Final 2014 Remedial Action Report

Project Chariot
Cape Thompson, Alaska

March 2015

Prepared for

U.S. Department of Energy

and

U.S. Army Corps of Engineers, Alaska District

Post Office Box 6898
JBER, Alaska 99506-0898

Contract W911KB-14-C-0002

Prepared by

Tanik Construction

4011 Arctic Blvd, Suite 101
Anchorage, Alaska 99503 (907) 903-4265

and

Fairbanks Environmental Services

3538 International Street
Fairbanks, Alaska 99701 (907) 452-1006

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LIST OF ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ADN	Alaska Dispatch News
AEC	U.S. Atomic Energy Commission
ANCSA	Alaskan Native Claims Settlement Act
APP	Accident Prevention Plan
APRN	Alaska Public Radio Network
ASRC	Arctic Slope Regional Corporation
ATV	all-terrain vehicle
bgs	below ground surface
BLM	Bureau of Land Management
BTEX	benzene, toluene, ethylbenzene, and xylenes
°C	degrees Celsius
CD	compact disk
CDQR	Chemical Data Quality Report
CFR	Code of Federal Regulations
cy	cubic yard
DQCR	Daily Quality Control Reports
DOD	Department of Defense
DOE	Department of Energy
DRO	diesel range organics
ELAP	Environmental Laboratory Accreditation Program
EMT	emergency medical technician
°F	degrees Fahrenheit
FES	Fairbanks Environmental Services
FUDS	Formerly Used Defense Site
GAC	granular activated carbon
GNSS	Global Navigation Satellite System
GPS	global positioning system
GRO	gasoline range organics
HSO	Health & Safety Officer
HTDP	Horizontal Time Dependent Positioning
ICs	institutional controls
LM	Legacy Management
LocID	location identification number
LOD	limit of detection
LOQ	limit of quantitation
LUCs	land use restrictions
µR/hr	micro Roentgens per hour
mg/kg	milligrams per kilogram

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

MS/MSD	matrix spike/matrix spike duplicate
NA	not applicable
NAC	Northern Air Cargo
NAD83	North American Datum of 1983
ND	not detected
NAVD88	North American Vertical Datum 1988
NALEMP	Native American Lands Environmental Mitigation Program
NARL	Naval Arctic Research Laboratory
NGS	National Geodetic Survey
N-P-K	nitrogen, phosphorus, potassium
OPUS	Online Positioning User Service
PAH	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PID	photo-ionization detector (instrument)
POL	petroleum, oil, and lubricants
ppm	parts per million
QC	quality control
RA	remedial action
RCRA	Resource Conservation and Recovery Act
RMS	Root Mean Square
RRO	residual range organics
RTK	real-time kinematic
SDG	sample data group
SGS	SGS North America, Inc.
SI	Site Investigation
SVOC	semi-volatile organic compounds
TAH	Total Aromatic Hydrocarbons
Tanik	Tanik Construction Company
TAqH	Total Aqueous Hydrocarbons
TCLP	toxicity characteristic leaching procedure
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator
UTV	utility vehicle
VOC	volatile organic compounds
WGS84	World Geodetic System of 1984

EXECUTIVE SUMMARY

This report was prepared to document remedial action (RA) work performed at the former Project Chariot site located near Cape Thompson, Alaska during 2014. The work was managed by the U.S. Army Corps of Engineers (USACE) Alaska District for the U.S. Department of Energy (DOE) Office of Legacy Management (LM).

Due to the short field season and the tight barge schedule, all field work was conducted at the site July 6 through September 12, 2014. Excavation activities occurred between July 16 and August 26, 2014. A temporary field camp was constructed at the site prior to excavation activities to accommodate the workers at the remote, uninhabited location.

A total of 785.6 tons of petroleum, oil, and lubricants (POL)-contaminated soil was excavated from four former drill sites associated with test holes installed circa 1960. Diesel was used in the drilling process during test hole installations and resulted in impacts to surface and subsurface soils at four of the five sites (no contamination was identified at Test Hole Able). Historic information is not definitive as to the usage for Test Hole X-1; it may have actually been a dump site and not a drill site. In addition to the contaminated soil, the steel test hole casings were decommissioned and associated debris was removed as part of the remedial effort.

The POL-contaminated soil was placed in lined super sacks, and the filled super sacks were weighed and then loaded into connex boxes to facilitate off-site shipping. The quantities of POL-contaminated soil removed from each site are summarized in Table ES-1.

Table ES-1 Summary of POL-Contaminated Soil Removed

Test Hole[1]	Casing Status	Quantity of POL-Contaminated Soil Removed (Tons)[2]	Number of Super Sacks[3]	Average Depth of Excavation (inches)	Estimated Area of Excavation (Square Feet)
Able	Cut and Capped	0	0	0	0
Baker	Cut and Capped	15.5	24	15 (40 in NW corner)	130
Charlie	Cut and Capped	248.0	204	36 (pad) and 24 (tundra)	2,100
Dog	Cut and Capped	254.7	212	24 (pad) and 12 (tundra)	2,300
X-1	Removed	267.4	217	66	1,100
TOTAL REMOVED		**785.6**	**657**	**Varies**	**Total Area: 5,630**

[1] Test Hole X-1 may have actually been a dump site and not a drill site.

[2] A ton (short ton) is equivalent to 2,000 pounds. The quantities are based on collective weight measurements made on site during the field effort.

[3] Super sacks were constructed of woven polypropylene with a polyethylene liner and were 1-cubic yard (cy) in capacity.

The POL-contaminated soil was barged to Seattle, Washington, and transported overland for disposal at the Columbia Ridge landfill in Arlington, Oregon.

Results of soil confirmation samples collected from the limits of the excavations were all below regulatory standards except for three instances:

- The soil sample collected from inside the steel casing at Test Hole Baker exceeded the Method One cleanup level for diesel range organics (DRO). The casing was sealed with bentonite and a cap was welded onto the top preventing further contact.
- One floor sample collected immediately adjacent to the Test Hole Charlie casing exceeded the Method Two cleanup level for DRO. Permafrost restricted further soil removal.
- One floor sample from collected directly below the former Test Hole X-1 casing (casing was completely removed), exceeded the Method Two cleanup level for DRO. Permafrost and/or bedrock restricted further soil removal.

The Alaska Department of Environmental Conservation (ADEC) approved excavation closures after reviewing preliminary analytical results and field data. The excavations were subsequently backfilled with local materials and contoured to match the surrounding topography, then fertilizer and grass seed were applied to facilitate re-vegetation.

The requirements of the Work Plan have been met (the casings were properly decommissioned or removed and all accessible POL-contaminated soil has been removed) and site closure is recommended for all five test hole sites.

- Cleanup Complete status is recommended for the Test Hole Able site since there was no indication of diesel contamination at that site.
- Cleanup Complete with land use restrictions/institutional controls (LUCs/ICs) is recommended for the Test Hole Baker, Charlie, Dog, and X-1 sites. LUCs/ICs are recommended because either sample results indicate that residual diesel contamination remains in soil at these sites, or diesel contamination is presumably present in soil below the top of permafrost along the length of each of the boreholes. A LUCs/ICs plan should be prepared to document the site closure requirements.

1.0 INTRODUCTION

This report was prepared to document remedial action (RA) work performed at the former Project Chariot site located near Cape Thompson, Alaska (Figure 1-1). Tanik Construction Company (Tanik) was the prime contractor and Fairbanks Environmental Services (FES) provided sampling and documentation services. The project was conducted under contract to the U.S. Army Corps of Engineers (USACE), Contract Number W911KB-14-C-0002. The work was managed by the USACE Alaska District for the U.S. Department of Energy (DOE) Office of Legacy Management (LM). RA field work was conducted between July and September 2014.

1.1 Project Objectives

The objective of the remediation effort was to abandon test holes at the former U.S. Atomic Energy Commission (AEC) Project Chariot site and remove contaminated soil to below ADEC action levels. POL-contaminated water was removed from test hole casings, and the casings were either completely removed or were cut below grade and a cap welded in place. POL-contaminated soil surrounding the test holes was excavated and removed from the site and transported to a permitted landfill for proper disposal. Following excavation activities, the test hole sites were contoured to match surrounding terrain.

1.2 Site Background

In 1958, the AEC authorized planning and studies for Project Chariot, an experimental harbor excavation using nuclear explosives. This project was developed as part of the Plowshare Program created in 1957. This was a program to investigate and develop peaceful uses of atomic energy. The AEC made a withdrawal of public lands to use the Cape Thompson location between 1958 and 1963. The study area consisted of the entire Ogotoruk Creek drainage (approximately 4,700 acres), but most facilities were concentrated near the Chukchi Sea coast.

Test holes were installed to evaluate geologic conditions in support of Project Chariot. The test holes were installed with a rotary drill rig using hollow-stem diamond drill bit technology to allow for coring. It was noted in 1959 that the traditional drilling fluid thawed the permafrost which caused the sides of the test holes to slump into the bottom of the uncased holes. To overcome this difficulty, the conventional drilling fluid was replaced with refrigerated diesel fuel in 1960 and resulted in lack of sidewall sloughing (U.S. Geological Survey [USGS], 1961a).

Table 1-1 Summary of Test Hole Construction[1]

Test Hole	Date Drilled	Total Depth (feet bgs)	Depth of Permafrost (feet bgs)
Able	1959	596	2.4 to >596
Baker	1959	1,172	2.1 to >1,000
Charlie	1960	1,002	1.5 to 945
Dog	1960	1,202	1.2 to 1,170

[1] Sources: USGS, 1960 and USGS, 1961a. No data were available for Test Hole X-1.
bgs – below ground surface

Scientists conducted a radioactive tracer experiment from August 20-25, 1962 on soils and sediments in test plots along Snowbank Creek and its confluence with Ogotoruk Creek; soil containing various radioisotopes from a Nevada nuclear blast was sprinkled on local flora to evaluate the mobility of radioactive fission products subjected to simulated conditions of rain and runoff. At the conclusion of the tests, tracer-contaminated soil was removed and transported in drums to a nearby area, where it was mixed with native soil (DOE, 2009). The soils, boards, and polyethylene sheeting used to enclose and cover the test plots were covered with about 4 feet of clean soil, which formed a small mound that occupied an area of about 400 feet; the mound remained intact until it was removed in 1993. Although a substantial amount of information was acquired, Project Chariot was cancelled due to lack of public support. No nuclear explosive devices were brought to the site. The steel test hole casings and associated diesel-contaminated soil remained at the site.

In 1963, the Department of the Navy assumed control of the AEC improvements and obtained a Bureau of Land Management (BLM) permit effective for a 5-year period. The former AEC site was activated as a logistical support base for the Naval Arctic Research Laboratory (NARL) at Barrow, Alaska, and was identified as the Cape Thompson Naval Site. The main camp, buildings, airstrip, and other structures were used by the U.S. Navy, and some additional structures were built. The NARL discontinued use of the site in 1970, and administration was transferred to the BLM. In 1972, the acreage was set aside for review and classification by BLM. On December 2, 1980, the area was classified as a National Wildlife Refuge, transferring jurisdiction to the U.S. Fish & Wildlife Service, with the exception of a 160 acre Native allotment (shown on Figure 1-2). More recently, the land surrounding the allotment was conveyed to the Arctic Slope Regional Corporation (ASRC) under the Alaskan Native Claims Settlement Act (ANCSA).

A removal action was performed in August 1991 to clean up the main camp under the Formerly Used Defense Site (FUDS) program. FUDS, which is managed by the USACE, is used to clean up environmental problems created by Department of Defense (DOD) activities on lands the DOD no longer owned, controlled, or had jurisdiction over as of 1986. The work included demolition and disposal of tanks, structures, and other improvements; and the limited excavation and offsite disposal of POL-contaminated soils. Debris that could not be burned was disposed in a permitted onsite landfill. A second cleanup was performed during the 2009 field season under the National

American Lands Environmental Mitigation Program (NELAMP) to address impacts to the native allotment; several buildings and equipment that were left in place following the 1991 effort were removed from the site or burned. One building, identified as a cabin on Figure 1-2, was retained as a safety shelter.

The field work conducted from July through September 2014 addressed impacts from AEC activities associated with Project Chariot and included the decommissioning the test hole casings, removal of diesel-contaminated soils, contouring of the sites to match local topography, and the addition of seed and fertilizer to disturbed areas to promote re-vegetation.

1.3 Physical Setting

The DOE Chariot site is located near Cape Thompson. The Chariot site lies in the Ogotoruk Creek valley, which is located about 120 miles northwest of Kotzebue along the coast of the Chukchi Sea. There are no roads in the Cape Thompson area and vehicular traffic is limited to the winter, when the river and sea ice are thick enough to permit ice roads. During summer and fall, access to the site is limited to small fixed-wing aircraft, helicopter, barge, and all-terrain vehicle (ATV); from Point Hope which is located 30 miles northwest or Kivalina which is 41 miles southeast. Figure 1-1 shows the site and vicinity location. Figure 1-2 presents the project site and key features.

The Ogotoruk Valley is approximately three miles wide, seven miles long, and bordered by an 800-foot-high ridge to the west and 500-foot-high rolling hills to the east. Vegetation in the area consists of arctic and mountain tundra in the low regions, and sparse tundra at high elevations. The creek flow varies greatly, depending on seasonal fluctuations in precipitation and ambient temperatures. Shallow permafrost (1 to 3 feet below ground surface [bgs]) was identified in unconsolidated deposits (USGS, 1960).

Climate

The Cape Thompson site lies north of the Arctic Circle in a transitional climate zone characterized by long, cold winters and cool summers. Average temperatures range from between 40 and 60 degrees Fahrenheit (˚F) in the summer, and between -20 and 0 ˚F in the winter (Weatherspark, 2013). July is normally the warmest month and January is the coldest month. Mean maximum air temperature is below freezing from October to May. The Chukchi Sea is typically ice-free from May/June through October.

Late summer is the wet season with August being the wettest month. The average annual precipitation at the site is estimated to be about 8 inches. About 60 percent of the precipitation (about 5 inches) occurs as rain between June and September. The site is known for having frequent strong winds, often with velocities exceeding 20 knots. Also, the Ogotoruk valley is frequently covered by fog and/or cloud cover, either of which can inhibit accessibility to the site.

Geology and Land Surface

The Cape Thompson site is located within the Ogotoruk Creek valley and is characterized by the following major land-surface types: rock outcrops, rubble (talus and colluvium), tundra vegetation, bare soil, and long shore lagoons (USGS, 1961a). Bedrock crops out in sea cliffs, higher ridges, and in scattered stream cuts. Principal types are mudstone, siltstone, sandstone, limestone, shale, and conglomerate. Talus is not extensive and occurs only on steep slopes, generally below limestone outcrops. Talus generally ranges from 6 inches to 2 feet thick at the site. Talus is intermingled with the courser colluvium that has a matrix of grit, sand, and silt. Colluvium is generally located on slopes of intermediate steepness and essentially void of vegetation. Colluvium at the site is generally no more than a few feet thick.

Lush tundra vegetation at the site typically grows in low gradient, poorly drained areas. In other areas of the site, the vegetal cover (mainly tussock grass) is sparse and occupies all but the steepest and driest slopes. Bare soil is interspersed with the tundra vegetation and is composed of material described as sandy to pebbly.

1.4 Summary of Previous Investigations Associated with Test Holes

The main camp area used by the U.S. Navy was mitigated under the FUDS and Native American Lands Environmental Mitigation Program (NALEMP) programs. The following reports summarize past investigations and RA activities associated with Project Chariot.

1993 Site Assessment and Remedial Action

In 1992, a researcher from the University of Alaska, Fairbanks identified the documented presence of radioisotopes remaining at the Project Chariot site. In July and August 1993, DOE removed the stockpiled soils containing the radioactive contamination and conducted a large scale biota sampling program (DOE, 1994). Approximately 150 cubic yards (cy) of material were removed, placed on a barge to Seattle, and then transported overland to the Nevada Test Site for final burial.

In August 1995, upon their review of project data, ADEC issued clean closure (ADEC Contaminated Sites Database).

2008 Site Investigation

The 2008 Site Investigation (SI) was primarily focused on the Cape Thompson FUDS. However, surface soil samples were also collected from near Test Hole Baker, and diesel range organics (DRO) in excess of the ADEC Method One soil cleanup level (500 milligrams per kilogram {mg/Kg}) were identified in two discrete soil samples (FES, 2008) prompting further investigation.

2010 Limited Site Investigation

Based on investigation results from the 2008 SI, a limited soil investigation was performed on all five test holes located at the site to evaluate site conditions. DRO in excess of the ADEC Method One soil cleanup level was identified at four of the five test holes (FES, 2010).

2013 Site Visits

Site visits were performed in July and August 2013 to gather and document logistical information to support this remediation project. The objectives of the site visits were to evaluate the condition of airstrips; identify possible barge landing, field camp, staging, and borrow locations; evaluate access routes to contaminated sites; measure gamma radiation levels; and make Chukchi Sea depth sounding measurements in the vicinity of possible barge landings. The 2013 gamma radiation measurements were collected from all five of the test hole locations; gamma results ranged from 6 to 14 micro Roentgens per hour (µR/hr) and were similar to background concentrations (FES, 2013).

1.5 Site Cleanup Levels

Cleanup levels for the Project Chariot site are presented in Table 1-2. The cleanup levels for the imported drill pad soils are from Table A2 (Method One) of Title 18 of the Alaska Administrative Code (AAC), Chapter 341 (18 AAC 75.341). The cleanup levels for tundra soil, which includes soil that underlies the drill pads, are from Table B2 (Method Two) for the Arctic Zone.

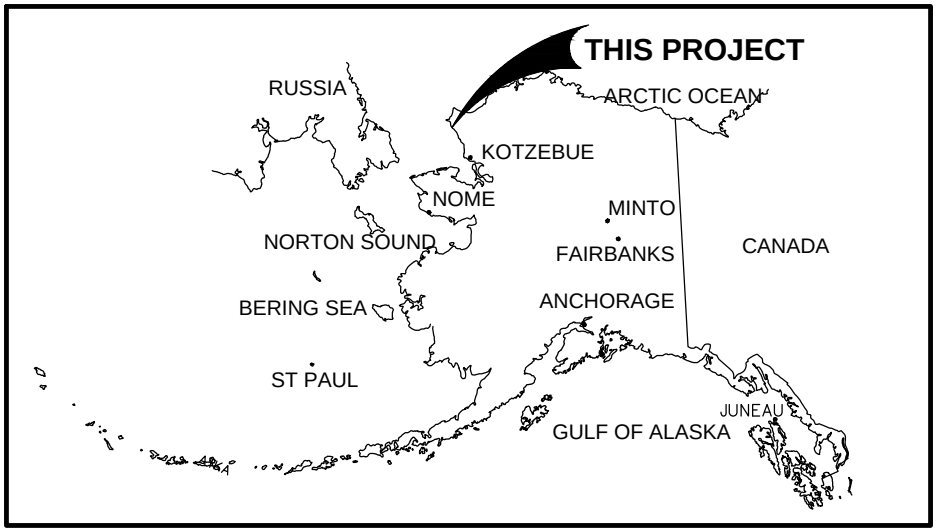
Water pumped from test hole casings must meet the surface water criteria listed in 18 AAC 70 (Water Quality Standards for Designated Uses [Petroleum Hydrocarbons, Oils and Grease, for Freshwater Uses]) before it can be discharged on site. In addition to the Total Aromatic Hydrocarbons (TAH) and Total Aqueous Hydrocarbons (TAqH) criteria listed in Table 1-2, water must also be free of visible film and sheen.

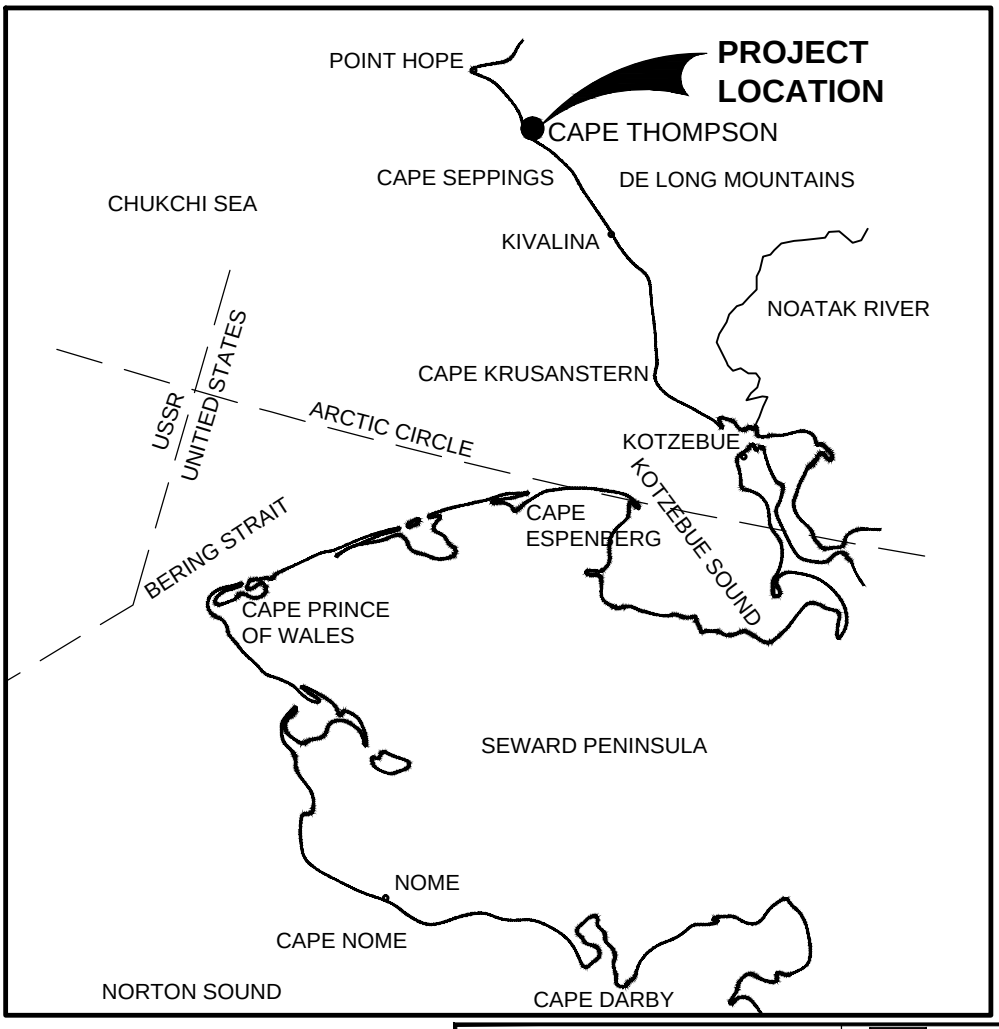
Table 1-2 – Site Cleanup Levels

Contaminant of Concern	Gravel Pad Soil (mg/Kg)	Tundra Soil (mg/Kg)	Surface Water (mg/L)
Gasoline Range Organics (GRO)	1,400	1,400	No sheen
DRO	500	12,500	No sheen
Residual Range Organics (RRO)	13,700	13,700	No sheen
TAH	NA	NA	0.01
TAqH	NA	NA	0.015

mg/L - milligrams per liter
NA – not applicable

Waste characterization samples were compared to toxicity characteristic leaching procedure (TCLP) limits presented in Title 40 of the Code of Federal Regulations (CFR) part 261.24.





NORTH

0 30 60 120

SCALE IN MILES

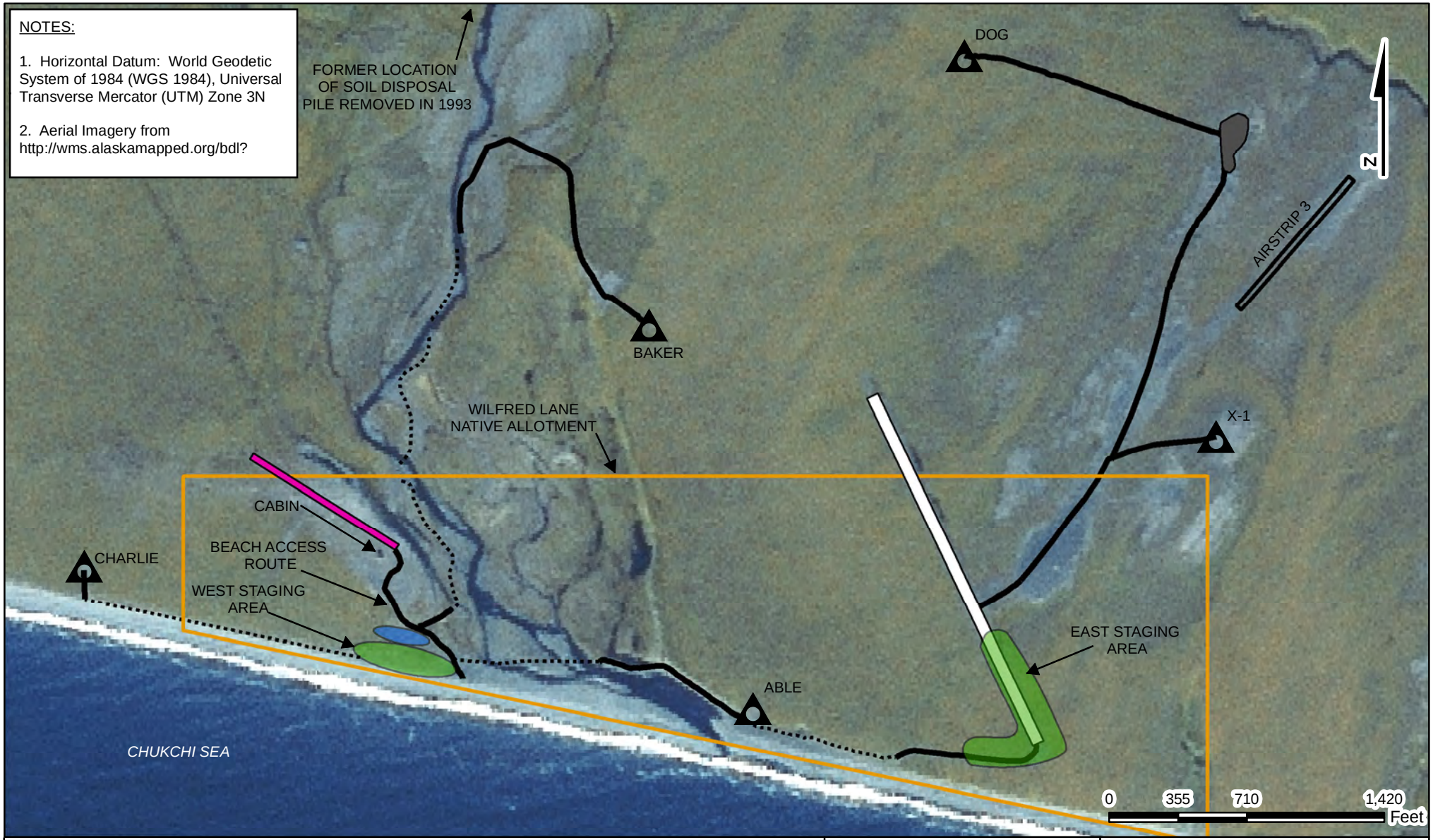
FAIRBANKS ENVIRONMENTAL SERVICES
3538 INTERNATIONAL STREET
FAIRBANKS, ALASKA

ALASKA DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

Regional Site Map

2014 Remedial Action Report, Project Chariot
Cape Thompson, Alaska

CONTRACT:	FIGURE:	DATE:
W911KB-14-C-0002	1-1	3/15



LEGEND:

- Test Hole Area
- Inferred Route
- Established Route
- Wilfred Lane Native Allotment
- West Airstrip
- East Airstrip - Not Usable in Current Condition
- Camp Location
- Staging Areas
- Borrow Area

Fairbanks Environmental Services
3538 International Street
Fairbanks, AK 99701

Alaska District
U.S. Army Corps of Engineers
Anchorage, AK

Project Site Map and Access Routes
2014 Remedial Action Report, Project Chariot
Cape Thompson, Alaska

Contract: W911KB-12-D-0001	Figure: 1-2	Date: 3/15

2.0 PROJECT ORGANIZATION

The Project Chariot site is located in a remote part of Alaska on the northwest coast. Site logistics and weather were major considerations when planning this remedial effort. Site conditions limited most RA activities to July and August.

2.1 Project Team

Many organizations were involved in the successful completion of the project. Table 2-1 summarizes the project team responsibilities.

Table 2-1 Project Team Responsibilities

Name	Responsibility
DOE & SM Stoller (DOE Contractor)	Site Responsibility
USACE	Contract Management
ADEC	Regulatory Agency
Tanik	Prime Contractor
FES	Sampling & Documentation
Alaska Minerals	Field Camp
Northland Services	Barge & Landing Craft Transport
Northwestern Aviation	Air Transport
SGS Environmental	Laboratory Analysis
Fairweather	Medic and Bear Watch
Windy Creek Survey	Sample locations surveys

2.2 June 2014 Site Visit

A site visit was performed on June 25, 2014. Bill Jury and Ken Rissew of Tanik and Mike Boese of FES visited the site to evaluate site conditions and identify any issues prior to arrival of the landing craft and field crew. The proposed camp location and staging areas were evaluated, as were trail conditions and site access. In addition, approximately 25 to 30 test pits (varying in depth) were dug at Test Hole Charlie to further refine the estimated extent of soil contamination and determine depth to permafrost. While the areal extent that was estimated in the draft Work Plan appeared to be accurate (albeit shifted slightly), the estimated depths (2.5 to 3.5 feet) of contaminated soil at the Test Hole Charlie pad were greater than what was previously assumed (1.5 feet).

Two laboratory samples were collected for additional waste characterization, and five laboratory samples were collected from the periphery of the contaminated area for correlating field observations/screening results at Test Hole Charlie. Screening samples were also collected, stored in the iced cooler, and were screened the following day upon heating them in a water bath; photo-ionization detector (PID) results from these screening samples ranged from 0.5 parts per million (ppm) to 4.2 ppm. Analytical results from Test Hole Charlie samples are discussed in Section 8.

The pre-work site visit was cut short due to the advancement of fog, and there was not enough time to visit the other test hole sites.

2.3 Mobilization

Northland Services barged equipment and supplies from Seattle (fuel) and Anchorage (camp, tools, and equipment) to Kotzebue. The barge left Anchorage on June 19, 2014 and arrived at Kotzebue on July 5, 2014. Equipment and supplies were then transferred to a 140-foot Northland Services landing craft which arrived on site on July 9, 2014.

Field personnel and site visitors accessed the site via small fixed wing aircraft from Kotzebue, Alaska. Northwestern Aviation utilized modified Cessna 206 aircraft capable of transporting up to four passengers or up to 800 pounds of freight to the remote site. Most takeoffs and landings occurred on the West Airstrip. However, during periods of strong north-south winds, an alternate airstrip (Airstrip 3) located northeast of the East Airstrip was used. The East Airstrip was in bad condition and was not used by aircraft.

Two Tanik personnel arrived at the site on July 6, 2014 to prepare for the landing craft arrival and field camp setup. The landing craft arrived on July 9, 2014 with the main camp (contained within 2 connexes), fuel (2 connexes), field vehicles and excavation equipment (2 connexes), and 26 empty connex boxes. The camp, fuel and equipment, and 20 empty connex boxes were unloaded from the landing craft on the west site of Ogotoruk Creek. Six empty connexes were offloaded on the east side of the creek.

Field camp personnel arrived at Cape Thompson to erect camp on July 9, 2014. Two additional Tanik personnel arrived onsite on July 12, 2014, and two more arrived on July 14, 2014. The FES samplers (Mike Boese and Bryan Johnson) were scheduled to arrive at Cape Thompson on July 15, 2014 but they were delayed in Kotzebue until July 17, 2014 due to weather. The medic was onsite July 23 through August 26, 2014.

SM Stoller personnel were onsite July 30 through August 7, 2014 (Rick Hutton), August 7 through August 13, 2014 (Gretchen Baer), and August 19 through August 26, 2014 (Jeff Price) to oversee field operations. Jeff Price returned to the site on August 29, 2014 for the final inspection.

Eric Cousino of Windy Creek Surveys, a certified land surveyor, arrived on August 26, 2014 after soil excavation was completed.

2.4 Field Camp

The field camp was erected between July 9 and 13, 2014 and was installed in the large, flat area located above high tide line between the beach and the airstrip access road (Figure 1-2). The field camp was originally planned for the area adjacent to an existing cabin, at the southeast end of the west airstrip, but high winds required the location be moved to a less exposed area.

The field camp consisted of the main tent, eight sleeping tents, and two outhouses. The main tent housed the kitchen and dining area on the east end; and a shower, laundry facilities, and large freezer on the west end. Each sleeping tent contained two bunks and an oil heater (Toyostove). Shipping connexes were used to store equipment and supplies. A 12 kilowatt diesel-powered generator provided electrical service to operate lights, hot water heater and pumps, and other electrical equipment including the office equipment and the bear fence 24 hours per day. Water was pumped from Ogotoruk Creek to a 1,200-gallon storage bladder located at the field camp.

Weekly food shipments arrived by aircraft. To minimize potential conflicts with bears and other wildlife, the field camp was kept in an orderly condition. Food and paper wastes were burned almost daily.

2.5 Project Communication

A small office was installed in one of the Quonset tents. Computers and a laser printer/scanner were used to document and communicate project activities. A satellite dish was installed to facilitate communications. A telephone (operated via the internet) and Wi-Fi were installed in the mail tent to allow wireless internet and email transmissions and was available to all field personnel. An iDirect satellite system with Wi-Fi connection was used to transfer daily reports and photographs from the site to the USACE, and receive analytical data from the laboratory at the site.

The telephone was used frequently to coordinate flights and shipments and for weekly project meetings with USACE. The field camp was also equipped with satellite phones to enable communication and to allow for emergency notifications in the event the internet failed. The satellite phones were rarely needed.

2.6 Visits by ADEC, Media, and Residents of Nearby Villages

Several scheduled visits were conducted to the site during remedial activities. Visitors arrived and departed via fixed wing aircraft.

- On August 5, 2014, Mark Kautsky and Judy Miller of the DOE, and John Halverson of ADEC, arrived at the site and left the same day.
- A media tour occurred on August 6, 2014. In addition to Mr. Kautsky, Ms. Miller, and Mr. Halverson, four media personnel visited the site: Suzanna Caldwell (Alaska Dispatch News [ADN]), Carey Restino (Alaska Media), Zachariah Hughes (Alaska Public Radio Network [APRN]), and Robert Hallinen (ADN).
- Mr. Kautsky, Ms. Miller, and Mr. Halverson returned to the site on August 21, 2014 with April Gil of the DOE. The four returned to the site on August 22, 2014 and accompanied four representatives of the Native Village of Point Hope (Daisy Sage, Nancy Ohok, Eva Kinneeveauk, and Jack Schaefer).
- On August 29, 2014, two representatives, Erik Kenning and Teresa Imm, from ASRC visited the site following completion of excavation activities to review the work that had been performed on ASRC land.

In addition to the scheduled site visits, residents from local villages passed by the site on ATVs; however no one approached the excavations or observed the work, and the marking of exclusion zones was unnecessary.

2.7 Demobilization

Demobilization of field personnel and equipment began on August 24, 2014 following completion of excavation activities; one of the two FES samplers left the site along with some sampling and medical gear. Two Tanik employees flew out on August 25, 2014. On August 27, 2014, two Alaska Minerals personnel arrived onsite to start deconstruction of the camp. The medic, SM Stoller personnel, the surveyor, and the remaining FES sampler departed Cape Thompson with the survey gear and remaining sampling and medical gear.

Field camp personnel, including the cook, demobilized on September 6, 2014; they left one sleeping tent standing and the satellite dish installed so the remaining field personnel would have shelter and communication awaiting arrival of the landing craft. The remaining field crew departed the site via fixed-wing aircraft on September 10, 2014 after deconstructing the final tent and satellite dish. Field personnel did not accompany the barge company on September 12, 2014, during final barge loading.

The landing craft was scheduled to arrive on September 6, 2014 but was delayed due to rough weather on the North Slope. The barge arrived on September 10, 2014, and then returned on September 12, 2014 with larger equipment, to remove all remaining connexes and equipment.

The landing craft demobilized the connexes and equipment from the site to Kotzebue. In Kotzebue, the camp and small vehicles (ATVs and Kubota utility vehicles [UTVs]) were conveyed to the airport and were loaded onto Northern Air Cargo (NAC) aircraft for air transport to

Anchorage. Remaining equipment on the barge was shipped to Seattle, Washington where it was transferred to a north bound barge and returned to Anchorage. Transport and disposal of POL-contaminated soil and other debris removed from the site is discussed in Section 11.

3.0 SITE SAFETY

The following section discusses safety guidelines, procedures, and inspections associated with the work performed as part of the RA efforts. RA activities were performed without any reportable safety incidents.

3.1 General Safety

Due to the remoteness of the site and the abundance of wildlife, site personnel worked in teams for safety. In addition, a bear guard/observer accompanied the site personnel at the main work area each day. Each team had a radio and a firearm, and each member continually checked for bears during work activities and communicated their observations to the other workers. The gentle terrain and lack of trees generally allowed unobstructed viewing. The radios were equipped with an emergency signal that was triggered when bears were present. When the emergency signal was triggered, all work stopped until working conditions were deemed safe. Although bears were present fairly often during fieldwork, there were no close bear/human encounters. The emergency medical technician (EMT) was onsite in case of medical emergencies and also performed duty as bear watch.

A five-foot high electric bear fence equipped with a metal gate was erected around the camp and operated 24-hours a day.

3.2 Safety Inspections

Daily and Monthly site safety inspections were performed by the site superintendent and/or the health and safety officer (HSO). Safety meetings were also performed each morning during work activities to discuss potential hazards and how best to mitigate them. Copies of the safety forms are included on compact disk (CD) included with this report. Specifically, safety forms are located in the Supplemental Data folder.

3.3 Air Monitoring

Breathing zone air monitoring was performed during excavation activities to ensure worker safety. Breathing zone air was monitored with a PID a minimum of twice per day (once in the morning and once in the afternoon) at each site where excavation occurred. No readings exceeded the threshold of 15 ppm listed in the Accident Prevention Plan (APP). Breathing zone air monitoring readings are summarized in Table 3-1.

Table 3-1 - Breathing Zone Measurements
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Number	Date	Time	Test Hole	Activity	PID Result (ppm)
1	7/17/2014	1300	Charlie	Surface Soil Screening	0.0
2	7/17/2014	1900	Baker	Excavation Soil Screening	0.0
3	7/18/2014	1100	Baker	Sample Collection	0.0
4	7/18/2014	1300	Charlie	Excavation and Bag Loading	0.0
5	7/19/2014	850	Baker	Excavation and Bag Loading	0.0
6	7/19/2014	1200	Baker	Excavation and Bag Loading	0.0
7	7/19/2014	1230	Charlie	Excavation and Bag Loading	0.0
8	7/19/2014	1345	Charlie	Excavation and Bag Loading	0.0
9	7/19/2014	1600	Charlie	Excavation and Bag Loading	0.0
10	7/20/2014	930	Charlie	Excavation and Bag Loading	0.0
11	7/20/2014	1400	Charlie	Excavation and Bag Loading	0.0
12	7/21/2014	900	Charlie	Excavation and Bag Loading	0.0
13	7/21/2014	1200	Charlie	Excavation and Bag Loading	0.0
14	7/21/2014	1600	Charlie	Excavation and Bag Loading	0.0
15	7/22/2014	830	Charlie	Excavation and Bag Loading	0.0
16	7/22/2014	1030	Charlie	Excavation and Bag Loading	0.0
17	7/22/2014	1430	Charlie	Excavation and Bag Loading	0.0
18	7/22/2014	1500	Charlie	Excavation and Bag Loading	0.0
19	7/22/2014	1700	Charlie	Excavation and Bag Loading	0.0
20	7/23/2014	1030	Charlie	Excavation and Bag Loading	0.0
21	7/23/2014	1330	Charlie	Excavation and Bag Loading	0.0
22	7/24/2014	1000	Charlie	Excavation and Bag Loading	0.0
23	7/24/2014	1600	Charlie	Excavation and Bag Loading	0.0
24	7/25/2014	900	Charlie	Excavation and Bag Loading	0.0
25	7/25/2014	1100	Charlie	Excavation and Bag Loading	0.0
26	7/25/2014	1330	Charlie	Excavation and Bag Loading	0.0
27	7/26/2014	1030	X-1	Excavation and Bag Loading	0.0
28	7/26/2014	1215	X-1	Excavation and Bag Loading	0.0
29	7/26/2014	1230	X-1	Excavation and Bag Loading	0.0
30	7/26/2014	1400	X-1	Excavation and Bag Loading	0.0
31	7/26/2014	1600	X-1	Excavation and Bag Loading	0.0
32	7/29/2014	900	X-1	Excavation and Bag Loading	0.0
33	7/29/2014	1130	X-1	Excavation and Bag Loading	0.0-3.8
34	7/29/2014	1315	X-1	Excavation and Bag Loading	0.0-3.1
35	7/29/2014	1515	X-1	Excavation and Bag Loading	0.7-3.8
36	7/29/2014	1630	X-1	Excavation and Bag Loading	0.1-0.9
37	7/30/2014	930	X-1	Excavation and Bag Loading	0.7
38	7/30/2014	1130	X-1	Excavation and Bag Loading	0.1-1.1
39	7/30/2014	1330	X-1	Excavation and Bag Loading	0.0-0.2
40	7/30/2014	1730	X-1	Excavation and Bag Loading	0.4
41	8/2/2014	1000	X-1	Excavation and Bag Loading	0.0
42	8/2/2014	1200	X-1	Excavation and Bag Loading	0.9
43	8/2/2014	1330	X-1	Excavation and Bag Loading	0.0
44	8/2/2014	1500	X-1	Excavation and Bag Loading	0.3
45	8/4/2014	930	X-1	Excavation and Bag Loading	0.0
46	8/4/2014	1045	X-1	Excavation and Bag Loading	0.9
47	8/4/2014	1200	X-1	Excavation and Bag Loading	0.0-3.2
48	8/4/2014	1330	X-1	Excavation and Bag Loading	0.0
49	8/4/2014	1540	X-1	Excavation and Bag Loading	0.0-2.0
50	8/5/2014	1000	X-1	Excavation and Bag Loading	0.0
51	8/14/2014	1430	Dog	Excavation	0.2

Table 3-1 - Breathing Zone Measurements
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Number	Date	Time	Test Hole	Activity	PID Result (ppm)
52	8/15/2014	900	Dog	Excavation and Bag Loading	0.0-0.9
53	8/16/2014	1330	Dog	Excavation and Bag Loading	0.1-1.8
54	8/17/2014	915	Dog	Excavation and Bag Loading	0.0
55	8/17/2014	1100	Dog	Excavation and Bag Loading	0.0
56	8/17/2014	1400	Dog	Excavation and Bag Loading	0.0-0.4
57	8/17/2014	1430	Dog	Excavation and Bag Loading	0.1-0.4
58	8/18/2014	955	Dog	Excavation and Bag Loading	0.0-0.3
59	8/18/2014	1506	Dog	Excavation and Bag Loading	0.1-0.3
60	8/18/2014	1625	Dog	Excavation and Bag Loading	0.0-2.0
61	8/19/2014	1000	Dog	Excavation and Bag Loading	0.1-0.4
62	8/19/2014	1510	Dog	Excavation and Bag Loading	0.1
63	8/20/2014	1000	Dog	Excavation and Bag Loading	0.0
64	8/20/2014	1400	Dog	Excavation and Bag Loading	0.0
65	8/21/2014	1030	Dog	Excavation and Bag Loading	0.0

PID - photoionization detector (field screening instrument)

ppm - parts per million

4.0 EXCAVATION AND SOIL HANDLING PROCEDURES

The following section discusses the work performed and equipment used as part of the RA excavation efforts. The excavations were guided by soil screening and sampling, which is described in Section 5. The site-specific excavation work performed at each test hole is discussed in more detail in Sections 7 through 10; no excavation was required at Test Hole Able (Section 6). Field activities were documented in photographs provided in Appendix A (additional photographs were included on CD). Copies of field books are included in Appendix D.

