the ground east of the storage containers, three of which were thought to be transformers. One box was on its side and had some oily staining along one edge, as shown in Photo 6.2-5.

6.2.2 Site Sampling

Nine locations at the out-of-use AVEC site were selected for soil sample screening, based on likely locations of fuel-storage and power-generation facilities, and on field observations. A hand shovel and, where necessary, a pick-mattock were used to break into frozen surface soil or the vegetation mat to facilitate near-surface soil sampling. Water entry and/or frozen ground limited the depths of the sampling test pits. Sample depths ranged from 0.1 to 1.0 feet bgs, and PID readings ranged from 1.4 ppm to 110 ppm. Soils encountered were predominantly fibrous peat, with gravelly sand encountered at two locations. The sample locations are shown on Figure 6.1-1. Table 6.2-1 includes the locations and descriptions of the samples collected at the former AVEC facility.

- Samples AVS1 and AVS2 were collected from the estimated southern ends of two decommissioned AST groups where the most direct route for piping might have been. Foam board was encountered at the Sample AVS1 location, and woven polyethylene sheeting was encountered at the Sample AVS2 location. Both samples were collected just beyond the edges of these materials in gravelly sand. The sample AVS1 location is shown in Photo 6.2.6. Field screening readings and field observations did not suggest petroleum contamination, and analytical samples were not submitted to the laboratory.

Photograph 6.2-6: Looking south from the Sample AVS1 location, past the remaining decommissioned ASTs, with Tundra Street along the left side of the picture.

- Sample AVS3 was collected from adjacent to piping exiting the older tank farm containment where eight tanks remain.
- Sample AVS4 was collected from soil beneath the torn and weathered fabric between the remaining tanks.
- Sample AVS5 was collected from an area of stained soil adjacent to a discarded oil filter element and remnants of an electric motor.
- Samples AVS6, AVS7 and AVS9 were collected from beneath the perimeter of the Butler power plant building. Sample AVS6 was collected beneath the approximate location of the southern generator motor. Sample AVS7 was collected from an area with potentially stressed vegetation under the northwest corner of the Butler Building. Sample AVS9, from the northeast corner near piping, had a lower headspace screening result than the other two samples and was not submitted for laboratory analysis. A field duplicate, designated Sample AVS11, of Sample AVS6 was also collected.
- Sample AVS8 was collected from discolored soil between electrical boxes that were on the ground.

Analytical samples were collected at six of the above described locations based on the screening results and apparent staining. Samples AVS3, AVS4 and AVS7 were analyzed for DRO and BTEX. Samples AVS5 and duplicate set AVS6/AVS11 were analyzed for DRO, RRO, RCRA Metals, PCBs, and VOCs. Sample AVS8 was analyzed for DRO, RRO, and PCBs.

6.2.3 Discussion of Sampling Results

Seven analytical soil samples, including one duplicate sample, were collected from the Former AVEC Facility. The analytical results are presented in Table 6.2-2.

Samples AVS4, AVS5, AVS6 and its duplicate AVS11, AVS7 and AVS8 contained concentrations of DRO and/or RRO that exceed the applicable DEC cleanup levels. The DRO concentrations exceeding the applicable cleanup level ranged from 25,900 mg/kg in Sample AVS8 to 144,000 mg/kg in AVS7. The RRO concentrations greater than the cleanup criterion ranged from 14,400 mg/kg in the duplicate sample (Sample AVS11) to 35,500 mg/kg in Sample AVS8. Sample AVS5 contained concentrations of arsenic (51.5 mg/kg) and lead (572 mg/kg) that exceed the applicable DEC cleanup levels of 6.1 mg/kg arsenic and 400 mg/kg lead. The lead concentration (572 mg/kg) has the potential to fail EPA's toxicity characteristic leaching procedure (TCLP), which would require excavated soil to be handled as a characteristic hazardous waste under RCRA. The remaining target analytes were either not detected or were detected at concentrations less than the applicable cleanup levels.

According to the laboratory case-narrative notes, all of the samples except one (Sample AVS3) exhibited chromatogram patterns consistent with weathered middle distillates, suggesting diesel fuel. The case narrative note for Sample AVS3 suggests some degree of biogenic interference although the concentrations reported in this sample were less than the applicable cleanup levels. The RRO chromatographic pattern for sample AVS8 is consistent with lubricating oil. The Sample AVS5 DRO concentration may be biased high due to a heavier unknown hydrocarbon.

6.3 Environmental Review

The environmental conditions identified for this site include information gathered during the document and records review, from on-site observations, and from the results of limited analytical samples collected from the site.

6.3.1 Historical Environmental Review

Fuel to generate electricity for the city of Selawik has been handled on the site for over 30 years. Electrical power generation and distribution equipment has also been handled and operated on the site. One reported small spill was found in the data bases.

6.3.2 Identified or Potential Source Areas

Potential source areas at the Former AVEC Facility include three groups of ASTs; fuel piping, diesel powered generator units, lubricants, solvents and other chemicals for equipment maintenance; transformer oil, and creosote treated wood used to support structures. Areas where soil contaminants were identified with laboratory testing of samples include the older southern group of 8 ASTs, the soil beneath the old generator building, the soil between the old generator building and the storage containers, and the soil beneath a group of transformers. The samples from these locations were collected within 6 inches of the ground surface. Contaminants in excess of the Arctic Zone cleanup criteria include DRO, RRO, arsenic, and lead, as summarized in Table 6.2-2.

6.3.3 Data Gaps

A limited number of samples were scoped for the Former AVEC Facility. The horizontal and vertical extents of identified contaminants are not delineated. Much of the northern and western portions of the site had ice between the tussocks of vegetation, making observation of soil quality difficult. The contaminants may have impacted the surface water on the site. Additional soil sampling and surface water sampling is recommended. The leachable lead concentrations also need to be measured by TCLP analysis to determine if the soil could be a hazardous waste under RCRA.

6.3.4 Exposure Pathways

Based on the analytical results, concentrations of DRO, RRO, arsenic, and lead are present at the Former AVEC Facility at concentrations that may potentially pose a risk to human health and the environment. The potentially complete exposure pathways for this site include direct contact with contaminated soil (through either incidental ingestion or dermal exposure), inhalation of fugitive dust, inhalation of outdoor air, and dermal exposure to and/or ingestion of surface water. Potential receptors include current and future site visitors, recreational users, and/or trespassers, and future construction and commercial workers.

Contact with and consumption of impacted surface water by humans, plants, and animals is a potential exposure pathway. Water samples were not collected as part of this effort; however, the impacted soil identified at the site has the potential to impact surface water. Because groundwater is not used for drinking, and groundwater is not believed to be present within a few hundred feet beneath the permafrost, the groundwater exposure pathway is not considered complete.

6.3.5 Environmental Overview

Diesel fuel, lubricating oil, metals, and potentially solvents have been released to the site's soil. The concentrations of DRO and RRO measured in the southern portion of the Former AVEC Facility are higher than the maximum allowable concentrations in the DEC Method Two risk-based criteria. Direct contact is an exposure pathway of concern because observed staining and samples collected at 0.1 feet bgs suggest that exposed soil is contaminated. Organic compounds such as DRO and RRO tend to adsorb tightly to organic soils such as the peat encountered at this site, decreasing the mobility of the contaminants. However, because the soil encountered in the test pits was at or near saturation with water, and standing water was observed within 50 feet of the test pit locations, the contaminants may migrate in pore water and surface water to the on-site wetlands. Fluids remaining in transformers and generator engines have the potential to be released to the environment. Creosote-treated wood has the potential to leach contaminants into the wet soil.

Remedial actions will likely be required for the site due to the presence of DRO and RRO in excess of the DEC maximum allow concentrations. Proper assessment of remedial alternatives is not practicable given the remaining data gaps.

LEGEND

AVS4 Approximate location of near-surface Soil Sample AVS4 by Shannon & Wilson, Inc., 2010, with sample results greater than the ADEC cleanup levels. Concentrations of analytes with exceedences shown in mg/kg. For other analytes see Table 6.2-2

AVS3 Approximate location of near-surface Soil Sample AVS3 by Shannon & Wilson, Inc., 2010, with sample results less than the ADEC cleanup levels, or not analyzed (AVS1, AVS2, and AVS9).

0 25 50 100

APPROXIMATE SCALE IN FEET

Notes:
1) Figure based on June 26, 2008 aerial photograph from AeroMetric, Inc.
- Alaska Division, June 18, 1990 Plant Site Drawing, revised September 16, 1999 by AVEC, and the Alaska DCRA 1999 Community Map, Selawik.

2) Lot Identifiers are for U.S. Survey No. 4492 Tract B.

3) Property boundaries are approximate.

N

Selawik Area-Wide PACP
Selawik, Alaska

FORMER AVEC FACILITY

May 2011 32-1-17385

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 6.1-1
Page 46

TABLE 6.2-1 - SAMPLE LOCATIONS AND DESCRIPTIONS, FORMER AVEC FACILITY

Sample Number	Date	Sample Location (See Figure 6.1-1)	Depth (feet)	Headspace (ppm) ^	Sample Classification
Soil Samples					
AVS1	10/2/2010	Southern edge of western gravel pad	0.8-1.0	8.8	Brown, gravelly SAND; moist
AVS2	10/2/2010	Southern edge of northern tanks liner	0.3-0.5	4.0	Brown, gravelly SAND with trace organic silt and roots; wet
* AVS3	10/2/2010	Southern edge of existing old tank farm	0.3-0.5	52	Reddish brown, fibrous PEAT; moist to wet; swampy odor
* AVS4	10/2/2010	In existing old tank farm containment	0.2-0.4	110	Reddish brown, fibrous PEAT; wet; sheen; swampy odor
* AVS5	10/2/2010	West side of connex, east of Butler building	0.3-0.5	17	Brown, fibrous PEAT with some debris; moist; oily stain
* AVS6	10/2/2010	Under southwest corner of Butler building	0.1-0.3	70	Brown, fibrous PEAT; moist to frozen; petroleum odor
* AVS11	10/2/2010	Duplicate of Sample AVS6	0.1-0.3	70	Brown, fibrous PEAT; moist to frozen; petroleum odor
* AVS7	10/2/2010	Under northwest corner of Butler building	0.2-0.4	64	Brown, fibrous PEAT; moist to frozen; petroleum odor
* AVS8	10/2/2010	Beneath eastern transformers	0.2-0.4	1.4	Dark brown to black, fibrous PEAT; frozen to wet
AVS9	10/2/2010	Under fuel pipe flanges	0.3-0.4	37	Brown, fibrous PEAT; moist; petroleum odor
Quality Control Samples					
TB2	10/1/2010	Soil Trip Blank	-	-	Ottawa sand with methanol added in the laboratory

KEY	DESCRIPTION
*	Sample analyzed by the project laboratory (See Table 6.2-2)
^	Field screening instrument was a ThermoInstruments 580B photoionization detector (PID)
-	Measurement not recorded or not applicable
ppm	parts per million

TABLE 6.2-2 - SUMMARY OF ANALYTICAL RESULTS, FORMER AVEC FACILITY

		Cleanup Levels (mg/kg)**		**Sample Source, ID Number^, and Collection Depth in Feet (See Table 6.2-1, Figure 6.1-1, and Appendix C)**							
				Former AVEC Tank Farm							**QC**
Parameter Tested	**Method***	Direct Contact / Ingestion	Outdoor Inhalation	AVS3 0.3-0.5	AVS4 0.2-0.4	AVS5 0.3-0.5	AVS6 0.1-0.3	AVS11~ 0.1-0.3	AVS7 0.2-0.4	AVS8 0.2-0.4	TB2 10/1/2010
PID Headspace Reading - ppm	580B PID	-	-	52	110	17	70	70	64	1.4	-
Percent Solids	SM20 2540G	-	-	27.9	23.2	26.5	56.8	55.1	48.0	31.9	-
Diesel Range Organics (DRO) - mg/kg	AK 102	12,500	12,500	2,440	**34,300**	9,410	**125,000**	**132,000**	**144,000**	**25,900**	-
Residual Range Organics (RRO) - mg/kg	AK 103	13,700	22,000	-	-	**25,900**	11,500	**14,400**	-	**35,500**	-
Aromatic Volatile Organics (BTEX)											
Benzene - mg/kg	EPA 8021B	200	17	<0.147	<0.137	-	-	-	<0.0780	-	<0.0127
Toluene - mg/kg	EPA 8021B	11,000	220	4.34	1.23	-	-	-	<0.312	-	<0.0509
Ethylbenzene - mg/kg	EPA 8021B	13,700	110	<0.590	<0.547	-	-	-	<0.312	-	<0.0254
Xylenes - mg/kg	EPA 8021B	27,400	63	<0.590	3.03	-	-	-	1.99	-	<0.102
Metals											
Arsenic - mg/kg	SW6020	6.1	-	-	-	**51.5**	2.11	1.93	-	-	-
Barium - mg/kg	SW6020	27,400	-	-	-	117	62.4	60.6	-	-	-
Cadmium - mg/kg	SW6020	110	-	-	-	3.23	<0.333	<0.343	-	-	-
Chromium - mg/kg	SW6020	410	-	-	-	28.7	18.5	18.0	-	-	-
Lead - mg/kg	SW6020	400	-	-	-	**572**	7.37	7.92	-	-	-
Nickel - mg/kg	SW7471B	2,700	-	-	-	15.6	8.92	8.68	-	-	-
Vanadium - mg/kg	SW6020	960	-	-	-	<10.6	20.0	20.2	-	-	-
Polychlorinated Biphenyls (PCBs) - mg/kg	SW8082A			-	-	ND	ND	ND	-	ND	-
Volatile Organic Compounds (VOCs)											
1,2,4-Trimethylbenzene - mg/kg	SW8260B	6,800	49	-	-	<0.615	2.63	5.02	-	-	<0.0509
1,3,5-Trimethylbenzene - mg/kg	SW8260B	6,800	42	-	-	<0.307	11.0	11.6	-	-	<0.0254
4-Isopropyltoluene - mg/kg	SW8260B	-	-	-	-	<0.307	3.94	5.87	-	-	<0.0254
Isopropylbenzene - mg/kg	SW8260B	13,700	62	-	-	<0.307P	0.271P	1.45P	-	-	<0.0254
sec-Butylbenzene - mg/kg	SW8260B	1,400	41	-	-	<0.307	1.83	3.31	-	-	<0.0254
tert-Butylbenzene - mg/kg	SW8260B	1,400	70	-	-	<0.307	0.298	1.19	-	-	<0.0254
Toluene - mg/kg	SW8260B	11,000	220	-	-	0.615	<0.246	<2.32	-	-	<0.0509
Trichlorofluoromethane - mg/kg	SW8260B	41,100	990	-	-	5.94	<0.246	<2.32	-	-	<0.0509
Xylenes - mg/kg	SW8260B	27,400	63	-	-	<1.23	1.12	<4.65	-	-	<0.102
Other VOCs - mg/kg	SW8260B	various	various	-	-	ND	ND	ND	-	-	ND

(Key provided on next page)

TABLE 6.2-2 - SUMMARY OF ANALYTICAL RESULTS, FORMER AVEC FACILITY

KEY	DESCRIPTION
*	See Appendix C for compounds tested, methods, and laboratory reporting limits
**	Soil cleanup levels are the arctic zone levels from Tables B1 and B2 of 18 AAC 75.341 (October 2008)
^	Sample ID No. preceded by "17385-" on the chain of custody form
~	Duplicate of the preceding sample
ppm	Parts per million
mg/kg	Milligrams per kilogram
<0.0155	Analyte not detected; laboratory reporting limit of 0.0155 mg/kg
<0.307P	Estimated value due to precision
ND	Individual analytes not detected
-	Not applicable or sample not tested for this analyte
34,300	Reported concentration exceeds the most stringent of the Arctic Zone cleanup levels
QC	Quality Control

7.0 FORMER SCHOOL TANK FARM AND STORAGE PAD

The Former School Tank Farm and Storage Pad comprise the fourth property included in this PACP. The active Davis-Ramoth School in Selwik partially overlaps the footprint of the Former School Tank Farm. The objective of this assessment is to investigate potential environmental risks that may remain from the former tank farm. Community plans for the Storage Pad area were not identified, and the objective of this PACP is to provide preliminary environmental information.

7.1 Site Overview

The fourth area assessed includes two specific sites. One is the former location of a fuel tank farm for the old (removed) Selawik School. The second site has been called the old school storage pad. The sites are located in the northwestern portion of Selawik, at the southwestern corner of the new Davis-Ramoth school building as shown on Figures 1.0-1 and 7.1-1. The Former School Tank Farm lies within the Selawik School Lease Parcel (Plat 98-6). A gravel road that links the barge landing road to the rest of town runs over the approximate center of the former tank farm. The Storage Pad area lies within Tract A of the North Selawik Subdivision (Plat 92-2). The pad is an approximately 50-foot by 100-foot rectangular steel platform.

7.1.1 Current Use

The active Davis-Ramoth School is the center for primary and secondary education in Selawik. A portion of the in-use school building is constructed over the northern portion of the former tank farm. The remainder of the tank farm lies under a gravel road that connects to the Barge Landing Area. The Storage Pad is not known to be in active use.

7.1.2 Historical Use

The former tank farm was used to store fuel for heating the former school, and was decommissioned for the 1996-1997 construction of the new Selawik School. The old tank farm was not present in 1972 aerial photography, but was present in the 1976, 1986 and 1990 photographs. Twenty tanks are visible in the 1986 photo. The tank farm may also have supplied fuel to the water treatment plant/washeteria based on proximity and the lack of visible fuel storage facilities around the treatment plant in aerial photographs.

The storage pad was evident southwest of the former tank farm, and west of the water treatment facility in the 1986 through 2008 aerial photographs. Most of the pad was cut off when the aerial photographs in Appendix D were printed from negatives. Various items appeared to be stored on the pad in the aerial photographs, but it does not appear to have been put to a specific use. The October 8, 1992 DEC field trip report suggests that the pad may have been for a tank farm intended to replace the former school tank farm. The inspectors were unable to get additional information about the pad. Shannon & Wilson was also unable to uncover the history of the pad. A 1996 drawing provided with the DBA, and included in Appendix F (Sheet M1 of 5) suggests that the Storage pad was used to store out-of-use tanks from the Former School Tank Farm before the tank farm was decommissioned and the new school constructed.

7.1.3 Proposed Community Development and Land Reuse

The Former School Tank Farm location has been redeveloped with the construction of the new school. The community members contacted did not have plans or knowledge of the Storage Pad. The DEC added the School Storage Pad to the RFP.

7.1.4 Ownership

The Former School Tank Farm is located on the Selawik School Lease Parcel, Plat 98-6. The Storage Pad is located on Tract A of the North Selawik Subdivision (Plat 92-2). Both parcels are owned by NANA under IC 552. Plat 98-6 is leased by the Northwest Arctic Borough. According to Mr. Jeff Nelson, Assistant Director of Lands for NANA, Tract A has been leased to the Northwest Inupiat Housing Authority. The plats are included in Appendix E.

7.1.5 Records Review

The Former School Tank Farm is listed as active on the DEC Contaminated Sites Database. A visit to the tank farm was included in an October 8, 1992 inspection by DEC and U.S. Coast Guard representatives. The October 13, 1992, inspection memorandum noted that three spills had been reported since 1986, that the facility was in poor condition, and that a complex of piping linked to other sites.

A copy of the June 1998 *Environmental Assessment, Selawik School* prepared by CH2MHill for the Northwest Arctic Borough School district was reviewed. CH2MHill collected seven soil samples from visibly impacted areas of the former tank farm gravel pad after the tanks had been removed for construction of the new Davis-Ramoth School. DRO concentrations in the samples ranged from 32 to 8,050 mg/kg, and benzene ranged from non-detect to 0.89 mg/kg. Using the acquired data, CH2MHill performed a two-tiered risk assessment using volatilization from soil to ambient air, and direct contact with contaminated soil as the potential exposure pathways. The risk analysis concluded that the concentrations of DRO and BTEX did not exceed risk-based screening levels for human health, and the report recommended that the site be designated as closed.

The only record recovered for the Storage Pad was the October 8, 1992, inspection by DEC and U.S. Coast Guard representatives. To quote the October 13, 1992 inspection memorandum: “Of note, the city had begun work on a new tankfarm area near the school and washeteria and near the back-up generator. The work included installing thermalpiles beneath a steel platform. It appears the work was stopped at this point and no one could tell us the status of the project. It appears this may be a viable location for tank storage.”

7.1.6 Adjoining Properties

The School Lease is bounded by the water treatment plant/former washeteria on the south, open IC 552 land and the former clinic to the west, open IC-552 land to the north, and the old city office and former AVEC facility to the east. The Storage Pad is bounded by an apartment complex to the south, and a utilidor separates the pad from the water treatment plant on the east. Undeveloped land and the former aircraft landing strip (now a pond) are north and west of the pad.

7.2 Site Reconnaissance and Sampling

Visual Reconnaissance and sampling of the Former AVEC Facility were performed on October 2, 2010.

7.2.1 Field Observations

Little surficial evidence remains of the Former School Tank Farm. The Davis-Ramoth School partially overlaps the northern boundary of the former tank farm. The new school is built on steel pilings. A gravel road that links the barge landing road to the rest of town runs over the approximate center of the former tank farm, as shown in Photo 7.2-1. The gravel fill comprising

Photograph 7.2-1: The southwest portion of the Davis-Ramoth School, and the gravel pad/road over the location of the Former School Tank Farm, looking north-northwest from the water treatment plant. The 4-wheeler is near the location of Test Pit SF1. (10/2/2010)

Photograph 7.2-2: Looking northwest beneath the Davis-Ramoth School. Ice and water is visible on the ground surface, which appears to be wet peat with residual tundra vegetation. (10/2/2010)

the road slopes off along the southern edge of the school, and the ground surface beneath the school appears to be wet peat and tundra vegetation, as shown in Photo 7.2-2. Runoff from the school roof drips onto the slope of the gravel fill.

A low, wet area lies between the gravel road and the utilidor to the south of the former tank farm. A light, thin petroleum hydrocarbon sheen was observed on wet ice in the low area, as shown in Photo 7.2-3. Two blanked off steel pipes at either end of the low area appeared to be part of an out-of-use fuel handling system. Similar welded steel pipe could be traced to the east toward the Selawik River near the arch bridge. The water treatment plant complex is on the south side of the utilidor. Several 55-gallon drums were observed in the vicinity of the water treatment plant. The drums were not examined for potential contents.

Photograph 7.2-3: Area of ponded water and ice with petroleum sheen and steel piping at location of former AST south of the Former School Tank Farm, looking northwest. The old clinic and the southwest corner of the Davis-Ramoth School are visible in the upper right corner of the photo. (10/2/2010)

The Storage Pad is an approximately 50-foot by 100-foot steel platform with risers for a refrigeration system sticking up along the sides. The pad is located in a wetland area, and partially frozen standing water was present between tussocks of vegetation at the time of our site visit. The vegetation around the pad did not appear to be distressed. The base of the steel pad is at ground level, and it could not be determined if it was sitting on refrigerated piles. The pad was not quite level, and the top was slightly warped giving the impression that the structural support had either partially failed or was never finished.

The sheet steel surface of the Storage Pad was mostly unoccupied, with some piping, construction debris and scrap stored on it, as shown in Photo 7.2-4. A variety of items were on the tundra around the edges of the pad, including a partially disassembled 4-wheeler, plastic pipe, and plywood, as shown in Photo 7.2-5. Five 55-gallon drums were in the wetland off the edge of the pad. The drums were frozen in place, making it difficult to determine if they contained fluids. One drum had an intact label for Vantherm; VanWaters &

Photograph 7.2-4: Looking south-southwest across the Storage Pad, with piping, construction debris, a drum, and scrap visible. (10/2/2010)

Rogers product number 223780. Vantherm is a glycol heat transfer fluid.

7.2.2 Site Sampling

Four test pits, designated Test Pits SF1 though SF4, were dug with a hand shovel to depths ranging from 1.2 to 2.2 feet. Test Pit SF1 was extended to 3.5 feet bgs, through water, using a hand auger. As shown on Figure 7.1-1, the test pits were advanced along the southern edge of the Davis-Ramoth School, and at least three locations were within the estimated containment area of the former tank farm. Two or three headspace screening samples were collected from each test pit. Water was encountered in each test pit at depths ranging from 0.6 to 1.9 feet bgs. The samples consisted of brown to gray gravelly sand presumed to be fill. Table 7.2-1 contains a summary of sample locations, visual soil classifications, and screening results.

Photograph 7.2-5: Looking southeast at the steel Storage Pad with cooling risers, drum and 4-wheeler in foreground and a fuel tank and water tank in background. (10/2/2010)

- The soils encountered in Test Pit SF1 had a diesel odor and PID screening readings of 77 to 450 ppm. Clear polyethylene sheeting (estimated to be approximately 6 to 8 mil. weight) was encountered at approximately 2 feet bgs, and water began entering the hole at approximately 1.2 feet bgs, as shown in Photo 7.2-6. A sheen and small droplets of potential fuel were observed on the water in the test pit. At 3.5 feet a vegetation mat, which felt stiff and frozen, was encountered. To collect the analytical portion of Sample SF1S1 and its field duplicate, designated Sample SF1S11, an adjacent test pit was excavated to sample depth because the original test pit had filled with water. An analytical sample was also collected from the bottom of Test Pit SF1 (Sample SF1S3, at 3.3 to 3.5 feet).

Photograph 7.2-6: Former School Tank Farm Test Pit SF1 with staining, oily water entry at the base, and polyethylene sheeting visible in the right hand side of the test pit. (10/2/2010)

- Test Pit SF2 was located west of Test Pit SF1. Water began entering the test pit at approximately 0.7 feet bgs and clear polyethylene sheeting was encountered at approximately 1.4 feet bgs. The plastic was not perforated, and the fuel odor was noted to be milder than at Test Pit SF1. An analytical sample (Sample SF2S1, at 1.0 to 1.2 feet) was collected from above the sheeting.

- Test Pit SF3 was located west of Test Pit SF2 near an entry way to the school. The clear polyethylene sheeting was encountered at approximately 0.6 feet bgs and consisted of three layers. Water began entering the hole between 1.0 and 1.1 feet bgs. An analytical sample (Sample SF3S1, at 0.4 to 0.6 feet) was collected from above the sheeting.
- Test Pit SF4 was located east of Test Pit SF1 toward the main school entrance, at a location thought to be just beyond the original tank farm boundary. The soil had a light diesel odor, and felt more dense or compact than that encountered in the other test pits. Polyethylene sheeting was not encountered to the maximum depth of 2.2 feet bgs. An analytical sample (Sample SF4S3, at 0.4 to 0.6 feet) was collected from the test pit.

7.2.3 Discussion of Sampling Results

Five analytical samples were collected from the test pits at the Former School Tank Farm and analyzed for DRO and BTEX. One sample was also tested for PAHs. The analytical samples were collected based on location, field screening results, and visual observations. Analytical samples were not collected around the Storage Pad. The analytical results are summarized in Table 7.2-2.

DRO was detected in each sample submitted for analysis from the Former School Tank Farm. The DRO results ranged from 49 mg/kg to 6,450 mg/kg. DRO was measured in soil samples collected both above and below the polyethylene sheeting encountered in three test pits. The DRO concentrations were less than the Arctic Zone inhalation and ingestion cleanup levels. According to laboratory case narrative notes, the DRO chromatograms for the Former School Tank Farm samples exhibited a pattern consistent with a “weathered middle distillate.” BTEX and PAH constituents were detected in Sample SF1S3 at concentrations less than the inhalation and ingestion cleanup criteria. Benzene and toluene were not detected, and ethylbenzene and xylenes either not detected or detected at concentrations less than the applicable cleanup levels in the remaining samples.

7.3 Environmental Review

The environmental conditions identified for this site include information gathered during the document and records review, field observations, and the analytical results for soil samples collected from the site.

7.3.1 Historical Environmental Review

The Former School Tank Farm was in place for approximately 20 years. A 1992 DEC inspection noted that three spills had been reported since 1986, the facility was in poor condition, and piping connected the tank farm to other sites. In 1996, while moving the tank farm for construction of the new Davis-Ramoth School, the construction contractor encountered petroleum stained soils. CH2MHill conducted soil sampling at the most visibly-impacted areas of the gravel pad. Seven soil samples were collected at depths of 1.5 to 3.5 feet bgs. Analytical results indicated that six of the seven samples were considered to be hydrocarbon contaminated, based upon classification criteria at the time. DRO concentrations ranged from 32 to 8,050 ppm, and benzene ranged from non-detect to 0.89 ppm. At the time of the investigation, the gravel pad was the proposed location of the school playground.

A risk assessment performed by CH2MHill, using the acquired data, addressed inhalation and contact risks if the contaminated soils were exposed. Groundwater was eliminated as a medium of concern. The potential receptors were school children and school staff. The risk analysis concluded that the concentrations of chemicals in the soil did not exceed risk-based screening levels for human health, and that the proposed plan to construct a school playground on the old gravel pad would meet ADEC-acceptable risk criteria for children and staff using the playground. The plan for the proposed playground included placing a petroleum resistant barrier, gravel, insulation, and clean cover over the site, further minimizing the risk. The report recommended that the site be designated as closed.

7.3.2 Identified or Potential Source Areas

DRO and BTEX were detected in soil samples collected from the gravel pad of the Former School Tank Farm in 1998 and in 2010. Although the primary source of the contamination is presumed to be the Former School Tank Farm, the fuel remaining in the soil is a secondary source of contamination. Fuel piping and storage tanks have also been located to the south of the former tank farm, and may have been potential sources of contaminants measured in the assessment area.

It was not determined whether the steel storage pad was regularly used for storing items that could be contaminant sources. Five 55-gallon drums were observed around the perimeter of the steel storage pad, suggesting that fluids have been stored in the past. Refrigerant possibly present in the subsurface cooling system of the pad is another potential source of contaminants.

7.3.3 Data Gaps

Although the DRO and BTEX concentrations measured do not exceed the Arctic Zone contact, ingestion, or inhalation cleanup levels, water moving through the soil at the former tank farm may carry contaminants to the surrounding wetlands. Field observations in 2010 suggested that there was free water with entrained fuel at shallow depths within the gravel pad. Sampling water from the surrounding wetlands is recommended to assess whether the migration to surface water exposure pathway is complete. The limited soil sampling conducted in 1996 and 2010 were not intended to fully characterize the vertical and lateral extent of impacted soil. Based on the concentrations measured, the potential exists for contaminants to exist above the cleanup levels in the soil. Additional soil sampling may be necessary to investigate the magnitude and extent of contamination prior to altering the site.

A release of fluids from the storage pad would likely run off the edges of the pad into the surrounding wetlands. Samples were not collected from storage pad area in 2010. Characterizing the surface water and sediments around and beneath the pad would be necessary to assess potential environmental risks.

7.3.4 Exposure Pathways

Dermal contact, ingestion, and inhalation are the potential exposure pathways identified for this site. The contact pathway would be a consideration for construction workers if the ground were to be disturbed. Surface water contact and ingestion are potential exposure pathways if contaminants are present in the wetlands surrounding the gravel area. Inhalation of volatile constituents being released from the soil is a potentially complete exposure pathway for both indoor and outdoor air. A portion of the school building is directly above the northern portion of the old tank farm pad. However, the structure sits on piles, which allows a three to four-foot gap through which air can freely circulate between the ground and the structure. Recirculating hot water heat was observed in the entryway and kindergarten classrooms located over the former tankfarm location. Because groundwater is not used for drinking, and groundwater is not believed to be present within a few hundred feet beneath the permafrost, the groundwater exposure pathway is not considered complete.

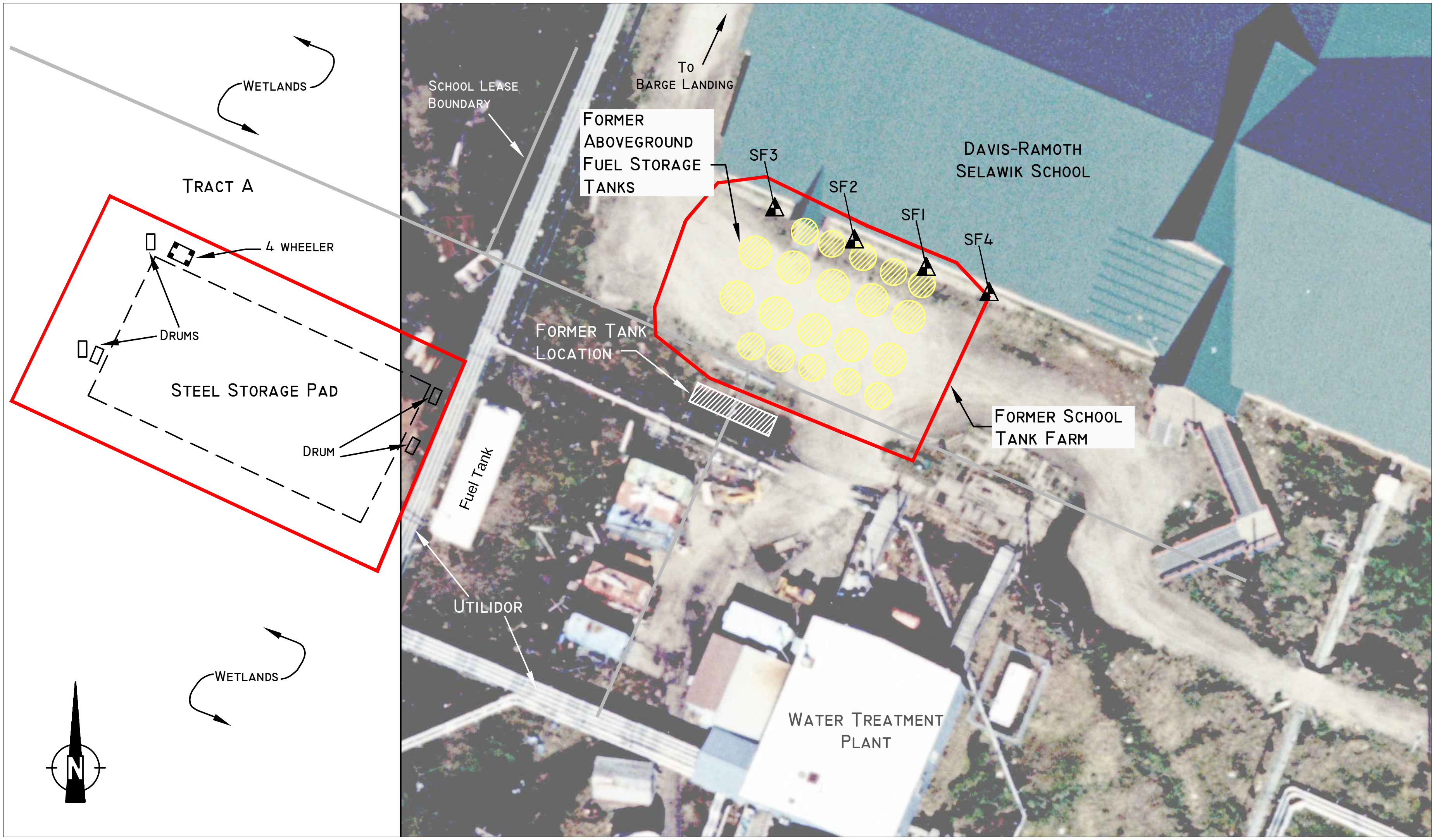
7.3.5 Environmental Overview

During Shannon & Wilson's field October 2010 field activities, the playground was located north of the school building rather than on the old tank farm location. The discontinuous polyethylene sheet liner noted in the CH2MHill report was encountered at depths varying between 0.6 to 2.0 feet beneath sand and gravel pad, and did not appear to be an effective barrier to contaminant movement. There were no indications that the proposed fuel resistant barrier or insulation had been installed on the pad.

Based on the 1996 and 2010 data, there are petroleum hydrocarbons below the surface in granular soil at the location of the Former School Tank Farm. The concentrations detected are less than the current Arctic Zone contact/ingestion and outdoor inhalation cleanup levels. The analytical soil samples collected by Shannon & Wilson in October 2010 contained concentrations of DRO and benzene that are comparable to the 1996 CH2MHill samples.

Migration of petroleum impacted water from the gravelly soil to surface water in the surrounding tundra is likely to be the highest exposure risk.

Field observations at the steel Storage Pad platform suggest that there is potential for contaminants to have been release from the pad. Significant areas of distressed vegetation were not observed in the surrounding wetland. Neither soil, sediment, nor water sampling were performed during this investigation.



LEGEND

SF1 Approximate location of Test Pit SF1 by Shannon & Wilson, Inc., 2010, with sample results less than the ADEC arctic zone cleanup levels

Approximate Assessment Areas

Notes:
1) Figure based on June 26, 2008 and June 15, 1986 aerial photographs from AeroMetric, Inc.
- Alaska Division and the Alaska DCRA 1999 Community Map, Selawik.

2) Property boundaries are approximate.

0 25 50 100
APPROXIMATE SCALE IN FEET

Selawik Area-wide PACP
Selawik, Alaska

FORMER SCHOOL TANK FARM AND STORAGE PAD

May 2011 32-1-17385

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 7.1-1

TABLE 7.2-1 - SAMPLE LOCATIONS AND DESCRIPTIONS, FORMER SCHOOL TANK FARM AND STORAGE PAD

Sample Number	Date	Sample Location (See Figure 7.1-1)	Depth (feet)	Headspace (ppm) ^	Sample Classification
Test Pit Samples					
Test Pit SF1 - Northeast portion of former tank farm containment					
* SF1S1	10/2/2010	Sample 1	1.1-1.3	410	Brown to gray, gravelly SAND; wet; petroleum odor
* SF1S11	10/2/2010	Duplicate of Sample SF1S1	1.1-1.3	410	Brown to gray, gravelly SAND; wet; petroleum odor
SF1S2	10/2/2010	Sample 2	0.4-0.6	77	Mixed brown, gravelly SAND; moist
* SF1S3	10/2/2010	Sample 3, collected beneath poly sheeting	3.3-3.5	450	Mixed gray and brown, gravelly SAND; wet; petroleum and sewage odor
Test Pit SF2 - North central portion of former tank farm					
* SF2S1	10/2/2010	Sample 1, collected above plastic liner	1.0-1.2	100	Mixed color, gravelly SAND; wet
SF2S2	10/2/2010	Sample 2, collected beneath plastic liner	0.4-0.6	4.9	Mixed color, gravelly SAND; moist; swamp odor
Test Pit SF3 - Northwest portion of former tank farm					
* SF3S1	10/2/2010	Sample 1, collected above plastic liner	0.4-0.6	30	Mixed brown, gravelly SAND; moist
SF3S2	10/2/2010	Sample 2, collected beneath plastic liner	1.0-1.2	7.2	Mixed gray and brown, gravelly SAND; wet; swamp odor
Test Pit SF4 - East edge of former tank pad					
SF4S1	10/2/2010	Sample 1 (plastic not encountered)	2.0-2.1	45	Gray to brown, gravelly SAND; wet
SF4S2	10/2/2010	Sample 2	0.9-1.1	19	Gray to brown, gravelly SAND; moist
* SF4S3	10/2/2010	Sample 3	0.4-0.6	120	Brown to gray, gravelly SAND; moist; petroleum odor
Quality Control Samples					
TB2	10/1/2010	Soil Trip Blank	-	-	Ottawa sand with methanol added in the laboratory

KEY	DESCRIPTION
*	Sample analyzed by the project laboratory (See Table 7.2-2)
^	Field screening instrument was a ThermoInstruments 580B photoionization detector (PID)
-	Measurement not recorded or not applicable
ppm	parts per million

TABLE 7.2-2 - SUMMARY OF ANALYTICAL RESULTS, FORMER SCHOOL TANK FARM AND STORAGE PAD

		Cleanup Levels (mg/kg)**		Sample Source, ID Number^, and Collection Depth in Feet (See Table 7.2-1, Figure 7.1-1, and Appendix C)						
				Former School Tank Farm and Storage Pad						QC
		Direct Contact /	Outdoor	SF1S1	SF1S11~	SF1S3	SF2S1	SF3S1	SF4S3	TB2
Parameter Tested	**Method***	Ingestion	Inhalation	1.1-1.3	1.1-1.3	3.3-3.5	1.0-1.1	0.4-0.6	0.4-0.6	10/1/2010
PID Headspace Reading - ppm	580B PID	-	-	410	410	450	100	30	120	-
Percent Solids	SM20 2540G	-	-	86.0	86.6	85.9	91.0	91.1	90.0	-
Diesel Range Organics (DRO) - mg/kg	AK 102	13,700	22,000	5,590	5,220	6,450	49.0	1,020	803	-
Aromatic Volatile Organics (BTEX)										
Benzene - mg/kg	EPA 8021B	200	17	<0.0155	<0.0144	0.212	<0.0123	<0.0136	<0.0159	<0.0127
Toluene - mg/kg	EPA 8021B	11,000	220	<0.0622	<0.0577	6.06	<0.0493	<0.0545	<0.0636	<0.0509
Ethylbenzene - mg/kg	EPA 8021B	13,700	110	<0.0622	<0.0577	3.42	<0.0493	<0.0545	0.0846	<0.0254
Xylenes - mg/kg	EPA 8021B	27,400	63	2.57	2.47	18.69	<0.0493	<0.0545	0.605	<0.102
Polynuclear Aromatic Hydrocarbons (PAHs)										
1-Methylnaphthalene - mg/kg	EPA 8270D SIMS	380	1,100	-	-	19.9	-	-	-	-
2-Methylnaphthalene - mg/kg	EPA 8270D SIMS	380	1,100	-	-	26.5	-	-	-	-
Fluorene - mg/kg	EPA 8270D SIMS	3,200	-	-	-	0.433	-	-	-	-
Naphthalene - mg/kg	EPA 8270D SIMS	1,900	42	-	-	8.59	-	-	-	-
Phenanthrene - mg/kg	EPA 8270D SIMS	27,800	-	-	-	0.127	-	-	-	-
Other PAHs - mg/kg	EPA 8270D SIMS	various	various	-	-	ND	-	-	-	-

KEY	DESCRIPTION
*	See Appendix C for compounds tested, methods, and laboratory reporting limits
**	Soil cleanup levels are the arctic zone levels from Tables B1 and B2 of 18 AAC 75.341 (October 2008)
^	Sample ID No. preceded by "17385-" on the chain of custody form
~	Duplicate of the preceding sample
ppm	Parts per million
mg/kg	Milligrams per kilogram
<0.0155	Analyte not detected; laboratory reporting limit of 0.0155 mg/kg
ND	Individual analytes not detected
-	Not applicable or sample not tested for this analyte
QC	Quality Control

8.0 RECOMMENDED ACTIONS/OPINIONS

To move the four sites toward redevelopment, and/or assess potential remedial alternatives, additional site characterization is recommended. Proposed site characterization activities are described below on a site by site basis, and other options may exist. The goal of the proposed site characterization activities is to address data gaps and otherwise collect sufficient information to develop site-specific remedial options. Agency input may also influence the selection of remedial actions. Despite the absence of complete data, this section includes a preliminary discussion of potential remedial strategies, alternatives, and resources that may apply to impacted media and potential source areas at the subject sites. Finally, we discuss the rough order of magnitude (ROM) cost estimate for the recommended actions.

8.1 General Environmental Actions and Remedial Requirements

The IRA Fuel Project Former Tank Farm and the Former School Tank Farm are identified as active contaminated sites on the DEC contaminated site database. The Former AVEC Facility has an informational listing in the DEC contaminated site database, and the analytical results from soil samples for this PACP suggest that hazardous substances have been released in the past. The site cleanup rules of 18 AAC 75.325 apply to these three sites until the ADEC makes a written determination otherwise. Under 18 AAC 75.325, a responsible party is required to investigate, contain, and perform cleanup of a release of a hazardous substance. A responsible party is required to meet the applicable cleanup levels determined under 18 AAC 75.340 through 18 AAC 75.350 (cleanup levels are discussed in Section 3.3). Under 18 AAC 75.375, the DEC may determine that institutional controls are necessary to ensure the protection of human health, safety, or welfare, or the environment. DEC requires that institutional controls be applied to a site where current or potential future exposure to contaminated soil or groundwater does not allow for unrestricted land and groundwater use.

In our opinion, institutional and engineering controls are likely to be required for the Selawik sites. Engineering controls are used as part of a final remedy in closure determinations that allow contamination to remain on site above DEC Arctic Zone Method 2 cleanup levels. These controls may consist of physical mechanisms to contain or stabilize contamination while ensuring the effectiveness of a remedial action over time. Common examples of such controls include caps, covers, trenches, signs, fences, physical access controls, and groundwater monitoring systems. Institutional controls provide notice to the public that contaminants remain in the soil and or groundwater above the DEC cleanup levels. Institutional controls may also incorporate requirements for maintenance of engineering controls, or restrict land uses in accordance with a conceptual site model. Common examples of such controls may include structure, land, and natural resource use restrictions, well restriction areas, groundwater classification exception areas, deed notices, and declarations of environmental restrictions.

Groundwater is not currently used as a drinking water source in Selawik and is not anticipated to be used in the future; however it may be necessary to record this presumption as part of the institutional controls for these sites.

Initial or emergency spill response actions are not recommended for the Selawik sites because the confirmed releases to the environment appear to have happened sometime in the past, are not likely to be spreading rapidly, and do not appear to pose an immediate danger to life or health. Removal of potential contaminants that are stored in an uncontrolled manner is the first recommended action in order to avoid additional releases. Because the extents of confirmed releases are not delineated, and there are potential source areas that have not been investigated, we are recommending conducting additional site characterization, with potential follow-on remedial actions, and/or engineering and institutional controls for the sites included in this PACP. Combining remedial actions to eliminate or control exposure pathways with investigation and characterization activities may reduce the costs of mobilizing equipment and personnel to the site. Note that DEC approval of the selected actions is necessary prior to implementation.

8.2 Recommended Remedial Actions by Source Area

This section presents Shannon & Wilson's recommended initial actions for further characterizing potentially complete exposure pathways at each assessment area based on the information gathered and presented in this PACP. Although remedial actions will likely be necessary at the IRA Fuel Project Former Tank Farm and the Former AVEC Facility, additional site characterization is recommended prior to selecting a remedial action. For both of these sites, we have conducted a preliminary evaluation of several remedial actions. Estimated costs to conduct additional site characterization activities at each of the sites are included in Appendix H.

8.2.1 IRA Fuel Project Former Tank Farm

The planned reuse for this site is a grocery store. The measured concentrations of DRO, GRO, BTEX and naphthalene in soil at the former tank farm present risks through inhalation, contact or ingestion exposure pathways. The reported concentrations of GRO and DRO also exceed the DEC's maximum allowable concentrations for these compounds. The concentration of benzene detected in the site's soil may also classify the material as a RCRA characteristic hazardous waste, depending on the leaching potential of the benzene-impacted soil.

We recommend additional characterization/investigation to better define the extent of impacted soil, determine the TCLP benzene concentration, the level of risk associated with potentially complete exposure pathways, and to narrow the selection and design of remedial action alternatives, institutional controls, and/or engineering controls. In particular, we recommend investigating if, and to what extent, the contaminants may be mobile and moving from on-site soil to air, surface water, or off-site soil. The following are our additional characterization recommendations. Estimated costs to conduct the additional site characterization activities are included in Appendix H, Table H-1.

- Collect ambient air samples from the site. Of particular concern are petroleum vapor concentrations when the top 1 to 2 feet of soil is thawed and the air is warm and calm.
    - Collect discrete time-interval samples from approximately 3 feet above the ground surface within the proposed building footprint near Test Pit I6, and outside the four corners of the building footprint. We recommend collecting the samples in early June when the top 6-inches of soil are thawed and spring infiltration may be occurring and in late August/early September when soil temperatures are high.
    - Analyze samples for VOCs (EPA TO-15). For cost estimation purposes we have assumed 12 samples, including two duplicates.
- Collect water samples from the shallow pond east of the site and from runoff occurring in the late spring as the surface starts to thaw.
    - Analyze samples for TAH, and TAqH (EPA SW8260M and SW625M SIMS). Three samples have been assumed, including one duplicate.
- Hand-excavate approximately five test pits following the methodology used for this PACP to investigate the eastern extent of contamination.
    - Field screen soil from at least two depths in each test pit using headspace techniques.
    - Select up to seven sample locations and one duplicate sample based on field screening. Analyze samples for DRO, GRO, BTEX, and naphthalene. Also analyze the sample with the highest screening result for total lead (EPA SW 6020).
- Hand-excavate approximately three test pits following the methodology used for this PACP to further evaluate the benzene contamination identified in Test Pit I6.
    - Field screen soil from at least two depths in each test pit using headspace techniques.
    - Select up to two sample locations from each test pit and one duplicate sample based on field screening. Analyze samples for DRO, GRO, BTEX, and total lead.
    - Collect one soil sample from the approximate location of Sample I6S3 for analysis of total lead and TCLP benzene.
- Reevaluate potential exposure risks and the applicability of monitored natural attenuation with institutional and engineering controls based on the results of the additional investigation.

The following engineering controls could be incorporated into the building design to reduce the potential inhalation risks associated with the volatile hydrocarbons measured in the soil:

- Construct the proposed building on the piles that are currently in place at the site. The piles would elevate the bottom of the proposed building at least 3 feet above the ground surface and allow for air to circulate freely beneath the building.
- Install a tightly sealed vapor intrusion barrier on the underside of the building;
- Place the air intake for heating, ventilation, and air conditioning systems high on the building and at the upwind end relative to the prevailing summer wind direction;
- Minimize the number of windows low on the building that might be kept open in the summer months; and
- To help minimize inhalation exposure outside the building, design boardwalks for access, parking, and material handling that are elevated above the soil and have well-ventilated decks.

Until additional site characterization is conducted, earthwork for construction should be minimized. Earthwork activities could potentially generate hazardous waste by disturbing soil with leachable benzene concentrations. Incorporating design features that minimize earthwork into the building plans, and having workers qualified to assess potential exposures on site during construction are recommended. Estimating the costs of building design and construction modifications are not considered to be within the scope of this PACP.

Soil exceeding ADEC maximum allowable concentrations for GRO and DRO will require treatment. Moreover, potentially hazardous concentrations of benzene impacted soil at the site complicate such treatment and limits current remedial options. Depending upon the results of the additional site characterization activities, it may be possible to excavate or treat the impacted soil on-site, either in-situ or ex-situ. It may be necessary to develop separate cleanup strategies for the GRO/DRO and benzene-impacted soil. We recommend conducting additional site characterization activities prior to selecting a remedial action. Remedial alternatives are discussed further in Section 8.3.

If we assume that remedial action is required to address inhalation, ingestion, and/or contact exposure pathways, three alternatives are recommended for future consideration. Capping the site with an impermeable barrier and passively venting or actively extracting the volatile hydrocarbons that accumulate beneath the barrier is one potential remedial alternative. Note that active soil vapor extraction is not likely to be a cost effective remedial alternative based on the fine-grained soil observed at the site and the time periods the soil is frozen.

A second alternative is to perform active remediation on-site by mixing a chemical oxidizer into the soil. This option is likely not preferred/cost effective if benzene concentrations fail the toxicity characteristic and are considered hazardous.

A third option consists of excavating and treating and/or disposing the impacted soil. Using this option, exposure risks may be mitigated and applicable cleanup levels achieved most quickly. This could be accomplished with the support of a barge in the eastern reach of the Selawik River and access through the property to the east of the site. Because of the expenses anticipated due to limited construction equipment availability, the presence of installed piles, the potential presence of hazardous waste, potential impact to permafrost, and challenges associated with soil movement and management in Selawik, we have not recommended the soil excavation and removal alternative, at this time.

As an interim measure to mitigate risk associated with petroleum hydrocarbons the following engineering controls could be put in place:

- Install a chain-link fence around the site to limit site access and reduce potential exposure pathways.

- Apply institutional controls to maintain the fence and notify potential site users or purchasers of known environmental conditions.

8.2.2 Barge Landing Area

The analytical soil samples obtained from the Barge Landing Area did not contain target analyte concentrations greater than the applicable DEC cleanup levels. There is a potential that burned and discarded materials in the swale along the west side of the gravel storage pad may have impacted surface water. We recommend additional characterization to assess this potential exposure pathway. Estimated costs to conduct the additional site characterization activities are included in Appendix H, Table H-2.

- Collect up to four surface water samples, one up-gradient of the debris, two from the swale drainage, and one from to the pond northwest of the Barge Landing storage pad.
    - Analyze samples for VOCs, TAqH, RCRA metals, dioxins (EPA SW8290), and PCBs. For cost estimation purposes, we have assumed five water samples, including one duplicate sample.
    - Evaluate potential exposure risks based on the laboratory results.

- Collect up to two soil samples from surface stain located beneath marine header.
  Analyze for DRO, BTEX, and PAHs.

The recommendations below have been considered general maintenance items rather than remedial actions, and have not been included in the summary cost estimate.

- Clean up the broken fluorescent light tubes on the gravel storage pad using qualified personnel taking appropriate precautions. The generated waste stream would likely include a mix of soil, glass, and residue that should be handled as potentially containing hazardous levels of mercury.
- Inspect the red, skid-mounted horizontal AST for fuel. Remove fuel from tank and fittings if found.
- Repair the cover for the marine header drip tub to minimize the potential need to handle fuel-impacted water;
- Clean up general debris and transport metals and other recycling off site so that potential releases to the soil may be more easily observed.
- Create more secure storage facilities to protect potential contaminant sources from vandals (such as fluorescent tubes or paint staged for recycling).

8.2.3 Former AVEC Facility

The Former AVEC Facility was used for power generation between 1970 and 2003, and redevelopment or reuse plans have not been completed for the property. Concentrations of DRO and RRO exceeding the DEC's maximum allowable concentrations were documented in soil at the site. Arsenic and lead concentrations also exceed the cleanup levels in one sample. The concentration of lead detected may also classify the material as a RCRA characteristic hazardous waste, depending on leaching potential. Based on the limited sampling conducted to date, the volume of impacted soil present at the site cannot be determined. Water samples were not collected as part of this effort; however, the impacted soil identified at the site has the potential to impact surface water.

We recommend investigation of the migration to surface water pathway and additional characterization to further delineate the extent of soil contamination. Estimated costs to conduct the additional site characterization activities are included in Appendix H, Table H-3.

- Collect surface water samples from four locations in the on-site wetlands, and if a pathway that allows surface water to runoff the site can be identified, one sample from the runoff channel.
    - Analyze samples for VOCs, TAqH, and RCRA metals. Six samples have been assumed, including one duplicate.
- Hand excavate up to 15 test pits following the methodology used for this PACP to investigate the depth and extent of contamination.
    - Field screen up to 30 soil samples for indications of petroleum hydrocarbons.

- Select up to 12 soil samples for analysis of DRO, RRO, PCBs, PAHs, VOCs, arsenic, and lead. For cost estimation purposes we have assumed that 14 samples, including two duplicates will be analyzed by each of these methods. The analytes of concern may be narrowed based on field location and observations.
- Collect one soil sample from the approximate location of Sample AVS5 for analysis of TCLP lead.

The recommendations below have been considered general maintenance items rather than remedial actions, and have not been included in the summary cost estimate:

- Drain and remove fluids remaining in the engines for the electrical generators and in the electrical boxes.

Soil exceeding ADEC maximum allowable concentrations for GRO and DRO will require treatment. Moreover, potentially hazardous concentrations of lead measured in the site's soil complicate such treatment and limits remedial options. Depending upon the results of the additional site characterization activities, it may be possible to excavate or treat the impacted soil on-site, either in-situ or ex-situ. It may be necessary to develop separate cleanup strategies for the DRO/RRO and lead-impacted soil. We recommend conducting additional site characterization activities prior to selecting a remedial action. It may be necessary to remove the existing on-site structure in order to fully remediate the site. Remedial alternatives are discussed further in Section 8.3.

Excavation and removal of the impacted soil identified at the Former AVEC Facility would likely be an effective remedial action to mitigate the exposure risks. The organic soil encountered, and the magnitude of RRO and lead in some samples suggest that excavation with off-site disposal would be a preferred treatment/disposal alternative, relative to in-situ methods. There are a number of challenges to excavating and removing soil from this site. Access for heavy equipment is restricted due to the location of the aboveground utilidors and boardwalks around the site. Buildings and tanks remaining in place on or above the impacted soil also restrict access. It may be necessary to access the site with heavy equipment during the winter in order to bridge the utilidors and boardwalks; however, soil screening and excavation work would be difficult until the ground thawed. If soil cleanup work is performed in the summer, transportation of excavated soil may have to wait until the following winter. Removal of the stained soil without promptly replacing it with clean soil would likely create small ponds and hasten permafrost melting. Transportation and staging of fill would need to be completed before the contaminated soil was excavated. A wetland permit would likely be required from the U.S. Army Corps of Engineers to move soil at the site.

Other remedial options include capping/encapsulation of the impacted soil, with a limited removal action for soil containing DRO/RRO concentrations greater than the ADEC maximum allowable concentrations, performed by hand and/or light equipment. For the limited removal option, impacted soil could be containerized and stored on site until provisions were made to haul out the remaining structures and tanks. Small quantities of fill material, possibly supplemented with straw, could be transported to the site with 4-wheelers to insulate and cover the excavation areas. This option would reduce potential exposure pathways, but is unlikely to achieve applicable cleanup levels, because tanks and structures would not be moved. Placing an impermeable barrier over and around the impacted soil would not be practicable if the existing structures and equipment remain in place or the soil exceeding maximum allowable concentrations cannot be removed. Both options could restrict future land use.

Because of the expected costs associated with overcoming these challenges, we do not recommend soil excavation and removal until funding is in place to remove, transport, and dispose the remaining structures and equipment. The equipment selected to complete the facility decommissioning could be selected to function for soil excavation and removal also. The materials remaining at this site (including generators, transformers, building materials, and, potentially, residual fuel in piping and tanks) pose potential for future releases. We have not included estimated costs for incorporating environmental cleanup into a demolition and removal project in our ROM cost estimate.

As an interim measure to mitigate risk associated with petroleum hydrocarbons the following engineering controls could be put in place:

- Install a chain-link fence around the southern portion of the site to limit site access and reduce potential exposure pathways.

- Apply institutional controls to maintain the fence and notify potential site users or purchasers of known environmental conditions.

8.2.4 Former School Tank Farm and Storage Pad

Based on the sampling performed to date, the concentrations of DRO and BTEX remaining in the soil at the Former School Tank Farm are below risk-based cleanup levels for ingestion, contact, and inhalation. Evidence of petroleum contamination was observed on the water that seeped into Test Pit SF1 and sheen was observed in the wet area to the south. Potential contaminant migration to surface water may lead to exposure risks that have not been investigated. We recommend additional characterization at this site. Estimated costs to conduct the additional site characterization activities are included in Appendix H, Table H-4.