Remedial activities were performed between July 6 and September 10, 2014. Excavation activities, which included backfilling and contouring the excavations, were performed between July 16 and August 26, 2014; work is summarized in daily quality control reports (DQCR) included on CD. Work performed before and after excavation activities primarily include setting up and tearing down the field camp and unloading/loading the landing craft.

4.1 Field Equipment

Equipment selection considered functionality for the project requirements, versatility of the equipment, and size of the equipment. The following equipment and vehicles were used:

- Contaminated soil was excavated using two mini-excavators (Bobcat E35 and E50). The tracked vehicles were also equipped with a blade. A small, towable backhoe on wheels was utilized for the Test Hole Baker site due to the numerous creek crossings. The mini-excavators were also used to weigh filled super sacks and backfill excavations.
- A skid steer was used to repair access routes and contour excavations following excavation activities. The skid steer was only used on the east side of Ogotoruk Creek.
- UTVs and ATVs equipped with trailers were used to transport filled super sacks from the test hole excavation sites to the staging areas. They were also used to transport field personnel and gear around the site.
- The four wheel drive Terex forklift equipped with an extendable boom was used to unload super sacks from UTV/ATV trailers and load super sacks into connex boxes. The Terex was used in both the East and West Staging Areas.

A Caterpillar 980C-4 loader equipped with forks was used to load and unload shipping containers from the landing craft. The loader was owned and operated by Northland Services and accompanied the landing craft.

4.2 Site Access

The camp and staging areas were accessed from the beach upon arrival of the landing craft. The established beach access route shown on Figure 1-2 was used to travel from the camp to the West Airstrip.

Access to the test hole sites was primarily along the established routes shown on Figure 1-2. However, since there was no route to Test Hole Charlie and the beach was too soft to support wheeled vehicles towing heavy loads, a new route along the high tide line (comprised of a mixture of sand and vegetation) was used to access Test Hole Charlie.

Access to Test Hole Baker required several creek crossings, but the existing trails were used without modification. Access to Test Holes Dog and X-1 were via the East Airstrip. Extensive modification was required to improve the route from the ridge to Test Hole Dog across the tundra. Gravel from the borrow area at the ridge was deposited on the existing trail. Mud mats were installed in the wettest areas immediately adjacent to the Test Hole Baker drill pad to allow for safety concerns and to reduce impact to the environment. The route to Test Hole X-1 was used without modification.

4.3 Staging Areas

Staging areas were installed on either side of Ogotoruk Creek as shown on Figure 1-2. The West Staging Area was installed just above the high tide adjacent to the field camp. The East Staging Area was installed on the road leading to the East Airstrip, but was later expanded to include the southern portion of the East Airstrip. These locations were chosen because they were large flat areas that were accessible to the landing craft's forklift.

The staging areas were used to store the empty connex shipping containers. Bagged soil from Test Holes Baker and Charlie was transported to the West Staging Area and bagged soil from Test Holes Dog and X-1 was transported to the East Staging Area. The filled super sacks were then weighed and loaded into the empty connexes pending demobilization.

4.4 Decommissioning of Test Hole Casings

The following section identifies field activities associated with the abandonment of the five test holes associated with Project Chariot. The locations of the test holes that were abandoned during 2014 are shown on Figure 1-2.

4.4.1 Casing Water Removal, Treatment, and Sampling

Prior to the decommissioning of the test holes, water was removed from casings. Water was removed from the test hole casings using a peristaltic pump and tubing inserted to the bottom of

the casing. Water that was removed was temporarily stored in a 15-gallon polyethylene container. The quantities of water removed from the casings are summarized in Table 4-1.

Table 4-1 Summary of Water Removed from Test Hole Casings

Test Hole	Inside Diameter (Inches)	Water with Hydrocarbon Odor and/or Sheen	Approximate Volume of Water Removed (Gallons)
Able	6.375	No	4.5
Baker	3	Yes	0.4
Charlie	3	Yes	1.8
Dog	3.25	Yes	2.0
X-1	10.25	No Water Present	
TOTAL GALLONS REMOVED			**8.7**

Water removed from the casing was treated by running it through a 5-gallon vessel filled with granular activated carbon (GAC). The treated water was temporarily stored in a clean 15-gallon polyethylene container. Samples were collected prior to and following the GAC treatment and submitted for laboratory analysis. Water samples were collected by pumping a portion of the containerized water directly into sample jars using a peristaltic pump. Samples were analyzed for gasoline range organics (GRO); benzene, toluene, ethylbenzene, and xylenes (BTEX); and polycyclic aromatic hydrocarbons (PAHs). TAH and TAqH were calculated from BTEX and PAH results.

Casing water results are summarized in Table 4-2, and water sample tracking and results are presented as Tables 4-3 and 4-4, respectively. GRO and several BTEX and PAH analytes were detected in the pre-treatment sample, but only GRO was detected in the post-treatment sample. The pre-treatment sample exceeded surface water criterion due to the presence of sheen.

Table 4-2 Results of Casing Water Samples

Sample[1]	TAH[2] (mg/L)	TAqH[2] (mg/L)	GRO (mg/L)	Sheen Present?
Cleanup Level[3]	0.01	0.015	-	No Sheen
Pre-Treatment	0.0070	0.0141	0.0529 J	**Yes**
Post-Treatment	0.0027	0.0032	0.0360 J	No

[1] Approximately 9 gallons of collective casing water was removed from Test Holes Able, Baker, Charlie, and Dog.
[2] TAH and TAqH were calculated using limits of detection (LODs) for analytes that were not detected.
[3] ADEC surface water criteria listed in 18 AAC 70 must be met before it was discharged on site.
Bolded results exceeded cleanup criteria.
J – Result is considered estimated because it was reported below the limit of quantitation (LOQ)

Following receipt of the laboratory results, the treated water was disposed of through surface discharge in a heavily vegetated area northwest of the field camp just south of the west airstrip.

The spent GAC material was placed in a super sack and disposed of with the POL-contaminated soil.

4.4.2 Casing Decommissioning

After water was removed and treated, the steel casings were cut below grade with an electric handheld band saw, sampled if possible, then sealed with hydrated bentonite and welded shut. An effort to remove the Test Hole Charlie casing by attaching a chain from the well casing to the mini-excavator and extracting the casing from the ground was attempted but failed, likely due to the presence of shallow permafrost. The casing at Test Hole X-1 was completely removed; the casing was only buried to a depth of 5 feet and was not installed in permafrost.

Soil was encountered inside the casings associated with Test Holes Able and Baker, and samples were collected for laboratory analysis. The bottoms of Test Holes Charlie and Dog were too deep to collect soil samples relative to the cut. Soil results from casing samples from Test Hole Able and Baker are discussed in Sections 6.2 and 7.2, respectively.

4.4.3 Debris Removal and Disposal

Removed casing material and other debris (plastic piping, a fire extinguisher, steel over-casings made from 55-gallon drums, a braided steel cable attached to a concrete anchor, and coated thermistor cables) were transported to the West Staging Area where they were loaded into a connex. Wood debris unearthed at Test Holes Baker, Charlie, Dog, and X-1 was gathered and burned onsite near the cabin. The ashes were bagged following completion of field activities. The debris and bagged ashes were transported to Kotzebue and disposed of in the Kotzebue landfill.

The thermistor electrical connector removed from the Test Hole Charlie site and wire cable removed from Test Hole Baker pad were retained at the request of Jack Schaefer, Mayor of Point Hope, and will be relinquished to the USACE.

4.5 Determination of Initial Excavation Boundaries

Prior to excavation, the surface soils at the sites were delineated by installing shallow test pits and screening samples with a PID. Surface soils at Test Hole Baker were not screened since the area impacted by POL was small. The approximate areal extent of surface contamination based on screening results was then marked with spray paint. The visual display helped with the planning and coordination of the field activities.

Screening results at Test Holes Charlie and Dog indicated that contamination was present in the top foot of the soil column so no overburden stockpiles were attempted. Because soil screening

indicated that there were areas with uncontaminated surface soils at Test Hole X-1, overburden stockpiles were utilized at that site.

Laboratory samples were collected from the tundra areas adjacent to Test Holes Charlie and Dog to evaluate impact to those areas. Shallow test pits installed in the presumed tundra area at Test Hole Dog indicated that the gravel pad extended much further east than originally anticipated.

4.6 Soil Excavation Process

Once the approximate excavation boundaries were identified and marked with spray paint, the POL-contaminated soil was excavated using a mini-excavator. The excavation was guided by PID field screening performed by FES qualified samplers. One grab sample was collected at an approximate frequency of one per cy and screened with a PID (as described in Section 5.1.2) to characterize the soil and direct excavation. Screening results are included in Appendix B. In some cases the grossly contaminated soils were not screened. The Work Plan identified a 10 ppm screening limit for pad soils, but excavation guidance samples collected at a rate of 1 in 20 screening samples were used to estimate a site-specific screening level. The correlations between PID screening and DRO laboratory results were generally poor but indicated that the 10 ppm level was too conservative; site specific correlations are discussed in Section 6 through 10. Excavations were generally terminated at permafrost.

4.7 Super Sack Filling and Soil Stockpiling

POL-contaminated soil was generally placed directly into super sacks. There were some instances where contaminated soil was piled inside the excavation for a short period before it was transferred to super sacks. POL-contaminated soil was loaded into super sacks using the excavator bucket. Initially, a metal frame jig was used to keep the bags open during filling; however, the bags expanded and would get lodged inside the jig. As a result, the bags were filled using two workers holding the bags open. This method of filling the bags required constant visual communication between the laborers holding the bags and the equipment operator.

Super sacks were generally filled inside the excavations. In some situations, the bags were filled outside the excavation on liners. Pre- and post-loading area footprint samples were collected to verify the operations did not adversely impact these locations.

Once filled, the bags were labeled and placed on a trailer so they could be moved to the staging area. Each bag was labeled with a non-hazardous waste sticker tied to the super sack handle. The date and the sequential bag number (which included a letter that represented site from which the soil originated) were documented on the labels.

No soil was stockpiled at Test Holes Charlie and Dog because screening and/or laboratory results indicated that clean overburden was not present at those sites. Overburden soil from Test Hole X-1 was stockpiled during excavation activities. Prior to building the stockpiles, pre-stockpile footprint samples were collected for DRO/residual range organics (RRO) analysis and the location was marked with a labeled pin flag. For comparison, post-stockpile samples were also collected following stockpile dismantling. All stockpiles installed outside the limits of excavation were placed on 10-millimeter liners surrounded by a berm of clean soil, and were covered by additional liner material.

Stockpiled soils were sampled following ADEC guidelines listed in the draft Field Sampling Guidance (ADEC, 2010). Screening samples were collected at the specified frequency and laboratory samples were collected from the stockpile from the locations with the highest screening results for verification purposes. Laboratory samples were analyzed for DRO and RRO and compared to applicable cleanup levels.

4.8 Transport and Disposal of Contaminated Soil

Super sacks containing POL-contaminated soil were conveyed to the staging areas for weighing and loading into connex shipping containers. Figure 1-2 identifies the locations of the two staging areas, one on each side of the Ogotoruk Creek, and access routes connecting each test hole. Upon arrival at the staging area, the super sacks were lifted from the ATV/UTV trailers using the fork lift and the loops at the top of the sacks. The filled super sacks were typically stored in the staging areas next to the connex boxes for a couple days prior to weighing. Based on visual inspections, no bags leaked material.

Each super sack was weighed using a Caston II 5000 crane scale (a commercial scale used for high-load capacities that is suspended from a piece of equipment) to document the amount of POL-contaminated soil removed from each test hole site and to quantify the amount of weight that is placed in each connex. The crane scales are designed to measure up to 5,000 pounds, and were checked on site using a known mass. Initially two 50-pound steel blocks were measured, and then the blocks were added to a filled super sack to verify the 100 pound change could be verified. This exercise was performed with both scales on the same bag to verify precision. The field checks indicated that the scales met accuracy requirements.

The Terex forklift equipped with an extendable boom was used to load the super sacks into connex boxes. Since the weight of soil varied between bags, between 12 and 26 super sacks were loaded into 20-foot-long connex boxes for off-site shipment. The super sacks were placed into the connex shipping containers in an efficient manner to minimize dead space and evenly distribute weight. The total weight of POL-contaminated soil placed in each connex was documented on the shipping manifests (included in Appendix G) which were provided to all shippers.

4.9 Equipment Decontamination

Heavy equipment was decontaminated prior to leaving each test hole site as necessary. In general, mats were used to isolate the excavator tracks from POL-contaminated soil when the equipment was used inside the limits of excavation (where contamination was identified in surface soils). In addition, the excavator buckets were decontaminated when leaving an excavation site and prior to placing overburden soil into stockpiles.

Soil adhered to the equipment used during excavation activities was removed using a stiff brush and/or a rigid tool (i.e. a rock hammer) to reduce the potential for POL-contaminated soil to contaminate other areas of the site. Decontamination was performed over the excavation or over a liner to collect the loose soil.

4.10 Site Restoration

Once the excavations were deemed complete by the ADEC project manager, the sites were re-contoured to blend with the existing grade. Since the excavations were backfilled prior to the surveyor arriving on site, temporary control points outside of the excavation were created and swing tie measurements made to identify sample locations. The pin flags were then re-installed following the re-contouring efforts using recorded distances from each pin flag to the control points (control points were located outside the excavation) and triangulation to re-establish the sample locations.

Gravel material remaining in clean portions of the drill pads was used to fill low areas. Clean stockpiled overburden was used to backfill the Test Hole X-1 excavation. Backfilled material was compacted by a minimum of two passes by heavy equipment. Once sufficient soil had been added to the excavated area the site was smoothed to match the existing grade.

Impacted areas including gravel pads, the West Staging Area, and access roads were fertilized using 20-20-10 nitrogen, phosphorus, potassium (N-P-K) at a rate of 500 pounds per acre. Following application of fertilizer, the areas were seeded with the mix recommended by the Alaska Coastal Revegetation and Erosion Control Guide (70% by weight “Arctared” red fescue and 30% by weight “Tundra” glaucous bluegrass). Since the dirt work extended beyond August 1, 2014, fertilizing and seeding were completed as the last work item onsite prior to demobilization as per the scope of work requirement.

The pits installed in the field camp for disposal of gray water and human waste were backfilled and contoured to match the existing grade.

4.11 Final Site Inspection

The final site inspection was performed by Ken Rissew (Tanik), Mike Boese (FES), and Jeff Price (SM Stoller) August 27 through 29, 2014. All equipment and material were removed from the site on September 8 and 10, 2014. A copy of the inspection checklist is included as Appendix F.

Table 4-3 - Summary of Laboratory Samples from Casing Water
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Sample ID	Location ID	Description	Sample Date	Sample Time	Sampler	Sample Type	Sample Matrix	GRO (AK101)	BTEX (8260B)	PAHs (8270D-SIM)	Cooler Number	Sample Data Group
CASING WATER												
14PCW001WX	W001NWC	Pre-Treatment	7/18/2014	1815	MB/BJ	Primary	Water	X	X	X	72201	1143274
14PCW002WX	W002NWC	Post-Treatment	7/18/2014	2100	MB/BJ	Primary	Water	X	X	X	72201	1143274
QUALITY CONTROL SAMPLES												
Trip Blanks												
14PCW003WX	Trip Blank	Trip Blank	7/18/2014	1700	NA	Trip Blank	Water	X	X		72201	1143274

X indicates analysis was conducted.
All samples were analyzed by SGS North America Inc, Alaska (RUSH turn-around time). NPDL #14-030.

BJ -Bryan Johnson
BTEX - Benzene, Toluene, Ethylbenzene, Total Xylenes
°C - degrees Celsius
GRO - gasoline range organics
HCl - hydrochloric acid
MB - Mike Boese
PAHs - polynuclear aromatic hydrocarbons
VOA - volatile organic analysis

Water samples for GRO and BTEX were collected in 3 each HCl preserved VOA vials and stored at 4 °C.
Water samples for PAHs were collected in 2 each 1-Liter ambers and stored at 4 °C.

Table 4-4 - Water Sample Results
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

			Sample ID	ADEC Cleanup Level[1]	14PCW001WX		14PCW002WX		14PCW003WX	
			Location ID		W001NWC		W002NWC		TRIPBLK1	
			Collection Date		7/18/2014		7/18/2014		7/18/2014	
			Laboratory Report		1143274		1143274		1143274	
			Sample Type		Pre-Treatment		Post-Treatment		Trip Blank	
			Source		Casing Water		Casing Water		Trip Blank	
			Matrix		Water		Water		Water	
Analyte	**Method**	**Units**			**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**
Gasoline Range Organics	AK101	mg/L		NE	0.0529	[0.05] J	0.036	[0.05] J	ND	[0.05]
Benzene	SW8260B	mg/L		NE	0.00021	[0.0002] J	ND	[0.0002]	ND	[0.0002]
Ethylbenzene	SW8260B	mg/L		NE	0.00065	[0.0005] J	ND	[0.0005]	ND	[0.0005]
Toluene	SW8260B	mg/L		NE	0.00174	[0.0005]	ND	[0.0005]	ND	[0.0005]
Xylene, Isomers m & p	SW8260B	mg/L		NE	0.0027	[0.001]	ND	[0.001]	ND	[0.001]
o-Xylene	SW8260B	mg/L		NE	0.00173	[0.0005]	ND	[0.0005] ML	ND	[0.0005]
1-Methylnaphthalene	8270SIM	mg/L		NE	0.00612	[0.294]	ND	[0.0000294]	-	-
2-Methylnaphthalene	8270SIM	mg/L		NE	0.00774	[0.294]	ND	[0.0000294]	-	-
Acenaphthene*	8270SIM	mg/L		NE	0.000197	[0.0294]	ND	[0.0000294]	-	-
Acenaphthylene*	8270SIM	mg/L		NE	ND	[0.0294]	ND	[0.0000294]	-	-
Anthracene*	8270SIM	mg/L		NE	ND	[0.0294]	ND	[0.0000294]	-	-
Benzo(a)anthracene*	8270SIM	mg/L		NE	ND	[0.0294]	ND	[0.0000294]	-	-
Benzo(a)pyrene*	8270SIM	mg/L		NE	ND	[0.0294]	ND	[0.0000294]	-	-
Benzo(b)fluoranthene*	8270SIM	mg/L		NE	ND	[0.0294]	ND	[0.0000294]	-	-
Benzo(g,h,i)perylene*	8270SIM	mg/L		NE	ND	[0.0294]	ND	[0.0000294]	-	-
Benzo(k)fluoranthene*	8270SIM	mg/L		NE	ND	[0.0294]	ND	[0.0000294]	-	-
Chrysene*	8270SIM	mg/L		NE	ND	[0.0294]	ND	[0.0000294]	-	-
Dibenzo(a,h)anthracene*	8270SIM	mg/L		NE	ND	[0.0294]	ND	[0.0000294]	-	-
Fluoranthene*	8270SIM	mg/L		NE	ND	[0.0294]	ND	[0.0000294]	-	-
Fluorene*	8270SIM	mg/L		NE	0.000522	[0.0294]	ND	[0.0000294]	-	-
Indeno(1,2,3-cd)pyrene*	8270SIM	mg/L		NE	ND	[0.0294]	ND	[0.0000294]	-	-
Naphthalene*	8270SIM	mg/L		NE	0.00523	[0.59]	ND	[0.000059]	-	-
Phenanthrene*	8270SIM	mg/L		NE	0.000744	[0.0294]	ND	[0.0000294]	-	-
Pyrene*	8270SIM	mg/L		NE	ND	[0.0294]	ND	[0.0000294]	-	-
TAH[2]	SW8260B/8270SIM	mg/L		0.01	0.00703		0.00270		0.00270	
TAqH[2]		mg/L		0.015	0.0141		0.00320		-	

[1] Surface water cleanup levels for TAH and TAqH, which apply to casing water, are from ADEC Title 18 Alaska Administrative Code, Chapter 70.020.
[2] TAH was calculated by summing the results of BTEX compounds; TAqH was calculated by summing BTEX results plus EPA's 16 priority PAH pollutants. LODs were used for ND results.
* Represents the 16 EPA priority PAH pollutants.

Data Qualifiers:
J - result qualified as estimate because it is less than the limit of quantitation.
M - result considered an estimate (biased L-low; H-high; N-unknown) due to matrix issues
ND - analyte not detected

ADEC - Alaska Department of Environmental Conservation
BTEX - benzene, toluene, ethylbenzene, and xylenes
EPA - U.S. Environmental Protection Agency
LOD - limit of detection
NE - not established

5.0 FIELD SCREENING AND SOIL SAMPLING

The following section discusses the field screening strategy and procedures used to guide excavation of contaminated soil. The section also discusses the different types of soil samples submitted for laboratory analysis and their intended purposes. Site specific soil sample results are presented in Sections 6 through 10.

5.1 Field Screening and Excavation Guidance

5.1.1 Field Screening and Excavation Strategy

The 2010 investigation roughly delineated the extent of soil contamination at the test hole sites. Screening samples were collected from shallow pre-excavation test pits (to determine extent of impacted surface soil) and during excavation activities (to determine initial limits of excavation in floor and sidewalls). Soil contamination was generally obvious and was identifiable by both soil staining and a strong petroleum odor. Thus it was possible to efficiently excavate soil that was grossly contaminated. Field screening was primarily used to define the clean limits of the excavation.

5.1.2 Field Screening Sample Collection Process

All field screening and soil sampling was conducted by Mike Boese and Bryan Johnson of Fairbanks Environmental Services. Both Mr. Boese and Mr. Johnson are environmental professionals and meet the requirements of a qualified person as defined in Title 18 of the Alaska Administrative Code Chapter 75.990 (18 AAC 75.990).

Screening samples were collected from newly exposed areas at least 6 inches below the existing surface (or 6 inches laterally for sidewalls). In general, the excavator bucket or a spade shovel was used to expose sample locations. A driven probe was used to collect six soil samples from the floor of Test Hole Charlie due to the presence of standing water. Field screening samples were collected by placing excavated soil directly into quart-sized sealable plastic bags using a gloved hand and/or a small sampling spade. Each bag was labeled with a unique PID number and the approximate sample depth, soil description, and approximate sample location were also recorded.

5.1.3 Field Screening Method

PIDs were used to screen soil samples in the field to help determine the extent of POL-contaminated soil. The field instruments were calibrated daily to 100 ppm using a 100 ppm isobutylene standard. Soil samples were field screened using the following headspace screening procedure:

- Partially fill (one-third to one-half) a clean zip-closure plastic bag with the sample to be analyzed.
- Allow headspace vapors to develop in the zip lock bag for at least 10 minutes but no longer than one hour in a warm water bath (heated to a minimum of 40 degrees Fahrenheit [°F]), then shake or agitate the zip lock bag at the beginning and end of the headspace development period to assist volatilization.
- Insert the instrument sampling probe to a point about one-half the headspace depth, minimizing the container opening; record the highest meter reading, which normally will occur between two and five seconds after probe insertion, on a field form.

5.2 Soil Samples and Laboratory Analysis

5.2.1 Soil Sample Collection and Storage Process

Sampling was performed by ADEC-qualified persons Mike Boese and Bryan Johnson. Fresh soil was exposed using the excavator bucket or a spade shovel, and laboratory samples were collected directly from the newly exposed surface (at least 6 inches beyond the existing surface) using new stainless steel spoons and scooping the soil into 4 or 8 ounce sample jars. Six samples from the floor of Test Hole Charlie (14PCC036SO through 14PCC042SO) were collected using a driven stainless steel soil probe because of the presence of standing water; soil was removed from a window in the side of the probe barrel using a gloved hand and then placed into a 4 ounce sample jar. New sample gloves were used for each laboratory sample.

Laboratory samples were immediately placed in coolers cooled with frozen gel ice. The condition of the ice was checked daily and replenished with frozen gel ice as needed. At night, sample coolers were stored in the sampler's sleeping tent so custody could be maintained.

5.2.2 Soil Sample Categories

Soil samples were submitted for laboratory analysis for several different purposes. The following identifies the different categories of soil samples.

Waste Characterization Samples

The contaminated soil disposal facility, Columbia Ridge Landfill, requested additional waste characterization sampling be performed to confirm that the POL-contaminated soil is not a hazardous waste. The landfill requested that BTEX and Resource Conservation and Recovery Act (RCRA) metals be analyzed on TCLP extracts. Two samples were collected for waste characterization purposes during the pre-work site visit in June 2014. The samples were collected from stained soils having a strong hydrocarbon odor at Test Hole Charlie, and the results were supplied to Emerald Alaska and Columbia Ridge prior to excavation. The waste characterization results are discussed in Section 8.3 and did not change the waste profile of the soil.

Pre-Excavation Laboratory Samples

Surface soil samples were collected from the perimeters of known contaminated areas and from tundra areas adjacent to known contaminated pad areas to further define the areas to be excavated. In addition, pre-excavation samples were collected from test pits to vertically delineate soil horizons and potential for clean overburden. Pre-excavation samples were field screened with a PID, and approximately 5 percent were submitted for DRO/RRO analysis by the project laboratory. The pre-excavation samples were also used for correlation of screening and laboratory results.

Soil Loading Area Footprint Samples

Soil samples were collected from within the footprint of super sack filling areas that were located outside of excavations. Samples were collected prior to excavation and following the removal of super sacks from the site to document that contaminated soil did not remain in the loading areas. Loading area footprint samples were screened with a PID and were analyzed by the project laboratory for DRO/RRO analysis. Loading of super sacks in loading areas (outside of the excavation) was performed on liners to reduce potential for impact to clean areas. Each footprint sample location was marked with a pin flag labeled with the location identification (LocID) number for follow up (post-loading) sampling and surveying.

Excavation Guidance Samples

Excavation guidance samples were collected for field screening purposes and were used to direct soil excavation. A portion of the screening samples (minimum of 1 in 20) were analyzed by the project laboratory for DRO/RRO analysis to further document field conditions and for establishing a correlation between screening and laboratory results. Note that although excavation guidance samples and field observations were used for determining the rough limits of excavation, laboratory excavation confirmation sample results were used for determining or confirming the actual excavation limits.

Excavation Confirmation Samples

Following the completion of excavation activities, PID screening samples were collected from the floor and sidewalls per ADEC frequency requirements listed in ADEC's Draft Field Sampling Guidance (ADEC, 2010). Laboratory confirmation samples were collected for laboratory analysis of DRO/RRO from the locations with the highest PID results. The locations of excavation confirmation samples collected for laboratory analysis were marked with labeled pin flags for surveying. (Since the survey was performed after the sites were backfilled, the pin flags had to be removed and then replaced. Measurements were taken and recorded from control points outside the excavation area to pin flags marking confirmation sample locations. Once the excavated areas were backfilled, previously collected measurement data were used to triangulate confirmation sample locations). All excavations remained open until laboratory sample results had been evaluated against the criteria in Table 1-2 and ADEC approved excavation closures.

Stockpile Footprint and Stockpile Verification Samples

Stockpile verification samples were collected to characterize stockpiled soil. Screening samples were collected at the frequency listed in ADEC's Draft Field Sampling Guidance document, and laboratory samples were collected from the locations with the highest screening results. Stockpile footprint samples were collected pre- and post- installation from within the liner footprint and were field screened and submitted to the laboratory for analysis of DRO/RRO.

5.2.3 Quality Control Samples

Two quality control samples were submitted for laboratory analysis; an equipment blank and a trip blank sample.

Equipment Blank Sample

An equipment blank sample was collected for quality control purposes from a soil sampling device that was used to collect six confirmation samples from the floor of Test Hole Charlie. Disposable equipment was primarily used for laboratory sample collection, and with this one exception, equipment blanks were unnecessary.

Equipment blank sample 14PCC043WQ was collected from the stainless steel hand-driven soil probe after it was decontaminated (the probe barrel was decontaminated between each soil sample). The probe was utilized because floor samples were collected from underneath standing water in the southeast corner of the excavation. The equipment blank was collected by pouring distilled water through the sample barrel and collecting the water in two sample jars containing a hydrochloric acid preservative. The equipment blank was analyzed for the same analyses and methods as the soil matrix confirmation samples, DRO and RRO. Laboratory results from the equipment blank sample are presented in Table 8-2, and as discussed in the Chemical Data Quality Review (CDQR) in Appendix C, the low levels DRO and RRO detections did not impact associated soil sample results.

Trip Blank Sample

Methanol trip blank sample 14PCX078SO was submitted with project sample 14PCX076SO and field duplicate sample 14PCX077SO to evaluate potential cross contamination during shipment and storage. These samples were analyzed for VOCs and GRO, and results are presented in Table 10-3. No analytes were detected in the trip blank sample.

5.2.4 Laboratory Sample Summary

Soil samples collected for laboratory analysis as part of the 2014 field work are summarized in Table 5-1. A total of 202 samples, including 22 field duplicates, were collected.

Table 5-1 Summary of Soil Samples Submitted for Laboratory Analysis[1]

Test Hole[1]	Pre-Excavation Samples	Casing Interior	Footprint and Stockpile	Excavation Guidance	Excavation Confirmation	Total Number of Soil Samples
Able	0	1	0	0	0	1
Baker	0	1	2	1	6	10
Charlie	16 [2]	0[3]	4	8 [2]	26	54
Dog	13 [2]	0[3]	7	7	33	60
X-1	2	0[3]	25	23	27	77
TOTALS	**31**	**2**	**38**	**39**	**92**	**202**

[1] Sample numbers include both primary and field duplicate samples. Twenty-two field duplicate soil samples were collected from a variety of locations throughout the site.

[2] Some of the pre-excavation and excavation guidance samples from Test Holes Charlie and Dog were also used for confirmation purposes because they were collected from the limits of excavation and the locations were marked.

[3] Soil samples were not collected from inside casing interiors at Test Holes Charlie, Dog, or X-1. The soil was too deep at Test Holes Charlie and Dog, and the casing was completely removed from Test Hole X-1.

5.2.5 Laboratory Sample Shipment and Expedited Analysis

Arrangements were made with Northwestern Aviation to transport sample coolers from the site to Kotzebue. The samples were shipped from Kotzebue to Anchorage using Alaska Airlines Goldstreak services. The project laboratory would then courier the samples from the Anchorage airport to the laboratory facility. Successful shipment of the sample coolers required logistical coordination and good communication between all parties involved. Custody seals on coolers ensured no samples were tampered with during shipment.

Due to the tight field schedule, laboratory samples were analyzed on an expedited basis. Samples were generally analyzed within one to two days upon arrival at the laboratory and results emailed to the project team to enable timely decisions regarding soil excavation.

5.3 Excavation Complete and Concurrence

Excavation activities at each of the sites was curtailed once the requirements of the approved Work Plan had been met (the required number of screening and laboratory samples were collected from limits of excavation, and preliminary laboratory results from confirmation samples were below applicable action levels and/or permafrost limited further vertical excavation). The screening and preliminary laboratory results, site photographs, and field sketches were forwarded to the USACE and ADEC for review and comment. The excavations remained open pending ADEC concurrence. Correspondence with ADEC and USACE are provided in Appendix E.

5.4 Data Review Summary

All project and quality control (QC) samples were analyzed by SGS North America, Inc. (SGS) of Anchorage, Alaska. The laboratory is approved by the State of Alaska through the Contaminated Sites Program and is certified through the DOD Environmental Laboratory Accreditation Program (ELAP) for the contaminant methods used for this project. All samples were shipped in 12 sample data groups (SDG) and assigned the SGS report numbers 1142724, 1143274, 1143333, 1143374, 1143385, 1143470, 1143517, 1143634, 1143815, 1143866, 1143960, and 1144035. A sample summary table is included with the Chemical Data Quality Review (CDQR) in Appendix C. Analytical results tables are presented in site-specific sections in the report text and on figures. Laboratory reports and data deliverables are included on CD.

The chemical data were evaluated in order to assess whether it met data quality objectives and were acceptable for project use. The findings of the review are documented in the CDQR and ADEC Checklist (Appendix C). Analytical data summarized in tables and figures were qualified based on those findings. All soil data were considered usable (reported with adequate sensitivity and no data were rejected), so a completeness score of 100% was calculated for this project. Therefore, the 90% completeness criterion in the Work Plan was met for the project.

Overall, the review process deemed the soil project data acceptable for use. Multiple results were qualified; however, the impact to data quality for the majority of the samples was minor. Data quality issues that may have significantly impacted project soil data usability are summarized below:

- The cooler for SDG 1142724 was received with its temperature blank measuring 7.1 degrees Celsius (°C), above the acceptable temperature range of 2 °C to 6 °C. Results for all samples in this SDG are considered affected, and qualified 'QL' indicating the potential low bias. This SDG included six pre-excavation samples, and two samples for waste characterization TCLP analysis of RCRA metals and BTEX. No decisions were made based on the pre-excavation sample data, and detected analytes reported from the waste characterization samples were over an order of magnitude below waste characterization criteria.
- Recovery of spiked DRO (19%) was below laboratory control limits (75%-125%) for the matrix spike duplicate (MSD) of sample 14PCD050SO. The recovery of DRO in the matrix spike was acceptable at 78%. The DRO result for this sample is considered estimated, biased low due to matrix interference, and qualified 'ML.' The affected low-biased DRO result (473 mg/kg) is only slightly below the applicable Method One soil cleanup level of 500 mg/kg. In an abundance of caution, this wall confirmation sample may be considered as potentially exceeding the cleanup level for project decision making.
- VOC sample 14PCX010SO was not preserved with methanol in the field. VOC analysis was requested at the request of the ADEC (to investigate the pungent odor) after the

sample had been submitted to the laboratory. The VOC sample was extracted by the laboratory several days after collection, and consequently the results are low biased. Results for detected VOC analytes in sample 14PCX010SO were flagged QL and non-detected VOC results were rejected.

- The DRO result for sample 14PCX076SO collected directly below the Test Hole X-1 casing exceeded the tundra-soil cleanup level of 12,500 mg/kg; the DRO result for its duplicate 14PCX077SO was below this cleanup level. Therefore we cannot conclusively determine whether DRO exceeds the cleanup level at the sample location. The higher of the two results was conservatively used to represent the DRO concentration for the sample location.

5.5 Surveying of Confirmation Sample Locations

Horizontal and vertical surveys were conducted by Windy Creek Surveys of Fairbanks, Alaska following completion of the field excavation activities. The survey was conducted in accordance with the Engineering Manual 1110-1-1005 (USACE, 2007). However, the survey was performed after the excavations were backfilled, so the vertical data does not accurately represent the sample locations. Sample depths were manually measured with a tape measure from the top of the sidewalls.

The basis of the survey was an Online Positioning User Service (OPUS) solution from a National Geodetic Survey (NGS) monument installed in the southwest corner of the Wilfred Lane allotment, located between the camp and Test Hole Charlie. Due to the dynamic and Horizontal Time Dependent Positioning (HTDP) nature of passive control stations in Alaska, an OPUS solution was used. A copy of the solution was shared on the NGS' OPUS-DB and is provided with the survey report.

The survey was conducted using four JAVAD Triumph-1 Global Navigation Satellite System (GNSS) receivers for static global positioning system (GPS) and real-time kinematic (RTK) surveys. Static GPS surveys were processed using the most current version of JAVAD Justin Software. Results of the static survey were corrected using a least-squares adjustment, and the accuracy evaluation was based on the Root Mean Square (RMS) error.

The RTK survey effort utilized Carlson SurvCE 4.0 software for data collection. For RTK GPS locations, a differential correction was completed as a translation from assumed World Geodetic System of 1984 (WGS84) to OPUS-derived WGS84 locations. Please refer to the Survey Report for additional specific information related to this effort.

Horizontal survey results were provided in latitude and longitude (decimal degrees), and projected in the Universal Transverse Mercator (UTM) Zone 3 North (feet) in the WGS84 datum; figures for this report were drawn using the WGS84 UTM projection. Survey coordinates were also provided in the North American Datum of 1983 (NAD83), State Plane Zone 8(feet). Vertical

survey results were provided using the North American Vertical Datum 1988 (NAVD88) in U.S. Survey feet. The survey deliverable including survey field notes, sketches, spatial data in excel format, and raw survey data were provided on CD.

5.6 Deviations from the Work Plan

The following deviations to the Work Plan (FES, 2014) were noted. Also discussed is the impact to project data.

- The beach between the West Staging Area and the Test Hole Charlie site was too soft and could not be utilized to transport filled super sacks. In order to minimize damage to the environment, a path along the high tide line was used and resulted in some damage to the vegetation. The trail was reseeded and fertilized to promote site restoration.
- Pre-excavation tundra laboratory samples collected from the Test Hole Charlie and Dog sites were not field screened with a PID. While this is not specifically a Work Plan deviation, the information would have been helpful to correlate PID readings to DRO concentrations in a tundra matrix at those sites. The pre-excavation tundra samples were analyzed for DRO and RRO; laboratory results were below cleanup levels and there was no impact to the closure determination of these sites.
- No pre-excavation samples were collected from the Test Hole Dog site. The sampling team was delayed two days due to bad weather, and the contractor excavated approximately 5 cy of soil (10-foot by 10-foot by 15-inches) from immediately around the Test Hole Dog casing; the excavated soil was placed in super sacks and disposed of off-site. Additionally, no pre-loading footprint samples were collected from this site, and no air monitoring performed during the initial excavation. Impact to the closure decision for the Test Hole Dog site is minor. The Test Hole Dog site was relatively small, the soil immediately surrounding the casing was likely impacted by POL and needed to be removed, the post-loading footprint samples were below ADEC Method One cleanup levels, and breathing air monitoring results from this site during subsequent excavation work were far below safety standards listed in the APP.
- No soil samples were collected from inside the casings at Test Holes Charlie or Dog due to the depths of the soil relative to the top of the steel pipes.
- Due to time constraints, the test hole excavations were backfilled/recontoured prior to surveying of sample locations. This required the samplers to relocate the sample locations utilizing swing tie measurements and re-mark them with pin flags. While this concern is not a deviation and was identified in the Work Plan, the process does introduce some error. Additionally, the vertical survey data generated does not identify the bottom of the excavations but rather the elevation of the sample locations after the excavations were backfilled and recontoured.
- Additional soil samples and analyses (in addition to DRO and RRO) were requested by ADEC from Test Hole X-1 to investigate a pungent odor observed during excavation

activities and/or the additional peaks identified on a DRO sample chromatogram. The analyses and results are discussed in Section 10.5.

6.0 TEST HOLE ABLE

The following section describes work performed at Test Hole Able during the 2014 RA efforts. The location of Test Hole Able is shown on Figure 1-2. The 2010 investigation did not identify POL contamination at the site, so remedial activities were limited to the casing removal. A summary of 2010 sample results is shown on Figure 6-1. The sample summary and analytical results for the sample collected from the Test Hole Able casing are included in Tables 6-1 and 6-2.

6.1 Site Description

The Test Hole Able site was situated immediately east of Ogotoruk Creek just above the high tide line. The drill pad is primarily constructed of sand from the adjacent beach. No historic information indicates that chilled diesel was used at Test Hole Able. During this timeframe for drilling at the Project Chariot site, diesel was commonly used as an additive to drilling mud during the timeframe.

6.2 Casing Decommissioning and Debris Removal

Approximately 4.5 gallons of water was pumped from the Test Hole Able casing on July 18, 2014. The water was treated and discharged onsite as discussed in Section 4.4.1.

The area surrounding the test hole casing was excavated to an approximate depth of 3.5 feet bgs, and the steel casing was cut below grade and capped on July 24, 2014. A sample collected from gravelly soil from the casing interior had a PID reading of 11.9 ppm, and laboratory analysis DRO (90.7 mg/Kg) and RRO (299 mg/Kg) concentrations were below ADEC Method One soil cleanup levels (see Table 6-2). The casing sample and the 2010 sample results indicated that diesel may have not been used in the drill mud at this site. In addition to the gravelly soil, a caribou hoof and bone were also found inside the Test Hole Able casing. A cable attached to a concrete block was removed from the soils surrounding the casing, and the top section of casing was removed.