- Collect surface water samples from two locations beneath the school, from the former location of a horizontally-oriented AST, and from near the corner of the gravel road southwest of the school. Depending on the season, and weather patterns, shallow test pits may be required to create ‘ponds’ and facilitate sampling.

  - Analyze samples for TAH, and TAqH. Five samples have been assumed, including one duplicate.

- Investigate the possibility that contaminants are migrating from sources to the south. With permission from the City of Selawik, hand excavate up to four test pits, two to the south and two along the north side of the wet area of the former horizontal AST.
  - Field screen up to 10 soil samples using headspace techniques for indications of petroleum hydrocarbons.
  - Select up to 4 soil samples for analysis of DRO and BTEX, and the sample with the highest screening result for PAH analysis. One field duplicate has also been assumed.
- Reevaluate potential exposure risks based on the results of sampling and analysis.

There is a potential that items once stored on the Storage Pad released contaminants to the surrounding land. We recommend that soil/sediment/water samples be collected from the wetlands area around the Storage Pad to characterize the soil at this location.

- Collect surface water samples from four locations from the wetlands surrounding the Storage Pad. Depending on the season, and weather patterns, shallow test pits may be required to create ‘ponds’ and facilitate sampling.
  - Analyze samples for VOCs, TAqH, and RCRA metals. Five samples have been assumed, including one duplicate.
- Collect soil/sediment samples from up to six shallow test pits, including four near the locations of the water samples.
  - Field screen soil samples using headspace techniques for indications of petroleum hydrocarbons.
  - Select up three soil sample locations for analysis of DRO, RRO, PAHs, VOCs, and RCRA metals. For cost estimation purposes we have assumed one duplicate for PAHs, VOCs, and RCRA metals.
- Evaluate potential exposure risks based on the characterization results.

The materials stored on and around the pad, including drums and debris, should be removed. If the site is to be redeveloped, the stability of the pad is in question and would likely need to be removed rather than incorporated into the new development. If the pad were to be decommissioned, the refrigeration system should be drained into containers, and the captured material recycled. Soil and water could be sampled beneath the pad once it has been removed. We have not included estimated costs for this general cleanup in the ROM

8.3 General Remediation Strategies and Alternatives

The recommended actions discussed above include additional investigation and characterization to improve estimates of exposure risks, monitored natural attenuation, and engineering and institutional controls. Other approaches may be considered. Soil and water alternatives are discussed below.

8.3.1 Soil Management Strategies

Depending upon the contaminant concentrations, soil may be remediated in-situ with passive or active remediation, or by removal and treatment. Natural attenuation may be a potential option for soil that does not exhibit hazardous characteristics or contain contaminants in excess of the DEC's maximum allowable concentrations. Natural attenuation is a slow process, and may require institutional controls and long-term monitoring for periods in excess of 30 years. Active in-situ remediation has been performed in a variety of ways, and remediation rates and costs are highly variable depending on the selected technology, the soil, and the contaminants. Soil removal and treatment is relatively expensive initially, but effective for reaching cleanup goals quickly. Other remedial technologies such as in-situ soil vapor extraction are currently not thought to be practicable at the Selawik sites due to the shallow depth of contamination, soil types, potential impact to the permafrost layer, potential impact to surface water, and electricity/energy requirements.

Excavation and removal of contaminated soil as a primary remediation strategy in Selawik is challenging and expensive for a number of reasons: access and transportation are limited due to boardwalks, bridges, and utilidors; heavy equipment must be brought in via barge; accessible locations away from wetlands where soil can be stored and treated are limited; shipping costs for sending soil to treatment or disposal facilities are high; soil removal may expose permafrost to melting, causing land settlement; and availability of granular backfill is limited. Should excavation and removal of contaminated soil be a desired approach, it would be most cost effective to organize site cleanup at multiple sites and coordinate the cleanup effort with other work requiring heavy equipment and imported fill, such as future expansion of the Barge Landing Area.

Removed soil will require treatment or disposal. Soil impacted with gasoline and diesel fuel/heating oil may be effectively treated with natural attenuation/bioremediation techniques such as landfarming or biopiles. These treatment options require sufficient non-environmentally sensitive space for spreading and piling the soil, and can take from one to several seasons. Landfarming in particular can take up a large amount of surface area. Assuming space, equipment, and personnel are readily available, landfarming is relatively inexpensive, and consists of spreading the soil to a depth of 1 to 2 feet, and turning the soil periodically.

Landfarming requires a reliable party to regularly monitor the condition of the cell and till the soil. Natural degradation processes reduce contaminant concentrations over time. Biological degradation can be enhanced with biopiles by blending nutrient amendments in to the soil and placing the soil in a treatment cell that includes a leachate collection and an aeration system. These techniques are not likely to be effective with soils containing metals and longer-chain petroleum hydrocarbons such as used oil and asphalt, or with cohesive and fine-grained soils. Impacted soil could potentially be treated on one portion of a site as redevelopment activities occur in another portion, depending on the size of the site.

Excavated petroleum-impacted soil may be treated with thermal desorption, either on site or off site. Thermal desorption is performed by screening out large particles, breaking up large agglomerations of soil, and feeding the soil into a heated rotary kiln. The emitted gasses are passed through an afterburner to oxidize unburned hydrocarbons. Organic soils (peat) and high concentrations of long-chain hydrocarbons such as asphalt can be difficult to remediate using thermal desorption. Shipping costs, fuel costs, on-site resources, and available space are all factors when considering on-site versus off-site thermal treatment. With a rough estimate of less than 2,500 tons of petroleum-impacted soil between the IRA Former Tank Farm and the Former AVEC Facility, shipping soil to an off-site thermal treatment or permitted landfill facility is likely to be more cost effective than on-site thermal treatment in Selawik.

Depending upon contaminant concentrations, monitored natural attenuation may be a practicable approach to managing petroleum-impacted soil in Selawik. To reduce exposure risks and minimize contaminant migration, isolating the soil from potential receptors by capping, fencing, and/or runoff control may be required. Periodic sampling is also likely to be required.

Several options incorporating ground cover could potentially be used to isolate or cap soil, depending on the desired result. Each option requires soil handling, and performs best if the ground surface is shaped and sloped to allow for surface water runoff. Because contamination would be left in place for each of these options it would likely be necessary to place institutional controls on the site and would require maintenance of the liner and/or piping.

- Permeable cover: A permeable geotextile fabric cover topped with approximately 3 to 6 inches of soil would reduce direct contact and dust exposure pathways, facilitate vegetative growth, and allow some oxygen exchange for natural attenuation. A permeable cover would not prevent migration of volatile compounds to the atmosphere or infiltration of water in to the soil.
- Impermeable cover: An impermeable cover topped with 3 to 6 inches of soil could be placed over the impacted area. This option reduces direct contact with contaminated soil, mitigates the inhalation pathway, and restricts surface water infiltration; however, it also limits air circulation which could restrict natural remediation over time.

- Passive venting: Includes placing geotextile wrapped perforated piping on the ground surface and covering the piping with an impermeable liner and approximately 6 inches of soil. The perforated piping would connect to blank riser pipe that extends from the ground surface to an elevation higher than the typical breathing zone for people in that area (e.g. the piping could extend to above the roof level of the planned store at the IRA Fuel Project Former Tank Farm). This option mitigates the direct contact and inhalation pathways, and blocks surface water infiltration while still allowing airflow to the impacted soil beneath the liner.

8.3.2 Water Management Strategies

Surface water may become impacted by near-surface pore water moving through, or overland water flow moving across contaminated soil. Seasonal thawing and rain events will influence the rate and extent of this transport mechanism. Water samples were not collected as part of this PACP; however, potential petroleum impacts to water were observed at the Former School Tank Farm site, and the contaminant concentrations measured in soil from three sites have the potential to impact water. If contaminated soil is left in place near the ground surface, exposure pathways from surface water runoff and infiltration will need to be controlled.

The first strategy for managing potential impacts to water is to prevent or reduce the contact of water with contaminated soil. Controlling water drainage and runoff while contaminated soil remains in place may be accomplished by grading and sloping sites, establishing or maintaining vegetative cover, installing ditches, and/or placing impermeable covers over impacted soil. Managing how and where snow is removed and stored, and controlling snow drifting can impact how water moves in the vicinity of contaminated soil. Members of the Selawik community are likely to have specific knowledge and observations that would be useful in determining ways to reduce water movement over and through contaminated soil. The low-angle topography, permafrost, wetlands, utilidors, and boardwalks in Selawik present drainage challenges.

Remedial action options for water that has been contaminated vary with the nature and concentration of the contaminant, the type of water body that has been impacted, and the risk to potential receptors. Petroleum compounds that have reached surface water are likely to naturally attenuate during the summer if the water is separated from the contaminant source. Metals dissolved in water are not likely to attenuate quickly, and may bioaccumulate in aquatic vegetation. Booms, dikes, and active treatment may be necessary depending on exposure risks. Dewatering of excavations may be necessary if contaminated soil is removed from sites such as the Former AVEC Facility. Impacted water from excavations would likely require treatment before discharge. On-site treatment with particulate filters and granular activated carbon is likely to be the preferred strategy.

8.3.3 Other Materials Management

Miscellaneous materials including but not limited to used tanks, transformers, drums, and/or staged materials designated for recycling, were observed at the Barge Landing Area, the Former AVEC Facility, and the Former School Tank Farm and Storage Area. These materials should be consolidated, transported, and disposed in accordance with applicable regulations by a qualified professional. Many of these miscellaneous materials present potential for future releases. The disposal practices currently in use could be modified to consolidate the materials and secure the storage location to reduce the potential for vandalism and/or destruction of the contained materials.

In addition to removing potential sources and general site cleanup and organization, community education (if not already in place) may also be helpful in increasing awareness and reducing potential for future releases. Community education may consist of identifying and understanding potential environmental concerns, developing a management plan for various waste streams, and developing a spill/release response program that would assist in timely response to known releases.

8.4 Community Resources

There are no excavation contractors in the Selawik area, and the City does not maintain a fleet of heavy equipment. It may be possible to utilize equipment brought to the area for other purposes; however, the presence and availability of equipment operators with the qualifications required for work on contaminated sites has not been determined.

The presence and availability of laborers with the qualifications required for work on contaminated sites has not been determined. The population of the region is small enough that it is unlikely that a qualified contractor or qualified sampler are available in Selawik; however, the costs for providing laborers to this remote location are much lower than obtaining the necessary equipment.

8.4.1 Resource Leveraging Opportunities

Other potential projects planned for the Selawik area include construction of the grocery store at the IRA Fuel Project Former Tank Farm and the expansion of the Barge Landing Area planned for 2012. Either of these projects may include bringing materials and/or equipment to the Selawik area. In the event that equipment and/or materials are available, it may be possible with additional coordination to use these available resources for remediating the sites included in this PACP.

8.4.2 Potential Funding Sources

The Center for Creative Land Recycling (CCLR) provides summaries of potential grants available to Alaska communities. CCLR can be found on the internet at http://www.cclr.org/resources/AK. The February 13, 2011 *Funding for Brownfield Redevelopment Projects* table developed by CCLR for Alaska is included in Appendix G. The table lists a variety of Federal, State of Alaska, and other organization programs, some of which are potential funding sources for redevelopment of the Old School site.

8.5 Rough Order of Magnitude Cost Estimate

The ROM cost estimate presented in Appendix H was developed for the site characterization actions outlined in Section 8.2 based on estimates and assumptions made from limited sampling and observation data. The costs are broken out by site, and include project planning and work plan preparation, additional site investigation/characterization, limited engineering controls, and report preparation. Combining the efforts for multiple sites may lead to cost efficiencies. This cost estimate is not comprehensive and does not include cleanup, redesign of facilities, equipment, demolition and debris removal, and other items that might be negotiated based on available resources. With the assumptions listed in Section 8.2, our rough order of magnitude cost estimate totals $190,000.

The intent of this ROM cost estimate is to provide preliminary costs associated with site characterization activities. Following completion of each task, it may be necessary to modify the project scope and associated costs as site-specific information is acquired. Additional undocumented areas of impacted soil and/or groundwater may be present at the site. Therefore, we recommend adding a contingency to the attached ROM cost estimates. Based on our past experiences, a contingency ranging from 10 to 30 percent is appropriate.

9.0 CONCLUSIONS

Based on Shannon & Wilson's research, field observations, limited sampling, and laboratory analysis, the four sites included in this PACP have potential and confirmed environmental conditions that could pose a risk to human health and/or the environment. Petroleum hydrocarbon concentrations that exceed the DEC Method Two risk-based cleanup levels were measured in soil samples from the IRA Fuel Project Former Tank Farm and the Former AVEC Facility. Arsenic and lead concentrations in excess of the cleanup levels were measured in one soil sample from the Former AVEC Facility. The results of limited analyses performed on soil samples from the Barge Landing Area and the Former School Tank Farm did not exceed the Method Two cleanup levels for the Arctic Zone. Field observations and laboratory results suggest that substances at each of the four sites have the potential to contaminate surface water.

In addition to the documented contamination, field observations and historic documents suggest that there is potential for contamination at several locations that have not been characterized by laboratory testing. The extents of areas with confirmed soil contamination have not been delineated. Various stored materials remaining at several sites are potential sources of additional contamination. The Environment Review sections for each site (Sections 4.3, 5.3, 6.3, and 7.3) discuss potential and confirmed source areas in greater detail.

We have recommended additional characterization to better define risks, assist in selecting future actions, and reduce exposure to ADEC and EPA-regulated substances. Our recommended actions/opinions are outlined for each site in Section 8. Once data gaps are addressed, a more comprehensive assessment of potential remedial action alternatives can be conducted. In general, the location and environment of Selawik create limitations for many remedial technologies. Engineering controls and institutional controls have been recommended to mitigate potential risks associated with the identified exposure pathways at the IRA Fuel Project Former Tank Farm and the Former AVEC Facility.

The ROM cost estimate in Appendix H includes estimated costs for planning and performing additional characterization and release investigations, and includes elements of the recommended engineering controls. However, these ROM estimates are not comprehensive and do not include costs for redesign of facilities, equipment, demolition and debris removal, and other items that might be negotiated based on available resources. We recommend investigating each site further and developing a corrective action plan before or concurrently with a reuse plan before performing remedial actions. We also recommend prioritizing the remedial actions and developing a phased approach based on the planned reuse.

10.0PERSONNEL QUALIFICATIONS

This PACP and incorporated Phase I Environmental Site Assessment was prepared by Mr. Randy Hessong under the supervision of Mr. Haydar Turker, and Mr. Matt Hemry, P.E. Mr. Hessong received a Bachelor of Science (B.S.) degree in Environmental Conservation from the University of Colorado in 1986 and a Master of Science (M.S.) degree in Agricultural Engineering from Colorado State University in 1993. Mr. Turker received a B.S. in Engineering Geology from University of Selcuk, Turkey, in 1986 and a M.S. in Environmental Science from University of Houston in 1995. Mr. Hemry received a B.S. in Engineering Sciences from Dartmouth College in 1990 and a M.S. in Environmental Engineering from Duke University in 1992. We declare that, to the best of our professional knowledge and belief, each of the individuals satisfies the definition of Environmental Professional as defined in §312.10 of this part. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

11.0LIMITATIONS AND EXCEPTIONS

The following elements constitute deviations, exceptions, and/or data gaps, with respect to the standard requirements of ASTM E 1527-05 and pertain to Section 4.1 for the IRA Fuel Project Former Tank Farm. In our opinion, none of these considerations impacts our ability to identify recognized environmental conditions at the subject property.

- The Alaska Department of Environmental Conservation (ADEC) List of Contaminated Sites is assumed to be equivalent to a hazardous waste sites list and includes voluntary cleanup sites.
- Tribal lists of environmental concerns were not reviewed. The tribal lists are identified as “standard environmental sources” in ASTM Section 8.2.1. To our knowledge, such databases do not exist for the State of Alaska.
- Historical use of the IRA Fuel Project Former Tank Farm is identified back to 1972, not to 1940, as required by ASTM E 1527-05. The oldest historical record is an aerial photo taken in 1972 and shows a small outbuilding, likely an outhouse, present between the community hall and the former location of the tank farm. In our opinion, our findings are consistent with local historical record searches.
- All of the Standard Historical Sources listed in ASTM Section 8.3.4 were not researched because they were not reasonably ascertainable or likely to be useful. For example, fire insurance maps, local street directories, building department records, and property tax files were not researched.

12.0CLOSURE/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 research, sampling, and analyses that we conducted. They should not be construed as definite conclusions regarding the site’s soil or groundwater. It is possible that our subsurface tests missed higher levels of petroleum hydrocarbon constituents, although our intention was to sample areas likely to be impacted. As a result, the sampling and analysis performed can only provide you with 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 site assessment. Changes in site conditions can occur with 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 attachments in Appendix H, "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 (DEC, 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 this opportunity to perform these services. Please call the undersigned or Mr. Matt Hemry at (907) 561-2120 with questions or comments concerning the contents of this report.

SHANNON & WILSON, INC.

Prepared By:

Randy Hessong
Engineer IV

Reviewed By:

Haydar Turker
Principal Engineering Geologist

STATE OF ALASKA
49TH
Matthew S. Hemry
CE - 9484
5/23/11
REGISTERED PROFESSIONAL ENGINEER

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APPENDIX A

ADEC BROWNFIELDS ASSESSMENT REQUEST (DBA)

DEC's Reuse and Redevelopment Program

DEC Brownfields Assessment Request Form – 2010

Please check the appropriate box for each question at the top of this page, and then answer questions 1–7 by inserting text in the blank area under each question, using as much space as you need. Forms with questions left blank will be returned to the applicant. The deadline for receipt of requests is February 19, 2010.

Site Name: Native Village of Selawik Area-Wide DBA

Eligibility Determination—General Questions:

Is the site federally owned?

☐ Yes ☒ No

Has the site or facility received funding for remediation from the Leaking Underground Storage Tank (LUST) Trust Fund?

☐ Yes ☒ No ☐ Unknown

Is the applicant in any way responsible for the potential contamination at the site, or related to those who may be responsible?

☐ Yes ☒ No

If you answered "yes" to any of the above questions, we recommend that you please call DEC to discuss the specifics of your eligibility determination.

To the best of your knowledge, is the *owner* of the property in question:

☐ Private ☒ City/Public ☐ State ☐ Native Corp ☒ Tribe ☐ Unknown

Known or suspected contaminant(s) (check one):

☐ Hazardous Substances ☐ Petroleum Only ☒ Hazardous Substances and Petroleum

Is this site currently listed on DEC's *Contaminated Sites* database?

☒ Yes ☐ No ☐ Unknown

If yes, please list the project name: Selawik IRA Fuel Project Former Tank Farm 500.38.001/ Former School Tank Farm Gravel Pad – Selawik-500.38.003

RANKING CRITERIA

1. Project Summary - Explain in your own words what you are hoping to obtain through this effort (what would you like to see *in place* of the site for which you are requesting assessment, and how will this project help you achieve your goals for the site?):

The Native Village of Selawik (Village) would like to determine if historical activities resulted in hazardous substance or petroleum product impacts to site soils and groundwater at three sites in Selawik. These three sites include: The former AVEC Tank Farm; Adam's Barge Landing; and the Selawik IRA Fuel Project Former Tank Farm. Actual or perceived impacts from hazardous substances or petroleum products have hindered the beneficial reuse of these areas by limiting development opportunities. This DBA would allow the Village a mechanism for determining the existence and extent of impacts currently present which would affect the Village's re-development plans. This information would allow the Village to develop an appropriate remediation/redevelopment plan so that a beneficial end-use can be achieved. Currently, the Village wishes to re-develop the properties into a new store; possible community housing/recreational area for children; and provide space for additional storage for incoming and outgoing barge shipments. In addition, understanding the level of impacts at the sites would allow the Village to properly manage the sites so as to protect the Village residents and/or construction workers from inadvertent exposure to hazardous substances or petroleum products.

2. Applicant/Owner

a) ***Applicant*** - Who is applying for this service? Provide the name and address of the **organization** applying for the DBA, the name of the contact person, email, telephone, and fax numbers.

Native Village of Selawik, Alaska
P.O. Box 59
Selawik, AK 99770
Phone (907) 484-2165
Fax (907) 484-2226
Attn: Raven Sheldon-Transportation Department

b) ***Property Owner* -** The owner of the property must allow DEC access to the site. If the applicant is different from the owner, include *written consent* for access from the owner. (*Note: the applicant must be able to secure access for DEC and its contractors to conduct the assessment.*)

Current ownership consists of the Native Village of Selawik and the City of Selawik. The Native Village of Selawik and the City have a close working relationship and any required access agreements could be quickly obtained.

If Applicant is IGAP staff, please provide name and contact of EPA Project Officer:

Lorraine M. Ticket (907) 484-2005

3. Project Team - We request that you form a *project team* (three or more individuals or organizations) to ensure continuity beyond this DBA and coordination for success of the overall project. Attach a letter of support from each team member. (Team members may include: city or village government representatives, tribal council members, environmental managers, elders or other community leaders, local non-profit or community development organizations, and other interested parties.)

The Village has developed a partnership that includes: The Native Village of Selawik Administrative Branch and the IRA Fuel project; and the City of Selawik. This partnership is committed to ensuring the ultimate success of the planned redevelopment. A letter of commitment from each partner is attached.

4. Site Information

a) ***Current Site Condition and Use*** **-** Provide the common name of the site, address, approximate acreage, zoning, and types of buildings. Please attach a site map or aerial photograph showing the site's location in the community and adjacent land use. Identify any areas of known or suspected contamination (for Question 5). Identify approximate property boundaries.

The Native Village of Selawik is depicted on the attached Vicinity Map (Figure 1). The individual sites included in this DBA request, including acreage, are depicted on the Site Map Overview (Figure 2). Figure 3 shows the current land ownership around Selawik, and Figure 4 shows the zoning classification for Selawik. Current site condition and use information for the three sites being proposed for a DBA is as follows

Site #1- Barge Landing- Site #1 is located along the south side of the Selawik River in the northwest portion of the Village. Site # 1 consists of approximately 4.5 acres and is zoned as Village. Currently, Site #1 contains various abandoned equipment and old tanks that are scattered randomly over the area. The tanks consist of: one Northwest Indian Housing Authority (NIHA) owned petroleum fuel tank; several abandoned Alaska Village Electrical Cooperative (AVEC) fuel tanks; and several fuel tanks that were relocated from the school tank farm (site # 3). Adjacent land use consists of the Selawik River to the north, and residential houses to the south. Some drinking water may be derived directly from the Selawik River; however, the Village primary drinking water source is from Selawik Lake and a water treatment facility. Village residents utilize the river for subsistence fishing as well. Site #1 is currently used as a barge landing site for incoming and outgoing shipments of goods and materials necessary to support life in the village. Contamination is suspected around the abandoned tanks in the form of fuel and potentially other hazardous substances due to relocation of tanks from other parts of the village. Impacts to the Selawik River and shallow groundwater are also a concern.

Site # 2 Old Fuel Tank Farm- Site #2 is located on the northeast portion of an the village island, and along the west shore of the Selawik River. The site is located on Parcel 5 on the east side of Ballot Street and north of Community Avenue and Community Hall. Site # 2 consists of approximately 2.0 acres and is zoned as Village. Currently, Site #2 consists of vacant land, and part of the former Selawik tank farm. This is the proposed site of a new store for the community. Initial work has begun in the form of installing support piles for the store. No soil excavation has taken place. Adjacent land use consists of the Selawik River immediately to the east and residential houses and community buildings to the south, west and north. Some drinking water may be derived directly from the Selawik River; however, the Village derives its drinking water from Selawik Lake and a water treatment facility. Village residents utilize the river for subsistence fishing as well. Site #2 is currently not in use due to previous releases of petroleum product during its use as a tank farm. As stated previously, construction of the new store has begun by installing support piles; however, that has been halted due to the threat of encountering petroleum contaminated soils and groundwater. Petroleum product contamination has been documented by the DEC (500.38.001). Information relating to the documented releases and DEC site assessments in included below in question #5.

Site # 3 Old AVEC Tank Farm- Site #3 is located at the northern end of the Village along the west shore of the Selawik River and near the Village office. The site is also located on the east side of the village school and close to residential houses. Site # 3 consists of approximately 4.4 acres and is zoned as Village. Currently, Site #3 consists of partially vacant land associated with the former AVEC tank farm. Site # 3 also contains residential houses and several conex containers, leftover tanks from the old tank farm, and a generator building. Adjacent land use consists of the Selawik River and residential houses. The village school is located immediately west. Some drinking water may be derived directly from the Selawik River; however, the Village derives its drinking water from Selawik Lake and a water treatment facility. Village residents utilize the river for subsistence fishing as well. Petroleum product contamination has been documented by the DEC (500.38.003). Information relating to the documented releases and DEC site assessments in included below in question #5.

b) ***Historical Site Use -*** Describe, to the best of your ability, the previous known uses of the site since development, and when the different activities occurred. Summarize any historic or cultural significance of the property. Identify <u>when</u> and <u>how</u> the site became or may have become contaminated, with what substance(s), and where any contamination is likely to be found.

Site # 1-Site #1 has always been used as a barge landing. Various materials essential to life in the village have been stored at this site over time. The primary concern is for abandoned fuel tanks left scattered around the area and leaks from the tanks. Leaking tanks from the old AVEC tank farm (Site #3) were relocated to the barge landing. Suspected contaminants include petroleum products; however, other unknown hazardous substances could have been released. This property is very important to the village because it is the primary source of shipments in and out of Selawick. The scattered tanks and materials have reduced usable space and potentially contaminated the site soils that limit expansion of the area.

Site #2- Site # 2 has historically been used as a tank farm for the village. This is the location of the very first tank farm in Selawik. Operational petroleum tanks were on this location from 1972 to 1996. The tanks were positioned on the ground with no spill containment or support structures. Fuel releases were common during fuel transfer. Fuel leaks are also likely due to the bottoms rusting from constant contact with the ground surface.

Site # 3- Site # 3 was historically used by AVEC for fuel tank storage and electrical generation. No data is available to determine when fuel storage began; however, the tanks were decommissioned sometime around 2000 and the tanks were transferred to the barge landing. Impacts in this area are likely from petroleum products and potentially polychlorinated by-phenyls from the electrical components at the generator shed. The generator still exists in this location.

5. <u>Environmental Information</u>

a) ***Prior Environmental Assessments*** - Please describe any prior site assessment or cleanup activities at the site and briefly state what you know about the findings of that work. Provide an electronic copy of the report if possible, or the summary or conclusion sections of the reports if available. If reports are not available, provide the consultant, client, approximate date of the study, and any other pertinent information.

Site # 1- No prior environmental assessments are known to have occurred for this site.

Site # 2- According to the DEC Contaminated Sites Database, Site #2 has been assigned a file identification number (500.38.001). The hazard identification is listed as 1421 and the current DEC staff assigned to this site is Grant Linden. This site is listed as active. A cleanup Chronology Report (attached) indicates no site assessments have been completed. The report indicates that petroleum impacts to soils, groundwater, and possibly surface water are, or may be present. The DEC report indicates documented releases have occurred, and a limited oil spill cleanup occurred in 1984. Water samples collected in 1991, from the Selawik River, indicated impacts from petroleum products were present at levels below the Maximum Contaminant Level (MCL).

Site # 3- According to the DEC Contaminated Sites Database, Site #3 has been assigned a file identification number (500.38.003). The hazard identification is listed as 1422 and the current DEC staff assigned to this site is Janice Wiegers. This site is listed as active. A cleanup Chronology Report (attached) indicates no site assessments have been completed. The report indicates that petroleum impacts to soils and groundwater may be present from releases onto the former tank farm gravel pad.

b) ***Reason for Concern*** **-** What is the reason for concern? Please discuss community concerns in general, and identify any specific problems if possible.

Site #1- Community concerns revolve around the need for upgrading the barge landing to accommodate increased barge traffic to the village. In the current state, the abandoned tanks occupy valuable space that could be used for conex storage units and for temporary storage of shipments. Renovation/expansion of the barge landing area is hampered by the fact that potentially contaminated soils and groundwater may be present. Construction workers may come in contact with those soils/groundwater during future redevelopment activities. Also, exposure of contaminated soils and groundwater during construction could result in contaminants being introduced to the adjacent Selawik River, which is a valuable ecological resource for subsistence fishing. The river also supplies drinking water to the village.

Site #2- The village of Selawik is in need of a new, larger store that has more storage space and additional freezers for perishable items. The proposed location of the store is the former IRA fuel tank farm. The village is concerned that impacts from the former tank farm in this location would hamper the construction of the new store (planned for 2011 construction). Soil and groundwater contamination could pose a threat to worker safety and to the Selawik River.

Site #3- The former tank farm at this location is located immediately adjacent to a school and residential houses. Children often play in this area, and the Village is concerned for their safety if petroleum and possibly PCBs are present in the soils. Potential impacts to the Selawik River from contaminants is also a concern.

c) ***Project Need*** **-** Describe to the best of your ability what your project team believes are the needed environmental assessment activities, and what result you would like to see from this project. Indicate any constraints as to when this work must be completed (e.g., to meet construction timeline, property transaction pending, etc.).

The project team believes these sites represent areas of Selawik that are in immediate need of a complete assessment of environmental impacts related to historical activities. The project team believes that soil and groundwater sampling at the sites is of primary concern, so that impacts, if any, can be sufficiently documented and delineated. In addition, the team believes surface water sampling for the Selawik River is needed to determine if impacts to this most valuable ecological and drinking water resource are present. We are hopeful that these activities can be conducted as soon as practicable considering the planned construction of the new store and for the safety of children that play near the old AVEC Tank Farm. Also, Alaska Department of Transportation & Public Facilities (DOT&PF) plans to upgrade the barge landing in the near future. An assessment of environmental site conditions to determine impacts prior to this planned upgrade would need to occur.

6. Community Planning and Reuse

a) ***Reuse or Redevelopment Plans*** **-** Does the community have well defined plans for reuse of this site if it were not for the environmental problems? Is this site affecting the use of adjacent properties, subsistence habitat, or other resources? Do reuse plans include the incorporation of greenspace or sustainable, green building practices? If so, please describe.

Site # 1- The DOT&PF has plans to upgrade and expand this site to accommodate increased barge shipments to and from the village. Potential impacts to this site could be migrating to the Selawik River, which is used for subsistence fishing and as a drinking water supply for the village.

Site # 2- The village has plans to construct a new store at this location. Potential environmental concerns relating to the former tank farm are delaying the construction of the new store. Potential impacts to this site could be migrating to the Selawik River, which is used for subsistence fishing and as a drinking water supply for the village. Potential impacts could also have migrated to adjacent residential areas via shallow groundwater.

Site # 3- The village would like to determine if impacts exist at this location and develop a remedial plan of action to protect the residents, especially children who play in the area. The village may decide to construct housing units and a recreational in this area once environmental impacts are evaluated. Potential impacts to this site could be migrating to the Selawik River, which is used for subsistence fishing and as a drinking water supply for the village. Adjacent residential houses and a school could also be impacted via shallow groundwater due to their close proximity.

b) ***Other Community Plans or Projects*** **-** It is helpful to know if other state or federal agencies are planning work in your community. List any community *plans* that may exist or are in development, such as: economic development plans, hazard mitigation plans, or erosion studies. Describe any other community *projects* that may be scheduled or pending, such as: water and sewer upgrades, a new landfill, road or airport construction, a new school or addition, fuel-storage tank farms, new housing, or other facilities.

Other projects that have are in the planning stages, or that are underway include:

1. New Boardroad Construction-Denali Commission; Native Village of Selawik
2. New Residential Housing Construction on Island- Housing and Urban Development (HUD)
3. Barge Landing Access and Boardroad Improvements_ DOT&PF
4. Water & Sewer utilities Upgrades- Alaska Native Tribal Health Consortium (ANTHC)

7. Public Involvement

a) ***Public Benefit*** - Briefly discuss how your proposed reuse or redevelopment plans for the property will provide a benefit to the public. Why is this important to your community? (Things to consider: creation of jobs, preservation of historically or culturally significant property, preservation of subsistence habitat, reuse or recycling of materials or infrastructure, cost savings to the community, or increased property values.)

The proposed reuse plans for these sites will allow for: increased barge shipments to and from the village; construction of a new store that will accommodate more inventory and provide increased perishable goods storage; allow for the determination of existing impacts and the appropriate response action for a former tank farm near a school and residential housing. This assessment will also determine if impacts exist to the Selawik River, which is an important source of subsistence fishing and a source of drinking water for the community.

b) ***Community Support and Resources*** - Is the community strongly *supportive* of this project? Have resolutions been approved by city or tribal councils in support of it? Our assessment often requires local assistance with site visits, lodging, excavation equipment, and local transportation. Describe local *resources* that are available to assist with this project. (It is helpful to include copies of resolutions or community letters of support, as well as cost-sheets for equipment and labor that may be needed.)

Because this project would allow for the appropriate level of remedial design and the ultimate beneficial reuse of the areas of concern, the community is very much in support of this project. The Native Village of Selawik, and the City of Selawik would provide their full support toward the completion of the project. Resources within Selawik that would be available to DEC include:

1. 4-wheeler rental
2. Lodging
3. Earth moving equipment (bobcat etc.)
4. Conference room space

c) ***Community Resources for Other Phases of the Revitalization Project*** - Does the community have financial or other resources for other phases of the project, such as equipment, labor, in-kind services, or funding for cleanup or new construction? Can this DBA be used to leverage other funding or services for the project?

Currently, funding is in place for the construction of the new village store. Additionally, DOT&PF has committed to providing resources to expand and upgrade the barge landing. The village is confident that adequate funding would be available to redevelop the former AVEC fuel tank farm. This DBA may be used a leverage for requesting United States Environmental Protection Agency (USEPA) Brownfields Cleanup Funding

The selection of a site for a DBA in no way implies that DEC is accepting liability for any contamination that may exist at the site, nor is DEC responsible for any necessary cleanup of hazardous substances that may be found at the site. Liability for contamination on a property is specifically addressed in Alaska Statute (AS) 46.03.822, which outlines those who are liable for the release of a hazardous substance. The general liability categories include: (1) those with an ownership interest in the property; (2) those in control of the substance at the time of the release; or (3) those who arrange for disposal or transport of the substance.

Submit Completed Forms by February 19, 2010, to:

By email: Sonja.Benson@alaska.gov or
By fax: (907) 451-2155 c/o Sonja Benson

Or by regular mail:

DEC Brownfield Assessments
c/o Sonja Benson
Department of Environmental Conservation
610 University Avenue
Fairbanks, Alaska 99709

If you have questions, call Sonja Benson at (907) 451-2156, Deborah Williams at (907) 451-5174, or John Carnahan at (907) 451-2166.

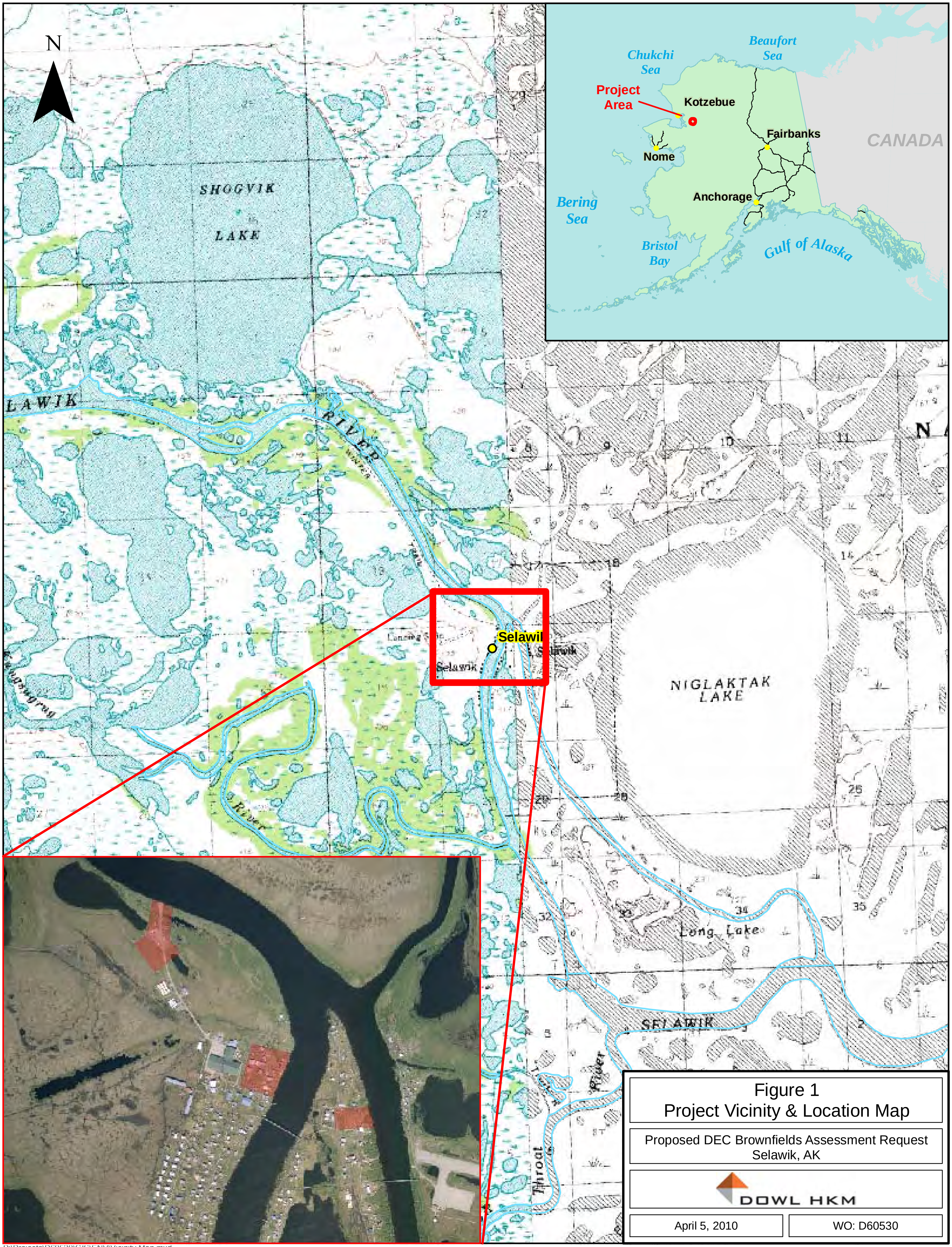


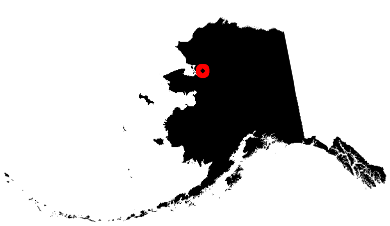
Figure 1
Project Vicinity & Location Map

Proposed DEC Brownfields Assessment Request
Selawik, AK

DOWL HKM

April 5, 2010	WO: D60530

P:\Projects\D60530\GIS\ENV\Vicinity Map.mxd



N

Study Sites

500 250 0 500 Feet

Figure 2:
Site Map Overview

Proposed DEC Brownfields Assessment Request
Selawik, AK

DOWL HKM

April 5, 2010 | WO: D60530

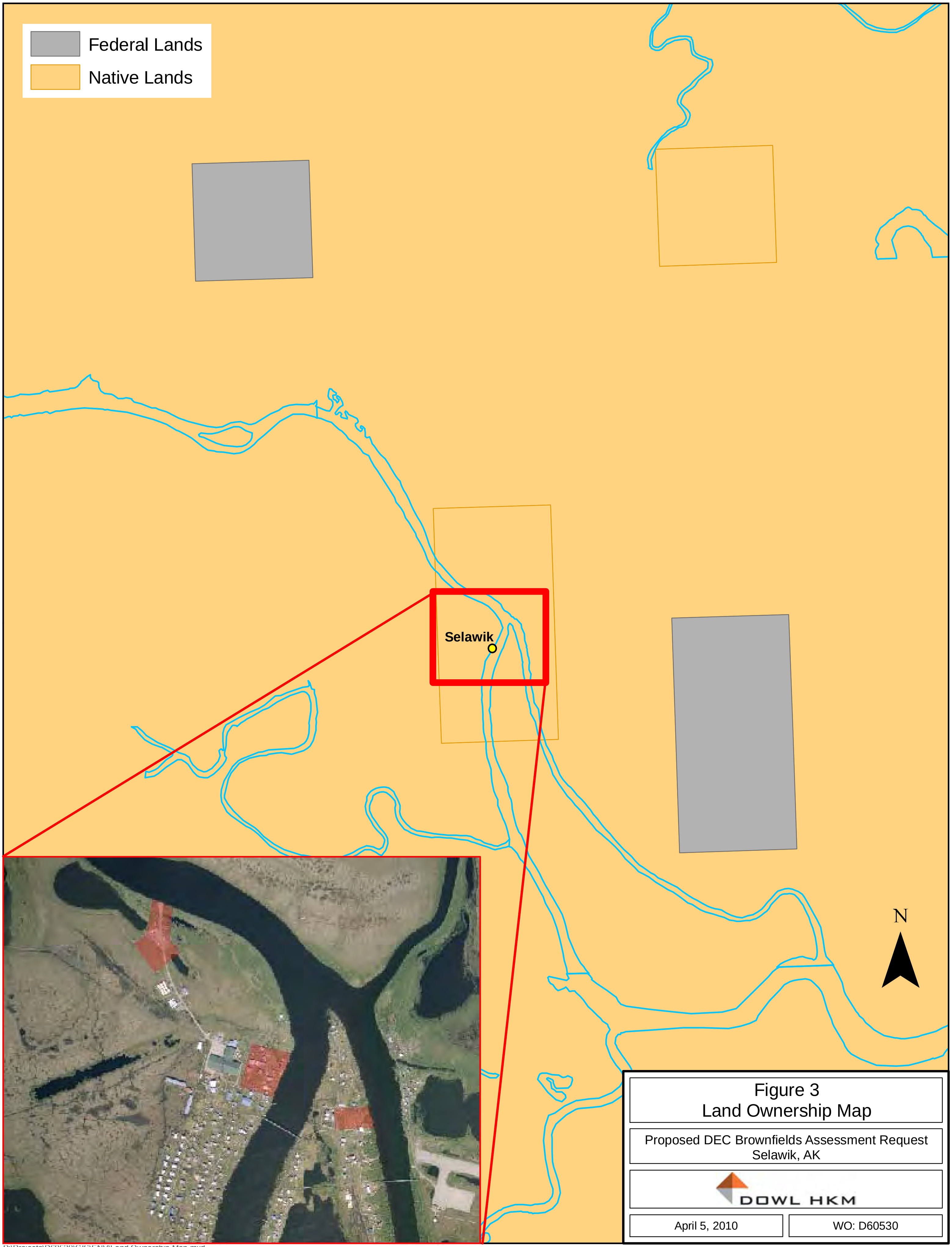
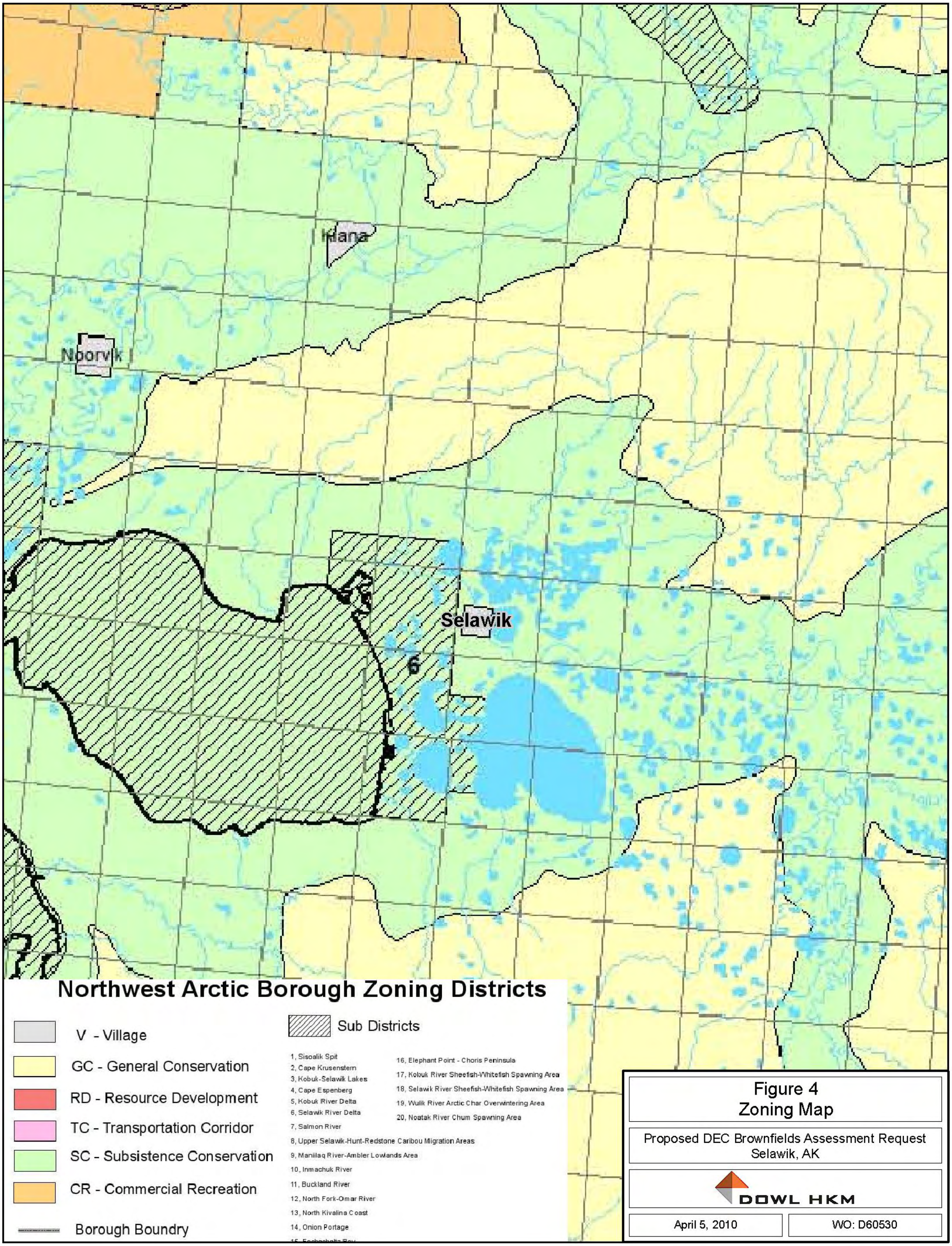


Figure 3
Land Ownership Map

Proposed DEC Brownfields Assessment Request
Selawik, AK

April 5, 2010 | WO: D60530


Kiana
Noorvik
Selawik
6
Northwest Arctic Borough Zoning Districts
V - Village
GC - General Conservation
RD - Resource Development
TC - Transportation Corridor
SC - Subsistence Conservation
CR - Commercial Recreation
Borough Boundry
Sub Districts
1, Sisoalik Spit
2, Cape Krusenstern
3, Kobuk-Selawik Lakes
4, Cape Espenberg
5, Kobuk River Delta
6, Selawik River Delta
7, Salmon River
8, Upper Selawik-Hunt-Redstone Caribou Migration Areas
9, Maniilaq River-Ambler Lowlands Area
10, Inmachuk River
11, Buckland River
12, North Fork-Omar River
13, North Kivalina Coast
14, Onion Portage
16, Elephant Point - Choris Peninsula
17, Kobuk River Sheefish-Whitefish Spawning Area
18, Selawik River Sheefish-Whitefish Spawning Area
19, Wulik River Arctic Char Overwintering Area
20, Noatak River Chum Spawning Area
Figure 4
Zoning Map
Proposed DEC Brownfields Assessment Request
Selawik, AK
DOWL HKM
April 5, 2010
WO: D60530

Native Village of Selawik
Selawik IRA Council
P.O. Box 59
Selawik, Alaska 99770
Phone: (907) 484-2165
Fax: (907) 484-2226

April 6, 2010

Sonja Benson
Contamination Site Program
Alaska Department of Environmental Conservation
610 University Avenue
Fairbanks, Alaska 99709

Dear Sonja:

The Native Village of Selawik supports and recommends the proposal to the Alaska Department of Environmental Conservation. The clean-up at the old AVEC tank farm, old Fuel store tank farm and the Barge landing is much needed and important so other construction can take place at these sites. We will be in support and like to see that the project is complete to benefit our tribal members health and safety.

If you have any questions please contact me at the above address or email at tribeadmin@akuligaq.org .

Sincerely,

Lenora Foxglove

Lenora Foxglove
Executive Director
Selawik IRA Council

4/6/2010

Native Village of Selawik
Selawik IRA Fuel Project
PO Box 81
Selawik, Alaska 99770

Sonja L. Benson
Contamination Sites Program
Alaska Department of Environmental Conservation
610 University Avenue
Fairbanks, Alaska 99709

Dear Sonja:

The Native Village of Selawik, Selawik IRA Fuel Project supports and recommends their proposal to The Alaska Department of Environmental Conservation.

The Selawik IRA Project has plans to build a 60'x100' new store. The current store we have now is need of repair and has outgrown the needs of our village. We currently have pilings installed at the site and making payments, we have updated our business plan and are in the process of updating the floor plans. The testing and possible clean up of the new site is important to us so that we can start the process of constructing the new store.

Should you have any questions please feel free to email me at [illegible] or you can call me at (907) 484-2006.

Sincerely,

Raven Sheldon
Chair
Selawik IRA Fuel Project

City of Selawik
Selawik City Council
Selawik, Alaska

April 6, 2010

Re : ***Letter of Support***

To Whom It May Concern:

The City of Selawik supports the Native Village of Selawik's efforts in cleaning up the old tank farm sites at (a) Old Native Store tank farm (b) Old AVEC tank farm (c) Barge landing area. These areas are potential areas of future construction for our community needs and their locations are prime locations for future expansion.

Please seriously consider Native Village of Selawik's request for assistance, as it will benefit all local residents, and provide more accessible locations for future businesses or offices.

Sincerely ;
Roger Clark
Roger Clark
Administrator

c : file
councilmembers

APPENDIX B

TELECONFERENCE MINUTES

SELAWIK AREA-WIDE
PROPERTY ASSESSMENT AND CLEANUP PLAN

Stakeholder Scoping and Planning Meeting
Teleconference Minutes

Date and Time: August 26, 2010, 14:00 to 15:30
Participants:

- Alaska Department of Environmental Conservation (DEC):
  - John Carnahan, Sonja Benson, Deborah Williams, Contaminated Sites Brownfield Program
  - Grant Lidren, Contaminated Sites Program
- U.S. Environmental Protection Agency (EPA):
  - Mary Goolie, Region 10 Brownfield Project Officer
- Native Village of Selawik, Selewik IRA Fuel Project:
  - Raven Sheldon, Chairman of Fuel Board; Lenora Foxglove, Fuel Board member
- Native Village of Selawik, Environmental Program:
  - Lucy Snyder, Susan Clark
- Alaska Village Electrical Cooperative (AVEC):
  - Mark Teitzel, Vice President and Manager of Engineering
- Shannon & Wilson, Inc. (S&W):
  - Haydar Turker, Project Manager; Randy Hessong, Project Engineer

Deborah Williams, DEC project manager, and Sonja Benson facilitated the meeting following the agenda outline circulated via e-mail on August 23, 2010. After each participant introduced themselves, John Carnahan provided an overview of the DEC's Re-use and Redevelopment (R&R) Program.

Overview and Objectives

John explained that the objective of the teleconference was to get everybody together and discuss their role, interests and goals for the property assessment and cleanup plan (PACP) project so that it gets a good start. The R&R (or brownfield) Program is intended to clarify environmental issues of concern, provide some quantification of the concerns, identify potential future uses, and outline practical steps for remediation and cleanup. The objective is to end up with a better understanding of the site and facilitate moving to the next step for putting a site back into beneficial use.

John described R&R funding through a grant from the Environmental Protection Agency's (EPA) State and Tribal Response Program. From this grant, DEC administers assessment work through term contractors.

This project is unique, John noted, because it combines multiple sites in one project. He also emphasized that input from all stakeholders is required to get the most out of the PACP process.

<u>Selawik Community Input</u>

Sonja facilitated gathering input from Selawik community members.

Raven Sheldon started by discussing the background and status of the former IRA Fuel Project tank farm area. Raven described Selawik's need for a larger store, and plans for a new 60-foot by 100-foot structure at the former IRA tank farm. Selawik obtained a loan to start the store project, and pilings were driven in the area of the former tank farm in 2007. The loan for the pilings is still active. Planning was started for construction of the new store, but the planning was put on hold when the DEC notified Selawik of the potential for contamination at the site. Raven noted that they would like to get funding in place and order materials for the new store this year so that construction could be started in 2011. Community members feel that assessment of the IRA tank farm area is the highest priority for the PACP.

The next priority, according to Raven is the barge landing area. When a barge lands with materials, the landing area gets overloaded. Raven noted that State Transportation Improvement Program (STIP) funds are designated for enlarging the barge landing and making road improvements in 2012. The barge landing is operated by the City of Selawik.

Assessment of the former AVEC tank farm is a lower priority for the community, according to Raven. John asked if it might be possible to build the store at the former AVEC location if contamination issues at the former IRA tank farm were problematic. Raven did not think that was possible because of the investment already made for pilings at the IRA site.

Sonja asked if any of the funding for the new store or the barge landing work could be used for potential cleanup work. Raven was uncertain but did not think it was likely.

Grant Lidren asked if any analytical samples have been collected from the former IRA tank farm area. Raven could only recall limited geotechnical sampling for piling design. Randy Hessong explained that S&W is scoped to collect ten soil samples from the former IRA tank farm area for diesel range organics (DRO) and benzene, toluene, ethylbenzene, and xylenes (BTEX) analysis. Diesel #2/stove oil was the primary product stored, but gasoline was also stored at the former IRA tank farm according to Raven.

Raven explained that one of the reasons for selecting the former IRA tank farm location for the new store was proximity to the airport. Bypass mail must be transported from the airport to the store/post office, and reducing the distance travelled will reduce wear and tear on the board roads.

<u>AVEC</u>

Mark Teitzel, Vice President and manager of engineering at AVEC, provided historical background and status of the former AVEC tank farm and power plant. According to Mark, the power plant was originally energized in 1970, and he believes that AVEC originally obtained a trustee permit for land use.

Funding through partnering with the Denali Commission allowed AVEC to build a new plant and a new tank farm jointly used by the school, city, and AVEC. The power plant was energized in 2003.

The contractor that built the new power plant also was contracted to clean and render unusable 22 tanks that were at the old site. Removed tanks were staged at the barge landing area. Some structures, including a steel generator module were moved during that period. The Butler building with two of its original three engines remains at the site. AVEC has requested funding to remove the remaining buildings, but Mark was unaware of any funding becoming available.

Randy asked Mark when the tanks were decommissioned and moved. Mark was not sure. Raven thought the tanks were likely moved in winter of 2004/2005. Randy noted that there are eight tanks visible in a 2008 aerial photograph of the site. Raven and Mark discussed that the tanks were difficult to access with a crane and other equipment due to boardwalks and above-ground piping, and the crane may not have been able to reach all the tanks. Raven confirmed that six or more tanks remain on the old AVEC site.

Mark was unsure of the status, but work on conveyance of the former AVEC property had occurred in the last year. Raven thought that the conveyance was not complete, but that the process was on-going.

Action Item: Look into status of property ownership for the old AVEC site – Raven and S&W.

Mark noted that he has some historical drawings of the old power plant that S&W may be able to obtain from him.

<u>DEC Contractor</u>

Randy reviewed S&Ws understanding of site background, the majority of which was covered earlier in the teleconference.

Based on aerial photograph review, Randy observed that the former IRA Fuel Project tank farm appeared to be active between 1972 and the late 1990’s. In 2000, it appears that soil was being graded across the former location of the tank farm.

The old AVEC site appears to have had a number of changes over the years. Besides the possible impacts from handling large volumes of fuel, Randy noted potential concerns from handling PCB-containing oils in electrical equipment.

The new school appears to be built over a large portion of the former school tank farm. An environmental assessment was performed at the former tank farm location in 1996, and the former tank farm is on the contaminated sites list.

The barge landing area appeared to become active in the 1990s based on aerial photography. Storage of tanks and equipment are potential sources of contamination, and a marine header and pipeline appeared after 2000, likely around 2003.

Randy outlined the PACP scope of work based on the request for proposal. The scope includes review the historical background and property ownership of four sites, preparation of a work plan, a site visit, and a report. The site visit includes collecting 10 soil samples from the former IRA tank farm and 15 samples from select locations across the remaining three sites. He noted that an important part of the site visit would be visiting with people with experience at each site.

Deborah asked if there had been another marine header prior to the 2003 header for the new tank farm. Mark noted that there had to have been a header for the old AVEC tank farm. Randy suggested that an AVEC header may not have been located at the barge landing. Raven explained that there was an older marine header at the barge landing for the old Public Health Service and School District tank farms. Sonja suggested that it would be a good idea for the assessor to walk to old pipeline route.

Randy discussed tentative scheduling. A work plan would be prepared in a few weeks, and S&W hopes to schedule the site visit for late September. Randy asked if there were any events or activities planned in the community that should be scheduled around. Raven stated that any time before mid-October when things start to freeze should be good.

Randy asked about the potential availability of equipment for test pits. Raven explained that there is a Bobcat with a loader bucket and forks, but no backhoe. Haydar Turker noted that the proposal was prepared assuming hand tools would be used.

Randy asked if members of the community could share the names of people that would be good to visit with about each site. Raven introduced Vida Coaltrain with the Selawik store and Tommy Ballot with the Fuel Board, who were joining the teleconference.

<u>Followup</u>

Action Item: Sonja noted that it would be good for everybody to have each other's contact information, and that DEC would put together a contact list and send it to participants.

Action Item: S&W will be putting together meeting minutes, and Deborah will be sending the minutes out for others to comment on.

John reiterated that there is a limiting funding source, but there is some flexibility in the scope of the PACP. The community has made it clear that their priority is the new store. John would like to prioritize collecting enough information that some decisions can be made for the former IRA tank farm/new store site. He also asked that everyone keep Deborah informed as the project moves forward.

Sonja pointed out that the Maniilaq Association assisted in preparing the Selawik brownfields application and may be a helpful resource, and asked if there were any questions.

Mary Goolie with the EPA introduced herself after joining the teleconference in progress.

Raven asked about the content of the report, if there would be a deadline for cleanup, and if Selawik would chose their own cleanup contractor if required. John responded that the report would contain results and recommendations, but would not contain actions required by the regulator. Grant would be the DEC project manager for reviewing the findings and deciding what actions might be required. Raven inquired about when the report will be available. John responded that the PACP report should be completed around mid-December,

Sonja provided a wrap up of the meeting. Sonja also requested that participants in the brownfield program provide feedback so that the program can develop, improve, and possibly get more funding.