6.3 Re-Contouring, Re-Vegetation, and Survey

The site was re-contoured to smooth out the disturbances associated with decommissioning the casing. The top of the capped test hole casing was buried approximately 2.5 feet below the finished ground surface. The drill pad was then re-seeded and fertilized on August 25, 2014. The location of the former casing (which was marked by an orange pin flag after the casing removal) was surveyed on August 27, 2014.

Table 6-1 - Summary of Laboratory Samples, Test Hole Able
2014 Remedial Action, Project Chariot
Project Chariot, Cape Thompson, Alaska

Sample ID	Location ID	Description	Depth (inches bgs)	Sample Date	Sample Time	Sampler	Sample Type	Sample Matrix[1]	DRO/RRO (AK102/ AK103)	Cooler Number	Sample Data Group
TEST HOLE ABLE											
14PCA001SO	A001NNN	Inside Casing	30"	7/24/2014	1430	BJ	Primary	Sandy Gravel	X	72501	1143374

X indicates analysis was conducted.
The sample was analyzed by SGS North America Inc, Alaska (RUSH turn-around time). NPDL #14-030.
[1] "Sandy Gravel" indicates imported pad material (typically sandy gravel) or minor amounts of drill cuttings.

bgs - below ground surface
BJ -Bryan Johnson
°C - degrees Celsius
DRO - diesel range organics
RRO - residual range organics

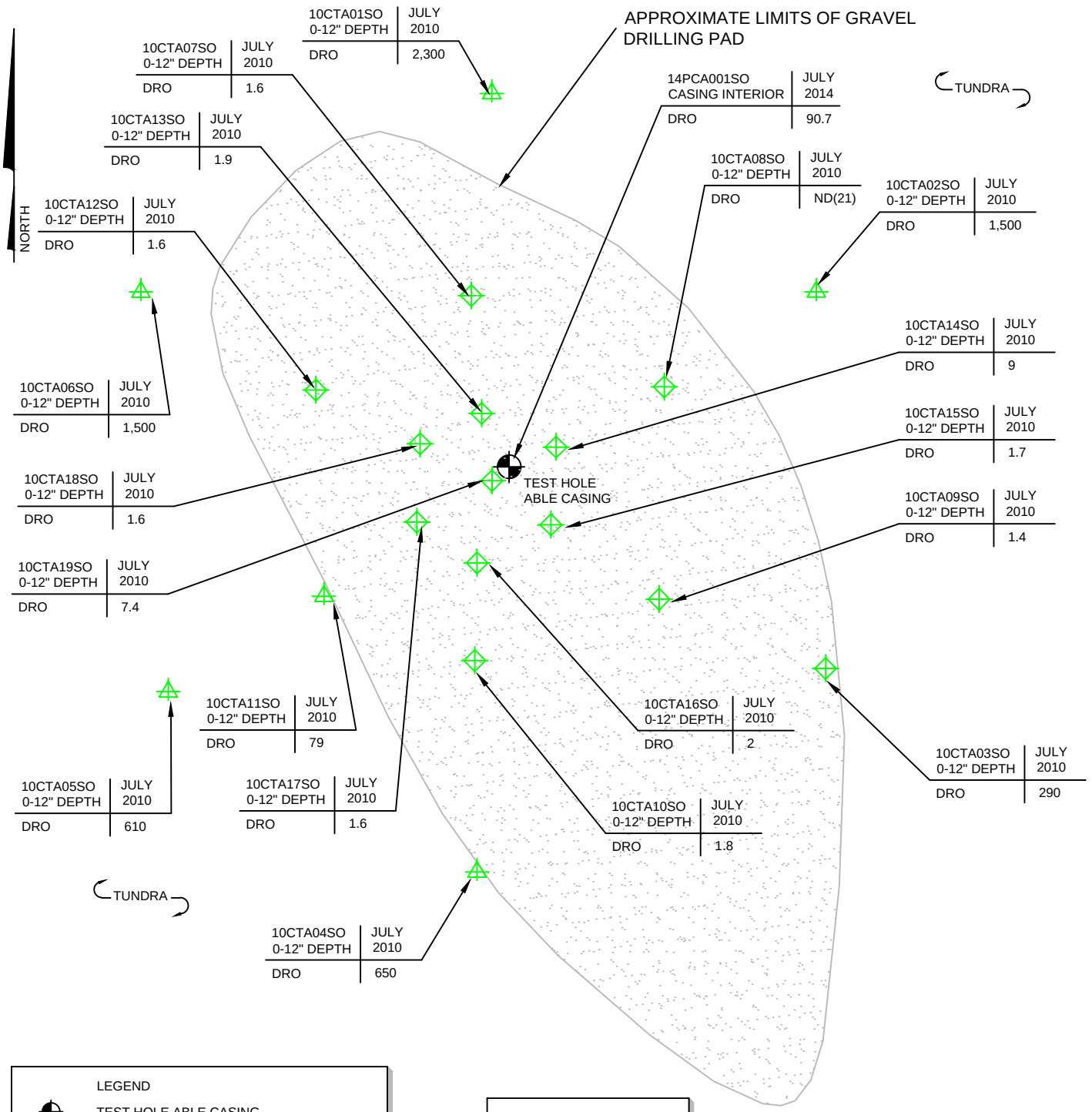
Soil samples were collected in 4 or 8 ounce jars and stored at 4 °C

Table 6-2 - DRO/RRO Results, Test Hole Able
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

			ADEC Method One Cleanup Level[1]		
		Sample ID		14PCA001SO	
		Test Hole Site		ABLE	
		Location ID		A001NNN	
		Description		Casing	
		Collection Date		7/24/2014	
		Laboratory Report		1143374	
		Sample Type		Primary	
		Matrix		Soil	
Analyte	**Method**	**Units**		**Result [LOD]**	
Diesel Range Organics	AK102	mg/Kg	500	90.7	[12.3]
Residual Range Organics	AK103	mg/Kg	13,700	299	[12.3]
Total Solids	A2540G	Percent	-	81.6	[0]

[1] ADEC Method One soil cleanup levels (from Title 18 Alaska Administrative Code Chapter 75.341) apply to imported gravel pad material.

ADEC - Alaska Department of Environmental Conservatior
LOD - limit of detection
mg/Kg - milligrams per kilogram



LEGEND

- TEST HOLE ABLE CASING
- 2010 GRAVEL SAMPLE LOCATION
- 2010 TUNDRA SAMPLE LOCATION

ADEC ALASKA DEPARTMENT OF CONSERVATION
DRO DIESEL RANGE ORGANICS
MG/KG MILLIGRAM PER KILOGRAM

ADEC CLEANUP LEVELS (METHOD ONE TABLE A2) FOR GRAVEL PADS IN MG/KG
500 DRO

ADEC CLEANUP LEVELS (METHOD TWO TABLE B2) FOR TUNDRA SOILS IN MG/KG
12,500 DRO

KEY:
SAMPLE ID — 10CTA04SO 0-12" DEPTH JULY 2010 DRO 650 — LABORATORY RESULT
SEE LEGEND FOR ABBREVIATIONS.

NOTES:
1. DRO RESULTS SHOWN IN MG/KG
2. MAP BASED ON SURVEY DATA. WORLD GEODETIC SYSTEM 1984, (WGS84), UNIVERSAL TRANSVERSE MERCATOR (UTM) ZONE 3N.
3. GRAVEL PAD WAS INSTALLED ON TUNDRA; TUNDRA SURROUNDS AND UNDERLIES THE DRILL PAD.

0 10 20 40
SCALE IN FEET

FAIRBANKS ENVIRONMENTAL SERVICES
3538 INTERNATIONAL STREET
FAIRBANKS, ALASKA

ALASKA DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

Laboratory Results of 2010 and 2014 Samples, Test Hole Able

2014 Remedial Action Report, Project Chariot
Cape Thompson, Alaska

CONTRACT:	FIGURE:	DATE:
W911KB-14-C-0002	6-1	3/15

able

7.0 TEST HOLE BAKER

The following section describes field screening and laboratory results associated with excavation activities at Test Hole Baker. The location of Test Hole Baker is shown on Figure 1-2. The section also describes quantities of soil removed and the results of soil confirmation samples collected from the limits of excavation. A summary of 2010 sample results are shown on Figure 7-1. Field screening results from the limits of excavation are shown on Figure 7-2, and laboratory confirmation results are shown on Figure 7-3. The sample summary and analytical results for the Test Hole Baker site are included in Tables 7-1 and 7-2.

7.1 Site Description and Applicable Soil Cleanup Levels

The Test Hole Baker drill pad was situated on a bench positioned east of the Ogotoruk Creek delta. The site was accessed via a trail along the creek, crossing the creek several times. A gravel road connected the creek to the drill pad. The drill pad was surrounded by tundra.

The drill pad is constructed of approximately 2 feet of sandy gravel lain over tundra. The gravel was similar to that identified in a borrow area located 400 feet west of the pad.

ADEC Method One soil cleanup levels are applicable to the sandy gravels used to construct the access road and drill pad. ADEC Method Two soil cleanup levels are applicable to the native soil and tundra underlying and surrounding the drill pad. No historic information indicates that chilled diesel was used at Test Hole Baker. During this timeframe for drilling at the Project Chariot site, diesel was commonly used as an additive to drilling mud during the timeframe.

7.2 Casing Decommissioning and Debris Removal

Approximately 0.4 gallons of water was pumped from the Test Hole Baker casing on July 18, 2014. The water was treated and discharged onsite as discussed in Section 4.4.1.

The area surrounding the test hole casing was excavated to an approximate depth of 1.5 feet bgs, and the steel casing was cut below grade and capped on July 22, 2014. Gravel was identified inside the Test Hole Baker casing. The DRO concentration of 1,920 mg/Kg from soil sample 14PCB010SO collected from the soil inside the casing exceeded the Method One soil cleanup level of 500 mg/Kg for DRO (the DRO result from sample 14PCB010SO was bolded in Table 7-2 and Figure 7-3 to indicate it exceeded the applicable cleanup level); the RRO result from the casing sample was below the soil cleanup level.

The cut section of casing, over-casing, steel cable, and thermistor cable were removed from the site. Wood debris was burned. See Section 4.4 for additional information regarding decommissioning of the casing.

7.3 Excavation Activities

Excavation activities at Test Hole Baker commenced July 16, 2014. A small towable backhoe was used since access to the site required multiple creek crossings which limited access by the larger excavator. Approximately 8.5 tons of soil immediately surrounding the casing was excavated to a depth of 15 inches (deeper on the north side where a gravel mound was located) and placed in super sacks.

Samples were collected from the initial limits of excavation on July 18, 2014. One floor sample exhibited an elevated PID concentration (596 ppm), so the northwest corner was over-excavated on July 19, 2014. A 7-foot by 8-foot area was excavated into permafrost, which was encountered approximately 36 inches below grade. An additional 7 tons of POL-contaminated soil was excavated and removed before screening results indicated clean limits were met. Field screening results are summarized in Table B1 (Appendix B) and screening locations are shown in field sketches included on CD.

Approximately 15.5 tons of POL-contaminated soil was removed from the Test Hole Baker site. The POL-contaminated soil was loaded into 24 partially filled super sacks. The super sacks were filled directly on UTV trailers and transported to the West Staging Area where they were weighed and loaded into connex boxes.

The final Test Hole Baker excavation was approximately 11 feet by 12 feet (130 square feet). The northwest corner was excavated into permafrost to an approximate depth of 40 inches. Other portions of the excavation were only 15 inches deep. A cross section of the excavation is shown on Figure 7-3.

7.4 Confirmation Sampling Results and ADEC Approval

Confirmation samples were collected for DRO/RRO analysis from limits of the Test Hole Baker excavation on July 18 and 19, 2014. Screening and laboratory samples were collected from freshly exposed soils as described in Sections 5.1.2 and 5.2.1 respectively. Eight screening samples were collected from the walls of the excavation, and laboratory confirmation samples were submitted from the locations with the three highest PID results. Four screening samples were collected from the floor of the excavation, and laboratory confirmation samples were submitted from the locations with the two highest PID results. The sample frequencies meet ADEC requirements for the 130 square foot excavation.

PID readings from the limits of the excavation are shown on Figure 7-2, and laboratory confirmation sample results are presented in Table 7-2 and are shown on Figure 7-3. Confirmation sample results are below applicable cleanup levels. DRO concentrations as high as 472 mg/Kg were measured in a loading area footprint sample collected from pad gravels and DRO concentrations as high as 255 mg/Kg were measured in tundra clay samples. RRO

concentrations as high as 500 mg/Kg and 1,780 mg/Kg, respectively, were measured in pad gravels and tundra soils. RRO concentrations appear to be higher than DRO concentrations in tundra samples. DRO and RRO concentration ranges in confirmation samples representing remaining soils are presented in Table 7-3.

Table 7-3 DRO/RRO Concentrations Remaining in Soil, Test Hole Baker

Soil Type	Location	Applicable ADEC Soil Cleanup Level (mg/Kg)	Range of DRO Concentrations (mg/Kg)[1]	Range of RRO Concentrations (mg/Kg)
Pad	Floor	Method One: DRO=500 RRO=13,700	426*[1]	500*
	Sidewall		ND*	26.8*
Tundra	Floor	Method Two: DRO=12,500 RRO=13,700	255*	1,780*
	Sidewall		35.3 - 162	299 - 1,140

[1] The highest DRO concentration detected in gravel pad soils (472 mg/Kg) was from loading area footprint sample 14PCB009SO

*Only one sample was collected from the stated soil type/location, so only one result (not a range) is presented

ND – not detected

The DRO result was from the sample collected from inside the Test Hole Baker casing; the DRO concentration from sample 14PCB010SO (1,920 mg/Kg) exceeded the Method One soil cleanup level. The casing was sealed and capped to prevent any future contact.

On July 29, 2014, based on preliminary confirmation sample results and other field data, ADEC agreed that the Test Hole Baker excavation could be backfilled and re-contoured. Email correspondence with ADEC regarding closure of the Test Hole Baker excavation is included in Appendix E.

7.5 Loading Area Footprint Results

Two loading areas were established on the west side of Test Hole Baker excavation where the excavated soils were loaded into super sacks. Both loading areas were approximately 10 feet by 10 feet in size and are shown in Figure 7-3. A tarp was used to catch spilled soil during the super sack filling process which was later added to sacks.

Loading area soil samples (14PCB008SO [BLF1] and 14PCB009SO [BLF2]) were collected from approximately the center of each loading areas after excavation activities were completed on July 19, 2014. Due to a field error, no pre-loading area footprint samples were collected from this site. Loading area footprint samples were collected at depths of approximately 6 inches bgs from freshly exposed soils (as per Section 5.2.1). Pin flags were used to mark the footprint sample locations shown on Figure 7-4.

Post-loading area footprint samples were analyzed for DRO and RRO, and results were below ADEC Method One soil cleanup levels as shown in Table 7-4.

Table 7-4 Loading Area Footprint Sample Results, Test Hole Baker

Location[1]	Sample Number	DRO (mg/Kg)	RRO (mg/Kg)
ADEC Soil Cleanup Level[2]		**500**	**13,700**
BLF1	14PCB008SO	57.2	229
BLF2	14PCB009SO	472	228

[1] Only post-loading area footprint samples were collected at this site.

[2] ADEC Method One cleanup levels apply to drill pad soils.

7.6 Re-Contouring, Re-Vegetation, and Survey

Following ADEC approval, the Test Hole Baker excavation was backfilled and re-contoured to match the surrounding area on July 31, 2014. The unexcavated pad material was used to fill the excavation. The top of the capped test hole casing was buried approximately 1 foot below the finished ground surface.

The site was re-seeded and fertilized on August 25, 2014. Pin flags representing confirmation sample locations and the location of the former casing were replaced following the re-contouring effort; swing ties were utilized to re-establish pin flag locations. The pin flag locations were surveyed on August 27, 2014.

Table 7-1 - Summary of Laboratory Samples, Test Hole Baker
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Sample ID	Location ID	Description	Depth (inches bgs)	Sample Date	Sample Time	Sampler	Sample Type	Sample Matrix[1]	DRO/RRO (AK102/ AK103)	Cooler Number	Sample Data Group
TEST HOLE BAKER											
14PCB001SO	B001WEC	Confirmation (Wall)	8"	7/18/2014	1210	MB/BJ	Primary	Sandy Gravel	X	72201	1143274
14PCB002SO	B002FEC	Confirmation (Floor)	15"	7/18/2014	1219	MB/BJ	Primary	Sandy Gravel	X	72201	1143274
14PCB003SO	B003NEG	Excavation Guidance	16"	7/19/2014	930	MB	Primary	Sandy Gravel	X	72201	1143274
14PCB004SO	B004WEC	Confirmation (Wall)	26"	7/19/2014	1217	MB	Primary	Tundra	X	72201	1143274
14PCB005SO	B005FEC	Confirmation (Floor)	42"	7/19/2014	1259	MB	Primary	Tundra	X	72201	1143274
14PCB006SO	B006WEC	Confirmation (Wall)	30"	7/19/2014	1312	MB	Primary	Tundra	X	72201	1143274
14PCB007SO	B007DEC	Confirmation (Wall)	30"	7/19/2014	1322	MB	Dup (-B006SO)	Tundra	X	72201	1143274
14PCB008SO	B008NLF	Post-Loading Footprint (BLF1)	6"	7/19/2014	1730	MB	Primary	Sandy Gravel	X	72201	1143274
14PCB009SO	B009NLF	Post-Loading Footprint (BLF2)	6"	7/19/2014	1735	MB	Primary	Sandy Gravel	X	72201	1143274
14PCB010SO	B010NNN	Inside Casing	30"	7/22/2014	1215	BJ	Primary	Sandy Gravel	X	072301	1143333

X indicates analysis was conducted.
All samples were analyzed by SGS North America Inc, Alaska (RUSH turn-around time). NPDL #14-030.
[1] "Sandy Gravel" indicates imported pad material (typically sandy gravel) or minor amounts of drill cuttings. "Tundra" indicates a fine gray or tan clay matrix.

BJ -Bryan Johnson
bgs - below ground surface
°C - degrees Celsius
DRO - diesel range organics
MB - Mike Boese
RRO - residual range organics

Soil (and Tundra soil) samples were collected in 4 or 8 ounce jars and stored at 4 °C

Table 7-2 - DRO/RRO Results, Test Hole Baker
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

		Sample ID			14PCB001SO		14PCB002SO		14PCB003SO	
		Test Hole Site	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	BAKER		BAKER		BAKER	
		Location ID			B001WEC		B002FEC		B003NEG	
		Description			Conf (Wall)		Conf (Floor)		Excav Guidance	
		Collection Date			7/18/2014		7/18/2014		7/19/2014	
		Laboratory Report			1143274		1143274		1143274	
		Sample Type			Primary		Primary		Primary	
		Matrix			Soil		Soil		Soil	
Analyte	**Method**	**Units**			**Result**	**[LOD] Qual**	**Result**	**[LOD] Qual**	**Result**	**[LOD] Qual**
Diesel Range Organics	AK102	mg/Kg	500	12,500	ND	[12.2]	426	[12.1]	82.2	[11.6]
Residual Range Organics	AK103	mg/Kg	13,700	13,700	26.8	[12.2] QN	500	[12.1] QN	165	[11.6] QN
Total Solids	A2540G	Percent	-	-	82	[0]	82	[0]	86.3	[0]

		Sample ID			14PCB004SO		14PCB005SO		14PCB006SO	
		Test Hole Site	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	BAKER		BAKER		BAKER	
		Location ID			B004WEC		B005FEC		B006WEC	
		Description			Conf (Wall)		Conf (Floor)		Conf (Wall)	
		Collection Date			7/19/2014		7/19/2014		7/19/2014	
		Laboratory Report			1143274		1143274		1143274	
		Sample Type			Primary		Primary		Primary	
		Matrix			Soil		TUNDRA		TUNDRA	
Analyte	**Method**	**Units**			**Result**	**[LOD] Qual**	**Result**	**[LOD] Qual**	**Result**	**[LOD] Qual**
Diesel Range Organics	AK102	mg/Kg	500	12,500	162	[56.5]	255	[55.5]	35.3	[14.1] QN
Residual Range Organics	AK103	mg/Kg	13,700	13,700	1080	[56.5] QN	1780	[55.5] QN	299	[14.1] QN
Total Solids	A2540G	Percent	-	-	70	[0]	71.3	[0]	70.8	[0]

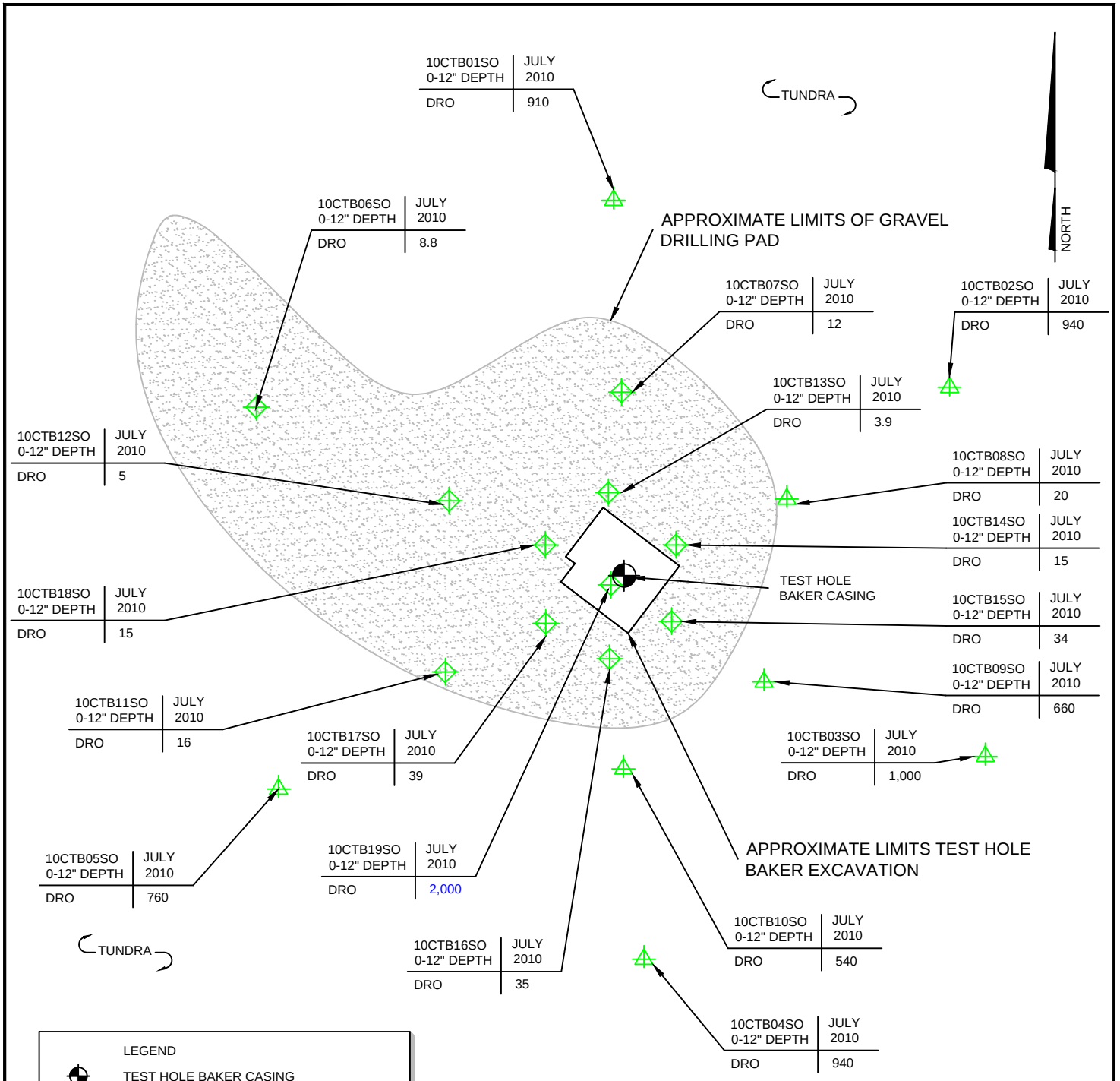
		Sample ID			14PCB007SO		14PCB008SO		14PCB009SO	
		Test Hole Site	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	BAKER		BAKER		BAKER	
		Location ID			B007DEC		B008NLF		B009NLF	
		Description			Conf (Wall)		Post-Load Footprint		Post-Load Footprint	
		Collection Date			7/19/2014		7/19/2014		7/19/2014	
		Laboratory Report			1143274		1143274		1143274	
		Sample Type			Dup. (-B006SO)		Primary		Primary	
		Matrix			TUNDRA		Soil		Soil	
Analyte	**Method**	**Units**			**Result**	**[LOD] Qual**	**Result**	**[LOD] Qual**	**Result**	**[LOD] Qual**
Diesel Range Organics	AK102	mg/Kg	500	12,500	145	[14.2] QN	57.2	[11.7]	472	[41.9]
Residual Range Organics	AK103	mg/Kg	13,700	13,700	1140	[57] QN	229	[11.7]	228	[41.9]
Total Solids	A2540G	Percent	-	-	70.1	[0]	85.4	[0]	94.8	[0]

		Sample ID			14PCB010SO					
		Test Hole Site	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	BAKER					
		Location ID			B010NNN					
		Description			Casing Soil					
		Collection Date			7/22/2014					
		Laboratory Report			1143274					
		Sample Type			Primary					
		Matrix			Soil					
Analyte	**Method**	**Units**			**Result**	**[LOD] Qual**				
Diesel Range Organics	AK102	mg/Kg	500	12,500	**1920**	**[45.1]**				
Residual Range Organics	AK103	mg/Kg	13,700	13,700	396	[45.1]				
Total Solids	A2540G	Percent	-	-	87.7	[0]				

[1] ADEC Method One soil cleanup levels (from Title 18 Alaska Administrative Code Chapter 75.341) apply to imported gravel pad material
ADEC Method Two soil cleanup levels apply to native tundra soils. Tundra cleanup levels and sample results are shaded in gray
The result that exceeded the applicable ADEC soil cleanup level and was from soil that was **NOT** excavated/removed from the site (14PCB010SO collected from inside casing) is **BOLDED**.

ADEC - Alaska Department of Environmental Conservatior
Dup. - Field duplicate (primary sample number in parenthesis)
LOD - limit of detection
LOQ - limit of quantitation
mg/Kg - milligrams per kilogram
qual - data qualifier

Data Qualifiers:
B - analyte was also detected in a blank; result may be due to cross-contamination
J - result qualified as estimate because it is less than the limit of quantitation
ND - analyte not detected
Q - result considered an estimate (biased L-low; H-high; N-unknown) due to a quality control failure



LEGEND

- TEST HOLE BAKER CASING
- 2010 GRAVEL SAMPLE LOCATION
- 2010 TUNDRA SAMPLE LOCATION

ADEC	ALASKA DEPARTMENT OF CONSERVATION
DRO	DIESEL RANGE ORGANICS
MG/KG	MILLIGRAM PER KILOGRAM

ADEC CLEANUP LEVELS (METHOD ONE TABLE A2) FOR GRAVEL PADS IN MG/KG
500 DRO

ADEC CLEANUP LEVELS (METHOD TWO TABLE B2) FOR TUNDRA SOILS IN MG/KG
12,500 DRO

KEY:
SAMPLE ID: 10CTB04SO 0-12" DEPTH JULY 2010
LABORATORY RESULT: DRO 940
SEE LEGEND FOR ABBREVIATIONS.

NOTES:
1. DRO RESULTS SHOWN IN MG/KG
2. MAP BASED ON SURVEY DATA. WORLD GEODETIC SYSTEM 1984, (WGS84), UNIVERSAL TRANSVERSE MERCATOR (UTM) ZONE 3N.
3. GRAVEL PAD WAS INSTALLED ON TUNDRA; TUNDRA SURROUNDS AND UNDERLIES THE DRILL PAD.
4. BOLD RESULT EXCEEDED THE APPLICABLE ADEC CLEANUP LEVEL - METHOD ONE FOR GRAVEL PAD OR METHOD TWO FOR TUNDRA.

0 10 20 40
SCALE IN FEET

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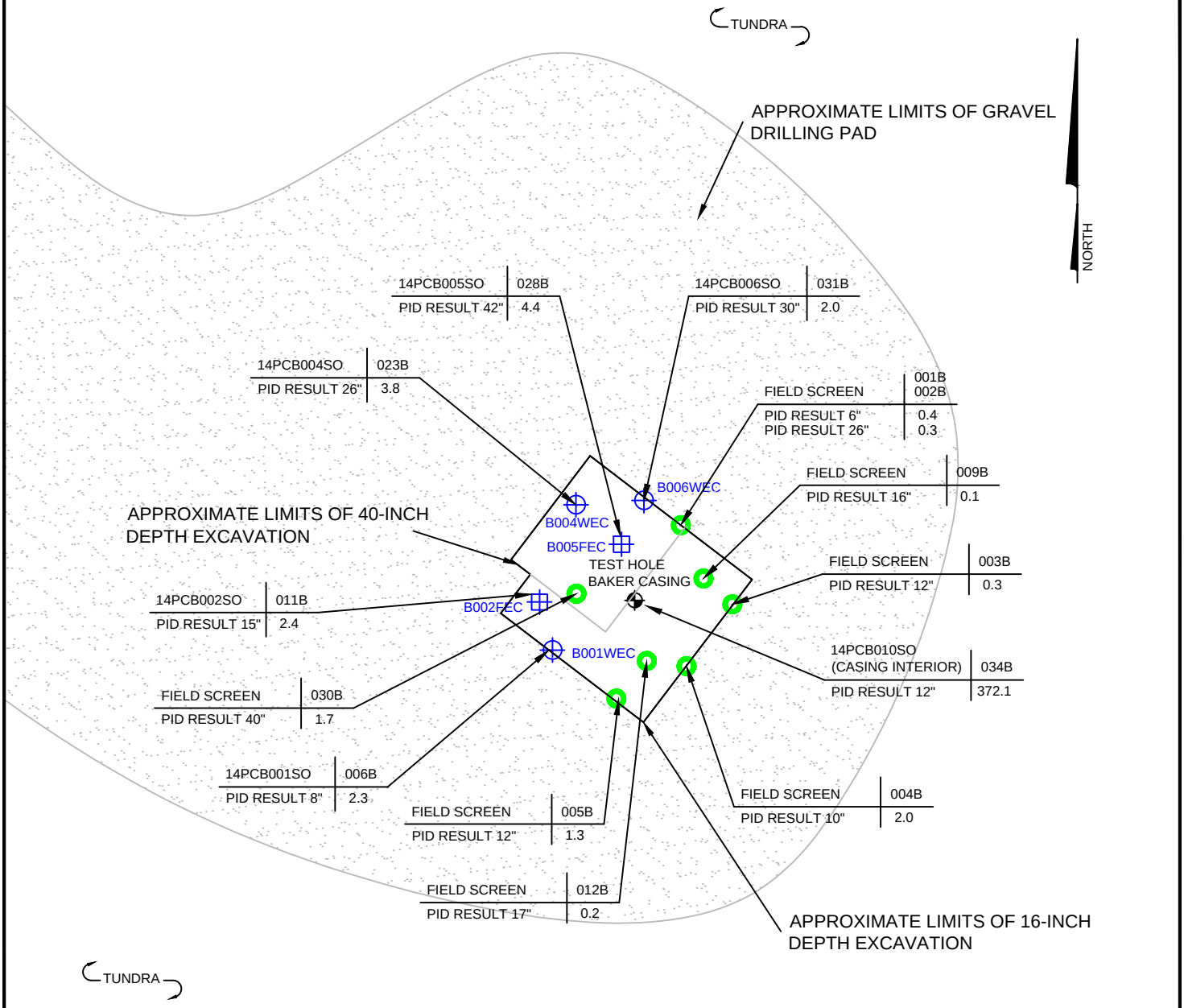
3538 INTERNATIONAL STREET
FAIRBANKS, ALASKA

ALASKA DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

Laboratory Results of Pre-excavation (2010) Samples, Test Hole Baker

2014 Remedial Action Report, Project Chariot
Cape Thompson, Alaska

CONTRACT:	FIGURE:	DATE:
W911KB-14-C-0002	7-1	3/15



NOTES

PID RESULTS SHOWN IN PPM

KEY:

FIELD SCREEN | 003B — PID NUMBER

PID RESULT 12" | 0.3

DEPTH BELOW GROUND SURFACE

PID RESULT IN PPM

SEE LEGEND FOR ABBREVIATIONS.

LEGEND

- TEST HOLE BAKER CASING
- PID FIELD SCREENING LOCATION ONLY (NO LABORATORY SAMPLES COLLECTED FROM THIS LOCATION)
- B001WEC — WALL EXCAVATION SAMPLE LOCATION
- B002FEC — FLOOR EXCAVATION SAMPLE LOCATION
- PID — PHOTOIONIZATION DETECTOR
- PPM — PARTS PER MILLION

0 5 10 20

SCALE IN FEET

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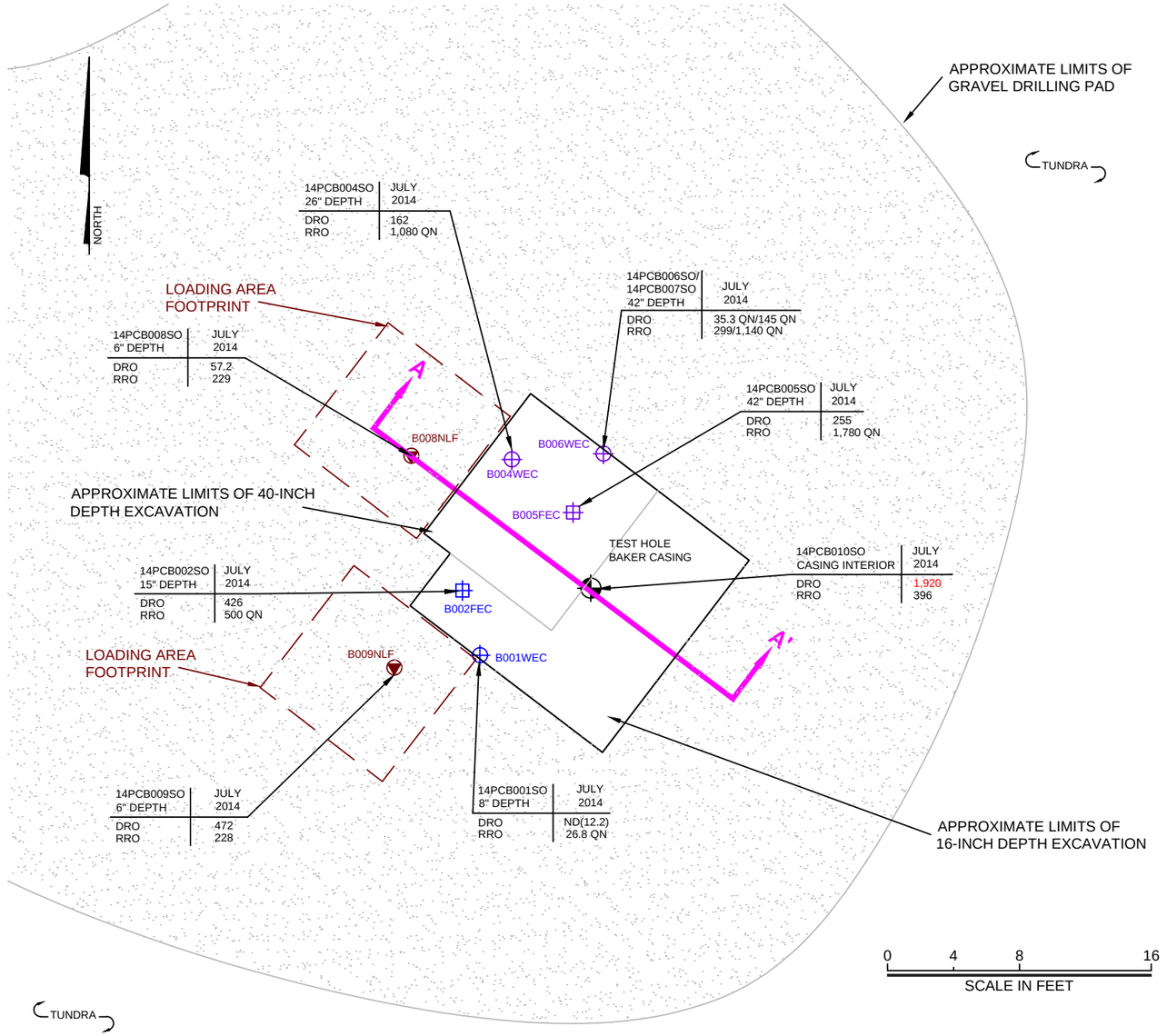
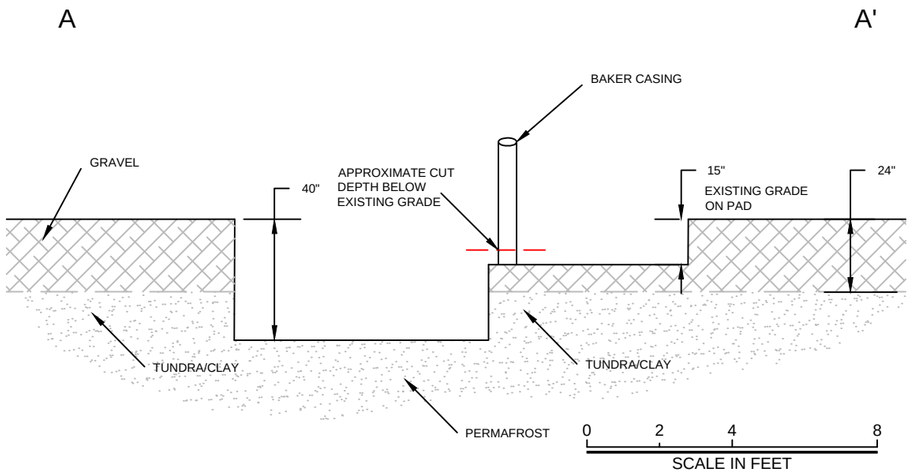
Field Screening Results of Confirmation Samples, Test Hole Baker

2014 Remedial Action Report, Project Chariot
Cape Thompson, Alaska

CONTRACT:	FIGURE:	DATE:
W911KB-14-C-0002	7-2	3/15



Plan View of Test Hole Baker Excavation



Cross Section A-A' of Test Hole Baker Excavation

LEGEND

	TEST HOLE BAKER CASING
B009NLF	LOADING AREA SAMPLE LOCATION
B001WEC	WALL (PAD) EXCAVATION SAMPLE LOCATION
B002FEC	FLOOR (PAD) EXCAVATION SAMPLE LOCATION
B006WEC	WALL (TUNDRA) EXCAVATION SAMPLE LOCATION
B005FEC	FLOOR (PAD) EXCAVATION SAMPLE LOCATION
	LOADING AREA FOOTPRINT

ADEC	ALASKA DEPARTMENT OF CONSERVATION
DRO	DIESEL RANGE ORGANICS
LOD	LIMITS OF DETECTION
LOQ	LIMIT OF QUANTITATION
MG/KG	MILLIGRAM PER KILOGRAM
ND	NOT DETECTED (LOD)
Q	RESULT QUALIFIED AS ESTIMATE (BIASED L-LOW; H-HIGH; N-UNKNOWN) DUE TO QUALITY CONTROL FAILURE
RRO	RESIDUAL RANGE ORGANICS

ADEC CLEANUP LEVELS (METHOD ONE TABLE A2) FOR GRAVEL PADS IN MG/KG	
500	DRO
13,700	RRO
ADEC CLEANUP LEVELS (METHOD TWO TABLE B2) FOR TUNDRA SOILS IN MG/KG	
12,500	DRO
13,700	RRO

KEY:

SAMPLE ID → 14PCB005SO 42" DEPTH | JULY 2014
DRO 255
RRO 1,780
← LABORATORY RESULT

SEE LEGEND FOR ABBREVIATIONS.

NOTES:

1. DRO AND RRO RESULTS SHOWN IN MG/KG
2. MAP BASED ON SURVEY DATA. WORLD GEODETIC SYSTEM 1984, (WGS84), UNIVERSAL TRANSVERSE MERCATOR (UTM) ZONE 3N.
3. GRAVEL PAD WAS INSTALLED ON TUNDRA; TUNDRA SURROUNDS AND UNDERLIES THE DRILL PAD. FLOOR SAMPLES ARE SUBJECT TO METHOD TWO TUNDRA CLEANUP LEVELS. WALL SAMPLES WITHIN THE GRAVEL PAD ARE SUBJECT TO METHOD ONE CLEANUP LEVELS.
4. BOLD RESULT EXCEEDED THE ADEC METHOD ONE CLEANUP LEVEL

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FAIRBANKS, ALASKA

ALASKA DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

Laboratory Results of Confirmation Samples, Test Hole Baker

2014 Remedial Action Report, Project Chariot
Cape Thompson, Alaska

CONTRACT:	FIGURE:	DATE:
W911KB-14-C-0002	7-3	3/15

BAKER

8.0 TEST HOLE CHARLIE

The following section describes field screening and laboratory results associated with excavation activities at Test Hole Charlie. The location of Test Hole Charlie is shown on Figure 1-2. The section also describes quantities of soil removed and the results of soil confirmation samples collected from the limits of excavation. Pre-excavation results (including a summary of 2010 results) are shown on Figure 8-1, field screening results from the limits of excavation are shown on Figures 8-2 and 8-3, and laboratory confirmation results are shown on Figure 8-4.

A summary of laboratory samples collected from Test Hole Charlie is presented as Table 8-1. Waste characterization sample results are presented in Table 8-2, and DRO/RRO results from soil samples are presented in Table 8-3.

8.1 Site Description and Applicable Soil Cleanup Levels

The Test Hole Charlie drill pad is located north of the high tide line approximately 3,000 feet west of the mouth of Ogotoruk Creek. The drill pad, which is accessed from the beach by a 300-foot access road, is surrounded by tundra.

The drill pad and access road are constructed of approximately 2.5 feet of sandy gravel installed over tundra. The gravel material used to construct the access road and drill pad is consistent with the material identified in the adjacent beach. Records indicate that chilled diesel was used in the construction of the Test Hole Charlie soil boring in an effort to reduce sidewall sloughing (USGS, 1961a).