Prepared by:

SHANNON & WILSON, INC.

Randy Hessong
Engineer IV

APPENDIX C

RESULTS OF ANALYTICAL TESTING
BY SGS NORTH AMERICA, INC. OF ANCHORAGE, ALASKA
AND
LABORATORY DATA REVIEW CHECKLISTS

Revised Report

SGS North America Inc.
Alaska Division
Level II Laboratory Data Report

Project:	32-1-17385 Selawik PACP
Client:	Shannon & Wilson, Inc.
SGS Work Order:	1105368

Released by:

Contents (Bookmarked in PDF):

SGS North America Inc.

Case Narrative

Customer: SHANNOT Shannon & Wilson, Inc.
Project: 1105368 32-1-17385 Selawik PACP

Refer to the sample receipt form for information on sample condition.

1105368001 PS 17385-BLS1
AK102 - Unknown hydrocarbon with several peaks is present.

1105368005 PS 17385-SF1S1
AK102 - The pattern is consistent with a weathered middle distillate.

1105368006 PS 17385-SF1S11
AK102 - The pattern is consistent with a weathered middle distillate.

1105368007 PS 17385-SF1S3
AK102 - The pattern is consistent with a weathered middle distillate.

8270D SIM - Surrogate recovery is outside of QC criteria due to sample dilution.

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

1105368008 PS 17385-SF2S1
AK102 - The pattern is consistent with a weathered middle distillate.

1105368009 PS 17385-SF3S1
AK102 - The pattern is consistent with a weathered middle distillate.

1105368010 PS 17385-SF4S3
AK102 - The pattern is consistent with a weathered middle distillate.

1105368011 PS 17385-AVS3
AK102 - Unknown hydrocarbon with several peaks is present.

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

1105368012 PS 17385-AVS4
AK102 - The pattern is consistent with a weathered middle distillate.

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

1105368013 PS 17385-AVS5
AK102 - The pattern is consistent with a weathered middle distillate.

AK102 - Diesel range organics result is biased high due to heavier hydrocarbons contributing to the middle distillate range.

AK103 - Unknown hydrocarbon with several peaks is present.

AK102/103 - 5a-Androstane and n-triacontane (surrogates) recoveries are outside QC criteria due to sample dilution.

1105368014 PS 17385-AVS6
AK102 - The pattern is consistent with a weathered middle distillate.

AK103 - Unknown hydrocarbon with several peaks is present.

AK102/103 - 5a-Androstane and n-triacontane (surrogates) recoveries are outside QC criteria due to sample dilution.

1105368015 PS 17385-AVS7
AK102 - The pattern is consistent with a weathered middle distillate.

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

1105368016 PS 17385-AVS8
AK102 - The pattern is consistent with a weathered middle distillate.

AK103 - The pattern is consistent with a lube oil.

AK102/103 - 5a-Androstane and n-triacontane (surrogates) recoveries are outside QC criteria due to sample dilution.

SGS North America Inc.

Case Narrative

Customer: SHANNOT Shannon & Wilson, Inc.

Project: 1105368 32-1-17385 Selawik PACP

1105368017 PS 17385-AVS11

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

AK103 - Unknown hydrocarbon with several peaks is present.

AK102/103 - 5a-Androstane and n-triacontane (surrogates) recoveries are outside QC criteria due to sample dilution.

1105368020 PS 17385-I1S4

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to hydrocarbon interference.

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

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

1105368022 PS 17385-I2S1

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to hydrocarbon interference.

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

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

1105368023 PS 17385-I3S3

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to hydrocarbon interference.

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

1105368024 PS 17385-I4S3

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to hydrocarbon interference.

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

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

1105368025 PS 17385-I5S3

AK102 - Unknown hydrocarbon with several peaks is present.

1105368026 PS 17385-I6S1

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to hydrocarbon interference.

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

1105368027 PS 17385-I6S3

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to hydrocarbon interference.

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

AK102 - The pattern is consistent with a weathered gasoline.

8270D SIM - Sample was extracted past the 14 day hold time.

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

8270D SIM - LCS recovery for benzo[a]pyrene does not meet QC criteria (biased low).

1105368028 PS 17385-I6S12

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to hydrocarbon interference.

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

AK102 - The pattern is consistent with a weathered gasoline.

8270D SIM - Sample was extracted past the 14 day hold time.

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

8270D SIM - LCS recovery for benzo[a]pyrene does not meet QC criteria (biased low).

SGS North America Inc.

Case Narrative

Customer: SHANNOT Shannon & Wilson, Inc.

Project: 1105368 32-1-17385 Selawik PACP

1105368029 PS 17385-I7S2

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to hydrocarbon interference.

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

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

1105368030 PS 17385-I9S2

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

1105368031 PS 17385-I10S3

AK102 - Unknown hydrocarbon with several peaks is present.

1001963 MS 1106017001MS

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to dark sample extract.

8270D SIM - MS recovery for multiple analytes is outside of QC criteria. Refer to LCS for accuracy.

996247 MS 996246MS

8260B - MS recoveries for several analytes do not meet QC criteria due to high fuel pattern of the original sample. Refer to the LCS for accuracy information.

8260B - MS surrogate recovery for 1,2-dichloroethane-D4 does not meet QC criteria (biased low). This sample is posted as a standin only for batch RPD.

997458 MS 1105553008MS

8270D SIM - Surrogate recovery is outside of QC criteria (biased high). No analytes were detected above the LOQ in the original sample.

8270D SIM - MS recovery for phenanthrene is outside of QC criteria (biased high). Refer to LCS for accuracy.

1001964 MSD 1106017001MSD

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to dark sample extract.

8270D SIM - MS recovery for multiple analytes is outside of QC criteria. Refer to LCS for accuracy.

8270D SIM - MS/MSD RPD for pyrene does not meet QC criteria. Results for this analyte are estimated in the original sample.

996248 MSD 996246MSD

8260B - MSD recoveries for several analytes do not meet QC criteria due to high fuel pattern of the original sample. Refer to the LCS for accuracy information.

8260B - MS/MSD RPDs do not meet QC criteria for 1,1-dichloroethane and 1,2,3-trichlorobenzene. These analytes were not detected in the associated samples.

8260B - MSD surrogate recovery for 1,2-dichloroethane-D4 does not meet QC criteria (biased low). This sample is posted as a standin only for batch RPD.

997020 MSD 997018MSD

8260B - MS/MSD recovery for naphthalene does not meet QC criteria. Refer to LCS for accuracy.

8260B - MS/MSD RPD for chloroform and 1,2-dibromo-3-chloropropane does not meet QC criteria. These analytes were not detected above the LOQ in the associated samples.

997459 MSD 1105553008MSD

8270D SIM - Surrogate recovery is outside of QC criteria (biased high). No analytes were detected above the LOQ in the original sample.

8270D SIM - MSD recovery for phenanthrene is outside of QC criteria (biased high). Refer to LCS for accuracy.

1001962 LCS XXX/24046]

8270D SIM - LCS recovery for benzo[a]pyrene does not meet QC criteria (biased low).

995981 CCV VMS/11670]

8260B - CCV recovery for dichlorodifluoromethane does not meet QC criteria (biased high). This analyte was not detected above the LOQ in the associated samples.

SGS North America Inc.

Case Narrative

Customer: SHANNOT **Shannon & Wilson, Inc.**

Project: 1105368 **32-1-17385 Selawik PACP**

997021 CCV **VMS/11680]**

8260B - CCV recoveries for multiple analytes do not meet QC criteria (biased high). These analytes were not detected above the LOQ in the associated samples.

997026 CCV **XMS/5721]**

8270D-SIM - CCV recovery for fluorene does not meet QC criteria (biased high). This analyte was not detected above the LOQ in the associated samples.

Laboratory Analysis Report

Revised Report

Randy Hessong
Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, AK 99518

Work Order:	1105368 32-1-17385 Selawik PACP
Client:	Shannon & Wilson, Inc.
Report Date:	November 09, 2010

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 AK100001 for NELAP (RCRA methods: 1020A, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035B, 6010B, 6020, 7470A, 7471B, 8021B, 8081B, 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, the National Environmental Laboratory Accreditation Program and 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
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., 2xDL)
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.

SGS North America Inc. | Environmental Division 200 West Potter Drive Anchorage AK 99518 t(907)562.2343 f(907)561.5301
www.ussgs.com Member of SGS Group

Detectable Results Summary

Print Date: 11/9/2010 10:36 am

Client Sample ID: **17385-BLS1**
SGS Ref. #: 1105368001

Semivolatile Organic Fuels Department

Parameter	Result	Units
Diesel Range Organics	45.9	mg/Kg

Client Sample ID: **17385-BLS3**
SGS Ref. #: 1105368003

Metals by ICP/MS

Parameter	Result	Units
Barium	46.2	mg/Kg
Chromium	7.62	mg/Kg
Lead	3.77	mg/Kg

Client Sample ID: **17385-BLS13**
SGS Ref. #: 1105368004

Metals by ICP/MS

Parameter	Result	Units
Barium	47.8	mg/Kg
Lead	3.49	mg/Kg

Client Sample ID: **17385-SF1S1**
SGS Ref. #: 1105368005

Volatile Fuels Department

Parameter	Result	Units
o-Xylene	1870	ug/Kg
P & M -Xylene	702	ug/Kg

Semivolatile Organic Fuels Department

Parameter	Result	Units
Diesel Range Organics	5590	mg/Kg

Client Sample ID: **17385-SF1S11**
SGS Ref. #: 1105368006

Volatile Fuels Department

Parameter	Result	Units
o-Xylene	1820	ug/Kg
P & M -Xylene	647	ug/Kg

Semivolatile Organic Fuels Department

Parameter	Result	Units
Diesel Range Organics	5220	mg/Kg

Revised Report

Detectable Results Summary

Print Date: 11/9/2010 10:36 am

Client Sample ID: **17385-SF1S3**
SGS Ref. #: 1105368007

	Parameter	Result	Units
Volatile Fuels Department			
	Benzene	212	ug/Kg
	Toluene	6060	ug/Kg
	Ethylbenzene	3420	ug/Kg
	o-Xylene	7390	ug/Kg
	P & M -Xylene	11300	ug/Kg
Semivolatile Organic Fuels Department			
	Diesel Range Organics	6450	mg/Kg
Polynuclear Aromatics GC/MS			
	Naphthalene	8590	ug/Kg
	2-Methylnaphthalene	26500	ug/Kg
	1-Methylnaphthalene	19900	ug/Kg
	Fluorene	433	ug/Kg
	Phenanthrene	127	ug/Kg

Client Sample ID: **17385-SF2S1**
SGS Ref. #: 1105368008

	Parameter	Result	Units
Semivolatile Organic Fuels Department			
	Diesel Range Organics	49.0	mg/Kg

Client Sample ID: **17385-SF3S1**
SGS Ref. #: 1105368009

	Parameter	Result	Units
Semivolatile Organic Fuels Department			
	Diesel Range Organics	1020	mg/Kg

Client Sample ID: **17385-SF4S3**
SGS Ref. #: 1105368010

	Parameter	Result	Units
Volatile Fuels Department			
	Ethylbenzene	84.6	ug/Kg
	o-Xylene	475	ug/Kg
	P & M -Xylene	130	ug/Kg
Semivolatile Organic Fuels Department			
	Diesel Range Organics	803	mg/Kg

Client Sample ID: **17385-AVS3**
SGS Ref. #: 1105368011

	Parameter	Result	Units
Volatile Fuels Department			
	Toluene	4340	ug/Kg
Semivolatile Organic Fuels Department			
	Diesel Range Organics	2440	mg/Kg

Detectable Results Summary

Print Date: 11/9/2010 10:36 am

Client Sample ID: **17385-AVS4**

SGS Ref. #: 1105368012

	Parameter	Result	Units
Volatile Fuels Department			
	Toluene	1230	ug/Kg
	o-Xylene	1550	ug/Kg
	P & M -Xylene	1480	ug/Kg
Semivolatile Organic Fuels Department			
	Diesel Range Organics	34300	mg/Kg

Client Sample ID: **17385-AVS5**

SGS Ref. #: 1105368013

	Parameter	Result	Units
Metals by ICP/MS			
	Arsenic	51.5	mg/Kg
	Barium	117	mg/Kg
	Cadmium	3.23	mg/Kg
	Chromium	28.7	mg/Kg
	Lead	572	mg/Kg
	Nickel	15.6	mg/Kg
Semivolatile Organic Fuels Department			
	Diesel Range Organics	9410	mg/Kg
	Residual Range Organics	25900	mg/Kg
Volatile Gas Chromatography/Mass Spectroscopy			
	Toluene	615	ug/Kg
	Trichlorofluoromethane	5940	ug/Kg

Detectable Results Summary

Print Date: 11/9/2010 10:36 am

Client Sample ID: **17385-AVS6**
SGS Ref. #: 1105368014

Parameter	Result	Units
Metals by ICP/MS		
Arsenic	2.11	mg/Kg
Barium	62.4	mg/Kg
Chromium	18.5	mg/Kg
Lead	7.37	mg/Kg
Nickel	8.92	mg/Kg
Vanadium	20.0	mg/Kg
Semivolatile Organic Fuels Department		
Diesel Range Organics	125000	mg/Kg
Residual Range Organics	11500	mg/Kg
Volatile Gas Chromatography/Mass Spectroscopy		
1,3,5-Trimethylbenzene	11000	ug/Kg
4-Isopropyltoluene	3940	ug/Kg
sec-Butylbenzene	1830	ug/Kg
o-Xylene	888	ug/Kg
Xylenes (total)	1120	ug/Kg
1,2,4-Trimethylbenzene	2630	ug/Kg
tert-Butylbenzene	298	ug/Kg
Isopropylbenzene (Cumene)	271	ug/Kg

Client Sample ID: **17385-AVS7**
SGS Ref. #: 1105368015

Parameter	Result	Units
Volatile Fuels Department		
o-Xylene	1680	ug/Kg
P & M -Xylene	314	ug/Kg
Semivolatile Organic Fuels Department		
Diesel Range Organics	144000	mg/Kg

Client Sample ID: **17385-AVS8**
SGS Ref. #: 1105368016

Parameter	Result	Units
Semivolatile Organic Fuels Department		
Diesel Range Organics	25900	mg/Kg
Residual Range Organics	35500	mg/Kg

Detectable Results Summary

Print Date: 11/9/2010 10:36 am

Client Sample ID: **17385-AVS11**
SGS Ref. #: 1105368017

Parameter	Result	Units
Metals by ICP/MS		
Arsenic	1.93	mg/Kg
Barium	60.6	mg/Kg
Chromium	18.0	mg/Kg
Lead	7.92	mg/Kg
Nickel	8.68	mg/Kg
Vanadium	20.2	mg/Kg
Semivolatile Organic Fuels Department		
Diesel Range Organics	132000	mg/Kg
Residual Range Organics	14400	mg/Kg
Volatile Gas Chromatography/Mass Spectroscopy		
1,3,5-Trimethylbenzene	11600	ug/Kg
4-Isopropyltoluene	5870	ug/Kg
sec-Butylbenzene	3310	ug/Kg
1,2,4-Trimethylbenzene	5020	ug/Kg
tert-Butylbenzene	1190	ug/Kg
Isopropylbenzene (Cumene)	1450	ug/Kg

Client Sample ID: **17385-I1S4**
SGS Ref. #: 1105368020

Parameter	Result	Units
Volatile Fuels Department		
Gasoline Range Organics	258	mg/Kg
Benzene	2640	ug/Kg
Toluene	6320	ug/Kg
Ethylbenzene	956	ug/Kg
o-Xylene	29100	ug/Kg
P & M -Xylene	23900	ug/Kg
Semivolatile Organic Fuels Department		
Diesel Range Organics	11400	mg/Kg

Client Sample ID: **17385-I2S1**
SGS Ref. #: 1105368022

Parameter	Result	Units
Volatile Fuels Department		
Gasoline Range Organics	4930	mg/Kg
Benzene	23600	ug/Kg
Toluene	301000	ug/Kg
Ethylbenzene	10600	ug/Kg
o-Xylene	538000	ug/Kg
P & M -Xylene	938000	ug/Kg
Semivolatile Organic Fuels Department		
Diesel Range Organics	37300	mg/Kg

Revised Report

Detectable Results Summary

Print Date: 11/9/2010 10:36 am

Client Sample ID: **17385-I3S3**
SGS Ref. #: 1105368023

	Parameter	Result	Units
Volatile Fuels Department			
	Gasoline Range Organics	1530	mg/Kg
	Benzene	77100	ug/Kg
	Toluene	233000	ug/Kg
	Ethylbenzene	48900	ug/Kg
	o-Xylene	72400	ug/Kg
	P & M -Xylene	166000	ug/Kg
Semivolatile Organic Fuels Department			
	Diesel Range Organics	615	mg/Kg

Client Sample ID: **17385-I4S3**
SGS Ref. #: 1105368024

	Parameter	Result	Units
Volatile Fuels Department			
	Gasoline Range Organics	1350	mg/Kg
	Benzene	2920	ug/Kg
	Toluene	6960	ug/Kg
	Ethylbenzene	45000	ug/Kg
	o-Xylene	69900	ug/Kg
	P & M -Xylene	76000	ug/Kg
Semivolatile Organic Fuels Department			
	Diesel Range Organics	26800	mg/Kg

Client Sample ID: **17385-I5S3**
SGS Ref. #: 1105368025

	Parameter	Result	Units
Volatile Fuels Department			
	Benzene	419	ug/Kg
Semivolatile Organic Fuels Department			
	Diesel Range Organics	60.5	mg/Kg

Client Sample ID: **17385-I6S1**
SGS Ref. #: 1105368026

	Parameter	Result	Units
Volatile Fuels Department			
	Gasoline Range Organics	69.4	mg/Kg
	Benzene	176	ug/Kg
	o-Xylene	1790	ug/Kg
	P & M -Xylene	615	ug/Kg
Semivolatile Organic Fuels Department			
	Diesel Range Organics	3010	mg/Kg

Revised Report

Detectable Results Summary

Print Date: 11/9/2010 10:36 am

Client Sample ID: **17385-I6S3**
SGS Ref. #: 1105368027

	Parameter	Result	Units
Volatile Fuels Department			
	Gasoline Range Organics	21200	mg/Kg
	Benzene	1270000	ug/Kg
	Toluene	3690000	ug/Kg
	Ethylbenzene	761000	ug/Kg
	o-Xylene	1120000	ug/Kg
	P & M -Xylene	2510000	ug/Kg
Semivolatile Organic Fuels Department			
	Diesel Range Organics	20900	mg/Kg
Polynuclear Aromatics GC/MS			
	Naphthalene	33300	ug/Kg
	2-Methylnaphthalene	33200	ug/Kg
	1-Methylnaphthalene	22900	ug/Kg
	Fluorene	1750	ug/Kg
	Pyrene	85.0	ug/Kg

Client Sample ID: **17385-I6S12**
SGS Ref. #: 1105368028

	Parameter	Result	Units
Volatile Fuels Department			
	Gasoline Range Organics	17300	mg/Kg
	Benzene	1210000	ug/Kg
	Toluene	3240000	ug/Kg
	Ethylbenzene	615000	ug/Kg
	o-Xylene	911000	ug/Kg
	P & M -Xylene	2000000	ug/Kg
Semivolatile Organic Fuels Department			
	Diesel Range Organics	20100	mg/Kg
Polynuclear Aromatics GC/MS			
	Naphthalene	67400	ug/Kg
	2-Methylnaphthalene	64700	ug/Kg
	1-Methylnaphthalene	45400	ug/Kg
	Fluorene	1770	ug/Kg
	Pyrene	97.0	ug/Kg

Revised Report

Detectable Results Summary

Print Date: 11/9/2010 10:36 am

Client Sample ID: **17385-I7S2**
SGS Ref. #: 1105368029

	Parameter	Result	Units
Volatile Fuels Department			
	Gasoline Range Organics	654	mg/Kg
	Ethylbenzene	3340	ug/Kg
	o-Xylene	56900	ug/Kg
	P & M -Xylene	22400	ug/Kg
Semivolatile Organic Fuels Department			
	Diesel Range Organics	17200	mg/Kg

Client Sample ID: **17385-I9S2**
SGS Ref. #: 1105368030

	Parameter	Result	Units
Volatile Fuels Department			
	Gasoline Range Organics	14.9	mg/Kg
	o-Xylene	234	ug/Kg
	P & M -Xylene	192	ug/Kg
Semivolatile Organic Fuels Department			
	Diesel Range Organics	131	mg/Kg

Client Sample ID: **17385-I10S3**
SGS Ref. #: 1105368031

	Parameter	Result	Units
Semivolatile Organic Fuels Department			
	Diesel Range Organics	48.0	mg/Kg

Revised Report

SGS Ref.#	1105368001		
Client Name	Shannon & Wilson, Inc.	**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP	**Collected Date/Time**	10/01/2010 19:00
Client Sample ID	17385-BLS1	**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

AK102 - Unknown hydrocarbon with several peaks is present.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Benzene	43.5 U	43.5	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	174 U	174	ug/Kg	SW8021B	B			10/08/10	HM
o-Xylene	174 U	174	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	174 U	174	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	174 U	174	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates									
1,4-Difluorobenzene <surr>	97.8		%	SW8021B	B	80-120		10/08/10	HM
Semivolatile Organic Fuels Department									
Diesel Range Organics	45.9	33.2	mg/Kg	AK102	A		10/06/10	10/11/10	LCE
Surrogates									
5a Androstane <surr>	56.6		%	AK102	A	50-150	10/06/10	10/11/10	LCE
Solids									
Total Solids	60.1		%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368002		
Client Name	Shannon & Wilson, Inc.	**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP	**Collected Date/Time**	10/01/2010 19:50
Client Sample ID	17385-BLS2	**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department									
Mercury	42.3 U	42.3	ug/Kg	SW7471B	A		10/06/10	10/07/10	SMH
Solids									
Total Solids	92.8		%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368003		
Client Name	Shannon & Wilson, Inc.	**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP	**Collected Date/Time**	10/01/2010 20:05
Client Sample ID	17385-BLS3	**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department									
Mercury	524 U	524	ug/Kg	SW7471B	A		10/06/10	10/07/10	SMH
Metals by ICP/MS									
Arsenic	12.7 U	12.7	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Barium	46.2	3.80	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Cadmium	2.53 U	2.53	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Chromium	7.62	5.07	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Lead	3.77	2.53	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Selenium	6.34 U	6.34	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Silver	1.27 U	1.27	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Solids									
Total Solids	7.45		%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368004		
Client Name	Shannon & Wilson, Inc.	**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP	**Collected Date/Time**	10/01/2010 20:10
Client Sample ID	17385-BLS13	**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals Department									
Mercury	756 U	756	ug/Kg	SW7471B	A		10/06/10	10/07/10	SMH
Metals by ICP/MS									
Arsenic	17.4 U	17.4	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Barium	47.8	5.23	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Cadmium	3.49 U	3.49	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Chromium	6.97 U	6.97	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Lead	3.49	3.49	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Selenium	8.72 U	8.72	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Silver	1.74 U	1.74	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Solids									
Total Solids	5.30		%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368005
Client Name	Shannon & Wilson, Inc.
Project Name/#	32-1-17385 Selawik PACP
Client Sample ID	17385-SF1S1
Matrix	Soil/Solid (dry weight)

Printed Date/Time	11/09/2010 10:36
Collected Date/Time	10/02/2010 14:20
Received Date/Time	10/05/2010 14:40
Technical Director	**Stephen C. Ede**

Sample Remarks:

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

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Benzene	15.5 U	15.5	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	62.2 U	62.2	ug/Kg	SW8021B	B			10/08/10	HM
o-Xylene	1870	62.2	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	702	62.2	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	62.2 U	62.2	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates									
1,4-Difluorobenzene <surr>	105		%	SW8021B	B	80-120		10/08/10	HM
Semivolatile Organic Fuels Department									
Diesel Range Organics	5590	460	mg/Kg	AK102	A		10/06/10	10/08/10	LCE
Surrogates									
5a Androstane <surr>	80.7		%	AK102	A	50-150	10/06/10	10/08/10	LCE
Solids									
Total Solids	86.0		%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368006
Client Name	Shannon & Wilson, Inc.
Project Name/#	32-1-17385 Selawik PACP
Client Sample ID	17385-SF1S11
Matrix	Soil/Solid (dry weight)

Printed Date/Time	11/09/2010 10:36
Collected Date/Time	10/02/2010 14:30
Received Date/Time	10/05/2010 14:40
Technical Director	**Stephen C. Ede**

Sample Remarks:

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

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Benzene	14.4 U	14.4	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	57.7 U	57.7	ug/Kg	SW8021B	B			10/08/10	HM
o-Xylene	1820	57.7	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	647	57.7	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	57.7 U	57.7	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates									
1,4-Difluorobenzene <surr>	105		%	SW8021B	B	80-120		10/08/10	HM
Semivolatile Organic Fuels Department									
Diesel Range Organics	5220	459	mg/Kg	AK102	A		10/06/10	10/08/10	LCE
Surrogates									
5a Androstane <surr>	76.3		%	AK102	A	50-150	10/06/10	10/08/10	LCE
Solids									
Total Solids	86.6		%	SM20 2540G	A			10/06/10	AHJ

SGS Ref.#	1105368007		
Client Name	Shannon & Wilson, Inc.	**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP	**Collected Date/Time**	10/02/2010 12:10
Client Sample ID	17385-SF1S3	**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

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

8270D SIM - Surrogate recovery is outside of QC criteria due to sample dilution.

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Benzene	212	30.3	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	3420	121	ug/Kg	SW8021B	B			10/08/10	HM
o-Xylene	7390	121	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	11300	121	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	6060	121	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates									
1,4-Difluorobenzene <surr>	108		%	SW8021B	B	80-120		10/08/10	HM
Semivolatile Organic Fuels Department									
Diesel Range Organics	6450	465	mg/Kg	AK102	A		10/06/10	10/08/10	LCE
Surrogates									
5a Androstane <surr>	75.8		%	AK102	A	50-150	10/06/10	10/08/10	LCE
Polynuclear Aromatics GC/MS									
1-Methylnaphthalene	19900	1160	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE
2-Methylnaphthalene	26500	2890	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE
Acenaphthene	116 U	116	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE
Acenaphthylene	116 U	116	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE
Anthracene	116 U	116	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE
Benzo(a)Anthracene	116 U	116	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE
Benzo[a]pyrene	116 U	116	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE
Benzo[b]Fluoranthene	116 U	116	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE
Benzo[g,h,i]perylene	116 U	116	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE

Revised Report

SGS Ref.#	1105368007		
Client Name	Shannon & Wilson, Inc.	**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP	**Collected Date/Time**	10/02/2010 12:10
Client Sample ID	17385-SF1S3	**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)	**Technical Director**	**Stephen C. Ede**

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Polynuclear Aromatics GC/MS									
Benzo[k]fluoranthene	116 U	116	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE
Chrysene	116 U	116	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE
Dibenzo[a,h]anthracene	116 U	116	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE
Fluoranthene	116 U	116	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE
Fluorene	433	116	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE
Indeno[1,2,3-c,d] pyrene	116 U	116	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE
Naphthalene	8590	1160	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE
Phenanthrene	127	116	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE
Pyrene	116 U	116	ug/Kg	8270D SIMS			10/15/10	10/19/10	CDE
Surrogates									
Terphenyl-d14 <surr>	137	!	%	8270D SIMS		30-125	10/15/10	10/19/10	CDE
Solids									
Total Solids	85.9		%	SM20 2540G	A			10/06/10	AHJ

SGS

SGS Ref.#	1105368008
Client Name	Shannon & Wilson, Inc.
Project Name/#	32-1-17385 Selawik PACP
Client Sample ID	17385-SF2S1
Matrix	Soil/Solid (dry weight)

Printed Date/Time	11/09/2010 10:36
Collected Date/Time	10/02/2010 14:55
Received Date/Time	10/05/2010 14:40
Technical Director	**Stephen C. Ede**

Sample Remarks:

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

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Benzene	12.3 U	12.3	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	49.3 U	49.3	ug/Kg	SW8021B	B			10/08/10	HM
o-Xylene	49.3 U	49.3	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	49.3 U	49.3	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	49.3 U	49.3	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates									
1,4-Difluorobenzene <surr>	97.2		%	SW8021B	B	80-120		10/08/10	HM
Semivolatile Organic Fuels Department									
Diesel Range Organics	49.0	21.9	mg/Kg	AK102	A		10/06/10	10/08/10	HM
Surrogates									
5a Androstane <surr>	102		%	AK102	A	50-150	10/06/10	10/08/10	HM
Solids									
Total Solids	91.0		%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368009			
Client Name	Shannon & Wilson, Inc.		**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP		**Collected Date/Time**	10/02/2010 15:10
Client Sample ID	17385-SF3S1		**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)		**Technical Director**	**Stephen C. Ede**

Sample Remarks:

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

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Benzene	13.6 U	13.6	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	54.5 U	54.5	ug/Kg	SW8021B	B			10/08/10	HM
o-Xylene	54.5 U	54.5	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	54.5 U	54.5	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	54.5 U	54.5	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates									
1,4-Difluorobenzene <surr>	97.4		%	SW8021B	B	80-120		10/08/10	HM
Semivolatile Organic Fuels Department									
Diesel Range Organics	1020	108	mg/Kg	AK102	A		10/06/10	10/08/10	LCE
Surrogates									
5a Androstane <surr>	94.8		%	AK102	A	50-150	10/06/10	10/08/10	LCE
Solids									
Total Solids	91.1		%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368010			
Client Name	Shannon & Wilson, Inc.		**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP		**Collected Date/Time**	10/02/2010 15:25
Client Sample ID	17385-SF4S3		**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)		**Technical Director**	**Stephen C. Ede**

Sample Remarks:

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

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Benzene	15.9 U	15.9	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	84.6	63.6	ug/Kg	SW8021B	B			10/08/10	HM
o-Xylene	475	63.6	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	130	63.6	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	63.6 U	63.6	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates									
1,4-Difluorobenzene <surr>	96.1		%	SW8021B	B	80-120		10/08/10	HM
Semivolatile Organic Fuels Department									
Diesel Range Organics	803	31.0	mg/Kg	AK102	A		10/06/10	10/08/10	HM
Surrogates									
5a Androstane <surr>	91		%	AK102	A	50-150	10/06/10	10/08/10	HM
Solids									
Total Solids	90.0		%	SM20 2540G	A			10/06/10	AHJ

SGS Ref.#	1105368011	**Printed Date/Time**	11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.	**Collected Date/Time**	10/02/2010 20:18
Project Name/#	32-1-17385 Selawik PACP	**Received Date/Time**	10/05/2010 14:40
Client Sample ID	17385-AVS3	**Technical Director**	**Stephen C. Ede**
Matrix	Soil/Solid (dry weight)		

Sample Remarks:

AK102 - Unknown hydrocarbon with several peaks is present.

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Benzene	147 U	147	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	590 U	590	ug/Kg	SW8021B	B			10/08/10	HM
o-Xylene	590 U	590	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	590 U	590	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	4340	590	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates									
1,4-Difluorobenzene <surr>	96.1		%	SW8021B	B	80-120		10/08/10	HM
Semivolatile Organic Fuels Department									
Diesel Range Organics	2440	1920	mg/Kg	AK102	A		10/06/10	10/10/10	LCE
Surrogates									
5a Androstane <surr>	0 !		%	AK102	A	50-150	10/06/10	10/10/10	LCE
Solids									
Total Solids	27.9		%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368012		
Client Name	Shannon & Wilson, Inc.	**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP	**Collected Date/Time**	10/02/2010 20:25
Client Sample ID	17385-AVS4	**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

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

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

Parameter	Results		LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department										
Benzene	137 U		137	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	547 U		547	ug/Kg	SW8021B	B			10/08/10	HM
o-Xylene	1550		547	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	1480		547	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	1230		547	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates										
1,4-Difluorobenzene <surr>	95.5			%	SW8021B	B	80-120		10/08/10	HM
Semivolatile Organic Fuels Department										
Diesel Range Organics	34300		3020	mg/Kg	AK102	A		10/06/10	10/10/10	LCE
Surrogates										
5a Androstane <surr>	0	!		%	AK102	A	50-150	10/06/10	10/10/10	LCE
Solids										
Total Solids	23.2			%	SM20 2540G	A			10/06/10	AHJ

SGS

Revised Report

SGS Ref.#	1105368013			
Client Name	Shannon & Wilson, Inc.		**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP		**Collected Date/Time**	10/02/2010 21:10
Client Sample ID	17385-AVS5		**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)		**Technical Director**	**Stephen C. Ede**

Sample Remarks:

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

AK102 - Diesel range organics result is biased high due to heavier hydrocarbons contributing to the middle distillate range.

AK103 - Unknown hydrocarbon with several peaks is present.

AK102/103 - 5a-Androstane and n-triacontane (surrogates) recoveries are outside QC criteria due to sample dilution.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals by ICP/MS									
Arsenic	51.5	3.52	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Barium	117	1.06	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Cadmium	3.23	0.705	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Chromium	28.7	1.41	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Lead	572	0.705	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Nickel	15.6	0.705	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Vanadium	10.6 U	10.6	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Semivolatile Organic Fuels Department									
Diesel Range Organics	9410	5670	mg/Kg	AK102	A		10/06/10	10/10/10	LCE
Residual Range Organics	25900	5670	mg/Kg	AK103	A		10/06/10	10/10/10	LCE
Surrogates									
5a Androstane <surr>	0 !		%	AK102	A	50-150	10/06/10	10/10/10	LCE
n-Triacontane-d62 <surr>	0 !		%	AK103	A	50-150	10/06/10	10/10/10	LCE
Polychlorinated Biphenyls									
Aroclor-1016	187 U	187	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1221	187 U	187	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1232	187 U	187	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1242	187 U	187	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1248	187 U	187	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1254	187 U	187	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1260	187 U	187	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS

Revised Report

SGS Ref.#	1105368013		
Client Name	Shannon & Wilson, Inc.	**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP	**Collected Date/Time**	10/02/2010 21:10
Client Sample ID	17385-AVS5	**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)	**Technical Director**	**Stephen C. Ede**

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Polychlorinated Biphenyls									
Surrogates									
Decachlorobiphenyl <surr>	99.8		%	SW8082A	A	60-125	10/06/10	10/08/10	RTS
Volatile Gas Chromatography/Mass Spectroscopy									
1,1,1,2-Tetrachloroethane	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
1,1,1-Trichloroethane	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
1,1,2,2-Tetrachloroethane	615 U	615	ug/Kg	SW8260B	B			10/08/10	JDB
1,1,2-Trichloroethane	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
1,1-Dichloroethane	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
1,1-Dichloroethene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
1,1-Dichloropropene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
1,2,3-Trichlorobenzene	615 U	615	ug/Kg	SW8260B	B			10/08/10	JDB
1,2,3-Trichloropropane	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
1,2,4-Trichlorobenzene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
1,2,4-Trimethylbenzene	615 U	615	ug/Kg	SW8260B	B			10/08/10	JDB
1,2-Dibromo-3-chloropropane	1230 U	1230	ug/Kg	SW8260B	B			10/08/10	JDB
1,2-Dibromoethane	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
1,2-Dichlorobenzene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
1,2-Dichloroethane	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
1,2-Dichloropropane	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
1,3,5-Trimethylbenzene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
1,3-Dichlorobenzene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
1,3-Dichloropropane	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
1,4-Dichlorobenzene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
2,2-Dichloropropane	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
2-Butanone (MEK)	3070 U	3070	ug/Kg	SW8260B	B			10/08/10	JDB
2-Chlorotoluene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
2-Hexanone	3070 U	3070	ug/Kg	SW8260B	B			10/08/10	JDB
4-Chlorotoluene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB

Revised Report

SGS Ref.#	1105368013
Client Name	Shannon & Wilson, Inc.
Project Name/#	32-1-17385 Selawik PACP
Client Sample ID	17385-AVS5
Matrix	Soil/Solid (dry weight)

Printed Date/Time	11/09/2010 10:36
Collected Date/Time	10/02/2010 21:10
Received Date/Time	10/05/2010 14:40
Technical Director	**Stephen C. Ede**

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Gas Chromatography/Mass Spectroscopy									
4-Isopropyltoluene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
4-Methyl-2-pentanone (MIBK)	3070 U	3070	ug/Kg	SW8260B	B			10/08/10	JDB
Benzene	154 U	154	ug/Kg	SW8260B	B			10/08/10	JDB
Bromobenzene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
Bromochloromethane	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
Bromodichloromethane	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
Bromoform	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
Bromomethane	2460 U	2460	ug/Kg	SW8260B	B			10/08/10	JDB
Carbon disulfide	1230 U	1230	ug/Kg	SW8260B	B			10/08/10	JDB
Carbon tetrachloride	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
Chlorobenzene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
Chloroethane	2460 U	2460	ug/Kg	SW8260B	B			10/08/10	JDB
Chloroform	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
Chloromethane	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
cis-1,2-Dichloroethene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
cis-1,3-Dichloropropene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
Dibromochloromethane	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
Dibromomethane	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
Dichlorodifluoromethane	615 U	615	ug/Kg	SW8260B	B			10/08/10	JDB
Ethylbenzene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
Hexachlorobutadiene	615 U	615	ug/Kg	SW8260B	B			10/08/10	JDB
Isopropylbenzene (Cumene)	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
Methylene chloride	1230 U	1230	ug/Kg	SW8260B	B			10/08/10	JDB
Methyl-t-butyl ether	1230 U	1230	ug/Kg	SW8260B	B			10/08/10	JDB
Naphthalene	615 U	615	ug/Kg	SW8260B	B			10/08/10	JDB
n-Butylbenzene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
n-Propylbenzene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
o-Xylene	615 U	615	ug/Kg	SW8260B	B			10/08/10	JDB
P & M -Xylene	615 U	615	ug/Kg	SW8260B	B			10/08/10	JDB
sec-Butylbenzene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB

SGS Ref.#	1105368013			
Client Name	Shannon & Wilson, Inc.		**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP		**Collected Date/Time**	10/02/2010 21:10
Client Sample ID	17385-AVS5		**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)		**Technical Director**	**Stephen C. Ede**

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Gas Chromatography/Mass Spectroscopy									
Styrene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
tert-Butylbenzene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
Tetrachloroethene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
Toluene	615	615	ug/Kg	SW8260B	B			10/08/10	JDB
trans-1,2-Dichloroethene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
trans-1,3-Dichloropropene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
Trichloroethene	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
Trichlorofluoromethane	5940	615	ug/Kg	SW8260B	B			10/08/10	JDB
Vinyl chloride	307 U	307	ug/Kg	SW8260B	B			10/08/10	JDB
Xylenes (total)	1230 U	1230	ug/Kg	SW8260B	B			10/08/10	JDB
Surrogates									
1,2-Dichloroethane-D4 <surr>	102		%	SW8260B	B	80-117		10/08/10	JDB
4-Bromofluorobenzene <surr>	92.5		%	SW8260B	B	68-136		10/08/10	JDB
Toluene-d8 <surr>	102		%	SW8260B	B	85-121		10/08/10	JDB
Solids									
Total Solids	26.5		%	SM20 2540G	A			10/06/10	AHJ

SGS Ref.#	1105368014		
Client Name	Shannon & Wilson, Inc.	**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP	**Collected Date/Time**	10/02/2010 20:35
Client Sample ID	17385-AVS6	**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

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

AK103 - Unknown hydrocarbon with several peaks is present.

AK102/103 - 5a-Androstane and n-triacontane (surrogates) recoveries are outside QC criteria due to sample dilution.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals by ICP/MS									
Arsenic	2.11	1.67	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Barium	62.4	0.500	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Cadmium	0.333 U	0.333	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Chromium	18.5	0.666	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Lead	7.37	0.333	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Nickel	8.92	0.333	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Vanadium	20.0	5.00	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Semivolatile Organic Fuels Department									
Diesel Range Organics	125000	4270	mg/Kg	AK102	A		10/08/10	10/11/10	LCE
Residual Range Organics	11500	4270	mg/Kg	AK103	A		10/08/10	10/11/10	LCE
Surrogates									
5a Androstane <surr>	0 !		%	AK102	A	50-150	10/08/10	10/11/10	LCE
n-Triacontane-d62 <surr>	0 !		%	AK103	A	50-150	10/08/10	10/11/10	LCE
Polychlorinated Biphenyls									
Aroclor-1016	86.7 U	86.7	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1221	86.7 U	86.7	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1232	86.7 U	86.7	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1242	86.7 U	86.7	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1248	86.7 U	86.7	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1254	86.7 U	86.7	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1260	86.7 U	86.7	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS

Revised Report

SGS Ref.#	1105368014			
Client Name	Shannon & Wilson, Inc.		**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP		**Collected Date/Time**	10/02/2010 20:35
Client Sample ID	17385-AVS6		**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)		**Technical Director**	**Stephen C. Ede**

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Polychlorinated Biphenyls									
Surrogates									
Decachlorobiphenyl <surr>	79.7		%	SW8082A	A	60-125	10/06/10	10/08/10	RTS
Volatile Gas Chromatography/Mass Spectroscopy									
1,1,1,2-Tetrachloroethane	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
1,1,1-Trichloroethane	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
1,1,2,2-Tetrachloroethane	246 U	246	ug/Kg	SW8260B	B			10/08/10	JDB
1,1,2-Trichloroethane	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
1,1-Dichloroethane	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
1,1-Dichloroethene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
1,1-Dichloropropene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
1,2,3-Trichlorobenzene	246 U	246	ug/Kg	SW8260B	B			10/08/10	JDB
1,2,3-Trichloropropane	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
1,2,4-Trichlorobenzene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
1,2,4-Trimethylbenzene	2630	246	ug/Kg	SW8260B	B			10/08/10	JDB
1,2-Dibromo-3-chloropropane	493 U	493	ug/Kg	SW8260B	B			10/08/10	JDB
1,2-Dibromoethane	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
1,2-Dichlorobenzene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
1,2-Dichloroethane	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
1,2-Dichloropropane	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
1,3,5-Trimethylbenzene	11000	1230	ug/Kg	SW8260B	B			10/13/10	SCL
1,3-Dichlorobenzene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
1,3-Dichloropropane	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
1,4-Dichlorobenzene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
2,2-Dichloropropane	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
2-Butanone (MEK)	1230 U	1230	ug/Kg	SW8260B	B			10/08/10	JDB
2-Chlorotoluene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
2-Hexanone	1230 U	1230	ug/Kg	SW8260B	B			10/08/10	JDB
4-Chlorotoluene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB

SGS Ref.#	1105368014
Client Name	Shannon & Wilson, Inc.
Project Name/#	32-1-17385 Selawik PACP
Client Sample ID	17385-AVS6
Matrix	Soil/Solid (dry weight)

Printed Date/Time	11/09/2010 10:36
Collected Date/Time	10/02/2010 20:35
Received Date/Time	10/05/2010 14:40
Technical Director	**Stephen C. Ede**

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Gas Chromatography/Mass Spectroscopy									
4-Isopropyltoluene	3940	123	ug/Kg	SW8260B	B			10/08/10	JDB
4-Methyl-2-pentanone (MIBK)	1230 U	1230	ug/Kg	SW8260B	B			10/08/10	JDB
Benzene	61.6 U	61.6	ug/Kg	SW8260B	B			10/08/10	JDB
Bromobenzene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
Bromochloromethane	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
Bromodichloromethane	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
Bromoform	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
Bromomethane	985 U	985	ug/Kg	SW8260B	B			10/08/10	JDB
Carbon disulfide	493 U	493	ug/Kg	SW8260B	B			10/08/10	JDB
Carbon tetrachloride	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
Chlorobenzene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
Chloroethane	985 U	985	ug/Kg	SW8260B	B			10/08/10	JDB
Chloroform	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
Chloromethane	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
cis-1,2-Dichloroethene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
cis-1,3-Dichloropropene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
Dibromochloromethane	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
Dibromomethane	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
Dichlorodifluoromethane	246 U	246	ug/Kg	SW8260B	B			10/08/10	JDB
Ethylbenzene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
Hexachlorobutadiene	246 U	246	ug/Kg	SW8260B	B			10/08/10	JDB
Isopropylbenzene (Cumene)	271	123	ug/Kg	SW8260B	B			10/08/10	JDB
Methylene chloride	493 U	493	ug/Kg	SW8260B	B			10/08/10	JDB
Methyl-t-butyl ether	493 U	493	ug/Kg	SW8260B	B			10/08/10	JDB
Naphthalene	246 U	246	ug/Kg	SW8260B	B			10/08/10	JDB
n-Butylbenzene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
n-Propylbenzene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
o-Xylene	888	246	ug/Kg	SW8260B	B			10/08/10	JDB
P & M -Xylene	246 U	246	ug/Kg	SW8260B	B			10/08/10	JDB
sec-Butylbenzene	1830	123	ug/Kg	SW8260B	B			10/08/10	JDB

Revised Report

SGS Ref.#	1105368014			
Client Name	Shannon & Wilson, Inc.		**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP		**Collected Date/Time**	10/02/2010 20:35
Client Sample ID	17385-AVS6		**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)		**Technical Director**	**Stephen C. Ede**

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Gas Chromatography/Mass Spectroscopy									
Styrene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
tert-Butylbenzene	298	123	ug/Kg	SW8260B	B			10/08/10	JDB
Tetrachloroethene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
Toluene	246 U	246	ug/Kg	SW8260B	B			10/08/10	JDB
trans-1,2-Dichloroethene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
trans-1,3-Dichloropropene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
Trichloroethene	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
Trichlorofluoromethane	246 U	246	ug/Kg	SW8260B	B			10/08/10	JDB
Vinyl chloride	123 U	123	ug/Kg	SW8260B	B			10/08/10	JDB
Xylenes (total)	1120	493	ug/Kg	SW8260B	B			10/08/10	JDB
Surrogates									
1,2-Dichloroethane-D4 <surr>	91.7		%	SW8260B	B	80-117		10/08/10	JDB
4-Bromofluorobenzene <surr>	76.3		%	SW8260B	B	68-136		10/08/10	JDB
Toluene-d8 <surr>	92.6		%	SW8260B	B	85-121		10/08/10	JDB
Solids									
Total Solids	56.8		%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368015		
Client Name	Shannon & Wilson, Inc.	**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP	**Collected Date/Time**	10/02/2010 20:55
Client Sample ID	17385-AVS7	**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

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

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Benzene	78.0 U	78.0	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	312 U	312	ug/Kg	SW8021B	B			10/08/10	HM
o-Xylene	1680	312	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	314	312	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	312 U	312	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates									
1,4-Difluorobenzene <surr>	97.2		%	SW8021B	B	80-120		10/08/10	HM
Semivolatile Organic Fuels Department									
Diesel Range Organics	144000	4820	mg/Kg	AK102	A		10/08/10	10/11/10	LCE
Surrogates									
5a Androstane <surr>	0 !		%	AK102	A	50-150	10/08/10	10/11/10	LCE
Solids									
Total Solids	48.0		%	SM20 2540G	A			10/06/10	AHJ

SGS

Revised Report

SGS Ref.#	1105368016			
Client Name	Shannon & Wilson, Inc.		**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP		**Collected Date/Time**	10/02/2010 21:15
Client Sample ID	17385-AVS8		**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)		**Technical Director**	**Stephen C. Ede**

Sample Remarks:

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

AK103 - The pattern is consistent with a lube oil.

AK102/103 - 5a-Androstane and n-triacontane (surrogates) recoveries are outside QC criteria due to sample dilution.

Parameter	Results		LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Semivolatile Organic Fuels Department										
Diesel Range Organics	25900		2820	mg/Kg	AK102	A		10/08/10	10/12/10	LCE
Residual Range Organics	35500		2820	mg/Kg	AK103	A		10/08/10	10/12/10	LCE
Surrogates										
5a Androstane <surr>	0	!		%	AK102	A	50-150	10/08/10	10/12/10	LCE
n-Triacontane-d62 <surr>	0	!		%	AK103	A	50-150	10/08/10	10/12/10	LCE
Polychlorinated Biphenyls										
Aroclor-1016	153 U		153	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1221	153 U		153	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1232	153 U		153	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1242	153 U		153	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1248	153 U		153	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1254	153 U		153	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1260	153 U		153	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Surrogates										
Decachlorobiphenyl <surr>	86.4			%	SW8082A	A	60-125	10/06/10	10/08/10	RTS
Solids										
Total Solids	31.9			%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368017	**Printed Date/Time**	11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.	**Collected Date/Time**	10/02/2010 20:45
Project Name/#	32-1-17385 Selawik PACP	**Received Date/Time**	10/05/2010 14:40
Client Sample ID	17385-AVS11	**Technical Director**	**Stephen C. Ede**
Matrix	Soil/Solid (dry weight)		

Sample Remarks:

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

AK103 - Unknown hydrocarbon with several peaks is present.

AK102/103 - 5a-Androstane and n-triacontane (surrogates) recoveries are outside QC criteria due to sample dilution.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Metals by ICP/MS									
Arsenic	1.93	1.72	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Barium	60.6	0.515	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Cadmium	0.343 U	0.343	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Chromium	18.0	0.687	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Lead	7.92	0.343	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Nickel	8.68	0.343	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Vanadium	20.2	5.15	mg/Kg	SW6020	A		10/07/10	10/08/10	NRB
Semivolatile Organic Fuels Department									
Diesel Range Organics	132000	5440	mg/Kg	AK102	A		10/08/10	10/11/10	LCE
Residual Range Organics	14400	5440	mg/Kg	AK103	A		10/08/10	10/11/10	LCE
Surrogates									
5a Androstane <surr>	0	!	%	AK102	A	50-150	10/08/10	10/11/10	LCE
n-Triacontane-d62 <surr>	0	!	%	AK103	A	50-150	10/08/10	10/11/10	LCE
Polychlorinated Biphenyls									
Aroclor-1016	89.2 U	89.2	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1221	89.2 U	89.2	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1232	89.2 U	89.2	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1242	89.2 U	89.2	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1248	89.2 U	89.2	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1254	89.2 U	89.2	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS
Aroclor-1260	89.2 U	89.2	ug/Kg	SW8082A	A		10/06/10	10/08/10	RTS

Revised Report

SGS Ref.#	1105368017
Client Name	Shannon & Wilson, Inc.
Project Name/#	32-1-17385 Selawik PACP
Client Sample ID	17385-AVS11
Matrix	Soil/Solid (dry weight)

Printed Date/Time	11/09/2010 10:36
Collected Date/Time	10/02/2010 20:45
Received Date/Time	10/05/2010 14:40
Technical Director	**Stephen C. Ede**

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Polychlorinated Biphenyls									
Surrogates									
Decachlorobiphenyl <surr>	83		%	SW8082A	A	60-125	10/06/10	10/08/10	RTS
Volatile Gas Chromatography/Mass Spectroscopy									
1,1,1,2-Tetrachloroethane	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
1,1,1-Trichloroethane	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
1,1,2,2-Tetrachloroethane	2320 U	2320	ug/Kg	SW8260B	B			10/13/10	SCL
1,1,2-Trichloroethane	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
1,1-Dichloroethane	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
1,1-Dichloroethene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
1,1-Dichloropropene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
1,2,3-Trichlorobenzene	2320 U	2320	ug/Kg	SW8260B	B			10/13/10	SCL
1,2,3-Trichloropropane	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
1,2,4-Trichlorobenzene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
1,2,4-Trimethylbenzene	5020	2320	ug/Kg	SW8260B	B			10/13/10	SCL
1,2-Dibromo-3-chloropropane	4650 U	4650	ug/Kg	SW8260B	B			10/13/10	SCL
1,2-Dibromoethane	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
1,2-Dichlorobenzene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
1,2-Dichloroethane	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
1,2-Dichloropropane	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
1,3,5-Trimethylbenzene	11600	1160	ug/Kg	SW8260B	B			10/13/10	SCL
1,3-Dichlorobenzene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
1,3-Dichloropropane	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
1,4-Dichlorobenzene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
2,2-Dichloropropane	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
2-Butanone (MEK)	11600 U	11600	ug/Kg	SW8260B	B			10/13/10	SCL
2-Chlorotoluene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
2-Hexanone	11600 U	11600	ug/Kg	SW8260B	B			10/13/10	SCL
4-Chlorotoluene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL

SGS Ref.#	1105368017
Client Name	Shannon & Wilson, Inc.
Project Name/#	32-1-17385 Selawik PACP
Client Sample ID	17385-AVS11
Matrix	Soil/Solid (dry weight)

Printed Date/Time	11/09/2010 10:36
Collected Date/Time	10/02/2010 20:45
Received Date/Time	10/05/2010 14:40
Technical Director	**Stephen C. Ede**

Volatile Gas Chromatography/Mass Spectroscopy

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
4-Isopropyltoluene	5870	1160	ug/Kg	SW8260B	B			10/13/10	SCL
4-Methyl-2-pentanone (MIBK)	11600 U	11600	ug/Kg	SW8260B	B			10/13/10	SCL
Benzene	581 U	581	ug/Kg	SW8260B	B			10/13/10	SCL
Bromobenzene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
Bromochloromethane	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
Bromodichloromethane	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
Bromoform	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
Bromomethane	9290 U	9290	ug/Kg	SW8260B	B			10/13/10	SCL
Carbon disulfide	4650 U	4650	ug/Kg	SW8260B	B			10/13/10	SCL
Carbon tetrachloride	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
Chlorobenzene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
Chloroethane	9290 U	9290	ug/Kg	SW8260B	B			10/13/10	SCL
Chloroform	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
Chloromethane	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
cis-1,2-Dichloroethene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
cis-1,3-Dichloropropene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
Dibromochloromethane	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
Dibromomethane	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
Dichlorodifluoromethane	2320 U	2320	ug/Kg	SW8260B	B			10/13/10	SCL
Ethylbenzene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
Hexachlorobutadiene	2320 U	2320	ug/Kg	SW8260B	B			10/13/10	SCL
Isopropylbenzene (Cumene)	1450	1160	ug/Kg	SW8260B	B			10/13/10	SCL
Methylene chloride	4650 U	4650	ug/Kg	SW8260B	B			10/13/10	SCL
Methyl-t-butyl ether	4650 U	4650	ug/Kg	SW8260B	B			10/13/10	SCL
Naphthalene	2320 U	2320	ug/Kg	SW8260B	B			10/13/10	SCL
n-Butylbenzene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
n-Propylbenzene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
o-Xylene	2320 U	2320	ug/Kg	SW8260B	B			10/13/10	SCL
P & M -Xylene	2320 U	2320	ug/Kg	SW8260B	B			10/13/10	SCL
sec-Butylbenzene	3310	1160	ug/Kg	SW8260B	B			10/13/10	SCL

Revised Report

SGS Ref.#	1105368017		
Client Name	Shannon & Wilson, Inc.	**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP	**Collected Date/Time**	10/02/2010 20:45
Client Sample ID	17385-AVS11	**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)	**Technical Director**	**Stephen C. Ede**

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Gas Chromatography/Mass Spectroscopy									
Styrene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
tert-Butylbenzene	1190	1160	ug/Kg	SW8260B	B			10/13/10	SCL
Tetrachloroethene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
Toluene	2320 U	2320	ug/Kg	SW8260B	B			10/13/10	SCL
trans-1,2-Dichloroethene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
trans-1,3-Dichloropropene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
Trichloroethene	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
Trichlorofluoromethane	2320 U	2320	ug/Kg	SW8260B	B			10/13/10	SCL
Vinyl chloride	1160 U	1160	ug/Kg	SW8260B	B			10/13/10	SCL
Xylenes (total)	4650 U	4650	ug/Kg	SW8260B	B			10/13/10	SCL
Surrogates									
1,2-Dichloroethane-D4 <surr>	103		%	SW8260B	B	80-117		10/13/10	SCL
4-Bromofluorobenzene <surr>	91.3		%	SW8260B	B	68-136		10/13/10	SCL
Toluene-d8 <surr>	97.3		%	SW8260B	B	85-121		10/13/10	SCL
Solids									
Total Solids	55.1		%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368019
Client Name	Shannon & Wilson, Inc.
Project Name/#	32-1-17385 Selawik PACP
Client Sample ID	17385-TB2
Matrix	Soil/Solid (dry weight)

Printed Date/Time	11/09/2010 10:36
Collected Date/Time	10/01/2010 18:00
Received Date/Time	10/05/2010 14:40
Technical Director	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Gas Chromatography/Mass Spectroscopy									
1,1,1,2-Tetrachloroethane	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
1,1,1-Trichloroethane	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
1,1,2,2-Tetrachloroethane	50.9 U	50.9	ug/Kg	SW8260B	A			10/08/10	JDB
1,1,2-Trichloroethane	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
1,1-Dichloroethane	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
1,1-Dichloroethene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
1,1-Dichloropropene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
1,2,3-Trichlorobenzene	50.9 U	50.9	ug/Kg	SW8260B	A			10/08/10	JDB
1,2,3-Trichloropropane	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
1,2,4-Trichlorobenzene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
1,2,4-Trimethylbenzene	50.9 U	50.9	ug/Kg	SW8260B	A			10/08/10	JDB
1,2-Dibromo-3-chloropropane	102 U	102	ug/Kg	SW8260B	A			10/08/10	JDB
1,2-Dibromoethane	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
1,2-Dichlorobenzene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
1,2-Dichloroethane	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
1,2-Dichloropropane	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
1,3,5-Trimethylbenzene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
1,3-Dichlorobenzene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
1,3-Dichloropropane	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
1,4-Dichlorobenzene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
2,2-Dichloropropane	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
2-Butanone (MEK)	254 U	254	ug/Kg	SW8260B	A			10/08/10	JDB
2-Chlorotoluene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
2-Hexanone	254 U	254	ug/Kg	SW8260B	A			10/08/10	JDB
4-Chlorotoluene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
4-Isopropyltoluene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
4-Methyl-2-pentanone (MIBK)	254 U	254	ug/Kg	SW8260B	A			10/08/10	JDB
Benzene	12.7 U	12.7	ug/Kg	SW8260B	A			10/08/10	JDB

SGS Ref.#	1105368019			
Client Name	Shannon & Wilson, Inc.		**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP		**Collected Date/Time**	10/01/2010 18:00
Client Sample ID	17385-TB2		**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)		**Technical Director**	**Stephen C. Ede**

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Gas Chromatography/Mass Spectroscopy									
Bromobenzene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
Bromochloromethane	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
Bromodichloromethane	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
Bromoform	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
Bromomethane	203 U	203	ug/Kg	SW8260B	A			10/08/10	JDB
Carbon disulfide	102 U	102	ug/Kg	SW8260B	A			10/08/10	JDB
Carbon tetrachloride	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
Chlorobenzene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
Chloroethane	203 U	203	ug/Kg	SW8260B	A			10/08/10	JDB
Chloroform	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
Chloromethane	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
cis-1,2-Dichloroethene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
cis-1,3-Dichloropropene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
Dibromochloromethane	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
Dibromomethane	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
Dichlorodifluoromethane	50.9 U	50.9	ug/Kg	SW8260B	A			10/08/10	JDB
Ethylbenzene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
Hexachlorobutadiene	50.9 U	50.9	ug/Kg	SW8260B	A			10/08/10	JDB
Isopropylbenzene (Cumene)	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
Methylene chloride	102 U	102	ug/Kg	SW8260B	A			10/08/10	JDB
Methyl-t-butyl ether	102 U	102	ug/Kg	SW8260B	A			10/08/10	JDB
Naphthalene	50.9 U	50.9	ug/Kg	SW8260B	A			10/08/10	JDB
n-Butylbenzene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
n-Propylbenzene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
o-Xylene	50.9 U	50.9	ug/Kg	SW8260B	A			10/08/10	JDB
P & M -Xylene	50.9 U	50.9	ug/Kg	SW8260B	A			10/08/10	JDB
sec-Butylbenzene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
Styrene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
tert-Butylbenzene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
Tetrachloroethene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB

SGS Ref.#	1105368019		
Client Name	Shannon & Wilson, Inc.	**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP	**Collected Date/Time**	10/01/2010 18:00
Client Sample ID	17385-TB2	**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)	**Technical Director**	**Stephen C. Ede**

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Gas Chromatography/Mass Spectroscopy									
Toluene	50.9 U	50.9	ug/Kg	SW8260B	A			10/08/10	JDB
trans-1,2-Dichloroethene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
trans-1,3-Dichloropropene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
Trichloroethene	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
Trichlorofluoromethane	50.9 U	50.9	ug/Kg	SW8260B	A			10/08/10	JDB
Vinyl chloride	25.4 U	25.4	ug/Kg	SW8260B	A			10/08/10	JDB
Xylenes (total)	102 U	102	ug/Kg	SW8260B	A			10/08/10	JDB
Surrogates									
1,2-Dichloroethane-D4 <surr>	101		%	SW8260B	A	80-117		10/08/10	JDB
4-Bromofluorobenzene <surr>	117		%	SW8260B	A	68-136		10/08/10	JDB
Toluene-d8 <surr>	101		%	SW8260B	A	85-121		10/08/10	JDB

Revised Report

SGS Ref.#	1105368020
Client Name	Shannon & Wilson, Inc.
Project Name/#	32-1-17385 Selawik PACP
Client Sample ID	17385-I1S4
Matrix	Soil/Solid (dry weight)

Printed Date/Time	11/09/2010 10:36
Collected Date/Time	09/30/2010 15:30
Received Date/Time	10/05/2010 14:40
Technical Director	**Stephen C. Ede**

Sample Remarks:

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to hydrocarbon interference.

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

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

Parameter	Results		LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department										
Benzene	2640		133	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	956		532	ug/Kg	SW8021B	B			10/08/10	HM
Gasoline Range Organics	258		26.6	mg/Kg	AK101	B			10/08/10	HM
o-Xylene	29100		532	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	23900		532	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	6320		532	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates										
1,4-Difluorobenzene <surr>	103			%	SW8021B	B	80-120		10/08/10	HM
4-Bromofluorobenzene <surr>	678	!		%	AK101	B	50-150		10/08/10	HM
Semivolatile Organic Fuels Department										
Diesel Range Organics	11400		564	mg/Kg	AK102	A		10/08/10	10/11/10	LCE
Surrogates										
5a Androstane <surr>	0	!		%	AK102	A	50-150	10/08/10	10/11/10	LCE
Solids										
Total Solids	69.9			%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368022		
Client Name	Shannon & Wilson, Inc.	**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP	**Collected Date/Time**	09/30/2010 16:25
Client Sample ID	17385-I2S1	**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to hydrocarbon interference.

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

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Benzene	23600	2420	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	10600	9690	ug/Kg	SW8021B	B			10/08/10	HM
Gasoline Range Organics	4930	485	mg/Kg	AK101	B			10/08/10	HM
o-Xylene	538000	9690	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	938000	9690	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	301000	9690	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates									
1,4-Difluorobenzene <surr>	103		%	SW8021B	B	80-120		10/08/10	HM
4-Bromofluorobenzene <surr>	2710 !		%	AK101	B	50-150		10/08/10	HM
Semivolatile Organic Fuels Department									
Diesel Range Organics	37300	3100	mg/Kg	AK102	A		10/08/10	10/12/10	LCE
Surrogates									
5a Androstane <surr>	0 !		%	AK102	A	50-150	10/08/10	10/12/10	LCE
Solids									
Total Solids	64.4		%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368023			
Client Name	Shannon & Wilson, Inc.		**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP		**Collected Date/Time**	09/30/2010 17:15
Client Sample ID	17385-I3S3		**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)		**Technical Director**	**Stephen C. Ede**

Sample Remarks:

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to hydrocarbon interference.

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

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Benzene	77100	964	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	48900	3860	ug/Kg	SW8021B	B			10/08/10	HM
Gasoline Range Organics	1530	193	mg/Kg	AK101	B			10/08/10	HM
o-Xylene	72400	3860	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	166000	3860	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	233000	3860	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates									
1,4-Difluorobenzene <surr>	106		%	SW8021B	B	80-120		10/08/10	HM
4-Bromofluorobenzene <surr>	901	!	%	AK101	B	50-150		10/08/10	HM
Semivolatile Organic Fuels Department									
Diesel Range Organics	615	149	mg/Kg	AK102	A		10/08/10	10/12/10	LCE
Surrogates									
5a Androstane <surr>	68.4		%	AK102	A	50-150	10/08/10	10/12/10	LCE
Solids									
Total Solids	66.1		%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368024
Client Name	Shannon & Wilson, Inc.
Project Name/#	32-1-17385 Selawik PACP
Client Sample ID	17385-I4S3
Matrix	Soil/Solid (dry weight)

Printed Date/Time	11/09/2010 10:36
Collected Date/Time	09/30/2010 18:10
Received Date/Time	10/05/2010 14:40
Technical Director	**Stephen C. Ede**

Sample Remarks:

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to hydrocarbon interference.

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

AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

Parameter	Results		LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department										
Benzene	2920		511	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	45000		2050	ug/Kg	SW8021B	B			10/08/10	HM
Gasoline Range Organics	1350		102	mg/Kg	AK101	B			10/08/10	HM
o-Xylene	69900		2050	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	76000		2050	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	6960		2050	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates										
1,4-Difluorobenzene <surr>	104			%	SW8021B	B	80-120		10/08/10	HM
4-Bromofluorobenzene <surr>	2730	!		%	AK101	B	50-150		10/08/10	HM
Semivolatile Organic Fuels Department										
Diesel Range Organics	26800		948	mg/Kg	AK102	A		10/08/10	10/11/10	LCE
Surrogates										
5a Androstane <surr>	0	!		%	AK102	A	50-150	10/08/10	10/11/10	LCE
Solids										
Total Solids	63.2			%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368025
Client Name	Shannon & Wilson, Inc.
Project Name/#	32-1-17385 Selawik PACP
Client Sample ID	17385-I5S3
Matrix	Soil/Solid (dry weight)

Printed Date/Time	11/09/2010 10:36
Collected Date/Time	10/01/2010 10:55
Received Date/Time	10/05/2010 14:40
Technical Director	**Stephen C. Ede**

Sample Remarks:

AK102 - Unknown hydrocarbon with several peaks is present.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Benzene	419	34.2	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	137 U	137	ug/Kg	SW8021B	B			10/08/10	HM
Gasoline Range Organics	6.84 U	6.84	mg/Kg	AK101	B			10/08/10	HM
o-Xylene	137 U	137	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	137 U	137	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	137 U	137	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates									
1,4-Difluorobenzene <surr>	96.3		%	SW8021B	B	80-120		10/08/10	HM
4-Bromofluorobenzene <surr>	102		%	AK101	B	50-150		10/08/10	HM
Semivolatile Organic Fuels Department									
Diesel Range Organics	60.5	42.2	mg/Kg	AK102	A		10/08/10	10/12/10	LCE
Surrogates									
5a Androstane <surr>	66.6		%	AK102	A	50-150	10/08/10	10/12/10	LCE
Solids									
Total Solids	68.9		%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368026			
Client Name	Shannon & Wilson, Inc.		**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP		**Collected Date/Time**	10/01/2010 15:25
Client Sample ID	17385-I6S1		**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)		**Technical Director**	**Stephen C. Ede**

Sample Remarks:

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to hydrocarbon interference.

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

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Benzene	176	36.5	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	146 U	146	ug/Kg	SW8021B	B			10/08/10	HM
Gasoline Range Organics	69.4	7.31	mg/Kg	AK101	B			10/08/10	HM
o-Xylene	1790	146	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	615	146	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	146 U	146	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates									
1,4-Difluorobenzene <surr>	105		%	SW8021B	B	80-120		10/08/10	HM
4-Bromofluorobenzene <surr>	237	!	%	AK101	B	50-150		10/08/10	HM
Semivolatile Organic Fuels Department									
Diesel Range Organics	3010	145	mg/Kg	AK102	A		10/08/10	10/12/10	LCE
Surrogates									
5a Androstane <surr>	59.7		%	AK102	A	50-150	10/08/10	10/12/10	LCE
Solids									
Total Solids	68.9		%	SM20 2540G	A			10/06/10	AHJ

SGS

Revised Report

SGS Ref.#	1105368027			
Client Name	Shannon & Wilson, Inc.		**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP		**Collected Date/Time**	10/01/2010 11:25
Client Sample ID	17385-I6S3		**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)		**Technical Director**	**Stephen C. Ede**

Sample Remarks:

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to hydrocarbon interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered gasoline.
8270D SIM - Sample was extracted past the 14 day hold time.
8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.
8270D SIM - LCS recovery for benzo[a]pyrene does not meet QC criteria (biased low).

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Benzene	1270000	8270	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	761000	33100	ug/Kg	SW8021B	B			10/08/10	HM
Gasoline Range Organics	21200	1650	mg/Kg	AK101	B			10/08/10	HM
o-Xylene	1120000	33100	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	2510000	33100	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	3690000	33100	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates									
1,4-Difluorobenzene <surr>	107		%	SW8021B	B	80-120		10/08/10	HM
4-Bromofluorobenzene <surr>	9950 !		%	AK101	B	50-150		10/08/10	HM
Semivolatile Organic Fuels Department									
Diesel Range Organics	20900	1440	mg/Kg	AK102	A		10/08/10	10/12/10	LCE
Surrogates									
5a Androstane <surr>	0 !		%	AK102	A	50-150	10/08/10	10/12/10	LCE
Polynuclear Aromatics GC/MS									
1-Methylnaphthalene	22900	10800	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
2-Methylnaphthalene	33200	10800	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Acenaphthene	1080 U	1080	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Acenaphthylene	1080 U	1080	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE

Revised Report

SGS Ref.#	1105368027		
Client Name	Shannon & Wilson, Inc.	**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP	**Collected Date/Time**	10/01/2010 11:25
Client Sample ID	17385-I6S3	**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)	**Technical Director**	**Stephen C. Ede**

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Polynuclear Aromatics GC/MS									
Anthracene	1080 U	1080	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Benzo(a)Anthracene	54.1 U	54.1	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Benzo[a]pyrene	54.1 U	54.1	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Benzo[b]Fluoranthene	54.1 U	54.1	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Benzo[g,h,i]perylene	54.1 U	54.1	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Benzo[k]fluoranthene	54.1 U	54.1	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Chrysene	54.1 U	54.1	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Dibenzo[a,h]anthracene	54.1 U	54.1	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Fluoranthene	54.1 U	54.1	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Fluorene	1750	1080	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Indeno[1,2,3-c,d] pyrene	54.1 U	54.1	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Naphthalene	33300	10800	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Phenanthrene	1080 U	1080	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Pyrene	85.0	54.1	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Surrogates									
Terphenyl-d14 <surr>	99.2		%	8270D SIMS	A	30-125	11/03/10	11/04/10	CDE
Solids									
Total Solids	68.6		%	SM20 2540G	A			10/06/10	AHJ

SGS

Revised Report

SGS Ref.#	1105368028			
Client Name	Shannon & Wilson, Inc.		**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP		**Collected Date/Time**	10/01/2010 11:35
Client Sample ID	17385-I6S12		**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)		**Technical Director**	**Stephen C. Ede**

Sample Remarks:

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to hydrocarbon interference.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.
AK102 - The pattern is consistent with a weathered gasoline.
8270D SIM - Sample was extracted past the 14 day hold time.
8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.
8270D SIM - LCS recovery for benzo[a]pyrene does not meet QC criteria (biased low).

Parameter	Results		LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department										
Benzene	1210000		7420	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	615000		29700	ug/Kg	SW8021B	B			10/08/10	HM
Gasoline Range Organics	17300		1480	mg/Kg	AK101	B			10/08/10	HM
o-Xylene	911000		29700	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	2000000		29700	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	3240000		29700	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates										
1,4-Difluorobenzene <surr>	107			%	SW8021B	B	80-120		10/08/10	HM
4-Bromofluorobenzene <surr>	8330	!		%	AK101	B	50-150		10/08/10	HM
Semivolatile Organic Fuels Department										
Diesel Range Organics	20100		1440	mg/Kg	AK102	A		10/08/10	10/12/10	LCE
Surrogates										
5a Androstane <surr>	0	!		%	AK102	A	50-150	10/08/10	10/12/10	LCE
Polynuclear Aromatics GC/MS										
1-Methylnaphthalene	45400		14600	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
2-Methylnaphthalene	64700		14600	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Acenaphthene	1460 U		1460	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Acenaphthylene	1460 U		1460	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE

Revised Report

SGS Ref.#	1105368028
Client Name	Shannon & Wilson, Inc.
Project Name/#	32-1-17385 Selawik PACP
Client Sample ID	17385-I6S12
Matrix	Soil/Solid (dry weight)

Printed Date/Time	11/09/2010 10:36
Collected Date/Time	10/01/2010 11:35
Received Date/Time	10/05/2010 14:40
Technical Director	**Stephen C. Ede**

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Polynuclear Aromatics GC/MS									
Anthracene	1460 U	1460	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Benzo(a)Anthracene	73.0 U	73.0	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Benzo[a]pyrene	73.0 U	73.0	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Benzo[b]Fluoranthene	73.0 U	73.0	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Benzo[g,h,i]perylene	73.0 U	73.0	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Benzo[k]fluoranthene	73.0 U	73.0	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Chrysene	73.0 U	73.0	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Dibenzo[a,h]anthracene	73.0 U	73.0	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Fluoranthene	73.0 U	73.0	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Fluorene	1770	1460	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Indeno[1,2,3-c,d] pyrene	73.0 U	73.0	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Naphthalene	67400	14600	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Phenanthrene	1460 U	1460	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Pyrene	97.0	73.0	ug/Kg	8270D SIMS	A		11/03/10	11/04/10	CDE
Surrogates									
Terphenyl-d14 <surr>	91.9		%	8270D SIMS	A	30-125	11/03/10	11/04/10	CDE
Solids									
Total Solids	68.4		%	SM20 2540G	A			10/06/10	AHJ

SGS Ref.#	1105368029		
Client Name	Shannon & Wilson, Inc.	**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP	**Collected Date/Time**	10/01/2010 15:40
Client Sample ID	17385-I7S2	**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to hydrocarbon interference.
AK102 - The pattern is consistent with a weathered middle distillate.
AK102 - 5a-Androstane (surrogate) recovery is outside QC criteria due to sample dilution.

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Benzene	153 U	153	ug/Kg	SW8021B	B			10/08/10	HM
Ethylbenzene	3340	611	ug/Kg	SW8021B	B			10/08/10	HM
Gasoline Range Organics	654	30.6	mg/Kg	AK101	B			10/08/10	HM
o-Xylene	56900	611	ug/Kg	SW8021B	B			10/08/10	HM
P & M -Xylene	22400	611	ug/Kg	SW8021B	B			10/08/10	HM
Toluene	611 U	611	ug/Kg	SW8021B	B			10/08/10	HM
Surrogates									
1,4-Difluorobenzene <surr>	104		%	SW8021B	B	80-120		10/08/10	HM
4-Bromofluorobenzene <surr>	1950 !		%	AK101	B	50-150		10/08/10	HM
Semivolatile Organic Fuels Department									
Diesel Range Organics	17200	575	mg/Kg	AK102	A		10/08/10	10/11/10	LCE
Surrogates									
5a Androstane <surr>	0 !		%	AK102	A	50-150	10/08/10	10/11/10	LCE
Solids									
Total Solids	68.4		%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368030
Client Name	Shannon & Wilson, Inc.
Project Name/#	32-1-17385 Selawik PACP
Client Sample ID	17385-I9S2
Matrix	Soil/Solid (dry weight)

Printed Date/Time	11/09/2010 10:36
Collected Date/Time	10/01/2010 16:55
Received Date/Time	10/05/2010 14:40
Technical Director	**Stephen C. Ede**

Sample Remarks:

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

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Benzene	35.7 U	35.7	ug/Kg	SW8021B	B			10/09/10	HM
Ethylbenzene	143 U	143	ug/Kg	SW8021B	B			10/09/10	HM
Gasoline Range Organics	14.9	7.15	mg/Kg	AK101	B			10/09/10	HM
o-Xylene	234	143	ug/Kg	SW8021B	B			10/09/10	HM
P & M -Xylene	192	143	ug/Kg	SW8021B	B			10/09/10	HM
Toluene	143 U	143	ug/Kg	SW8021B	B			10/09/10	HM
Surrogates									
1,4-Difluorobenzene <surr>	95.2		%	SW8021B	B	80-120		10/09/10	HM
4-Bromofluorobenzene <surr>	122		%	AK101	B	50-150		10/09/10	HM
Semivolatile Organic Fuels Department									
Diesel Range Organics	131	29.9	mg/Kg	AK102	A		10/08/10	10/12/10	LCE
Surrogates									
5a Androstane <surr>	62.2		%	AK102	A	50-150	10/08/10	10/12/10	LCE
Solids									
Total Solids	66.5		%	SM20 2540G	A			10/06/10	AHJ

SGS

Revised Report

SGS Ref.#	1105368031			
Client Name	Shannon & Wilson, Inc.		**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP		**Collected Date/Time**	10/01/2010 15:10
Client Sample ID	17385-I10S3		**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)		**Technical Director**	**Stephen C. Ede**

Sample Remarks:

AK102 - Unknown hydrocarbon with several peaks is present.

Volatile Fuels Department

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Benzene	40.8 U	40.8	ug/Kg	SW8021B	B			10/09/10	HM
Ethylbenzene	163 U	163	ug/Kg	SW8021B	B			10/09/10	HM
Gasoline Range Organics	8.17 U	8.17	mg/Kg	AK101	B			10/09/10	HM
o-Xylene	163 U	163	ug/Kg	SW8021B	B			10/09/10	HM
P & M -Xylene	163 U	163	ug/Kg	SW8021B	B			10/09/10	HM
Toluene	163 U	163	ug/Kg	SW8021B	B			10/09/10	HM

Surrogates

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
1,4-Difluorobenzene <surr>	97.5		%	SW8021B	B	80-120		10/09/10	HM
4-Bromofluorobenzene <surr>	97.1		%	AK101	B	50-150		10/09/10	HM

Semivolatile Organic Fuels Department

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Diesel Range Organics	48.0	28.3	mg/Kg	AK102	A		10/08/10	10/12/10	LCE

Surrogates

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
5a Androstane <surr>	59.1		%	AK102	A	50-150	10/08/10	10/12/10	LCE

Solids

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Total Solids	69.7		%	SM20 2540G	A			10/06/10	AHJ

Revised Report

SGS Ref.#	1105368037		
Client Name	Shannon & Wilson, Inc.	**Printed Date/Time**	11/09/2010 10:36
Project Name/#	32-1-17385 Selawik PACP	**Collected Date/Time**	09/30/2010 15:00
Client Sample ID	17385-TB1	**Received Date/Time**	10/05/2010 14:40
Matrix	Soil/Solid (dry weight)	**Technical Director**	**Stephen C. Ede**

Sample Remarks:

Parameter	Results	LOQ	Units	Method	Container ID	Allowable Limits	Prep Date	Analysis Date	Init
Volatile Fuels Department									
Benzene	12.7 U	12.7	ug/Kg	SW8021B	A			10/08/10	HM
Ethylbenzene	50.6 U	50.6	ug/Kg	SW8021B	A			10/08/10	HM
Gasoline Range Organics	2.53 U	2.53	mg/Kg	AK101	A			10/08/10	HM
o-Xylene	50.6 U	50.6	ug/Kg	SW8021B	A			10/08/10	HM
P & M -Xylene	50.6 U	50.6	ug/Kg	SW8021B	A			10/08/10	HM
Toluene	50.6 U	50.6	ug/Kg	SW8021B	A			10/08/10	HM
Surrogates									
1,4-Difluorobenzene <surr>	97		%	SW8021B	A	80-120		10/08/10	HM
4-Bromofluorobenzene <surr>	96.9		%	AK101	A	50-150		10/08/10	HM

SGS Ref.#	995419	Method Blank	**Printed Date/Time**		11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.		**Prep**	**Batch**	XXX23832
Project Name/#	32-1-17385 Selawik PACP			**Method**	SW3550C
Matrix	Soil/Solid (dry weight)			**Date**	10/06/2010

QC results affect the following production samples:

1105368013, 1105368014, 1105368016, 1105368017

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
Polychlorinated Biphenyls					
Aroclor-1016	30.0 U	50.0	15.0	ug/Kg	10/08/10
Aroclor-1221	30.0 U	50.0	15.0	ug/Kg	10/08/10
Aroclor-1232	30.0 U	50.0	15.0	ug/Kg	10/08/10
Aroclor-1242	30.0 U	50.0	15.0	ug/Kg	10/08/10
Aroclor-1248	30.0 U	50.0	15.0	ug/Kg	10/08/10
Aroclor-1254	30.0 U	50.0	15.0	ug/Kg	10/08/10
Aroclor-1260	30.0 U	50.0	15.0	ug/Kg	10/08/10
Surrogates					
Decachlorobiphenyl <surr>	107	60-125		%	10/08/10

Batch XGC7221
Method SW8082A
Instrument HP 6890 Series II ECD SV L R

Revised Report

SGS Ref.#	995432	Method Blank	**Printed Date/Time**		11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.		**Prep**	**Batch**	XXX23835
Project Name/#	32-1-17385 Selawik PACP			**Method**	SW3550C
Matrix	Soil/Solid (dry weight)			**Date**	10/06/2010

QC results affect the following production samples:

1105368001, 1105368005, 1105368006, 1105368007, 1105368008, 1105368009, 1105368010, 1105368011, 1105368012, 1105368013

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
Semivolatile Organic Fuels Department					
Diesel Range Organics	12.4 U	20.0	6.20	mg/Kg	10/07/10
Surrogates					
5a Androstane <surr>	82.7	60-120		%	10/07/10
Batch XFC9566					
Method AK102					
Instrument HP 7890A FID SV E R					
Residual Range Organics	12.4 U	20.0	6.20	mg/Kg	10/07/10
Surrogates					
n-Triacontane-d62 <surr>	99.3	60-120		%	10/07/10
Batch XFC9566					
Method AK103					
Instrument HP 7890A FID SV E R					

Revised Report

SGS Ref.#	995437	Method Blank	**Printed Date/Time**		11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.		**Prep**	**Batch**	
Project Name/#	32-1-17385 Selawik PACP			**Method**	
Matrix	Soil/Solid (dry weight)			**Date**	

QC results affect the following production samples:

1105368001, 1105368002, 1105368003, 1105368004, 1105368005, 1105368006, 1105368007, 1105368008, 1105368009, 1105368010, 1105368011, 1105368012, 1105368013, 1105368014, 1105368015, 1105368016, 1105368017, 1105368020, 1105368022, 1105368023, 1105368024, 1105368025, 1105368026, 1105368027, 1105368028, 1105368029, 1105368030, 1105368031

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
Solids					
Total Solids	100			%	10/06/10

Batch SPT8258
Method SM20 2540G
Instrument

SGS Ref.#	995667	Method Blank	**Printed Date/Time**		11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.		**Prep**	**Batch**	MXX23634
Project Name/#	32-1-17385 Selawik PACP			**Method**	SW3050B
Matrix	Soil/Solid (dry weight)			**Date**	10/07/2010

QC results affect the following production samples:

1105368003, 1105368004, 1105368013, 1105368014, 1105368017

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
Metals by ICP/MS					
Arsenic	0.620 U	1.00	0.310	mg/Kg	10/08/10
Barium	0.188 U	0.300	0.0940	mg/Kg	10/08/10
Cadmium	0.124 U	0.200	0.0620	mg/Kg	10/08/10
Chromium	0.240 U	0.400	0.120	mg/Kg	10/08/10
Lead	0.124 U	0.200	0.0620	mg/Kg	10/08/10
Nickel	0.124 U	0.200	0.0620	mg/Kg	10/08/10
Selenium	0.300 U	0.500	0.150	mg/Kg	10/08/10
Silver	0.0620 U	0.100	0.0310	mg/Kg	10/08/10
Vanadium	1.88 U	3.00	0.940	mg/Kg	10/08/10

Batch MMS6737

Method SW6020

Instrument Perkin Elmer Sciex ICP-MS P3

Revised Report

SGS Ref.#	995773	Method Blank	**Printed Date/Time**	11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.		**Prep** **Batch**	MXX23636
Project Name/#	32-1-17385 Selawik PACP		**Method**	METHOD
Matrix	Soil/Solid (dry weight)		**Date**	10/06/2010

QC results affect the following production samples:

1105368002, 1105368003, 1105368004

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
Metals Department					
Mercury	24.0 U	40.0	12.0	ug/Kg	10/07/10

Batch	MCV4670
Method	SW7471B
Instrument	PSA Millennium mercury AA

SGS Ref.#	995906 Method Blank	**Printed Date/Time**		11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.	**Prep**	**Batch**	XXX23852
Project Name/#	32-1-17385 Selawik PACP		**Method**	SW3550C
Matrix	Soil/Solid (dry weight)		**Date**	10/08/2010

QC results affect the following production samples:

1105368014, 1105368015, 1105368016, 1105368017, 1105368020, 1105368022, 1105368023, 1105368024, 1105368025, 1105368026, 1105368027, 1105368028, 1105368029, 1105368030, 1105368031

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
Semivolatile Organic Fuels Department					
Diesel Range Organics	12.4 U	20.0	6.20	mg/Kg	10/08/10
Surrogates					
5a Androstane <surr>	81.2	60-120		%	10/08/10
Batch XFC9567					
Method AK102					
Instrument HP 6890 Series II FID SV D R					
Residual Range Organics	12.4 U	20.0	6.20	mg/Kg	10/08/10
Surrogates					
n-Triacontane-d62 <surr>	96.4	60-120		%	10/08/10
Batch XFC9567					
Method AK103					
Instrument HP 6890 Series II FID SV D R					

Revised Report

SGS Ref.#	995978 Method Blank	**Printed Date/Time**		11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.	**Prep**	**Batch**	
Project Name/#	32-1-17385 Selawik PACP		**Method**	
Matrix	Soil/Solid (dry weight)		**Date**	

QC results affect the following production samples:

1105368013, 1105368014, 1105368019

Parameter	Results	LOQ/CL	DL	Units	Analysis Date

Volatile Gas Chromatography/Mass Spectroscopy

Revised Report

SGS Ref.#	995978 Method Blank	**Printed Date/Time**	11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.	**Prep**	**Batch**
Project Name/#	32-1-17385 Selawik PACP		**Method**
Matrix	Soil/Solid (dry weight)		**Date**

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
Volatile Gas Chromatography/Mass Spectroscopy					
1,1,1,2-Tetrachloroethane	15.6 U	25.0	7.80	ug/Kg	10/08/10
1,1,1-Trichloroethane	15.6 U	25.0	7.80	ug/Kg	10/08/10
1,1,2,2-Tetrachloroethane	30.0 U	50.0	15.0	ug/Kg	10/08/10
1,1,2-Trichloroethane	15.6 U	25.0	7.80	ug/Kg	10/08/10
1,1-Dichloroethane	15.6 U	25.0	7.80	ug/Kg	10/08/10
1,1-Dichloroethene	15.6 U	25.0	7.80	ug/Kg	10/08/10
1,1-Dichloropropene	15.6 U	25.0	7.80	ug/Kg	10/08/10
1,2,3-Trichlorobenzene	30.0 U	50.0	15.0	ug/Kg	10/08/10
1,2,3-Trichloropropane	15.6 U	25.0	7.80	ug/Kg	10/08/10
1,2,4-Trichlorobenzene	15.6 U	25.0	7.80	ug/Kg	10/08/10
1,2,4-Trimethylbenzene	30.0 U	50.0	15.0	ug/Kg	10/08/10
1,2-Dibromo-3-chloropropane	62.0 U	100	31.0	ug/Kg	10/08/10
1,2-Dibromoethane	15.6 U	25.0	7.80	ug/Kg	10/08/10
1,2-Dichlorobenzene	15.6 U	25.0	7.80	ug/Kg	10/08/10
1,2-Dichloroethane	15.6 U	25.0	7.80	ug/Kg	10/08/10
1,2-Dichloropropane	15.6 U	25.0	7.80	ug/Kg	10/08/10
1,3,5-Trimethylbenzene	15.6 U	25.0	7.80	ug/Kg	10/08/10
1,3-Dichlorobenzene	15.6 U	25.0	7.80	ug/Kg	10/08/10
1,3-Dichloropropane	15.6 U	25.0	7.80	ug/Kg	10/08/10
1,4-Dichlorobenzene	15.6 U	25.0	7.80	ug/Kg	10/08/10
2,2-Dichloropropane	15.6 U	25.0	7.80	ug/Kg	10/08/10
2-Butanone (MEK)	156 U	250	78.0	ug/Kg	10/08/10
2-Chlorotoluene	15.6 U	25.0	7.80	ug/Kg	10/08/10
2-Hexanone	156 U	250	78.0	ug/Kg	10/08/10
4-Chlorotoluene	15.6 U	25.0	7.80	ug/Kg	10/08/10
4-Isopropyltoluene	15.6 U	25.0	7.80	ug/Kg	10/08/10
4-Methyl-2-pentanone (MIBK)	156 U	250	78.0	ug/Kg	10/08/10
Benzene	7.80 U	12.5	3.90	ug/Kg	10/08/10
Bromobenzene	15.6 U	25.0	7.80	ug/Kg	10/08/10
Bromochloromethane	15.6 U	25.0	7.80	ug/Kg	10/08/10
Bromodichloromethane	15.6 U	25.0	7.80	ug/Kg	10/08/10
Bromoform	15.6 U	25.0	7.80	ug/Kg	10/08/10
Bromomethane	124 U	200	62.0	ug/Kg	10/08/10
Carbon disulfide	62.0 U	100	31.0	ug/Kg	10/08/10
Carbon tetrachloride	15.6 U	25.0	7.80	ug/Kg	10/08/10
Chlorobenzene	15.6 U	25.0	7.80	ug/Kg	10/08/10
Chloroethane	124 U	200	62.0	ug/Kg	10/08/10
Chloroform	15.6 U	25.0	7.80	ug/Kg	10/08/10
Chloromethane	15.6 U	25.0	7.80	ug/Kg	10/08/10

Revised Report

SGS Ref.#	995978 Method Blank	**Printed Date/Time**	11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.	**Prep** **Batch**	
Project Name/#	32-1-17385 Selawik PACP	**Method**	
Matrix	Soil/Solid (dry weight)	**Date**	

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
Volatile Gas Chromatography/Mass Spectroscopy					
cis-1,2-Dichloroethene	15.6 U	25.0	7.80	ug/Kg	10/08/10
cis-1,3-Dichloropropene	15.6 U	25.0	7.80	ug/Kg	10/08/10
Dibromochloromethane	15.6 U	25.0	7.80	ug/Kg	10/08/10
Dibromomethane	15.6 U	25.0	7.80	ug/Kg	10/08/10
Dichlorodifluoromethane	30.0 U	50.0	15.0	ug/Kg	10/08/10
Ethylbenzene	15.6 U	25.0	7.80	ug/Kg	10/08/10
Hexachlorobutadiene	30.0 U	50.0	15.0	ug/Kg	10/08/10
Isopropylbenzene (Cumene)	15.6 U	25.0	7.80	ug/Kg	10/08/10
Methylene chloride	62.0 U	100	31.0	ug/Kg	10/08/10
Methyl-t-butyl ether	62.0 U	100	31.0	ug/Kg	10/08/10
Naphthalene	30.0 U	50.0	15.0	ug/Kg	10/08/10
n-Butylbenzene	15.6 U	25.0	7.80	ug/Kg	10/08/10
n-Propylbenzene	15.6 U	25.0	7.80	ug/Kg	10/08/10
o-Xylene	30.0 U	50.0	15.0	ug/Kg	10/08/10
P & M -Xylene	30.0 U	50.0	15.0	ug/Kg	10/08/10
sec-Butylbenzene	15.6 U	25.0	7.80	ug/Kg	10/08/10
Styrene	15.6 U	25.0	7.80	ug/Kg	10/08/10
tert-Butylbenzene	15.6 U	25.0	7.80	ug/Kg	10/08/10
Tetrachloroethene	15.6 U	25.0	7.80	ug/Kg	10/08/10
Toluene	30.0 U	50.0	15.0	ug/Kg	10/08/10
trans-1,2-Dichloroethene	15.6 U	25.0	7.80	ug/Kg	10/08/10
trans-1,3-Dichloropropene	15.6 U	25.0	7.80	ug/Kg	10/08/10
Trichloroethene	15.6 U	25.0	7.80	ug/Kg	10/08/10
Trichlorofluoromethane	30.0 U	50.0	15.0	ug/Kg	10/08/10
Vinyl chloride	15.6 U	25.0	7.80	ug/Kg	10/08/10
Xylenes (total)	62.0 U	100	31.0	ug/Kg	10/08/10
Surrogates					
1,2-Dichloroethane-D4 <surr>	97.3	80-117		%	10/08/10
4-Bromofluorobenzene <surr>	107	68-136		%	10/08/10
Toluene-d8 <surr>	106	85-121		%	10/08/10

Batch VMS11670
Method SW8260B
Instrument HP 5890 Series II MS5 VLA

SGS Ref.#	996125 Method Blank	**Printed Date/Time**		11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.	**Prep**	**Batch**	
Project Name/#	32-1-17385 Selawik PACP		**Method**	
Matrix	Soil/Solid (dry weight)		**Date**	

QC results affect the following production samples:

1105368001, 1105368005, 1105368006, 1105368007, 1105368008, 1105368009, 1105368010, 1105368011, 1105368012, 1105368015, 1105368020, 1105368022, 1105368023, 1105368024, 1105368025, 1105368026, 1105368027, 1105368028, 1105368029, 1105368037

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
Volatile Fuels Department					
Gasoline Range Organics	1.50 U	2.50	0.750	mg/Kg	10/08/10
Surrogates					
4-Bromofluorobenzene <surr>	107	50-150		%	10/08/10
Batch VFC10219					
Method AK101					
Instrument HP 5890 Series II PID+FID VCA					
Benzene	8.00 U	12.5	4.00	ug/Kg	10/08/10
Ethylbenzene	30.0 U	50.0	15.0	ug/Kg	10/08/10
o-Xylene	30.0 U	50.0	15.0	ug/Kg	10/08/10
P & M -Xylene	30.0 U	50.0	15.0	ug/Kg	10/08/10
Toluene	30.0 U	50.0	15.0	ug/Kg	10/08/10
Surrogates					
1,4-Difluorobenzene <surr>	97	80-120		%	10/08/10
Batch VFC10219					
Method SW8021B					
Instrument HP 5890 Series II PID+FID VCA					

Revised Report

SGS Ref.#	996148	Method Blank	**Printed Date/Time**	11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.		**Prep** **Batch**	
Project Name/#	32-1-17385 Selawik PACP		**Method**	
Matrix	Soil/Solid (dry weight)		**Date**	

QC results affect the following production samples:

1105368030, 1105368031

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
Volatile Fuels Department					
Gasoline Range Organics	1.50 U	2.50	0.750	mg/Kg	10/08/10
Surrogates					
4-Bromofluorobenzene <surr>	104	50-150		%	10/08/10
Batch VFC10219					
Method AK101					
Instrument HP 5890 Series II PID+FID VCA					
Benzene	8.00 U	12.5	4.00	ug/Kg	10/08/10
Ethylbenzene	30.0 U	50.0	15.0	ug/Kg	10/08/10
o-Xylene	30.0 U	50.0	15.0	ug/Kg	10/08/10
P & M -Xylene	30.0 U	50.0	15.0	ug/Kg	10/08/10
Toluene	30.0 U	50.0	15.0	ug/Kg	10/08/10
Surrogates					
1,4-Difluorobenzene <surr>	96.8	80-120		%	10/08/10
Batch VFC10219					
Method SW8021B					
Instrument HP 5890 Series II PID+FID VCA					

SGS Ref.#	997016	Method Blank	**Printed Date/Time**	11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.		**Prep**	**Batch**
Project Name/#	32-1-17385 Selawik PACP			**Method**
Matrix	Soil/Solid (dry weight)			**Date**

QC results affect the following production samples:

1105368014, 1105368017

Parameter	Results	LOQ/CL	DL	Units	Analysis Date

Volatile Gas Chromatography/Mass Spectroscopy

Revised Report

SGS Ref.#	997016 Method Blank	**Printed Date/Time**	11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.	**Prep** **Batch**	
Project Name/#	32-1-17385 Selawik PACP	**Method**	
Matrix	Soil/Solid (dry weight)	**Date**	

Parameter	Results	LOQ/CL	DL	Units	Analysis Date

Volatile Gas Chromatography/Mass Spectroscopy

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
1,1,1,2-Tetrachloroethane	15.6 U	25.0	7.80	ug/Kg	10/13/10
1,1,1-Trichloroethane	15.6 U	25.0	7.80	ug/Kg	10/13/10
1,1,2,2-Tetrachloroethane	30.0 U	50.0	15.0	ug/Kg	10/13/10
1,1,2-Trichloroethane	15.6 U	25.0	7.80	ug/Kg	10/13/10
1,1-Dichloroethane	15.6 U	25.0	7.80	ug/Kg	10/13/10
1,1-Dichloroethene	15.6 U	25.0	7.80	ug/Kg	10/13/10
1,1-Dichloropropene	15.6 U	25.0	7.80	ug/Kg	10/13/10
1,2,3-Trichlorobenzene	30.0 U	50.0	15.0	ug/Kg	10/13/10
1,2,3-Trichloropropane	15.6 U	25.0	7.80	ug/Kg	10/13/10
1,2,4-Trichlorobenzene	15.6 U	25.0	7.80	ug/Kg	10/13/10
1,2,4-Trimethylbenzene	30.0 U	50.0	15.0	ug/Kg	10/13/10
1,2-Dibromo-3-chloropropane	62.0 U	100	31.0	ug/Kg	10/13/10
1,2-Dibromoethane	15.6 U	25.0	7.80	ug/Kg	10/13/10
1,2-Dichlorobenzene	15.6 U	25.0	7.80	ug/Kg	10/13/10
1,2-Dichloroethane	15.6 U	25.0	7.80	ug/Kg	10/13/10
1,2-Dichloropropane	15.6 U	25.0	7.80	ug/Kg	10/13/10
1,3,5-Trimethylbenzene	15.6 U	25.0	7.80	ug/Kg	10/13/10
1,3-Dichlorobenzene	15.6 U	25.0	7.80	ug/Kg	10/13/10
1,3-Dichloropropane	15.6 U	25.0	7.80	ug/Kg	10/13/10
1,4-Dichlorobenzene	15.6 U	25.0	7.80	ug/Kg	10/13/10
2,2-Dichloropropane	15.6 U	25.0	7.80	ug/Kg	10/13/10
2-Butanone (MEK)	156 U	250	78.0	ug/Kg	10/13/10
2-Chlorotoluene	15.6 U	25.0	7.80	ug/Kg	10/13/10
2-Hexanone	156 U	250	78.0	ug/Kg	10/13/10
4-Chlorotoluene	15.6 U	25.0	7.80	ug/Kg	10/13/10
4-Isopropyltoluene	15.6 U	25.0	7.80	ug/Kg	10/13/10
4-Methyl-2-pentanone (MIBK)	156 U	250	78.0	ug/Kg	10/13/10
Benzene	7.80 U	12.5	3.90	ug/Kg	10/13/10
Bromobenzene	15.6 U	25.0	7.80	ug/Kg	10/13/10
Bromochloromethane	15.6 U	25.0	7.80	ug/Kg	10/13/10
Bromodichloromethane	15.6 U	25.0	7.80	ug/Kg	10/13/10
Bromoform	15.6 U	25.0	7.80	ug/Kg	10/13/10
Bromomethane	124 U	200	62.0	ug/Kg	10/13/10
Carbon disulfide	62.0 U	100	31.0	ug/Kg	10/13/10
Carbon tetrachloride	15.6 U	25.0	7.80	ug/Kg	10/13/10
Chlorobenzene	15.6 U	25.0	7.80	ug/Kg	10/13/10
Chloroethane	124 U	200	62.0	ug/Kg	10/13/10
Chloroform	15.6 U	25.0	7.80	ug/Kg	10/13/10
Chloromethane	15.6 U	25.0	7.80	ug/Kg	10/13/10

Revised Report

SGS Ref.#	997016	Method Blank	**Printed Date/Time**	11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.		**Prep**	**Batch**
Project Name/#	32-1-17385 Selawik PACP			**Method**
Matrix	Soil/Solid (dry weight)			**Date**

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
Volatile Gas Chromatography/Mass Spectroscopy					
cis-1,2-Dichloroethene	15.6 U	25.0	7.80	ug/Kg	10/13/10
cis-1,3-Dichloropropene	15.6 U	25.0	7.80	ug/Kg	10/13/10
Dibromochloromethane	15.6 U	25.0	7.80	ug/Kg	10/13/10
Dibromomethane	15.6 U	25.0	7.80	ug/Kg	10/13/10
Dichlorodifluoromethane	30.0 U	50.0	15.0	ug/Kg	10/13/10
Ethylbenzene	15.6 U	25.0	7.80	ug/Kg	10/13/10
Hexachlorobutadiene	30.0 U	50.0	15.0	ug/Kg	10/13/10
Isopropylbenzene (Cumene)	15.6 U	25.0	7.80	ug/Kg	10/13/10
Methylene chloride	62.0 U	100	31.0	ug/Kg	10/13/10
Methyl-t-butyl ether	62.0 U	100	31.0	ug/Kg	10/13/10
Naphthalene	30.0 U	50.0	15.0	ug/Kg	10/13/10
n-Butylbenzene	15.6 U	25.0	7.80	ug/Kg	10/13/10
n-Propylbenzene	15.6 U	25.0	7.80	ug/Kg	10/13/10
o-Xylene	30.0 U	50.0	15.0	ug/Kg	10/13/10
P & M -Xylene	30.0 U	50.0	15.0	ug/Kg	10/13/10
sec-Butylbenzene	15.6 U	25.0	7.80	ug/Kg	10/13/10
Styrene	15.6 U	25.0	7.80	ug/Kg	10/13/10
tert-Butylbenzene	15.6 U	25.0	7.80	ug/Kg	10/13/10
Tetrachloroethene	15.6 U	25.0	7.80	ug/Kg	10/13/10
Toluene	30.0 U	50.0	15.0	ug/Kg	10/13/10
trans-1,2-Dichloroethene	15.6 U	25.0	7.80	ug/Kg	10/13/10
trans-1,3-Dichloropropene	15.6 U	25.0	7.80	ug/Kg	10/13/10
Trichloroethene	15.6 U	25.0	7.80	ug/Kg	10/13/10
Trichlorofluoromethane	30.0 U	50.0	15.0	ug/Kg	10/13/10
Vinyl chloride	15.6 U	25.0	7.80	ug/Kg	10/13/10
Xylenes (total)	62.0 U	100	31.0	ug/Kg	10/13/10
Surrogates					
1,2-Dichloroethane-D4 <surr>	104	80-117		%	10/13/10
4-Bromofluorobenzene <surr>	98.2	68-136		%	10/13/10
Toluene-d8 <surr>	91.5	85-121		%	10/13/10

Batch VMS11680
Method SW8260B
Instrument HP 5890 Series II MS5 VLA

SGS Ref.#	997456 Method Blank	**Printed Date/Time**		11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.	**Prep**	**Batch**	XXX23909
Project Name/#	32-1-17385 Selawik PACP		**Method**	SW3550C
Matrix	Soil/Solid (dry weight)		**Date**	10/15/2010

QC results affect the following production samples:

1105368007

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
Polynuclear Aromatics GC/MS					
1-Methylnaphthalene	3.00 U	5.00	1.50	ug/Kg	10/19/10
2-Methylnaphthalene	3.00 U	5.00	1.50	ug/Kg	10/19/10
Acenaphthene	3.00 U	5.00	1.50	ug/Kg	10/19/10
Acenaphthylene	3.00 U	5.00	1.50	ug/Kg	10/19/10
Anthracene	3.00 U	5.00	1.50	ug/Kg	10/19/10
Benzo(a)Anthracene	3.00 U	5.00	1.50	ug/Kg	10/19/10
Benzo[a]pyrene	3.00 U	5.00	1.50	ug/Kg	10/19/10
Benzo[b]Fluoranthene	3.00 U	5.00	1.50	ug/Kg	10/19/10
Benzo[g,h,i]perylene	3.00 U	5.00	1.50	ug/Kg	10/19/10
Benzo[k]fluoranthene	3.00 U	5.00	1.50	ug/Kg	10/19/10
Chrysene	3.00 U	5.00	1.50	ug/Kg	10/19/10
Dibenzo[a,h]anthracene	3.00 U	5.00	1.50	ug/Kg	10/19/10
Fluoranthene	3.00 U	5.00	1.50	ug/Kg	10/19/10
Fluorene	3.00 U	5.00	1.50	ug/Kg	10/19/10
Indeno[1,2,3-c,d] pyrene	3.00 U	5.00	1.50	ug/Kg	10/19/10
Naphthalene	3.00 U	5.00	1.50	ug/Kg	10/19/10
Phenanthrene	3.00 U	5.00	1.50	ug/Kg	10/19/10
Pyrene	3.00 U	5.00	1.50	ug/Kg	10/19/10
Surrogates					
Terphenyl-d14 <surr>	120	30-125		%	10/19/10

Batch	XMS5727
Method	8270D SIMS
Instrument	HP 6890/5973 MS SVQA

Revised Report

SGS Ref.#	1001961 Method Blank	**Printed Date/Time**		11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.	**Prep**	**Batch**	XXX24046
Project Name/#	32-1-17385 Selawik PACP		**Method**	SW3550C
Matrix	Soil/Solid (dry weight)		**Date**	11/03/2010

QC results affect the following production samples:

1105368027, 1105368028

Parameter	Results	LOQ/CL	DL	Units	Analysis Date
Polynuclear Aromatics GC/MS					
1-Methylnaphthalene	1.79J	5.00	1.50	ug/Kg	11/04/10
2-Methylnaphthalene	2.71J	5.00	1.50	ug/Kg	11/04/10
Acenaphthene	3.00 U	5.00	1.50	ug/Kg	11/04/10
Acenaphthylene	3.00 U	5.00	1.50	ug/Kg	11/04/10
Anthracene	3.00 U	5.00	1.50	ug/Kg	11/04/10
Benzo(a)Anthracene	3.00 U	5.00	1.50	ug/Kg	11/04/10
Benzo[a]pyrene	3.00 U	5.00	1.50	ug/Kg	11/04/10
Benzo[b]Fluoranthene	3.00 U	5.00	1.50	ug/Kg	11/04/10
Benzo[g,h,i]perylene	3.00 U	5.00	1.50	ug/Kg	11/04/10
Benzo[k]fluoranthene	3.00 U	5.00	1.50	ug/Kg	11/04/10
Chrysene	3.00 U	5.00	1.50	ug/Kg	11/04/10
Dibenzo[a,h]anthracene	3.00 U	5.00	1.50	ug/Kg	11/04/10
Fluoranthene	3.00 U	5.00	1.50	ug/Kg	11/04/10
Fluorene	3.00 U	5.00	1.50	ug/Kg	11/04/10
Indeno[1,2,3-c,d] pyrene	3.00 U	5.00	1.50	ug/Kg	11/04/10
Naphthalene	4.61J	5.00	1.50	ug/Kg	11/04/10
Phenanthrene	3.00 U	5.00	1.50	ug/Kg	11/04/10
Pyrene	3.00 U	5.00	1.50	ug/Kg	11/04/10
Surrogates					
Terphenyl-d14 <surr>	84.2	30-125		%	11/04/10

Batch XMS5748

Method 8270D SIMS

Instrument HP 6890/5973 MS SVQA

Revised Report

SGS Ref.#	995438	Duplicate	**Printed Date/Time**	11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.		**Prep** **Batch**	
Project Name/#	32-1-17385 Selawik PACP		**Method**	
Original	1105374001		**Date**	
Matrix	Soil/Solid (dry weight)			

QC results affect the following production samples:

1105368001, 1105368002, 1105368003, 1105368004, 1105368005, 1105368006, 1105368007, 1105368008, 1105368009, 1105368010, 1105368011, 1105368012, 1105368013, 1105368014, 1105368015, 1105368016, 1105368017, 1105368020, 1105368022, 1105368023, 1105368024, 1105368025, 1105368026, 1105368027, 1105368028, 1105368029, 1105368030, 1105368031

Parameter	Original Result	QC Result	Units	RPD	RPD Limits	Analysis Date
Solids						
Total Solids	65.7	66.6	%	1	(< 15)	10/06/2010

Batch SPT8258
Method SM20 2540G
Instrument

Revised Report

SGS Ref.#	995420 Lab Control Sample	**Printed Date/Time**	11/09/2010 10:36
		Prep **Batch**	XXX23832
Client Name	Shannon & Wilson, Inc.	**Method**	SW3550C
Project Name/#	32-1-17385 Selawik PACP	**Date**	10/06/2010
Matrix	Soil/Solid (dry weight)		

QC results affect the following production samples:

1105368013, 1105368014, 1105368016, 1105368017

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Polychlorinated Biphenyls								
Aroclor-1016	LCS	210	95	(58-122)			222 ug/Kg	10/08/2010
Aroclor-1260	LCS	262	118	(61-130)			222 ug/Kg	10/08/2010
Surrogates								
Decachlorobiphenyl <surr>	LCS		110	(60-125)				10/08/2010

Batch XGC7221
Method SW8082A
Instrument HP 6890 Series II ECD SV L R

SGS Ref.#	995433 Lab Control Sample	**Printed Date/Time**		11/09/2010	10:36
	995434 Lab Control Sample Duplicate	**Prep**	**Batch**	XXX23835	
Client Name	Shannon & Wilson, Inc.		**Method**	SW3550C	
Project Name/#	32-1-17385 Selawik PACP		**Date**	10/06/2010	
Matrix	Soil/Solid (dry weight)				

QC results affect the following production samples:

1105368001, 1105368005, 1105368006, 1105368007, 1105368008, 1105368009, 1105368010, 1105368011, 1105368012, 1105368013

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Semivolatile Organic Fuels Department								
Diesel Range Organics	LCS	162	98	(75-125)			167 mg/Kg	10/07/2010
	LCSD	160	96		1	(< 20)	167 mg/Kg	10/07/2010
Surrogates								
5a Androstane <surr>	LCS		101	(60-120)				10/07/2010
	LCSD		103		3			10/07/2010

Batch	XFC9566	
Method	AK102	
Instrument	HP 7890A	FID SV E R

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Residual Range Organics	LCS	169	102	(60-120)			167 mg/Kg	10/07/2010
	LCSD	171	102		1	(< 20)	167 mg/Kg	10/07/2010
Surrogates								
n-Triacontane-d62 <surr>	LCS		99	(60-120)				10/07/2010
	LCSD		101		1			10/07/2010

Batch	XFC9566	
Method	AK103	
Instrument	HP 7890A	FID SV E R

Revised Report

SGS Ref.#	995668 Lab Control Sample	**Printed Date/Time**	11/09/2010 10:36
		Prep **Batch**	MXX23634
Client Name	Shannon & Wilson, Inc.	**Method**	SW3050B
Project Name/#	32-1-17385 Selawik PACP	**Date**	10/07/2010
Matrix	Soil/Solid (dry weight)		

QC results affect the following production samples:

1105368003, 1105368004, 1105368013, 1105368014, 1105368017

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Metals by ICP/MS								
Arsenic	LCS	53.8	108	(80-120)			50 mg/Kg	10/08/2010
Barium	LCS	55.8	112	(80-120)			50 mg/Kg	10/08/2010
Cadmium	LCS	5.39	108	(80-120)			5 mg/Kg	10/08/2010
Chromium	LCS	19.9	100	(80-120)			20 mg/Kg	10/08/2010
Lead	LCS	57.1	114	(80-120)			50 mg/Kg	10/08/2010
Nickel	LCS	52.0	104	(80-120)			50 mg/Kg	10/08/2010
Selenium	LCS	52.8	106	(80-120)			50 mg/Kg	10/08/2010
Silver	LCS	5.60	112	(80-120)			5 mg/Kg	10/08/2010
Vanadium	LCS	9.88	99	(80-120)			10 mg/Kg	10/08/2010

Batch MMS6737
Method SW6020
Instrument Perkin Elmer Sciex ICP-MS P3

SGS Ref.#	995774 Lab Control Sample	**Printed Date/Time**		11/09/2010 10:36
		Prep	**Batch**	MXX23636
Client Name	Shannon & Wilson, Inc.		**Method**	METHOD
Project Name/#	32-1-17385 Selawik PACP		**Date**	10/06/2010
Matrix	Soil/Solid (dry weight)			

QC results affect the following production samples:

1105368002, 1105368003, 1105368004

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Metals Department								
Mercury	LCS	148	89	(80-120)			167 ug/Kg	10/07/2010

Batch	MCV4670
Method	SW7471B
Instrument	PSA Millennium mercury AA

SGS Ref.#	995907 Lab Control Sample	**Printed Date/Time**		11/09/2010 10:36
	995908 Lab Control Sample Duplicate	**Prep**	**Batch**	XXX23852
Client Name	Shannon & Wilson, Inc.		**Method**	SW3550C
Project Name/#	32-1-17385 Selawik PACP		**Date**	10/08/2010
Matrix	Soil/Solid (dry weight)			

QC results affect the following production samples:

1105368014, 1105368015, 1105368016, 1105368017, 1105368020, 1105368022, 1105368023, 1105368024, 1105368025, 1105368026, 1105368027, 1105368028, 1105368029, 1105368030, 1105368031

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Semivolatile Organic Fuels Department								
Diesel Range Organics	LCS	161	97	(75-125)			167 mg/Kg	10/08/2010
	LCSD	159	95		2	(< 20)	167 mg/Kg	10/08/2010
Surrogates								
5a Androstane <surr>	LCS		79	(60-120)				10/08/2010
	LCSD		76		4			10/08/2010

Batch XFC9567
Method AK102
Instrument HP 6890 Series II FID SV D R

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Residual Range Organics	LCS	162	97	(60-120)			167 mg/Kg	10/08/2010
	LCSD	160	96		1	(< 20)	167 mg/Kg	10/08/2010
Surrogates								
n-Triacontane-d62 <surr>	LCS		100	(60-120)				10/08/2010
	LCSD		102		2			10/08/2010

Batch XFC9567
Method AK103
Instrument HP 6890 Series II FID SV D R

SGS Ref.#	995979 Lab Control Sample	**Printed Date/Time**	11/09/2010 10:36
		Prep **Batch**	
Client Name	Shannon & Wilson, Inc.	**Method**	
Project Name/#	32-1-17385 Selawik PACP	**Date**	
Matrix	Soil/Solid (dry weight)		

QC results affect the following production samples:

1105368013, 1105368014, 1105368019

Parameter	QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date

Volatile Gas Chromatography/Mass Spectroscopy

SGS

Revised Report

SGS Ref.#	995979 Lab Control Sample	Printed Date/Time	11/09/2010 10:36
		Prep Batch	
Client Name	Shannon & Wilson, Inc.	Method	
Project Name/#	32-1-17385 Selawik PACP	Date	
Matrix	Soil/Solid (dry weight)		

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Volatile Gas Chromatography/Mass Spectroscopy								
1,1,1,2-Tetrachloroethane	LCS	775	103	(80-125)			750 ug/Kg	10/08/2010
1,1,1-Trichloroethane	LCS	753	100	(80-127)			750 ug/Kg	10/08/2010
1,1,2,2-Tetrachloroethane	LCS	735	98	(80-124)			750 ug/Kg	10/08/2010
1,1,2-Trichloroethane	LCS	765	102	(80-124)			750 ug/Kg	10/08/2010
1,1-Dichloroethane	LCS	753	100	(77-125)			750 ug/Kg	10/08/2010
1,1-Dichloroethene	LCS	705	94	(65-150)			750 ug/Kg	10/08/2010
1,1-Dichloropropene	LCS	807	108	(76-134)			750 ug/Kg	10/08/2010
1,2,3-Trichlorobenzene	LCS	654	87	(68-125)			750 ug/Kg	10/08/2010
1,2,3-Trichloropropane	LCS	655	87	(78-123)			750 ug/Kg	10/08/2010
1,2,4-Trichlorobenzene	LCS	603	80	(76-122)			750 ug/Kg	10/08/2010
1,2,4-Trimethylbenzene	LCS	710	95	(80-122)			750 ug/Kg	10/08/2010
1,2-Dibromo-3-chloropropane	LCS	605	81	(71-128)			750 ug/Kg	10/08/2010
1,2-Dibromoethane	LCS	771	103	(80-124)			750 ug/Kg	10/08/2010
1,2-Dichlorobenzene	LCS	723	96	(80-120)			750 ug/Kg	10/08/2010
1,2-Dichloroethane	LCS	757	101	(80-122)			750 ug/Kg	10/08/2010
1,2-Dichloropropane	LCS	765	102	(80-120)			750 ug/Kg	10/08/2010
1,3,5-Trimethylbenzene	LCS	704	94	(80-123)			750 ug/Kg	10/08/2010
1,3-Dichlorobenzene	LCS	759	101	(80-122)			750 ug/Kg	10/08/2010
1,3-Dichloropropane	LCS	796	106	(80-124)			750 ug/Kg	10/08/2010
1,4-Dichlorobenzene	LCS	790	105	(80-122)			750 ug/Kg	10/08/2010
2,2-Dichloropropane	LCS	812	108	(80-129)			750 ug/Kg	10/08/2010