ADEC Method One soil cleanup levels are applicable to the sandy gravels used to construct the access road and drill pad. ADEC Method Two soil cleanup levels are applicable to the tundra clay material underneath and surrounding the drill pad.

8.2 Casing Decommissioning and Debris Removal

Approximately 1.8 gallons of water was pumped from the Test Hole Charlie casing on July 18, 2014. The water was treated and discharged onsite as discussed in Section 4.4.1.

The area surrounding the test hole casing was excavated to an approximate depth of 2.5 feet bgs, and the steel casing was cut below grade and capped on July 22, 2014. In addition to the cut section of casing, the thermistor head and associated cable were removed from the site. Several steel mats (Marsden mats) and wood debris were unearthed during excavation activities; the mats were used to improve trail conditions to the site and the wood debris was burned. The cut section of casing and thermistor cable were removed from the site. See Section 4.4 for additional information regarding decommissioning of the casing.

8.3 Pre-Excavation Sampling and Results

Eight gravel pad samples were collected as part of the pre-work site visit on June 25, 2014. Samples 14CTC001SO and 14CTC002SO were collected at the request of the disposal contractor for additional waste characterization, and they were collected from locations that exceeded cleanup levels during the 2010 sampling effort. The samples were analyzed for BTEX (EPA Method 8260B) and RCRA metals (EPA Method 6020); the samples were extracted using the TCLP (EPA Method 1311). The laboratory results of waste characterization samples (summarized in Table 8-2) were provided to Emerald Alaska in advance of the fieldwork, and they did not impact the existing waste profile.

In addition to the waste characterization samples, five additional samples and a field duplicate (14CTC003SO through 14CTC008SO) were collected for DRO and RRO analysis to estimate the extent of POL-contamination in the pad. One sample, 14CTC003SO, collected from the northern part of the pad, exceeded the ADEC Method One DRO cleanup level at 658 mg/Kg. Figure 8-1 shows the results from pre-excavation samples. The results helped roughly delineate soil contamination. However, high winds presumably moved the pin flags used to mark the sample locations prior to the return of the field team to the site three weeks later.

On July 17, 2014, surface soils within the Test Hole Charlie pad were again screened to estimate the lateral extent of contamination prior to excavation activities. Approximately 50 shallow test pits (some grossly contaminated test pits were not screened) and 33 PID screening samples (PID samples 009C through 041C) were collected and the rough limits were marked with orange spray paint to assist the excavator operator. The lateral extent was similar to that identified in the Work Plan.

After initial delineation of the drill pad area, six tundra soil samples (14CTC012SO through 14CT016SO) were collected from immediately below the vegetative mat to evaluate impact to the tundra approximately 15 feet east of the pad. Soil in shallow test pits which were installed in tundra closer to the pad were presumed to be contaminated based on field observations (visual and olfactory). Laboratory results from the tundra samples were less than the Method Two soil cleanup level of 12,500 mg/kg. The highest DRO result (553 mg/Kg) was from sample 14PCC014SO. The results indicated that the excavation did not need to extend any further east than the “line” created by these samples. Tundra samples 14CTC012SO through 14CT016SO are shown on Figure 8-1.

8.4 Excavation Activities

Excavation activities at Test Hole Charlie commenced July 18, 2014 utilizing the Bobcat E85 excavator. Initially, the soil immediately adjacent to the casing was excavated. Soil excavation progressed further east and then progressed further southeast toward the ocean between July 19 and 25, 2014. The final limits of excavation at Test Hole Charlie were completed on July 25.

The drill pad topography sloped slightly from the northwest to the southeast in the direction of the excavation. Water from precipitation events started pooling in the lower sections of the excavation (southern extent) on July 21, 2014.

The excavation was guided by PID screening samples; approximately 200 PID screening samples were collected. Field screening results are included in Table B2 (Appendix B). The final limits of the 2,100 square foot excavation extended approximately 10 feet into the tundra on the eastern edge. (DRO results from pre-excavation samples collected 15 feet into the tundra [shown on Figure 8-4] were an order of magnitude below the cleanup level).

The drill pad consisted of approximately 30 inches of sandy gravel installed over native tundra. A compressed vegetative layer approximately 2 to 6-inches thick underlying the gravel was also excavated. A gray clay layer was encountered underneath the compressed vegetative mat. The tundra east of the pad consisted of a 10-inch layer of vegetative mat overlying gray clay. A cross-section profile of the Test Hole Charlie excavation is shown on Figure 8-4. The excavation extended approximately 6 inches vertically into the clay layer where permafrost was encountered.

A total of 248 tons of POL-contaminated soil from Test Hole Charlie was loaded into 203 super sacks. The filled super sacks were loaded into trailers and transported to the West Staging Area where they were weighed and loaded into connex boxes.

The final Test Hole Charlie excavation was approximately 30 feet by 70 feet (2,100 square feet) and extended approximately 10 feet beyond the drill pad into the tundra on the southeast side. The entire floor was excavated to permafrost; depth of the excavation was approximately 36 inches within the pad footprint and 24 inches outside of it. A cross section of the excavation is shown on Figure 8-4.

8.5 Confirmation Sampling Results and ADEC Approval

Confirmation samples were collected for DRO/RRO analysis from limits of the Test Hole Charlie excavation July 23 through 26, 2014. Screening and laboratory samples were collected from freshly exposed soils as described in Sections 5.1.2 and 5.2.1 respectively. A total of 34 screening samples were collected from the walls of the completed excavation, and laboratory confirmation samples were submitted from the locations with the 13 highest PID results. Although they were not specifically labeled as “confirmation” samples, two additional samples (14PCC022SO and 14PCC023SO/14PCC024SO) were collected from the limits of excavation sidewall (the excavation was terminated upon reaching those sample locations), so data from those samples were also included on figures. A total of 33 screening samples were collected from the floor of the excavation, and laboratory confirmation samples were submitted from the locations with the 12 highest PID results. The sample frequencies meet or exceed ADEC requirements for the 2,100 square foot excavation.

PID readings from the limits of the excavation are shown on Figures 8-2 and 8-3, and laboratory confirmation sample results are presented in Table 8-3 and are shown on Figure 8-4. ADEC Method Two soil cleanup levels apply to the entire floor of the excavation and a section of the eastern and southern sidewalls (tundra samples are shown in purple on Figure 8-4). Method One cleanup levels apply to the gravel sidewalls (gravel pad samples are shown in blue on Figure 8-4) within the pad boundaries.

Confirmation sample results were below applicable soil cleanup levels, except for one DRO result in the floor sample collected immediately adjacent the Test Hole Charlie casing. At 83,300 mg/Kg, sample 14PCC028SO exceeded the Method Two soil cleanup level for DRO (the DRO result from sample 14PCC028SO was bolded in Table 8-3 and Figure 8-4 to indicate it exceeded the applicable cleanup level). Although elevated concentrations were expected to be present adjacent the borehole where the diesel was dispensed, additional excavation was not conducted due to the presence of permafrost.

In addition to the DRO cleanup level exceedance in the sample collected closest to the Test Hole Charlie casing, elevated DRO and RRO concentrations remain present in the floor and eastern edge of the excavation; a DRO concentration as high as 11,800 mg/Kg was detected (below the cleanup level of 12,500 mg/Kg) in tundra sidewall sample 14PCC045SO, and a RRO concentration as high as 5,320 mg/Kg was detected (below the cleanup level of 13,700 mg/Kg) in tundra sidewall sample 14PCC023SO. Results from pre-excavation tundra samples collected 5 feet east of the eastern sidewall and outside the excavation were an order of magnitude below the Method Two cleanup levels. In general, sample results from the gravel pad soils were well below Method One cleanup levels. DRO and RRO concentration ranges in confirmation samples representing remaining soils are presented in Table 8-4.

Table 8-4 DRO/RRO Concentrations Remaining in Soil, Test Hole Charlie

Soil Type	Location	Applicable ADEC Soil Cleanup Level (mg/Kg)	Range of DRO Concentrations (mg/Kg)	Range of RRO Concentrations (mg/Kg)
Pad	Sidewall	Method One: DRO=500 RRO=13,700	ND - 154	ND - 33
Tundra	Floor	Method Two: DRO=12,500 RRO=13,700	138 - **83,300**	161 - 4,420
	Sidewall[1]		206 - 11,800	207 - 5,320

[1] Pre-excavation and excavation guidance samples were also included in the sidewall evaluation since the locations were marked/surveyed and the samples are representative of sidewall conditions (see locations C012NPE and C023NEG on Figure 8-4).

ND – not detected

Bolded result exceeded the applicable cleanup level.

On August 6, 2014, based on preliminary confirmation sample results and other field data, ADEC agreed that the Test Hole Charlie excavation could be backfilled and re-contoured. Email correspondence with ADEC regarding closure of the Test Hole Charlie excavation is included in Appendix E.

8.6 Loading Area Footprint Results

A 10-foot by 15-foot loading area was established outside of the Test Hole Charlie excavation where the excavated soils were loaded into super sacks (shown in Figure 8-4). The majority of super sacks from Test Hole Charlie were filled inside the excavation to reduce the potential for spreading contamination. However, due to standing water inside the southern portion of the excavation, some POL-contaminated soil was loaded into super sacks outside of the excavation footprint. A tarp was used to catch spilled soil during the super sack filling process which was later added to sacks.

Two loading area footprint samples (CLF4 and CLF5) were collected from inside the loading area footprint as shown on Figure 8-4 for laboratory analysis. Loading area footprint samples were collected at depths of approximately 6 inches bgs from freshly exposed soils (as per Section 5.2.1) and analyzed for DRO and RRO. Samples were collected prior to and following excavation activities to assess impacts, if any, in the areas where soil was loaded. Pin flags were used to mark the footprint sample locations shown on Figure 8-4. Areas where previous loading area footprint samples (CLF1 through CLF3) were collected were excavated so those samples were not submitted to the laboratory.

Pre- and Post-loading area footprint results were all below ADEC Method One soil cleanup levels as shown in Table 8-5.

Table 8-5 Loading Area Footprint Sample Results, Test Hole Charlie

Location	Sample Number (Pre/Post)	DRO (mg/Kg)		RRO (mg/Kg)	
		Pre	Post	Pre	Post
ADEC Soil Cleanup Level[1]		500		13,700	
CLF4	14PCC034SO/14PCC054SO	80.4	56.8	36.7	ND(21.9)
CLF5	14PCC035SO/14PCC055SO	105	38.9	17.7 J	ND(21.1)

[1] ADEC Method One cleanup levels apply to drill pad soils.

Pre-Loading Area footprint samples were collected on July 24, 2014 (14PCC034SO and 14PCC035SO), and post-loading area footprint samples (14PCC054SO and 14PCC055SO) were collected on July 26, 2014, after excavation activities were completed. Soil associated with loading area footprint samples from CLF1 through CLF3 was excavated and removed from the site; the samples from these locations were not submitted to the laboratory.

J – Analyte is considered an estimate because it was detected below the LOQ.

ND – analyte was not detected at the LOD shown in parenthesis.

8.7 Re-Contouring, Re-Vegetation, and Survey

The Test Hole Charlie excavation was backfilled and re-contoured to match the surrounding area on August 7, 2014. The remaining pad material was used to fill the excavation. The top of the capped test hole casing was buried approximately 1 foot below the finished ground surface.

The site was re-seeded and fertilized on August 25, 2014. Pin flags representing confirmation sample locations and the location of the casing were replaced on August 12, 2014; swing ties were utilized to re-establish pin flag locations. The pin flag locations were surveyed on August 27, 2014.

Table 8-1 - Summary of Laboratory Samples, Test Hole Charlie
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Sample ID	Location ID	Description	Depth (inches bgs)	Sample Date	Sample Time	Sampler	Sample Type	Sample Matrix[1]	DRO/RRO (AK102/ AK103)	BTEX (8260B)	RCRA Metals (6020A)	Cooler Number	Sample Data Group
TEST HOLE CHARLIE													
14PCC001SO	C001NWC	Waste Characterization	4"	6/25/2014	1425	MB	Primary	Sandy Gravel		X[2]	X[2]	6271401	1142724
14PCC002SO	C002NWC	Waste Characterization	12"	6/25/2014	1445	MB	Primary	Sandy Gravel		X[2]	X[2]	6271401	1142724
14PCC003SO	C003NPE	Pre-Excavation Delineation	10"	6/25/2014	1500	MB	Primary	Sandy Gravel	X			6271401	1142724
14PCC004SO	C004NPE	Pre-Excavation Delineation	10"	6/25/2014	1505	MB	Primary	Sandy Gravel	X			6271401	1142724
14PCC005SO	C005DPE	Pre-Excavation Delineation	10"	6/25/2014	1510	MB	Dup (-C004SO)	Sandy Gravel	X			6271401	1142724
14PCC006SO	C006NPE	Pre-Excavation Delineation	14"	6/25/2014	1515	MB	Primary	Sandy Gravel	X			6271401	1142724
14PCC007SO	C007NPE	Pre-Excavation Delineation	14"	6/25/2014	1520	MB	Primary	Sandy Gravel	X			6271401	1142724
14PCC008SO	C008NPE	Pre-Excavation Delineation	11"	6/25/2014	1525	MB	Primary	Sandy Gravel	X			6271401	1142724
14PCC009SO	C009NPE	Pre-Excavation Delineation	9"	7/17/2014	1720	MB/BJ	Primary	Sandy Gravel	X			72201	1143274
14PCC010SO	C010NPE	Pre-Excavation Delineation	10"	7/17/2014	1730	MB/BJ	Primary	Sandy Gravel	X			72201	1143274
14PCC011SO	C011DPE	Pre-Excavation Delineation	10"	7/17/2014	1735	MB/BJ	Dup (-C010SO)	Sandy Gravel	X			72201	1143274
14PCC012SO	C012NPE	Tundra Delineation	10"	7/17/2014	1745	MB/BJ	Primary	Tundra	X			72201	1143274
14PCC013SO	C013NPE	Tundra Delineation	9"	7/17/2014	1750	MB/BJ	Primary	Tundra	X			72201	1143274
14PCC014SO	C014NPE	Tundra Delineation	10"	7/17/2014	1800	MB/BJ	Primary	Tundra	X			72201	1143274
14PCC015SO	C015NPE	Tundra Delineation	12"	7/17/2014	1810	MB/BJ	Primary	Tundra	X			72201	1143274
14PCC016SO	C016NPE	Tundra Delineation	10"	7/17/2014	1820	MB/BJ	Primary	Tundra	X			72201	1143274
14PCC017SO	C017NEG	Excavation Guidance	27"	7/19/2014	1330	BJ	Primary	Sandy Gravel	X			72201	1143274
14PCC018SO	C018NEG	Excavation Guidance	32"	7/21/2014	1015	MB	Primary	Tundra	X			72201	1143274
14PCC019SO	C019NEG	Excavation Guidance	12"	7/22/2014	945	MB	Primary	Sandy Gravel	X			072301	1143333
14PCC020SO	C020NEG	Excavation Guidance	10"	7/22/2014	1110	BJ	Primary	Sandy Gravel	X			072301	1143333
14PCC021SO	C021NEG	Excavation Guidance	20"	7/22/2014	1445	BJ	Primary	Sandy Gravel	X			072301	1143333
14PCC022SO	C022NEG	Excavation Guidance[3]	18"	7/22/2014	1530	BJ	Primary	Tundra	X			072301	1143333
14PCC023SO	C023NEG	Excavation Guidance[3]	16"	7/22/2014	1700	MB	Primary	Tundra	X			072301	1143333
14PCC024SO	C024DEG	Excavation Guidance[3]	16"	7/22/2014	1710	MB	Dup (-C023SO)	Tundra	X			072301	1143333
14PCC025SO	C025WEC	Confirmation (Wall)	36"	7/23/2014	1145	MB	Primary	Sandy Gravel	X			72501	1143374
14PCC026SO	C026WEC	Confirmation (Wall)	28"	7/23/2014	1200	MB	Primary	Sandy Gravel	X			72501	1143374
14PCC027SO	C027DEC	Confirmation (Wall)	28"	7/23/2014	1210	MB	Dup (-C026SO)	Sandy Gravel	X			72501	1143374
14PCC028SO	C028FEC	Confirmation (Floor)	31"	7/24/2014	1020	MB	Primary	Tundra	X			72501	1143374
14PCC029SO	C029FEC	Confirmation (Floor)	27"	7/24/2014	1120	MB	Primary	Tundra	X			72501	1143374
14PCC030SO	C030FEC	Confirmation (Floor)	35"	7/24/2014	1125	MB	Primary	Tundra	X			72501	1143374
14PCC031SO	C031FEC	Confirmation (Floor)	38"	7/24/2014	1115	MB	Primary	Tundra	X			72501	1143374
14PCC032SO	C032FEC	Confirmation (Floor)	32"	7/24/2014	1110	MB	Primary	Tundra	X			72501	1143374
14PCC033SO	C033FEC	Confirmation (Floor)	32"	7/24/2014	1100	MB	Primary	Tundra	X			72501	1143374
14PCC034SO	C034NLF	Pre-Loading Footprint (CLF4)	6"	7/24/2014	1650	MB	Primary	Sandy Gravel	X			72501	1143374
14PCC035SO	C035NLF	Pre-Loading Footprint (CLF5)	6"	7/24/2014	1700	MB	Primary	Sandy Gravel	X			72501	1143374

Table 8-1 - Summary of Laboratory Samples, Test Hole Charlie
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Sample ID	Location ID	Description	Depth (inches bgs)	Sample Date	Sample Time	Sampler	Sample Type	Sample Matrix[1]	DRO/RRO (AK102/ AK103)	BTEX (8260B)	RCRA Metals (6020A)	Cooler Number	Sample Data Group
14PCC036SO	C036FEC	Confirmation (Floor)	25"	7/26/2014	930	MB/BJ	Primary	Tundra	X			72701	1143385
14PCC037SO	C037FEC	Confirmation (Floor)	22"	7/26/2014	950	MB/BJ	Primary	Tundra	X			72701	1143385
14PCC038SO	C038FEC	Confirmation (Floor)	22"	7/26/2014	1000	MB/BJ	Primary	Tundra	X			72701	1143385
14PCC039SO	C039FEC	Confirmation (Floor)	30"	7/26/2014	1015	MB	Primary	Tundra	X			72701	1143385
14PCC040SO	C040FEC	Confirmation (Floor)	35"	7/26/2014	1025	MB	Primary	Tundra	X			72701	1143385
14PCC041SO	C041FEC	Confirmation (Floor)	27"	7/26/2014	1040	MB	Primary	Tundra	X			72701	1143385
14PCC042SO	C042DEC	Confirmation (Floor)	27"	7/26/2014	1045	MB	Dup (-C041SO)	Tundra	X			72701	1143385
14PCC044SO	C044WEC	Confirmation (Wall)	17"	7/26/2014	1430	MB	Primary	Tundra	X			72701	1143385
14PCC045SO	C045WEC	Confirmation (Wall)	16"	7/26/2014	1425	MB	Primary	Tundra	X			72701	1143385
14PCC046SO	C046WEC	Confirmation (Wall)	16"	7/26/2014	1435	MB	Primary	Tundra	X			72701	1143385
14PCC047SO	C047WEC	Confirmation (Wall)	10"	7/26/2014	1415	MB	Primary	Tundra	X			72701	1143385
14PCC048SO	C048DEC	Confirmation (Wall)	10"	7/26/2014	1420	MB	Dup (-C047SO)	Tundra	X			72701	1143385
14PCC049SO	C049WEC	Confirmation (Wall)	36"	7/26/2014	1355	MB	Primary	Sandy Gravel	X			72701	1143385
14PCC050SO	C050WEC	Confirmation (Wall)	24"	7/26/2014	1400	MB	Primary	Sandy Gravel	X			72701	1143385
14PCC051SO	C051WEC	Confirmation (Wall)	23"	7/26/2014	1405	MB	Primary	Sandy Gravel	X			72701	1143385
14PCC052SO	C052WEC	Confirmation (Wall)	18"	7/26/2014	1430	MB	Primary	Sandy Gravel	X			72701	1143385
14PCC053SO	C053WEC	Confirmation (Wall)	15"	7/26/2014	1425	MB	Primary	Sandy Gravel	X			72701	1143385
14PCC054SO	C054NLF	Post-Loading Footprint (CLF4)	6"	7/26/2014	1650	MB	Primary	Sandy Gravel	X			72701	1143385
14PCC055SO	C055NLF	Post-Loading Footprint (CLF5)	6"	7/26/2014	1700	MB	Primary	Sandy Gravel	X			72701	1143385
QUALITY CONTROL SAMPLES													
Equipment Blanks													
14PCC043WQ	C043NER	Rinsate	NA	7/26/2014	1250	MB	Equip. Blank	Water	X			72701	1143385

X indicates analysis was conducted.

All samples were analyzed by SGS North America Inc, Alaska (RUSH turn-around time). NPDL #14-030.

[1] "Sandy Grav." indicates imported pad material (typically sandy gravel) or minor amounts of drill cuttings. "Tundra" indicates a fine gray or tan clay matrix.

[2] Waste confirmation samples 14PCC001SO and 14PCC002SO were analyzed for BTEX and RCRA Metals using the TCLP (EPA Method 1311) extraction method.

[3] Samples 14PCC022SO through 14PCC024SO were also used for wall confirmation samples since the sample locations were undisturbed and marked with pin flags.

BJ -Bryan Johnson
bgs - below ground surface
BTEX - Benzene, Toluene, Ethylbenzene, Total Xylenes
°C - degrees Celsius
DRO - diesel range organics
MB - Mike Boese
RCRA metals include Ag, As, Ba, Cd, Cr, Hg, Pb, and Se
RRO - residual range organics
TCLP - toxicity characteristic leaching procedure

Soil (and Tundra soil) samples were collected in 4 or 8 ounce jars and stored at 4°C

Table 8-2 - Waste Characterization and Equipment Blank Sample Results, Test Hole Charlie
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

			Sample ID	TCLP Limit[1]	14PCC001SO		14PCC002SO		14PCC043WQ	
			Location ID		C001NWC		C002NWC		C034NER	
			Collection Date		6/25/2014		6/25/2014		7/26/2014	
			Laboratory Report		1142724		1142724		1143385	
			Sample Type		Waste Characterization		Waste Characterization		Equipment Blank	
			Source		Drill Pad Soil		Drill Pad Soil		Equipment Blank[3]	
			Matrix		Soil (TCLP)[2]		Soil (TCLP)[2]		Water	
Analyte	**Method**	**Units**			**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**
Diesel Range Organics	AK102	mg/L	NA		-	-	-	-	0.295	[0.300] J,B
Residual Range Organics	AK103	mg/L	NA		-	-	-	-	0.234	[0.255] J
Arsenic	SW6020A	mg/L	5.0		ND	[0.125] QL	ND	[0.125] QL	-	-
Barium	SW6020A	mg/L	100.0		0.538	[0.075] QL	0.644	[0.075] QL	-	-
Cadmium	SW6020A	mg/L	1.0		ND	[0.05] QL	ND	[0.05] QL	-	-
Chromium	SW6020A	mg/L	5.0		ND	[0.1] QL	ND	[0.1] QL	-	-
Lead	SW6020A	mg/L	5.0		ND	[0.025] QL	0.0883	[0.025] QL	-	-
Mercury	SW6020A	mg/L	0.2		ND	[0.005] QL	ND	[0.005] QL	-	-
Selenium	SW6020A	mg/L	1.0		ND	[0.5] QL	ND	[0.5] QL	-	-
Silver	SW6020A	mg/L	5.0		ND	[0.05] QL	ND	[0.05] QL	-	-
Benzene	SW8260B	mg/L	0.5		ND	[0.010] QL	0.039	[0.010] QL	-	-
Ethylbenzene	SW8260B	mg/L	NA		ND	[0.025] QL	ND	[0.025] QL	-	-
Toluene	SW8260B	mg/L	NA		0.0265	[0.025] J,QL	0.109	[0.025] QL	-	-
Xylene, Isomers m & p	SW8260B	mg/L	NA		ND	[0.050] QL	0.0445	[0.050] J,QL	-	-
o-Xylene	SW8260B	mg/L	NA		ND	[0.025] QL	0.0205	[0.025] J,QL	-	-

[1] TCLP criteria for waste characterization are from Title 40 of the Code of Federal Regulations part 261.24.
[2] Waste characterization soil samples were TCLP extracted using Method 1311 prior to analysis. Consequently, results of TCLP samples are in mg/L.
[3] The equipment blank was taken from the driven probe used to collect select floor samples at Test Hole Charlie. All other samples were collected using disposable equipment.

LOD - limit of detection
mg/L - milligrams per liter
NA - not applicable
qual - data qualifier
TCLP - toxicity characteristic leaching procedure

Data Qualifiers:
B - analytes was also detected in a blank; result may be due to cross-contamination
J - result qualified as estimate because it is less than the limit of quantitation
ND - analyte not detected
Q - result considered an estimate (biased L-low; H-high; N-unknown) due to a quality control failure

Table 8-3 - DRO/RRO Results, Test Hole Charlie
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Sample ID			ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCC003SO	14PCC004SO	14PCC005SO	14PCC006SO	14PCC007SO	14PCC008SO	14PCC009SO	14PCC010SO	14PCC011SO	14PCC012SO	14PCC013SO	14PCC014SO	14PCC015SO
Test Hole Site					CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE
Location ID					C003NPE	C004NPE	C005DPE	C006NPE	C007NPE	C008NPE	C009NPE	C010NPE	C011DPE	C012NPE	CO13NPE	CO14NPE	CO15NPE
Description					Pre-Excavation	Pre-Excavation	Pre-Excavation	Pre-Excavation	Pre-Excavation	Pre-Excavation	Pre-Excavation	Pre-Excavation	Pre-Excavation	Tundra Delineation	Tundra Delineation	Tundra Delineation	Tundra Delineation
Collection Date					6/25/2014	6/25/2014	6/25/2014	6/25/2014	6/25/2014	6/25/2014	7/17/2014	7/17/2014	7/17/2014	7/17/2014	7/17/2014	7/17/2014	7/17/2014
Laboratory Report					1142724	1142724	1142724	1142724	1142724	1142724	1143274	1143274	1143274	1143274	1143274	1143274	1143274
Sample Type					Primary	Primary	Dup. (-C004SO)	Primary	Primary	Primary	Primary	Primary	Dup. (-C010SO)	Primary	Primary	Primary	Primary
Matrix					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	TUNDRA	TUNDRA	TUNDRA	TUNDRA
Analyte	**Method**	**Units**			**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**
Diesel Range Organics	AK102	mg/Kg	500	12,500	**658 [10.4] QL**	ND [10.3] QL	ND [10.3] QL	325 [10.4] QL	ND [10.2] QL	154 [11.4] QL	60.9 [11.9]	40.8 [10.3]	53.4 [10.3]	206 [12.6]	316 [12.9] QL	469 [60.5]	553 [68]
Residual Range Organics	AK103	mg/Kg	13,700	13,700	313 [10.4] QL	ND [10.3] QL	ND [10.3] QL	68.4 [10.4] QL	ND [10.2] QL	22.2 [11.4] J,QL	104 [11.9] QN	20.3 [10.3] J,QN	32.3 [10.3] QN	1030 [50] QN	1530 [51.5] QN,Q	2620 [60.5] QN	2840 [68] QN
Total Solids	A2540G	Percent	-	-	95.5 [0]	97.2 [0]	97.1 [0]	96.4 [0]	97.1 [0]	87.5 [0]	82.7 [0]	96 [0]	96.1 [0]	79.1 [0]	76.5 [0]	65.8 [0]	58 [0]

Sample ID			ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCC016SO	14PCC017SO	14PCC018SO	14PCC019SO	14PCC020SO	14PCC021SO	14PCC022SO	14PCC023SO	14PCC024SO	14PCC025SO	14PCC026SO	14PCC027SO	14PCC028SO
Test Hole Site					CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE
Location ID					CO16NPE	CO17NEG	CO18NEG	C019NEG	C020NEG	C021NEG	C022NEG	C023NEG	C024DEG	C025WEC	C026WEC	C027DEC	C028FEC
Description					Tundra Delineation	Excavation Guidance	Excavation Guidance	Excavation Guidance	Excavation Guidance	Excavation Guidance	Excavation Guidance	Excavation Guidance	Excavation Guidance	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Floor)
Collection Date					7/17/2014	7/19/2014	7/21/2014	7/22/2014	7/22/2014	7/22/2014	7/22/2014	7/22/2014	7/22/2014	7/23/2014	7/23/2014	7/23/2014	7/24/2014
Laboratory Report					1143274	1143274	1143274	1143333	1143333	1143333	1143333	1143333	1143333	1143374	1143374	1143374	1143374
Sample Type					Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Dup. (-C023SO)	Primary	Primary	Dup. (-C026SO)	Primary
Matrix					TUNDRA	Soil	TUNDRA	Soil	Soil	Soil	Soil	TUNDRA	TUNDRA	Soil	Soil	Soil	TUNDRA
Analyte	**Method**	**Units**			**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD]**	**Result [LOD]**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**
Diesel Range Organics	AK102	mg/Kg	500	12,500	93.4 [12.5]	***777 [41.6]***	109 [12.9]	***1740 [48.8]***	294 [54.5]	13.5 [11.1] J	428 [49.5]	4900 [187]	5360 [195]	154 [11.1] QN	ND [11]	ND [10.7]	**83300 [2190]**
Residual Range Organics	AK103	mg/Kg	13,700	13,700	359 [12.5] QN	114 [10.4] QN	485 [12.9] QN	733 [48.8]	1360 [54.5]	9.23 [11.1] J	708 [49.5]	5320 [187]	4630 [195]	11.1 [11.1] J	ND [11]	ND [10.7]	4420 [2190]
Total Solids	A2540G	Percent	-	-	79.1 [0]	95.5 [0]	77.1 [0]	81.7 [0]	73 [0]	89.8 [0]	79.7 [0]	53.4 [0]	50.6 [0]	89.9 [0]	90.3 [0]	91.1 [0]	86.5 [0]

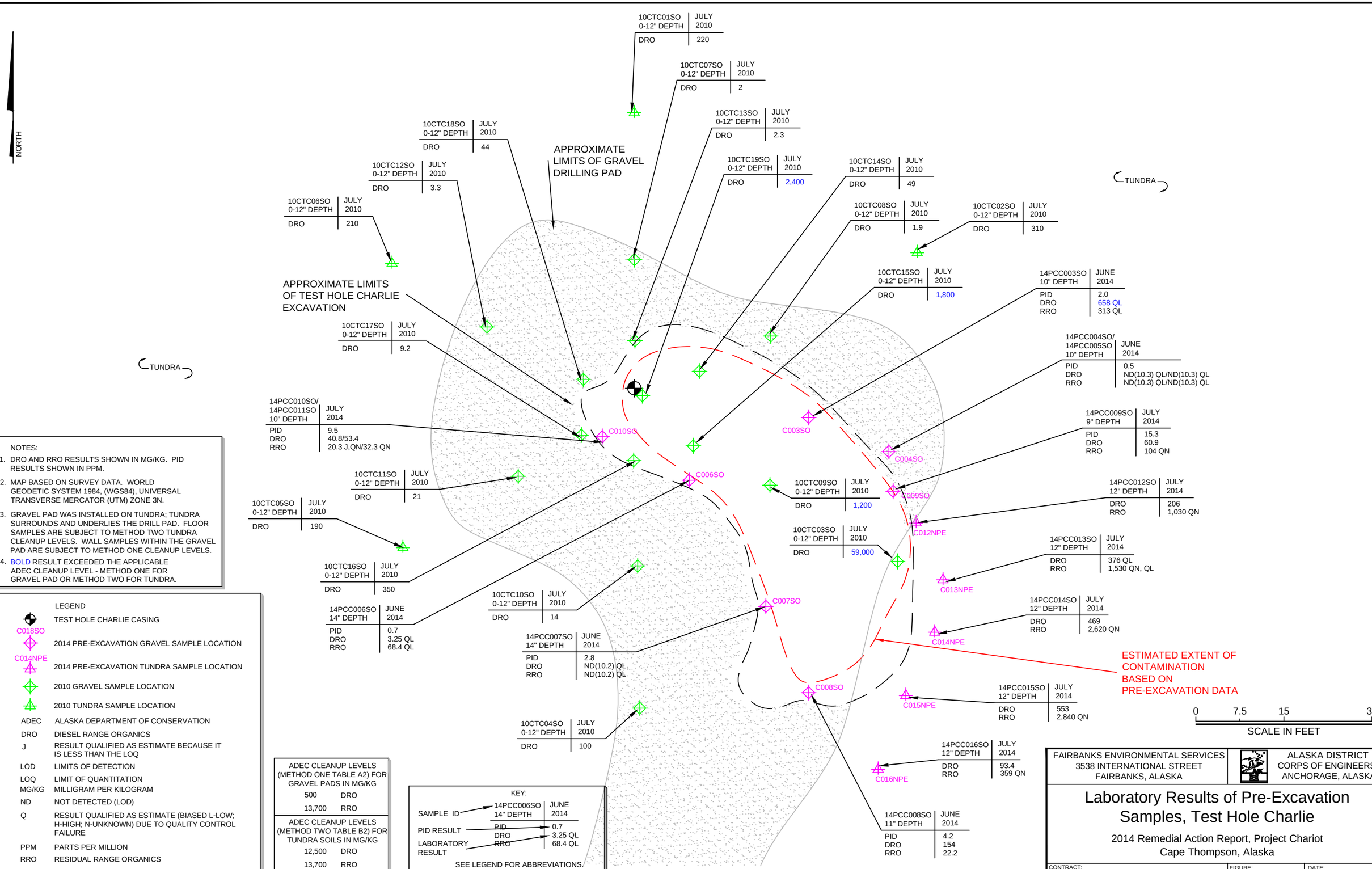
Sample ID			ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCC029SO	14PCC030SO	14PCC031SO	14PCC032SO	14PCC033SO	14PCC034SO	14PCC035SO	14PCC036SO	14PCC037SO	14PCC038SO	14PCC039SO	14PCC040SO	14PCC041SO
Test Hole Site					CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE
Location ID					C029FEC	C030FEC	C031FEC	C032FEC	C033FEC	C034NLF	C035NLF	C036FEC	C037FEC	C038FEC	C039FEC	C040FEC	C041FEC
Description					Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Pre-Load Footprint	Pre-Load Footprint	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)
Collection Date					7/24/2014	7/24/2014	7/24/2014	7/24/2014	7/24/2014	7/24/2014	7/24/2014	7/26/2014	7/26/2014	7/26/2014	7/26/2014	7/26/2014	7/26/2014
Laboratory Report					1143374	1143374	1143374	1143374	1143374	1143374	1143374	1143385	1143385	1143385	1143385	1143385	1143385
Sample Type					Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Matrix					TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	Soil	Soil	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA
Analyte	**Method**	**Units**			**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**
Diesel Range Organics	AK102	mg/Kg	500	12,500	4670 [264]	294 [11.6]	212 [48.3]	138 [48.5]	316 [48.5]	80.4 [11.4]	105 [10.8]	249 [13.3]	256 [11.8]	172 [12.9]	628 [49.4]	1400 [50.5]	447 [55]
Residual Range Organics	AK103	mg/Kg	13,700	13,700	790 [264]	1170 [46.4]	1190 [48.3]	725 [48.5]	1170 [48.5]	36.7 [11.4]	17.7 [10.8] J	195 [13.3]	161 [11.8]	363 [12.9]	429 [49.4]	499 [50.5]	906 [55] QN
Total Solids	A2540G	Percent	-	-	74.8 [0]	85.8 [0]	82.2 [0]	82.3 [0]	81.3 [0]	87.5 [0]	91.6 [0]	75.1 [0]	83.6 [0]	77.3 [0]	79.5 [0]	78.7 [0]	72.8 [0]

Sample ID			ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCC042SO	14PCC044SO	14PCC045SO	14PCC046SO	14PCC047SO	14PCC048SO	14PCC049SO	14PCC050SO	14PCC051SO	14PCC052SO	14PCC053SO	14PCC054SO	14PCC055SO
Test Hole Site					CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE	CHARLIE
Location ID					C042DEC	C044WEC	C045WEC	C046WEC	C047WEC	C048DEC	C049WEC	C050WEC	C051WEC	C052WEC	C053WEC	C054NLF	C055NLF
Description					Confirmation (Floor)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Post-Load Footprint	Post-Load Footprint
Collection Date					7/26/2014	7/26/2014	7/26/2014	7/26/2014	7/26/2014	7/26/2014	7/26/2014	7/26/2014	7/26/2014	7/26/2014	7/26/2014	7/25/2014	7/25/2014
Laboratory Report					1143385	1143385	1143385	1143385	1143385	1143385	1143385	1143385	1143385	1143385	1143385	1143385	1143385
Sample Type					Dup. (-C041SO)	Primary	Primary	Primary	Primary	Dup. (-C047SO)	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Matrix					TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Analyte	**Method**	**Units**			**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**
Diesel Range Organics	AK102	mg/Kg	500	12,500	586 [13.7]	9820 [310]	11800 [189]	2770 [163]	401 [12.9] QN	1480 [51.5] QN	90.9 [10.6]	38.7 [10.6]	37.1 [10.4]	82.4 [10]	25.8 [10.9]	56.8 [21.9]	38.9 [21.1] J
Residual Range Organics	AK103	mg/Kg	13,700	13,700	414 [13.7] QN	2350 [62]	4420 [189]	4170 [163]	207 [12.9] QN	571 [51.5] QN	33 [10.6]	13.5 [10.6] J	17.2 [10.4] J	18.2 [10] J	16.5 [10.9] J	ND [21.9]	ND [21.1]
Total Solids	A2540G	Percent	-	-	73.1 [0]	63.8 [0]	52.7 [0]	44.9 [0]	77.3 [0]	77.5 [0]	94 [0]	93.2 [0]	93.9 [0]	96.5 [0]	90.8 [0]	89.5 [0]	93.2 [0]

[1] ADEC Method One soil cleanup levels (from Title 18 Alaska Administrative Code Chapter 75.341) apply to imported gravel pad material.
ADEC Method Two soil cleanup levels apply to native tundra soils. Tundra cleanup levels and sample results are shaded in gray
Results that exceed applicable ADEC soil cleanup level and were from soil that was excavated and removed from the site (14PCC017SO and 14PCC019SP) are *ITALICIZED.*
The result that exceeded the applicable ADEC soil cleanup level and was from soil that was **NOT** excavated/removed from the site (14PCC028SO) is **BOLDED**.

ADEC - Alaska Department of Environmental Conservation
Dup. - Field duplicate (primary sample number in parenthesis)
LOD - limit of detection
LOQ - limit of quantitation
mg/Kg - milligrams per kilogram
qual - data qualifier

Data Qualifiers:
B - analyte was also detected in a blank; result may be due to cross-contamination
J - result qualified as estimate because it is less than the limit of quantitation
ND - analyte not detected
Q - result considered an estimate (biased L-low; H-high; N-unknown) due to a quality control failure



NOTES:

1. DRO AND RRO RESULTS SHOWN IN MG/KG. PID RESULTS SHOWN IN PPM.
2. MAP BASED ON SURVEY DATA. WORLD GEODETIC SYSTEM 1984, (WGS84), UNIVERSAL TRANSVERSE MERCATOR (UTM) ZONE 3N.
3. GRAVEL PAD WAS INSTALLED ON TUNDRA; TUNDRA SURROUNDS AND UNDERLIES THE DRILL PAD. FLOOR SAMPLES ARE SUBJECT TO METHOD TWO TUNDRA CLEANUP LEVELS. WALL SAMPLES WITHIN THE GRAVEL PAD ARE SUBJECT TO METHOD ONE CLEANUP LEVELS.
4. BOLD RESULT EXCEEDED THE APPLICABLE ADEC CLEANUP LEVEL - METHOD ONE FOR GRAVEL PAD OR METHOD TWO FOR TUNDRA.

LEGEND

	TEST HOLE CHARLIE CASING
C018SO	
	2014 PRE-EXCAVATION GRAVEL SAMPLE LOCATION
C014NPE	
	2014 PRE-EXCAVATION TUNDRA SAMPLE LOCATION
	2010 GRAVEL SAMPLE LOCATION
	2010 TUNDRA SAMPLE LOCATION
ADEC	ALASKA DEPARTMENT OF CONSERVATION
DRO	DIESEL RANGE ORGANICS
J	RESULT QUALIFIED AS ESTIMATE BECAUSE IT IS LESS THAN THE LOQ
LOD	LIMITS OF DETECTION
LOQ	LIMIT OF QUANTITATION
MG/KG	MILLIGRAM PER KILOGRAM
ND	NOT DETECTED (LOD)
Q	RESULT QUALIFIED AS ESTIMATE (BIASED L-LOW; H-HIGH; N-UNKNOWN) DUE TO QUALITY CONTROL FAILURE
PPM	PARTS PER MILLION
RRO	RESIDUAL RANGE ORGANICS

ADEC CLEANUP LEVELS (METHOD ONE TABLE A2) FOR GRAVEL PADS IN MG/KG	
500	DRO
13,700	RRO
ADEC CLEANUP LEVELS (METHOD TWO TABLE B2) FOR TUNDRA SOILS IN MG/KG	
12,500	DRO
13,700	RRO

KEY:

SAMPLE ID	14PCC006SO 14" DEPTH	JUNE 2014
PID RESULT	PID	0.7
LABORATORY RESULT	DRO	3.25 QL
	RRO	68.4 QL

SEE LEGEND FOR ABBREVIATIONS.

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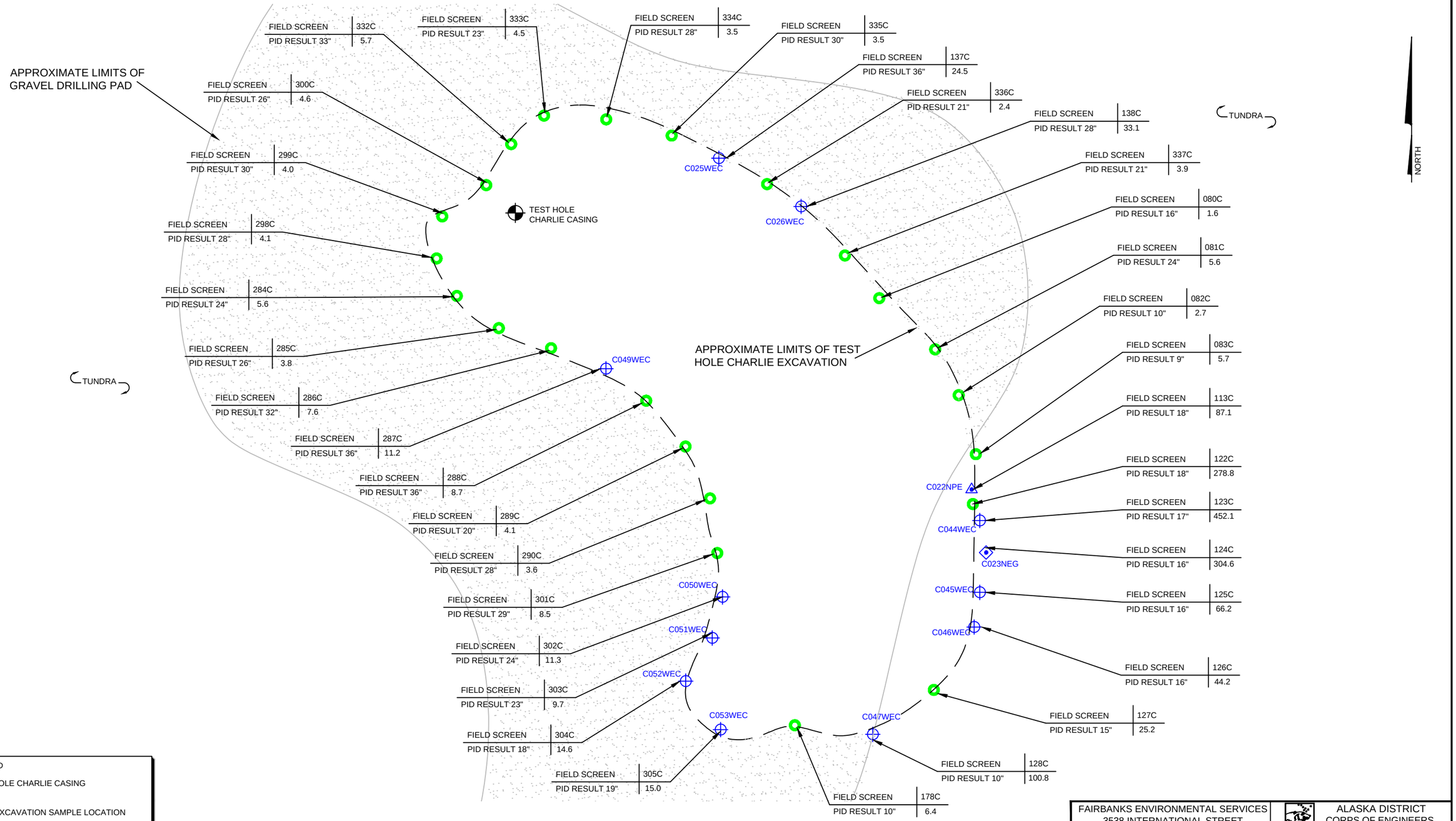
ANCHORAGE, ALASKA

Laboratory Results of Pre-Excavation Samples, Test Hole Charlie

2014 Remedial Action Report, Project Chariot
Cape Thompson, Alaska

CONTRACT:	FIGURE:	DATE:
W911KB-14-C-0002	8-1	3/15



LEGEND

- TEST HOLE CHARLIE CASING
- C001WEC — WALL EXCAVATION SAMPLE LOCATION
- C016NPE — PRE- EXCAVATION SAMPLE LOCATION
- C023NEG — EXCAVATION GUIDANCE SAMPLE LOCATION
- PID FIELD SCREENING LOCATION ONLY (NO LABORATORY SAMPLES COLLECTED FROM THIS LOCATION)
- PID — PHOTOIONIZATION DETECTOR
- PPM — PARTS PER MILLION

NOTES:

1. PID RESULTS SHOWN IN PPM
2. MAP BASED ON SURVEY DATA. WORLD GEODETIC SYSTEM 1984, (WGS84), UNIVERSAL TRANSVERSE MERCATOR (UTM) ZONE 3N.

KEY:

FIELD SCREEN 305C / PID RESULT 19" 15.0

SAMPLE ID

PID NUMBER

DEPTH BELOW GROUND SURFACE

PID RESULT IN PPM

SEE LEGEND FOR ABBREVIATIONS.

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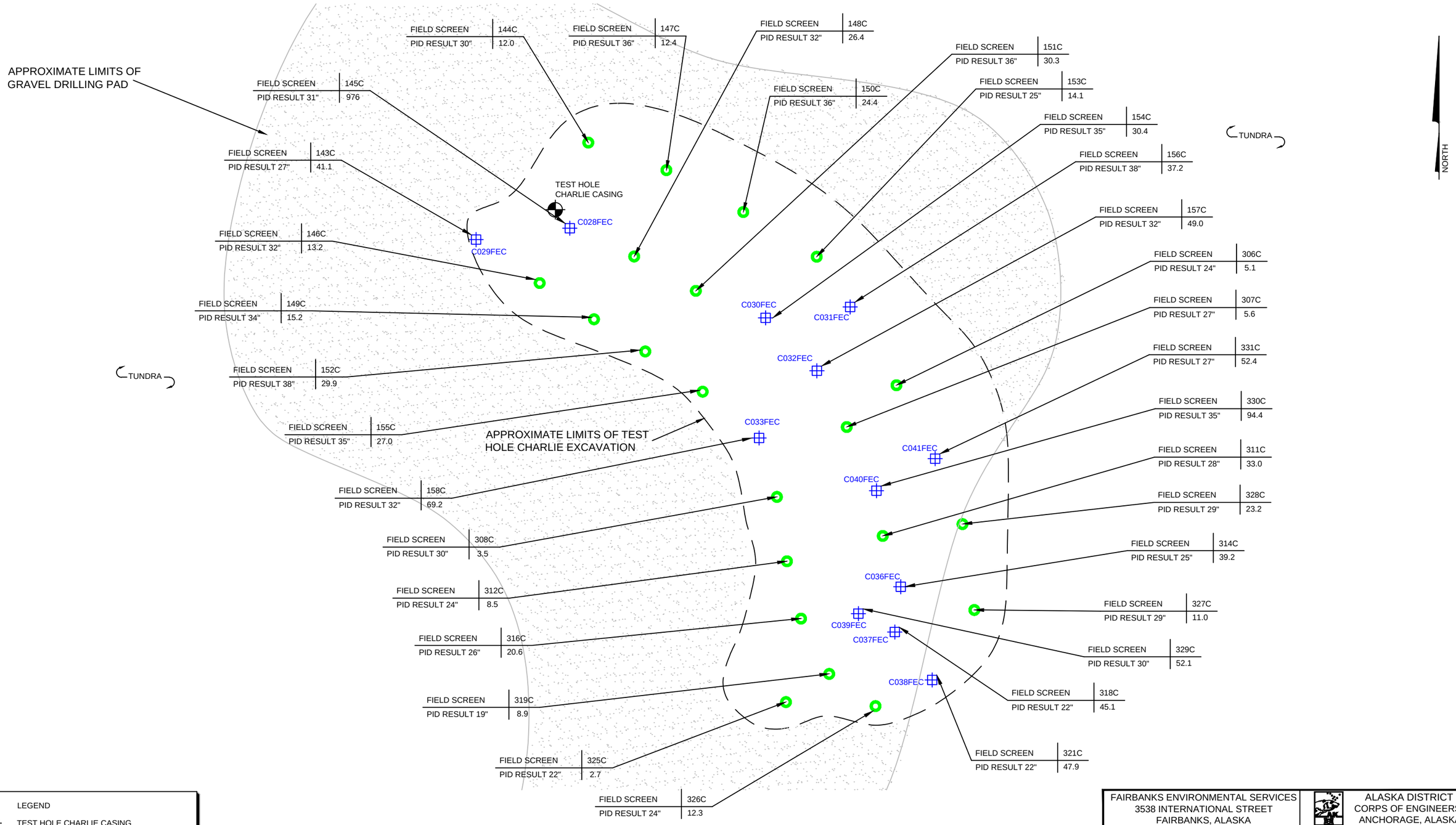
Field Screening Results of Wall Confirmation Samples, Test Hole Charlie

2014 Remedial Action Report, Project Chariot
Cape Thompson, Alaska

CONTRACT:	FIGURE:	DATE:
W911KB-14-C-0002	8-2	3/15



LEGEND

- TEST HOLE CHARLIE CASING
- C039FEC — FLOOR EXCAVATION SAMPLE LOCATION
- PID FIELD SCREENING LOCATION ONLY (NO LABORATORY SAMPLES COLLECTED FROM THIS LOCATION)
- PID — PHOTOIONIZATION DETECTOR
- PPM — PARTS PER MILLION

NOTES:

1. PID RESULTS SHOWN IN PPM
2. MAP BASED ON SURVEY DATA. WORLD GEODETIC SYSTEM 1984, (WGS84), UNIVERSAL TRANSVERSE MERCATOR (UTM) ZONE 3N.

KEY:

FIELD SCREEN 326C / PID RESULT 24" 12.3

SAMPLE ID; PID NUMBER; DEPTH BELOW GROUND SURFACE; PID RESULT IN PPM

SEE LEGEND FOR ABBREVIATIONS.

0 5 10 20

SCALE IN FEET

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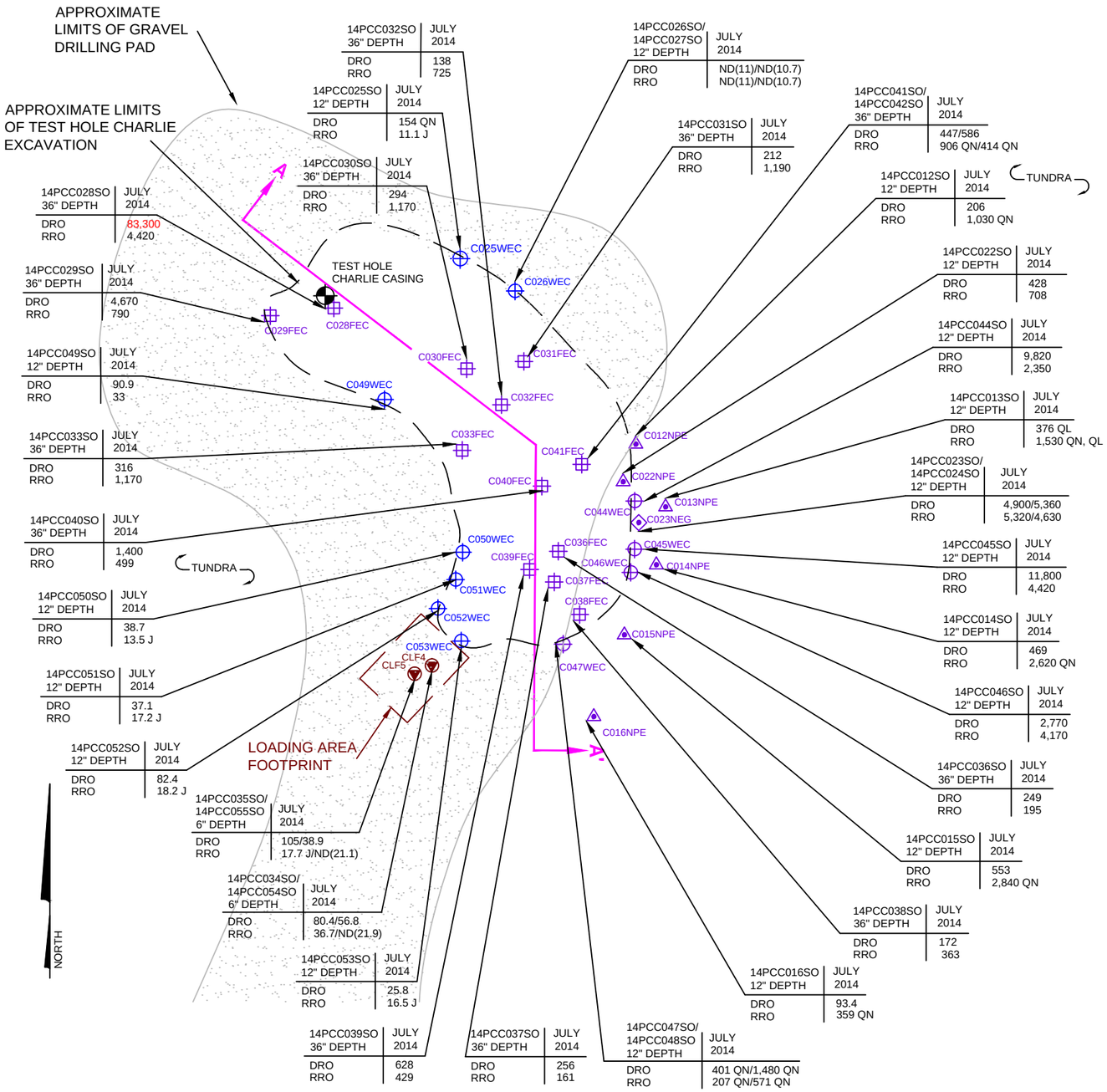
Field Screening Results of Floor Confirmation Samples, Test Hole Charlie

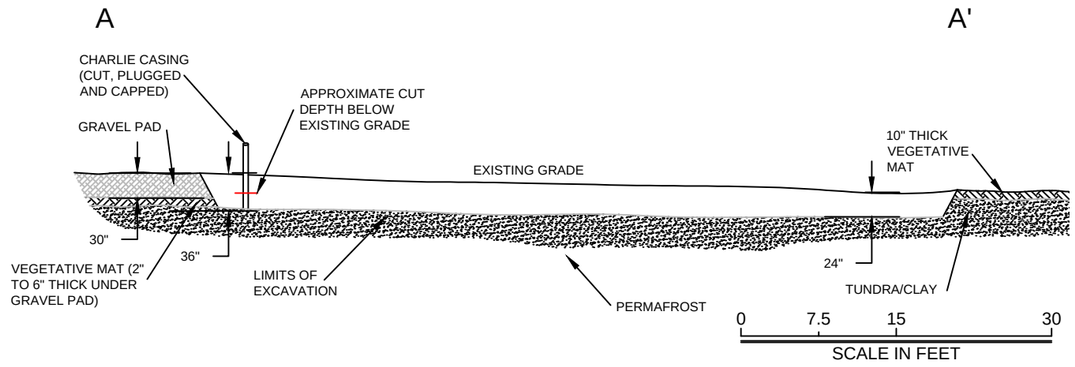
2014 Remedial Action Report, Project Chariot
Cape Thompson, Alaska

CONTRACT:	FIGURE:	DATE:
W911KB-14-C-0002	8-3	3/15

CHARLIE



Plan View of Test Hole Charlie Excavation



Cross Section A-A' of Test Hole Charlie Excavation

KEY:
SAMPLE ID: 14PCC015SO | JULY 2014 | 12" DEPTH | DRO 553
LABORATORY RESULT
SEE LEGEND FOR ABBREVIATIONS.

ADEC CLEANUP LEVELS (METHOD ONE TABLE A2) FOR GRAVEL PADS IN MG/KG	
500	DRO
13,700	RRO
ADEC CLEANUP LEVELS (METHOD TWO TABLE B2) FOR TUNDRA SOILS IN MG/KG	
12,500	DRO
13,700	RRO

NOTES:
1. DRO AND RRO RESULTS SHOWN IN MG/KG
2. MAP BASED ON SURVEY DATA. WORLD GEODETIC SYSTEM 1984, (WGS84), UNIVERSAL TRANSVERSE MERCATOR (UTM) ZONE 3N.
3. GRAVEL PAD WAS INSTALLED ON TUNDRA; TUNDRA SURROUNDS AND UNDERLIES THE DRILL PAD. FLOOR SAMPLES ARE SUBJECT TO METHOD TWO TUNDRA CLEANUP LEVELS. WALL SAMPLES WITHIN THE GRAVEL PAD ARE SUBJECT TO METHOD ONE CLEANUP LEVELS.
4. BOLD RESULT EXCEEDED THE ADEC METHOD TWO CLEANUP LEVEL

LEGEND

	TEST HOLE CHARLIE CASING
C049WEC	WALL (PAD) EXCAVATION SAMPLE LOCATION
C029FEC	FLOOR (TUNDRA) EXCAVATION SAMPLE LOCATION
C023NEG	EXCAVATION GUIDANCE (TUNDRA) SAMPLE LOCATION
C044WEC	WALL (TUNDRA) EXCAVATION SAMPLE LOCATION
C013NPE	PRE- EXCAVATION (TUNDRA) SAMPLE LOCATION
	LOADING AREA FOOTPRINT
CLF4	LOADING FOOTPRINT SAMPLE LOCATION
ADEC	ALASKA DEPARTMENT OF CONSERVATION
DRO	DIESEL RANGE ORGANICS
J	RESULT QUALIFIED AS ESTIMATE BECAUSE IT IS LESS THAN THE LOQ
LOD	LIMITS OF DETECTION
LOQ	LIMIT OF QUANTITATION
MG/KG	MILLIGRAM PER KILOGRAM
ND	NOT DETECTED (LOD)
Q	RESULT QUALIFIED AS ESTIMATE (BIASED L-LOW; H-HIGH; N-UNKNOWN) DUE TO QUALITY CONTROL FAILURE
RRO	RESIDUAL RANGE ORGANICS

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ALASKA DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

Laboratory Results of Confirmation Samples, Test Hole Charlie

2014 Remedial Action Report, Project Chariot
Cape Thompson, Alaska

CONTRACT:	FIGURE:	DATE:
W911KB-14-C-0002	8-4	3/15

CHARLIE

9.0 TEST HOLE DOG

The following section describes field screening and laboratory results associated with excavation activities at Test Hole Dog. The location of Test Hole Dog is shown on Figure 1-2. The section also describes quantities of soil removed and the results of soil confirmation samples collected from the limits of excavation. Pre-excavation results (including a summary of 2010 results) are shown on Figure 9-1, field screening results from the limits of excavation are shown on Figures 9-2 and 9-3, and laboratory confirmation results are shown on Figure 9-4.

A summary of laboratory samples collected from Test Hole Dog is presented as Table 9-1. DRO/RRO results from soil samples collected from the Test Hole Dog site are included in Table 9-2.

9.1 Site Description and Applicable Soil Cleanup Levels

The Test Hole Dog drill pad is situated in a tundra field east of Ogotoruk Creek. The site is located the furthest north of all the drill pads (furthest away from the Chukchi Sea) and is accessed by traversing an earthen ridge to the north, and then taking a 2,000 foot gravel access road west to the drill pad. The drill pad is surrounded by tundra.

The drill pad is constructed of approximately 2 feet of sandy gravel installed over tundra. The gravel material is consistent with material identified in a borrow area located 2,000 feet east of the pad. Records indicate that chilled diesel was used in the construction of the Test Hole Dog soil boring in an effort to reduce sidewall sloughing (USGS, 1961a).

ADEC Method One soil cleanup levels are applicable to the sandy gravels used to construct the access road and drill pad. ADEC Method Two soil cleanup levels are applicable to the tundra clay material underlying and surrounding the drill pad.

9.2 Casing Decommissioning and Debris Removal

Water was pumped from the Test Hole Dog casing on July 18, 2014. The water was treated and discharged onsite as discussed in Section 4.4.1.

The area surrounding the test hole casing was excavated to an approximate depth of 3 feet bgs, and the steel casing was cut below grade and capped on August 6, 2014. A 55-gallon drum over-casing was also removed from the site, and wood crib debris was burned. Several sections of abandoned Marsden mat were retrieved from the north side of the drill pad and were used to repair the access road to Test Hole Dog. See Section 4.4 for additional information regarding decommissioning of the casing.

9.3 Pre-Excavation Delineation of Surface Soils

On July 20, 2014, five tundra samples and a field duplicate (14PCD002SO through 14PCB007SO) were collected for laboratory analysis (DRO and RRO) to evaluate impacts to tundra on the east and southeastern sides of the Test Hole Dog pad. Upon digging several test holes, it was noted that the gravel pad extended 10 feet further to the east than previously identified; the area was covered in thick vegetation and was previously presumed to be tundra. One sample (14PCD001SO) was collected near the beginning of the access road from a gravel matrix. The "road" sample was below ADEC Method One cleanup levels and all of the tundra samples were below ADEC Method Two soil cleanup levels indicating that the eastern and southeastern boundaries of POL-contaminated soil had been identified. Pre-excavation sample results, including results from tundra samples, are shown on Figure 9-1 and Table 9-2.

Surface soils in the drill pad were delineated on July 20 and 23, 2014. Approximately 70 shallow test pits and 50 PID samples were screened and the rough limits of POL-contaminated soil were marked with spray paint. In addition, permafrost was estimated to be 2 feet deep based on the extent that one of the test pits could be dug using hand tools. The estimated dimensions of the area to be excavated were 40 feet by 50 feet based on preliminary delineation results.

Two test pits were installed in the Test Hole Dog drill pad on August 6, 2014 using a mini-excavator. The purpose of the test pits was to further evaluate the depth to permafrost and to evaluate the potential for clean over-burden. One test pit was installed immediately east of the Test Hole Dog casing and the second test pit was installed near the eastern edge of the drill pad. Both pits indicated gravel was installed over clay; however, there was no compressed vegetation layer like there was at Test Hole Charlie. Approximately 2 feet of gravel was measured near the casing and 1 foot of gravel was measured near the edge of the pad, and permafrost was measured at approximately 2 feet deep in both test pits. PID and laboratory results from test pits indicated that soil contamination was primarily confined to the gravel layer and that there was no clean overburden material. Test pit results are summarized in Tables 9-3 and 9-4, and laboratory results from Test Pit 2 (no laboratory samples were collected from the first test pit) are shown on Figure 9-1.

Table 9-3 Test Pit 1 Results, Test Hole Dog

Depth (feet)	Soil Description	Applicable ADEC Soil Cleanup Level	PID Result (ppm)
0-1	Gravel Pad	Method One	176.9
1-2	Gravel Pad		108.8
2-3	Tundra Clay	Method Two	53.1

Test Pit 1 was installed immediately northeast of the Test Hole Dog casing. Permafrost was encountered at 22 inches bgs.

Table 9-4 Test Pit 2 Results, Test Hole Dog

Depth (feet)	Soil Description and Sample Number	Applicable ADEC Soil Cleanup Level	PID Result (ppm)	DRO Result (mg/Kg)	RRO Result (mg/Kg)
0-1	Gravel Pad 14PCD011SO	Method One	118.7	3,990	112
1-2	Tundra Clay 14PCD012SO	Method Two	76.6	20.8 J	72.8
2-3	Tundra Clay 14PCD013SO		109.3	1,050	737

Test Pit 2 was installed on the eastern edge of the Test Hole Dog drill pad. Permafrost was encountered 24 inches bgs.
J – Analyte is considered an estimate because it was detected below the LOQ.

9.4 Excavation Activities

Excavation activities at Test Hole Dog commenced August 14, 2014. The Bobcat E50 mini-excavator was used to excavate POL-contaminated soil at the site. Based on pre-excavation test pit results (Section 9.2) and the applicability of ADEC Method Two cleanup levels for the tundra soil beneath the drill pad, the excavation at Test Hole Dog was curtailed just below the gravel layer. The average depth of the Test Hole Dog excavation was approximately 2 feet bgs, but it was slightly shallower on the eastern and southern edges along the section of tundra. Approximately 250 PID samples were field screened at this site (Table B3 in Appendix B).

Excavation activities started at the far eastern edge in the tundra so that the excavator could be positioned on the drill pad and minimize impact to the surrounding tundra field. As noted during the pre-excavation delineation (see Section 9.3), the gravel material used to create the drill pad extended further to the east and southeast than previously thought. The area was covered in heavy vegetation and was presumed to be comprised solely of tundra soils. As a result, only a minor amount of tundra soil (approximately 0 to 2 feet beyond the edge of the gravel) required excavation on the eastern edge.

The excavation progressed further west and then north towards the test hole casing August 14 and 16, 2014. On August 17 through 19, 2014, the northern and northeastern sections of the excavation were completed. Filled super sacks were temporarily staged on the western edge of the drill pad pending arrival of the mud mats at the end of the day on August 17, 2014. The mud mats were installed over the top of the access road on August 18, 2014, and allowed for the safe transport of the sacks from the site to the East Staging Area.

Elevated PID readings were measured in sidewall screening samples collected from gravel pad material on August 19 (190D = 62.6 ppm; 192D = 214.9 ppm; 194D = 69.0 ppm), so additional soil was removed from three locations (north, northwest, and the southwest) on August 20, 2014. A considerable amount of POL-contaminated soil was excavated from the northwest (120 square feet) and southwest (375 square feet) locations. The excavated soil was “stockpiled”

inside the excavation and was subsequently loaded into super sacks and removed from the Test Hole Dog site on August 20 and 21, 2014.

The final Test Hole Dog excavation was approximately 45 feet by 50 feet (2,300 square feet) and extended approximately 2 to 3 feet beyond the drill pad into tundra on the southeast side. The entire floor was excavated to permafrost; depth of the excavation was approximately 24 inches within the pad footprint. A cross section of the excavation is shown on Figure 9-4.

9.5 Confirmation Sample Results and ADEC Approval

Confirmation samples were collected for DRO/RRO analysis from limits of the Test Hole Dog excavation on August 19 and 20, 2014. Screening and laboratory samples were collected from freshly exposed soils as described in Sections 5.1.2 and 5.2.1 respectively. A total of 26 screening samples were collected from the walls of the excavation, and laboratory confirmation samples were submitted from the locations with the 16 highest PID results. A total of 31 screening samples were collected from the floor of the excavation, and laboratory confirmation samples were submitted from the locations with the 14 highest PID results. The sample frequencies meet or exceed ADEC requirements for the roughly 2,300 square foot excavation.

PID readings from the limits of the excavation are shown on Figures 9-2 and 9-3, and laboratory confirmation sample results are presented in Table 9-2 and are shown on Figure 9-4. ADEC Method Two soil cleanup levels apply to the entire floor of the excavation and a section of the eastern and southern sidewalls (tundra matrix samples are shown in purple on Figure 9-4). Method One cleanup levels apply to the gravel sidewalls (gravely pad samples are shown in blue on Figure 9-4) within the pad boundaries.

Confirmation sample results were all below applicable soil cleanup levels at the Test Hole Dog site. However, the DRO result in sample 14PCD050SO (473 mg/Kg) was just below the Method One cleanup level of 500 mg/Kg and may have been low biased due to matrix effects and low MSD recovery (19%; however, MS recovery was acceptable at 78%); in an abundance of caution, this wall confirmation sample may be considered as potentially exceeding the cleanup level for project decision making.

DRO concentrations from samples representing remaining soils ranged from non-detect to 473 mg/Kg in pad soils (cleanup level of 500 mg/Kg), and from 18.3 mg/Kg to 3,110 mg/Kg in tundra soils (cleanup level of 12,500 mg/Kg). The highest RRO concentration (1,200 mg/Kg) was detected in pre-excavation tundra sample 14PCD002SO and was well below the 13,700 mg/Kg cleanup level. DRO and RRO concentration ranges in confirmation samples representing remaining soils are presented in Table 9-5.

Table 9-5 DRO/RRO Concentrations Remaining in Soil, Test Hole Dog

Soil Type	Location	Applicable ADEC Soil Cleanup Level (mg/Kg)	Range of DRO Concentrations (mg/Kg)	Range of RRO Concentrations (mg/Kg)[3]
Pad	Sidewall	Method One: DRO=500 RRO=13,700	ND – 473	21.4 – 116 [2]
Tundra	Floor	Method Two: DRO=12,500 RRO=13,700	43.8 - 4,420	72 - 472
	Sidewall[1]		18.3 - 3,110	91.8 - 1,200

[1] Pre-excavation samples were also included in the tundra sidewall evaluation since the locations were marked/surveyed and the samples are representative of sidewall conditions (see locations D002NPE and D005NPE on Figure 9-4).
[2] The highest RRO concentration detected in the gravel pad soil (143 mg/Kg) was from pre-loading area footprint sample 14PCD019SO.
ND – not detected

On August 25, 2014, based on preliminary confirmation sample results and other field data, ADEC agreed that the Test Hole Dog excavation could be backfilled and re-contoured. Email correspondence with ADEC regarding closure of the Test Hole Dog excavation is included in Appendix E.

9.6 Loading Area Footprint Results

Three 10-foot by 10-foot loading areas were established outside of the Test Hole Dog excavation where the excavated soils were loaded into super sacks (shown in Figure 9-4). The majority of super sacks were filled inside the excavation at Test Hole Dog to reduce the potential for spreading contamination. However, due to muddy conditions inside the excavation, some POL-contaminated soil was loaded into super sacks outside of the excavation footprint. A tarp was used to catch spilled soil during the super sack filling process which was later added to sacks.

One loading area footprint sample was collected from the center of each of the three loading areas (DLF1 through DLF3) for laboratory analysis. Loading area footprint samples were collected at depths of approximately 6 inches bgs from freshly exposed soils (as per Section 5.2.1) and analyzed for DRO and RRO. Samples were collected prior to and following excavation activities to assess impacts, if any, in the areas where soil was loaded. Pin flags were used to mark the footprint sample locations shown on Figure 9-4.

Pre- and Post-loading area footprint results were all below ADEC Method One soil cleanup levels as shown in Table 9-6.

Table 9-6 Loading Area Footprint Sample Results, Test Hole Dog

Location	Sample Number (Pre/Post)	DRO (mg/Kg)		RRO (mg/Kg)	
		Pre	Post	Pre	Post
ADEC Soil Cleanup Level[1]		500		13,700	
DLF1	14PCD017SO/14PCD057SO[2]	138	43.9	108	131
DLF2	14PCD019SO/14PCD059SO	19.4 J	25.1	143	62.5
DLF3	14PCD022SO/14PCD060SO	ND(11.8)	60.7	15.3 J	236

[1] ADEC Method One cleanup levels apply to drill pad soils.

[2] Sample 14PCD058SO is a field duplicate of sample 14PCD057SO. The highest duplicate results were reported.

Pre-Loading Area footprint samples were collected on August 15, 16, and 19, 2014, and post-loading area footprint samples were collected August 21, 2014, after excavation activities were completed.

J – Analyte is considered an estimate because it was detected below the LOQ.

9.7 Re-Contouring, Re-Vegetation, and Survey

The Test Hole Dog excavation was backfilled and re-contoured to match the surrounding area on August 25, 2014. The remaining pad material was used to fill the excavation opening. The top of the capped test hole casing was buried approximately 1 foot below the finished ground surface.

The site was re-seeded and fertilized on August 26, 2014, and the mud mats were removed from the Test Hole Dog access road. Pin flags representing confirmation sample locations and the location of the former casing were placed based upon swing tie measurements. The pin flag locations were surveyed on August 27, 2014.

Table 9-1 - Summary of Laboratory Samples, Test Hole Dog
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Sample ID	Location ID	Description	Depth (inches bgs)	Sample Date	Sample Time	Sampler	Sample Type	Sample Matrix[1]	DRO/RRO (AK102/ AK103)	Cooler Number	Sample Data Group
TEST HOLE DOG											
14PCD001SO	D001NPE	Tundra Delineation	8"	7/20/2014	1615	MB/BJ	Primary	Sandy Gravel	X	72201	1143274
14PCD002SO	D002NPE	Tundra Delineation	8"	7/20/2014	1620	MB/BJ	Primary	Tundra	X	72201	1143274
14PCD003SO	D003DPE	Tundra Delineation	8"	7/20/2014	1630	MB/BJ	Dup (-D002SO)	Tundra	X	72201	1143274
14PCD004SO	D004NPE	Tundra Delineation	8"	7/20/2014	1640	MB/BJ	Primary	Tundra	X	72201	1143274
14PCD005SO	D005NPE	Tundra Delineation	8"	7/20/2014	1645	MB/BJ	Primary	Tundra	X	72201	1143274
14PCD006SO	D006NPE	Tundra Delineation	8"	7/20/2014	1650	MB/BJ	Primary	Tundra	X	72201	1143274
14PCD007SO	D007NPE	Tundra Delineation	8"	7/20/2014	1700	MB/BJ	Primary	Tundra	X	72201	1143274
14PCD008SO	D008NPE	Pre-Excavation Delineation	8"	7/20/2014	1800	BJ	Primary	Sandy Gravel	X	72201	1143274
14PCD009SO	D009NPE	Pre-Excavation Delineation	8"	7/23/2014	1525	MB	Primary	Sandy Gravel	X	72501	1143374
14PCD010SO	D010NPE	Pre-Excavation Delineation	8"	7/23/2014	1645	MB	Primary	Sandy Gravel	X	72501	1143374
14PCD011SO	D011NPE	Pre-Excavation Delineation	8"	8/6/2014	1050	MB	Primary	Sandy Gravel	X	80601	1143634
14PCD012SO	D012NPE	Pre-Excavation Delineation	18"	8/6/2014	1055	MB	Primary	Tundra	X	80601	1143634
14PCD013SO	D013NPE	Pre-Excavation Delineation	30"	8/6/2014	1100	MB	Primary	Tundra	X	80601	1143634
14PCD014SO	D014NEG	Excavation Guidance	8"	8/14/2014	1415	MB	Primary	Sandy Gravel	X	81701	1143866
14PCD015SO	D015NEG	Excavation Guidance	24"	8/14/2014	1510	MB	Primary	Sandy Gravel	X	81701	1143866
14PCD016SO	D016DEG	Excavation Guidance	24"	8/14/2014	1515	MB	Dup (-D015SO)	Sandy Gravel	X	81701	1143866
14PCD017SO	D017NLF	Pre-Loading Footprint (DLF1)	6"	8/15/2014	900	MB	Primary	Sandy Gravel	X	81701	1143866
14PCD018SO	D018NEG	Excavation Guidance	12"	8/15/2014	950	MB	Primary	Sandy Gravel	X	81701	1143866
14PCD019SO	D019NLF	Pre-Loading Footprint (DLF2)	6"	8/16/2014	1515	MB	Primary	Sandy Gravel	X	81701	1143866
14PCD020SO	D020NEG	Excavation Guidance	12"	8/17/2014	1400	MB	Primary	Sandy Gravel	X	82001	1143960
14PCD021SO	D021NEG	Excavation Guidance	12"	8/18/2014	1130	MB	Primary	Sandy Gravel	X	82001	1143960
14PCD022SO	D022NLF	Pre-Loading Footprint (DLF3)	6"	8/19/2014	945	MB/BJ	Primary	Sandy Gravel	X	82001	1143960
14PCD023SO	D023NEG	Excavation Guidance	12"	8/19/2014	1030	MB/BJ	Primary	Sandy Gravel	X	82001	1143960
14PCD024SO	D024FEC	Confirmation (Floor)	24"	8/19/2014	1540	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD025SO	D025FEC	Confirmation (Floor)	24"	8/19/2014	1541	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD026SO	D026FEC	Confirmation (Floor)	24"	8/19/2014	1545	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD027SO	D027FEC	Confirmation (Floor)	30"	8/19/2014	1600	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD028SO	D028FEC	Confirmation (Floor)	24"	8/19/2014	1544	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD029SO	D029FEC	Confirmation (Floor)	24"	8/19/2014	1547	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD030SO	D030FEC	Confirmation (Floor)	24"	8/19/2014	1550	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD031SO	D031FEC	Confirmation (Floor)	24"	8/19/2014	1552	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD032SO	D032FEC	Confirmation (Floor)	24"	8/19/2014	1555	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD033SO	D033DEC	Confirmation (Floor)	24"	8/19/2014	1557	MB/BJ	Dup (-D032SO)	Tundra	X	82001	1143960
14PCD034SO	D034FEC	Confirmation (Floor)	24"	8/19/2014	1604	MB/BJ	Primary	Tundra	X	82001	1143960

Table 9-1 - Summary of Laboratory Samples, Test Hole Dog
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Sample ID	Location ID	Description	Depth (inches bgs)	Sample Date	Sample Time	Sampler	Sample Type	Sample Matrix[1]	DRO/RRO (AK102/ AK103)	Cooler Number	Sample Data Group
14PCD035SO	D035WEC	Confirmation (Wall)	12"	8/19/2014	2010	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD036SO	D036WEC	Confirmation (Wall)	12"	8/19/2014	2000	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD037SO	D037DEC	Confirmation (Wall)	12"	8/19/2014	2005	MB/BJ	Dup (-D036SO)	Tundra	X	82001	1143960
14PCD038SO	D038WEC	Confirmation (Wall)	12"	8/19/2014	2015	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD039SO	D039WEC	Confirmation (Wall)	12"	8/19/2014	2020	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD040SO	D040WEC	Confirmation (Wall)	12"	8/19/2014	2025	MB/BJ	Primary	Sandy Gravel	X	82001	1143960
14PCD041SO	D041FEC	Confirmation (Floor)	24"	8/20/2014	1000	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD042SO	D042FEC	Confirmation (Floor)	24"	8/20/2014	1100	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD043SO	D043FEC	Confirmation (Floor)	24"	8/20/2014	1125	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD044SO	D044FEC	Confirmation (Floor)	24"	8/20/2014	1135	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD045SO	D045DEC	Confirmation (Floor)	24"	8/20/2014	1140	MB/BJ	Dup (-D044SO)	Tundra	X	82001	1143960
14PCD046SO	D046WEC	Confirmation (Wall)	12"	8/20/2014	1200	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD047SO	D047WEC	Confirmation (Wall)	12"	8/20/2014	1210	MB/BJ	Primary	Sandy Gravel	X	82001	1143960
14PCD048SO	D048WEC	Confirmation (Wall)	12"	8/20/2014	1215	MB/BJ	Primary	Tundra	X	82001	1143960
14PCD049SO	D049DEC	Confirmation (Wall)	12"	8/20/2014	1220	MB/BJ	Dup (-D048SO)	Tundra	X	82001	1143960
14PCD050SO	D050WEC	Confirmation (Wall)	12"	8/20/2014	1240	MB/BJ	Primary	Sandy Gravel	X	82001	1143960
14PCD051SO	D051WEC	Confirmation (Wall)	12"	8/20/2014	1020	MB/BJ	Primary	Sandy Gravel	X	82001	1143960
14PCD052SO	D052WEC	Confirmation (Wall)	12"	8/20/2014	1250	MB/BJ	Primary	Sandy Gravel	X	82001	1143960
14PCD053SO	D053WEC	Confirmation (Wall)	12"	8/20/2014	1245	MB/BJ	Primary	Sandy Gravel	X	82001	1143960
14PCD054SO	D054WEC	Confirmation (Wall)	12"	8/20/2014	1235	MB/BJ	Primary	Sandy Gravel	X	82001	1143960
14PCD055SO	D055WEC	Confirmation (Wall)	12"	8/20/2014	1230	MB/BJ	Primary	Sandy Gravel	X	82001	1143960
14PCD056SO	D056WEC	Confirmation (Wall)	12"	8/20/2014	1210	MB/BJ	Primary	Sandy Gravel	X	82001	1143960
14PCD057SO	D057NLF	Post-Loading Footprint (DLF1)	6"	8/21/2014	1620	MB/BJ	Primary	Sandy Gravel	X	82301	1144035
14PCD058SO	D058DLF	Post-Loading Footprint (DLF1)	6"	8/21/2014	1625	MB/BJ	Dup (-D057SO)	Sandy Gravel	X	82301	1144035
14PCD059SO	D059NLF	Post-Loading Footprint (DLF2)	6"	8/21/2014	1630	MB/BJ	Primary	Sandy Gravel	X	82301	1144035
14PCD060SO	D060NLF	Post-Loading Footprint (DLF3)	6"	8/21/2014	1635	MB/BJ	Primary	Sandy Gravel	X	82301	1144035

X indicates analysis was conducted.

All samples were analyzed by SGS North America Inc, Alaska (RUSH turn-around time). NPDL #14-030.

[1] "Sandy Grav." indicates imported pad material (typically sandy gravel) or minor amounts of drill cuttings. "Tundra" indicates a fine gray or tan clay matrix.