Revised Report

SGS Ref.#	995979 Lab Control Sample	**Printed Date/Time**	11/09/2010 10:36
		Prep **Batch**	
Client Name	Shannon & Wilson, Inc.	**Method**	
Project Name/#	32-1-17385 Selawik PACP	**Date**	
Matrix	Soil/Solid (dry weight)		

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Volatile Gas Chromatography/Mass Spectroscopy								
2-Butanone (MEK)	LCS	1820	81	(61-140)			2250 ug/Kg	10/08/2010
2-Chlorotoluene	LCS	754	100	(80-123)			750 ug/Kg	10/08/2010
2-Hexanone	LCS	1980	88	(74-129)			2250 ug/Kg	10/08/2010
4-Chlorotoluene	LCS	771	103	(80-123)			750 ug/Kg	10/08/2010
4-Isopropyltoluene	LCS	757	101	(80-123)			750 ug/Kg	10/08/2010
4-Methyl-2-pentanone (MIBK)	LCS	2080	92	(76-126)			2250 ug/Kg	10/08/2010
Benzene	LCS	770	103	(80-123)			750 ug/Kg	10/08/2010
Bromobenzene	LCS	821	109	(80-123)			750 ug/Kg	10/08/2010
Bromochloromethane	LCS	784	105	(72-125)			750 ug/Kg	10/08/2010
Bromodichloromethane	LCS	803	107	(80-123)			750 ug/Kg	10/08/2010
Bromoform	LCS	762	102	(74-125)			750 ug/Kg	10/08/2010
Bromomethane	LCS	735	98	(60-149)			750 ug/Kg	10/08/2010
Carbon disulfide	LCS	1130	100	(45-160)			1130 ug/Kg	10/08/2010
Carbon tetrachloride	LCS	676	90	(80-126)			750 ug/Kg	10/08/2010
Chlorobenzene	LCS	826	110	(80-123)			750 ug/Kg	10/08/2010
Chloroethane	LCS	728	97	(59-154)			750 ug/Kg	10/08/2010
Chloroform	LCS	787	105	(72-125)			750 ug/Kg	10/08/2010
Chloromethane	LCS	796	106	(62-140)			750 ug/Kg	10/08/2010
cis-1,2-Dichloroethene	LCS	779	104	(76-125)			750 ug/Kg	10/08/2010
cis-1,3-Dichloropropene	LCS	817	109	(80-125)			750 ug/Kg	10/08/2010

SGS Ref.#	995979 Lab Control Sample	Printed Date/Time	11/09/2010 10:36
Client Name	Shannon & Wilson, Inc.	Prep Batch	
Project Name/#	32-1-17385 Selawik PACP	Method	
Matrix	Soil/Solid (dry weight)	Date	

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Volatile Gas Chromatography/Mass Spectroscopy								
Dibromochloromethane	LCS	764	102	(80-125)			750 ug/Kg	10/08/2010
Dibromomethane	LCS	770	103	(80-119)			750 ug/Kg	10/08/2010
Dichlorodifluoromethane	LCS	1030	137	(51-155)			750 ug/Kg	10/08/2010
Ethylbenzene	LCS	780	104	(80-123)			750 ug/Kg	10/08/2010
Hexachlorobutadiene	LCS	686	91	(78-124)			750 ug/Kg	10/08/2010
Isopropylbenzene (Cumene)	LCS	750	100	(80-123)			750 ug/Kg	10/08/2010
Methylene chloride	LCS	679	91	(73-125)			750 ug/Kg	10/08/2010
Methyl-t-butyl ether	LCS	1090	97	(79-124)			1130 ug/Kg	10/08/2010
Naphthalene	LCS	665	89	(68-122)			750 ug/Kg	10/08/2010
n-Butylbenzene	LCS	730	97	(80-124)			750 ug/Kg	10/08/2010
n-Propylbenzene	LCS	732	98	(80-125)			750 ug/Kg	10/08/2010
o-Xylene	LCS	762	102	(80-123)			750 ug/Kg	10/08/2010
P & M -Xylene	LCS	1540	103	(80-125)			1500 ug/Kg	10/08/2010
sec-Butylbenzene	LCS	747	100	(80-122)			750 ug/Kg	10/08/2010
Styrene	LCS	745	99	(80-124)			750 ug/Kg	10/08/2010
tert-Butylbenzene	LCS	822	110	(80-121)			750 ug/Kg	10/08/2010
Tetrachloroethene	LCS	832	111	(79-128)			750 ug/Kg	10/08/2010
Toluene	LCS	763	102	(80-125)			750 ug/Kg	10/08/2010
trans-1,2-Dichloroethene	LCS	800	107	(76-126)			750 ug/Kg	10/08/2010
trans-1,3-Dichloropropene	LCS	747	100	(80-124)			750 ug/Kg	10/08/2010
Trichloroethene	LCS	741	99	(80-123)			750 ug/Kg	10/08/2010

Revised Report

SGS Ref.#	995979 Lab Control Sample	**Printed Date/Time**	11/09/2010 10:36
		Prep **Batch**	
Client Name	Shannon & Wilson, Inc.	**Method**	
Project Name/#	32-1-17385 Selawik PACP	**Date**	
Matrix	Soil/Solid (dry weight)		

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Volatile Gas Chromatography/Mass Spectroscopy								
Trichlorofluoromethane	LCS	794	106	(62-149)			750 ug/Kg	10/08/2010
Vinyl chloride	LCS	884	118	(68-139)			750 ug/Kg	10/08/2010
Xylenes (total)	LCS	2300	102	(86-124)			2250 ug/Kg	10/08/2010
Surrogates								
1,2-Dichloroethane-D4 <surr>	LCS		99	(80-117)				10/08/2010
4-Bromofluorobenzene <surr>	LCS		99	(68-136)				10/08/2010
Toluene-d8 <surr>	LCS		110	(85-121)				10/08/2010

Batch VMS11670
Method SW8260B
Instrument HP 5890 Series II MS5 VLA

Revised Report

SGS Ref.#	996126	Lab Control Sample
	996127	Lab Control Sample Duplicate
Client Name	Shannon & Wilson, Inc.	
Project Name/#	32-1-17385 Selawik PACP	
Matrix	Soil/Solid (dry weight)	

Printed Date/Time 11/09/2010 10:36

Prep **Batch**
Method
Date

QC results affect the following production samples:

1105368001, 1105368005, 1105368006, 1105368007, 1105368008, 1105368009, 1105368010, 1105368011, 1105368012, 1105368015, 1105368020, 1105368022, 1105368023, 1105368024, 1105368025, 1105368026, 1105368027, 1105368028, 1105368029, 1105368037

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Volatile Fuels Department								
Benzene	LCS	1100	88	(80-125)			1250 ug/Kg	10/08/2010
	LCSD	1120	90		2	(< 20)	1250 ug/Kg	10/08/2010
Ethylbenzene	LCS	1350	108	(85-125)			1250 ug/Kg	10/08/2010
	LCSD	1370	110		2	(< 20)	1250 ug/Kg	10/08/2010
o-Xylene	LCS	1340	107	(85-125)			1250 ug/Kg	10/08/2010
	LCSD	1360	109		1	(< 20)	1250 ug/Kg	10/08/2010
P & M -Xylene	LCS	2620	105	(85-125)			2500 ug/Kg	10/08/2010
	LCSD	2660	106		2	(< 20)	2500 ug/Kg	10/08/2010
Toluene	LCS	1280	102	(85-120)			1250 ug/Kg	10/08/2010
	LCSD	1300	104		2	(< 20)	1250 ug/Kg	10/08/2010
Surrogates								
1,4-Difluorobenzene <surr>	LCS		100	(80-120)				10/08/2010
	LCSD		100		0			10/08/2010

Batch	VFC10219
Method	SW8021B
Instrument	HP 5890 Series II PID+FID VCA

Revised Report

SGS Ref.#	996128 Lab Control Sample	**Printed Date/Time**		11/09/2010 10:36
	996129 Lab Control Sample Duplicate	**Prep**	**Batch**	
Client Name	Shannon & Wilson, Inc.		**Method**	
Project Name/#	32-1-17385 Selawik PACP		**Date**	
Matrix	Soil/Solid (dry weight)			

QC results affect the following production samples:

1105368001, 1105368005, 1105368006, 1105368007, 1105368008, 1105368009, 1105368010, 1105368011, 1105368012, 1105368015, 1105368020, 1105368022, 1105368023, 1105368024, 1105368025, 1105368026, 1105368027, 1105368028, 1105368029, 1105368037

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Volatile Fuels Department								
Gasoline Range Organics	LCS	11.8	105	(60-120)			11.3 mg/Kg	10/08/2010
	LCSD	11.9	106		1	(< 20)	11.3 mg/Kg	10/08/2010
Surrogates								
4-Bromofluorobenzene <surr>	LCS		108	(50-150)				10/08/2010
	LCSD		106		2			10/08/2010

Batch VFC10219
Method AK101
Instrument HP 5890 Series II PID+FID VCA

Revised Report

SGS Ref.#	996149 Lab Control Sample	**Printed Date/Time**	11/09/2010 10:36
	996150 Lab Control Sample Duplicate	**Prep** **Batch**	
Client Name	Shannon & Wilson, Inc.	**Method**	
Project Name/#	32-1-17385 Selawik PACP	**Date**	
Matrix	Soil/Solid (dry weight)		

QC results affect the following production samples:

1105368030, 1105368031

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Volatile Fuels Department								
Benzene	LCS	1130	90	(80-125)			1250 ug/Kg	10/08/2010
	LCSD	1120	90		1	(< 20)	1250 ug/Kg	10/08/2010
Ethylbenzene	LCS	1380	110	(85-125)			1250 ug/Kg	10/08/2010
	LCSD	1370	110		0	(< 20)	1250 ug/Kg	10/08/2010
o-Xylene	LCS	1360	109	(85-125)			1250 ug/Kg	10/08/2010
	LCSD	1360	109		0	(< 20)	1250 ug/Kg	10/08/2010
P & M -Xylene	LCS	2660	106	(85-125)			2500 ug/Kg	10/08/2010
	LCSD	2650	106		0	(< 20)	2500 ug/Kg	10/08/2010
Toluene	LCS	1300	104	(85-120)			1250 ug/Kg	10/08/2010
	LCSD	1300	104		0	(< 20)	1250 ug/Kg	10/08/2010
Surrogates								
1,4-Difluorobenzene <surr>	LCS		100	(80-120)				10/08/2010
	LCSD		100		0			10/08/2010

Batch VFC10219
Method SW8021B
Instrument HP 5890 Series II PID+FID VCA

Revised Report

SGS Ref.#	996151 Lab Control Sample	**Printed Date/Time**		11/09/2010 10:36
	996152 Lab Control Sample Duplicate	**Prep**	**Batch**	
Client Name	Shannon & Wilson, Inc.		**Method**	
Project Name/#	32-1-17385 Selawik PACP		**Date**	
Matrix	Soil/Solid (dry weight)			

QC results affect the following production samples:

1105368030, 1105368031

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Volatile Fuels Department								
Gasoline Range Organics	LCS	11.5	102	(60-120)			11.3 mg/Kg	10/09/2010
	LCSD	11.5	103		1	(< 20)	11.3 mg/Kg	10/09/2010
Surrogates								
4-Bromofluorobenzene <surr>	LCS		105	(50-150)				10/09/2010
	LCSD		103		2			10/09/2010

Batch VFC10219
Method AK101
Instrument HP 5890 Series II PID+FID VCA

Revised Report

SGS Ref.#	997017 Lab Control Sample	**Printed Date/Time**	11/09/2010 10:36
		Prep	**Batch**
Client Name	Shannon & Wilson, Inc.		**Method**
Project Name/#	32-1-17385 Selawik PACP		**Date**
Matrix	Soil/Solid (dry weight)		

QC results affect the following production samples:

1105368014, 1105368017

Parameter	QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date

Volatile Gas Chromatography/Mass Spectroscopy

SGS

Revised Report

SGS Ref.#	997017 Lab Control Sample	Printed Date/Time	11/09/2010 10:36
		Prep Batch	
Client Name	Shannon & Wilson, Inc.	Method	
Project Name/#	32-1-17385 Selawik PACP	Date	
Matrix	Soil/Solid (dry weight)		

Volatile Gas Chromatography/Mass Spectroscopy

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
1,1,1,2-Tetrachloroethane	LCS	798	106	(80-125)			750 ug/Kg	10/13/2010
1,1,1-Trichloroethane	LCS	846	113	(80-127)			750 ug/Kg	10/13/2010
1,1,2,2-Tetrachloroethane	LCS	674	90	(80-124)			750 ug/Kg	10/13/2010
1,1,2-Trichloroethane	LCS	703	94	(80-124)			750 ug/Kg	10/13/2010
1,1-Dichloroethane	LCS	752	100	(77-125)			750 ug/Kg	10/13/2010
1,1-Dichloroethene	LCS	882	118	(65-150)			750 ug/Kg	10/13/2010
1,1-Dichloropropene	LCS	851	113	(76-134)			750 ug/Kg	10/13/2010
1,2,3-Trichlorobenzene	LCS	715	95	(68-125)			750 ug/Kg	10/13/2010
1,2,3-Trichloropropane	LCS	764	102	(78-123)			750 ug/Kg	10/13/2010
1,2,4-Trichlorobenzene	LCS	762	102	(76-122)			750 ug/Kg	10/13/2010
1,2,4-Trimethylbenzene	LCS	777	104	(80-122)			750 ug/Kg	10/13/2010
1,2-Dibromo-3-chloropropane	LCS	780	104	(71-128)			750 ug/Kg	10/13/2010
1,2-Dibromoethane	LCS	750	100	(80-124)			750 ug/Kg	10/13/2010
1,2-Dichlorobenzene	LCS	731	98	(80-120)			750 ug/Kg	10/13/2010
1,2-Dichloroethane	LCS	839	112	(80-122)			750 ug/Kg	10/13/2010
1,2-Dichloropropane	LCS	701	94	(80-120)			750 ug/Kg	10/13/2010
1,3,5-Trimethylbenzene	LCS	751	100	(80-123)			750 ug/Kg	10/13/2010
1,3-Dichlorobenzene	LCS	856	114	(80-122)			750 ug/Kg	10/13/2010
1,3-Dichloropropane	LCS	788	105	(80-124)			750 ug/Kg	10/13/2010
1,4-Dichlorobenzene	LCS	843	112	(80-122)			750 ug/Kg	10/13/2010
2,2-Dichloropropane	LCS	875	117	(80-129)			750 ug/Kg	10/13/2010

SGS

Revised Report

SGS Ref.#	997017 Lab Control Sample	**Printed Date/Time**	11/09/2010 10:36
		Prep Batch	
Client Name	Shannon & Wilson, Inc.	**Method**	
Project Name/#	32-1-17385 Selawik PACP	**Date**	
Matrix	Soil/Solid (dry weight)		

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Volatile Gas Chromatography/Mass Spectroscopy								
2-Butanone (MEK)	LCS	2200	98	(61-140)			2250 ug/Kg	10/13/2010
2-Chlorotoluene	LCS	820	109	(80-123)			750 ug/Kg	10/13/2010
2-Hexanone	LCS	1850	82	(74-129)			2250 ug/Kg	10/13/2010
4-Chlorotoluene	LCS	778	104	(80-123)			750 ug/Kg	10/13/2010
4-Isopropyltoluene	LCS	774	103	(80-123)			750 ug/Kg	10/13/2010
4-Methyl-2-pentanone (MIBK)	LCS	2060	92	(76-126)			2250 ug/Kg	10/13/2010
Benzene	LCS	848	113	(80-123)			750 ug/Kg	10/13/2010
Bromobenzene	LCS	873	116	(80-123)			750 ug/Kg	10/13/2010
Bromochloromethane	LCS	862	115	(72-125)			750 ug/Kg	10/13/2010
Bromodichloromethane	LCS	768	102	(80-123)			750 ug/Kg	10/13/2010
Bromoform	LCS	767	102	(74-125)			750 ug/Kg	10/13/2010
Bromomethane	LCS	838	112	(60-149)			750 ug/Kg	10/13/2010
Carbon disulfide	LCS	1230	109	(45-160)			1130 ug/Kg	10/13/2010
Carbon tetrachloride	LCS	823	110	(80-126)			750 ug/Kg	10/13/2010
Chlorobenzene	LCS	766	102	(80-123)			750 ug/Kg	10/13/2010
Chloroethane	LCS	1080	143	(59-154)			750 ug/Kg	10/13/2010
Chloroform	LCS	773	103	(72-125)			750 ug/Kg	10/13/2010
Chloromethane	LCS	796	106	(62-140)			750 ug/Kg	10/13/2010
cis-1,2-Dichloroethene	LCS	768	102	(76-125)			750 ug/Kg	10/13/2010
cis-1,3-Dichloropropene	LCS	792	106	(80-125)			750 ug/Kg	10/13/2010

Revised Report

SGS Ref.#	997017 Lab Control Sample	**Printed Date/Time**	11/09/2010 10:36
		Prep	**Batch**
Client Name	Shannon & Wilson, Inc.		**Method**
Project Name/#	32-1-17385 Selawik PACP		**Date**
Matrix	Soil/Solid (dry weight)		

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Volatile Gas Chromatography/Mass Spectroscopy								
Dibromochloromethane	LCS	759	101	(80-125)			750 ug/Kg	10/13/2010
Dibromomethane	LCS	817	109	(80-119)			750 ug/Kg	10/13/2010
Dichlorodifluoromethane	LCS	1100	147	(51-155)			750 ug/Kg	10/13/2010
Ethylbenzene	LCS	809	108	(80-123)			750 ug/Kg	10/13/2010
Hexachlorobutadiene	LCS	908	121	(78-124)			750 ug/Kg	10/13/2010
Isopropylbenzene (Cumene)	LCS	724	97	(80-123)			750 ug/Kg	10/13/2010
Methylene chloride	LCS	744	99	(73-125)			750 ug/Kg	10/13/2010
Methyl-t-butyl ether	LCS	1070	95	(79-124)			1130 ug/Kg	10/13/2010
Naphthalene	LCS	778	104	(68-122)			750 ug/Kg	10/13/2010
n-Butylbenzene	LCS	752	100	(80-124)			750 ug/Kg	10/13/2010
n-Propylbenzene	LCS	760	101	(80-125)			750 ug/Kg	10/13/2010
o-Xylene	LCS	709	95	(80-123)			750 ug/Kg	10/13/2010
P & M -Xylene	LCS	1410	94	(80-125)			1500 ug/Kg	10/13/2010
sec-Butylbenzene	LCS	766	102	(80-122)			750 ug/Kg	10/13/2010
Styrene	LCS	715	95	(80-124)			750 ug/Kg	10/13/2010
tert-Butylbenzene	LCS	737	98	(80-121)			750 ug/Kg	10/13/2010
Tetrachloroethene	LCS	861	115	(79-128)			750 ug/Kg	10/13/2010
Toluene	LCS	849	113	(80-125)			750 ug/Kg	10/13/2010
trans-1,2-Dichloroethene	LCS	739	99	(76-126)			750 ug/Kg	10/13/2010
trans-1,3-Dichloropropene	LCS	804	107	(80-124)			750 ug/Kg	10/13/2010
Trichloroethene	LCS	826	110	(80-123)			750 ug/Kg	10/13/2010

Revised Report

SGS Ref.#	997017 Lab Control Sample	**Printed Date/Time**	11/09/2010 10:36
		Prep **Batch**	
Client Name	Shannon & Wilson, Inc.	**Method**	
Project Name/#	32-1-17385 Selawik PACP	**Date**	
Matrix	Soil/Solid (dry weight)		

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Volatile Gas Chromatography/Mass Spectroscopy								
Trichlorofluoromethane	LCS	843	112	(62-149)			750 ug/Kg	10/13/2010
Vinyl chloride	LCS	853	114	(68-139)			750 ug/Kg	10/13/2010
Xylenes (total)	LCS	2120	94	(86-124)			2250 ug/Kg	10/13/2010
Surrogates								
1,2-Dichloroethane-D4 <surr>	LCS		110	(80-117)				10/13/2010
4-Bromofluorobenzene <surr>	LCS		118	(68-136)				10/13/2010
Toluene-d8 <surr>	LCS		104	(85-121)				10/13/2010

Batch VMS11680
Method SW8260B
Instrument HP 5890 Series II MS5 VLA

Revised Report

SGS Ref.#	997457 Lab Control Sample	**Printed Date/Time**		11/09/2010 10:36
		Prep	**Batch**	XXX23909
Client Name	Shannon & Wilson, Inc.		**Method**	SW3550C
Project Name/#	32-1-17385 Selawik PACP		**Date**	10/15/2010
Matrix	Soil/Solid (dry weight)			

QC results affect the following production samples:

1105368007

Parameter	QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date

Polynuclear Aromatics GC/MS

Revised Report

SGS Ref.#	997457	Lab Control Sample	Printed Date/Time	11/09/2010 10:36
			Prep Batch	XXX23909
Client Name	Shannon & Wilson, Inc.		Method	SW3550C
Project Name/#	32-1-17385 Selawik PACP		Date	10/15/2010
Matrix	Soil/Solid (dry weight)			

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Polynuclear Aromatics GC/MS								
1-Methylnaphthalene	LCS	17.2	78	(47-121)			22.2 ug/Kg	10/19/2010
2-Methylnaphthalene	LCS	15.8	71	(45-105)			22.2 ug/Kg	10/19/2010
Acenaphthene	LCS	17.8	80	(55-110)			22.2 ug/Kg	10/19/2010
Acenaphthylene	LCS	18.4	83	(52-105)			22.2 ug/Kg	10/19/2010
Anthracene	LCS	17.6	79	(55-105)			22.2 ug/Kg	10/19/2010
Benzo(a)Anthracene	LCS	22.7	102	(58-110)			22.2 ug/Kg	10/19/2010
Benzo[a]pyrene	LCS	8.53	38	(20-110)			22.2 ug/Kg	10/19/2010
Benzo[b]Fluoranthene	LCS	24.4	110	(65-125)			22.2 ug/Kg	10/19/2010
Benzo[g,h,i]perylene	LCS	19.1	86	(62-125)			22.2 ug/Kg	10/19/2010
Benzo[k]fluoranthene	LCS	22.8	103	(64-125)			22.2 ug/Kg	10/19/2010
Chrysene	LCS	21.4	96	(65-110)			22.2 ug/Kg	10/19/2010
Dibenzo[a,h]anthracene	LCS	21.8	98	(65-125)			22.2 ug/Kg	10/19/2010
Fluoranthene	LCS	22.0	99	(64-125)			22.2 ug/Kg	10/19/2010
Fluorene	LCS	19.3	87	(58-110)			22.2 ug/Kg	10/19/2010
Indeno[1,2,3-c,d] pyrene	LCS	21.3	96	(65-120)			22.2 ug/Kg	10/19/2010
Naphthalene	LCS	15.6	70	(52-103)			22.2 ug/Kg	10/19/2010
Phenanthrene	LCS	19.7	89	(60-110)			22.2 ug/Kg	10/19/2010
Pyrene	LCS	20.8	94	(59-125)			22.2 ug/Kg	10/19/2010
Surrogates								
Terphenyl-d14 <surr>	LCS		114	(30-125)				10/19/2010

Revised Report

SGS Ref.#	997457 Lab Control Sample	**Printed Date/Time**		11/09/2010 10:36
		Prep	**Batch**	XXX23909
Client Name	Shannon & Wilson, Inc.		**Method**	SW3550C
Project Name/#	32-1-17385 Selawik PACP		**Date**	10/15/2010
Matrix	Soil/Solid (dry weight)			

Parameter	QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date

Polynuclear Aromatics GC/MS

Batch	XMS5727
Method	8270D SIMS
Instrument	HP 6890/5973 MS SVQA

Revised Report

SGS Ref.#	1001962 Lab Control Sample	Printed Date/Time		11/09/2010 10:36
		Prep	Batch	XXX24046
Client Name	Shannon & Wilson, Inc.		Method	SW3550C
Project Name/#	32-1-17385 Selawik PACP		Date	11/03/2010
Matrix	Soil/Solid (dry weight)			

QC results affect the following production samples:

1105368027, 1105368028

Parameter	QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date

Polynuclear Aromatics GC/MS

SGS Ref.#	1001962 Lab Control Sample	**Printed Date/Time**	11/09/2010 10:36
		Prep **Batch**	XXX24046
Client Name	Shannon & Wilson, Inc.	**Method**	SW3550C
Project Name/#	32-1-17385 Selawik PACP	**Date**	11/03/2010
Matrix	Soil/Solid (dry weight)		

Parameter		QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Polynuclear Aromatics GC/MS								
1-Methylnaphthalene	LCS	20.4	92	(47-121)			22.2 ug/Kg	11/04/2010
2-Methylnaphthalene	LCS	19.3	87	(45-105)			22.2 ug/Kg	11/04/2010
Acenaphthene	LCS	17.3	78	(55-110)			22.2 ug/Kg	11/04/2010
Acenaphthylene	LCS	17.0	77	(52-105)			22.2 ug/Kg	11/04/2010
Anthracene	LCS	15.4	70	(55-105)			22.2 ug/Kg	11/04/2010
Benzo(a)Anthracene	LCS	20.8	93	(58-110)			22.2 ug/Kg	11/04/2010
Benzo[a]pyrene	LCS	3.98J	18 *	(20-110)			22.2 ug/Kg	11/04/2010
Benzo[b]Fluoranthene	LCS	21.1	95	(65-125)			22.2 ug/Kg	11/04/2010
Benzo[g,h,i]perylene	LCS	19.1	86	(62-125)			22.2 ug/Kg	11/04/2010
Benzo[k]fluoranthene	LCS	22.5	101	(64-125)			22.2 ug/Kg	11/04/2010
Chrysene	LCS	19.6	88	(65-110)			22.2 ug/Kg	11/04/2010
Dibenzo[a,h]anthracene	LCS	21.0	95	(65-125)			22.2 ug/Kg	11/04/2010
Fluoranthene	LCS	22.4	101	(64-125)			22.2 ug/Kg	11/04/2010
Fluorene	LCS	18.0	81	(58-110)			22.2 ug/Kg	11/04/2010
Indeno[1,2,3-c,d] pyrene	LCS	21.9	99	(65-120)			22.2 ug/Kg	11/04/2010
Naphthalene	LCS	19.1	86	(52-103)			22.2 ug/Kg	11/04/2010
Phenanthrene	LCS	18.0	81	(60-110)			22.2 ug/Kg	11/04/2010
Pyrene	LCS	21.6	97	(59-125)			22.2 ug/Kg	11/04/2010
Surrogates								
Terphenyl-d14 <surr>	LCS		103	(30-125)				11/04/2010

SGS Ref.#	1001962 Lab Control Sample	**Printed Date/Time**		11/09/2010 10:36
		Prep	**Batch**	XXX24046
Client Name	Shannon & Wilson, Inc.		**Method**	SW3550C
Project Name/#	32-1-17385 Selawik PACP		**Date**	11/03/2010
Matrix	Soil/Solid (dry weight)			

Parameter	QC Results	Pct Recov	LCS/LCSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date

Polynuclear Aromatics GC/MS

Batch	XMS5748
Method	8270D SIMS
Instrument	HP 6890/5973 MS SVQA

Revised Report

SGS Ref.#	995422	Matrix Spike	**Printed Date/Time**		11/09/2010 10:36
	995423	Matrix Spike Duplicate	**Prep**	**Batch**	XXX23832
				Method	Sonication Extraction Soil SW8
				Date	10/06/2010
Original	1105338002				
Matrix	Soil/Solid (dry weight)				

QC results affect the following production samples:

1105368013, 1105368014, 1105368016, 1105368017

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Polychlorinated Biphenyls										
Aroclor-1016	MS	(48.4) U	262	70	(58-122)			377	ug/Kg	10/08/2010
	MSD		207	63		24	(< 30)	327	ug/Kg	10/08/2010
Aroclor-1260	MS	(48.4) U	282	75	(61-130)			377	ug/Kg	10/08/2010
	MSD		217	66		26	(< 30)	327	ug/Kg	10/08/2010
Surrogates										
Decachlorobiphenyl <surr>	MS		318	84	(60-125)					10/08/2010
	MSD		210	65		41				10/08/2010

Batch	XGC7221
Method	SW8082A
Instrument	HP 6890 Series II ECD SV L R

Revised Report

SGS Ref.#	995669	Matrix Spike	**Printed Date/Time**		11/09/2010 10:36
	995670	Matrix Spike Duplicate	**Prep**	**Batch**	MXX23634
				Method	Soils/Solids Digest for Metals b
				Date	10/07/2010
Original	1105368003				
Matrix	Soil/Solid (dry weight)				

QC results affect the following production samples:

1105368003, 1105368004, 1105368013, 1105368014, 1105368017

Parameter	Qualifiers		Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Metals by ICP/MS											
Arsenic		MS	(12.7) U	665	104	(80-120)			637	mg/Kg	10/08/2010
		MSD		639	107		4	(< 20)	595	mg/Kg	10/08/2010
Barium		MS	46.2	717	105	(80-120)			637	mg/Kg	10/08/2010
		MSD		693	109		3	(< 20)	595	mg/Kg	10/08/2010
Cadmium		MS	(2.53) U	65.1	102	(80-120)			63.7	mg/Kg	10/08/2010
		MSD		60.9	102		7	(< 20)	59.5	mg/Kg	10/08/2010
Chromium		MS	7.62	255	97	(80-120)			255	mg/Kg	10/08/2010
		MSD		237	96		7	(< 20)	239	mg/Kg	10/08/2010
Lead		MS	3.77	728	114	(80-120)			637	mg/Kg	10/08/2010
		MSD		661	111		10	(< 20)	595	mg/Kg	10/08/2010
Selenium		MS	(6.34) U	651	102	(80-120)			637	mg/Kg	10/08/2010
		MSD		617	104		5	(< 20)	595	mg/Kg	10/08/2010
Silver		MS	(1.27) U	67.9	106	(80-120)			63.7	mg/Kg	10/08/2010
		MSD		64.1	108		6	(< 20)	59.5	mg/Kg	10/08/2010

Batch	MMS6737
Method	SW6020
Instrument	Perkin Elmer Sciex ICP-MS P3

Revised Report

SGS Ref.#	995777	Matrix Spike	**Printed Date/Time**		11/09/2010 10:36
	995778	Matrix Spike Duplicate	**Prep**	**Batch**	MXX23636
				Method	Digestion Mercury (S)
				Date	10/06/2010

Original 1106795002

Matrix Soil/Solid (dry weight)

QC results affect the following production samples:

1105368002, 1105368003, 1105368004

Parameter	Qualifiers		Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Metals Department											
Mercury		MS	(25.2) U	316	93	(80-120)			342	ug/Kg	10/07/2010
		MSD		310	88		2	(< 20)	352	ug/Kg	10/07/2010

Batch MCV4670

Method SW7471B

Instrument PSA Millennium mercury AA

SGS

Revised Report

SGS Ref.#	995779	Matrix Spike	**Printed Date/Time**		11/09/2010 10:36
	995780	Matrix Spike Duplicate	**Prep**	**Batch**	MXX23636
				Method	Digestion Mercury (S)
				Date	10/06/2010
Original	1105338002				
Matrix	Soil/Solid (dry weight)				

QC results affect the following production samples:

1105368002, 1105368003, 1105368004

Parameter	Qualifiers		Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Metals Department											
Mercury		MS	(26.0) U	345	94	(80-120)			367	ug/Kg	10/07/2010
		MSD		342	94		1	(< 20)	363	ug/Kg	10/07/2010

Batch	MCV4670
Method	SW7471B
Instrument	PSA Millennium mercury AA

SGS

Revised Report

SGS Ref.#	995785	Matrix Spike TCLP	**Printed Date/Time**		11/09/2010 10:36
	995786	Matrix Spike Dup TCLP	**Prep**	**Batch**	MXX23636
				Method	Digestion Mercury (O)
				Date	10/06/2010
Original	1106776004				
Matrix	Oil/Xylene Miscible Liquid				

QC results affect the following production samples:

1105368002, 1105368003, 1105368004

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
TCLP Constituents Metals										
Mercury	MST	(21.0) U	209	72	(50-150)			288	ug/L	10/07/2010
	MSDT		212	74		1	(< 20)	287	ug/L	10/07/2010

Batch MCV4670

Method SW7471B

Instrument PSA Millennium mercury AA

Revised Report

SGS Ref.#	996130	Matrix Spike	**Printed Date/Time**	11/09/2010 10:36
	996131	Matrix Spike Duplicate	**Prep** **Batch**	
			Method	
			Date	
Original	1105368001			
Matrix	Soil/Solid (dry weight)			

QC results affect the following production samples:

1105368001, 1105368005, 1105368006, 1105368007, 1105368008, 1105368009, 1105368010, 1105368011, 1105368012, 1105368015, 1105368020, 1105368022, 1105368023, 1105368024, 1105368025, 1105368026, 1105368027, 1105368028, 1105368029, 1105368037

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Volatile Fuels Department										
Benzene	MS	(43.5) U	2479	92	(80-125)			2696	ug/Kg	10/08/2010
	MSD		2413	90		3	(< 20)	2696	ug/Kg	10/08/2010
Ethylbenzene	MS	(174) U	3028	112	(85-125)			2696	ug/Kg	10/08/2010
	MSD		2945	109		3	(< 20)	2696	ug/Kg	10/08/2010
o-Xylene	MS	(174) U	2995	111	(85-125)			2696	ug/Kg	10/08/2010
	MSD		2928	109		2	(< 20)	2696	ug/Kg	10/08/2010
P & M -Xylene	MS	(174) U	5857	109	(85-125)			5391	ug/Kg	10/08/2010
	MSD		5707	106		2	(< 20)	5391	ug/Kg	10/08/2010
Toluene	MS	(174) U	2879	107	(85-120)			2696	ug/Kg	10/08/2010
	MSD		2795	104		3	(< 20)	2696	ug/Kg	10/08/2010
Surrogates										
1,4-Difluorobenzene <surr>	MS		2696	100	(80-120)					10/08/2010
	MSD		2712	100		0				10/08/2010

Batch VFC10219
Method SW8021B
Instrument HP 5890 Series II PID+FID VCA

SGS

SGS Ref.#	996153	Matrix Spike	**Printed Date/Time**	11/09/2010 10:36
	996154	Matrix Spike Duplicate	**Prep** **Batch**	
			Method	
			Date	
Original	1106791003			
Matrix	Soil/Solid (dry weight)			

QC results affect the following production samples:

1105368030, 1105368031

Parameter	Qualifiers		Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Volatile Fuels Department											
Benzene		MS	10.9	635	93	(80-125)			671	ug/Kg	10/09/2010
		MSD		654	96		3	(< 20)	671	ug/Kg	10/09/2010
Ethylbenzene		MS	(38.1) U	769	115	(85-125)			671	ug/Kg	10/09/2010
		MSD		791	118		3	(< 20)	671	ug/Kg	10/09/2010
o-Xylene		MS	(38.1) U	762	114	(85-125)			671	ug/Kg	10/09/2010
		MSD		782	117		3	(< 20)	671	ug/Kg	10/09/2010
P & M -Xylene		MS	(38.1) U	1491	111	(85-125)			1346	ug/Kg	10/09/2010
		MSD		1535	114		3	(< 20)	1346	ug/Kg	10/09/2010
Toluene		MS	(38.1) U	735	110	(85-120)			671	ug/Kg	10/09/2010
		MSD		756	113		3	(< 20)	671	ug/Kg	10/09/2010
Surrogates											
1,4-Difluorobenzene <surr>		MS		697	104	(80-120)					10/09/2010
		MSD		700	104		0				10/09/2010

Batch VFC10219
Method SW8021B
Instrument HP 5890 Series II PID+FID VCA

SGS Ref.#	996247	Matrix Spike	**Printed Date/Time**		11/09/2010 10:36
	996248	Matrix Spike Duplicate	**Prep**	**Batch**	
				Method	
				Date	
Original	996246				
Matrix	Solid/Soil (Wet Weight)				

QC results affect the following production samples:

1105368013, 1105368014, 1105368019

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date

Volatile Gas Chromatography/Mass Spectroscopy

Revised Report

SGS Ref.#	996247	Matrix Spike	Printed Date/Time	11/09/2010 10:36
	996248	Matrix Spike Duplicate	Prep Batch	
			Method	
			Date	
Original	996246			
Matrix	Solid/Soil (Wet Weight)			

Parameter		Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date

Volatile Gas Chromatography/Mass Spectroscopy

Parameter		Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
1,1,1,2-Tetrachloroethane	MS	(15.6) U	714	95	(80-125)			750	ug/Kg	10/08/2010
	MSD		723	96		1	(< 20)	750	ug/Kg	10/08/2010
1,1,1-Trichloroethane	MS	(15.6) U	699	93	(80-127)			750	ug/Kg	10/08/2010
	MSD		668	89		5	(< 20)	750	ug/Kg	10/08/2010
1,1,2,2-Tetrachloroethane	MS	(30.0) U	888	118	(80-124)			750	ug/Kg	10/08/2010
	MSD		883	118		1	(< 20)	750	ug/Kg	10/08/2010
1,1,2-Trichloroethane	MS	(15.6) U	726	97	(80-124)			750	ug/Kg	10/08/2010
	MSD		711	95		2	(< 20)	750	ug/Kg	10/08/2010
1,1-Dichloroethane	MS	(15.6) U	570	76*	(77-125)			750	ug/Kg	10/08/2010
	MSD		300	40*		62 *	(< 20)	750	ug/Kg	10/08/2010
1,1-Dichloroethene	MS	(15.6) U	631	84	(65-150)			750	ug/Kg	10/08/2010
	MSD		561	75		12	(< 20)	750	ug/Kg	10/08/2010
1,1-Dichloropropene	MS	(15.6) U	867	116	(76-134)			750	ug/Kg	10/08/2010
	MSD		851	113		2	(< 20)	750	ug/Kg	10/08/2010
1,2,3-Trichlorobenzene	MS	(30.0) U	571	76	(68-125)			750	ug/Kg	10/08/2010
	MSD		732	98		25 *	(< 20)	750	ug/Kg	10/08/2010
1,2,3-Trichloropropane	MS	(15.6) U	566	76*	(78-123)			750	ug/Kg	10/08/2010
	MSD		625	83		10	(< 20)	750	ug/Kg	10/08/2010
1,2,4-Trichlorobenzene	MS	(15.6) U	637	85	(76-122)			750	ug/Kg	10/08/2010
	MSD		720	96		12	(< 20)	750	ug/Kg	10/08/2010
1,2,4-Trimethylbenzene	MS	(30.0) U	684	91	(80-122)			750	ug/Kg	10/08/2010
	MSD		709	95		4	(< 20)	750	ug/Kg	10/08/2010
1,2-Dibromo-3-chloropropane	MS	(62.0) U	619	83	(71-128)			750	ug/Kg	10/08/2010
	MSD		570	76		8	(< 20)	750	ug/Kg	10/08/2010
1,2-Dibromoethane	MS	(15.6) U	796	106	(80-124)			750	ug/Kg	10/08/2010
	MSD		806	108		1	(< 20)	750	ug/Kg	10/08/2010
1,2-Dichlorobenzene	MS	(15.6) U	674	90	(80-120)			750	ug/Kg	10/08/2010
	MSD		695	93		3	(< 20)	750	ug/Kg	10/08/2010
1,2-Dichloroethane	MS	(15.6) U	624	83	(80-122)			750	ug/Kg	10/08/2010
	MSD		592	79*		5	(< 20)	750	ug/Kg	10/08/2010
1,2-Dichloropropane	MS	(15.6) U	780	104	(80-120)			750	ug/Kg	10/08/2010
	MSD		752	100		4	(< 20)	750	ug/Kg	10/08/2010
1,3,5-Trimethylbenzene	MS	(15.6) U	682	91	(80-123)			750	ug/Kg	10/08/2010
	MSD		696	93		2	(< 20)	750	ug/Kg	10/08/2010
1,3-Dichlorobenzene	MS	(15.6) U	711	95	(80-122)			750	ug/Kg	10/08/2010
	MSD		751	100		6	(< 20)	750	ug/Kg	10/08/2010
1,3-Dichloropropane	MS	(15.6) U	774	103	(80-124)			750	ug/Kg	10/08/2010
	MSD		765	102		1	(< 20)	750	ug/Kg	10/08/2010
1,4-Dichlorobenzene	MS	(15.6) U	764	102	(80-122)			750	ug/Kg	10/08/2010
	MSD		781	104		2	(< 20)	750	ug/Kg	10/08/2010

Revised Report

SGS Ref.#	996247	Matrix Spike	Printed Date/Time	11/09/2010 10:36
	996248	Matrix Spike Duplicate	Prep	Batch
				Method
				Date
Original	996246			
Matrix	Solid/Soil (Wet Weight)			

Volatile Gas Chromatography/Mass Spectroscopy

Parameter	Qualifiers		Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
2,2-Dichloropropane		MS	(15.6) U	549	73*	(80-129)			750	ug/Kg	10/08/2010
		MSD		539	72*		2	(< 20)	750	ug/Kg	10/08/2010
2-Butanone (MEK)		MS	(156) U	1900	85	(61-140)			2250	ug/Kg	10/08/2010
		MSD		1890	84		1	(< 20)	2250	ug/Kg	10/08/2010
2-Chlorotoluene		MS	(15.6) U	728	97	(80-123)			750	ug/Kg	10/08/2010
		MSD		745	99		2	(< 20)	750	ug/Kg	10/08/2010
2-Hexanone		MS	(156) U	1790	79	(74-129)			2250	ug/Kg	10/08/2010
		MSD		1720	76		4	(< 20)	2250	ug/Kg	10/08/2010
4-Chlorotoluene		MS	(15.6) U	712	95	(80-123)			750	ug/Kg	10/08/2010
		MSD		753	100		6	(< 20)	750	ug/Kg	10/08/2010
4-Isopropyltoluene		MS	(15.6) U	724	97	(80-123)			750	ug/Kg	10/08/2010
		MSD		726	97		0	(< 20)	750	ug/Kg	10/08/2010
4-Methyl-2-pentanone (MIBK)		MS	(156) U	2210	98	(76-126)			2250	ug/Kg	10/08/2010
		MSD		2270	101		3	(< 20)	2250	ug/Kg	10/08/2010
Benzene		MS	(7.80) U	838	112	(80-123)			750	ug/Kg	10/08/2010
		MSD		859	114		3	(< 20)	750	ug/Kg	10/08/2010
Bromobenzene		MS	(15.6) U	814	109	(80-123)			750	ug/Kg	10/08/2010
		MSD		857	114		5	(< 20)	750	ug/Kg	10/08/2010
Bromochloromethane		MS	(15.6) U	665	89	(72-125)			750	ug/Kg	10/08/2010
		MSD		715	95		7	(< 20)	750	ug/Kg	10/08/2010
Bromodichloromethane		MS	(15.6) U	750	100	(80-123)			750	ug/Kg	10/08/2010
		MSD		719	96		4	(< 20)	750	ug/Kg	10/08/2010
Bromoform		MS	(15.6) U	715	95	(74-125)			750	ug/Kg	10/08/2010
		MSD		766	102		7	(< 20)	750	ug/Kg	10/08/2010
Bromomethane		MS	(124) U	581	78	(60-149)			750	ug/Kg	10/08/2010
		MSD		553	74		5	(< 20)	750	ug/Kg	10/08/2010
Carbon disulfide		MS	(62.0) U	854	76	(45-160)			1130	ug/Kg	10/08/2010
		MSD		819	73		4	(< 20)	1130	ug/Kg	10/08/2010
Carbon tetrachloride		MS	(15.6) U	553	74*	(80-126)			750	ug/Kg	10/08/2010
		MSD		598	80*		8	(< 20)	750	ug/Kg	10/08/2010
Chlorobenzene		MS	(15.6) U	806	107	(80-123)			750	ug/Kg	10/08/2010
		MSD		816	109		1	(< 20)	750	ug/Kg	10/08/2010
Chloroethane		MS	(124) U	439	59*	(59-154)			750	ug/Kg	10/08/2010
		MSD		448	60		2	(< 20)	750	ug/Kg	10/08/2010
Chloroform		MS	(15.6) U	589	79	(72-125)			750	ug/Kg	10/08/2010
		MSD		575	77		2	(< 20)	750	ug/Kg	10/08/2010
Chloromethane		MS	(15.6) U	758	101	(62-140)			750	ug/Kg	10/08/2010
		MSD		726	97		4	(< 20)	750	ug/Kg	10/08/2010
cis-1,2-Dichloroethene		MS	(15.6) U	714	95	(76-125)			750	ug/Kg	10/08/2010
		MSD		712	95		0	(< 20)	750	ug/Kg	10/08/2010

Revised Report

SGS Ref.#	996247	Matrix Spike	Printed Date/Time	11/09/2010 10:36
	996248	Matrix Spike Duplicate	Prep Batch	
			Method	
			Date	
Original	996246			
Matrix	Solid/Soil (Wet Weight)			

Parameter	Qualifiers		Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Volatile Gas Chromatography/Mass Spectroscopy											
cis-1,3-Dichloropropene		MS	(15.6) U	872	116	(80-125)			750	ug/Kg	10/08/2010
		MSD		883	118		1	(< 20)	750	ug/Kg	10/08/2010
Dibromochloromethane		MS	(15.6) U	726	97	(80-125)			750	ug/Kg	10/08/2010
		MSD		723	96		0	(< 20)	750	ug/Kg	10/08/2010
Dibromomethane		MS	(15.6) U	741	99	(80-119)			750	ug/Kg	10/08/2010
		MSD		713	95		4	(< 20)	750	ug/Kg	10/08/2010
Dichlorodifluoromethane		MS	(30.0) U	962	128	(51-155)			750	ug/Kg	10/08/2010
		MSD		942	126		2	(< 20)	750	ug/Kg	10/08/2010
Ethylbenzene		MS	(15.6) U	759	101	(80-123)			750	ug/Kg	10/08/2010
		MSD		769	103		1	(< 20)	750	ug/Kg	10/08/2010
Hexachlorobutadiene		MS	(30.0) U	603	80	(78-124)			750	ug/Kg	10/08/2010
		MSD		647	86		7	(< 20)	750	ug/Kg	10/08/2010
Isopropylbenzene (Cumene)		MS	(15.6) U	719	96	(80-123)			750	ug/Kg	10/08/2010
		MSD		733	98		2	(< 20)	750	ug/Kg	10/08/2010
Methylene chloride		MS	(62.0) U	574	77	(73-125)			750	ug/Kg	10/08/2010
		MSD		556	74		3	(< 20)	750	ug/Kg	10/08/2010
Methyl-t-butyl ether		MS	(62.0) U	882	78*	(79-124)			1130	ug/Kg	10/08/2010
		MSD		833	74*		6	(< 20)	1130	ug/Kg	10/08/2010
Naphthalene		MS	(30.0) U	821	109	(68-122)			750	ug/Kg	10/08/2010
		MSD		911	122		10	(< 20)	750	ug/Kg	10/08/2010
n-Butylbenzene		MS	(15.6) U	674	90	(80-124)			750	ug/Kg	10/08/2010
		MSD		676	90		0	(< 20)	750	ug/Kg	10/08/2010
n-Propylbenzene		MS	(15.6) U	694	93	(80-125)			750	ug/Kg	10/08/2010
		MSD		734	98		6	(< 20)	750	ug/Kg	10/08/2010
o-Xylene		MS	(30.0) U	735	98	(80-123)			750	ug/Kg	10/08/2010
		MSD		769	103		5	(< 20)	750	ug/Kg	10/08/2010
P & M -Xylene		MS	32.8J	1410	92	(80-125)			1500	ug/Kg	10/08/2010
		MSD		1500	98		6	(< 20)	1500	ug/Kg	10/08/2010
sec-Butylbenzene		MS	(15.6) U	703	94	(80-122)			750	ug/Kg	10/08/2010
		MSD		700	93		0	(< 20)	750	ug/Kg	10/08/2010
Styrene		MS	(15.6) U	708	94	(80-124)			750	ug/Kg	10/08/2010
		MSD		730	97		3	(< 20)	750	ug/Kg	10/08/2010
tert-Butylbenzene		MS	(15.6) U	800	107	(80-121)			750	ug/Kg	10/08/2010
		MSD		852	114		6	(< 20)	750	ug/Kg	10/08/2010
Tetrachloroethene		MS	(15.6) U	901	120	(79-128)			750	ug/Kg	10/08/2010
		MSD		916	122		2	(< 20)	750	ug/Kg	10/08/2010
Toluene		MS	(30.0) U	770	103	(80-125)			750	ug/Kg	10/08/2010
		MSD		795	106		3	(< 20)	750	ug/Kg	10/08/2010
trans-1,2-Dichloroethene		MS	(15.6) U	677	90	(76-126)			750	ug/Kg	10/08/2010
		MSD		671	90		1	(< 20)	750	ug/Kg	10/08/2010

Revised Report

SGS Ref.#	996247	Matrix Spike	Printed Date/Time		11/09/2010 10:36
	996248	Matrix Spike Duplicate	Prep	Batch	
				Method	
				Date	
Original	996246				
Matrix	Solid/Soil (Wet Weight)				

Parameter	Qualifiers		Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Volatile Gas Chromatography/Mass Spectroscopy											
trans-1,3-Dichloropropene	MS		(15.6) U	641	86	(80-124)			750	ug/Kg	10/08/2010
	MSD			637	85		1	(< 20)	750	ug/Kg	10/08/2010
Trichloroethene	MS		(15.6) U	778	104	(80-123)			750	ug/Kg	10/08/2010
	MSD			818	109		5	(< 20)	750	ug/Kg	10/08/2010
Trichlorofluoromethane	MS		(30.0) U	392	52*	(62-149)			750	ug/Kg	10/08/2010
	MSD			380	51*		3	(< 20)	750	ug/Kg	10/08/2010
Vinyl chloride	MS		(15.6) U	858	114	(68-139)			750	ug/Kg	10/08/2010
	MSD			811	108		6	(< 20)	750	ug/Kg	10/08/2010
Xylenes (total)	MS		32.8J	2150	94	(86-124)			2250	ug/Kg	10/08/2010
	MSD			2270	100		6	(< 20)	2250	ug/Kg	10/08/2010
Surrogates											
1,2-Dichloroethane-D4 <surr>	MS			574	77*	(80-117)					10/08/2010
	MSD			553	74*		4				10/08/2010
4-Bromofluorobenzene <surr>	MS			1890	94	(68-136)					10/08/2010
	MSD			1940	97		3				10/08/2010
Toluene-d8 <surr>	MS			808	108	(85-121)					10/08/2010
	MSD			789	105		2				10/08/2010

Batch VMS11670
Method SW8260B
Instrument HP 5890 Series II MS5 VLA

SGS Ref.#	997019	Matrix Spike	**Printed Date/Time**	11/09/2010 10:36
	997020	Matrix Spike Duplicate	**Prep** **Batch**	
			Method	
			Date	
Original	997018			
Matrix	Solid/Soil (Wet Weight)			

QC results affect the following production samples:

1105368014, 1105368017

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date

Volatile Gas Chromatography/Mass Spectroscopy

Revised Report

SGS Ref.#	997019	Matrix Spike	Printed Date/Time	11/09/2010 10:36
	997020	Matrix Spike Duplicate	Prep Batch	
			Method	
			Date	
Original	997018			
Matrix	Solid/Soil (Wet Weight)			

Parameter	Qualifiers		Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Volatile Gas Chromatography/Mass Spectroscopy											
1,1,1,2-Tetrachloroethane		MS	(31.0) U	1560	105	(80-125)			1490	ug/Kg	10/13/2010
		MSD		1660	112		6	(< 20)	1490	ug/Kg	10/13/2010
1,1,1-Trichloroethane		MS	(31.0) U	1650	111	(80-127)			1490	ug/Kg	10/13/2010
		MSD		1710	115		4	(< 20)	1490	ug/Kg	10/13/2010
1,1,2,2-Tetrachloroethane		MS	(59.4) U	1300	87	(80-124)			1490	ug/Kg	10/13/2010
		MSD		1320	89		1	(< 20)	1490	ug/Kg	10/13/2010
1,1,2-Trichloroethane		MS	(31.0) U	1420	95	(80-124)			1490	ug/Kg	10/13/2010
		MSD		1520	102		7	(< 20)	1490	ug/Kg	10/13/2010
1,1-Dichloroethane		MS	(31.0) U	1410	95	(77-125)			1490	ug/Kg	10/13/2010
		MSD		1480	100		5	(< 20)	1490	ug/Kg	10/13/2010
1,1-Dichloroethene		MS	(31.0) U	1520	103	(65-150)			1490	ug/Kg	10/13/2010
		MSD		1770	119		15	(< 20)	1490	ug/Kg	10/13/2010
1,1-Dichloropropene		MS	(31.0) U	1600	108	(76-134)			1490	ug/Kg	10/13/2010
		MSD		1760	118		9	(< 20)	1490	ug/Kg	10/13/2010
1,2,3-Trichlorobenzene		MS	(59.4) U	1490	100	(68-125)			1490	ug/Kg	10/13/2010
		MSD		1740	117		16	(< 20)	1490	ug/Kg	10/13/2010
1,2,3-Trichloropropane		MS	(31.0) U	1540	103	(78-123)			1490	ug/Kg	10/13/2010
		MSD		1420	96		8	(< 20)	1490	ug/Kg	10/13/2010
1,2,4-Trichlorobenzene		MS	(31.0) U	1520	103	(76-122)			1490	ug/Kg	10/13/2010
		MSD		1630	110		7	(< 20)	1490	ug/Kg	10/13/2010
1,2,4-Trimethylbenzene		MS	(59.4) U	1420	96	(80-122)			1490	ug/Kg	10/13/2010
		MSD		1320	89		7	(< 20)	1490	ug/Kg	10/13/2010
1,2-Dibromo-3-chloropropane		MS	(123) U	1220	82	(71-128)			1490	ug/Kg	10/13/2010
		MSD		1530	103		22 *	(< 20)	1490	ug/Kg	10/13/2010
1,2-Dibromoethane		MS	(31.0) U	1570	106	(80-124)			1490	ug/Kg	10/13/2010
		MSD		1570	106		0	(< 20)	1490	ug/Kg	10/13/2010
1,2-Dichlorobenzene		MS	(31.0) U	1430	96	(80-120)			1490	ug/Kg	10/13/2010
		MSD		1410	95		1	(< 20)	1490	ug/Kg	10/13/2010
1,2-Dichloroethane		MS	(31.0) U	1570	106	(80-122)			1490	ug/Kg	10/13/2010
		MSD		1720	116		9	(< 20)	1490	ug/Kg	10/13/2010
1,2-Dichloropropane		MS	(31.0) U	1330	90	(80-120)			1490	ug/Kg	10/13/2010
		MSD		1450	98		9	(< 20)	1490	ug/Kg	10/13/2010
1,3,5-Trimethylbenzene		MS	(31.0) U	1460	98	(80-123)			1490	ug/Kg	10/13/2010
		MSD		1330	89		10	(< 20)	1490	ug/Kg	10/13/2010
1,3-Dichlorobenzene		MS	(31.0) U	1470	99	(80-122)			1490	ug/Kg	10/13/2010
		MSD		1480	100		1	(< 20)	1490	ug/Kg	10/13/2010
1,3-Dichloropropane		MS	(31.0) U	1560	105	(80-124)			1490	ug/Kg	10/13/2010
		MSD		1610	108		3	(< 20)	1490	ug/Kg	10/13/2010
1,4-Dichlorobenzene		MS	(31.0) U	1530	103	(80-122)			1490	ug/Kg	10/13/2010
		MSD		1580	106		4	(< 20)	1490	ug/Kg	10/13/2010

SGS

SGS Ref.#	997019	Matrix Spike	**Printed Date/Time**	11/09/2010 10:36
	997020	Matrix Spike Duplicate	**Prep** **Batch**	
			Method	
			Date	
Original	997018			
Matrix	Solid/Soil (Wet Weight)			

Volatile Gas Chromatography/Mass Spectroscopy

Parameter	Qualifiers		Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
2,2-Dichloropropane	MS		(31.0) U	1610	108	(80-129)			1490	ug/Kg	10/13/2010
	MSD			1700	114		6	(< 20)	1490	ug/Kg	10/13/2010
2-Butanone (MEK)	MS		(310) U	4590	103	(61-140)			4460	ug/Kg	10/13/2010
	MSD			5350	120		15	(< 20)	4460	ug/Kg	10/13/2010
2-Chlorotoluene	MS		(31.0) U	1520	103	(80-123)			1490	ug/Kg	10/13/2010
	MSD			1530	103		0	(< 20)	1490	ug/Kg	10/13/2010
2-Hexanone	MS		(310) U	3980	89	(74-129)			4460	ug/Kg	10/13/2010
	MSD			4280	96		7	(< 20)	4460	ug/Kg	10/13/2010
4-Chlorotoluene	MS		(31.0) U	1440	97	(80-123)			1490	ug/Kg	10/13/2010
	MSD			1400	94		3	(< 20)	1490	ug/Kg	10/13/2010
4-Isopropyltoluene	MS		(31.0) U	1380	93	(80-123)			1490	ug/Kg	10/13/2010
	MSD			1400	94		1	(< 20)	1490	ug/Kg	10/13/2010
4-Methyl-2-pentanone (MIBK)	MS		(310) U	4050	91	(76-126)			4460	ug/Kg	10/13/2010
	MSD			4420	99		9	(< 20)	4460	ug/Kg	10/13/2010
Benzene	MS		(15.5) U	1650	111	(80-123)			1490	ug/Kg	10/13/2010
	MSD			1730	116		5	(< 20)	1490	ug/Kg	10/13/2010
Bromobenzene	MS		(31.0) U	1690	114	(80-123)			1490	ug/Kg	10/13/2010
	MSD			1620	109		5	(< 20)	1490	ug/Kg	10/13/2010
Bromochloromethane	MS		(31.0) U	1610	109	(72-125)			1490	ug/Kg	10/13/2010
	MSD			1800	121		11	(< 20)	1490	ug/Kg	10/13/2010
Bromodichloromethane	MS		(31.0) U	1550	104	(80-123)			1490	ug/Kg	10/13/2010
	MSD			1660	112		7	(< 20)	1490	ug/Kg	10/13/2010
Bromoform	MS		(31.0) U	1580	106	(74-125)			1490	ug/Kg	10/13/2010
	MSD			1660	112		5	(< 20)	1490	ug/Kg	10/13/2010
Bromomethane	MS		(246) U	1750	118	(60-149)			1490	ug/Kg	10/13/2010
	MSD			1690	114		3	(< 20)	1490	ug/Kg	10/13/2010
Carbon disulfide	MS		(123) U	2300	103	(45-160)			2230	ug/Kg	10/13/2010
	MSD			2460	111		7	(< 20)	2230	ug/Kg	10/13/2010
Carbon tetrachloride	MS		(31.0) U	1470	99	(80-126)			1490	ug/Kg	10/13/2010
	MSD			1620	109		10	(< 20)	1490	ug/Kg	10/13/2010
Chlorobenzene	MS		(31.0) U	1600	108	(80-123)			1490	ug/Kg	10/13/2010
	MSD			1560	105		2	(< 20)	1490	ug/Kg	10/13/2010
Chloroethane	MS		(246) U	1880	126	(59-154)			1490	ug/Kg	10/13/2010
	MSD			2030	137		8	(< 20)	1490	ug/Kg	10/13/2010
Chloroform	MS		(31.0) U	1280	86	(72-125)			1490	ug/Kg	10/13/2010
	MSD			1590	107		21 *	(< 20)	1490	ug/Kg	10/13/2010
Chloromethane	MS		(31.0) U	1550	104	(62-140)			1490	ug/Kg	10/13/2010
	MSD			1770	119		13	(< 20)	1490	ug/Kg	10/13/2010
cis-1,2-Dichloroethene	MS		(31.0) U	1500	101	(76-125)			1490	ug/Kg	10/13/2010
	MSD			1600	107		6	(< 20)	1490	ug/Kg	10/13/2010