BJ -Bryan Johnson

bgs - below ground surface

°C - degrees Celsius

DRO - diesel range organics

MB - Mike Boese

RRO - residual range organics

Soil (and Tundra soil) samples were collected in 4 or 8 ounce jars and stored at 4 °C

Table 9-2 - DRO / RRO Results, Test Hole Dog
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Sample ID			ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCD001SO	14PCD002SO	14PCD003SO	14PCD004SO	14PCD005SO	14PCD006SO	14PCD007SO	14PCD008SO	14PCD009SO	14PCD010SO	14PCD011SO	14PCD012SO	14PCD013SO	14PCD014SO	14PCD015SO
Test Hole Site					DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG
Location ID					D001NPE	D002NPE	D003NPE	D004NPE	D005NPE	D006NPE	D007NPE	D008NPE	D009NPE	D010NPE	D011NPE	D012NPE	D013NPE	D014NEG	D015NEG
Description					Tundra Delineation	Tundra Delineation	Tundra Delineation	Tundra Delineation	Tundra Delineation	Tundra Delineation	Tundra Delineation	Pre-Excavation	Pre-Excavation	Pre-Excavation	Pre-Excavation	Pre-Excavation	Pre-Excavation	Excavation Guidance	Excavation Guidance
Collection Date					7/20/2014	7/20/2014	7/20/2014	7/20/2014	7/20/2014	7/20/2014	7/20/2014	7/20/2014	7/23/2014	7/23/2014	8/6/2014	8/6/2014	8/6/2014	8/14/2014	8/14/2014
Laboratory Report					1143274	1143274	1143274	1143274	1143274	1143274	1143274	1143274	1143274	1143274	1143274	1143274	1143274	1143866	1143866
Sample Type					Primary	Primary	Dup (-D002SO)	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Matrix					Soil	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	Soil	Soil	Soil	Soil	TUNDRA	TUNDRA	Soil	Soil
Analyte	**Method**	**Units**			**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**
Diesel Range Organics	AK102	mg/Kg	500	12,500	68.1 [11.8]	757 [15.3] QN	377 [15.4] QN	598 [15.4]	3110 [63]	249 [15.5]	155 [16.6]	397 [11.9]	***615 [118]***	259 [11.7]	***3990 [117]***	20.8 [14.4] J	1050 [57.5]	***1880 [44.1] QH***	***776 [58]***
Residual Range Organics	AK103	mg/Kg	13,700	13,700	110 [11.8]	1200 [61] QN	476 [15.4] QN	525 [15.4]	1020 [15.8]	869 [15.5]	1040 [16.6]	181 [11.9]	2960 [118]	43.2 [11.7]	112 [11.7]	72.8 [14.4]	737 [57.5]	73.9 [44.1] J	833 [58]
Total Solids	A2540G	Percent	-	-	84.2 [0]	65.1 [0]	65.2 [0]	64.9 [0]	63.2 [0]	63.3 [0]	60 [0]	83.1 [0]	82.8 [0]	85.6 [0]	85.5 [0]	69.4 [0]	69.2 [0]	90.4 [0]	68.1 [0]

Sample ID			ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCD016SO	14PCD017SO	14PCD018SO	14PCD019SO	14PCD020SO	14PCD021SO	14PCD022SO	14PCD023SO	14PCD024SO	14PCD025SO	14PCD026SO	14PCD027SO	14PCD028SO	14PCD029SO	14PCD030SO
Test Hole Site					DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG
Location ID					D016DEG	D017NLF	D018NEG	D019NLF	D020NEG	D021NEG	D022NLF	D023NEG	D024FEC	D025FEC	D026FEC	D027FEC	D028FEC	D029FEC	D030FEC
Description					Excavation Guidance	Pre-Loading Footprint	Excavation Guidance	Pre-Loading Footprint	Excavation Guidance	Excavation Guidance	Pre-Loading Footprint	Excavation Guidance	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)
Collection Date					8/14/2014	8/15/2014	8/15/2014	8/16/2014	8/17/2014	8/18/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014
Laboratory Report					1143866	1143866	1143866	1143866	1143960	1143960	1143960	1143960	1143960	1143960	1143960	1143960	1143960	1143960	1143960
Sample Type					Dup. (-D015SO)	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
Matrix					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA
Analyte	**Method**	**Units**			**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**
Diesel Range Organics	AK102	mg/Kg	500	12,500	***850 [58]***	138 [11.4]	***7590 [227]***	19.4 [11.6] J	***688 [11.8]***	67.5 [11.3]	ND [11.8]	234 [10.9]	183 [15]	202 [15.1]	4420 [149]	2670 [58.5]	61.7 [13.9]	46.8 [13.4]	1260 [57]
Residual Range Organics	AK103	mg/Kg	13,700	13,700	851 [58]	108 [11.4]	149 [45.4]	143 [11.6]	48.1 [11.8]	40.3 [11.3]	15.3 [11.8] J	36.1 [10.9]	111 [15]	72 [15.1]	436 [59.5]	160 [58.5]	291 [13.9]	173 [13.4]	326 [57]
Total Solids	A2540G	Percent	-	-	68 [0]	87.4 [0]	87.5 [0]	86 [0]	84.6 [0]	88.5 [0]	85 [0]	90.7 [0]	66.2 [0]	66.4 [0]	66.9 [0]	67.5 [0]	71.1 [0]	74.6 [0]	69 [0]

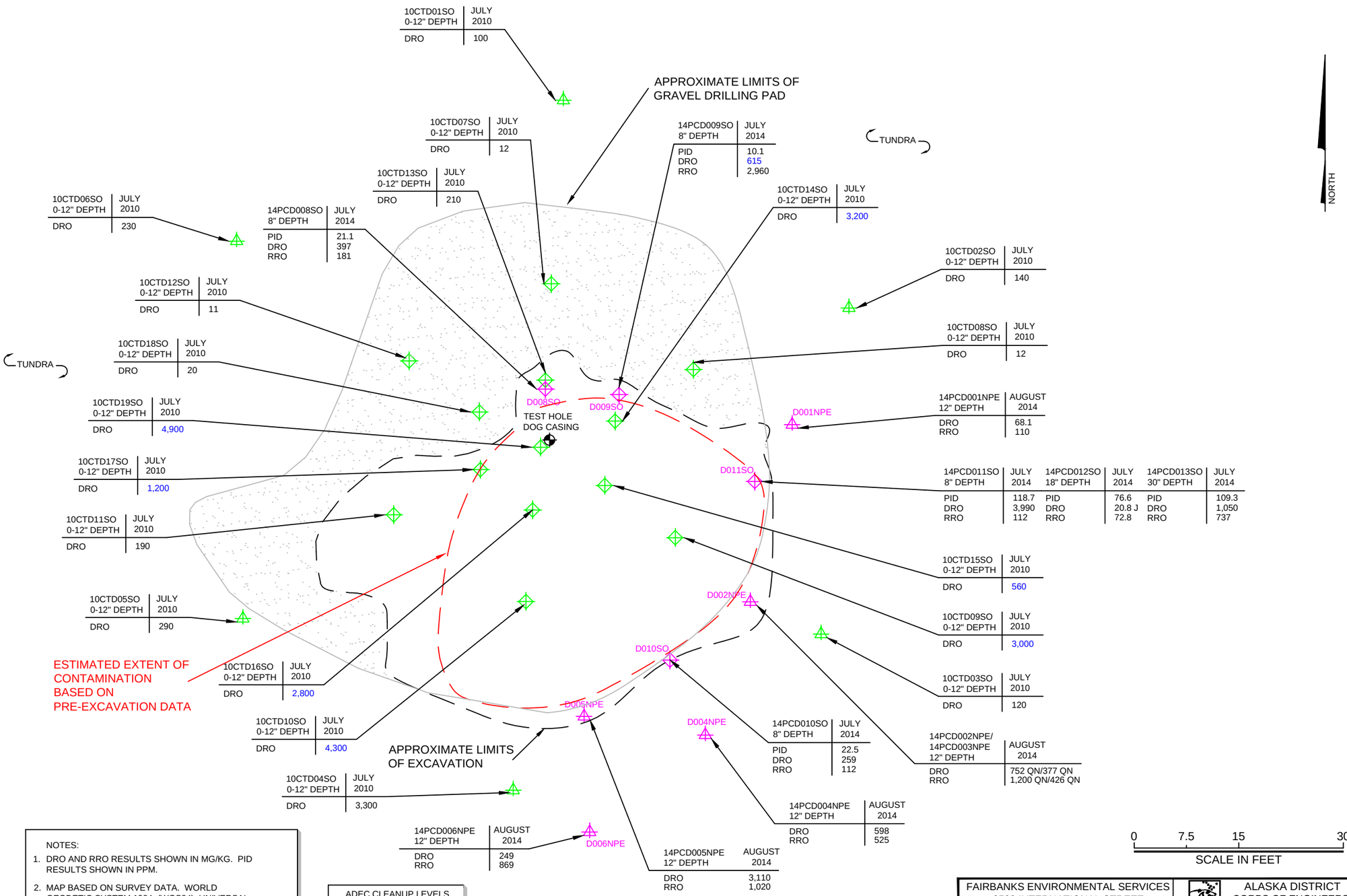
Sample ID			ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCD031SO	14PCD032SO	14PCD033SO	14PCD034SO	14PCD035SO	14PCD036SO	14PCD037SO	14PCD038SO	14PCD039SO	14PCD040SO	14PCD041SO	14PCD042SO	14PCD043SO	14PCD044SO	14PCD045SO
Test Hole Site					DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG
Location ID					D031FEC	D032FEC	D033DEC	D034FEC	D035WEC	D036WEC	D037DEC	D038WEC	D039WEC	D040WEC	D041FEC	D042FEC	D043FEC	D044FEC	D045DEC
Description					Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)
Collection Date					8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/19/2014	8/20/2014	8/20/2014	8/20/2014	8/20/2014	8/20/2014
Laboratory Report					1143960	1143960	1143960	1143960	1143960	1143960	1143960	1143960	1143960	1143960	1143960	1143960	1143960	1143960	1143960
Sample Type					Primary	Primary	Dup. (-D032SO)	Primary	Primary	Primary	Primary	Dup. (-D036SO)	Primary	Primary	Primary	Primary	Primary	Primary	Dup. (-D044SO)
Matrix					TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	Soil	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA
Analyte	**Method**	**Units**			**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD]**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**
Diesel Range Organics	AK102	mg/Kg	500	12,500	72.3 [14.4]	53.4 [13.9] QN	169 [13.9] QN	210 [13.8]	45.1 [14.9]	1980 [61.5] QN	999 [15.4] QN	129 [16]	23.1 [14.3] J	131 [11.1]	58.7 [13.9]	938 [58]	43.8 [13.4]	82.5 [13.4]	103 [13.4]
Residual Range Organics	AK103	mg/Kg	13,700	13,700	222 [14.4]	202 [13.9] QN	417 [13.9] QN	472 [13.8]	172 [14.9]	398 [61.5]	384 [15.4]	140 [16]	121 [14.3]	62.7 [11.1]	275 [13.9]	535 [58]	297 [13.4]	593 [13.4]	721 [13.4]
Total Solids	A2540G	Percent	-	-	69.6 [0]	71.6 [0]	71.6 [0]	71.3 [0]	67.3 [0]	64.3 [0]	64 [0]	62 [0]	69.8 [0]	89 [0]	71.8 [0]	69 [0]	73.4 [0]	74.3 [0]	73.8 [0]

Sample ID			ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCD046SO	14PCD047SO	14PCD048SO	14PCD049SO	14PCD050SO	14PCD051SO	14PCD052SO	14PCD053SO	14PCD054SO	14PCD055SO	14PCD056SO	14PCD057SO	14PCD058SO	14PCD059SO	14PCD060SO
Test Hole Site					DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG	DOG
Location ID					D046WEC	D047WEC	D048WEC	D049DEC	D050WEC	D051WEC	D052WEC	D053WEC	D054WEC	D055WEC	D056WEC	D057NLF	D058DLF	D059NLF	D060NLF
Description					Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Post-Loading Footprint	Post-Loading Footprint	Post-Loading Footprint	Post-Loading Footprint
Collection Date					8/20/2014	8/20/2014	8/20/2014	8/20/2014	8/20/2014	8/20/2014	8/20/2014	8/20/2014	8/20/2014	8/20/2014	8/20/2014	8/21/2014	8/21/2014	8/21/2014	8/21/2014
Laboratory Report					1143960	1143960	1143960	1143960	1143960	1143960	1143960	1143960	1143960	1143960	1143960	1144035	1144035	1144035	1144035
Sample Type					Primary	Primary	Primary	Dup (-D048SO)	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Dup (-D057SO)	Primary	Primary
Matrix					TUNDRA	Soil	TUNDRA	TUNDRA	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Analyte	**Method**	**Units**			**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**
Diesel Range Organics	AK102	mg/Kg	500	12,500	32.7 [15.3]	95.3 [15.4]	18.3 [14.8] J,QN	60.1 [14.7] QN	473 [11] ML	42 [11.4]	ND [10.7]	7.98 [11.3] J	41 [11.3]	21.7 [11] J	ND [11.2]	41.3 [11.1]	43.9 [10.9]	25.1 [10.8]	60.7 [11.9]
Residual Range Organics	AK103	mg/Kg	13,700	13,700	194 [15.3]	155 [15.4]	91.8 [14.8] QN	253 [14.7] QN	116 [11]	60.6 [11.4]	21.4 [10.7]	36 [11.3]	58.2 [11.3]	88.5 [11]	39.9 [11.2]	131 [11.1]	117 [10.9]	62.5 [10.8]	236 [11.9]
Total Solids	A2540G	Percent	-	-	65.2 [0]	64.4 [0]	67.5 [0]	67.3 [0]	89.7 [0]	87.3 [0]	92.7 [0]	88.2 [0]	87.6 [0]	89.8 [0]	88.7 [0]	89.7 [0]	91 [0]	90.8 [0]	82.6 [0]

[1] ADEC Method One soil cleanup levels (from Title 18 Alaska Administrative Code Chapter 75.341) apply to imported gravel pad material.
ADEC Method Two soil cleanup levels apply to native tundra soils. Tundra cleanup levels and sample results are shaded in gray.
Results that exceed applicable ADEC soil cleanup level and were from soil that was excavated/removed from the site (14PCD009SO, 14PCD011SO, 14PCD014SO, 14PCD015SO, 14PCD016SO, 14PCD018SO, and 14PCD020SO) are *ITALICIZED.*

ADEC - Alaska Department of Environmental Conservation
Dup. - Field duplicate (primary sample number in parenthesis)
LOD - limit of detection
LOQ - limit of quantitation
mg/Kg - milligrams per kilogram
qual - data qualifier

Data Qualifiers:
B - analyte was also detected in a blank; result may be due to cross-contamination
J - result qualified as estimate because it is less than the limit of quantitation
ND - analyte not detected
Q - result considered an estimate (biased L-low; H-high; N-unknown) due to a quality control failure



LEGEND

- TEST HOLE DOG CASING
- C018SO — 2014 PRE-EXCAVATION GRAVEL SAMPLE LOCATION
- C014NPE — 2014 PRE-EXCAVATION TUNDRA SAMPLE LOCATION
- 2010 GRAVEL SAMPLE LOCATION
- 2010 TUNDRA SAMPLE LOCATION

ADEC	ALASKA DEPARTMENT OF CONSERVATION
DRO	DIESEL RANGE ORGANICS
J	RESULT QUALIFIED AS ESTIMATE BECAUSE IT IS LESS THAN THE LOQ
LOD	LIMITS OF DETECTION
LOQ	LIMIT OF QUANTITATION
MG/KG	MILLIGRAMS PER KILOGRAM
ND	NOT DETECTED (LOD)
PPM	PARTS PER MILLION
RRO	RESIDUAL RANGE ORGANICS

NOTES:

1. DRO AND RRO RESULTS SHOWN IN MG/KG. PID RESULTS SHOWN IN PPM.
2. MAP BASED ON SURVEY DATA. WORLD GEODETIC SYSTEM 1984, (WGS84), UNIVERSAL TRANSVERSE MERCATOR (UTM) ZONE 3N.
3. GRAVEL PAD WAS INSTALLED ON TUNDRA; TUNDRA SURROUNDS AND UNDERLIES THE DRILL PAD. FLOOR SAMPLES ARE SUBJECT TO METHOD TWO TUNDRA CLEANUP LEVELS. WALL SAMPLES WITHIN THE GRAVEL PAD ARE SUBJECT TO METHOD ONE CLEANUP LEVELS.
4. BOLD RESULT EXCEEDED THE APPLICABLE ADEC CLEANUP LEVEL - METHOD ONE FOR GRAVEL PAD OR METHOD TWO FOR TUNDRA.

ADEC CLEANUP LEVELS (METHOD ONE TABLE A2) FOR GRAVEL PADS IN MG/KG	
500	DRO
13,700	RRO
ADEC CLEANUP LEVELS (METHOD TWO TABLE B2) FOR TUNDRA SOILS IN MG/KG	
12,500	DRO
13,700	RRO

KEY:

SAMPLE ID → 10CTD09SO | JULY 2010 | DRO | 3,000 ← LABORATORY RESULT

SEE LEGEND FOR ABBREVIATIONS.

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Laboratory Results of Pre-Excavation Samples, Test Hole Dog

2014 Remedial Action Report, Project Chariot
Cape Thompson, Alaska

CONTRACT:	FIGURE:	DATE:
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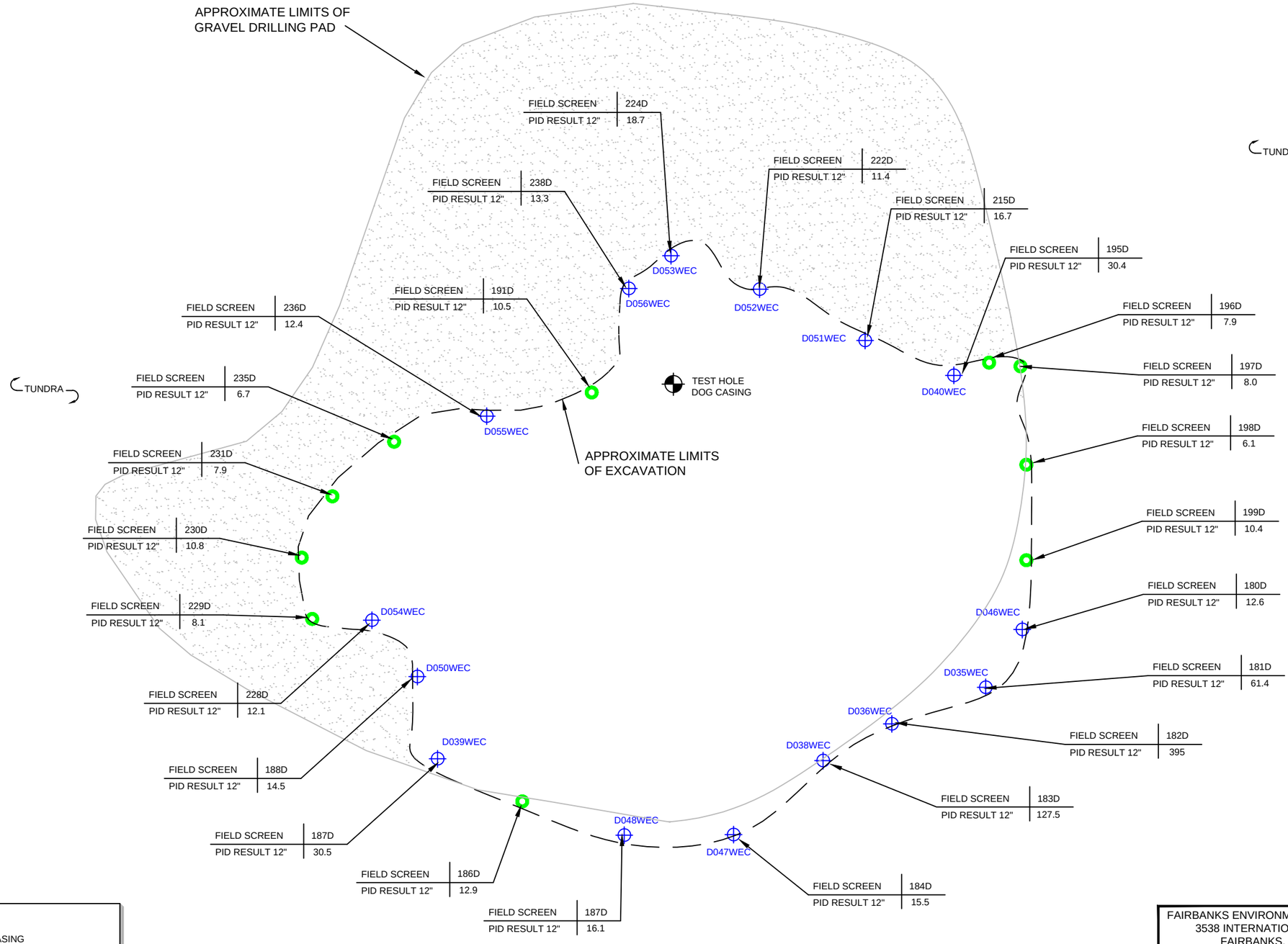

LEGEND

- TEST HOLE DOG CASING
- D039WEC — WALL EXCAVATION SAMPLE LOCATION
- PID FIELD SCREENING LOCATION ONLY (NO LABORATORY SAMPLES COLLECTED FROM THIS LOCATION)
- PID — PHOTOIONIZATION DETECTOR
- PPM — PARTS PER MILLION

NOTES:

1. PID RESULTS SHOWN IN PPM
2. MAP BASED ON SURVEY DATA. WORLD GEODETIC SYSTEM 1984, (WGS84), UNIVERSAL TRANSVERSE MERCATOR (UTM) ZONE 3N.

KEY:

FIELD SCREEN | 187D
PID RESULT 12" | 16.1

SAMPLE ID → 187D; PID NUMBER → 16.1
DEPTH BELOW GROUND SURFACE → PID RESULT IN PPM

SEE LEGEND FOR ABBREVIATIONS.

0 5 10 20
SCALE IN FEET

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Field Screening Results of Wall Confirmation Samples, Test Hole Dog

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Cape Thompson, Alaska

CONTRACT:	FIGURE:	DATE:
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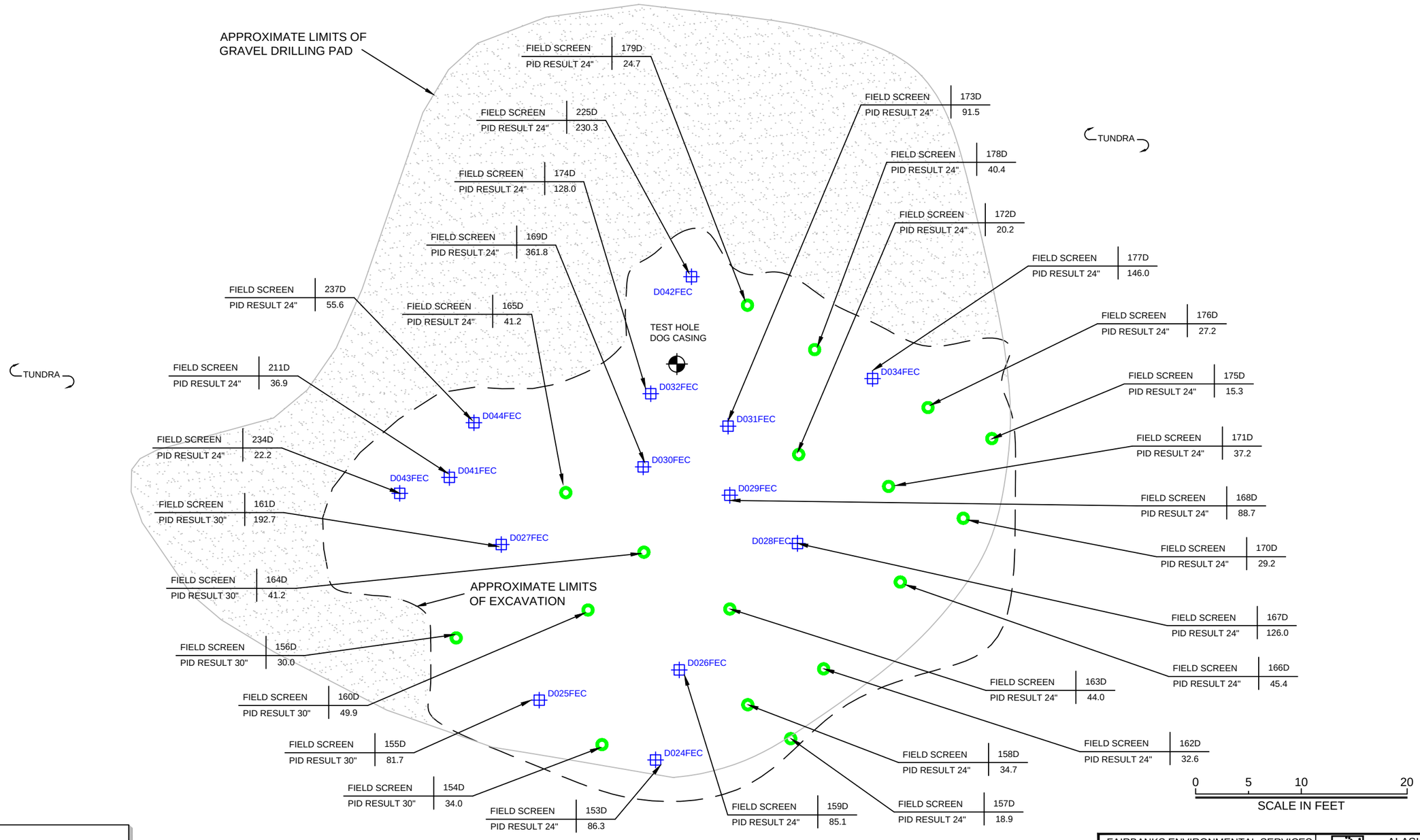
DOG



LEGEND

- TEST HOLE DOG CASING
- D032FEC — FLOOR EXCAVATION SAMPLE
- PID FIELD SCREENING LOCATION ONLY (NO LABORATORY SAMPLES COLLECTED FROM THIS LOCATION)
- PID — PHOTOIONIZATION DETECTOR
- PPM — PARTS PER MILLION

NOTES:

1. PID RESULTS SHOWN IN PPM
2. MAP BASED ON SURVEY DATA. WORLD GEODETIC SYSTEM 1984, (WGS84), UNIVERSAL TRANSVERSE MERCATOR (UTM) ZONE 3N.

KEY:

FIELD SCREEN | 153D
PID RESULT 24" | 86.3

SAMPLE ID — 153D
PID NUMBER — 86.3
DEPTH BELOW GROUND SURFACE — 24"
PID RESULT IN PPM — 86.3

SEE LEGEND FOR ABBREVIATIONS.

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Field Screening Results of Floor Confirmation Samples, Test Hole Dog

2014 Remedial Action Report, Project Chariot
Cape Thompson, Alaska

CONTRACT:	FIGURE:	DATE:
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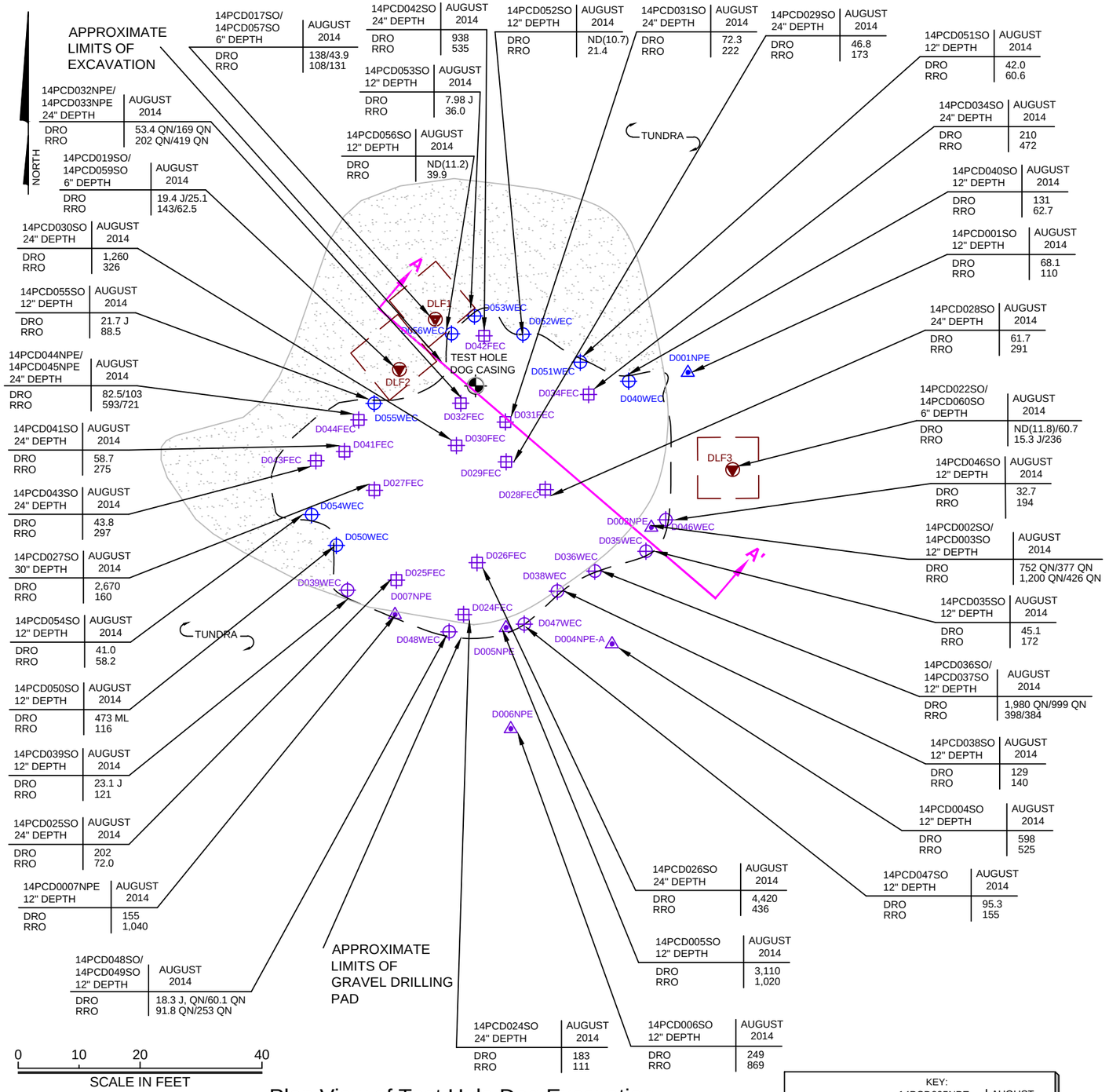
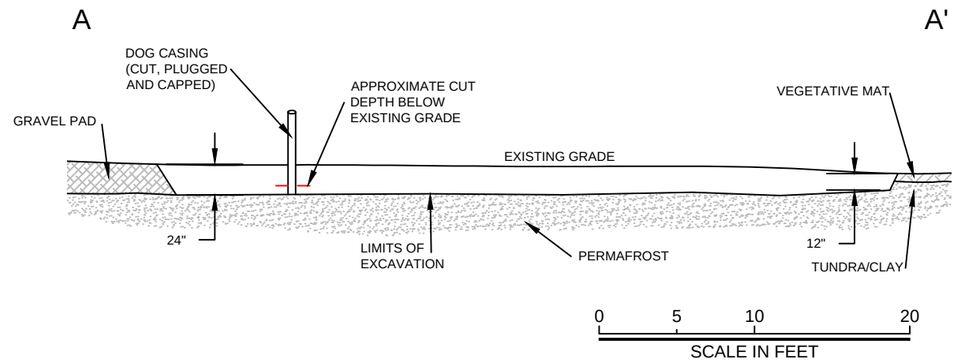
DOG



Plan View of Test Hole Dog Excavation



Cross Section A-A' of Test Hole Dog Excavation

LEGEND

- TEST HOLE DOG CASING
- D055WEC — WALL (PAD) EXCAVATION SAMPLE LOCATION
- D025FEC — FLOOR (TUNDRA) EXCAVATION SAMPLE LOCATION
- D039WEC — WALL (TUNDRA) EXCAVATION SAMPLE LOCATION
- D005NPE — PRE- EXCAVATION (TUNDRA) SAMPLE LOCATION
- D001NPE — PRE- EXCAVATION (PAD) SAMPLE LOCATION
- DLF3 — LOADING FOOTPRINT SAMPLE LOCATION
- LOADING AREA FOOTPRINT

ADEC	ALASKA DEPARTMENT OF CONSERVATION
DRO	DIESEL RANGE ORGANICS
J	RESULT QUALIFIED AS ESTIMATE BECAUSE IT IS LESS THAN THE LOQ
LOD	LIMITS OF DETECTION
LOQ	LIMIT OF QUANTITATION
M	RESULT QUALIFIED AS ESTIMATE (BIASED L-LOW; H-HIGH; N-UNKNOWN) DUE TO MATRIX ISSUES
MG/KG	MILLIGRAM PER KILOGRAM
ND	NOT DETECTED (LOD)
Q	RESULT QUALIFIED AS ESTIMATE (BIASED L-LOW; H-HIGH; N-UNKNOWN) DUE TO QUALITY CONTROL FAILURE
RRO	RESIDUAL RANGE ORGANICS

ADEC CLEANUP LEVELS (METHOD ONE TABLE A2) FOR GRAVEL PADS IN MG/KG	
500	DRO
13,700	RRO
ADEC CLEANUP LEVELS (METHOD TWO TABLE B2) FOR TUNDRA SOILS IN MG/KG	
12,500	DRO
13,700	RRO

KEY:
14PCD005NPE 12" DEPTH AUGUST 2014 DRO 3,110 RRO 1,020
SAMPLE ID
LABORATORY RESULT
SEE LEGEND FOR ABBREVIATIONS.

NOTES:
1. DRO AND RRO RESULTS SHOWN IN MG/KG
2. MAP BASED ON SURVEY DATA. WORLD GEODETIC SYSTEM 1984, (WGS84), UNIVERSAL TRANSVERSE MERCATOR (UTM) ZONE 3N.
3. GRAVEL PAD WAS INSTALLED ON TUNDRA; TUNDRA SURROUNDS AND UNDERLIES THE DRILL PAD. FLOOR SAMPLES ARE SUBJECT TO METHOD TWO TUNDRA CLEANUP LEVELS. WALL SAMPLES WITHIN THE GRAVEL PAD ARE SUBJECT TO METHOD ONE CLEANUP LEVELS.

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Laboratory Results of Confirmation Samples, Test Hole Dog

2014 Remedial Action Report, Project Chariot
Cape Thompson, Alaska

CONTRACT:	FIGURE:	DATE:
W911KB-14-C-0002	9-4	3/15

DOG

10.0 TEST HOLE X-1

The following section describes field screening and laboratory results associated with excavation activities at Test Hole X-1. The location of Test Hole X-1 is shown on Figure 1-2. The section also describes quantities of soil removed and the results of soil confirmation samples collected from the limits of excavation. Pre-excavation results (including a summary of 2010 results) are shown on Figure 10-1, field screening results from the limits of excavation are shown on Figures 10-2 and 10-3, and laboratory confirmation results are shown on Figure 10-4.

A summary of laboratory samples is presented as Table 10-1. DRO/RRO results for soil samples collected from the Test Hole X-1 site are included in Table 10-2. Results for the additional analyses performed on soil samples at the request of ADEC are presented in Table 10-3.

10.1 Site Description and Applicable Cleanup Levels

The Test Hole X-1 site is situated on a sparsely vegetated hilltop located near the east landing strip. The soil in the area is competent, and no material was imported to construct a drill pad. ADEC Method Two soil cleanup levels are applicable to this site; however, ADEC Method One soil cleanup levels were applied to a small quantity of overburden soil that was stockpiled.

POL-contamination identified at the Test Hole X-1 site had a more pungent odor than the other drill pads, and soil contamination was identified at greater depths than the other sites. Soil at the Test Hole X-1 site was excavated to permafrost approximately 5.5 feet bgs.

Based on historical records and observations made during the 2014 excavation activities, it is unknown if the site was actually used for the purposes of installing a soil test hole. Historical records indicate that the area may have been used as drum storage for diesel and kerosene and that a trench had previously been installed (USACE, 1988). These records corroborate field observations which include the following:

- The casing construction was different than the other sites. The casing was only 6 feet long and was not installed into permafrost. In addition, the diameter of the pipe (11 inches) was significantly larger than the other POL-contaminated drill sites (3.5 inches).
- Soil contamination seemed to have a much sharper odor than at the drill sites. The sharp odor may have been from a contaminant other than diesel (i.e., kerosene, for example).
- There was evidence uncovered during excavation of debris at depths which indicate a trench or test pit may have been installed at the site; the highest laboratory and PID screening results were from previously “disturbed” locations (mudstone soil was “mixed” and various debris [soil screen, rubber glove, rubber gaskets, wooden boards, and etc.] was encountered). Screening and laboratory results tended to decrease when undisturbed sidewall soils were encountered.

10.2 Casing Decommissioning

Water was not identified in the casing at the Test Hole X-1 site. The Test Hole X-1 casing, which measured 6 feet in length, was removed during excavation activities.

10.3 Pre-Excavation Delineation of Surface Soils

On July 20, 2014, the extent of POL-contamination in surface soils was estimated using PID screening techniques. A total of 32 (001X through 032X) soil samples were collected, warmed in a water bath, and screened. The results of the pre-excavation delineation indicated the area with dimensions of 16-feet by 18-feet (less than 300 square feet) near the test hole casing was impacted by POL-contamination.

10.4 Excavation Activities

Excavation activities at Test Hole X-1 commenced July 26, 2014. The Bobcat E50 mini-excavator was used to excavate POL-contaminated soil at the site. The excavation was guided by PID screening samples; approximately 400 PID screening samples were collected from this site and results are included in Table B4 (Appendix B). Laboratory samples collected for PID correlation purposes during the initial excavation activities indicated that 250-300 ppm screening results correlated roughly to a DRO concentration of 10,000 mg/Kg; therefore, after August 1, 2014, excavation activities proceeded at Test Hole X-1 until PID readings less than 250 ppm were obtained in sidewalls.

Excavation activities were started near the casing. Soil contamination at Test Hole X-1 had a much more pungent odor and extended deeper than the other drill sites; POL-contaminated soil was excavated to permafrost at approximately 5.5 feet bgs. Grain size tended to increase with depth; cobbles measuring up to 10 inches in diameter were identified in the excavation and partially decomposed mudstone (undisturbed) comprised some of the sidewalls. A cross-section profile of the Test Hole X-1 excavation is shown on Figure 10-4. POL-contaminated soil also extended well beyond the 300-square foot area that was estimated on July 20, 2014, with impacted surface soil identified prior to excavation (Section 10.3). Attempts to segregate clean overburden material were partially successful (see Section 10.7).

The size of the excavation increased in all directions as PID readings over 1,000 ppm were routinely measured in screening samples. The excavation progressed further south on July 29, 2014; to the northwest between July 30 and August 2, 2014; to the southeast August 2 and 3, 2014; and to the south on August 4, 2014. The final limits of excavation at Test Hole X-1 were completed on August 4.

A total of 267.4 tons of POL-contaminated soil from Test Hole X-1 was loaded into 217 super sacks. The filled super sacks were loaded into trailers and transported to the East Staging Area where they were weighed and loaded into connex boxes for transport.

The final Test Hole X-1 excavation was approximately 30 feet by 50 feet and had an area of roughly 1,100 square feet. The entire floor was excavated to permafrost, a depth of approximately 66 inches. A cross section of the excavation is shown on Figure 10-4.

10.5 Additional Investigation

ADEC requested additional laboratory analysis (in addition to DRO/RRO) be performed to help identify the source of the pungent odor observed during excavation activities and/or help identify the additional peaks identified on a DRO sample chromatogram.

The additional analyses were requested on existing samples that exhibited elevated DRO concentrations. Sample 14PCX010SO was analyzed for volatile organic compounds (VOC), sample 14PCX017SO was analyzed for polychlorinated biphenyls (PCBs), sample 14PCX042SO was analyzed for semi-volatile organic compounds (SVOCs), and sample 14PCX054SO was analyzed for DRO/RRO with silica gel cleanup.

In addition, additional samples were collected at the request of ADEC. Sample 14PCX076SO and field duplicate sample 14PSX077SO were collected from the excavation floor directly beneath the former casing location on August 16, 2014, and analyzed for DRO/RRO (with and without silica gel cleanup), GRO, VOCs, PCBs, and SVOCs.

The results of the additional investigation are presented in Table 10-3. All results from the additional analytes (which excludes DRO/RRO with/without silica gel cleanup) were below applicable Method Two arctic zone cleanup levels. Note that detected VOC results in sample 14PCX010SO were qualified as low-biased (QL) and non-detected VOC results were rejected because the sample was not preserved with methanol in the field. A new sample kit which included methanol was ordered for the sample 14PCX076SO and 14PSX077SO, and those samples were properly preserved.

GRO, BTEX, and other hydrocarbon-based fuel constituents were detected below cleanup levels in samples 14PCX076SO/14PSX077SO, and these constituents may be the source of the odor and the high PID readings. The only SVOC analytes detected were bis-(2-ethylhexyl)phthalate (in sample 14PCX042SO); and naphthalene, 2-methylnaphthalene, and phenanthrene in samples 14PCX042SO, 14PCX076SO, and 14PSX077SO. PCBs were not detected. DRO and RRO concentrations from the silica gel extracts were not significantly different from the results generated from unfiltered extracts indicating that there was little to no biogenic interference at this site.

10.6 Confirmation Sampling Results and ADEC Approval

Confirmation samples were collected for DRO/RRO analysis from limits of the excavation on August 5 and four additional confirmation samples were collected from a sidewall that exhibited elevated PID readings on August 12, 2014. Screening and laboratory samples were collected

from freshly exposed soils as described in Sections 5.1.2 and 5.2.1 respectively. A total of 17 screening samples were collected from the walls of the excavation, and laboratory confirmation samples were submitted from the locations with the 13 highest PID results. A total of 26 screening samples were collected from the floor of the excavation, and laboratory confirmation samples were submitted from the locations with the 9 highest PID results. The sample frequencies meet or exceed ADEC requirements for the roughly 1,100 square foot excavation.

One additional soil sample was collected from the limits of excavation at the request of ADEC. As discussed in Section 10.5, sample 14PCX076SO (and field duplicate sample 14PSX077SO) were collected from the floor directly beneath the former casing location on August 16, 2014, and analyzed for a suite of analyses. The results from these samples were also used to evaluate the completeness of the excavation. GRO, BTEX, and other hydrocarbon-based fuel constituents were detected below ADEC Method Two arctic zone cleanup levels in soil samples 14PCX076SO/14PSX077SO, and these constituents may be the source of the odor and the high PID readings. Naphthalene, 2-methylnaphthalene, and phenanthracene were the only SVOC analytes detected in unexcavated soil, and the detected concentrations were at least an order of magnitude below ADEC cleanup levels. PCBs were not detected.

PID readings from the limits of the excavation are shown on Figures 10-2 and 10-3, and laboratory confirmation sample results are presented in Table 10-2 and are shown on Figure 10-4. ADEC Method Two soil cleanup levels apply to the entire excavation as no drill pad was installed at the site (see email dated August 15, 2014, regarding use of Method Two cleanup levels from in Appendix E).

Confirmation sample results were below applicable soil cleanup levels, except for one DRO result (16,200 mg/Kg) in sample 14PCX076SO which was collected from directly beneath the casing location; the DRO concentration in the field duplicate sample from the same location was below the Method Two Arctic Zone cleanup level at 9,200 mg/Kg. (The DRO result from sample 14PCX076SO was bolded in Table 10-2 and Figure 10-4 to indicate it exceeded the applicable cleanup level). None of the additional analyses performed on the sample collected from beneath the former casing exceeded ADEC Method Two Arctic Zone soil cleanup levels. Additional excavation was not conducted in the area of sample 14PCX076SO due to the presence of permafrost and bedrock restricting additional excavation.