Revised Report

SGS Ref.#	997019	Matrix Spike	Printed Date/Time	11/09/2010 10:36
	997020	Matrix Spike Duplicate	Prep Batch	
			Method	
			Date	
Original	997018			
Matrix	Solid/Soil (Wet Weight)			

Parameter	Qualifiers		Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Volatile Gas Chromatography/Mass Spectroscopy											
cis-1,3-Dichloropropene		MS	(31.0) U	1580	106	(80-125)			1490	ug/Kg	10/13/2010
		MSD		1680	113		6	(< 20)	1490	ug/Kg	10/13/2010
Dibromochloromethane		MS	(31.0) U	1670	112	(80-125)			1490	ug/Kg	10/13/2010
		MSD		1580	106		6	(< 20)	1490	ug/Kg	10/13/2010
Dibromomethane		MS	(31.0) U	1540	103	(80-119)			1490	ug/Kg	10/13/2010
		MSD		1620	109		5	(< 20)	1490	ug/Kg	10/13/2010
Dichlorodifluoromethane		MS	(59.4) U	2240	151	(51-155)			1490	ug/Kg	10/13/2010
		MSD		2250	152		1	(< 20)	1490	ug/Kg	10/13/2010
Ethylbenzene		MS	(31.0) U	1620	109	(80-123)			1490	ug/Kg	10/13/2010
		MSD		1580	106		3	(< 20)	1490	ug/Kg	10/13/2010
Hexachlorobutadiene		MS	(59.4) U	1420	95	(78-124)			1490	ug/Kg	10/13/2010
		MSD		1610	108		13	(< 20)	1490	ug/Kg	10/13/2010
Isopropylbenzene (Cumene)		MS	(31.0) U	1490	100	(80-123)			1490	ug/Kg	10/13/2010
		MSD		1460	98		2	(< 20)	1490	ug/Kg	10/13/2010
Methylene chloride		MS	(123) U	1370	92	(73-125)			1490	ug/Kg	10/13/2010
		MSD		1470	99		7	(< 20)	1490	ug/Kg	10/13/2010
Methyl-t-butyl ether		MS	(123) U	2170	97	(79-124)			2230	ug/Kg	10/13/2010
		MSD		2330	105		7	(< 20)	2230	ug/Kg	10/13/2010
Naphthalene		MS	(59.4) U	1730	117	(68-122)			1490	ug/Kg	10/13/2010
		MSD		1830	123*		5	(< 20)	1490	ug/Kg	10/13/2010
n-Butylbenzene		MS	(31.0) U	1380	93	(80-124)			1490	ug/Kg	10/13/2010
		MSD		1320	89		4	(< 20)	1490	ug/Kg	10/13/2010
n-Propylbenzene		MS	(31.0) U	1410	95	(80-125)			1490	ug/Kg	10/13/2010
		MSD		1410	95		0	(< 20)	1490	ug/Kg	10/13/2010
o-Xylene		MS	(59.4) U	1480	99	(80-123)			1490	ug/Kg	10/13/2010
		MSD		1460	99		1	(< 20)	1490	ug/Kg	10/13/2010
P & M -Xylene		MS	(59.4) U	2930	99	(80-125)			2970	ug/Kg	10/13/2010
		MSD		2940	99		0	(< 20)	2970	ug/Kg	10/13/2010
sec-Butylbenzene		MS	(31.0) U	1410	95	(80-122)			1490	ug/Kg	10/13/2010
		MSD		1360	92		4	(< 20)	1490	ug/Kg	10/13/2010
Styrene		MS	(31.0) U	1510	101	(80-124)			1490	ug/Kg	10/13/2010
		MSD		1480	100		2	(< 20)	1490	ug/Kg	10/13/2010
tert-Butylbenzene		MS	(31.0) U	1430	96	(80-121)			1490	ug/Kg	10/13/2010
		MSD		1410	95		1	(< 20)	1490	ug/Kg	10/13/2010
Tetrachloroethene		MS	(31.0) U	1890	127	(79-128)			1490	ug/Kg	10/13/2010
		MSD		1780	120		6	(< 20)	1490	ug/Kg	10/13/2010
Toluene		MS	(59.4) U	1640	110	(80-125)			1490	ug/Kg	10/13/2010
		MSD		1670	113		2	(< 20)	1490	ug/Kg	10/13/2010
trans-1,2-Dichloroethene		MS	(31.0) U	1400	94	(76-126)			1490	ug/Kg	10/13/2010
		MSD		1510	102		7	(< 20)	1490	ug/Kg	10/13/2010

Revised Report

SGS Ref.#	997019	Matrix Spike	Printed Date/Time		11/09/2010 10:36
	997020	Matrix Spike Duplicate	Prep	Batch	
				Method	
				Date	
Original	997018				
Matrix	Solid/Soil (Wet Weight)				

Parameter	Qualifiers		Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
Volatile Gas Chromatography/Mass Spectroscopy											
trans-1,3-Dichloropropene		MS	(31.0) U	1600	108	(80-124)			1490	ug/Kg	10/13/2010
		MSD		1550	104		4	(< 20)	1490	ug/Kg	10/13/2010
Trichloroethene		MS	(31.0) U	1540	103	(80-123)			1490	ug/Kg	10/13/2010
		MSD		1560	105		2	(< 20)	1490	ug/Kg	10/13/2010
Trichlorofluoromethane		MS	(59.4) U	1820	123	(62-149)			1490	ug/Kg	10/13/2010
		MSD		1850	124		1	(< 20)	1490	ug/Kg	10/13/2010
Vinyl chloride		MS	(31.0) U	1710	115	(68-139)			1490	ug/Kg	10/13/2010
		MSD		1860	125		8	(< 20)	1490	ug/Kg	10/13/2010
Xylenes (total)		MS	(123) U	4400	99	(86-124)			4460	ug/Kg	10/13/2010
		MSD		4400	99		0	(< 20)	4460	ug/Kg	10/13/2010
Surrogates											
1,2-Dichloroethane-D4 <surr>		MS		1490	100	(80-117)					10/13/2010
		MSD		1560	105		4				10/13/2010
4-Bromofluorobenzene <surr>		MS		4250	107	(68-136)					10/13/2010
		MSD		4000	101		6				10/13/2010
Toluene-d8 <surr>		MS		1550	104	(85-121)					10/13/2010
		MSD		1560	105		1				10/13/2010

Batch VMS11680
Method SW8260B
Instrument HP 5890 Series II MS5 VLA

SGS

SGS Ref.#	997458	Matrix Spike	**Printed Date/Time**		11/09/2010 10:36
	997459	Matrix Spike Duplicate	**Prep**	**Batch**	XXX23909
				Method	Sonication Extraction Soil 8270
				Date	10/15/2010

Original 1105553008

Matrix Soil/Solid (dry weight)

QC results affect the following production samples:

1105368007

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date

Polynuclear Aromatics GC/MS

Revised Report

SGS Ref.#	997458	Matrix Spike	**Printed Date/Time**		11/09/2010 10:36
	997459	Matrix Spike Duplicate	**Prep**	**Batch**	XXX23909
				Method	Sonication Extraction Soil 8270
				Date	10/15/2010
Original	1105553008				
Matrix	Soil/Solid (dry weight)				

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date
Polynuclear Aromatics GC/MS									
1-Methylnaphthalene	MS	(5.21) U	21.2	93	(47-121)			22.9 ug/Kg	10/19/2010
	MSD		19.3	84		9	(< 30)	23.0 ug/Kg	10/19/2010
2-Methylnaphthalene	MS	(5.21) U	18.7	82	(45-105)			22.9 ug/Kg	10/19/2010
	MSD		17.5	76		6	(< 30)	23.0 ug/Kg	10/19/2010
Acenaphthene	MS	(5.21) U	21.9	96	(55-110)			22.9 ug/Kg	10/19/2010
	MSD		21.6	94		2	(< 30)	23.0 ug/Kg	10/19/2010
Acenaphthylene	MS	(5.21) U	20.7	91	(52-105)			22.9 ug/Kg	10/19/2010
	MSD		22.0	96		6	(< 30)	23.0 ug/Kg	10/19/2010
Anthracene	MS	(5.21) U	21.0	92	(55-105)			22.9 ug/Kg	10/19/2010
	MSD		20.9	91		1	(< 30)	23.0 ug/Kg	10/19/2010
Benzo(a)Anthracene	MS	(5.21) U	24.4	107	(58-110)			22.9 ug/Kg	10/19/2010
	MSD		24.7	107		1	(< 30)	23.0 ug/Kg	10/19/2010
Benzo[a]pyrene	MS	(5.21) U	20.7	91	(20-110)			22.9 ug/Kg	10/19/2010
	MSD		20.9	91		1	(< 30)	23.0 ug/Kg	10/19/2010
Benzo[b]Fluoranthene	MS	(5.21) U	26.7	117	(65-125)			22.9 ug/Kg	10/19/2010
	MSD		27.8	121		4	(< 30)	23.0 ug/Kg	10/19/2010
Benzo[g,h,i]perylene	MS	(5.21) U	20.6	90	(62-125)			22.9 ug/Kg	10/19/2010
	MSD		20.8	91		1	(< 30)	23.0 ug/Kg	10/19/2010
Benzo[k]fluoranthene	MS	(5.21) U	22.5	98	(64-125)			22.9 ug/Kg	10/19/2010
	MSD		21.6	94		4	(< 30)	23.0 ug/Kg	10/19/2010
Chrysene	MS	(5.21) U	20.9	91	(65-110)			22.9 ug/Kg	10/19/2010
	MSD		20.7	90		1	(< 30)	23.0 ug/Kg	10/19/2010
Dibenzo[a,h]anthracene	MS	(5.21) U	23.0	101	(65-125)			22.9 ug/Kg	10/19/2010
	MSD		23.0	100		0	(< 30)	23.0 ug/Kg	10/19/2010
Fluoranthene	MS	(5.21) U	27.8	122	(64-125)			22.9 ug/Kg	10/19/2010
	MSD		27.3	119		2	(< 30)	23.0 ug/Kg	10/19/2010
Fluorene	MS	(5.21) U	23.3	102	(58-110)			22.9 ug/Kg	10/19/2010
	MSD		23.4	102		1	(< 30)	23.0 ug/Kg	10/19/2010
Indeno[1,2,3-c,d] pyrene	MS	(5.21) U	22.1	97	(65-120)			22.9 ug/Kg	10/19/2010
	MSD		22.2	97		0	(< 30)	23.0 ug/Kg	10/19/2010
Naphthalene	MS	(5.21) U	15.7	69	(52-103)			22.9 ug/Kg	10/19/2010
	MSD		15.5	68		2	(< 30)	23.0 ug/Kg	10/19/2010
Phenanthrene	MS	(5.21) U	27.8	122*	(60-110)			22.9 ug/Kg	10/19/2010
	MSD		27.6	120*		1	(< 30)	23.0 ug/Kg	10/19/2010
Pyrene	MS	(5.21) U	26.7	117	(59-125)			22.9 ug/Kg	10/19/2010
	MSD		26.2	114		2	(< 30)	23.0 ug/Kg	10/19/2010
Surrogates									
Terphenyl-d14 <surr>	MS		31.5	138*	(30-125)				10/19/2010
	MSD		31.5	137*		0			10/19/2010

SGS Ref.#	997458	Matrix Spike	**Printed Date/Time**	11/09/2010 10:36
	997459	Matrix Spike Duplicate	**Prep** **Batch**	XXX23909
			Method	Sonication Extraction Soil 8270
			Date	10/15/2010
Original	1105553008			
Matrix	Soil/Solid (dry weight)			

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date

Polynuclear Aromatics GC/MS

Batch XMS5727
Method 8270D SIMS
Instrument HP 6890/5973 MS SVQA

Revised Report

SGS Ref.#	1001963	Matrix Spike	**Printed Date/Time**		11/09/2010 10:36
	1001964	Matrix Spike Duplicate	**Prep**	**Batch**	XXX24046
				Method	Sonication Extraction Soil 8270
				Date	11/03/2010
Original	1106017001				
Matrix	Soil/Solid (dry weight)				

QC results affect the following production samples:

1105368027, 1105368028

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date

Polynuclear Aromatics GC/MS

Revised Report

SGS Ref.#	1001963	Matrix Spike	
	1001964	Matrix Spike Duplicate	
Printed Date/Time		11/09/2010 10:36	
Prep	**Batch**	XXX24046	
	Method	Sonication Extraction Soil 8270	
	Date	11/03/2010	
Original	1106017001		
Matrix	Soil/Solid (dry weight)		

Polynuclear Aromatics GC/MS

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount		Analysis Date
1-Methylnaphthalene	MS	46.4J	53.3	28*	(47-121)			24.8	ug/Kg	11/04/2010
	MSD		54.1	31*		1	(< 30)	24.8	ug/Kg	11/04/2010
2-Methylnaphthalene	MS	(33.2) U	34.0	137*	(45-105)			24.8	ug/Kg	11/04/2010
	MSD		28.5	115*		18	(< 30)	24.8	ug/Kg	11/04/2010
Acenaphthene	MS	(33.2) U	20.2	81	(55-110)			24.8	ug/Kg	11/04/2010
	MSD		22.3	90		10	(< 30)	24.8	ug/Kg	11/04/2010
Acenaphthylene	MS	(33.2) U	35.0	141*	(52-105)			24.8	ug/Kg	11/04/2010
	MSD		33.5	135*		5	(< 30)	24.8	ug/Kg	11/04/2010
Anthracene	MS	(33.2) U	23.0	93	(55-105)			24.8	ug/Kg	11/04/2010
	MSD		22.4	91		3	(< 30)	24.8	ug/Kg	11/04/2010
Benzo(a)Anthracene	MS	(33.2) U	31.0	125*	(58-110)			24.8	ug/Kg	11/04/2010
	MSD		38.8	156*		22	(< 30)	24.8	ug/Kg	11/04/2010
Benzo[a]pyrene	MS	(33.2) U	30.7	124*	(20-110)			24.8	ug/Kg	11/04/2010
	MSD		35.7	144*		15	(< 30)	24.8	ug/Kg	11/04/2010
Benzo[b]Fluoranthene	MS	(33.2) U	35.6	143*	(65-125)			24.8	ug/Kg	11/04/2010
	MSD		43.6	176*		21	(< 30)	24.8	ug/Kg	11/04/2010
Benzo[g,h,i]perylene	MS	(33.2) U	39.1	157*	(62-125)			24.8	ug/Kg	11/04/2010
	MSD		33.7	136*		15	(< 30)	24.8	ug/Kg	11/04/2010
Benzo[k]fluoranthene	MS	(33.2) U	26.0	105	(64-125)			24.8	ug/Kg	11/04/2010
	MSD		25.0	101		4	(< 30)	24.8	ug/Kg	11/04/2010
Chrysene	MS	(33.2) U	40.4	163*	(65-110)			24.8	ug/Kg	11/04/2010
	MSD		46.1	186*		13	(< 30)	24.8	ug/Kg	11/04/2010
Dibenzo[a,h]anthracene	MS	(33.2) U	27.1	109	(65-125)			24.8	ug/Kg	11/04/2010
	MSD		23.3	94		15	(< 30)	24.8	ug/Kg	11/04/2010
Fluoranthene	MS	(33.2) U	31.9	129*	(64-125)			24.8	ug/Kg	11/04/2010
	MSD		41.3	167*		26	(< 30)	24.8	ug/Kg	11/04/2010
Fluorene	MS	(33.2) U	26.0	105	(58-110)			24.8	ug/Kg	11/04/2010
	MSD		25.1	101		4	(< 30)	24.8	ug/Kg	11/04/2010
Indeno[1,2,3-c,d] pyrene	MS	(33.2) U	29.0	117	(65-120)			24.8	ug/Kg	11/04/2010
	MSD		26.7	107		9	(< 30)	24.8	ug/Kg	11/04/2010
Naphthalene	MS	(33.2) U	26.8	108*	(52-103)			24.8	ug/Kg	11/04/2010
	MSD		25.7	104*		4	(< 30)	24.8	ug/Kg	11/04/2010
Phenanthrene	MS	(33.2) U	23.4	95	(60-110)			24.8	ug/Kg	11/04/2010
	MSD		27.1	109		14	(< 30)	24.8	ug/Kg	11/04/2010
Pyrene	MS	(33.2) U	32.8	132*	(59-125)			24.8	ug/Kg	11/04/2010
	MSD		44.9	181*		31 *	(< 30)	24.8	ug/Kg	11/04/2010
Surrogates										
Terphenyl-d14 <surr>	MS		23.5	95	(30-125)					11/04/2010
	MSD		21.5	87		9				11/04/2010

SGS Ref.#	1001963	Matrix Spike	**Printed Date/Time**	11/09/2010 10:36
	1001964	Matrix Spike Duplicate	**Prep** **Batch**	XXX24046
			Method	Sonication Extraction Soil 8270
			Date	11/03/2010
Original	1106017001			
Matrix	Soil/Solid (dry weight)			

Parameter	Qualifiers	Original Result	QC Result	Pct Recov	MS/MSD Limits	RPD	RPD Limits	Spiked Amount	Analysis Date

Polynuclear Aromatics GC/MS

Batch XMS5748
Method 8270D SIMS
Instrument HP 6890/5973 MS SVQA

Serna, Jennifer (Anchorage)

From: Randy Hessong [RTH@shanwil.com]
Sent: Tuesday, November 02, 2010 7:44 PM
To: Serna, Jennifer (Anchorage)
Subject: RE: SGS# 1105368 - S&W - 32-1-17385

Hi Jennifer,

I was supposed to get preliminary GRO/DRO results on two samples so we could select which to run PAHs on. Of course, I've been too busy to keep track of this. No doubt the samples are way beyond holding time, but please run PAHs on 1105368027 and 1105368028 (I6S3 and I6S12) anyway.

Randy Hessong
Shannon & Wilson, Inc.
Cell: (907) 441-9295

From: Serna, Jennifer (Anchorage) [Jennifer.Serna@sgs.com]
Sent: Tuesday, November 02, 2010 3:39 PM
To: Randy Hessong
Subject: SGS# 1105368 - S&W - 32-1-17385

Attached are the PDF and DV files for the above work order.

Thanks,

Jennifer Serna
Environmental Services, Alaska Division
Project Manager
SGS North America Inc.
200 West Potter Dr
Anchorage, AK 99518
Phone: 907-562-2343
Fax: 907-561-5301
E-mail : jennifer.serna@sgs.com<mailto:jennifer.serna@sgs.com>
Data Deliverables at: labview.sgs.com <http://labview.sgs.com/>

125 of 130

1105368

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTOD'

Cooler 2

Page ~~1~~3 of ~~2~~4

Laboratory SGS
Attn: Jennifer

400 N. 34th Street, Suite 100, Seattle, WA 98103, (206) 632-8020
2043 Westport Center Drive, St. Louis, MO 63146-3564, (314) 392-0050
303 Wellsian Way, Richland, WA 99352, (509) 946-6309
2055 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-AK101 SW8021B 1x4oz w/25ml MeOH	DRO-AK102 1x4oz	Total Mercury SW 7471 1x4oz	RCRA metals SW6020/7471 1x4oz		PAH-SIM SW8270D Amp 1x4oz	Total Number of Containers	Remarks/Matrix
17385-BLS1	1 AB	19:00	10/1/10		X	X	X					2	Soil
-BLS2	2 A	19:50			X			X				1	
-BLS3	3 A	20:05			X				X			1	
-BLS~~4~~13	4 A	20:18			X				X	~~Hold~~		~~2~~ 1	
-SF1S1	5 AB	14:20	10/2/10		X	X	X					2	
-SF1S11	6	14:30			X	X	X					2	
-SF1S3	7	12:10			X	X	X				X	2	
-SF2S1	8	14:55			X	X	X					2	
-SF3S1	9	15:10			X	X	X					2	
-SF4S3	10	15:25			X	X	X					2	

Project Information
Project Number: 32-1-17385
Project Name: Selawik PACP
Contact: Randy Hessong
Ongoing Project? Yes ☐ No ☒
Sampler: Randy Hessong

Sample Receipt
Total Number of Containers
COC Seals/Intact? Y/N/NA
Received Good Cond./Cold
Delivery Method:
(attach shipping bill, if any)

Instructions
Requested Turnaround Time: Standard
Special Instructions: ADEC Level II Deliverables

	Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature / Time	[signature] 11:40	[signature] 14:48	
Printed Name / Date	Randy Hessong 10/3/10	Randy Hessong 10/5/10	
Company	S&W	S&W	

	Received By: 1.	Received By: 2.	Received By: 3.
Signature / Time	[signature] 11:40		[signature] 11:40
Printed Name / Date	Randy Hessong 10/5/10		Annie Arn[illegible] 10/5/10
Company	S&W		SGS

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

Revised Report

F-19-91/UR Temp Blank 10/5 2.4°C

No. 27748

1105368

Page 24 of 24

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN OF CUSTODY RECORD

Laboratory SGS
Attn: Jennifer

Cooler 2

400 N. 34th Street, Suite 100, Seattle, WA 98103, (206) 632-8020
2043 Westport Center Drive, St. Louis, MO 63146-3564, (314) 392-0050
303 Wellsian Way, Richland, WA 99352, (509) 946-6309
2055 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-SW8021B 1x4oz w/25ml MeOH	DRO-AK102 1x4oz glass	DRO/RRO-AK102/103 1x8oz glass	VOC-SW8260B 1x4oz w/25ml MeOH	PCB-SW8082A from 8oz glass	Select Metals As, Cr, Cd, Ba, Pb, Ni, V SW6020 from 8oz	Total Number of Containers	Remarks/Matrix
17385-AVS3	11 A,B	20:18	10/2/10		X	X	X					2	Soil
17385-AVS4	12	20:25			X	X	X					2	
-AVS5	13	21:10			X			X	X	X	X	2	
-AVS6	14	20:35			X			X	X	X	Ni ~~Ag~~ V only	2	Ni+V only for metals
-AVS7	15	20:55			X	X	X					2	
-AVS8	16 A	21:15			X			X		X		1	
-AVS11	17 A,B	20:45			X			X	X	X	X	2	
-TB2	19 A	18:00	10/1/10		N/A				X			1	Lab-provided
-BLS4	18 A,B	20:18			X							2	Please HOLD

Project Information	
Project Number:	32-1-17385
Project Name:	Selawik PACP
Contact:	Randy Hessong
Ongoing Project?	Yes ☐ No ☒
Sampler:	Randy Hessong

Sample Receipt	
Total Number of Containers	
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Delivery Method: (attach shipping bill, if any)	

	Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature:	[signature]	[signature]	
Time:	11:40	14:40	
Printed Name:	Randy Hessong	Randy Hessong	
Date:	10/3/10	10/5/10	
Company:	S&W	S&W	

	Received By: 1.	Received By: 2.	Received By: 3.
Signature:	[signature]		[signature]
Time:	11:40		14:40
Printed Name:	Randy Hessong		Annie Ankos
Date:	10/5/10		10/5/10
Company:	S&W		SGS

Instructions

Requested Turnaround Time: Standard

Special Instructions: ADEC Level II Deliverables

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

Revised Report

F-19-91/UR Temp Blank 10/5: 2.4°C

@SGS: 5.8 #206 ~~100~~

No. 27749

127 of 130

1105368

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF CUSTODY RECORD

Page 1 of 2

Laboratory SGS
Attn: Jennifer

Cool.

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2043 Westport Center Drive
St. Louis, MO 63146-3564
(314) 392-0050

303 Wellsian Way
Richland, WA 99352
(509) 946-6309

2055 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	GRO/BTEX AK101/8021B 1x4oz w/24ml MeOH	DRO - AK102 1x4oz or 8oz glass	PAH-SIM-SW8270D from 8oz w/ others	Total lead SW6020 from 8oz w/ others			Total Number of Containers	Remarks/Matrix
17385-I1S4	20 A,B	15:30	9/30/10		X	X	X	Hold	Hold			2	Soil
-I1S11	21	15:40			X	Dispose		Hold	Hold				
-I2S1	22	16:25			X	X	X						
-I3S3	23	17:15			X	X	X						
-I4S3	24	18:10			X	X	X						
-I5S3	25	10:55	10/1/10		X	X	X						
-I6S1	26	~~11:25~~ 15:25			X	X	X						
-I6S3	27	11:25			X	X	X	Hold	Hold				
-I6S12	28	11:35			X	X	X	Hold	Hold				
-I7S2	29	15:40 ~~11:52~~			X	X	X						

Project Information	
Project Number:	32-1-17385
Project Name:	Selawik PACP
Contact:	Randy Hessong
Ongoing Project? Yes ☐ No ☒	
Sampler:	Randy Hessong

Sample Receipt	
Total Number of Containers	
COC Seals/Intact? Y/N/NA	Y
Received Good Cond./Cold	Y
Delivery Method:	Pickup @ ERA
(attach shipping bill, if any)	

	Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature / Time	[signature] 11:38	[signature] 14:40	
Printed Name / Date	Randy Hessong 10/3/10	Randy Hessong 10/5/10	
Company	S&W	S&W	

	Received By: 1.	Received By: 2.	Received By: 3.
Signature / Time	[signature] 11:30		[signature] 1440
Printed Name / Date	Randy Hessong 10/5/10		Annie Ariel 10/5/10
Company	S&W		SGS

Instructions

Requested Turnaround Time: Standard

Special Instructions: ADEC Level II Deliverables

Notify of preliminary results for I1S4, I6S3

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

F-19-91/UR Temp. Blank 10/5: 2.7°C

@SGS: TB: 5.0 #D03 A[illegible]

Revised Report

No. 27746

1105368

128 of 130

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY

Page 2 of 24

Laboratory SGS
Attn: Jennifer

Cooler 1

400 N. 34th Street, Suite 100, Seattle, WA 98103, (206) 632-8020
2043 Westport Center Drive, St. Louis, MO 63146-3564, (314) 392-0050
303 Wellsian Way, Richland, WA 99352, (509) 946-6309
2055 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	GRO/BTEX AK101/8021B 1x4oz w/25mL MeOH	DRO-AK101 1x4oz glass				Dispose	Total Number of Containers	Remarks/Matrix
17385-I952	30 AB	16:55	10/1/10		X	X	X					2	Soil
-I1053	31 ↓	15:10	10/1/10		X	X	X					2	soil
-TB1	37 A	15:00	9/30/10		NA	X						1	Lab-provided
17385-I153	32 AB	15:06	9/30/10								X	2	Soil w/possible gasoline & diesel fuels.
-I254	33 ↓	16:45									X	2	
~~-I354~~		~~17:20~~									~~X~~	~~2~~	NR
-I753	34 AB	12:00	10/1/10								X	2	
-I854	35	14:05									X	2	
-I953	36 ↓	14:43									X	2	

Project Information	
Project Number:	32-1-17385
Project Name:	Selawik PACP
Contact:	Randy Hessong
Ongoing Project? Yes ☐ No ☒	
Sampler:	Randy Hessong

Sample Receipt	
Total Number of Containers	
COC Seals/Intact? Y/N/NA	Y
Received Good Cond./Cold	Y
Delivery Method:	Pick-up @ ERA
(attach shipping bill, if any)	

	Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature / Time	[signature] / 11:38	[signature] / 14:40	
Printed Name / Date	Randy Hessong / 10/5/10	Randy Hessong / 10/5/10	
Company	S&W	S&W	

	Received By: 1.	Received By: 2.	Received By: 3.
Signature / Time	[signature] / 11:30		[signature] / 1440
Printed Name / Date	Randy Hessong / 10/5/10		Annie Ariel / 10/5/10
Company	S&W		SGS

Instructions

Requested Turnaround Time: Standard

Special Instructions: ADEC Level II Deliverables

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

F-19-91/UR Temp Blank 10/5: 2.7 °C

No. 27747

Revised Report

SGS

Revised Report
1105368

SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	Yes No N/A Yes No N/A	
Temperature blank compliant* (i.e., 0-6°C after correction factor)? * ***Note: Exemption permitted for chilled samples collected less than 8 hours ago.*** Cooler ID: 1 @ 5.0 w/ Therm.ID: 203 Cooler ID: 2 @ 5.8 w/ Therm.ID: 266 Cooler ID: ____ @ ____ w/ Therm.ID: ____ Cooler ID: ____ @ ____ w/ Therm.ID: ____ Cooler ID: ____ @ ____ w/ Therm.ID: ____ ***Note: If non-compliant, use form FS-0029 to document affected samples/analyses.*** If samples are received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled." **If temperature(s) <0°C, were all sample containers ice free?**	Yes No N/A Yes No N/A	
Delivery method (specify all that apply): Client USPS Alert Courier Road Runner ~~AK Air~~ Lynden Carlile ERA PenAir FedEx UPS NAC Other:	Note airbill/tracking # See Attached or N/A	
→ For samples received with payment, note amount ($) and cash / check / CC (circle one). → For samples received in FBKS, ANCH staff will verify all criteria are reviewed.		N/A SRF Initiated by: N/A
Do samples **match COC*** (i.e., sample IDs, dates/times collected)? * ***Note: Exemption permitted if collection times differ by less than an hour; in which case, the times on the COC will be used.*** Are analyses requested unambiguous?	Yes No N/A Yes No N/A	
Were samples in **good condition** (no leaks/cracks/breakage)? Packing material used (specify all that apply): Bubble Wrap Separate plastic bags Vermiculite Other:	Yes No N/A	*separate plastic bags on volatiles only
Were ~~all VOA vials~~ **free of headspace** (i.e., bubbles ≤6 mm)? Were all soil VOAs **field extracted** with MeOH+BFB? Were the bottles provided by SGS? (Note apparent exceptions.)	Yes No N/A Yes No N/A	
Were **proper containers** (type/mass/volume/preservative*) used? * ***Note: Exemption permitted for waters to be analyzed for metals.*** Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples?	Yes No N/A Yes No N/A	
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)? ***Refer to attached bottle sheet (form F066) for documentation.***	Yes No N/A Yes No N/A	
For **RUSH** or **SHORT HOLD TIME** samples, were the COC & this SRF flagged, bottles flagged (e.g., stickers) and lab notified?	Yes No N/A	
For client requested, **site-specific QC** (e.g., MS/MSD/DUP), were bottles flagged (e.g., stickers) and numbered accordingly?	Yes No N/A	
For **special handling** (e.g., "MI" or foreign soils, lab filter, limited volume, Ref Lab), were bottles/paperwork flagged (e.g., sticker)?	Yes No N/A	
Was the WO# recorded in Front Counter/Sample Receiving log? **For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?**	Yes No N/A Yes No N/A	SRF Completed by: [signature] Bottle Sheet by: [signature] PM = N/A
Was **PEER REVIEW** of sample numbering completed (i.e., compare WO# on containers to COC, container ID on containers to COC, unique lab ID on each container?)	Yes No N/A	Peer Reviewed by: Metrics:
Additional notes (if applicable):		

F004r25_SampleReceiptForm_revised_07302010

PRINT LABELS

WO# (7 digits)	Sample #	- Sample #	Container ID	- Container ID	Matrix	QC	Preservative (CHECKED)	TEST GROUP	Notes: **ANOMALIES -** *e.g., preservative added* **or SPECIAL HANDLING -** *e.g., Multi-Incremental (MI), Field Filter (FF), Lab Filter (LF), use "same jar as" (SJA) for QC, 2xMeOH, bubbles, etc.*
SAMPLE ID					TYPE		CONTAINERS	ANALYSIS	Type comments below:
1105368	001	001	A	A	2 Soil		N/A	S_Weigh_Out	
1105368	001	001	B	B	2 Soil		MeOH+BFB *	S_GRO/VOC	
1105368	002	004	A	A	2 Soil		N/A	S_Weigh_Out	
1105368	005	016	A	A	2 Soil		N/A	S_Weigh_Out	
1105368	005	015	B	B	2 Soil		MeOH+BFB *	S_GRO/VOC	
1105368	016	016	A	A	2 Soil		N/A	S_Weigh_Out	
1105368	017	018	A	A	2 Soil		N/A	S_Weigh_Out	
1105368	017	018	B	B	2 Soil		MeOH+BFB *	S_GRO/VOC	
1105368	019	019	A	A	2 Soil	Trip Blank	MeOH+BFB *	S_GRO/VOC	
1105368	020	020	A	A	2 Soil		N/A	S_Weigh_Out	
1105368	020	020	B	B	2 Soil		MeOH+BFB *	S_GRO/VOC	
1105368	021	021	A	A	2 Soil		N/A		On hold
1105368	021	021	B	B	2 Soil		MeOH+BFB *		for disposal
1105368	022	031	A	A	2 Soil		N/A	S_Weigh_Out	
1105368	022	031	B	B	2 Soil		MeOH+BFB *	S_GRO/VOC	
1105368	032	036	A	A	2 Soil		N/A		for disposal
1105368	032	036	B	B	2 Soil		MeOH+BFB *		for disposal
1105368	037	037	A	A	2 Soil	Trip Blank	MeOH+BFB *	S_GRO/VOC	

1105368

LABORATORY DATA REVIEW CHECKLIST

CS Report Name: Selawik Area-Wide Property Assessment and Cleanup Plan **Date:** May 2011

Laboratory Report Date: November 9, 2010

Consultant Firm: Shannon & Wilson, Inc.

Completed by: Amanda Compton
Title: Environmental Scientist

Laboratory Name: SGS Environmental Services, Inc.
Work Order Number: 1105368

ADEC File 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**
   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?
   ***NA* / Yes / No**
   Comments:

2. **Chain of Custody (COC)**

   a. COC information completed, signed, and dated (including released/received by)?
   Yes / No
   Comments**:**

   b. Correct analyses requested? **Yes / No**
   Comments: *The correct analytical methods were requested; however analysis of Sample I6S3 for total lead was inadvertently omitted from the COC.*

3. **Laboratory Sample Receipt Documentation**

   a. Sample/cooler temperatures documented and within range at receipt (4° ± 2° C)?
   Yes / No
   Comments: *Two of two coolers were within temperature range.*

b. Sample preservation acceptable - acidified waters, Methanol-preserved VOC soil (GRO, BTEX, VOCs, etc.)? ***NA*** **/ Yes / No**
Comments:

c. Sample condition documented - broken, leaking (soil MeOH), zero headspace (VOC vials)? **Yes / No**
Comments: *No problems with Project Sample condition were noted by laboratory.*

d. If there were any discrepancies, were they documented (e.g., incorrect sample containers/preservation, sample temperatures outside range, insufficient sample size, missing samples)? ***NA*** **/ Yes / No**
Comments: *No discrepancies were noted by laboratory.*

e. Data quality or usability affected? Explain. ***NA***
Comments:

4. Case Narrative

a. Present and understandable? **Yes / No**
Comments:

b. Discrepancies, errors or QC failures noted by the lab? ***None Noted*** **/ Yes**
Comments: *The CCV recoveries of multiple VOCs and one PAH were biased high. For case narrative comments on matrices see the discussion of analytical results in report text. For case narrative notes on elevated sample LOQs (formerly PQLs) and hold times, see section 5. For LCS/LCSD and/or MS/MSD discrepancies, see section 6.b. For surrogate discrepancies see section 6.c.*

c. Were corrective actions documented? ***None Noted*** **/ Yes**
Comments:

d. What is the effect on data quality/usability, according to the case narrative? ***NA***
Comments: *The analytes with biased high CCV recoveries were not detected above the respective LOQs in associated project samples.*

5. Sample Results

a. Correct analyses performed/reported as requested on COC? **Yes / No**
Comments:

b. All applicable holding times met? **Yes / No**
Comments: *The PAH analyses of Samples I6S3 and I6S12 were performed 19 days outside hold time.*

c. All soils reported on a dry-weight basis? ***NA*** **/ Yes / No**

Comments:

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project? **Yes / No**
Comments: *The LOQs of three BTEX constituents, two PAH constituents, multiple VOCs, and arsenic were greater than the migration to groundwater cleanup level detection limit goal in several project samples.*

e. Data quality or usability affected? Explain. ***NA***
Comments: *Based on the suspected age of the release (over 15 years) and the PAH constituents detected in project samples at concentrations above the detection limit goals, it is unlikely that that the past-hold time analysis of PAH had a significant effect on the results. However, the true bias of the results due to extended hold times cannot be determined.*

While the migration to groundwater cleanup levels were suggested as detection limit goals, the cleanup levels applied to this project are the Arctic Zone cleanup levels of 18 AAC 75.341. The LOQs for undetected BTEX, PAH and VOC analytes were below the Arctic Zone criteria, and the results are unaffected. The LOQs for arsenic in samples BLS3 and BLS13 were above the Arctic Zone criteria. The presence of an undetected analyte above the cleanup level cannot be confirmed when the LOQ is above the cleanup level. The results are presented in bold in the summary tables.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis, and 20 samples?
Yes / No
Comments:

ii. All method blank results less than PQL? **Yes / No**
Comments: *PAH constituents 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene were detected in the method blank at estimated concentrations less than the respective LOQs.*

iii. If above PQL, what samples are affected? ***NA***
Comments: *The two samples (I6S3 and I6S12) associated with this PAH method blank are potentially affected.*

iv. Do the affected sample(s) have data flags? ***NA* / Yes / No**
Comments:

If so, are the data flags clearly defined? ***NA* / Yes / No**
Comments:

v. Data quality or usability affected? Explain. ***NA***
Comments: *The PAHs detected in the method blank were detected in the project samples in concentrations greater than a factor of ten over the method blank detections. Due to the magnitude of difference between the project sample detections and the estimated method blank detection, the sample results are considered unaffected.*

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) ***NA* / Yes / No**
Comments: *No LCSD for VOC and PAH analyses; MS/MSD used to calculate precision*.

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples? ***NA* / Yes / No**
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**
Comments: [1] *LCS recovery of PAH benzo[a]pyrene biased low. [2] MS/MSD recoveries of multiple PAH analytes outside QC criteria; [3] MS/MSD recoveries of several VOCs outside QC criteria. [4] MS/MSD recovery of PAH phenanthrene is biased high. [5] MS/MSD recovery of VOC naphthalene does not meet QC criteria.*

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%; all other analyses see the laboratory QC pages) **Yes / No**
Comments: *[6] MS/MSD RPD for PAH pyrene does not meet QC criteria. [7] MS/MSD RPDs for VOCs 1,1-dichloroethane and 1,2,3-trichlorobenzene do not meet QC criteria. [8] MS/MSD RPDs for VOCs chloroform and 1,2-dibromo-3-chloropropane do not meet QC criteria.*

v. If %R or RPD is outside of acceptable limits, what samples are affected? **NA**
Comments: *[1,2,6] Samples I6S3 and I6S12 are potentially affected. [3,7] Samples AVS5 and AVS6 are potentially affected. [4] Sample SF1S3 is potentially affected. [5,8] Samples AVS6 and AVS11 are potentially affected.*
Do the affected samples(s) have data flags? ***NA* / Yes / No**
Comments:

If so, are the data flags clearly defined? ***NA* / Yes / No**
Comments:

vi. Data quality or usability affected? Explain. ***NA***
Comments: *[1] Benzo[a]pyrene was not detected above the LOQ in associated samples; results are considered usable for the purposes of this report. [2] Case narrative refers to LCS for accuracy. The PAH recoveries of the LCS associated with Samples I6S3 and I6S12 are within QC criteria with the exception of benzo[a]pyrene (see [1]); sample results are considered unaffected by MS PAH recovery discrepancies. [3] Case narrative refers to LCS for accuracy. The LCS associated with Samples AVS5 and AVS6 has recoveries of the VOCs with MS/MSD recovery discrepancies that are within QC criteria; project sample results are considered usable. [4] Case narrative refers to LCS for accuracy. The phenanthrene recovery for the LCS associated with Sample SF1S3 is within QC limits; project sample results are considered usable. [5] The LCS associated with Samples AVS6 and AVS11 has a recovery of naphthalene that is within QC limits. Project sample naphthalene results are considered unaffected. [6] Samples I6S3 and I6S12 comprise a field duplicate pair. The RPD for the sample/duplicate sample results is 12%, less than the 50% recommended maximum. Pyrene precision is not considered to be affected by MS/MSD RPD discrepancy. [7,8] VOCs with MS/MSD RPD discrepancies were not detected in the associated samples; precision of these analytes has no application with respect to sample results.*

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses, field, QC and laboratory samples? ***NA* / Yes / No**
Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages) ***NA* / Yes / No**
Comments: [1] *PAH surrogate recovery in Sample SF1S3 biased high. [2] GRO surrogate recoveries in eight project samples are outside acceptance criteria. [3] DRO surrogate recoveries in 13 project samples are outside acceptance criteria. [4] RRO surrogate recoveries in four project samples are outside acceptance criteria. [5] MS/MSD recoveries of VOC surrogate outside acceptance criteria. [6] MS/MSD recoveries of PAH surrogate outside acceptance criteria.*

iii. Do the sample results with failed surrogate recoveries have data flags? ***NA* / Yes / No**
Comments:

If so, are the data flags clearly defined? ***NA*** / **Yes / No**
Comments:

iv. Data quality or usability affected? Explain. ***NA***
Comments: *[1-3] Case narrative noted that surrogate recovery biases are due to dilution factor and [4] hydrocarbon interference. Project sample results are*

validated as associated LCS surrogate recoveries are within acceptance criteria. [5] remaining two of three VOC surrogate recoveries are within acceptance criteria. Project sample results are considered unaffected. [6] Case narrative notes that no analytes were detected above the LOQ in the original sample. LCS PAH surrogate recovery affecting same project sample is within acceptance criteria. Project sample results are considered unaffected.

d. Trip Blank - Volatile analyses only (GRO, BTEX, VOCs, etc.) [soil and water]

i. One trip blank reported per matrix, analysis and cooler? ***NA* / Yes / No**
Comments:

ii. Is the cooler used to transport the trip blank and volatile samples clearly indicated on the COC? ***NA* / Yes / No** (if no explain):

iii. All results less than PQL? ***NA* / Yes / No**
Comments:

iv. If above PQL, what samples are affected? ***NA***
Comments**:**

v. Data quality or usability affected? Explain. ***NA***
Comments:

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
Yes / No
Comments: *Primary/duplicate sample pairs are I6S3/I6S12, SF1S1/SF1S11 and AVS6/AVS11.*

ii. Were the field duplicates submitted blind to the lab? ***NA* / Yes / No**
Comments:

iii. Precision – All relative percent differences (RPDs) less than specified DQOs? (Recommended: 30% for water, 50% for soil) ***NA* / Yes / No**
Comments: *RPDs for I6S3/I6S12 of 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene are 66%, 64%, and 68% respectively. RPDs for AVS6/AVS11 of 1,2,4-trimethylbenzene, isopropyl benzene, sec-butylbenzene, and tert-butylbenzene are 62%, 137%, 58%, and 120%, respectively.*

iv. Data quality or usability affected? Explain. ***NA***
Comments: *With the exception of isopropyl benzene and tert-butylbezene, the analytes with RPD discrepancies were comparable within a factor of two, an acceptable range for soil field duplicates.*

f. Decontamination or Equipment Blank (if not applicable, a comment stating why must be entered below)
NA **/ Yes / No**
Comments: *The exclusion of an equipment blank was authorized by ADEC staff.*

i. All results less than PQL? ***NA*** **/ Yes / No**
Comments:

ii. If results are above PQL, what samples are affected? ***NA***
Comments:

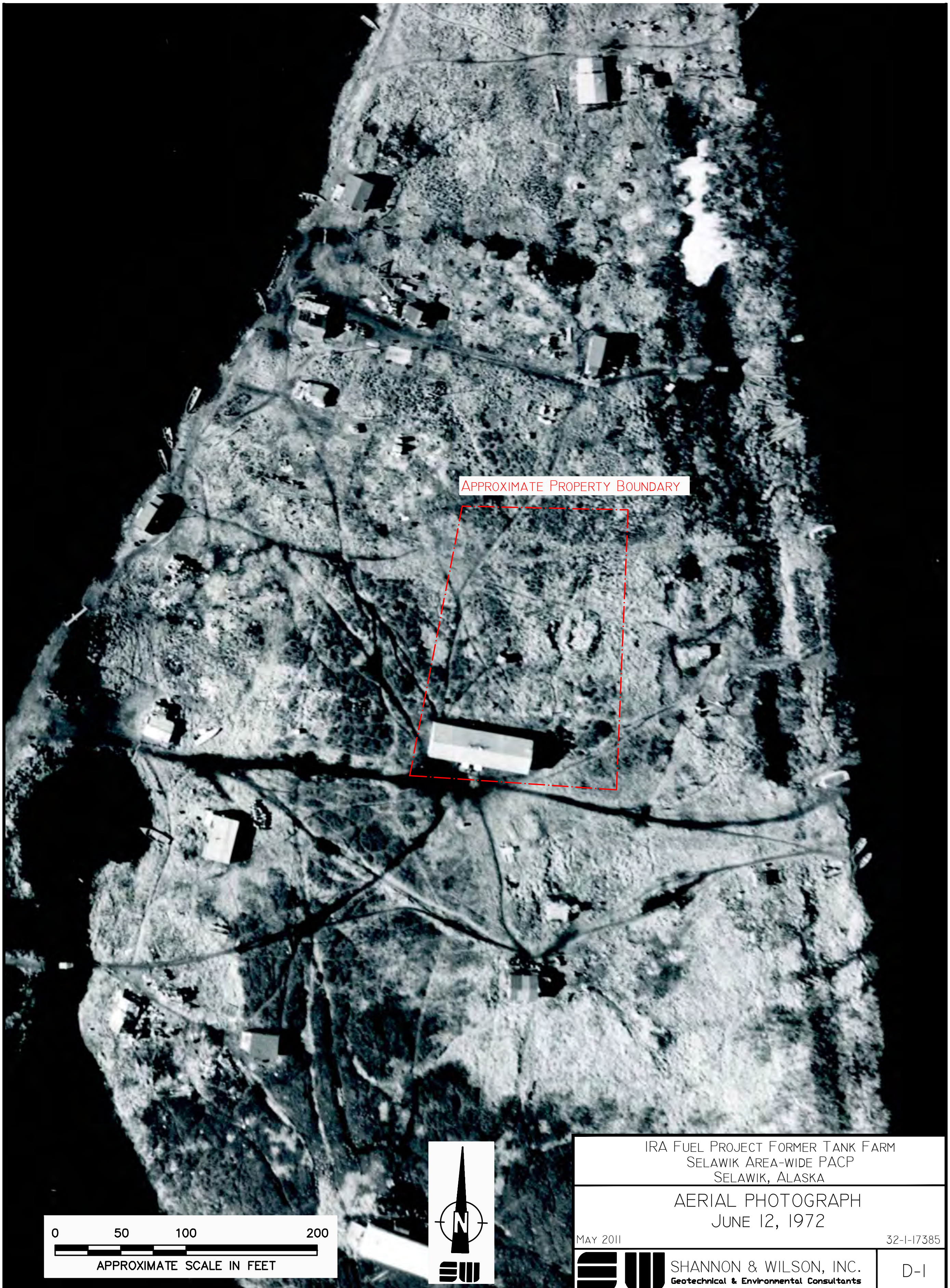
iii. Data quality or usability affected? Explain. ***NA***
Comments:

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

a. Are they defined and appropriate? ***NA*** **/ Yes / No**
Comments: *Data flags and qualifiers are defined on page following case narrative.*

APPENDIX D

HISTORICAL AERIAL PHOTOGRAPHS



IRA Fuel Project Former Tank Farm
Selawik Area-wide PACP
Selawik, Alaska

AERIAL PHOTOGRAPH
June 12, 1972

May 2011

32-1-17385

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

D-1

Approximate Property Boundary
IRA Fuel Project Former Tank Farm
Selawik Area-wide PACP
Selawik, Alaska
AERIAL PHOTOGRAPH
June 15, 1986
May 2011
32-1-17385
SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants
D-2
0 50 100 200
APPROXIMATE SCALE IN FEET
N

IRA FUEL PROJECT FORMER TANK FARM
SELAWIK AREA-WIDE PACP
SELAWIK, ALASKA

AERIAL PHOTOGRAPH
JUNE 26, 2000

MAY 2011

32-1-17385

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

D-3

IRA Fuel Project Former Tank Farm
Selawik Area-wide PACP
Selawik, Alaska

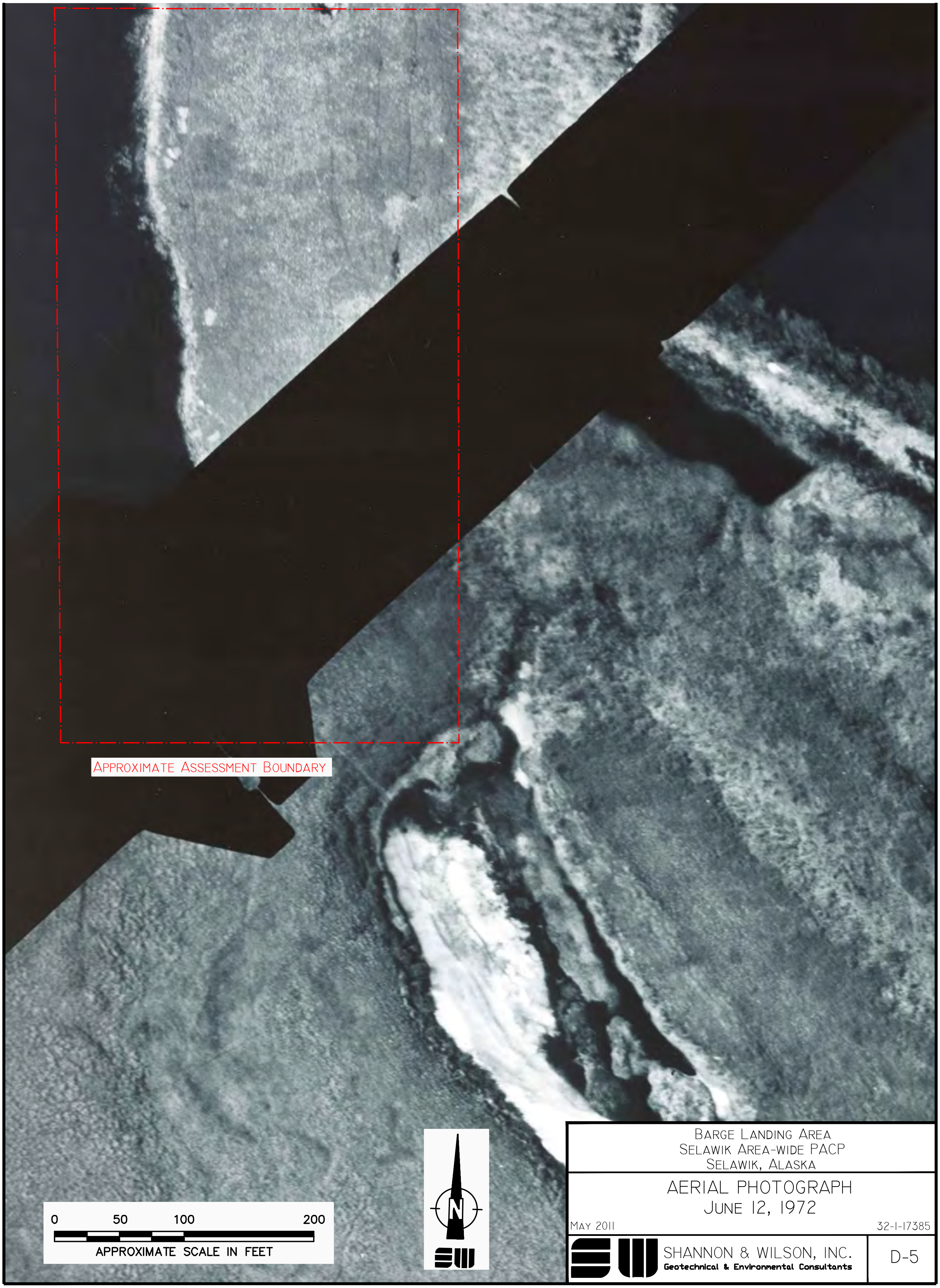
AERIAL PHOTOGRAPH
June 28, 2008

May 2011

32-1-17385

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

D-4



Barge Landing Area
Selawik Area-wide PACP
Selawik, Alaska

AERIAL PHOTOGRAPH
JUNE 12, 1972

May 2011

32-1-17385

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

D-5

Barge Landing Area
Selawik Area-wide PACP
Selawik, Alaska

AERIAL PHOTOGRAPH
JUNE 26, 2000

May 2011

32-1-17385

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

D-6

Barge Landing Area
Selawik Area-wide PACP
Selawik, Alaska

AERIAL PHOTOGRAPH
June 28, 2008

May 2011

32-1-17385

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

D-7

Former AVEC Facility and Former School Tank Farm
Selawik Area-wide PACP
Selawik, Alaska

AERIAL PHOTOGRAPH
JUNE 13, 1963

May 2011

32-1-17385

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

D-8

Former AVEC Facility and Former School Tank Farm
Selawik Area-wide PACP
Selawik, Alaska

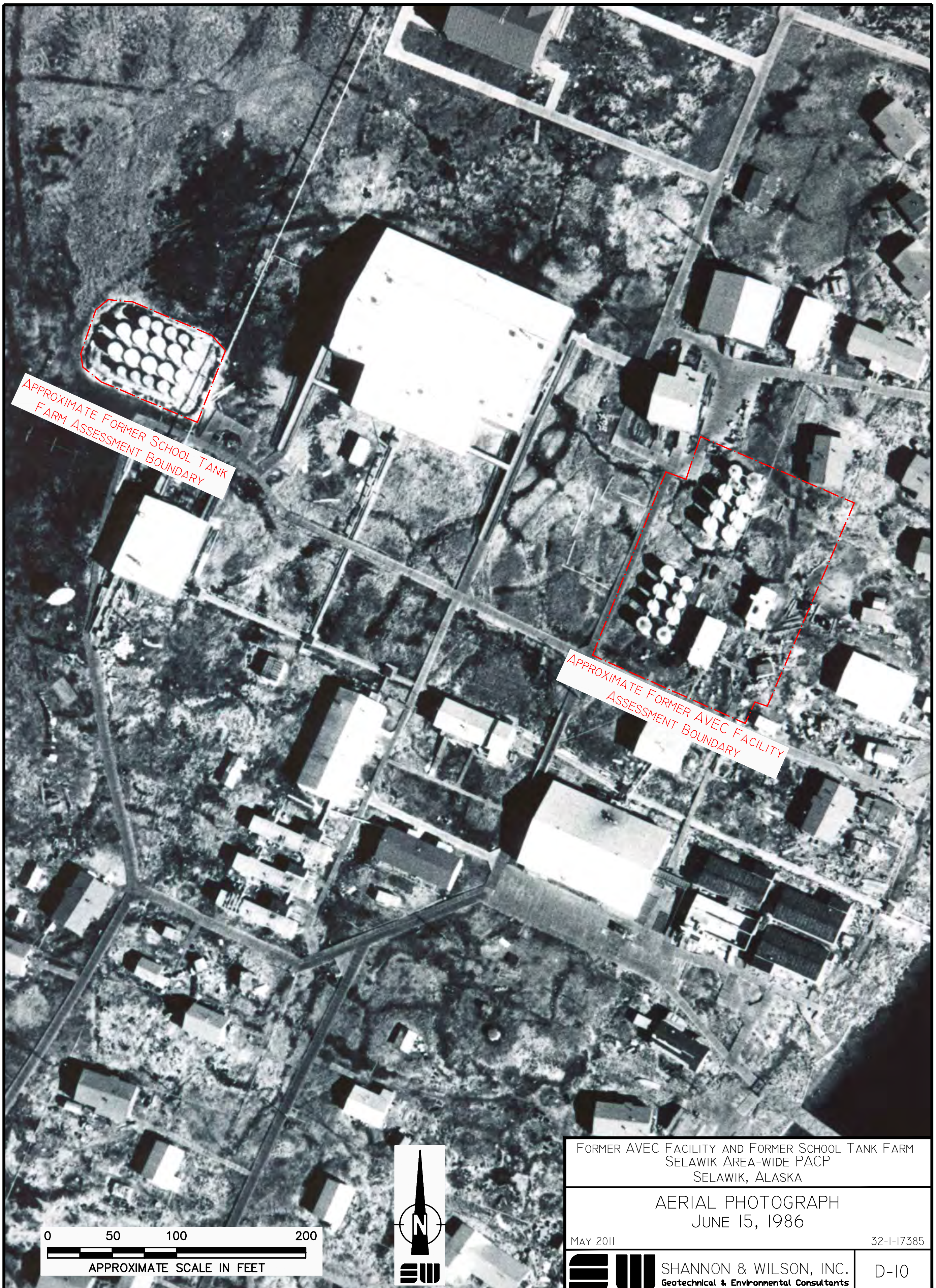
AERIAL PHOTOGRAPH
June 12, 1972

May 2011

32-1-17385

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

D-9



Former AVEC Facility and Former School Tank Farm
Selawik Area-wide PACP
Selawik, Alaska

AERIAL PHOTOGRAPH
June 15, 1986

May 2011

32-1-17385

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

D-10

Former AVEC Facility and Former School Tank Farm
Selawik Area-wide PACP
Selawik, Alaska

AERIAL PHOTOGRAPH
JUNE 26, 2000

May 2011

32-1-17385

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

D-11

Former AVEC Facility and Former School Tank Farm
Selawik Area-wide PACP
Selawik, Alaska

AERIAL PHOTOGRAPH
JUNE 28, 2008

May 2011

32-1-17385

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

D-12

APPENDIX E

OWNERSHIP DOCUMENTS

IRA FUEL PROJECT
FORMER TANK FARM
OWNERSHIP DOCUMENTS

2005-000547-0
Recording Dist: 215 - Kotzebue
10/21/2005 12:25 PM Pages: 1 of 2

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K
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CC

Y44617

THIS COVER SHEET HAS BEEN ADDED TO THIS DOCUMENT TO PROVIDE SPACE FOR RECORDING DATA AND TO COMPLY WITH MARGIN REQUIREMENTS SET FORTH IN 11 AAC 06.040 OF TITLE 11 OF THE ALASKA ADMINISTRATIVE CODE.