As shown in Figure 10-4, elevated DRO concentrations (above 10,000 mg/Kg) were detected in five floor samples (14PCX040SO, 14PCX041SO, 14PCX043SO, 14PCX044SO, 14PCX076SO), and DRO concentrations as high as 8,690 mg/Kg (sample 14PCX062SO) remain in sidewalls. The highest RRO concentration in remaining soils (293 mg/Kg in floor sample 14PCX044SO) was orders of magnitude below the 13,700 mg/Kg cleanup level. DRO and RRO concentration ranges in confirmation samples representing remaining soils at Test Hole X-1 are presented in Table 10-4.

Table 10-4 DRO/RRO Concentrations Remaining in Soil, Test Hole X-1

Soil Type	Location	Applicable ADEC Soil Cleanup Level (mg/Kg)	Range of DRO Concentrations (mg/Kg)	Range of RRO Concentrations (mg/Kg)
Tundra	Floor	Method Two: DRO=12,500 RRO=13,700	442 – **16,200**	ND - 293
	Sidewall		24.1 - 8,690	ND - 253

ND – not detected
Bolded result exceeded the applicable cleanup level.

On August 22, 2014, based on preliminary confirmation sample results and other field data, ADEC agreed that the Test Hole X-1 excavation could be backfilled and re-contoured. Email correspondence with ADEC regarding closure of the Test Hole X-1 excavation is included in Appendix E.

10.7 Stockpile Results

Four temporary stockpiles were constructed adjacent to the Test Hole X-1 excavation. During excavation activities, the top foot of soil within the excavation was placed into the lined and bermed stockpiles. Two stockpiles (XSP1 and XSP2) were installed on the west side; one (XSP3) was installed on the northeast, and one (XSP4) on the southeast side of the excavation. The stockpiles are shown on Figure 10-4 and are summarized in Table 10-5.

Table 10-5 Stockpile Summary, Test Hole X-1

Stockpile	Footprint (feet; square feet)	Height (feet)	Volume (cubic yards)
XSP1	9 x 12; 108	3.5	7
XSP2	7 x 12; 84	3.5	7
XSP3	11 x 13; 143	3	9
XSP4	9 x 12; 108	3	7

One stockpile footprint sample was collected from the center of each of the stockpiles (except two were collected from under stockpile XSP1). Samples collected from the stockpile footprints were collected prior to constructing the stockpiles, and following removal of the soil. Samples were collected at depths of approximately 6 inches bgs from freshly exposed soils (as per Section 5.2.1) and analyzed for DRO and RRO. Pin flags were used to mark the footprint sample locations shown on Figure 10-4.

Stockpile footprint sample results are summarized in Table 10-6. The pre- and post-stockpile footprint samples were all below ADEC Method One soil cleanup levels.

Table 10-6 Stockpile Footprint Sample Results, Test Hole X-1

Stockpile	Location	Sample Number (Pre/Post)	DRO (mg/Kg)		RRO (mg/Kg)	
			Pre	Post	Pre	Post
ADEC Soil Cleanup Level[1]			**500**		**13,700**	
XSP1	XSF1	14PCX006SO/14PCX072SO	28.5	151	175	396
	XSF2	14PCX007SO/14DCX073SO	81.2 J	78 J	103	158
XSP2	XSF3	14PCX021SO/14PCX074SO	ND(10.9)	48.4	38.5	168
XSP3	XSF4	14PCX028SO/14PCX068SO	14.9 J	11.8 J	48.7	140
XSP4	XSF5	14PCX036SO/14PCX066SO	31.9	16.2 J	131	101

[1] ADEC Method One cleanup levels were used for assessing footprint samples.
Pre-stockpile footprint samples were collected on July 26 and 30, 2014, and August 2 and 4, 2014, and post-stockpile footprint samples were collected August 16, 2014, after excavation activities were completed.
J – Analyte is considered an estimate because it was detected below the LOQ.
ND – analyte was not detected at the LOD shown in parenthesis.

Screening and laboratory samples were collected from the stockpiled soil to characterize it. Initially, five PID screening samples were collected from each stockpile (one from each side and one from the center) from freshly exposed soil at a depth of 1 foot as per Section 5.1.2. Soil samples for laboratory analysis were then collected as per Section 5.2.1 and analyzed for DRO and RRO. One laboratory sample was then collected each stockpile from the location with the highest PID screening result. The screening and sample frequencies meet ADEC guidelines for stockpiles less than 10 cy in volume. The results from the stockpile samples are summarized in Table 10-7.

Table 10-7 Stockpile Sample Results, Test Hole X-1

Stockpile	PID Results (ppm)[1]	Sample Number	Results (mg/Kg)		Fate of Soil
			DRO	RRO	
ADEC Soil Cleanup Level[2]			**500**	**13,700**	-
XSP1	4.8-71.4	14PCX023SO	**2,570**	98	Containerized and Disposed
XSP2	3.6-4.3	14PCX024SO	28.4	63.3	Backfilled
XSP3	27.6-304.3	14PCX059SO	**2,060**	263	Containerized and Disposed
XSP4	13.6-16.8	14PCX060SO	ND(10.7)	7.95 J	Backfilled

[1] Laboratory samples were collected from the location with the highest PID result.
[2] ADEC Method One cleanup levels were used for assessing stockpiles.
Stockpile samples were collected on August 1, 2014, (XSP1 and XSP2) and August 5, 2014 (XSP3 and XSP4).
J – Analyte is considered an estimate because it was detected below the LOQ.
ND – analyte was not detected at the LOD shown in parenthesis.

The samples from stockpiles XSP1 and XSP3 exceeded the ADEC Method One soil cleanup level for DRO, and at the request of the ADEC, the associated soils were placed in super sacks and

disposed with the POL-contaminated soil. The soil from stockpiles XSP2 and XSP4 was placed in the open excavation and were used as backfill.

10.8 Loading Area Footprint Results

Six 10-foot by 10-foot loading areas were established outside of the Test Hole X-1 excavation where the excavated soils were loaded into super sacks (shown in Figure 10-4). Due to the depth of the Test Hole X-1 excavation inhibiting the operator's view, super sacks could not be loaded inside the excavation. A tarp was used to catch spilled soil during the super sack filling process which was later added to sacks.

One loading area footprint sample was collected from the center of each of the six loading areas for laboratory analysis. Loading area footprint samples were collected at depths of approximately 6 inches bgs from freshly exposed soils (as per Section 5.2.1) and analyzed for DRO and RRO. Samples were collected prior to and following excavation activities to assess impacts, if any, in the areas where soil was loaded. One of the loading areas (XLF1) was excavated, so no post excavation sample was collected and the location is not shown on Figure 10-4. Pin flags were used to mark the footprint sample locations shown on Figure 10-4.

Pre- and post-loading area footprint results were all below ADEC Method One and Method Two soil cleanup levels as shown in Table 10-8.

Table 10-8 Loading Area Footprint Sample Results, Test Hole X-1

Location	Sample Number (Pre/Post)	DRO (mg/Kg)		RRO (mg/Kg)	
		Pre	Post	Pre	Post
ADEC Soil Cleanup Level[1]		**500**		**13,700**	
XLF1	14PCX003SO	7.09 J	Excavated[2]	57.4	Excavated[2]
XLF2	14PCX009SO/14PCX069SO	18 J	7.83 J	119	127
XLF3	14PCX016SO/14PCX070SO	23.7	13 J	65.6	113
XLF4	14PCX025SO/14PCX071SO	7.64 J	ND(11.4)	20.2 J	46.4
XLF5	14PCX032SO/14PCX067SO	16.9 J	7.73 J	108	113
XLF6	14PCX037SO/14PCX075SO	29	9.71 J	211	192

[1] ADEC Method One cleanup levels were used for assessing footprint samples.

[2] Loading area XLF1 was excavated so no post excavation sample was collected.

Pre-loading area footprint samples were collected on July 26, 29, and 30, and August 2 and 4, 2014, and post-loading area footprint samples were collected August 16, 2014, after excavation activities were completed.

J – Analyte is considered an estimate because it was detected below the LOQ.

ND – analyte was not detected at the LOD shown in parenthesis.

10.9 Re-Contouring, Re-Vegetation, and Survey

The Test Hole X-1 excavation was backfilled and re-contoured to match the surrounding area on August 21, 2014. Material from adjacent the excavation was used to fill the excavation opening.

The site was re-seeded and fertilized on August 25, 2014. Pin flags representing confirmation sample locations and the location of the casing were replaced following the re-contouring effort on August 23, 2014; swing ties were utilized to re-establish pin flag locations. The pin flag locations were surveyed on August 27, 2014.

Table 10-1 - Summary of Laboratory Samples, Test Hole X-1
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Sample ID	Location ID	Description	Depth (inches bgs)	Sample Date	Sample Time	Sampler	Sample Type	Sample Matrix[1]	DRO/RRO (AK102/ AK103)	GRO (AK101)	VOCs (8260B)	SVOCs (8270D)	PCBs (8082A)	Cooler Number	Sample Data Group
TEST HOLE X-1															
14PCX001SO	X001NPE	Pre-Excavation Delineation	6"	7/20/2014	1110	MB	Primary	Tundra	X					72201	1143274
14PCX002SO	X002NPE	Pre-Excavation Delineation	6"	7/20/2014	1115	MB	Primary	Tundra	X					72201	1143274
14PCX003SO	X003NLF	Pre-Loading Footprint (XLF1)	6"	7/26/2014	1015	BJ	Primary	Tundra	X					72701	1143385
14PCX004SO	X004NEG	Excavation Guidance	18"	7/26/2014	1100	BJ	Primary	Tundra	X					72701	1143385
14PCX005SO	X005NEG	Excavation Guidance	20"	7/26/2014	1600	MB	Primary	Tundra	X					72701	1143385
14PCX006SO	X006NSF	Pre-Stockpile Footprint (XSF1)	6"	7/26/2014	1610	MB	Primary	Tundra	X					72701	1143385
14PCX007SO	X007NSF	Pre-Stockpile Footprint (XSF2)	6"	7/26/2014	1615	MB	Primary	Tundra	X					72701	1143385
14PCX008SO	X008NEG	Excavation Guidance	20"	7/29/2014	930	MB	Primary	Tundra	X					73001	1143470
14PCX009SO	X009NLF	Pre-Loading Footprint (XLF2)	6"	7/29/2014	1000	MB	Primary	Tundra	X					73001	1143470
14PCX010SO	X010NEG	Excavation Guidance	40"	7/29/2014	1130	MB	Primary	Tundra	X		X			73001	1143470
14PCX011SO	X011NEG	Excavation Guidance	24"	7/29/2014	1330	MB	Primary	Tundra	X					73001	1143470
14PCX012SO	X012NEG	Excavation Guidance	20"	7/29/2014	1445	MB	Primary	Tundra	X					73001	1143470
14PCX013SO	X013NEG	Excavation Guidance	20"	7/29/2014	1600	MB	Primary	Tundra	X					73001	1143470
14PCX014SO	X014NEG	Excavation Guidance	44"	7/29/2014	1800	MB	Primary	Tundra	X					73001	1143470
14PCX015SO	X015DEG	Excavation Guidance	44"	7/29/2014	1810	MB	Dup (-X014SO)	Tundra	X					73001	1143470
14PCX016SO	X016NLF	Pre-Loading Footprint (XLF3)	6"	7/30/2014	950	MB	Primary	Tundra	X					83001	1143517
14PCX017SO	X017NEG	Excavation Guidance	60"	7/30/2014	1035	MB	Primary	Tundra	X				X	83001	1143517
14PCX018SO	X018NEG	Excavation Guidance	40"	7/30/2014	1400	BJ	Primary	Tundra	X					83001	1143517
14PCX019SO	X019DEG	Excavation Guidance	40"	7/30/2014	1415	BJ	Dup (-X018SO)	Tundra	X					83001	1143517
14PCX020SO	X020NEG	Excavation Guidance	48"	7/30/2014	1523	MB	Primary	Tundra	X					83001	1143517
14PCX021SO	X021NSF	Pre-Stockpile Footprint (XSF3)	6"	7/30/2014	1630	MB	Primary	Tundra	X					83001	1143517
14PCX022SO	X022NEG	Excavation Guidance	36"	7/30/2014	1740	MB	Primary	Tundra	X					83001	1143517
14PCX023SO	X023NSV	Stockpile Verification (XSP1)	12"	8/1/2014	1515	MB	Primary	Tundra	X					83001	1143517
14PCX024SO	X024NSV	Stockpile Verification (XSP2)	12"	8/1/2014	1520	MB	Primary	Tundra	X					83001	1143517
14PCX025SO	X025NLF	Pre-Loading Footprint (XLF4)	6"	8/2/2014	1000	MB	Primary	Tundra	X					83001	1143517
14PCX026SO	X026NEG	Excavation Guidance	48"	8/2/2014	1045	MB	Primary	Tundra	X					83001	1143517
14PCX027SO	X027NEG	Excavation Guidance	40"	8/2/2014	1220	MB	Primary	Tundra	X					83001	1143517
14PCX028SO	X028NSF	Pre-Stockpile Footprint (XSF4)	6"	8/2/2014	1345	MB	Primary	Tundra	X					83001	1143517
14PCX029SO	X029NEG	Excavation Guidance	24"	8/2/2014	1600	MB	Primary	Tundra	X					83001	1143517
14PCX030SO	X030NEG	Excavation Guidance	48"	8/2/2014	1615	MB	Primary	Tundra	X					83001	1143517
14PCX031SO	X031DEG	Excavation Guidance	48"	8/2/2014	1620	MB	Dup (-X030SO)	Tundra	X					83001	1143517
14PCX032SO	X032NSF	Pre-Loading Footprint (XLF5)	6"	8/4/2014	900	MB	Primary	Tundra	X					80601	1143634
14PCX033SO	X033NEG	Excavation Guidance	36"	8/4/2014	1000	MB	Primary	Tundra	X					80601	1143634
14PCX034SO	X034FEG	Excavation Guidance	60"	8/4/2014	1015	MB	Primary	Tundra	X					80601	1143634
14PCX035SO	X035DEG	Excavation Guidance	60"	8/4/2014	1020	MB	Dup (-X034SO)	Tundra	X					80601	1143634

Table 10-1 - Summary of Laboratory Samples, Test Hole X-1
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Sample ID	Location ID	Description	Depth (inches bgs)	Sample Date	Sample Time	Sampler	Sample Type	Sample Matrix[1]	DRO/RRO (AK102/ AK103)	GRO (AK101)	VOCs (8260B)	SVOCs (8270D)	PCBs (8082A)	Cooler Number	Sample Data Group
TEST HOLE X-1															
14PCX036SO	X036NSF	Pre-Stockpile Footprint (XSF5)	6"	8/4/2014	1400	MB	Primary	Tundra	X					80601	1143634
14PCX037SO	X037NLF	Pre-Loading Footprint (XLF6)	6"	8/4/2014	1420	MB	Primary	Tundra	X					80601	1143634
14PCX038SO	X038NEG	Excavation Guidance	48"	8/4/2014	1630	MB	Primary	Tundra	X					80601	1143634
14PCX039SO	X039FEC	Confirmation (Floor)	62"	8/5/2014	1030	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX040SO	X040FEC	Confirmation (Floor)	65"	8/5/2014	1035	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX041SO	X041FEC	Confirmation (Floor)	62"	8/5/2014	1040	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX042SO	X042FEC	Confirmation (Floor)	70"	8/5/2014	1045	MB/BJ	Primary	Tundra	X			X		80601	1143634
14PCX043SO	X043DEC	Confirmation (Floor)	70"	8/5/2014	1050	MB/BJ	Dup (-X042SO)	Tundra	X					80601	1143634
14PCX044SO	X044FEC	Confirmation (Floor)	68"	8/5/2014	1055	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX045SO	X045FEC	Confirmation (Floor)	60"	8/5/2014	1100	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX046SO	X046FEC	Confirmation (Floor)	62"	8/5/2014	1105	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX047SO	X047FEC	Confirmation (Floor)	58"	8/5/2014	1110	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX048SO	X0448FEC	Confirmation (Floor)	63"	8/5/2014	1125	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX049SO	X049WEC	Confirmation (Wall)	48"	8/5/2014	1515	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX050SO	X050WEC	Confirmation (Wall)	48"	8/5/2014	1520	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX051SO	X051WEC	Confirmation (Wall)	36"	8/5/2014	1525	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX052SO	X052WEC	Confirmation (Wall)	48"	8/5/2014	1530	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX053SO	X053WEC	Confirmation (Wall)	48"	8/5/2014	1535	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX054SO	X054WEC	Confirmation (Wall)	48"	8/5/2014	1540	MB/BJ	Primary	Tundra	X[2]					80601	1143634
14PCX055SO	X055WEC	Confirmation (Wall)	48"	8/5/2014	1545	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX056SO	X056WEC	Confirmation (Wall)	48"	8/5/2014	1550	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX057SO	X057WEC	Confirmation (Wall)	48"	8/5/2014	1555	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX058SO	X058DEC	Confirmation (Wall)	48"	8/5/2014	1558	MB/BJ	Dup (-X057SO)	Tundra	X					80601	1143634
14PCX059SO	X059NSV	Stockpile Verification (XSP3)	12"	8/5/2014	1600	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX060SO	X060NSV	Stockpile Verification (XSP4)	12"	8/5/2014	1630	MB/BJ	Primary	Tundra	X					80601	1143634
14PCX061SO	X061WEC	Confirmation (Wall)	48"	8/12/2014	1950	MB/BJ	Primary	Tundra	X					81301	1143815
14PCX062SO	X062WEC	Confirmation (Wall)	48"	8/12/2014	1948	MB/BJ	Primary	Tundra	X					81301	1143815
14PCX063SO	X063WEC	Confirmation (Wall)	48"	8/12/2014	2000	MB/BJ	Primary	Tundra	X					81301	1143815
14PCX064SO	X064WEC	Confirmation (Wall)	48"	8/12/2014	2005	MB/BJ	Primary	Tundra	X					81301	1143815
14PCX065SO	X065DEC	Confirmation (Wall)	48"	8/12/2014	2010	MB/BJ	Dup (-X064SO)	Tundra	X					81301	1143815
14PCX066SO	X066NSF	Post-Stockpile Footprint (XSF5)	6"	8/16/2014	1000	MB/BJ	Primary	Tundra	X					81701	1143866
14PCX067SO	X067NLF	Post-Loading Footprint (XLF5)	6"	8/16/2014	1005	MB/BJ	Primary	Tundra	X					81701	1143866
14PCX068SO	X068NSF	Post-Stockpile Footprint (XSF4)	6"	8/16/2014	1010	MB/BJ	Primary	Tundra	X					81701	1143866
14PCX069SO	X069NLF	Post-Loading Footprint (XLF2)	6"	8/16/2014	1015	MB/BJ	Primary	Tundra	X					81701	1143866
14PCX070SO	X070NLF	Post-Loading Footprint (XLF3)	6"	8/16/2014	1020	MB/BJ	Primary	Tundra	X					81701	1143866

Table 10-1 - Summary of Laboratory Samples, Test Hole X-1
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Sample ID	Location ID	Description	Depth (inches bgs)	Sample Date	Sample Time	Sampler	Sample Type	Sample Matrix[1]	DRO/RRO (AK102/ AK103)	GRO (AK101)	VOCs (8260B)	SVOCs (8270D)	PCBs (8082A)	Cooler Number	Sample Data Group
TEST HOLE X-1															
14PCX071SO	X071NLF	Post-Loading Footprint (XLF4)	6"	8/16/2014	1025	MB/BJ	Primary	Tundra	X					81701	1143866
14PCX072SO	X072NSF	Post-Stockpile Footprint (XSF1)	6"	8/16/2014	1030	MB/BJ	Primary	Tundra	X					81701	1143866
14PCX073SO	X073NSF	Post-Stockpile Footprint (XSF2)	6"	8/16/2014	1035	MB/BJ	Primary	Tundra	X					81701	1143866
14PCX074SO	X074NSF	Post-Stockpile Footprint (XSF3)	6"	8/16/2014	1040	MB/BJ	Primary	Tundra	X					81701	1143866
14PCX075SO	X075NLF	Post-Loading Footprint (XLF6)	6"	8/16/2014	1045	MB/BJ	Primary	Tundra	X					81701	1143866
14PCX076SO	X076FEC	Confirmation (Floor)	66"	8/5/2014	1100	MB/BJ	Primary	Tundra	X[2]	X	X	X	X	81701	1143866
14PCX077SO	X077DEC	Confirmation (Floor)	66"	8/5/2014	1110	MB/BJ	Dup (-X076SO)	Tundra	X[2]	X	X	X	X	81701	1143866
QUALITY CONTROL SAMPLES															
Trip Blanks															
14PCX078SO	Trip Blank	Trip Blank	NA	8/9/2014	1000	NA	Trip Blank	Solid		X	X			81701	1143866

All samples were analyzed by SGS North America Inc, Alaska (RUSH turn-around time). NPDL #14-030.

[1] "Tundra" indicates a fine gray or tan clay matrix, except for Test Hole X-1 (where it indicates decomposed mudstone).

[2] Samples 14PCX054SO, 14PCX076SO, and 14PCX077SO were also analyzed for DRO/RRO with silica gel cleanup.

bgs - below ground surface
BJ -Bryan Johnson
°C - degrees Celsius
DRO - diesel range organics
GRO - gasoline range organics
MB - Mike Boese
PCBs - polychlorinated biphenyls
RCRA metals include Ag, As, Ba, Cd, Cr, Hg, Pb, and Se
RRO - residual range organics
SVOC - semi-volatile organic compounds
VOCs - volatile organic compounds

Soil (and Tundra soil) samples were collected in 4 or 8 ounce jars and stored at 4 °C

Table 10-2 - DRO/RRO Results, Test Hole X-1
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Sample ID			ADEC Method Two Cleanup Level[1]	14PCX001SO	14PCX002SO	14PCX003SO	14PCX004SO	14PCX005SO	14PCX006SO	14PCX007SO	14PCX008SO	14PCX009SO	14PCX010SO	14PCX011SO	14PCX012SO	14PCX013SO	14PCX014SO	14PCX015SO	14PCX016SO
Test Hole Site				X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1
Location ID				X001NPE	X002NPE	X003NLF	X004NEG	X005NEG	X006NSF	X007NSF	X008NEG	X009NLF	X010NEG	X011NEG	X012NEG	X013NEG	X014NEG	X015DEG	X016NLF
Description				Pre-Excavation	Pre-Excavation	Pre-Loading Footprint	Excavation Guidance	Excavation Guidance	Pre-Stockpile Footprint	Pre-Stockpile Footprint	Excavation Guidance	Pre-Loading Footprint	Excavation Guidance	Excavation Guidance	Excavation Guidance	Excavation Guidance	Excavation Guidance	Excavation Guidance	Pre-Loading Footprint
Collection Date				7/20/2014	7/20/2014	7/26/2014	7/26/2014	7/26/2014	7/26/2014	7/26/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/29/2014	7/30/2014
Laboratory Report				1143274	1143274	1143385	1143385	1143385	1143385	1143385	1143470	1143470	1143470	1143470	1143470	1143470	1143470	1143517	1143517
Sample Type				Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Dup (-X014SO)	Primary
Matrix				TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA
Analyte	**Method**	**Units**		**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**
Diesel Range Organics	AK102	mg/Kg	12,500	11000 [224]	3730 [570]	7.09 [11.4] J	1220 [45.1]	10500 [640]	28.5 [11.7]	81.2 [46.9] J	62.4 [10.9]	18 [11.6] J	***38,700 [590]***	3370 [54.5]	ND [10.8]	20.2 [10.9] J	941 [44] QN	309 [10.9] QN	23.7 [11]
Residual Range Organics	AK103	mg/Kg	13,700	1150 [224]	3180 [570]	57.4 [11.4]	240 [45.1]	ND [640]	175 [11.7]	103 [46.9]	23.7 [10.9] B	119 [11.6]	2970 [590]	49.8 [10.9] B	6.86 [10.8] J,B	10.1 [10.9] J,B	117 [11] QN	30.6 [10.9] B,QN	65.6 [11]
Total Solids	A2540G	Percent	-	88.8 [0]	89.6 [0]	87.4 [0]	88.2 [0]	77.8 [0]	85 [0]	85 [0]	91.5 [0]	85.9 [0]	88.8 [0]	91.8 [0]	91.9 [0]	91.9 [0]	90.7 [0]	91.1 [0]	88.8 [0]

Sample ID			ADEC Method Two Cleanup Level[1]	14PCX017SO	14PCX018SO	14PCX019SO	14PCX020SO	14PCX021SO	14PCX022SO	14PCX023SO	14PCX024SO	14PCX025SO	14PCX026SO	14PCX027SO	14PCX028SO	14PCX029SO	14PCX030SO	14PCX031SO	14PCX032SO
Test Hole Site				X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1
Location ID				X017NEG	X018NEG	X019DEG	X020NEG	X021NSF	X022NEG	X023NSV	X024NSV	X025NLF	X026NEG	X027NEG	X028NSF	X029NEG	X030NEG	X031DEG	X032NSF
Description				Excavation Guidance	Excavation Guidance	Excavation Guidance	Excavation Guidance	Pre-Stockpile Footprint	Excavation Guidance	Stockpile Verification	Stockpile Verification	Pre-Loading Footprint	Excavation Guidance	Excavation Guidance	Pre-Stockpile Footprint	Excavation Guidance	Excavation Guidance	Excavation Guidance	Pre-Loading Footprint
Collection Date				7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	7/30/2014	8/1/2014	8/1/2014	8/2/2014	8/2/2014	8/2/2014	8/2/2014	8/2/2014	8/2/2014	8/2/2014	8/4/2014
Laboratory Report				1143517	1143517	1143517	1143517	1143517	1143517	1143517	1143517	1143517	1143517	1143517	1143517	1143517	1143517	1143517	1143634
Sample Type				Primary	Primary	Dup (-X018SO)	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Dup (-X030SO)	Primary
Matrix				TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA
Analyte	**Method**	**Units**		**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**
Diesel Range Organics	AK102	mg/Kg	12,500	3460 [112]	13.3 [10.9] J	16.4 [10.8] J	8.49 [10.9] J	ND [10.9]	ND [11.1]	2570 [46.4]	28.4 [11.4]	7.65 [11.4] J	342 [11.6]	***18500 [745]***	14.9 [11.2] J	14.1 [12.4] J	12.3 [11.2] J,QN	49.5 [10.9] QN	16.9 [11.5] J
Residual Range Organics	AK103	mg/Kg	13,700	53.3 [11.2]	ND [10.9]	ND [10.8]	ND [10.9]	38.5 [10.9]	ND [11.1]	98 [46.4]	63.3 [11.4]	20.2 [11.4] J	10.2 [11.6] J	ND [745]	48.7 [11.2]	68 [12.4]	ND [11.2]	ND [10.9]	108 [11.5]
Total Solids	A2540G	Percent	-	88.3 [0]	91.9 [0]	92.6 [0]	91 [0]	90.3 [0]	89.2 [0]	85.6 [0]	87.1 [0]	86.8 [0]	86.4 [0]	93.2 [0]	88.2 [0]	80.1 [0]	88.5 [0]	91 [0]	85.9 [0]

Sample ID			ADEC Method Two Cleanup Level[1]	14PCX033SO	14PCX034SO	14PCX035SO	14PCX036SO	14PCX037SO	14PCX038SO	14PCX039SO	14PCX040SO	14PCX041SO	14PCX042SO	14PCX043SO	14PCX044SO	14PCX045SO	14PCX046SO	14PCX047SO	14PCX048SO
Test Hole Site				X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1
Location ID				X033NEG	X034FEG	X035DEG	X036NSF	X037NLF	X038NEG	X039FEC	X040FEC	X041FEC	X042FEC	X043DEC	X044FEC	X045FEC	X046FEC	X047FEC	X048FEC
Description				Excavation Guidance	Excavation Guidance	Excavation Guidance	Pre-Stockpile Footprint	Pre-Loading Footprint	Excavation Guidance	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)	Confirmation (Floor)
Collection Date				8/4/2014	8/4/2014	8/4/2014	8/4/2014	8/4/2014	8/4/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014
Laboratory Report				1143634	1143634	1143634	1143634	1143634	1143634	1143634	1143634	1143634	1143634	1143634	1143634	1143634	1143634	1143634	1143634
Sample Type				Primary	Primary	Dup (-X034SO)	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Dup (-X042SO)	Primary	Primary	Primary	Primary	Primary
Matrix				TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA
Analyte	**Method**	**Units**		**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**
Diesel Range Organics	AK102	mg/Kg	12,500	37.5 [10.7]	4400 [227]	3280 [115]	31.9 [11.2]	29 [11.4]	ND [10.7]	7750 [580]	11000 [600]	10300 [595]	7150 [585]	11100 [610]	10100 [444]	5730 [121]	2970 [117]	1650 [59]	442 [11.9]
Residual Range Organics	AK103	mg/Kg	13,700	ND [10.7]	66.7 [11.4]	57.1 [11.4]	131 [11.2]	211 [11.4]	15.2 [10.7] J	132 [11.7]	184 [48]	111 [47.8]	171 [11.7]	209 [49]	293 [444] J	31.2 [12.1]	49.4 [11.7]	31.1 [11.8]	ND [11.9]
Total Solids	A2540G	Percent	-	93.3 [0]	87.2 [0]	86.2 [0]	88 [0]	87.6 [0]	93 [0]	85.6 [0]	83 [0]	83.4 [0]	84.9 [0]	81.3 [0]	84.4 [0]	82.5 [0]	83.9 [0]	84.6 [0]	83.8 [0]

Sample ID			ADEC Method Two Cleanup Level[1]	14PCX049SO	14PCX050SO	14PCX051SO	14PCX052SO	14PCX053SO	14PCX054SO		14PCX055SO	14PCX056SO	14PCX057SO	14PCX058SO	14PCX059SO	14PCX060SO	14PCX061SO	14PCX062SO	14PCX063SO
Test Hole Site				X-1	X-1	X-1	X-1	X-1	X-1		X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1
Location ID				X049WEC	X050WEC	X051WEC	X052WEC	X053WEC	X054WEC		X055WEC	X056WEC	X057WEC	X058DEC	X059NSV	X060NSV	X061WEC	X062WEC	X063WEC
Description				Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)	Stockpile Verification	Stockpile Verification	Confirmation (Wall)	Confirmation (Wall)	Confirmation (Wall)
Collection Date				8/5/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014		8/5/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014	8/5/2014	8/12/2014	8/12/2014	8/12/2014
Laboratory Report				1143634	1143634	1143634	1143634	1143634	1143634	1143634	1143634	1143634	1143634	1143634	1143634	1143634	1143815	1143815	1143815
Sample Type				Primary	Primary	Primary	Primary	Primary	Pre-Silica Gel	Post-Silica Gel	Primary	Primary	Primary	Dup (-X057SO)	Primary	Primary	Primary	Primary	Primary
Matrix				TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA
Analyte	**Method**	**Units**		**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**
Diesel Range Organics	AK102	mg/Kg	12,500	2950 [105]	5450 [207]	293 [10.7]	3260 [106]	2800 [104]	1630 [90]	1670 [90]	24.1 [10.4]	272 [10.5]	2530 [106]	2180 [106]	2060 [46.2]	ND [10.7]	3360 [113]	8690 [212]	6380 [228]
Residual Range Organics	AK103	mg/Kg	13,700	58.3 [10.5]	146 [10.4]	16.8 [10.7] J	79.9 [10.6]	72.7 [41.5] J	ND [22.5]	35.3 [22.5] J,B	ND [10.4]	10.2 [10.5] J	93.5 [10.6]	74.5 [10.6]	263 [46.2]	7.95 [10.7] J	52.3 [56.5] J	219 [212] J	253 [228] J
Total Solids	A2540G	Percent	-	95 [0]	95.1 [0]	93.6 [0]	94.4 [0]	95.4 [0]	88.1 [0]	88.1 [0]	96.1 [0]	94.9 [0]	94 [0]	94 [0]	86.5 [0]	93.2 [0]	87.8 [0]	94.1 [0]	87.4 [0]

Sample ID			ADEC Method Two Cleanup Level[1]	14PCX064SO	14PCX065SO	14PCX066SO	14PCX067SO	14PCX068SO	14PCX069SO	14PCX070SO	14PCX071SO	14PCX072SO	14PCX073SO	14PCX074SO	14PCX075SO	14PCX076SO		14PCX077SO	
Test Hole Site				X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1	X-1		X-1	
Location ID				X064WEC	X065WEC	X066NSF	X067NLF	X068NSF	X069NLF	X070NLF	X071NLF	X072NSF	X073NSF	X074NSF	X075NLF	X076FEC		X077DEC (dup of X076SO)	
Description				Confirmation (Wall)	Confirmation (Wall)	Post-Footprint	Post-Footprint	Post-Footprint	Post-Footprint	Post-Footprint	Post-Footprint	Post-Footprint	Post-Footprint	Post-Footprint	Post-Footprint	Confirmation (Floor)		Confirmation (Floor)	
Collection Date				8/12/2014	8/12/2014	8/16/2014	8/16/2014	8/16/2014	8/16/2014	8/16/2014	8/16/2014	8/16/2014	8/16/2014	8/16/2014	8/16/2014	8/16/2014		8/16/2014	
Laboratory Report				1143815	1143815	1143866	1143866	1143866	1143866	1143866	1143866	1143866	1143866	1143866	1143866	1143866	1143866	1143866	1143866
Sample Type				Primary	Dup. (-X064SO)	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Pre-Silica Gel	Post-Silica Gel	Pre-Silica Gel Dup	Post-Silica Gel Dup
Matrix				TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA	TUNDRA		TUNDRA	
Analyte	**Method**	**Units**		**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**	**Result [LOD] qual**
Diesel Range Organics	AK102	mg/Kg	12,500	4640 [118]	3750 [115]	16.2 [11.4] J	7.73 [10.9] J	11.8 [11.5] J	7.83 [11.2] J	13 [10.9] J	ND [11.4]	151 [46.5]	78 [45.8] J	48.4 [11.6]	9.71 [11.6] J	**16200**	**[1440] QN**	**14,100**	**[460]**	9,200 [289] QN	8,570 [232]
Residual Range Organics	AK103	mg/Kg	13,700	113 [118] J	95.6 [115] J	101 [11.4]	113 [10.9]	140 [11.5]	127 [11.2]	113 [10.9]	46.6 [11.4]	396 [46.5]	158 [45.8]	168 [11.6]	192 [11.6]	155	[230] J,B	209	[23]	ND [289]	ND [232]
Total Solids	A2540G	Percent	-	85.1 [0]	86 [0]	87.3 [0]	89.7 [0]	85.7 [0]	89.2 [0]	91 [0]	87.7 [0]	85.8 [0]	87.2 [0]	86.3 [0]	86.5 [0]	86.9 [0]		86.9 [0]		86 [0]	86 [0]

ADEC Method Two soil cleanup levels apply to native tundra soils. Tundra cleanup levels and sample results are shaded in gray.
Results that exceeded the applicable ADEC soil cleanup level and were from soil that was excavated/removed from the site (14PCX010SO and 14PCX027SO) are *ITALICIZED*.
Results that exceeded the applicable ADEC soil cleanup level and were from soil that was **NOT** excavated/removed from the site (14PCX076SO) are **BOLDED**.

ADEC - Alaska Department of Environmental Conservation
Dup. - Field duplicate (primary sample number in parenthesis)
LOD - limit of detection
LOQ - limit of quantitation
mg/Kg - milligrams per kilogram
qual - data qualifier

Data Qualifiers:
B - analyte was also detected in a blank; result may be due to cross-contamination
J - result qualified as estimate because it is less than the limit of quantitation
ND - analyte not detected
Q - result considered an estimate (biased L-low; H-high; N-unknown) due to a quality control failure

Table 10-3 - Additional Analytical Results, Test Hole X-1
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

		Sample ID	ADEC Method Two Cleanup Level[1]	14PCX010SO		14PCX017SO		14PCX042SO		14PCX054SO		14PCX076SO		14PCX077SO		14PCX078SO	
		Location		X010NEG		X017NEG		X042FEC		X054WEC		X076FEC		X077DEC		X078NTB	
		Collection Date		7/29/2014		7/30/2014		8/5/2014		8/5/2014		8/16/2014		8/16/2014		8/16/2014	
		Laboratory Report		1143470		1143517		1143634		1143634		1143866		1143866		1143866	
		Sample Type		Primary		Primary		Primary		Primary		Primary		Duplicate (-X076SO)		Trip Blank	
		Matrix		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Analyte	**Method**	**Units**		**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**
Gasoline Range Organics	AK101	mg/Kg	1400	-	-	-	-	-	-	-	-	123	[1.92] QH	97.3	[1.99] QH	ND	[1.27]
Diesel Range Organics	AK102	mg/Kg	12500	***38700***	***[590]***	3460	[112]	7150	[585]	1,630	[90]	**16200**	**[1440] QN**	9200	[289] QN	-	-
Diesel Range Organics (silica gel)	AK102	mg/Kg		-	-	-	-	-	-	1,670	[90]	**14100**	**[460]**	8570	[232]	-	-
Residual Range Organics	AK103	mg/Kg	13700	2970	[590]	53.3	[11.2]	171	[11.7]	ND	[22.5]	155	[230] J,B	ND	[232]	-	-
Residual Range Organics (silica gel)	AK103	mg/Kg		-	-	-	-	-	-	35.3	[22.5] J,B	209	[23]	ND	[232]	-	-
PCB-1016 (Aroclor 1016)	SW8082A	mg/Kg	1 (total)	-	-	ND	[0.139]	-	-	-	-	ND	[0.143]	ND	[0.145]	-	-
PCB-1221 (Aroclor 1221)	SW8082A	mg/Kg		-	-	ND	[0.139]	-	-	-	-	ND	[0.143]	ND	[0.145]	-	-
PCB-1232 (Aroclor 1232)	SW8082A	mg/Kg		-	-	ND	[0.139]	-	-	-	-	ND	[0.143]	ND	[0.145]	-	-
PCB-1242 (Aroclor 1242)	SW8082A	mg/Kg		-	-	ND	[0.139]	-	-	-	-	ND	[0.143]	ND	[0.145]	-	-
PCB-1248 (Aroclor 1248)	SW8082A	mg/Kg		-	-	ND	[0.139]	-	-	-	-	ND	[0.143]	ND	[0.145]	-	-
PCB-1254 (Aroclor 1254)	SW8082A	mg/Kg		-	-	ND	[0.139]	-	-	-	-	ND	[0.143]	ND	[0.145]	-	-
PCB-1260 (Aroclor 1260)	SW8082A	mg/Kg		-	-	ND	[0.139]	-	-	-	-	ND	[0.143]	ND	[0.145]	-	-
1,1,1,2-Tetrachloroethane	SW8260B	mg/Kg	NE	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
1,1,1-Trichloroethane	SW8260B	mg/Kg	360	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
1,1,2,2-Tetrachloroethane	SW8260B	mg/Kg	8.1	ND	[0.0865]	-	-	-	-	-	-	ND	[0.0096]	ND	[0.01]	ND	[0.0063]
1,1,2-Trichloroethane	SW8260B	mg/Kg	17	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
1,1-Dichloroethane	SW8260B	mg/Kg	900	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
1,1-Dichloroethene	SW8260B	mg/Kg	1.3	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
1,1-Dichloropropene	SW8260B	mg/Kg	NE	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
1,2,3-Trichlorobenzene	SW8260B	mg/Kg	NE	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0383]	ND	[0.0398]	ND	[0.0253]
1,2,3-Trichloropropane	SW8260B	mg/Kg	0.26	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
1,2,4-Trichlorobenzene	SW8260B	mg/Kg	41	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
1,2,4-Trimethylbenzene	SW8260B	mg/Kg	49	4.57	[0.346] QL	-	-	-	-	-	-	2.01	[0.0383] MH	2.04	[0.0398]	ND	[0.0253]
1,2-Dibromo-3-chloropropane	SW8260B	mg/Kg	NE	ND	[0.69] R	-	-	-	-	-	-	ND	[0.0765]	ND	[0.0795]	ND	[0.0505]
1,2-Dibromoethane	SW8260B	mg/Kg	0.89	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
1,2-Dichlorobenzene	SW8260B	mg/Kg	45	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192] ML	ND	[0.0199]	ND	[0.0127]
1,2-Dichloroethane	SW8260B	mg/Kg	7.1	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
1,2-Dichloropropane	SW8260B	mg/Kg	7.9	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
1,3,5-Trimethylbenzene	SW8260B	mg/Kg	42	3.68	[0.173] QL	-	-	-	-	-	-	7.75	[0.192]	7.51	[0.199]	ND	[0.0127]
1,3-Dichlorobenzene	SW8260B	mg/Kg	69	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192] ML	ND	[0.0199]	ND	[0.0127]
1,3-Dichloropropane	SW8260B	mg/Kg	NE	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
1,4-Dichlorobenzene	SW8260B	mg/Kg	44	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192] ML	ND	[0.0199]	ND	[0.0127]
2,2-Dichloropropane	SW8260B	mg/Kg	NE	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]

Table 10-3 - Additional Analytical Results, Test Hole X-1
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