THIS COVER SHEET APPEARS AS THE FIRST PAGE OF THE DOCUMENT IN THE OFFICIAL RECORD.

DO NOT DETACH

City of Selawik
P.O. Box 99 • Selawik, Alaska 99770
(907) 484-2132 • Fax (907) 484-2209
E-mail cos1@gci.net

STATUTORY WARRANTY DEED

THIS UNDENTURE, made this 1st June 2005, by and between the City of Selawik, an Alaskan Municipal Corporation, whose address is P.O. Box 99, Selawik, AK 99770, Grantors, and The Native Village of Selawik, whose address is P.O. Box 59, Selawik, AK 99770, Grantee, WITNESSETH:

That the said Grantors, for and in consideration of the sum of One dollar ($1.00) and other good and valuable consideration in hand paid convey and warrant to Grantee, and to its successors and assigns the following described real property near Selawik, Alaska, to – wit:

> Lot 6, Block 1, Tract "A", as shown on the official plat of U.S. SURVEY NO. 4492, SELAWIK TOWNSITE, as accepted by the Chief, Division of Cadastral Survey, for the Director on March 14, 1974 and located within the Kotzebue Recording District, Second Judicial District, State of Alaska.

TO HAVE AND TO HOLD the same, with the appurtenances, unto the said Grantee and to its successors and to its successors and assign, FOREVER.

DATED this 6th day of June 2005.

THE CITY OF SELAWIK:

By: [signature]

Its: Mayor

STATE OF ALASKA)
) ss.
2nd JUDICIAL DISTRICT)

THIS IS TO CERTIFY that on this 10 day of June, 2005, personally appeared before me Allen Ticket Sr *, to me known to be the individuals described in and who executed the within Instrument and acknowledged that they executed the same as their free and voluntary act and deed, for the uses and purposes therein mentioned.

*Mayor of the City of Selawik

GIVEN UNDER MY HAND and official seal the day and year last above written.

Melvin Brown
Notary Public, State of Alaska
My commission expires: With resignation

SELAWIK AK
JUN 06 2005
USPS - 99770

Postmaster/Notary Public
Per USPS ASM 122.44

Return to:
Alaska Growth Capital
3900 C Street, Suite 302
Anchorage, AK 99503

Return to:
Alaska Growth Capital
3900 C St., Ste 302
Anchorage, AK 99503

2 of 2
2005-000647-0

FORMER AVEC FACILITY
OWNERSHIP DOCUMENTS

UNITE STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ALASKA STATE OFFICE - ANCHORAGE, AK
TRUSTEE DEED

BOOK 29 PAGE 329
Kotzebue Recording District

THIS INDENTURE, made this 5th day of August, in the year of our Lord one thousand nine hundred and eighty-five, by and between Gail Ozmina as trustee for the townsite of Selawik, U. S. Survey Number 4492, in the State of Alaska, party of the first part, and Alaska Village Electric Cooperative, Inc. of 4831 Eagle Street, Anchorage, Alaska 99503-7497, ~~Alaska~~, party of the second part,

WITNESSETH, That said party of the first part, as such trustee, by virtue of the power vested in and conferred upon him by the terms of section 11 of the Act of Congress approved March 3, 1891 (26 Stat. 1095), and the regulations thereunder and the patent issued to him thereon, and in consideration of the sum of xxxxxxxxxxxxxxxxxxxxxxxxx Ninety dollars, the amount of the assessments upon the premises hereinafter described, the receipt of which is hereby acknowledged, by these presents does grant, convey, and confirm unto the said party of the second part and its successors ~~heirs~~ and assigns all the following lot xxxxx, piece xxxxx, and parcel xxxxx of land situate in the townsite of Selawik, State of Alaska, described as follows, to-wit: Lot Five (5), Block Three (3), Tract "B", as shown on the official plat of U.S. Survey 4492, Selawik Townsite, as accepted by the Chief, Division of Cadastral Survey, for the Director on March 14, 1974.

85-0687
8.00 chg.

RECORDED ~~FILED~~
KOTZEBUE RECORDING DISTRICT

AUG 7 11 55 AM '85

REQUESTED BY USA/BLM
ADDRESS 701 C St., Box 13 ANCHORAGE, AK 99513

Return to:
Alaska Village Electric Cooperative, Inc.
4831 Eagle Street
Anchorage, Ak. 99503-7497

according to the official plat of survey of said townsite, subject to rights and reservations in said patent expressed. To have and to hold the same, together with all and singular the tenements, hereditaments, and appurtenances thereunto belonging or in anywise appertaining, its successors ~~heirs and~~ assigns forever.

IN WITNESS WHEREOF said party of the first part, as trustee, has hereunto set his hand and seal on the day and year first above written.

In the presence of:

Dennis Benson

Ethelyn H. Taylor

Gail Ozmina (SEAL)
Gail Ozmina
Trustee for the townsite of Selawik
__________, State of Alaska

STATE OF ALASKA:

BE IT REMEMBERED, That on this 5th day of August A.D. 1985, before me, a Notary Public, came Gail Ozmina, to me personally known to be the trustee of said townsite of Selawik, and the identical person described in, and whose name is affixed to, the foregoing conveyance as grantor, and he acknowledged the execution of the same to be his voluntary act and deed as such trustee, for the uses and purposes therein mentioned.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed my official seal on the day and year first above written.

ORIGINAL

(SEAL) ALLAN J. BREITZMAN NOTARY PUBLIC STATE OF ALASKA

Allan J. Breitzman
Allan J. Breitzman
Notary Public for Alaska, residing at Anchorage, Alaska

My Commission expires December 17, 1988

AK 2564-21 (Feb. 1984)
(formerly 2560-4)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ALASKA STATE OFFICE - ANCHORAGE, AK
TRUSTEE DEED

BOOK 29 PAGE 330
Kotzebue Recording District

THIS INDENTURE, made this 5th day of August, in the year of our Lord one thousand nine hundred and eighty-five, by and between Gail Ozmina as trustee for the townsite of Selawik, U. S. Survey Number 4492, in the State of Alaska, party of the first part, and Alaska Village Electric Cooperative, Inc. of 4831 Eagle Street Anchorage, Alaska 99503-7497, ~~Alaska~~, party of the second part,

WITNESSETH, That said party of the first part, as such trustee, by virtue of the power vested in and conferred upon him by the terms of section 11 of the Act of Congress approved March 3, 1891 (26 Stat. 1095), and the regulations thereunder and the patent issued to him thereon, and in consideration of the sum of xxxxxxxxxxxxxxxxxxxxxxxxx Ninety dollars, the amount of the assessments upon the premises hereinafter described, the receipt of which is hereby acknowledged, by these presents does grant, convey, and confirm unto the said party of the second part and its successors ~~heirs~~ and assigns all the following lot xxxxx, piece xxxxx, and parcel xxxxx of land situate in the townsite of Selawik, State of Alaska, described as follows, to-wit: Lot One (1), Block Five (5), Tract "B", as shown on the official plat of U.S. Survey 4492, Selawik Townsite, as accepted by the Chief, Division of Cadastral Survey, for the Director on March 14, 1974.

85-0688
8.00 chg.

RECORDED ~~FILED~~
KOTZEBUE RECORDING
DISTRICT

AUG 7 11 55 AM '85

REQUESTED BY USA/BLM 701 C St., Box 13 Anchorage, AK. 99513
ADDRESS

Return to:
Alaska Village Electric Cooperative, Inc.
4831 Eagle Street
Anchorage, Ak. 99503-7497

According to the official plat of survey of said townsite, subject to rights and reservations in said patent expressed. To have and to hold the same, together with all and singular the tenements, hereditaments, and appurtenances thereunto belonging or in anywise appertaining, its successors ~~heirs~~ and assigns forever.

IN WITNESS WHEREOF said party of the first part, as trustee, has hereunto set his hand and seal on the day and year first above written.

In the presence of:

Dennis Benson
Etthelyn H. Taylor

(SEAL)
Gail Ozmina
Gail Ozmina
Trustee for the townsite of Selawik
, State of Alaska

STATE OF ALASKA:

BE IT REMEMBERED, That on this 5th day of August A.D. 19 85, before me, a Notary Public, came Gail Ozmina, to me personally known to be the trustee of said townsite of Selawik, and the identical person described in, and whose name is affixed to, the foregoing conveyance as grantor, and he acknowledged the execution of the same to be his voluntary act and deed as such trustee, for the uses and purposes therein mentioned.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed my official seal on the day and year first above written.

(SEAL)

ALLAN J. BREITZMAN NOTARY PUBLIC STATE OF ALASKA

ORIGINAL

Allan J. Breitzman
Allan J. Breitzman
Notary Public for Alaska, residing at Anchorage, Alaska

My Commission expires December 17, 1988

AK 2564-21 (Feb. 1984)
(Formerly 2560-4)

AFTER RECORDING PLEASE
FORWARD TO THE GRANTEE.

BOOK 0034 PAGE 312

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ALASKA STATE OFFICE - ANCHORAGE, AK.

TRUSTEE DEED

THIS INDENTURE, made this 17th day of August, in the year of our Lord one thousand nine hundred and eighty-eight, by and between Gail Ozmina, as trustee for the townsite of Selawik, U.S. Survey Number 4492, in the State of Alaska, party of the first part, and the City of Selawik, of P.O. Box 49, Alaska, 99770, party of the second part,

WITNESSETH, That said party of the first part, as such trustee, by virtue of the power vested in and conferred upon her by the terms of section 11 of the Act of Congress approved March 3, 1891 (26 Stat. 1095), and the regulations thereunder and the patent issued to her thereon, and in consideration of the sum of no dollars, the amount of the assessments upon the premises hereinafter described, the receipt of which is hereby acknowledged, by these presents does grant, convey and confirm unto the said party of the second part and its successors and assigns all the following lot, piece, and parcel of land situated in the townsite of Selawik, State of Alaska, described as follows, to-wit:

> Lot Two (2), Block Five (5), Tract "B", as shown on the official plat of U.S. Survey 4492, Alaska, Selawik Townsite, as accepted by the Chief, Division of Cadastral Survey, for the Director on March 14, 1974, and located within the Kotzebue Recording District.

According to the official plat of survey of said townsite, subject to rights and reservations in said patent expressed. To have and to hold the same, together with all and singular the tenements, hereditaments, and appurtenances thereunto belonging or in anywise appertaining, its successors and assigns forever.

IN WITNESS WHEREOF said party of the first part, as trustee, has hereunto set her hand and seal on the day year first above written.

In the presence of:

Dena C. Baker

Gail Ozmina

Gail Ozmina

Townsite Trustee for the Townsite of Selawik, State of Alaska

AK 2564-21 (Feb. 1984)

ORIGINAL

STATE OF ALASKA:

BE IT REMEMBERED, That on this 17th day of August, A.D. 1988, before me, a Notary Public, came Gail Ozmina, to me personally known to be the Trustee of said townsite of Selawik, and the identical person described in, and whose name is affixed to, the foregoing conveyance as grantor, and she acknowledged the execution of the same to be her voluntary act and deed as such Trustee, for the uses and purposes therein mentioned.

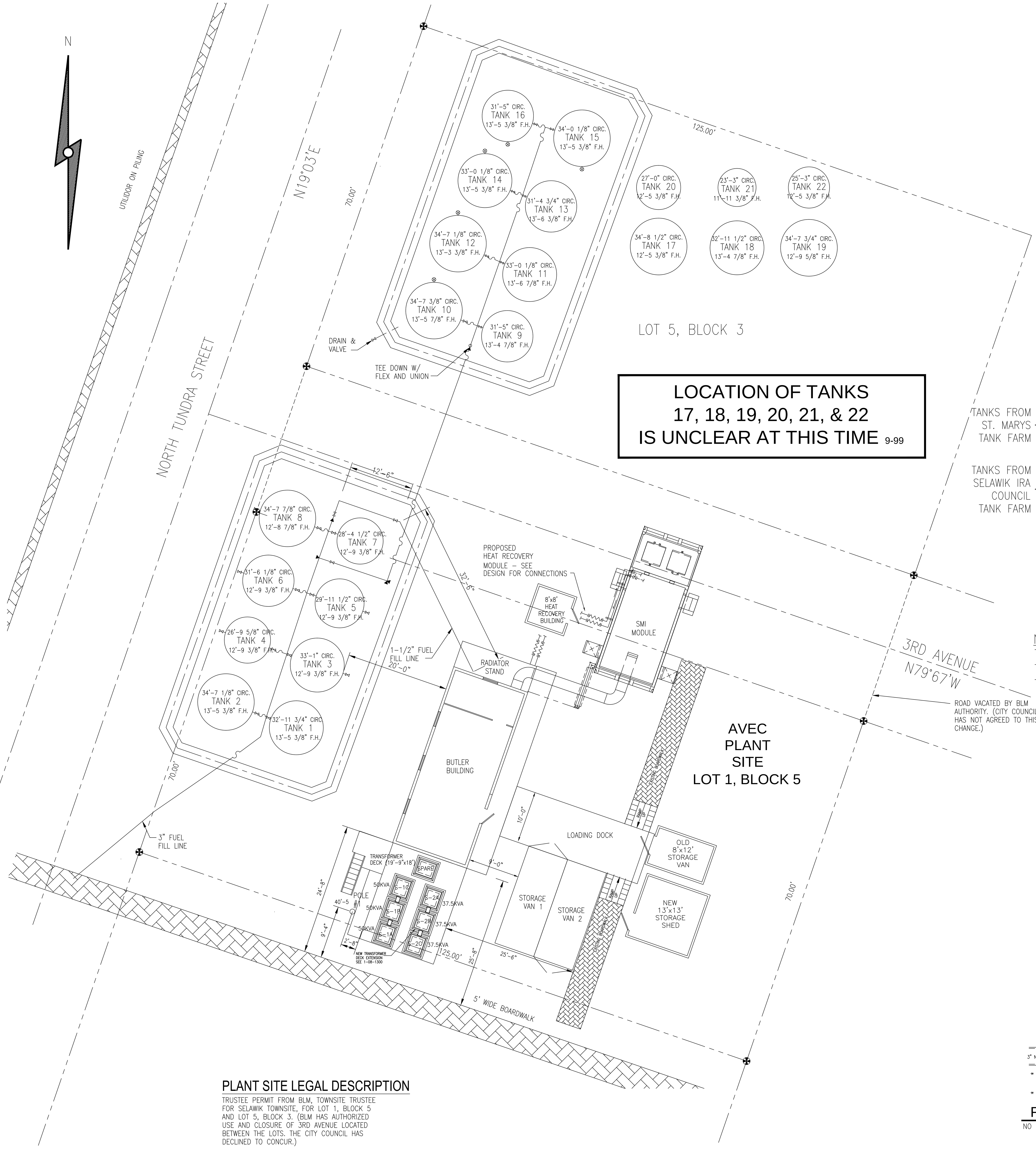
IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed my official seal on the day and year first written above.

Allan J. Breitzman

Allan J. Breitzman
Notary Public for Alaska, residing
at Anchorage, Alaska
My Commission expires December 17, 1988

88-0430
13 - cag
KOTZEBUE REC. DISTRICT
AUG 18 2 13 PM '88
BIA
ADDRESS Rtn to: City of Selawik

ORIGINAL



PLANT SITE LEGAL DESCRIPTION

TRUSTEE PERMIT FROM BLM, TOWNSITE TRUSTEE FOR SELAWIK TOWNSITE, FOR LOT 1, BLOCK 5 AND LOT 5, BLOCK 3. (BLM HAS AUTHORIZED USE AND CLOSURE OF 3RD AVENUE LOCATED BETWEEN THE LOTS. THE CITY COUNCIL HAS DECLINED TO CONCUR.)

Nearest Navigable Waters
APPROX. 283' EAST TO THE SELAWIK RIVER

	TANK DIMENSIONS FOR SELAWIK					TANK No.	FIELD INVENTORY		FOR OFFICE USE ONLY				FUEL (in gallons)		
	CIRCUMFERENCE feet – inches	RIM ANGLE HEIGHT feet – inches	BOTTOM NIPPLE HEIGHT (inches)	OUTSIDE DIAMETER feet	MAX FUEL FILL HEIGHT feet – inches		WATER inches	LIQUID IN TANK feet – inches	GALLONS PER FOOT MULTIPLER	GALLONS PER FOOT CALCULATION	GALLONS PER FOOT MULTIPLER	GALLONS PER FOOT CALCULATION	QUANTITY INVENTORIED	MAXIMUM FILL CAPACITY	USABLE CAPACITY
	32'-11 3/4"	13'-10"	8"	10.498'	13'-5.38"	1			643.28		53.606			8651	8222
	34'-7 1/8"	13'-10"	6"	11.012'	13'-5.38"	2			708.04		59.003			9522	9168
	33'-1"	13'-2"	7"	10.531'	12'-9.38"	3			647.36		53.947			8274	7897
	26'-9 5/8"	13'-2"	7"	8.532'	12'-9.38"	4			424.25		35.345			5423	5175
	29'-11 1/2"	13'-2"	7"	9.536'	12'-9.38"	5			530.48		44.207			6780	6471
	31'-6 1/8"	13'-2"	7"	10.030'	12'-9.38"	6			587.09		48.924			7504	7162
	28'-4 1/2"	13'-2"	7"	9.032'	12'-9.38"	7			475.70		39.642			6080	5803
	34'-7 7/8"	13'-1.5"	7"	11.032'	12'-8.88"	8			710.60		59.217			9053	8639
	31'-5"	13'-9.5"	5"	10.000'	13'-4.88"	9			583.58		48.631			7824	7581
	34'-7 3/8"	13'-10.5"	4.5"	11.018'	13'-5.88"	10			708.87		59.073			9563	9297
	33'-0 1/8"	13'-11.5"	5"	10.508'	13'-6.88"	11			644.50		53.708			8748	8479
	34'-7 1/8"	13'-8"	3.5"	11.012'	13'-3.38"	12			708.02		59.002			9404	9197
	31'-4 3/4"	13'-11"	5"	9.994'	13'-6.38"	13			582.80		48.567			7886	7643
	33'-0 1/8"	13'-10"	4.5"	10.508'	13'-5.38"	14			644.50		53.708			8667	8426
	34'-7 1/8"	13'-10"	8"	11.012'	13'-5.38"	15			708.02		59.002			9522	9050
	31'-5"	13'-10"	7"	10.000'	13'-5.38"	16			583.58		48.631			7848	7508
TANKS FROM ST. MARYS TANK FARM	34'-8 1/2"	13'-2"	7.5"	11.048'	12'-9.38"	17			712.73		59.394			9110	8664
	32'-11 1/2	13'-9 1/2"	2.63"	10.491'	13'-4.88"	18			642.46		53.538			8613	8472
	34'-7 3/4"	13'-2 1/4"	6.75"	11.028'	12'-9.63"	19			710.16		59.180			9092	8692
TANKS FROM SELAWIK IRA COUNCIL TANK FARM	27'-0"	12'-10"	7"	8.594'	12'-5.38"	20			430.55		35.879			5360	5108
	23'-3"	12'-4"	4.75"	7.401'	11'-11.38"	21			318.85		26.571			3810	3684
	25'-3"	12'-10"	6.5"	8.037'	12'-5.38"	22			376.34		31.362			4685	4481
									TANK FARM TOTALS					171,419	164,819

MAXIMUM FUEL FILL HEIGHT (F.H.) (ASSUMING 6" FOR EXPANSION OR TILT) = [OUTSIDE BOTTOM OF THE TANK TO THE TOP EDGE OF THE ROOF SUPPORT RIM] –4.62"

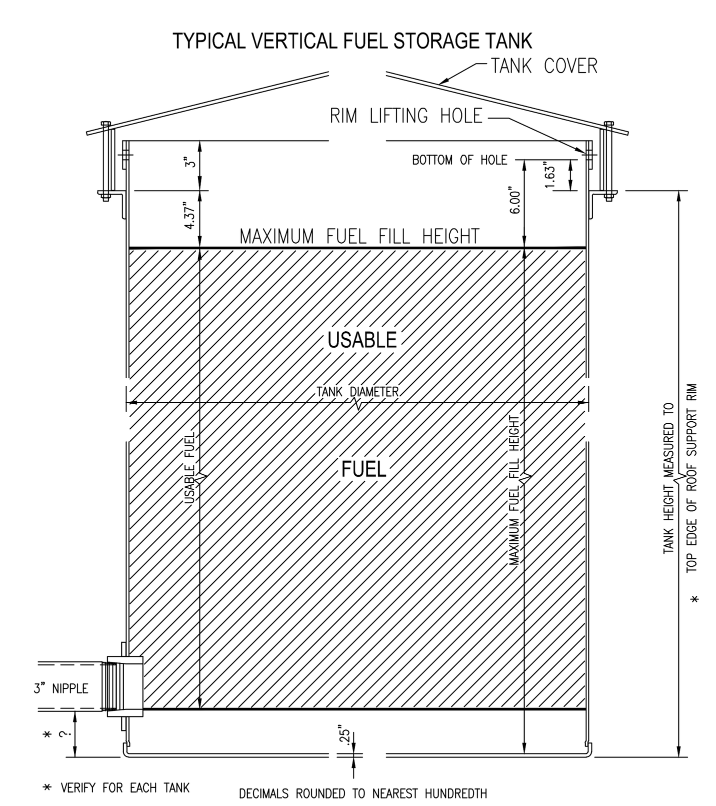
MAXIMUM FUEL FILL CAPACITY = MAXIMUM FUEL FILL HEIGHT (F.H.) X MULTIPLIER

USABLE FUEL CAPACITY = [MAXIMUM FUEL FILL HEIGHT (F.H.) – BOTTOM NIPPLE HEIGHT] X MULTIPLIER

NOTE:
TANK 17 WAS ORIGINALLY TANK 15 AT ST. MARYS
TANK 18 WAS ORIGINALLY TANK 18 AT ST. MARYS
TANK 19 WAS ORIGINALLY TANK 19 AT ST. MARYS

DAYTANK READING

DATE	AMOUNT OF FUEL IN TANK	REGISTER TOTAL	FUEL INVENTORY AND DAYTANK READING TAKEN BY: SIGNATURE
DAYTANK DIMENSIONS			NUMBER OF BARRELS OF LUBE OIL ON SITE
LENGTH	OUTSIDE DIAMETER		
64"	30"		GALLONS OF ANTIFREEZE ON SITE



FUEL TANK FILL CAPACITY DETAIL
NO SCALE

LEGEND

- BALL VALVE
- GATE VALVE
- CHECK VALVE
- FLEX
- FLANGE
- TEE
- CROSS
- ELBOW
- UNION
- PLUG
- 3-WAY VALVE, DURCO MG411-13 (ARRANGEMENT #13)
- CAP
- REDUCER

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 FT.

NO.	DATE	BY	REVISIONS
7	9-16-99	SJF / MET	ADD TANK DIMS. FOR TANKS 17, 18 & 19 PER R. EBENAL
6	7-1-97	TRA / DRB	TANK DIMENSIONS PER D. BIEGEL
5	8-12-96	RM / DRB	FIELD LOCATIONS OF STRUCTURES, MOD. XFM DECK
4	6-23-94	RM / MET	ADDED FIELD INFO PER B. BRYAN AT PLANT
3	12-3-92	RM / MET	ADDED FIELD INFO PER M. TEITZEL
2	6-18-90	RM / MET	NEW CADD DRAWING

AVEC
ALASKA VILLAGE ELECTRIC COOPERATIVE
4831 Eagle Street
Anchorage, Alaska 99503

TITLE
PLANT SITE
SELAWIK

WORK ORDER No.	
BY R. MONAHAN	FF # 16
ENGR. M. TEITZEL	CAD# P03GP000
VILLAGE SELAWIK	
SCALE 1" = 10'	DATE 6-18-90
SHEET 1 OF 1	
NO. 1-03-0000	REV. 7

FORMER SCHOOL TANK FARM AND STORAGE PAD
OWNERSHIP DOCUMENTS/PLATS

SURVEYORS CERTIFICATE

I, DONALD C. BLACK HEREBY CERTIFY THAT I AM PROPERLY REGISTERED AND LICENSED TO PRACTICE LAND SURVEYING IN THE STATE OF ALASKA, THAT THIS DRAWING REPRESENTS A SURVEY MADE BY ME, OR UNDER MY DIRECT SUPERVISION, THAT THE MONUMENTS SHOWN HEREON ACTUALLY EXIST AS DESCRIBED, AND THAT ALL DIMENSIONS AND OTHER DETAILS ARE CORRECT, TO THE BEST OF MY KNOWLEDGE AND BELIEF.

2-18-98
DATE

Donald C Black
REGISTERED LAND SURVEYOR

STATE OF ALASKA
49th
DONALD C. BLACK
LS-8851
REGISTERED PROFESSIONAL LAND SURVEYOR

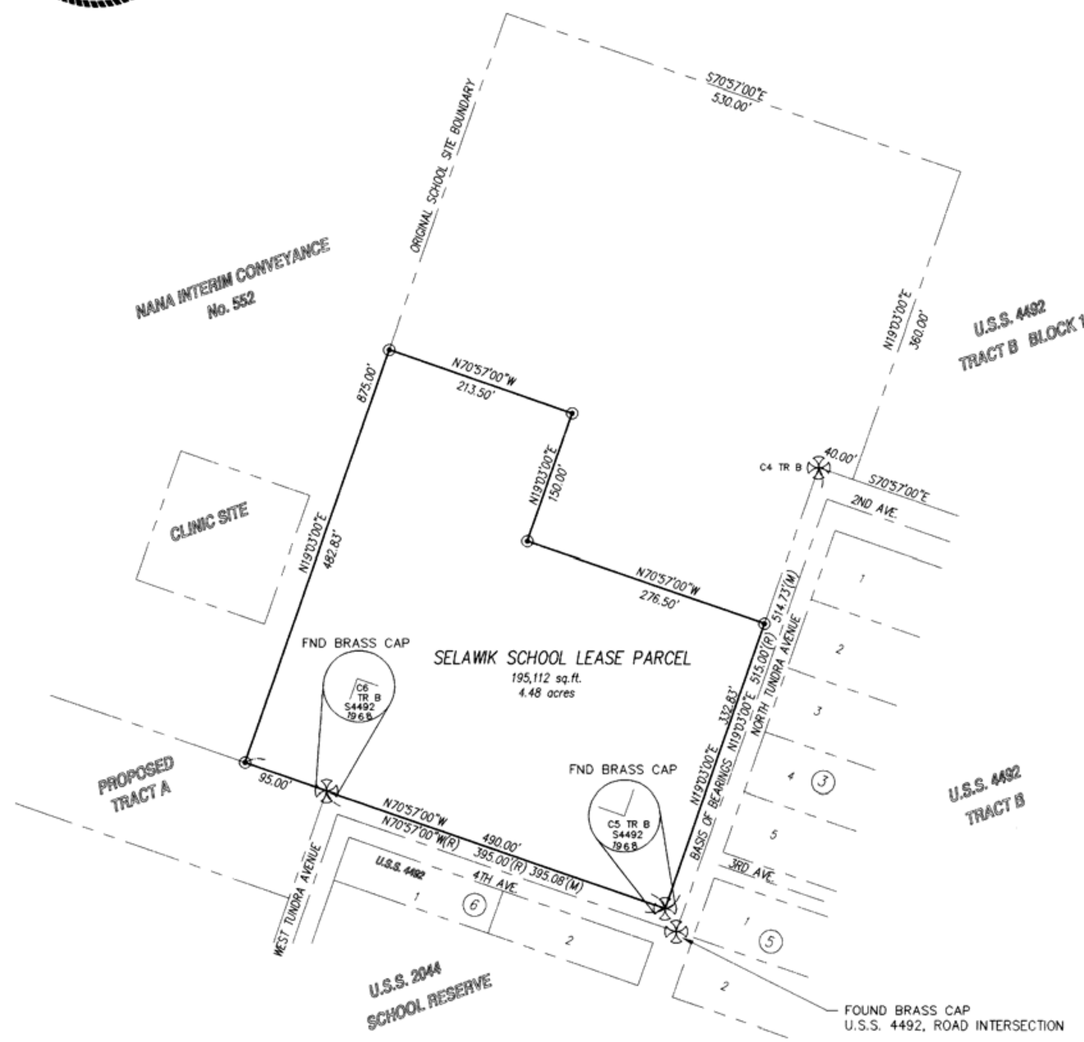
TAX CERTIFICATE

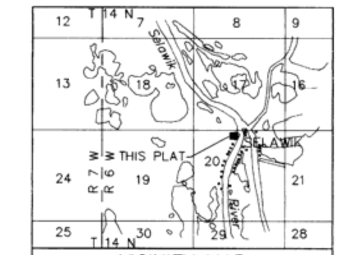
THE LANDS CONTAINED AND DESCRIBED HEREON ARE NOT SUBJECT TO TAXATION AT THE TIME OF RECORDING.

NOTES:

1. THIS PARCEL IS DESCRIBED AS THE SELAWIK SCHOOL LEASE, SEE BOOK 47, PAGES 440 THROUGH 455, KOTZEBUE RECORDERS OFFICE, THAT DESCRIPTION WILL BE AMENDED TO CONFORM TO THE PARCEL BOUNDARY AS DEPICTED HEREON.

2. THE ORIGINAL SCHOOL SITE BOUNDARY IS AS DESCRIBED ON A BLM TRUSTEE PERMIT DATED APRIL 13, 1973.





VICINITY MAP
U.S.G.S. SELAWIK(C-2/3) SCALE: 1"=1 MILE

LEGEND

⊗ FOUND BLM MONUMENT

⊙ SET 2" ALCAP ON 5/8" X 30" REBAR

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

CERTIFICATE OF OWNERSHIP AND DEDICATION

I, THE UNDERSIGNED, HEREBY CERTIFY THAT I REPRESENT THE NANA REGIONAL CORPORATION INC., AND THAT THE NANA REGIONAL CORPORATION INC. IS THE OWNER OF THE PROPERTY SHOWN HEREON. I HEREBY APPROVE THIS PLAT OF SUBDIVISION AND DEDICATE FOR PUBLIC USE AS NOTED, ALL EASEMENTS, PUBLIC UTILITY AREAS, AND RIGHTS-OF-WAY SHOWN HEREON.

Frank P. Greene
REPRESENTATIVE
NANA REGIONAL CORPORATION, INC.
1001 E. BENSON BOULEVARD
ANCHORAGE, ALASKA 99508

03/05/98
DATE

Director of Lands
TITLE

NOTARY'S ACKNOWLEDGMENT

SUBSCRIBED AND SWORN TO BEFORE ME THIS 5th DAY OF March, 1998.

Darlene C. O'Connor
NOTARY FOR THE STATE OF ALASKA
MY COMMISSION EXPIRES: 7-7-99

DARLENE C. O'CONNOR NOTARY PUBLIC STATE OF ALASKA

BOROUGH APPROVAL CERTIFICATE

THE NORTHWEST ARCTIC BOROUGH HEREBY APPROVES THIS PLAT.

REPRESENTATIVE

16 May 98
DATE

Planning Director
TITLE

FOR THE NORTHWEST ARCTIC BOROUGH.

NOTARY'S ACKNOWLEDGMENT

SUBSCRIBED AND SWORN TO BEFORE ME THIS 16th DAY OF March, 1998.

NOTARY FOR THE STATE OF ALASKA
MY COMMISSION EXPIRES: 9-15-99

NOTARY PUBLIC

98-6
RECORDED & ~~FILED~~ 20.00
Kotzebue REC. DIST.
DATE 3/31, 19 98
TIME 10:36 A M
Requested by Larsen Engineering
Address

PLAT OF

SELAWIK SCHOOL LEASE PARCEL
LOCATED IN SELAWIK, ALASKA
WITHIN SECTION 20, TOWNSHIP 14 NORTH, RANGE 6 WEST
KATEEL RIVER MERIDIAN
CONTAINING 4.48 ACRES MORE OR LESS

KOTZEBUE RECORDING DISTRICT ALASKA

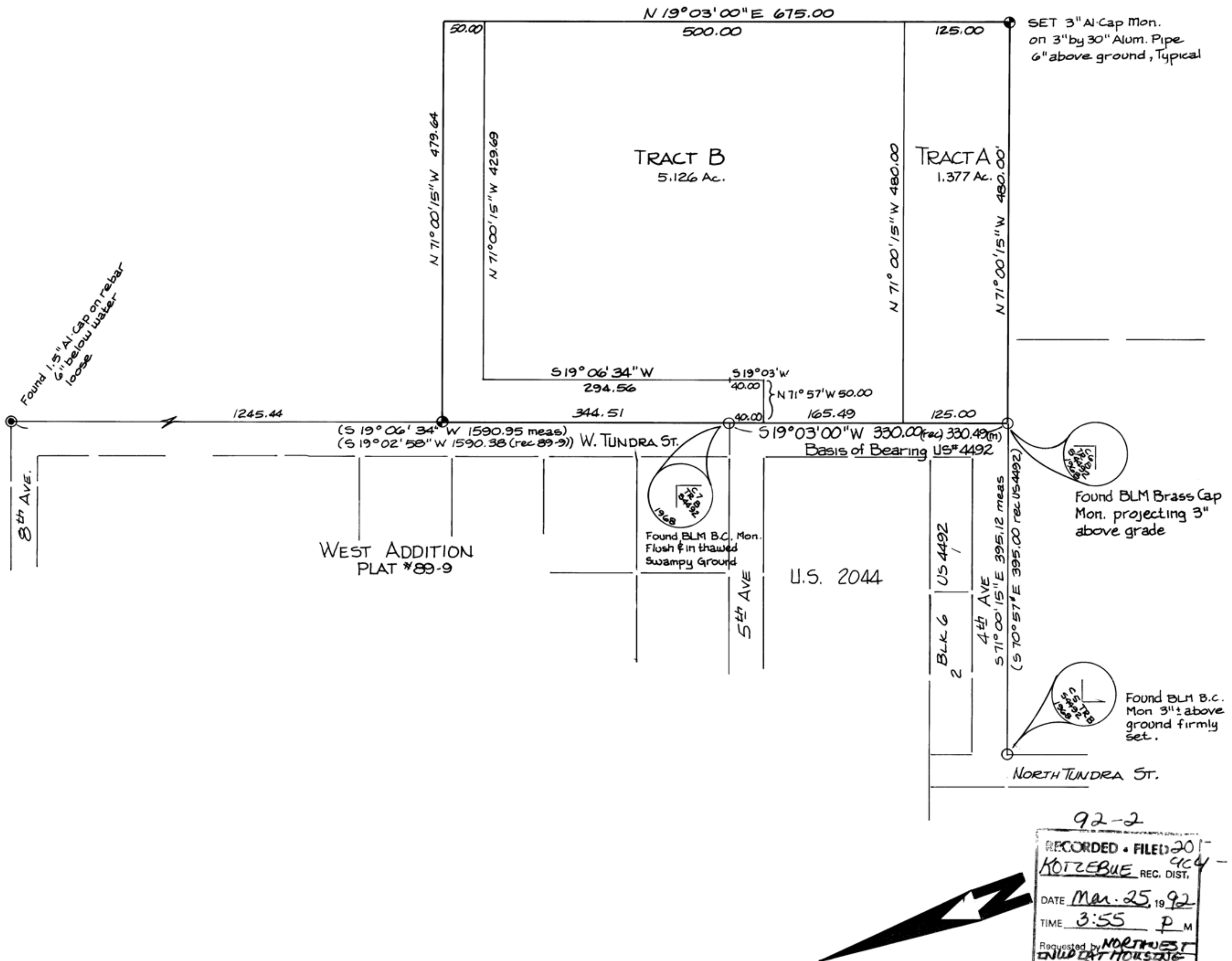
LARSEN ENGINEERING, Inc.
Engineering • Architecture • Surveying
3710 Woodland Dr.
Suite 2100
Anchorage, AK. 99517
(907) 243-8985

PROJECT NO.: 95046	F.B.: LEI 97-02
DRAWN DATE: 9/26/97	SCALE: 1"=100'
DRAWN BY: TFB	CHECKED BY: DB

95046SEL\SELAWIK_PLAT

Kotzebue 98-6

NORTH SUBDIVISION SELAWIK 92-2
WITHIN SEC 20 T14N R6W KRM
KOTZEBUE 3/25/92



92-2
RECORDED • FILED 2014
KOTZEBUE REC. DIST.
DATE Mar. 25, 1992
TIME 3:55 P M
Requested by NORTHWEST INUPIAT HOUSING AUTHORITY
Address BOX 331 KOTZEBUE AK 99752
296199

CERTIFICATE OF OWNERSHIP & DEDICATION

I, the undersigned, do hereby certify that, pursuant to the Interim Conveyance, NANA Regional Corporation is the owner of the surface estate of the property shown and described hereon and that it does accept and adopt this plat of subdivision. The corporation does further dedicate all public right of ways shown to the public and does grant all easements to the use shown.

Christina Westlake — 12-5-91
Christina Westlake, Chairperson — Date
NANA Regional Corp.
1001 E. Benson Blvd.
Anchorage, Ak.

NOTARY ACKNOWLEDGEMENT

Christina Westlake did personnelly appear, subscribe and swear to before me this 5th day of December 1991.

Notary for Alaska
my commission expires: 7-7-95

CERTIFICATE OF APPROVAL & ACCEPTANCE

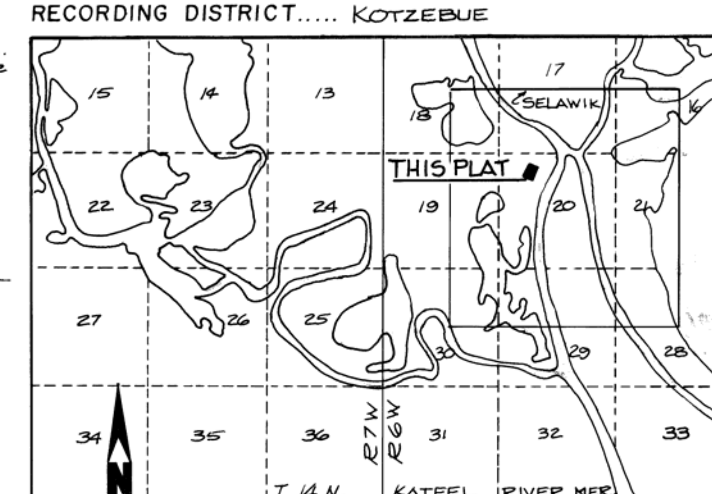
This plat of subdivision was approved by the N.W. Arctic Borough's Planning Commission at the meeting of December 4, 1991.

Authorized Official
N.W. Arctic Borough

TAX STATEMENT

The property shown and described hereon is not subject to taxation at this time of recording.

RECORDING DISTRICT..... KOTZEBUE



VICINITY MAP USGS SELAWIK (C-2&3) scale 1"=1mile

PLAT OF
NORTH SUBDIVISION SELAWIK
a partial subdivision of
INTERIM CONVEYANCE #
within
Unsurveyed Sec. 20, T 14 N., R. 6 W., KATEEL RIVER MER.

PREPARED BY	FOR		
KOWCHEE INC. 1042 E. 6th Ave Anchorage, Ak. 99501	N.W. INUPIAT REGIONAL HOUSING P.O. Box 331 KOTZEBUE AK.		
DATE 1 DEC. 91	DRAWN PDW	CHECKED PDW	SHEET 1 of 1
SCALE 1" = 100	F BOOK 90-01	W.O. 9106.02	

APPROVAL BY AK. D.E.C.

WASTEWATER DISPOSAL: The Alaska Department of Environmental Conservation has reviewed plans for this subdivisions wastewater disposal and approves this subdivision for platting.

12 MAR 92
Name and title of Ak. D.E.C. Approving Official — Date

SURVEYORS CERTIFICATION

I, Paul D. Whipple (LS-6992), do hereby certify that I am a duly registered professional land surveyor in the State of Alaska, and that this plat of subdivision does fully and accurately represent a survey made by me, and that the monumentation shown does exist as described, and that the dimensional data and other details shown are correct.

Paul Whipple
12/01/91

APPENDIX F

ENVIRONMENTAL RECORDS SOURCE INFORMATION

ERNS Incidents in Alaska (1982-2008)

Search Criteria Used (More)	
Reporting Year	ALL GO
Level of Detail	Complete GO
Type of Report Output	Text (HTML) GO

Reporting Year: 1998

Incident ID #1 : 422759

Call Recordkeeping

Incident ID Number	422759
Date / Time Call Received	2/3/1998 18:25
Date / Time Call Complete	2/3/1998 18:30
Date Call Received	02/03/1998
Date Call Complete	02/03/1998
Call Type	Incident
Incident ID Number	422759
Call Taker	CJM8755

Suspected Responsible Party

Resp. Company	ALASKA VILLAGE ELEC. COOP
Resp. Organization Type	PUBLIC UTILITY
Resp. Address	4831 EAGLE ST
Resp. City	ANCHORAGE
Resp. State	AK
Resp. Zip Code	99503
Resp. Last Name	MANN
Resp. First Name	CHRISTOPHER
Resp. Phone 1	9075611818
Resp. Phone Type 1	PRIMARY

Incident Description (Incident ID #1 : 422759)

Incident Description	55 GALLON DRUM / WHILE MOVING DRUM IT FELL OVER
Incident Type	FIXED
Incident Cause	OPERATOR ERROR
Incident Date / Time	2/3/1998 13:34
Incident Date	02/03/1998
Incident Occurred/ Discovered/ Planned	OCCURRED
Additional Info	AREA OF IMPACT: 3SQ FTCALLER HAD NO FURTHER INFORMATION / WILL NOTIFY: DEC

Incident Location

Location Address	AVEC POWER PLANT
City Near Location	SELAWIK
Location State	AK
Location County	UNKNOWN
Distance From City	0

Material

Chris Code	OMT
Amount Of Material	3
Amount Of Material Units	GALLON(S)

Name of Material	OIL, MISC: MOTOR
Material Reached Water	YES
Amount In Water	0
Amount In Water Units	NONE

Impact Information ? (Incident ID #1 : 422759)

Fire Involved (Yes/No)	No
Evacuations (Yes/No)	No
Number Evacuated	0
Number Injured	0
Number Fatalities	0
Property Damage (Yes/No)	No
Property Damage (in Dollars)	0
Air Corridor Closed (Yes/No)	No
Waterway Closed (Yes/No)	No
Road Closed (Yes/No)	No
Major Artery (Yes/No)	No
Track Closed (Yes/No)	No
Medium Description	LAND
Additional Medium Info	SNOW COVERED SOIL
Community Impact (Yes/No)	No
Passengers Transferred	UNK

Continuous Release ?

All data fields in this section were blank.

Remedial Action ? (Incident ID #1 : 422759)

Remedial Action	USED SORBENT PADS TO RECOVER MATERIAL / PLACED MATERIAL IN A BBLCALLER ESTIMATED 98% OF THE MATERIAL HAS BEEN RECOVERED

Drilling Platform Details ?

All data fields in this section were blank.

Fixed Object Details ?

Structure Operating (Yes/No)	Yes

Mobile Incident ?

All data fields in this section were blank.

Pipeline Details ?

Pipeline Above Ground	ABOVE

Railroad Incident ?

Grade Crossing (Yes/No)	No
Crossing Device Operational (Yes/No)	Yes
Brake Failure (Yes/No)	No

Storage Tank Details ? (Incident ID #1 : 422759)

Tank Above Ground	ABOVE

Aircraft Details ?

All data fields in this section were blank.

Vessel Incident ?

Allision (Yes/No)	No

Weather ?

All data fields in this section were blank.

Material In Water ?

Offshore (Yes/No)	No

Unknown Sheen Details ?

All data fields in this section were blank.

Disused Fields ? (Incident ID #1 :)

All data fields in this section were blank.

Record Counts ?

Number of Materials Records	1
Number of CR Materials Records	0
Number of Mobile Vehicle Records	0
Number of Train Records	0
Number of Derailed Train Records	0
Number of Vessel Records	0

Total incidents for reporting year 1998: 1

END OF REPORT

This search was done on September 13, 2010. It was compiled from government data last released on September 24, 2009. The data were obtained from the U.S. Coast Guard's **Emergency Response Notification System** database (ERNS).

Search Criteria Used	
Incident Location City	Selawik
Incident Location State	Alaska
Reporting Year	ALL GO
Level of Detail	Complete GO
Type of Report Output	Text (HTML) GO

Spills Database Online Query

Spill Details: - 2/3/1998

Facility Name	Street	City	Zip Code
SELAWIK CITY, AVEC POWER PLANT.	no address	Selawik	no zip

Facility Type
Other

Responsible Company	Contact	Address
A.V.E.C.	NO ENTRY, NO ENTRY	no address

Area	Sub Area	Region	Location
Northern Alaska	Northwest Arctic	West Coast	SELAWIK CITY

Substance	Released	Contained	Recovered	Unit
Engine Lube Oil	3	3	3	Gallons

Causes
Cargo Not Secured

Sources
Drum(s)

Reporter's Name	Reporter's Phone	Date Reported
CHRISTPHER MANN	484-2218	2/3/1998 1:30:00 PM

Action	Action Date
Case Closed, No Further Action	2/3/1998
Data Problem	no date

Disposal Code	Description
76	SNOW MELTED / OIL SEPARATOR

Comment
No Value - SPNOTE: No value - MONOTE: COMPACTED SNOW

Former AVEC Facility
Property

Spills Database Online Query

Spill Details: - 6/29/1999 12:15:00 PM

Facility Name	Street	City	Zip Code
SELAWIK CITY OFFICE	no address	Selawik	no zip

Facility Type
Other

Responsible Company	Contact	Address
EPA SELAWIK	NO ENTRY, NO ENTRY	no address

Area	Sub Area	Region	Location
Northern Alaska	Northwest Arctic	West Coast	SELAWIK CITY

Substance	Released	Contained	Recovered	Unit
Diesel	10	-	10	Gallons

Causes
Other

Sources
no source

Reporter's Name	Reporter's Phone	Date Reported
RAVEN SHELDON	484-2165	6/29/1999

Action	Action Date
Case Closed, No Further Action	6/29/1999
Data Problem	no date

Disposal Code	Description
59	PADSPREAD

Comment

No Value - SPNOTE: No value - MONOTE: BOARDWALK AND GRAVEL

#7
adjacent w/ to
AVEC facility

Spills Database Online Query

Spill Details: - 11/15/2005 4:00:00 PM

Facility Name	Street	City	Zip Code
Selawik School	no address	no city	no zip

Facility Type
School

Responsible Company	Contact	Address
NORTHWEST ARCTIC BOROUGH SCHOOL	NO ENTRY, NO ENTRY	no address

Area	Sub Area	Region	Location
Northern Alaska	Northwest Arctic	West Coast	SELAWIK CITY

Substance	Released	Contained	Recovered	Unit
Diesel	110	-	110	Gallons

Causes
Gauge/Site Glass Failure

Sources
Tank, Other

Reporter's Name	Reporter's Phone	Date Reported
Craig McConnell	no phone	11/16/2005 3:30:00 PM

Action	Action Date
Case Closed, No Further Action	11/16/2005

Disposal Code	Description
76	SNOW MELTED / OIL SEPARATOR

Comment
<<there are no comments for this spill>>

#4

Property

Spills Database Online Query

Spill Details: - 10/23/1998 4:00:00 PM

Facility Name	Street	City	Zip Code
SELAWIK CITY, APARTMENT COMPLEX	no address	Selawik	no zip

Facility Type
Other

Responsible Company	Contact	Address
STINE WANDA	STINE, WANDA	no address

Area	Sub Area	Region	Location
Northern Alaska	Northwest Arctic	West Coast	SELAWIK CITY

Substance	Released	Contained	Recovered	Unit
Diesel	10	-	10	Gallons

Causes
Gauge/Site Glass Failure

Sources
no source

Reporter's Name	Reporter's Phone	Date Reported
HANNA LUNE	484-2165	10/23/1998 10:42:00 AM

Action	Action Date
Case Closed, No Further Action	10/23/1998 4:00:00 PM
Data Problem	no date

Disposal Code	Description
54	RECYCLED

Comment

No Value - SPNOTE: No value - MONOTE: No Value

adjacent?

New Database Search

Printer Friendly Version

Alaska Department of Environmental Conservation

Contaminated Sites Database

Cleanup Chronology Report for
Selawik IRA Fuel Project Former Tank Farm

File Number	500.38.001	**Hazard ID**	1421
SiteName	Selawik IRA Fuel Project Former Tank Farm	**Staff**	Grant Lidren - 9072698685
Address 1	on Island, N of Community Ave and Community Hall. @ Parcel 5 on E side of Ballot St.	**Status**	Active
Address 2	NW of Airport	**Landowner**	Store Manager, Maniilaq Association
City/State/Zip	Selawik, AK 99770		
Latitude	66.603563	**Meridian**	Kateel River
Longitude	-160.002881	**Range**	006
Section	28	**Township**	014
Institutional Controls Report	No ICs exist for this site.	**Location**	View site on map

Problem/Comments Tank farm has evidence of leaks and past spills noted during 6/91 Non-crude Survey. Small pond adjacent to facility contains weathered sheen and stress to vegetation is evident. Facility located 50 yards from river which flows into Selawik Lake and provides drinking water to village. Extent of contamination unknown. Update 4/28/08 Selawik has a central water treatment facility that serves nearly all the homes. Groundwater has reportedly not been encountered during well installations 1984 oil spill reported at 1,000 gallons. Some cleanup occurred - amount unknown. Water Treatment plant treats river water for drinking but villagers known to use water straight from river. Water sample report from 10/30/91 showed contamination, not exceeding the MCL. (Also see 500.02.003 reagarding a Spill event responded to by PERP at the new TF located south of Evans Avenue and West of Selawik Street.

Glossary/Acronyms

Action Date	Action	Description	DEC Staff
09/03/1991	Site Added to Database	Site added by staff.	No Longer Assigned,
01/28/1992	Update or Other Action	Proposed Selawik work plan and cost estimate submitted by ADEC. The tank farm with a storage capacity of 100,000 gallons of fuel and 20,000 gallons of gasoline, is located on the island in mid-river, N of the Community Hall. In may 1984, a spill of 1,000 gallons from a pipe crack between tanks was reported. The fuel soaked into the ground covering an area of 900 square feet. An unknown amount of contaminated soil was removed and disposed of at the community dump. A site assement is proposed to determine groundwater flow characteristics, extent of permafrost, and horizontinal/vertical extent of the plume.	Lidren, Grant
01/14/1994	Update or Other Action	(Old R:Base Action Code = RPL2 - Site Information Request Letter). Sent PRP-CS Database Notification Letter to RP requesting update and more environmental information. RP responded but did not complete information form. Sent it back incomplete.	No Longer Assigned,
04/28/2008	Exposure Tracking Model Ranking	Initial ranking with ETM completed.	O'Connell, Bill
07/08/2009	Update or Other	ADEC contacted Selawik IRA Council on this date. In 1996, the tank farm was relocated between the pond on the island and the airport across the river(S of	Lidren,

	Action	Evans Ave. and W of Selawik Street). It is unknown whether a SA was ever performed. ADEC will contact Vida Coaltrain, of the IRA Council.	Grant
12/28/2009	Update or Other Action	On this date, ADEC discussed the issues with contamination at this site with Vida Coaltrain of the Selawik IRA Council. An SA was never completed for this site. A new store is currently being constructed at the Selawik IRA Fuel Project Former Tank Farm site. Pilings have been advanced into the ground and further construction will occur in 2010.	Lidren, Grant
12/30/2009	Update or Other Action	On this date, ADEC sent a letter to Raven Sheldon of the IRA Fuel Board. Mr. Sheldon will respond to ADEC concerns after the letter is discussed with the fuel Board.	Lidren, Grant
03/18/2010	Brownfield Inventory	This site is the subject of a DEC Brownfield Assessment (DBA) request from the Native Village of Selawik. The DBA request was received during the spring 2010 DBA request period, for projects to be done in State FY2011. The intended reuse is for a new village store. The DBA request also includes two other sites in Selawik: the former AVEC bulk fuel tank farm and power generation facility, and Adam's barge landing, which is scheduled for an upgrade with assistance from ADOT&PF in 2013. The DBA request will be evaluated for work using an area-wide approach.	Benson, Sonja
03/19/2010	Meeting or Teleconference Held	On this date, the DEC Contaminated Sites Program, DEC Brownfield Program, and Maniilaq Brownfield coordinator; attended a teleconference with the Selawik IRA Council Fuel Board. The Fuel Board indicates no soil had been removed during recent piling advancement activities. Furthermore, no olfactory or visual evidence of contamination was observed at the site during the piling advancement. The board indicated that no drinking water wells exist in Selawik. Instead they obtain drinking water from a surface water intake in the river, adjacent to the site, a ¼ mile away. Construction activities at the site won't commence until 2011.	Lidren, Grant
07/09/2010	Update or Other Action	DEC received a response from the Alaska State Historic Perservation Office (SHPO) for the assessment work planned for FY2011 that there is "No Historic Properties Affected."	Williams, Deborah

New Database Search

Printer Friendly Version

Alaska Department of Environmental Conservation

Contaminated Sites Database

Cleanup Chronology Report for
Selawik Old AVEC Tank Farm

File Number	500.57.001	**Hazard ID**	25508
SiteName	Selawik Old AVEC Tank Farm	**Staff**	Deborah Williams - 9074515174
Address 1	Old AVEC Tank Farm	**Status**	Informational
Address 2		**Landowner**	
City/State/Zip	Selawik, AK 99770		
Latitude	66.604000	**Meridian**	Kateel River
Longitude	-160.009000	**Range**	6
Section	20	**Township**	14
Institutional Controls Report	No ICs exist for this site.	**Location**	View site on map

Problem/Comments The Native Village of Selawik submitted a DEC Brownfield Assessment Request Form for an area-wide assessment of Selawik which includes the former AVEC tank farm. The site is located on the east side of the village school and close to residential houses. Some drinking water may be derived directly from the Selawik River; however, the Village derives its drinking water from Selawik Lake and a water treatment plant. Historically, the site was used by AVEC for fuel tank storage and electrical generation. Tanks were decommissioned sometime around 2000 and the tanks were transferred to the barge landing.

Glossary/Acronyms

Action Date	Action	Description	DEC Staff
04/26/2010	Site Added to Database	A new site has been added to the database	Williams, Deborah
04/26/2010	Brownfield Inventory	DEC received a DBA request from the Native Village of Selawik.	Williams, Deborah
07/09/2010	Update or Other Action	DEC received a response from the Alaska State Historic Perservation Office (SHPO) for the assessment work planned for FY2011 that there is "No Historic Properties Affected."	Williams, Deborah

New Database Search

Printer Friendly Version

Alaska Department of Environmental Conservation

Contaminated Sites Database

Cleanup Chronology Report for
Former School Tank Farm Gravel Pad - Selawik

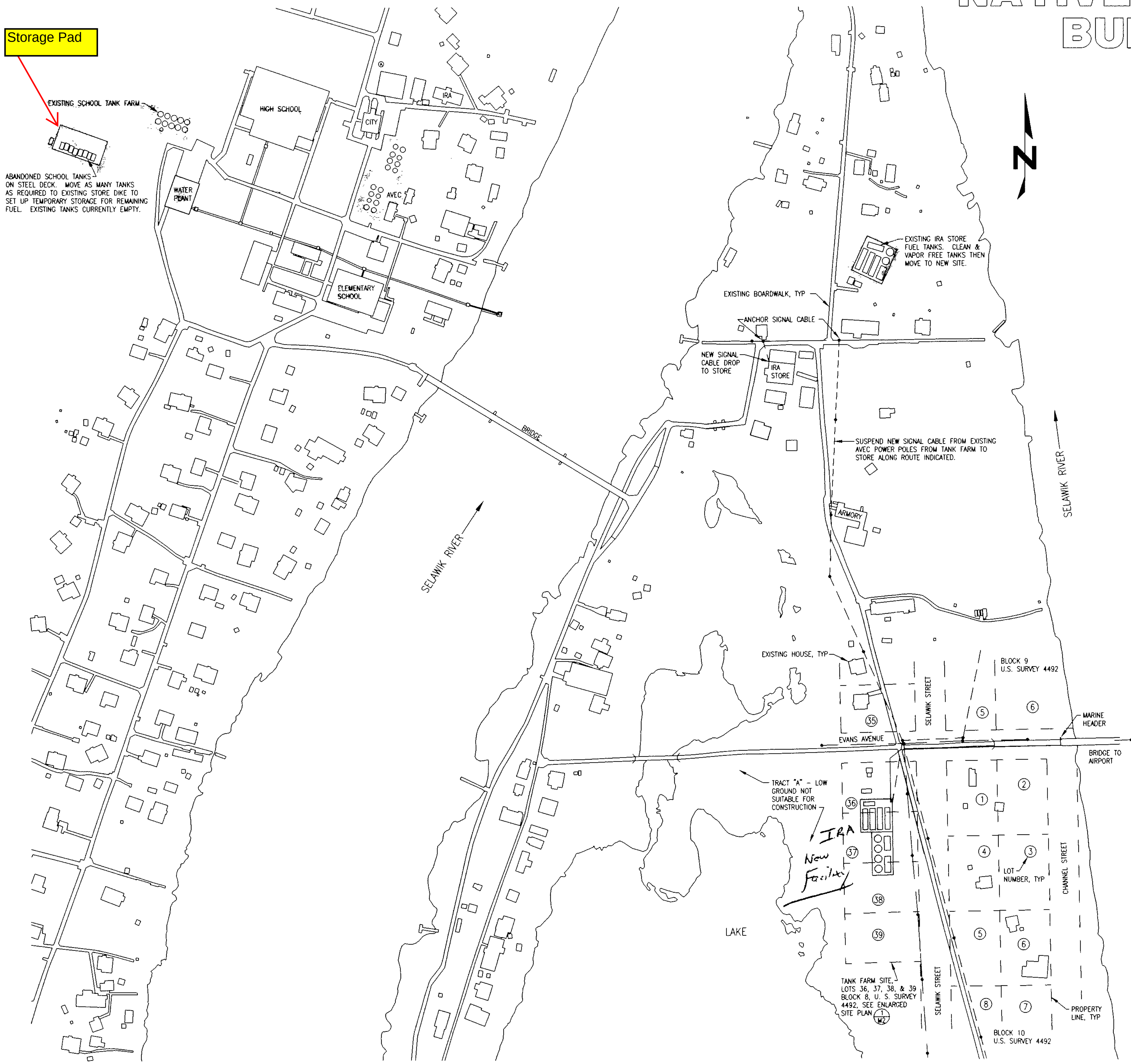
File Number	500.38.003	**Hazard ID**	1422
SiteName	Former School Tank Farm Gravel Pad - Selawik	**Staff**	Janice Wiegers - 9074512127
Address 1	~600-800' West of River	**Status**	Active
Address 2		**Landowner**	
City/State/Zip	Selawik, AK 99770		
Latitude	66.604442	**Meridian**	Kateel River
Longitude	-160.012661	**Range**	006
Section		**Township**	014
Institutional Controls Report	No ICs exist for this site.	**Location**	View site on map

Problem/Comments Historical discharges from tank farm to gravel pad. Site is 600-800' west of the Selawik River. GW reportedly not used in the village. All DW is taken from the Selawik River upstream of the community. No GW encountered to 315' during site investigations. Maximim active zone thickness ~30". Infiltration of SW is confined to the active layer during summer months.

Glossary/Acronyms

Action Date	Action	Description	DEC Staff
04/30/1998	Site Added to Database	Site added by staff.	Bauer, Doug
04/30/1998	Site Ranked Using the AHRM	Site ranked by staff. Too many unknowns(5), score = 0.	Bauer, Doug
11/29/2006	Update or Other Action	Staff transferred from Pikul to Jaynes.	Blandford, Aggie
11/15/2007	Update or Other Action	NFRAP was prepared in 1998- does not appear to have ever been sent. Considering site for conditional closure- need to check status of site and ICs (cap).	Everson, Neal
11/15/2007	Exposure Tracking Model Ranking	Intitial Ranking Complete for Source Area: 72400 (Autogenerated Action)	
12/04/2007	Update or Other Action	Phone conversation with Craig McConnel- head of facilities section for the NWSB- informed me that the cap was never installed. Property is not currently used for anything and is not a thoroughfare for students walking to new school addition. They will send pictures of the site.	Everson, Neal
03/09/2010	Update or Other Action	Updated lattitude/longitude based on information in file.	Wiegers, Janice
03/18/2010	Update or Other Action	Changed site name on file and in database to better reflect its identity as a school site. Site formerly known as "Selawik Tank Farm Gravel Pad."	Benson, Sonja

NATIVE VILLAGE OF SELAWIK BULK FUEL UPGRADE



LOCATION MAP

LEGEND

- GATE VALVE
- CHECK VALVE
- BALL VALVE
- FLEXIBLE CONNECTOR
- FLANGED JOINT
- ELBOW TURNED UP
- ELBOW TURNED DOWN
- PIPING CONNECTION

SCHEDULE OF DRAWINGS

M1	SITE PLAN, LEGEND, & LOCATION MAP
M2	ENLARGED SITE PLAN, DIKE LAYOUT PLAN, & SECTION
M3	PIPING PLAN AND DETAILS
M4	TANK DETAILS
M5	DETAILS AND SPECIFICATIONS
S1	PILE LAYOUT PLAN
S2	FRAMING PLAN
S3	DECK PLAN
S4	DETAILS
E1	ELECTRICAL PLANS, DETAIL, & SCHEDULE
E2	ELECTRICAL CONTROLS
E3	ONE-LINE DIAGRAMS, DETAILS

GENERAL NOTES

1. THE PURPOSE OF THIS PROJECT IS TO RELOCATE AND RENOVATE THE EXISTING NATIVE VILLAGE OF SELAWIK FUEL STORAGE AND DISPENSING FACILITY TO MEET CURRENT CODE AND REGULATION REQUIREMENTS.
2. THE RENOVATED FACILITY WILL PROVIDE BULK STORAGE AND DISPENSING OF #1 HEATING FUEL AND UNLEADED GASOLINE FOR RETAIL SALE. THE NET CAPACITY OF THE FACILITY IS 246,000 GALLONS - 142,500 GALLONS OF HEATING FUEL AND 103,500 GALLONS OF GASOLINE.
3. THE SCOPE OF THIS PROJECT INCLUDES CONSTRUCTION OF A WELDED STEEL DIKE ON PILING FOUNDATION, REPAIR OF EXISTING TANKS AND RELOCATION TO NEW DIKE, INSTALLATION OF TWO NEW BULK STORAGE TANKS AND ONE NEW DISPENSING TANK, INSTALLATION OF A NEW DISPENSER, INSTALLATION OF NEW PIPING, INSTALLATION OF NEW PUMPS AND CONTROLS, AND INSTALLATION OF BOARDWALKS AND OTHER ASSOCIATED SUPPORT FACILITIES.

RECORD DRAWING

THESE DRAWINGS HAVE BEEN PREPARED FROM A FIELD OBSERVATION BY THE UNDERSIGNED ENGINEER. THERE IS NO GUARANTEE AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION CONTAINED HEREIN.

DATE: ____________

PROJECT:	NATIVE VILLAGE OF SELAWIK BULK FUEL UPGRADE		
TITLE:	SITE PLAN, LEGEND, & LOCATION MAP		
ALASKA ENERGY AND ENGINEERING, INC P.O. BOX 111405 ANCHORAGE, ALASKA 99511-1405			
DRAWN BY: BCG DESIGNED BY: BCG DATE: 2/6/96	SCALE: 1"=100' PROJECT NUMBER 95-11-9770	FILE NAME SELABFM1	SHEET M1 OF 5

// STATE OF ALASKA

SEAN PARNELL, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

555 Cordova Street
Anchorage, AK 99501
PHONE: (907) 269-8685
FAX: (907) 269-7649
www.dec.state.ak.us

File: 500.38.001
Return Receipt Requested
Article No: 7008 1830 0002 6349 3886

December 30, 2009

Raven Sheldon
IRA Fuel Board Chairman
Selawik IRA Council
P.O. Box 59
Selawik, Alaska 99770

Re: Selawik IRA Fuel Project Former Tank Farm

Dear: Mr. Sheldon

The Alaska Department of Environmental Conservation (ADEC), Contaminated Sites Program, has determined that there is contaminated soil and/or water associated with the Selawik IRA Fuel Project Former Tank Farm on Selawik Island, 50 feet north of Community Hall, at Parcel 5 on the east side of Ballot Street . This letter introduces you to the state statutes and regulations that outline your responsibilities as landowner (or operator) and identifies an ADEC staff person assigned to work with you to evaluate any environmental issues.

According to our files, there have been several historic spills from the IRA Fuel Project Former Tank Farm site. In 1984, a spill of 1,000 gallons of gasoline from a cracked pipe impacted soil covering an area of 900 square feet of which an unknown amount was excavated and disposed of at the Selawik landfill. In 1991 during a site inspection, leaks from fuel pipes, stressed vegetation, weathered petroleum sheen in an adjacent pond, and issues with the dikes structural integrity were noted. In 1992 a site assessment was proposed to determine groundwater flow characteristics and horizontal and vertical extent of contaminated soil, but this work was never performed.

In 1996, the Selawik IRA Fuel Project Tank Farm was decommissioned and moved to a new containment area 900 feet south of the Community Hall. As per a telephone conversation with Vida Coaltrain, a new store is currently being constructed at the Selawik IRA Fuel Project Former Tank Farm site. Pilings have been advanced into the ground and further construction will occur in 2010.

ADEC is concerned that the contamination at the former tank farm has not been evaluated for potential threats to human health and the environment, therefore ADEC would like to schedule a teleconference to discuss the construction of the new store and if a cleanup of the site is feasible at this time. Additionally, any contaminated soil that is removed during construction work will likely requiring ~~special handling and disposal.~~

As required by law, ADEC ensures that hazardous substance contamination issues are addressed in accordance with state standards. Due to the complex nature of these standards, we want you to know that we are available to offer assistance in understanding the requirements and implementing any assessment and cleanup actions that may be required. Although there is some flexibility in how each cleanup project is managed, the assessment and cleanup actions must be performed by a "qualified person," who meets minimum regulatory qualifications.

The responsibility for the investigation and cleanup of hazardous substance contamination is established by state law. The owner and/or operator that caused the release of the hazardous substance(s) is responsible for its cleanup (Alaska Statutes 46.03.822). However, if the responsible party is not the owner of the property and/or is not willing or able to conduct the necessary cleanup actions, the landowner is liable for the cost of the cleanup actions. If you believe that another party is responsible for the contamination (e.g., a past owner or operator of the site), please provide this information to the ADEC Project Manager assigned to your site. It is best to identify and work with all potentially responsible parties from the beginning of the cleanup process so everyone understands their responsibilities. The process requires work plan(s) be submitted to ADEC *before* beginning any work on your site. The purpose of this review and approval process is to ensure regulatory requirements are met and, hopefully, accomplish a cost effective approach to resolving environmental issues. A useful guide to the cleanup process, giving a step-by-step description, can be found on the internet at http://www.dec.state.ak.us/spar/csp/process.htm.

In addition, state law requires ADEC to recover the costs associated with our oversight work from the responsible party/parties (AS 46.03.010 and AS 46.08.070). This may include conducting site inspections and any time associated with reviewing work plans. The contaminated site cleanup process can be a lengthy and costly endeavor. However, ADEC wishes to limit your costs by working with you to accomplish the primary goal of protecting public health and the environment. In general, the quicker that this environmental concern is resolved, the lower the cleanup costs.

We want you to be aware that the contamination at your property has been listed in ADEC's database of contaminated sites and information contained in the file is now public record. Our databases are accessible on the Internet at www.dec.state.ak.us/spar/csp/search/default.asp.

Please contact the ADEC Project Manager, Grant Lidren at **555 Cordova Street, Anchorage, Alaska 99501; 907-269-8685; or grant.lidren@alaska.gov** within thirty (30) days from the date of this letter to discuss your intended actions with respect to this site.

Sincerely,

Grant Lid

Grant Lidren
Environmental Specialist

APPENDIX G

CENTER FOR CREATIVE LAND RECYCLING – ALASKA FUNDING SPREADSHEET

Funding for Brownfield Redevelopment Projects

Alaska

Program Name	Grant/Loan	Who is Eligible	Site Eligibility	Eligible Costs	Typical Amount Per Site	Deadline	Contact
US Environmental Protection Agency (EPA):							
Assessment	Grant	States, local government, Intertribal Consortia (excluding Alaskan tribes), Alaska Native Regional Corporation, Alaska Native Village Corporation, & Metlakatla Indian Community	Petroleum or Hazardous & Site-Specific or Community-wide	Site assessment, community planning & outreach	$200K for Petroleum; $200K for Hazardous; or $350K for single site with EPA waiver $1M for coalitions of 3 eligible entities	Fall 2011	Mary Goolie goolie.mary@epa.gov 907.271.3414 Susan Morales morales.susan@epa.gov 206.553.7299 yosemite.epa.gov/R10/cleanup.nsf/sites/bf
Cleanup	Grant	Same as assessents; Nonprofits. Eligible party must own site	Petroleum or Hazardous	Cleanup	$200K/site, up to 3 sites (requires 20% cost share)	Fall 2011	
Revolving Loan Fund (RLF)	Grant	Same as assessents	Petroleum or Hazardous	Cleanup	$1M/entity (requires 20% cost share). May subgrant 50% of award to municipalities & nonprofits with site ownership	Fall 2011	
Targeted Brownfield Assessments (TBAs)	In-kind Technical Service	Same as assessents; nonprofits; Alaska tribes	Any brownfield	Site assessment	Site assessment services	Ongoing	Joanne LaBaw labaw.joanne@epa.gov 206.553.2594 yosemite.epa.gov/R10/CLEANUP.NSF/brownfields/targeted+brownfields+assessments
Environmental Workforce and Job Training Grant	Grant	Same as assessents; colleges, universities, nonprofit training centers	NA	Training	$300K	March 2011	Susan Morales morales.susan@epa.gov 206.553.7299 yosemite.epa.gov/R10/CLEANUP.NSF/brownfields/grants+&+competitions
US Department of Housing & Urban Development (HUD):							
Community Development Block Grant (CDBG)	Grant or Loan	State, urban county, or entitlement city who decides use of funds & to whom funds will be made available	Anything that passes HUD's Environmental Review	Site assessment, cleanup, rehabilitation, site improvements, limited construction	Depends on needs/size of community (average project award ranges from $200K - $1M)	Ongoing	Colleen Bickford colleen.bickford@hud.gov 907.677-9800
Section 108	Loan	same as CDBG	same as CDBG	same as CDBG	Up to five times the annual allocation less any outstanding loan amounts	Ongoing	same as above
Brownfields Economic Development Initiative (BEDI)	Grant	Same as CDBG	Same as CDBG	Same as CDBG	Up to $2M; may not exceed 1:1 ratio with Section 108 loan	Contact staff	Same as above
Sustainable Communities	Grant	Depending on program, local, regional, state or tribal government, & partnerships thereof	Depending on program, region or priority area	Planning	Up to $5M, depending on community size & number of coalition members	Contact staff	Zuleika K. Morales-Romero 202-402-7683 Zuleika.K.Morales@hud.gov portal.hud.gov/portal/page/portal/HUD/program_offices/sustainable_housing_communities
Alaska Office of Native American Programs (ONAP)	Grant	Native Alaskan communities	Same as CDBG	Same as CDBG	Contact staff	Contact staff	Bill Zachares bill.zachares@hud.gov 907.677.9860 www.hud.gov/offices/pih/ih/codetalk/onap/akonap/

Funding for Brownfield Redevelopment Projects

Alaska

Program Name	Grant/Loan	Who is Eligible	Site Eligibility	Eligible Costs	Typical Amount Per Site	Deadline	Contact
Indian Community Development Block Grant (ICDBG)	Grant	Any Indian tribe, band, group, or nation (including Alaska Indians, Aleut, & Eskimos) or Alaska Native village which has established a relationship to the Federal government as defined in the program regulations. In certain instances, tribal organizations may be eligible to apply.	Same as CDBG	Housing - Rehabilitation, land acquisition, & under limited circumstances, new housing construction. Community Facilities - Infrastructure, e.g., roads, water & sewer facilities; &, single or multipurpose community buildings. Economic Development - Commercial, industrial, agricultural projects which may be recipient-owned & operated or which may be owned &/or operated by a third party.	Contact staff	Contact Staff	Deb Alston deb.alston@hud.gov 907.677.9863 www.nls.gov/offices/pih/ih/grants/icdbg.cfm
US Department of Agriculture (USDA):							
Community Facilities	Grant or Loan	Political subdivisions of the State, nonprofits, & federally recognized Alaska Native Tribes	In a rural community	Costs for essential facilities, usually construction costs, for essential community services that are typically provided by local government or a community based organization for the benefit of the community	Contact staff	Ongoing	Palmer Office: Rural Programs - Deborah Davis Deborah.Davis@ak.usda.gov 907.761.7740 Business Programs - Dean Stewart Dean.Stewart@ak.usda.gov 907.761.7722 Community Programs - Merlaine Kruse Merlaine.Kruse@ak.usda.gov 907.761.7778 Regional contacts: Bethel - Gene Kane Gene.Kane@ak.usda.gov 907.543.3858 Dillingham - Spud Williams William.C.William@ak.usda.gov 907.842.3921 Fairbanks / Nome - James Polhman James.Polhlman@ak.usda.gov 907.479.6767.4 Kenai - Michelle Hoffman Michelle.Hoffman@ak.usda.gov 907.283.6640.4 Sitka - Keith Perkins Keith.Perkins@ak.usda.gov 907.747.3506 www.rurdev.usda.gov/ak/
Rural Development - Renewable Energy & Energy Efficiency; Housing; Community Facilities; Business; Coops; Electric; Telecommunication; Utility; Water & Environment; Community Development	Grant, Loan or technical assistance	Varies - depends on program	Varies	Loans, loan guarantees, down payment assistance, construction	Contact staff	Ongoing	
Rural Housing	Grant or Loan	Varies - depends on program	Varies	Loans, loan guarantees, down payment assistance, construction	Contact staff	Ongoing	
US Department of Commerce, Economic Development Administration (EDA):							
Public Works	Grant	States & political subdivisions of states; tribes, nonprofits, higher education institutions; BRAC impacted communities	In areas experiencing: high unemployment, low per capita income, or special needs; must be part of a Comprehensive Economic Development Strategy	Construction or rehab of public infrastructure & facilities that generate or retain private sector jobs & capital investment	No more than 50-80% of the total project cost (with exceptions); (average project award $1.4M)	March, June, September, December	Shirley Kelly skelly@eda.doc.gov 907-677.9800 www.eda.gov/InvestmentsGrants/Investments.xml

Funding for Brownfield Redevelopment Projects

Alaska

Program Name	Grant/Loan	Who is Eligible	Site Eligibility	Eligible Costs	Typical Amount Per Site	Deadline	Contact
Economic Adjustment	Grant	States & political subdivisions of states; tribes, nonprofits, higher education institutions; BRAC impacted communities	In areas experiencing: high unemployment, low per capita income, or special needs; must be part of a Comprehensive Economic Development Strategy	Strategy development, infrastructure construction, & revolving loan fund capitalization	No more than 50-80% of the total project cost (with exceptions); (average project award $570K)	March, June, September, December	same as above
Local Technical Assistance	Grant	States & political subdivisions of states; tribes, nonprofits, higher education institutions	Sites in areas of economic distress	Technical assistance (project planning, economic analyses, feasibility studies, etc.)	No more than 50-80% of the total project cost (with exceptions)	March, June, September, December	same as above
Partnership Planning	Grant	States & political subdivisions of states; tribes, nonprofits, higher education institutions	Sites in areas of economic distress	Economic development planning assistance	No more than 50-80% of the total project cost (with exceptions)	March, June, September, December	same as above
US Army Corps of Engineers (USACE):							
Planning Assistance to States	Cost share/match 50% / in-kind services	State, local government, Native Alaskan communities	Sites affected by coastal areas & waterways	Technical services provided by USACE	Maximum of $500,000 per year per state; $25K - $100K per project	Ongoing	Lisa Rabbe lisa.rabbe@usace.army.mil 907.753.2634 www.poa.usace.army.mil/en/cw/cap/brochures/PASbrochure.pdf
Alaska Department of Environmental Conservation (DEC):							
DEC Brownfields Assessments (DBAs)	In-kind Service	Public & nonprofits	Any brownfield.	Site assessment	Contact staff	Winter 2011	Sonja Benson Sonja.Benson@alaska.gov 907.451.2156 www.dec.state.ak.us/spar/csp/brownfields.htm#assess
Alaska Energy Authority (AEA):							
Various alternative energy projects	Grant/Loan & technical assistance	States & political subdivisions of states; tribes, nonprofits, energy generators	Various requirements	Technical assistance, system upgrade, training	Contact staff	Different deadlines	Butch White bwhite@aidea.org 907-771-3052 www.aidea.org/AEA/programs.html www.akenergyauthority.org/EETFundGrantProgram.html
Alaska Industrial Development & Export Authority (AIDEA):							
Revenue Bond Program	Loans	Business enterprises	Location of business enterprise	Financing for capital expenses	Contact staff	Ongoing	Chris Anderson canderson@aidea.org 907.771.3030 www.aidea.org/programscrb.html
Alaska Department of Natural Resources:							
Alaska Trails Initiative	Grants	Nonprofit organizations & local, state, federal & tribal entities	Proposed trail	Planning, permitting, design, construction, reconstruction, equipment purchase, education & interpretation of trails & trail related facilities.	Average of $500,000	Contact Staff	Bill Luck dnr.alaska.gov/shared/emailcontact.cfm?send=bill.luck 907.269.8699 www.dnr.alaska.gov/parks/grants/aktrailinit.htm

Funding for Brownfield Redevelopment Projects

Alaska

Program Name	Grant/Loan	Who is Eligible	Site Eligibility	Eligible Costs	Typical Amount Per Site	Deadline	Contact
Recreational Trails Program - Recreational trails & Snowmobiles	Matching grants	For recreational trails - nonprofit organizations & public agencies. For snowmobile trails - all organizations, clubs, public agencies, or businesses	Proposed or existing trail	Reimbursable, matching funds to develop & maintain recreational trails & trail-related facilities for both non-motorized & motorized recreational trail uses.	Subject to program requirements	Contact Staff	Bill Luck dnr.alaska.gov/shared/emailcontact.cfm?send=bill.luck 907.269.8699 www.dnr.alaska.gov/parks/grants/aktrailinit.htm
Land & Water Conservation Fund Grant Program	Partial grants	State, regional or local governments with authority to provide outdoor recreation services	Public lands	Acquisition of outdoor recreation lands &/or development of outdoor recreation facilities	$100,000 - $500,000	Contact Staff	Kristy Gray www.dnr.alaska.gov/standard/emailcontact.cfm?send=jean.ayers 907.269.8694 www.dnr.alaska.gov/parks/grants/lwcf.htm
National Coastal Wetlands Conservation Grant Program	Grants	Public agencies & land trusts	Coastal areas	Acquisition, restoration, management or enhancement of coastal wetlands	Contact staff, subject to availability of state matching funds	Contact Staff	Steve Neel dnr.alaska.gov/shared/emailcontact.cfm?send=steve.neel 907.269.8709 www.dnr.alaska.gov/parks/grants/ncwc.htm
Division of Forestry - Green Infrastructure Planning Grants	Grants	Local government	Publicly owned land	Green infrastructure planning	$20,000-$80,000	Applications are usually due in January	Patricia Joyner patricia.joyner@alaska.gov 907.269.8465 forestry.alaska.gov/community/grants.htm
Alaska Department of Commerce:							
Alaska CDBG	Grants	Municipalities	Publicly-owned sites	Community development, planning & Special Economic Development	Maximum of $850,000 per community	Applications are usually due in December	Jill Davis Jill.Davis@alaska.gov 907.451.2717 www.commerce.state.ak.us/dca/grt/blockgrants.htm
Alaska Housing Finance Corporation (AHFC):							
Beneficiary & Special Needs Housing Grant Program (SNHG)	Grant	Nonprofit service providers & housing developers for construction of housing for the Alaskan special needs populations, primarily the beneficiaries of the Alaska Mental Health Trust	A housing site	Planning & construction activities for congregate, supportive & transitional housing types	Contact staff	Typically in January	Daniel Delfino ddelfino@ahfc.state.ak.us 907.330.8273 www.ahfc.state.ak.us/grants/beneficiary_snhg.cfm
Elder Housing Program (Denali Commission)	Grant	Housing Authorities, local governments, nonprofits	A housing site	Grants to plan, construct & rehabilitate housing in rural locations	Contact staff. Predevelopment funds only for 2011	Contact Staff	Diana Faude dfaud@ahfc.state.ak.us 907.330.8277 www.ahfc.state.ak.us/grants/elder_housing.cfm
Matching Grants Program	Grant	Nonprofits providing supportive housing services	A housing site	Supportive Housing Program (SHP) activities	Contact staff	Contact Staff	Diana Faude dfaud@ahfc.state.ak.us 907.330.8277 www.ahfc.state.ak.us/grants/elder_housing.cfm
Matching Grants Program	Grant	Nonprofits	A housing site	Funds to meet the federal & state match requirements for grants awarded to nonprofit organizations.	Contact Staff	Contact Staff	Toni Butler tbutler@ahfc.state.ak.us 907.330.8280 www.ahfc.state.ak.us/grants/matching_grants.cfm

Funding for Brownfield Redevelopment Projects

Alaska

Program Name	Grant/Loan	Who is Eligible	Site Eligibility	Eligible Costs	Typical Amount Per Site	Deadline	Contact
Homeownership Development Program (HDP)	Grant	Participants in the USDA's 523 self-help homeownership program, Community Land Trusts & Habitat for Humanity organizations	A housing site	Real property acquisition & site improvements for new construction of permanent, single family housing.	Contact Staff	Contact Staff	Colette Slover cslover@ahfc.state.ak.us 907.330.8275 www.ahfc.state.ak.us/grants/hdp.cfm
Teacher, Health Professional & Public Safety Housing Program (AHFC/Denali Commission)	Grant	School districts, local governments, housing authorities & nonprofit health organizations	A housing site	New construction, rehabilitation or acquisition of rental or lease/purchase housing to develop housing in rural Alaska for teachers, public safety officials & health professionals	Contact Staff	Contact Staff	James Wiedle jwiedle@ahfc.state.ak.us 907.330.8235 www.ahfc.state.ak.us/grants/teacher_health_safety_housing.cfm
New Market Tax Credits (NMTC) & Community Lenders							
Rural Community Assistance Corporation (RCAC)	Loan, Equity, Technical Assistance	Local government, nonprofit, Native American	Qualifying census tract as defined by CDFI Fund Dept. Treasury	Housing, environmental infrastructure & community facilities	Contact staff	Ongoing	Bruce Newman - Housing programs bnewman@rcac.org 530.741.2227 Jim Wilson- Environmental programs jwilson@rcac.org 530.741.2227 www.rcac.org
RurAL CAP:							
Self Help housing	Grant	Contact staff	Contact staff	Self Help housing	Contact staff	Contact Staff	Mitzi Barker 907.865.7370 www.ruralcap.com/index.php?option=com_content&view=article&id=174&Itemid=225
Community planning	Grant	Contact staff	Contact staff	Community Planning Activities	Contact staff	Contact Staff	Mitzi Barker 907.865.7370 www.ruralcap.com/index.php?option=com_content&view=article&id=89&Itemid=87
Waste management	Grant	Contact staff	Contact staff	improving solid waste management, with an emphasis on protecting local water supplies from contamination	Contact staff	Contact Staff	Ellen Kazary 907.865.7358 www.ruralcap.com/www/?option=com_content&view=article&id=172&Itemid=247
Rasmuson Foundation:							
Pre-Development	Grants	Nonprofit organizations, municipal government & tribal communities	Contact staff	Contact staff	Contact staff	Ongoing	Chris Kowalczewski ckowalczewski@forakergroup.org 907.743.1203 www.rasmuson.org/index.php?switch=viewpage&pageid=141 www.forakergroup.org/index.cfm?section=Shared-Services&page=Pre-Development
Program-related investments	Loans, equity investments, linked deposits or loan guarantees	Nonprofit organizations	Contact staff	Program-related investments for housing, economic development, historic preservation	Contact staff	Ongoing	Chris Perez cperez@rasmuson.org 907.334.0522 www.rasmuson.org/index.php?switch=viewpage&pageid=159

Funding for Brownfield Redevelopment Projects

Alaska

Program Name	Grant/Loan	Who is Eligible	Site Eligibility	Eligible Costs	Typical Amount Per Site	Deadline	Contact
Capital projects - Tier 1	Grant	Nonprofit organizations	Contact staff	Capital projects i.e., community centers, playgrounds	Average $25,000	Ongoing	Aleesha Towns-Bain atowns-bain@rasmuson.org 907.297.2875 www.rasmuson.org/index.php?switch=viewpage&pageid=32
Strategic projects - Tier 2	Grant	Nonprofit organizations	Contact staff	Strategic projects & the expansion or start-up of innovative programs by established organizations.	Average $25,000	Ongoing	Same as above www.rasmuson.org/index.php?switch=viewpage&pageid=33
Alaska Community Foundation:							
Pebble Fund & other grant programs	Grant	Nonprofit organizations, municipal government & tribal communities	Contact staff	Donor fund grant requirements including renewable resources/fish, energy, education & community & economic development	Contact staff	Contact Staff	Iris Matthews imatthews@alaskacf.org 907.274.6707 www.alaskacf.org/GrantOpportunities/TypesofGrants/tabid/177/Default.aspx
Conoco:							
Community Giving	Grant, technical assistance or in-kind services	Contact staff	Contact staff	Various - contact staff	Contact staff	Apply between June 1 - August 1	www.conocophillips.com/EN/susdev/communities/pages/contributions.aspx
BP:							
Community Giving	Grant, technical assistance or in-kind services	Contact staff	Contact staff	Various - contact staff	Contact staff	Contact Staff	ancextaff@BP.com 907.564.5640 www.bp.com/sectiongenericarticle.do?categoryId=9030185&contentId=7055672
University of Alaska:							
Office of University Partnerships	Technical assistance / partnerships	Contact staff	Contact staff	Various - contact staff	Contact staff	Contact Staff	Andrew Parkerson-Gray fyosp@uaf.edu 907.474.6000

APPENDIX H

ROUGH ORDER OF MAGNITUDE COST ESTIMATE

TABLE H-1 - ROUGH ORDER OF MAGNITUDE COST ESTIMATE

Remedial Action/Additional Characterization/Engineering Controls

IRA FUEL PROJECT FORMER TANK FARM

Plans Preparation (Work, Sampling and Analysis, and Health and Safety Plans)	
Environmental Consultant	$5,000
Remedial Action/Release Investigation/Additional Characterization	
Environmental Consultant	$15,000
Laboratory Testing	$15,000
Report	
Environmental Consultant	$10,000
Contingency (15%)	$6,750
TOTAL	$51,750
Rough Order of Magnitude Cost Estimate	$55,000

Cost estimate is for additional characterization activities outlined in report text.

TABLE H-2 - ROUGH ORDER OF MAGNITUDE
COST ESTIMATE
Remedial Action/Additional Characterization/Engineering Controls

BARGE LANDING AREA

Plans Preparation (Work, Sampling and Analysis, and Health and Safety Plans)

Environmental Consultant	$5,000

Remedial Action/Release Investigation/Additional Characterization

Environmental Consultant	$6,000
Laboratory Testing	$7,500

Report

Environmental Consultant	$7,500
Contingency (15%)	$3,900
TOTAL	$29,900
Rough Order of Magnitude Cost Estimate	$35,000

Cost estimate is for additional characterization activities outlined in report text.

TABLE H-3 - ROUGH ORDER OF MAGNITUDE COST ESTIMATE

Remedial Action/Additional Characterization/Engineering Controls

FORMER AVEC FACILITY

Plans Preparation (Work, Sampling and Analysis, and Health and Safety Plans)

Environmental Consultant	$5,000

Remedial Action/Release Investigation/Additional Characterization

Environmental Consultant	$12,000
Laboratory Testing	$17,500

Report

Environmental Consultant	$10,000
Contingency (15%)	$6,675
TOTAL	$51,175
Rough Order of Magnitude Cost Estimate	$55,000

Cost estimate is for additional characterization activities outlined in report text.

TABLE H-4 - ROUGH ORDER OF MAGNITUDE
COST ESTIMATE
Remedial Action/Additional Characterization/Engineering Controls

FORMER SCHOOL TANK FARM AND STORAGE PAD

Plans Preparation (Work, Sampling and Analysis, and Health and Safety Plans)

Environmental Consultant	$5,000

Remedial Action/Release Investigation/Additional Characterization

Environmental Consultant	$7,500
Laboratory Testing	$12,500

Report

Environmental Consultant	$7,500
Contingency (15%)	$4,875
TOTAL	$37,375
Rough Order of Magnitude Cost Estimate	$45,000

Cost estimate is for additional characterization activities outlined in report text.

APPENDIX I

FIELD NOTES
AND
GPS COORDINATES

CONTENTS

PAGE	REFERENCE	DATE

32-1-17385
Selawik
PAEP

9/30/2010

Randy Hessong (RZH)

1

Travel Morning - Anch. - Kotz. Transfer baggage
& cargo - Bering Air 4:54 Airport

Wx: Mostly clear, calm, 20s F.

9:50 - In Selawik - All packages arrive
in-tact with me. "Peachy" is Bering agent

10:15 - Meet Dora McCoy + To lodging,
set up stuff.

10:50 - Joe McCoy Is running errand to
OTZ - sets me up w/ 4-wheeler, gives me
tour. Joe: - Modern tugs can't fit
1984 arrival under arch bridge
- Was involved with building
school, barge landing
- Barge landing built to facilitate
new school construction.
- Pretty certain no marine header
for fuel at barge landing until
after construction.
- Likely old marine header
far east, south of AVEC
- Modular building where original
new school tank farm was.
- Can't remember old school
tank farm well - may have been
at storage pad.

11:50 - walk AVEC site. wet, 1" ice

② 9/30/10 RJH

12:00 Meet Raven Sheldon Briefly - will have a worker from the IRA store help me this afternoon.

12:15 - Walk IRA site.
- Vegetated with grass, relatively high ground. Grass tall, not stressed except where 4-wheeler traffic runs through.
- Pilings are steel, refrigerated.
- Ground frozen. Walked over - No obvious marine header spot.

12:30 - lunch, catch up on notes.
13:05 - load tools, get decon water.
13:45 - Set up on IRA Former Tank Farm
Video area w/ narration
Stake out 9 spots to dig.
Mark site sketch w/ pile locations
OVM 580 B PID - Calibration - 99.8 to 100 iso ppm ✓

Start @ former dispenser shed.
TP1 0 - 0.2' - Dark brown, organic sandy SILT; with roots, debris, trash (0.05 frozen)
0.2 - 0.8' Dark brownish gray, sandy SILT, moist, petroleum odor (diesel)
0.8 - 4.4' Gray, sandy SILT; moist, diesel odor.
4.4 - 4.6' Lighter gray, fine sandy SILT; wet to frozen

14385 9/30/10 RJH ③

TP1 Samples
I1S1 @ 14:30, 0.6-0.7' bgs;
Headspace: 227 ppm
I1S2 @ 14:35, 2.0-2.1' bgs;
Headspace 372 ppm
? Shift to hand auger.
I1S3 @ 15:06; 3.6-3.8' bgs; Dark gray sandy SILT; moist; w/ organics. Bits of vegetation + roots suggests area has been disturbed.
1x4oz - 125 ml MeOH, 1x8oz
Headspace: 410 ppm
Needed MA?
I★ I1S4 @ 15:30; 4.4-4.6' bgs; med. gray fine sandy SILT; wet to frozen.
Bottom of active layer. Headspace: 415 ppm
Duplicate I1S11 @ 15:40
2x4oz w/ 25 ml MeOH, 2x8oz - homogenized in pan.

Soil back in hole, decon.
16:10 - Vida Craftrain stops by with Robert Skin - Robert to help.

④ 17385 9/30/10 [initials]

TPI2 0.5 - Veg mat/organics. 0.15 frozen
Brownish gray silt w/ organics + debris to 1.1' Fuel odor - gas + diesel

2 * I251; 16:25; 0.5-0.6' bgs - Mixed brown organic silt and grayish brown sandy SILT; moist 1X4oz w/MeOH, 1X4oz
Headspace: 290 ppm Just under edge of building -

I252; 16:30; 2-2.1' bgs
same soil Headspace: 88 ppm

I253; 16:35; 3.1-3.2' bgs - auger
grayish brown, sandy SILT; moist
Headspace: 176 ppm

* I254: 16:45; 3.8-4.1 Gray, sandy SILT, very moist to frozen. Fuel odor.
1X4oz w/25ml MeOH, 1X4oz
Headspace: 523

TPI3 0.3' veg mat. Odd color change @ 2' - doesn't last.

I351 18:00 (17:00); 0.5-0.6' bgs -
Brownish gray, fine sandy SILT; moist; with organics
Headspace: 70 ppm

17385 9/30/10 [initials] ⑤

18:05 (17:05)
I352; 2-2.1' bgs; Redish brown & gray mixed fine sandy SILT; moist
Headspace: 378 ppm

3 * I353; 16:15 (17:15); 2.8-3.2' bgs - brownish gray, fine sandy SILT; some roots + organics. Moist. Just frozen @ 3.0' fuel odor. 1X4oz w/25ml MeOH, 1X8oz.
Headspace 469 ppm 600+ - then steady climb - condense?

I354; 16:20 (17:20); 3.4-3.6' bgs - same soil, but few roots or organics.
All Frozen. Not as wet as TP1 or TP2
Headspace: 377 ppm ~~1X4oz 25m, 1X4oz~~ 17:24

Sun is at warming samples well @ 17:40 -
Headspace still high.
Empty Bag Check: 2.2 ppm.
Wesley - Neighbor to north concerned about property line - crossing.
- Check w/ Vidal / Racin - Plot last call?

17:50 → One More test pit w/ Roberts

17385 9/30/10 RJW 6

TPI4; 0.3' Veg mat. Similar soil profile.
No construction debris.

I4S1; 0.5-0.6' bgs; 17:58; Brownish gray sandy SILT; moist
Headspace: 24 ppm

I4S2; 2.0-2.2' bgs; 18:02; Gray, fine sandy SILT; moist mild fuel odor
Headspace: 562 ppm

I4S3; 2.9-3.3' bgs; 18:10; Gray, fine sandy SILT; moist to frozen; sewage odor. 1X4oz w/25ml MeOH, 1X4oz.
Headspace: ~~545~~ ppm 597 - climbed fast as I thawed down
1X4oz-25ml MeOH, 1X4oz.

Leave hole open - headspace at apartment.
Reaction in field was that TPI1 and TPI2 where "hotter" than TPI3 & TPI4 - temperature variations?
Returned to TPI4 w/ headspace soil, filled hole.
Strong petroleum odor.
Wrap up, ice samples (Robert off 18:20)
20:00 off

17385 10/1/10 RJW 7

9:30 - Wx: Mostly clouds, gusty East breeze, low 30s F
Calibrate PID 100.3-100.5 ppm ✓
Vera C. - Post Master once manage IRA fuel farm
Shuttle equip + decon water
check @ post office, pickup Robert
10:35 start diggings.

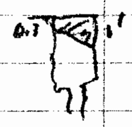
TPI5 - between entrance area piles.
0.3' veg mat then 0.1 frozen
mottled brown + gray fine sandy SILT; moist; with roots/organics
Headspace

I5S1; 0.4-0.6'; 10:49; same soil
Headspace: 1.4 ppm

I5S2; 1.9-2.0'; 10:50; same soil
Headspace: 25 ppm

I5S3; 3.4-3.65'; 10:55; Dark brownish gray, fine sandy SILT; moist to frozen.
(Frozen ≈ 3.55' bgs) 1X4oz w/25ml, 1X4oz.
Headspace: 45.3 ppm

17385 10/1/10 RRH (8)

TPI6 - West of old dispenser shed,
just W. of center of pilings
Duff/peat mat diagonal 
then grey fine sandy SILT;
Strong petroleum odor

6 *I6S1; 11:15; 0.4-0.6' bgs gray f.s. SILT; moist
fuel odor
Headspace: 220 ppm [collect analytical later]

I6S2; 11:20; 2-2.1' bgs same soil
fuel odor
Headspace: 268 ppm

7 I6S3; 11:25; 3.3-3.65' bgs - Across
frozen boundary - Dark brownish
gray, f.sandy SILT; moist to frozen
Duplicate fuel odor Headspace: 668 ppm
I6SD 2X 4oz w/25ml MeOH, 2X 8oz
11:35 possible duplicate/PAH

Walk possible supply pipeline route -
old pallets near river suggest a
barge landing area.

17385 10/1/10 RRH (9)

TPI7 - Plywood, metal, glass, fur in
top 0.4' w/ veg mat + duff.
then, dark, brownish gray silt
possible pipeline run.

I7S1; 11:48; 0.5-0.6' bgs, dark,
brownish gray, fine sandy SILT; moist;
light fuel odor.
Headspace: 30.6

8 I7S2; 11:52; 1.9-2.1' bgs; same soil
[Collect analytical later
Headspace: 608 ppm

I7S3; 12:00; 2.4-2.8' bgs; frozen ≈2.4'
Gray, f.sandy SILT; frozen;
1X4oz w/25ml MeOH, 1K4oz.
Headspace: 558 ppm
Robert off.

12:12 - Offload latest sample sets @
apartment - iced cooler. Read headspace,
lunch. Samples from frozen zone
slow to thaw.

12:48 → finally have samples near
equilibration - ready

17385 10/1/10 RTN (10)

1312 - on site - No Rubutes T-store - Jason to help.

TP1B - In low spot along brush free line from dispenser area to River. under old rotting pallets ≈ 36' W. of river. 0.5 root/veg mat. wet soil - w/organics.

I8S1; 0.5-0.6' bgs - 13:50; Dark brown, organic SILT; w/ roots moist to wet, boggy odor. Headspace 4.9ppm

I8S2; 1.8-2.0' bgs; 13:55; Dark brown Silt; wet; with organics, boggy odor Headspace; 6.6ppm recheck = 4.9

I8S3; 2.5-3' bgs; 14:05; same soil Headspace; 4.9

I8S4; 3.4-3.6' bgs; 14:05; Brown, SILT; moist to wet; less organics, less odor. Water entering hole at this depth. 1×4oz w/ 25mL MeOH, 1×4oz. Headspace; 5.1

17385 10/1/10 RTN (11)

Test Pit I9 - South end of pilings, between western of 4 smaller piles. 0.15 veg mat / 0.3' frozen, another veg mat 0.35-0.5' Frozen @ 2.5'

I9S1; 0.5-0.6' bgs 14:35 Brown peat and dark brown organic SILT; moist Headspace; 4.2

I9S2; 1.9-2.1' bgs 14:40; Brown (mixed) sl. fine sandy SILT; moist; with roots Headspace; 21.4 ppm [collect and speed later]

I9S3; 2.5-3.0'; 14:43; Dark brown, sl. fine sandy SILT; Frozen, some roots 1×4oz w/25mL MeOH; 1×4oz. Headspace; 17.2 ppm

TP I10 off N.E. corner pilings ≈ 16' (further N. concerned neighbor - Wesley Mitchell) 0.1 frozen, 0.3 veg. mat Debris in first 0.4' frozen ≈ 2.8' bgs

17385 10/1/10 ATN (12)

I1Ø51; 0.4-0.6' bgs; 1500; Mottled brown, slt sandy SILT, moist, w/ organics
Headspace: 5.1ppm

I1Ø52; 1.9-2.1' bgs; 1505; Dark brown, slt sandy SILT, moist; trace organics
Headspace: 5.5ppm

I1Ø53; 2.7-3.0' bgs; 1510; Brown, slt sandy SILT, frozen 1X4oz w/25ml MeOH, 1X4oz
Headspace: 2.2ppm

Headspace to IRA store furnace room to warm

Additional Analyticals:

6 I651 @ 15:25 for shallow under proposed building
1X4oz w/25ml MeOH, 1X4oz.

9 I752 @ 1540 - Fresh face @ 2' bgs
1X4oz w/25ml MeOH, 1X4oz.

Jason fills in TP5, 6, 7, 8, 10
Return to apt. to get preweighed for TPI952, put samples in iced cooler

17385 10/2/10 ATN (13)

Sample I952 1655; Fresh face 1.9-2.1' bgs.
1X4oz w/25ml MeOH, 1X4oz.

backfill TP7

Mark Way Points with GPS ±19-22'
Way Points 001-010 are
Test Pits TPI1-TPI10 in order
(photos of 10 pits at various times)

17:35 Off site

Visit briefly w/ Vela Coltram
2192 - Chester Tekee - school m - Fnd 5
Tonya Dallot - 444-4002 - IRA
If need help.

17:50 - Stop @ school site. Old storage pad is a steel platform with refrigerant risers, polystyrene beads under bottom for insulation. Now cut off from easy access by utilidors.

SW corner of school has imported gravel for road going around corner. No obvious impacts.
To south of road, old welded steel pipe may be previous fuel

supply line, Boggy. Debris. A variety of activities makes it hard to tell what may have applied to old tank farm.

1805-1830 - Barge Landing walk through, video.
- Some minor staining and odor at new marine header.
- Old vertical ASTs look like they were cut and cleaned then moved to barge landing.
- No apparent staining around old diesel generators - 2
- Broken florescent light bulbs ~~well~~ along face of shipping containers a potential concern.
- Only 3 empty drums observed.

- Horizontal tank on stand does not appear to be breached/cut. No staining or weeping. "sounds" empty.
- 55 gal antifreeze drum - empty.

BLS1; 19:00; 1' bgs grayish brown SILT, moist, with roots, organics. 1.5 feet toward river from marine header catch basin.
0-0.25' - Frozen multi-color gravelly sand
~~0-0.~~ 0.25-0.35 frozen silt w/ roots
No strong fuel odor.
- Collect 1x4oz w/25mL MeOH, 1x4oz (BTEX, DRO) for potential analysis to show small surface stain is not indicative of extensive impact.
Biogenic interference a concern.
Headspace: 4.9 ppm
Photo

19:15 - Investigate Generators, mobile heat plant. - Fuel tank appears dry, crank case empty, no staining around heat plant.
Radiators, crank case fillers open on generators. No visible staining.

Dig a small test pit into 0.7' of tundra/peat at low spot bellow ~~salt~~ heat plant + generators - right next to lower generator. No odor or stain. See no need to sample. Photo

Wander between ASTs - both sets. Appear to be all cut, no oily stains, placed after cut + cleaned. No fuel odors noted. Don't see a reason to sample.
Photos.

One lead-acid battery in a plastic tote.

Debris on West side of pad in wetland - appears to be 3 or 4 burned housing trailers. A large pile of discarded welding rods suggests concern for metals.
Photos

On west bank of gravel pad is some oily looking staining and a spilled 5-gallon bucket of acrylic-Latex paint. Photos

Sample BLS2; 19:50; 0.5 bgs - Brown, slightly silty, gravelly SAND; moist From beneath thickest accumulation of flourescent bulbs (broken) for possible metals analysis 1X4oz glass
Photo

Sample BLS3 20:05; 0.3-0.4' bgs Brown fiberous PEAT; wet (0.25' Frozen) just east of welding rod pile in wet swale. 1X4oz - potential metals analysis.
Decide to collect duplicate BLS13 20:10 - Did not try to homogenize wet fiberous PEAT. 1X4oz.

Sample BLS4; 20:18; 0.3-0.4' bgs (0.25 frozen) Brown, sl. silty, gravelly SAND; moist. Beneath stain below blue paint spill. Headspace: 3.5 ppm

17385 10/1/10 (18) RAH

B1S4 cont. 1X4oz w/MeOH, 1X4oz
(May just be surficial liter)
Photo used oil set?

WayPoints (GPS) ± 19'-22'
O11 - OilFare for Samples
BLS1 - BLS4, respectively

20:35 off site.
21:30 - Samples put away, gear stowed, headspace read off.

17385 10/2/10 RAH

9:24 - Tabulate IRA samples - 16
Pack up far set, instruments off chargers
Cal check OUMPID #6 99.4-99.6 - ok.
Load up.
Wx: NE wind to 15, rain, upper 30s F.

10:45 - 11:15 - Video tour of school site.
Meet Eddie Campbell - Principal.

Set up to use heat register inside entry for headspace.

17385 10/2/10 RAH (19)

ETPS1: Eastern most, a little west of line to water treatment plant
Diesel odor. Plastic liner ≈ 2'. water entry.
SF1S1; 1.1-1.3' bgs; 11:40; Mixed brown & gray gravelly SAND; wet
fuel odor. Zone of water fluctuation.
Water filling hole quickly
Headspace: 406 ppm
(sand is coarse, all rounded to sub-rounded)
SF1S2; 0.4-0.6' bgs; 11:45 Mixed colors - brown, gravelly SAND; moist
Headspace: 77.2 ppm

Plastic barrier is clear ≈ 6 to 8 mil, non-reinforced. Sheen on water.
liner 1.8-2' depending on side of hole.
Decide to auger through. Subrounded & rounded sands and gravels will not stay open - flows into hole.
SF1S3; 3.3-3.5' bgs; 12:10; Mixed gray and brown, gravelly SAND; wet,
fuel & sewage odor. Vegetation mat at 3.5' bgs - just cut into fiberous PEAT - difficult, frozen? 1X4oz w/25mL MeOH, 1X4oz
Headspace: 448 ppm DRO/BTEX (PAH?)

17395 10/2/10 RZK (20)

Get decon water from Janitor's closet in school.

TPS2 - West of TPS1 outside school drip line. Plastic liner @ 1.4' bgs water entry. Not as much fuel odor as TPS1

SF2S1; 1.0-1.15' bgs in wet zone 12:42; Mixed color gravelly SAND; wet
Headspace: 400 ppm

SF2S2; 0.4-0.6' bgs; 12:45; mixed color gravelly SAND; moist; swampy odor
Headspace: 4.9 ppm

Decide not to dig through liner. Water level in TPS1 continues to rise - did not drop when liner punctured.

TPS3 - W. side of W. entrance. Plastic liner intact 0.6' bgs (Photo) No odor. Cut square hole in plastic - 3 layers here.

17395 10/2/10 RZK (21)

SF3S1; 0.4-0.6' bgs; 13:05; above liner, Mixed Brown, gravelly SAND; moist.
Headspace: 30.3 ppm

SF3S2; 1.0-1.15' bgs; 13:13; Color turns more gray - zone of water fluct. Mixed Gray and brown, gravelly SAND; wet. swampy odor
Headspace: 7.2 ppm

TPS4; Move East of TPS1. Soil becomes gray ~ 0.5' bgs, fuelly? more dense, harder to dig than other holes. No plastic to 2.2' bgs.
SF4S1; 2.0-2.1' bgs; 13:45; Gray with some brown, gravelly SAND; just wet
Head space: 45.2 ppm

SF4S2; 0.9-1.1' bgs; 13:48; Same soil but moist.
Head space: ~~[illegible]~~ 19.0 ppm

SF4S3; 0.4-0.6' bgs; 13:50; mixed brown & gray, gravelly SAND; moist
Headspace: 118.8 ppm

Re-dig adjacent to TPS1 to get to 1' bgs
- hole has filled to ≈ 0.7' bgs. w/ water/ sheen (fuel globs?) To sample -
has torn bits of plastic -

SF1S1; 14:20; 1.0-1.1' bgs 1X4oz w/MeOH, 1X 4oz BTEX, DRO, (PAH!)

Duplicate
SF1S11; 14:30; 1X4oz w/25ml MeOH, 1X4oz. BTEX, DRO

Repeat headspace: 363 ppm - pretty close to 406 -

Re-dig TPS2
SF2S1; 14:55; 1.0-1.1' bgs 1X 4oz w/25ml MeOH, 1X4oz BTEX, DRO

Sample
SF3S1 0.4-0.6' bgs above plastic liner, 15:10
1X4oz w/25ml MeOH, 1X4oz. BTEX, DRO

SF4S3 0.4-0.6' bgs; 15:25 1X4oz w/25ml MeOH
1X4oz. BTEX, DRO

Backfill holes, decon shovel.
GPS coordinates:
Way Points 015-018 = TPS1 - TPS4

Contemplate sampling under shed - mostly wet ice, about the elevation of the samples with high headspace. No room to swing pick, maybe a water sample would be better.

Contemplate Sampling around steel storage pad. A release would roll off edge, into wetland. Did not observe any particularly gross staining, but plenty of debris. May be water + sediment samples would be better. Walk around + take still photos. Dark spots may just be recently emerged peat. Sniff a few - no odor, no sheen on wet ice. - Decide no samples.
(Jason + Joe both mentioned ground is highly contaminated around water plant).

Can't find principal in offices.

16:00 - Run to appartment for more sample kits

- via AVEC - Removed tanks must have been supported - now just tundra.

- Quick snack, back to school

16:40 meet Eddye at school - about another hour. Tape TPS locations

17:00 - AVEC Center of site is a wetland - walking on ice.

Little evidence of Northern 8 tanks

Gravel pad with foam underneath about the location of northern 6 tanks. Find edge of Northern tanks liner.

Grab some samples while I still have access to school.

AVS1; 17:25; 0.8-1.0' bgs at southern edge of small western gravel pad - below foam and thin vege mat, but before deeper veg. Mixed brown, gravelly SAND; moist (top 0.3' frozen)

Headspace: 8.8 ppm

(path to oldest tanks suggests route of piping)

AVS2; 17:40; 0.3-0.5' bgs at southern edge of northern tanks liner (or liner creating wetland?) Only place I could find liner/evidence of old tanks. Mixed brown gravelly SAND; wet; trace organic silt, roots.

Headspace: 4.0 ppm

AVS3; 17:48; 0.3-0.5' bgs (0-0.25' frozen) at southern edge of old tank farm (existing) - travelled, dark-colored area, possible stain (or just peat) under piping, outside containment. Redish brown fiberous PEAT moist to wet. swampy odor

Headspace: 52 ppm

AVS4; 17:55; 0.2-0.4' bgs (0-0.2' frozen)

Inside existing old tank containment

- did not encounter liner.

- Dark, possibly stained area in center of tanks.

Redish brown, old moss + fiberous PEAT; wet; sheen, swampy odor

Headspace: 11 ppm

17385 10/2/10 (26)

AVS5; 18:05; 0.3'-0.5' bgs; at dark stain - oil filter element. N side corner. 0.15' frozen.
Brown, fiberous PEAT; moist, some debris mixed in.
Headspace: 17.1 ppm

Photos of each spot - return to school to warm samples, decon. Finish up sample notes.

19:10 Back @ AVEC

AVS6; 19:20 - 0.1-0.3' bgs - stain under Butler building S.W. corner. Photos
Brown, fiberous PEAT; moist to frozen. Headspace: 69.6 ppm
uncertain odor - diesel + something else?

Note: Butler building foundation is creosote treated - some staining around timbers not sampled.

2 diesel generators in building. Oil filters still on, likely still contain motor oil. No containment under engines. Photos.
Insulation appears to be fiberglass.
Radiators removed.

17385 10/2/10 (27)

AVS7; 19:30; 0.2-0.4' bgs; stain under N.W. corner Butler building
Brown, fiberous PEAT; moist to frozen; diesel odor.
Headspace: 63.7

AVS8: 19:40; 0.2-0.4' bgs, just under frost, E. edge of site, potential staining at corner of transformer
Dark brown to black, fiberous PEAT frozen to wet.
Headspace: 1.4 ppm (Oily odor in area, not clear if at this location)

AVS9: 19:50; 0.3-0.4' bgs; under N.E. corner of Butler building beneath steel fuel pipe flanges (disconnected) A bit of diesel odor.
Brown fiberous PEAT; moist
Headspace: 37.3 ppm

Sample AVS3; 20:18; 1x4oz w/MeOH, 1x4oz BTEX, DRO
AVS4; 20:25; 1x4oz w/MeOH, 1x4oz BTEX, DRO

17385 10/2/10 (28) RZZ

AVS6 0.15-0.35'; 20:35 Not sure of odor. Too volatile for transformer oil. Go for waste oil parameters, duplicate. 1X4oz w/MeOH, 1X8oz

AVS11 dupe of AVS6 homog/wet 8oz. 1X4oz w/MeOH, 1X8oz @ 20:45

AVS7 20:55; 1X4oz w/MeOH, 1X4oz BTEX, DRO

AVS5; 21:10; 1X4oz w/MeOH, 1X8oz used oil parameters

AVS8 21:15; 1X 8oz - DRO/RRO, PCBs

Mark GPS WayPoints - 019-027 are samples AVS1 → AVS9 in order.

Load up

21:40 off site.

Move samples to chilled cooler, wrap up.

Off 22:18

17385 10/3/10 (29) RZZ

9:24 - Start sample handling Temp blank: 38°F.

Sign custody seals - Cooler 1 = [illegible] 11:3[illegible]

Cooler 2 = else @ 11:40

12:15 - Plane 15 min out - wrap up packing last of gear.

12:30 - To airport

12:50 - In air, 13:25 - Kotz.

13:50 - AK Air - jet is on ground, no one will accept cargo. Hazmat people out until later in week.

Everts/Frontier/[illegible] - Closed Sundays.

ERA - OK. - Ship → probably arrive Monday evening.

14:25 - board AK Air flight.

[illegible] samples

16:24 - load cab

RZZ

17385 10/5/10 (58) RZH

1045- Pickup Sample coolers/equipment @ERA aviation

Custody seals intact. Tape partially ripped on one side Cooler 2

1130- Open coolers to check, final label.
Temp - Cooler 1: 2.7°C
Temp - Cooler 2: 2.4°C
1440 Deliver Coolers to SGS

```
; Start ATMGPS 10/20/2010 7:51:47 AM
<+>
 <@ GetDef>

Area   Point   Latitude    Longitude
IRA    TPI1  66.60347750 -160.00359158 WGS84; 001; 001; Elev=2.0Ft Icon=178
IRA    TPI2  66.60351807 -160.00349762 WGS84; 002; 002; Elev=-2.0Ft Icon=178
IRA    TPI3  66.60357205 -160.00335429 WGS84; 003; 003; Elev=-5.9Ft Icon=178
IRA    TPI4  66.60363114 -160.00314198 WGS84; 004; 004; Elev=-7.5Ft Icon=178
IRA    TPI5  66.60364003 -160.00355210 WGS84; 005; 005; Elev=-11.4Ft Icon=178
IRA    TPI6  66.60349511 -160.00323686 WGS84; 006; 006; Elev=-13.8Ft Icon=178
IRA    TPI7  66.60346300 -160.00290569 WGS84; 007; 007; Elev=-16.9Ft Icon=178
IRA    TPI8  66.60347675 -160.00204202 WGS84; 008; 008; Elev=-16.1Ft Icon=178
IRA    TPI9  66.60342461 -160.00325060 WGS84; 009; 009; Elev=-7.5Ft Icon=178
IRA    TPI10 66.60368278 -160.00290091 WGS84; 010; 010; Elev=-13.0Ft Icon=178
Barge  BLS1  66.60932598 -160.01639787 WGS84; 011; 011; Elev=19.3Ft Icon=178
Barge  BLS2  66.60838335 -160.01648798 WGS84; 012; 012; Elev=39.0Ft Icon=178
Barge  BLS3  66.60827313 -160.01669987 WGS84; 013; 013; Elev=37.5Ft Icon=178
Barge  BLS4  66.60834161 -160.01681160 WGS84; 014; 014; Elev=35.9Ft Icon=178
School TPS1  66.60439038 -160.01263289 WGS84; 015; 015; Elev=13.8Ft Icon=178
School TPS2  66.60438510 -160.01258000 WGS84; 016; 016; Elev=12.2Ft Icon=178
School TPS3  66.60441678 -160.01273381 WGS84; 017; 017; Elev=13.8Ft Icon=178
School TPS4  66.60436540 -160.01208538 WGS84; 018; 018; Elev=13.8Ft Icon=178
AVEC   AVS1  66.60413858 -160.01019702 WGS84; 019; 019; Elev=13.8Ft Icon=178
AVEC   AVS2  66.60411721 -160.00997557 WGS84; 020; 020; Elev=11.5Ft Icon=178
AVEC   AVS3  66.60389149 -160.01029300 WGS84; 021; 021; Elev=4.4Ft Icon=178
AVEC   AVS4  66.60394974 -160.01020934 WGS84; 022; 022; Elev=2.8Ft Icon=178
AVEC   AVS5  66.60387481 -160.00988220 WGS84; 023; 023; Elev=7.5Ft Icon=178
AVEC   AVS6  66.60391085 -160.01006383 WGS84; 024; 024; Elev=9.9Ft Icon=178
AVEC   AVS7  66.60394161 -160.00996644 WGS84; 025; 025; Elev=9.1Ft Icon=178
AVEC   AVS8  66.60376215 -160.00975320 WGS84; 026; 026; Elev=8.3Ft Icon=178
AVEC   AVS9  66.60394186 -160.00992771 WGS84; 027; 027; Elev=5.1Ft Icon=178
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; End ATMGPS 10/20/2010 7:51:47 AM
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APPENDIX J

"IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT"

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