			Sample ID	ADEC Method Two Cleanup Level[1]	14PCX010SO		14PCX017SO		14PCX042SO		14PCX054SO		14PCX076SO		14PCX077SO		14PCX078SO	
			Location		X010NEG		X017NEG		X042FEC		X054WEC		X076FEC		X077DEC		X078NTB	
			Collection Date		7/29/2014		7/30/2014		8/5/2014		8/5/2014		8/16/2014		8/16/2014		8/16/2014	
			Laboratory Report		1143470		1143517		1143634		1143634		1143866		1143866		1143866	
			Sample Type		Primary		Primary		Primary		Primary		Primary		Duplicate (-X076SO)		Trip Blank	
			Matrix		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Analyte	**Method**	**Units**			**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**
2-Butanone	SW8260B	mg/Kg	23300		ND	[0.173] R	-	-	-	-	-	-	0.125	[0.192] J	ND	[0.199]	ND	[0.127]
2-Chlorotoluene	SW8260B	mg/Kg	NE		ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
2-Hexanone	SW8260B	mg/Kg	NE		ND	[1.73] R	-	-	-	-	-	-	ND	[0.192]	ND	[0.199]	ND	[0.127]
4-Chlorotoluene	SW8260B	mg/Kg	NE		ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192] ML	ND	[0.0199]	ND	[0.0127]
4-Isopropyltoluene	SW8260B	mg/Kg	NE		1.97	[0.173] MH,QL	-	-	-	-	-	-	0.667	[0.0192] MH	0.573	[0.0199]	ND	[0.0127]
4-Methyl-2-pentanone	SW8260B	mg/Kg	2100		ND	[1.73] R	-	-	-	-	-	-	ND	[0.192]	ND	[0.199]	ND	[0.127]
Benzene	SW8260B	mg/Kg	17		ND	[0.0865] R	-	-	-	-	-	-	0.0958	[0.0096]	0.0815	[0.01]	ND	[0.0063]
Bromobenzene	SW8260B	mg/Kg	NE		ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
Bromochloromethane	SW8260B	mg/Kg	NE		ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
Bromodichloromethane	SW8260B	mg/Kg	15		ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
Bromoform	SW8260B	mg/Kg	430		ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
Bromomethane	SW8260B	mg/Kg	21		ND	[1.38] R	-	-	-	-	-	-	ND	[0.154]	ND	[0.159]	ND	[0.101]
Carbon disulfide	SW8260B	mg/Kg	250		ND	[0.69] R	-	-	-	-	-	-	ND	[0.0765]	ND	[0.0795]	ND	[0.0505]
Carbon tetrachloride	SW8260B	mg/Kg	4.5		ND	[0.0865] R	-	-	-	-	-	-	ND	[0.0096]	ND	[0.01]	ND	[0.0063]
Chlorobenzene	SW8260B	mg/Kg	200		ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
Chloroethane	SW8260B	mg/Kg	34		ND	[1.38] R	-	-	-	-	-	-	ND	[0.154]	ND	[0.159]	ND	[0.101]
Chloroform	SW8260B	mg/Kg	4.7		ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
Chloromethane	SW8260B	mg/Kg	37		ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
Dibromochloromethane	SW8260B	mg/Kg	21		ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
Dibromomethane	SW8260B	mg/Kg	560		ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
Dichlorodifluoromethane	SW8260B	mg/Kg	570		ND	[0.346] R	-	-	-	-	-	-	ND	[0.0383]	ND	[0.0398]	ND	[0.0253]
Ethylbenzene	SW8260B	mg/Kg	110		0.128	[0.173] J,QL	-	-	-	-	-	-	0.187	[0.0192]	0.14	[0.0199]	ND	[0.0127]
Hexachlorobutadiene	SW8260B	mg/Kg	3.8		ND	[0.346] R	-	-	-	-	-	-	ND	[0.0383]	ND	[0.0398]	ND	[0.0253]
Isopropylbenzene	SW8260B	mg/Kg	62		ND	[0.173] R	-	-	-	-	-	-	0.0475	[0.0192]	0.0386	[0.0199] J	ND	[0.0127]
MTBE	SW8260B	mg/Kg	440		ND	[0.69] R	-	-	-	-	-	-	ND	[0.0765]	ND	[0.0795]	ND	[0.0505]
Methylene Chloride	SW8260B	mg/Kg	240		ND	[0.69] R	-	-	-	-	-	-	ND	[0.0765]	ND	[0.0795]	ND	[0.0505]
Naphthalene	SW8260B	mg/Kg	42		1.2	[0.346] QN,QL	-	-	-	-	-	-	1.93	[0.0383] MH	1.98	[0.0398]	ND	[0.0253]
Styrene	SW8260B	mg/Kg	200		ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
Tetrachloroethene	SW8260B	mg/Kg	15		ND	[0.0865] R	-	-	-	-	-	-	ND	[0.0096]	ND	[0.01]	ND	[0.0063]
Toluene	SW8260B	mg/Kg	220		0.149	[0.173] J,QL	-	-	-	-	-	-	0.743	[0.0192] MH	0.587	[0.0199]	ND	[0.0127]
Trichloroethene	SW8260B	mg/Kg	0.85		ND	[0.0865] R	-	-	-	-	-	-	ND	[0.0096]	ND	[0.01]	ND	[0.0063]
Trichlorofluoromethane	SW8260B	mg/Kg	990		ND	[0.346] R	-	-	-	-	-	-	ND	[0.0383]	ND	[0.0398]	ND	[0.0253]
Vinyl Chloride	SW8260B	mg/Kg	6.4		ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]
Xylene, Isomers m & p	SW8260B	mg/Kg	63 [2]		0.304	[0.346] J	-	-	-	-	-	-	1.04	[0.0383] MH	0.791	[0.0398]	ND	[0.0253]
Xylenes	SW8260B	mg/Kg	63 [2]		ND	[0.52] R	-	-	-	-	-	-	2.05	[0.0575] MH	1.68	[0.0595]	ND	[0.0379]

Table 10-3 - Additional Analytical Results, Test Hole X-1
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

			Sample ID	ADEC Method Two Cleanup Level[1]	14PCX010SO		14PCX017SO		14PCX042SO		14PCX054SO		14PCX076SO		14PCX077SO		14PCX078SO		14PCX079SO		14PCX080SO		14PCX081SO	
			Location		X010NEG		X017NEG		X042FEC		X054WEC		X076FEC		X077DEC		X078NTB		X079NTC		X080NTD		X081NTE	
			Collection Date		7/29/2014		7/30/2014		8/5/2014		8/5/2014		8/16/2014		8/16/2014		8/16/2014		8/16/2014		8/16/2014		8/16/2014	
			Laboratory Report		1143470		1143517		1143634		1143634		1143866		1143866		1143866		1143866		1143866		1143866	
			Sample Type		Primary		Primary		Primary		Primary		Primary		Duplicate (-X076SO)		Trip Blank		Trip Blank		Trip Blank		Trip Blank	
			Matrix		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Analyte	**Method**	**Units**			**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**
cis-1,2-Dichloroethene	SW8260B	mg/Kg	190	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192] MH	ND	[0.0199]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]
cis-1,3-Dichloropropene	SW8260B	mg/Kg	40 [2]	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]
n-Butylbenzene	SW8260B	mg/Kg	42	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]
n-Propylbenzene	SW8260B	mg/Kg	42	ND	[0.173] R	-	-	-	-	-	-	0.0778	[0.0192]	0.064	[0.0199]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]
o-Xylene	SW8260B	mg/Kg	63 [2]	ND	[0.173] R	-	-	-	-	-	-	1.01	[0.0192] MH	0.89	[0.0199]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]
sec-Butylbenzene	SW8260B	mg/Kg	41	0.725	[0.173] QL	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]
tert-Butylbenzene	SW8260B	mg/Kg	70	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]
trans-1,2-Dichloroethene	SW8260B	mg/Kg	240	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]
trans-1,3-Dichloropropene	SW8260B	mg/Kg	40 [2]	ND	[0.173] R	-	-	-	-	-	-	ND	[0.0192]	ND	[0.0199]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]	ND	[0.0127]
1,2,4-Trichlorobenzene	SW8270D	mg/Kg	41	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	SW8270D	mg/Kg	45	-	-	-	-	ND	[0.146]	-	-	ND	[0.705] ML	ND	[0.144]	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	SW8270D	mg/Kg	69	-	-	-	-	ND	[0.146]	-	-	ND	[0.705] ML	ND	[0.144]	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	SW8270D	mg/Kg	44	-	-	-	-	ND	[0.146]	-	-	ND	[0.705] ML	ND	[0.144]	-	-	-	-	-	-	-	-
1-Chloronaphthalene	SW8270D	mg/Kg	NE	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	SW8270D	mg/Kg	8800	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	SW8270D	mg/Kg	620	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	SW8270D	mg/Kg	310	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	SW8270D	mg/Kg	1800	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	SW8270D	mg/Kg	210	-	-	-	-	ND	[1.75]	-	-	ND	[8.5] ML	ND	[1.73]	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	SW8270D	mg/Kg	12	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	-	-	-	-	-	-
2,6-Dichlorophenol	SW8270D	mg/Kg	NE	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	SW8270D	mg/Kg	12	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	-	-	-	-	-	-
2-Chloronaphthalene	SW8270D	mg/Kg	6300	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	-	-	-	-	-	-
2-Chlorophenol	SW8270D	mg/Kg	680	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	-	-	-	-	-	-
2-Methyl-4,6-dinitrophenol	SW8270D	mg/Kg	NE	-	-	-	-	ND	[1.17]	-	-	ND	[5.65]	ND	[1.16]	-	-	-	-	-	-	-	-
2-Methylnaphthalene	SW8270D	mg/Kg	380	-	-	-	-	6.95	[0.73]	-	-	21	[0.705] MH,Q	9.06	[0.72] QN	-	-	-	-	-	-	-	-
2-Methylphenol (o-Cresol)	SW8270D	mg/Kg	4400	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	-	-	-	-	-	-
2-Nitroaniline	SW8270D	mg/Kg	NE	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	-	-	-	-	-	-
2-Nitrophenol	SW8270D	mg/Kg	NE	-	-	-	-	ND	[0.146]	-	-	ND	[0.705] ML	ND	[0.144]	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	SW8270D	mg/Kg	15	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	-	-	-	-	-	-
3-Methylphenol/4-Methylphenol Coelution	SW8270D	mg/Kg	480/4400	-	-	-	-	ND	[0.585]	-	-	ND	[2.83]	ND	[0.575]	-	-	-	-	-	-	-	-
3-Nitroaniline	SW8270D	mg/Kg	NE	-	-	-	-	ND	[0.293]	-	-	ND	[1.42]	ND	[0.288]	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	SW8270D	mg/Kg	NE	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	SW8270D	mg/Kg	NE	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	-	-	-	-	-	-

Table 10-3 - Additional Analytical Results, Test Hole X-1
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

			Sample ID	ADEC Method Two Cleanup Level[1]	14PCX010SO		14PCX017SO		14PCX042SO		14PCX054SO		14PCX076SO		14PCX077SO		14PCX078SO	
			Location		X010NEG		X017NEG		X042FEC		X054WEC		X076FEC		X077DEC		X078NTB	
			Collection Date		7/29/2014		7/30/2014		8/5/2014		8/5/2014		8/16/2014		8/16/2014		8/16/2014	
			Laboratory Report		1143470		1143517		1143634		1143634		1143866		1143866		1143866	
			Sample Type		Primary		Primary		Primary		Primary		Primary		Duplicate (-X076SO)		Trip Blank	
			Matrix		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Analyte	**Method**	**Units**			**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**
4-Chloroaniline	SW8270D	mg/Kg	NE	-	-	-	-	ND	[0.293]	-	-	ND	[1.42]	ND	[0.288]	-	-
4-Chlorophenyl phenyl ether	SW8270D	mg/Kg	NE	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
4-Nitroaniline	SW8270D	mg/Kg	NE	-	-	-	-	ND	[1.75]	-	-	ND	[8.5] ML	ND	[1.73]	-	-
4-Nitrophenol	SW8270D	mg/Kg	NE	-	-	-	-	ND	[0.585]	-	-	ND	[2.83]	ND	[0.575]	-	-
Acenaphthene	SW8270D	mg/Kg	3800	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Acenaphthylene	SW8270D	mg/Kg	3800	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Aniline	SW8270D	mg/Kg	NE	-	-	-	-	ND	[1.17]	-	-	ND	[5.65] ML	ND	[1.16]	-	-
Anthracene	SW8270D	mg/Kg	27800	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Azobenzene	SW8270D	mg/Kg	NE	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Benzo(a)anthracene	SW8270D	mg/Kg	6.6	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Benzo(a)pyrene	SW8270D	mg/Kg	0.66	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Benzo(b)fluoranthene	SW8270D	mg/Kg	6.6	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Benzo(g,h,i)perylene	SW8270D	mg/Kg	1900	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Benzo(k)fluoranthene	SW8270D	mg/Kg	66	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Benzoic acid	SW8270D	mg/Kg	428000	-	-	-	-	ND	[0.88]	-	-	ND	[4.25] ML	ND	[0.865]	-	-
Benzyl alcohol	SW8270D	mg/Kg	NE	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Benzyl butyl phthalate	SW8270D	mg/Kg	3900	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Carbazole	SW8270D	mg/Kg	390	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Chrysene	SW8270D	mg/Kg	660	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Di-n-butyl phthalate	SW8270D	mg/Kg	10700	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Di-n-octyl phthalate	SW8270D	mg/Kg	4200	-	-	-	-	ND	[0.293]	-	-	ND	[1.42]	ND	[0.288]	-	-
Dibenzo(a,h)anthracene	SW8270D	mg/Kg	0.66	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Dibenzofuran	SW8270D	mg/Kg	270	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Diethyl Phthalate	SW8270D	mg/Kg	84000	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Dimethyl phthalate	SW8270D	mg/Kg	>10[6]	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Fluoranthene	SW8270D	mg/Kg	2500	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Fluorene	SW8270D	mg/Kg	3200	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Hexachlorobenzene	SW8270D	mg/Kg	2.2	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Hexachlorobutadiene	SW8270D	mg/Kg	3.8	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Hexachlorocyclopentadiene	SW8270D	mg/Kg	3.0	-	-	-	-	ND	[0.41]	-	-	ND	[1.98] ML	ND	[0.404]	-	-
Hexachloroethane	SW8270D	mg/Kg	88	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Indeno(1,2,3-cd)pyrene	SW8270D	mg/Kg	6.6	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Isophorone	SW8270D	mg/Kg	7200	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-
Naphthalene	SW8270D	mg/Kg	42	-	-	-	-	3.9	[0.73]	-	-	4.01	[0.705] QN	1.91	[0.144] QN	-	-
Nitrobenzene	SW8270D	mg/Kg	68	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-

Table 10-3 - Additional Analytical Results, Test Hole X-1
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

			Sample ID	ADEC Method Two Cleanup Level[1]	14PCX010SO		14PCX017SO		14PCX042SO		14PCX054SO		14PCX076SO		14PCX077SO		14PCX078SO	
			Location		X010NEG		X017NEG		X042FEC		X054WEC		X076FEC		X077DEC		X078NTB	
			Collection Date		7/29/2014		7/30/2014		8/5/2014		8/5/2014		8/16/2014		8/16/2014		8/16/2014	
			Laboratory Report		1143470		1143517		1143634		1143634		1143866		1143866		1143866	
			Sample Type		Primary		Primary		Primary		Primary		Primary		Duplicate (-X076SO)		Trip Blank	
			Matrix		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Analyte	**Method**	**Units**			**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**	**Result**	**[LOD] qual**
Pentachlorophenol	SW8270D	mg/Kg	52	-	-	-	-	ND	[1.17]	-	-	ND	[5.65]	ND	[1.16]	-	-	
Phenanthrene	SW8270D	mg/Kg	27800	-	-	-	-	2.31	[0.146]	-	-	8.61	[0.705] QN	3.57	[0.144] QN	-	-	
Phenol	SW8270D	mg/Kg	31300	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	
Pyrene	SW8270D	mg/Kg	1900	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	
bis(2-Chloroisopropyl)ether	SW8270D	mg/Kg	NE	-	-	-	-	ND	042SO)	-	-	ND	[0.705]	ND	[0.144]	-	-	
bis-(2-Chloroethyl)ether	SW8270D	mg/Kg	4.9	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	
bis-(2-chloroethoxy)methane	SW8270D	mg/Kg	NE	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	
bis-(2-ethylhexyl)phthalate	SW8270D	mg/Kg	300	-	-	-	-	0.186	[0.146] J	-	-	ND	[0.705]	ND	[0.144]	-	-	
n-Nitrosodi-n-propylamine	SW8270D	mg/Kg	0.71	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	
n-Nitrosodimethylamine	SW8270D	mg/Kg	0.22	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	
n-Nitrosodiphenylamine	SW8270D	mg/Kg	1000	-	-	-	-	ND	[0.146]	-	-	ND	[0.705]	ND	[0.144]	-	-	

DRO and RRO were the only analyses identified in the Work Plan. The additional analytical results presented here were requested by ADEC to help identify the source of the strong odor at Test Hole X-1 and to identify additional peaks in a DRO/RRO chromatogram.

[1] ADEC Method Two soil cleanup levels (Title 18 Alaska Administrative Code, Chapter 75.341) apply to Test Hole X-1 samples. Cleanup levels from the most stringent pathway under Arctic Zone (and excluding migration to groundwater) are shown.

[2] Cleanup levels shown are for total xylenes and total 1,3-dichloropropene.

The result that exceeded the applicable ADEC soil cleanup level and was from soil that was excavated/removed from the site (14PCX010SO) is *ITALICIZED*.

Results that exceeded the applicable ADEC soil cleanup level and were from soil that was **NOT** excavated/removed from the site (14PCX076SO) are **BOLDED**.

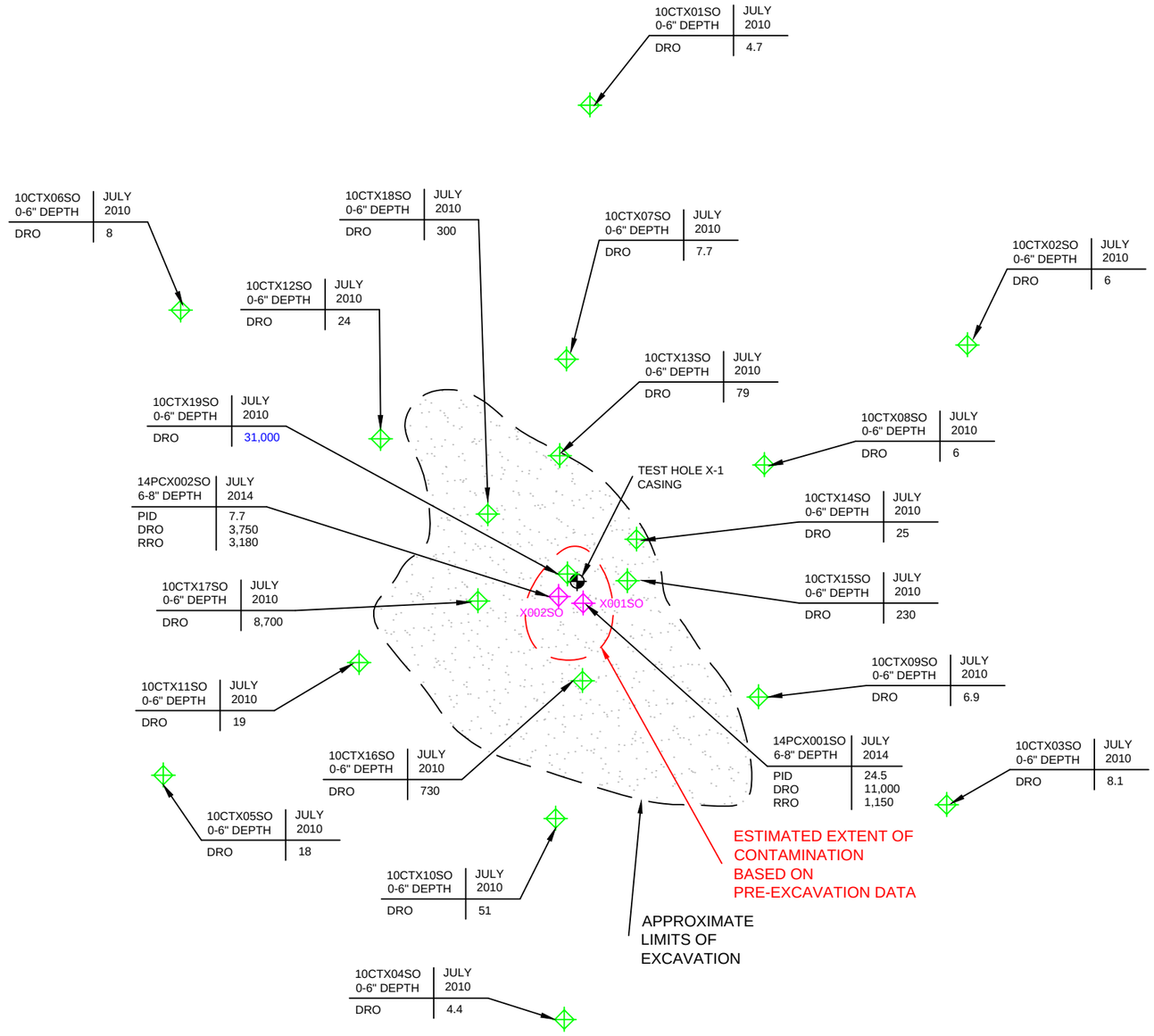
Results reported with LODs above cleanup levels are highlighted in gray.

ADEC - Alaska Department of Environmental Conservation
LOD - limit of detection
mg/Kg - milligrams per kilogram
NE - not established
qual - data qualifier

Data Qualifiers:

B - analytes was also detected in a blank; result may be due to cross-contamination
J - result qualified as estimate because it is less than the limit of quantitation
M - result considered an estimate (biased L-low; H-high; N-unknown) due to matrix issues
ND - analyte not detected
Q - result considered an estimate (biased L-low; H-high; N-unknown) due to a quality control failure
R - result was rejected due to improper preservation and should not be used for decisions making purposes

NORTH



LEGEND

	TEST HOLE X-1 CASING
X001SO	2014 PRE-EXCAVATION GRAVEL SAMPLE LOCATION
	2010 GRAVEL SAMPLE LOCATION
ADEC	ALASKA DEPARTMENT OF CONSERVATION
DRO	DIESEL RANGE ORGANICS
LOD	LIMITS OF DETECTION
LOQ	LIMIT OF QUANTITATION
MG/KG	MILLIGRAMS PER KILOGRAM
ND	NOT DETECTED (LOD)
PPM	PARTS PER MILLION
RRO	RESIDUAL RANGE ORGANICS

NOTES:

1. DRO AND RRO RESULTS SHOWN IN MG/KG. PID RESULTS SHOWN IN PPM.
2. MAP BASED ON SURVEY DATA. WORLD GEODETIC SYSTEM 1984, (WGS84), UNIVERSAL TRANSVERSE MERCATOR (UTM) ZONE 3N.
3. SOILS AT TEST HOLE X-1 ARE SUBJECT TO ADEC ARCTIC ZONE CLEANUP LEVELS.
4. BOLD RESULT EXCEEDED THE ADEC METHOD TWO CLEANUP LEVEL

ADEC CLEANUP LEVELS (METHOD TWO TABLE B2) FOR TUNDRA SOILS IN MG/KG

12,500	DRO
13,700	RRO

KEY:

SAMPLE ID: 14PCX001SO | 6-8" DEPTH | JULY 2014

LABORATORY RESULT: PID 24.5; DRO 11,000; RRO 1,150

SEE LEGEND FOR ABBREVIATIONS.

0 7.5 15 30

SCALE IN FEET

FAIRBANKS ENVIRONMENTAL SERVICES
3538 INTERNATIONAL STREET
FAIRBANKS, ALASKA

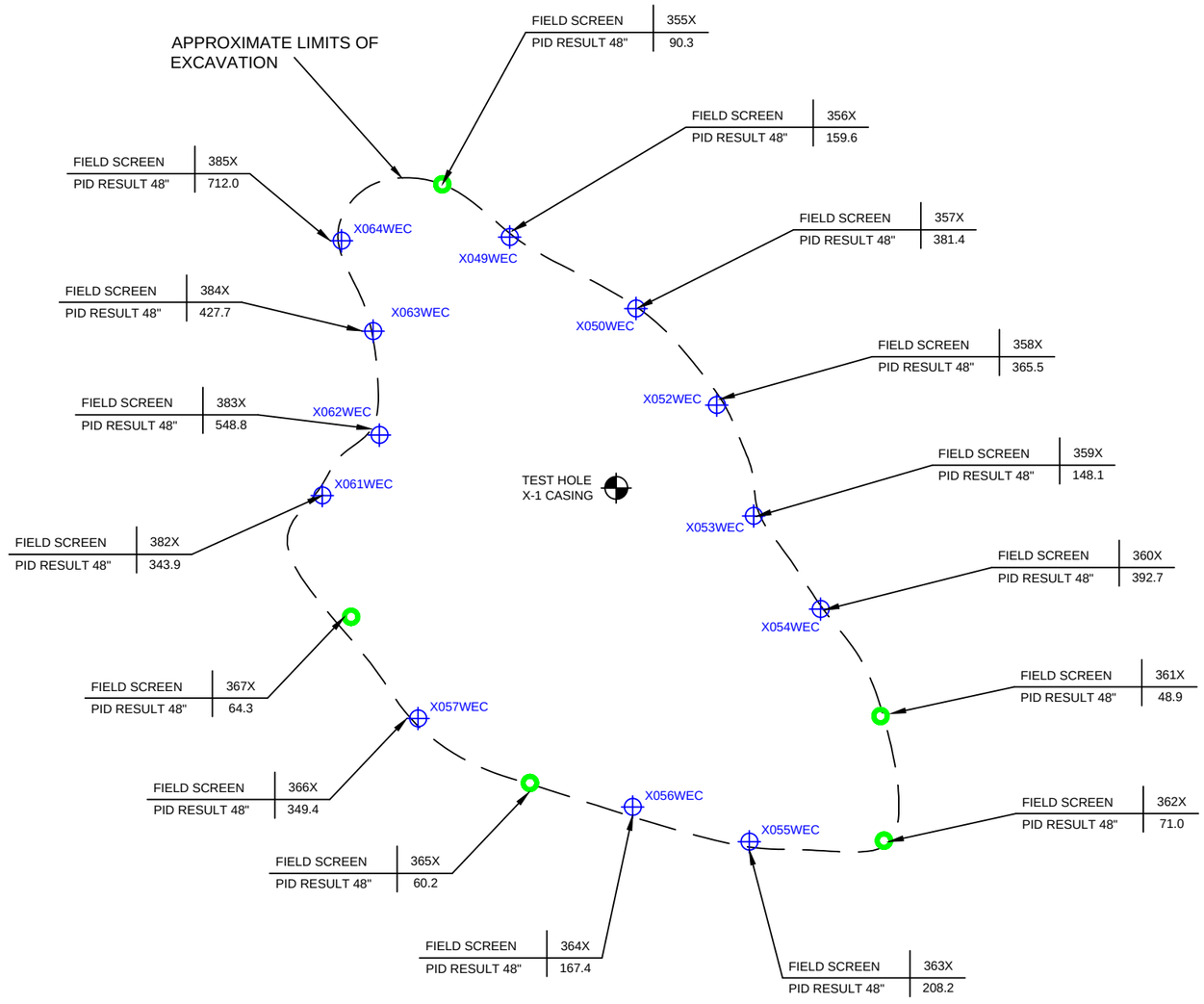
ALASKA DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

Laboratory Results of Pre-Excavation Samples, Test Hole X-1

2014 Remedial Action Report, Project Chariot
Cape Thompson, Alaska

CONTRACT:	FIGURE:	DATE:
W911KB-14-C-0002	10-1	3/15

X1 10-1



LEGEND

TEST HOLE X-1 CASING

X050WEC WALL EXCAVATION SAMPLE LOCATION

PID FIELD SCREENING LOCATION ONLY (NO LABORATORY SAMPLES COLLECTED FROM THIS LOCATION)

PID PHOTOIONIZATION DETECTOR

PPM PARTS PER MILLION

NOTES:

1. PID RESULTS SHOWN IN PPM
2. MAP BASED ON SURVEY DATA. WORLD GEODETIC SYSTEM 1984, (WGS84), UNIVERSAL TRANSVERSE MERCATOR (UTM) ZONE 3N.

KEY:

SAMPLE ID — FIELD SCREEN 364X / PID RESULT 48" 167.4 — PID NUMBER

DEPTH BELOW GROUND SURFACE

PID RESULT IN PPM

SEE LEGEND FOR ABBREVIATIONS.

0 5 10 20

SCALE IN FEET

FAIRBANKS ENVIRONMENTAL SERVICES
3538 INTERNATIONAL STREET
FAIRBANKS, ALASKA

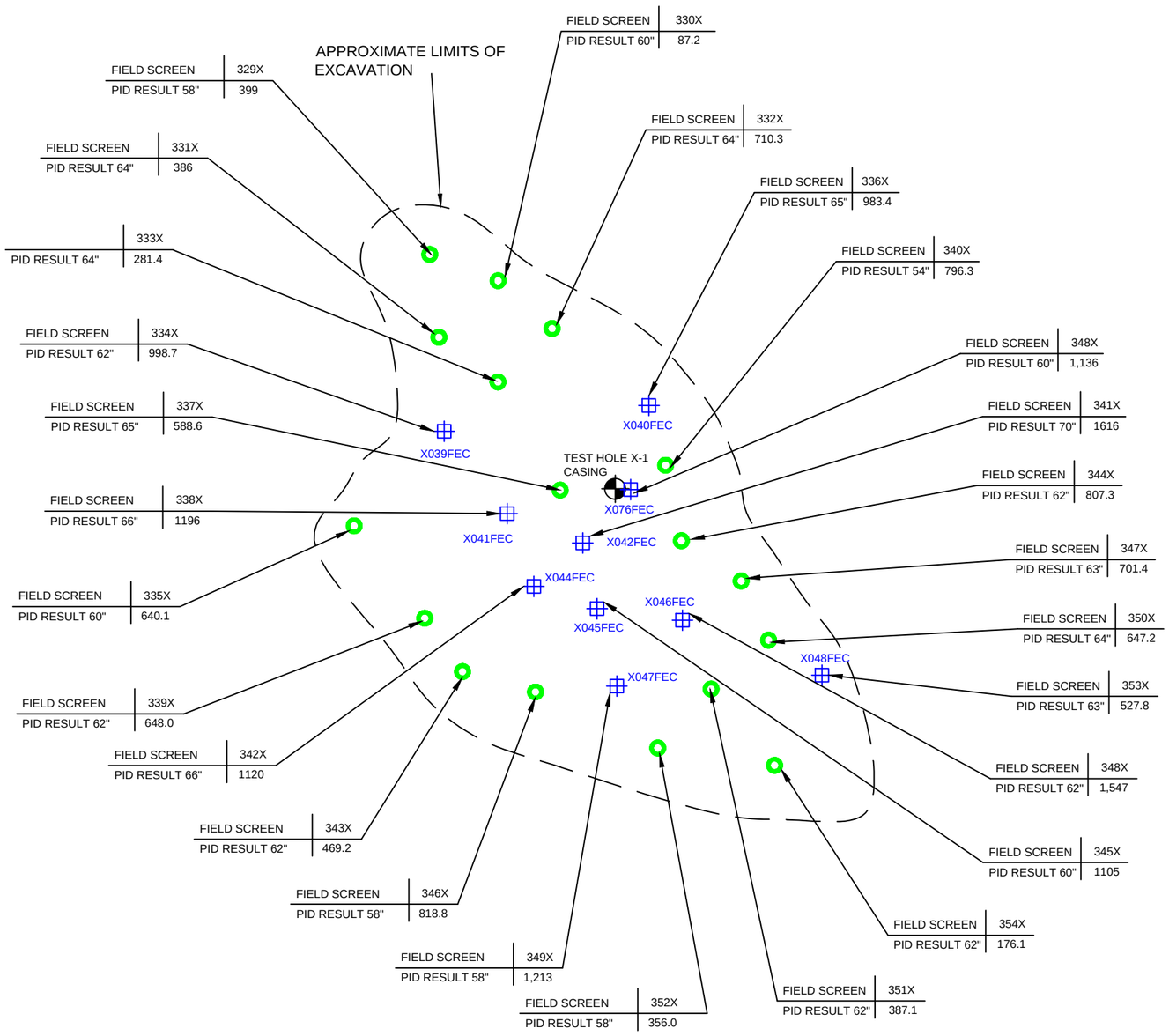
ALASKA DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

Field Screening Results of Wall Confirmation Samples, Test Hole X-1

2014 Remedial Action Report, Project Chariot
Cape Thompson, Alaska

CONTRACT:	FIGURE:	DATE:
W911KB-14-C-0002	10-2	3/15

X1



LEGEND

- TEST HOLE X-1 CASING
- X044FEC — FLOOR EXCAVATION SAMPLE
- PID FIELD SCREENING LOCATION ONLY (NO LABORATORY SAMPLES COLLECTED FROM THIS LOCATION)
- PID — PHOTOIONIZATION DETECTOR
- PPM — PARTS PER MILLION

NOTES:

1. PID RESULTS SHOWN IN PPM
2. MAP BASED ON SURVEY DATA. WORLD GEODETIC SYSTEM 1984, (WGS84), UNIVERSAL TRANSVERSE MERCATOR (UTM) ZONE 3N.

KEY:

FIELD SCREEN 349X / PID RESULT 58" 1,213

SAMPLE ID

PID NUMBER

DEPTH BELOW GROUND SURFACE

PID RESULT IN PPM

SEE LEGEND FOR ABBREVIATIONS.

0 5 10 20

SCALE IN FEET

FAIRBANKS ENVIRONMENTAL SERVICES
3538 INTERNATIONAL STREET
FAIRBANKS, ALASKA

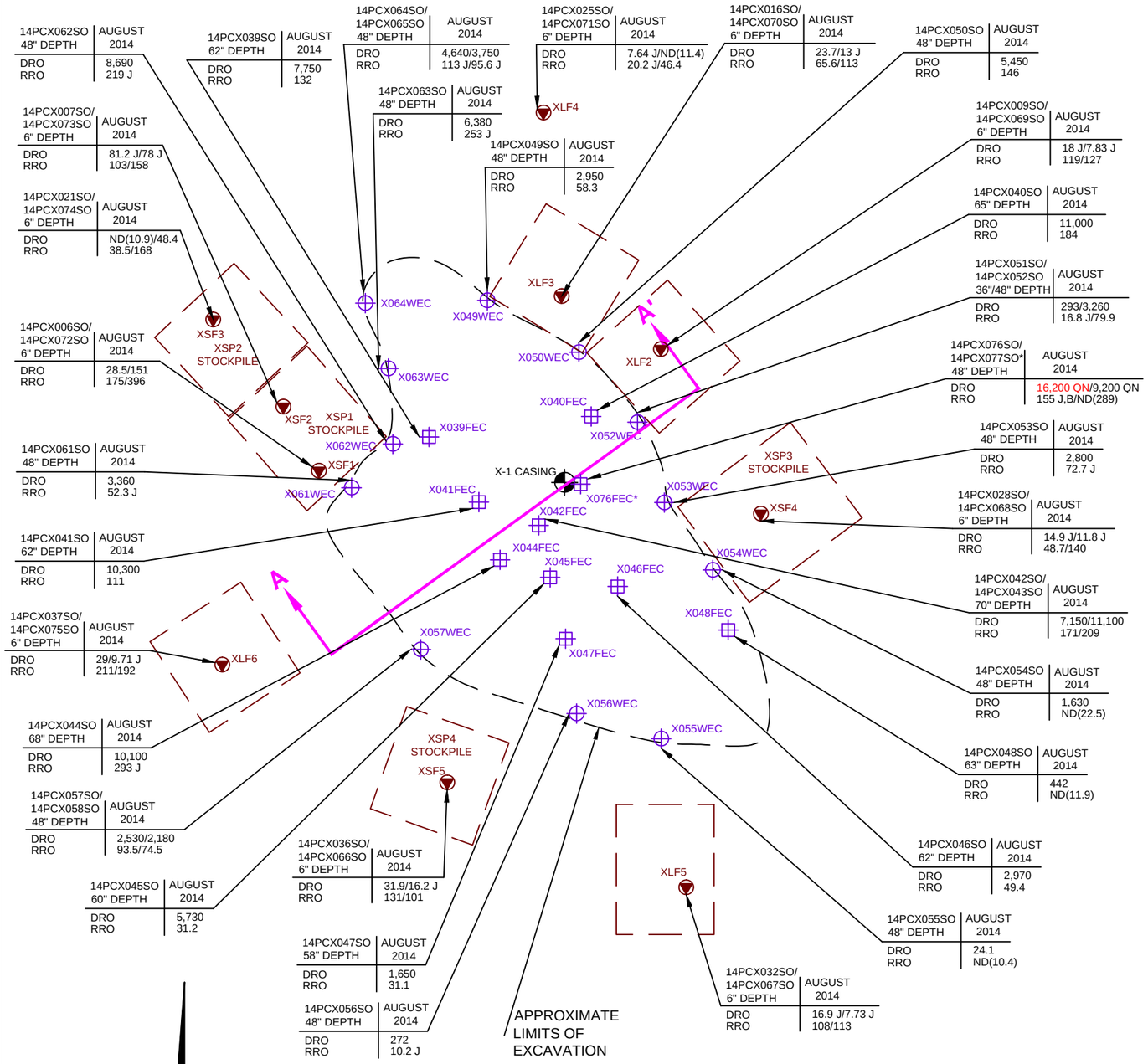
ALASKA DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

Field Screening Results of Floor Confirmation Samples, Test Hole X-1

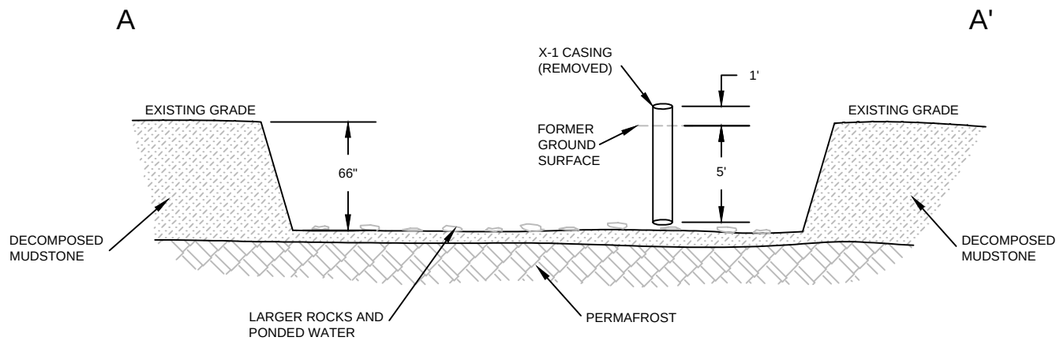
2014 Remedial Action Report, Project Chariot
Cape Thompson, Alaska

CONTRACT:	FIGURE:	DATE:
W911KB-14-C-0002	10-3	3/15

X1



Plan View of Test Hole X-1 Excavation



Cross Section A-A' of Test Hole X-1 Excavation

0 4 8 16
SCALE IN FEET

ADEC CLEANUP LEVELS (METHOD TWO TABLE B2) FOR TUNDRA SOILS IN MG/KG	
12,500	DRO
13,700	RRO

KEY:
SAMPLE ID → 14PCX048SO 63" DEPTH JULY 2014
LABORATORY RESULT → DRO 442 RRO ND
SEE LEGEND FOR ABBREVIATIONS.

NOTES:

1. DRO AND RRO RESULTS SHOWN IN MG/KG
2. MAP BASED ON SURVEY DATA. WORLD GEODETIC SYSTEM 1984, (WGS84), UNIVERSAL TRANSVERSE MERCATOR (UTM) ZONE 3N.
3. SOILS AT TEST HOLE X-1 ARE SUBJECT TO ADEC ARCTIC ZONE CLEANUP LEVELS.
4. BOLD RESULT EXCEEDED THE ADEC METHOD TWO CLEANUP LEVEL
5. * SAMPLES 14PCX076SO AND 14PCX077SO WERE ANALYZED FOR ADDITIONAL ANALYSES AT THE REQUEST OF OF ADEC. SEE TABLE 10-3 FOR ANALYTICAL RESULTS. NOTE THAT NONE OF THE ANALYTES OTHER THAN DRO EXCEEDED ADEC METHOD TWO ARCTIC ZONE SOIL CLEANUP LEVELS.
6. THE SAMPLE LOCATION FROM LOADING AREA FOOTPRINT SAMPLE XLF1 WAS EXCAVATED AND IS NOT SHOWN THE FIGURE.

LEGEND

- TEST HOLE X-1 CASING
- X045WEC — WALL (TUNDRA) EXCAVATION SAMPLE LOCATION
- X041FEC — FLOOR (TUNDRA) EXCAVATION SAMPLE LOCATION
- XLF3 — LOADING AND STOCKPILE FOOTPRINT SAMPLE LOCATION
- LOADING AREA AND STOCKPILE FOOTPRINT

ADEC	ALASKA DEPARTMENT OF CONSERVATION
DRO	DIESEL RANGE ORGANICS
J	RESULT QUALIFIED AS ESTIMATE BECAUSE IT IS LESS THAN THE LOQ
LOD	LIMITS OF DETECTION
LOQ	LIMIT OF QUANTITATION
MG/KG	MILLIGRAM PER KILOGRAM
ND	NOT DETECTED (LOD)
Q	RESULT QUALIFIED AS ESTIMATE (BIASED L-LOW; H-HIGH; N-UNKNOWN) DUE TO QUALITY CONTROL FAILURE
RRO	RESIDUAL RANGE ORGANICS

FAIRBANKS ENVIRONMENTAL SERVICES
3538 INTERNATIONAL STREET
FAIRBANKS, ALASKA

ALASKA DISTRICT
CORPS OF ENGINEERS
ANCHORAGE, ALASKA

Laboratory Results of Confirmation Samples, Test Hole X-1

2014 Remedial Action Report, Project Chariot
Cape Thompson, Alaska

CONTRACT:	FIGURE:	DATE:
W911KB-14-C-0002	10-4	3/15

X1

11.0 DISPOSAL OF POL-CONTAMINATED SOIL AND DEBRIS

This section describes the transport and disposal of POL-contaminated soil and other debris resulting from the 2014 remedial efforts.

11.1 Summary of Connexes Containing POL-Contaminated Soil

A total of 26 empty connex shipping containers were deployed to the site on July 9, 2014. An additional 16 connexes were deployed to the site on August 3, 2014, and 5 empty connexes were re-located from the West Staging Area to the East Staging Area. Ten more empty connexes were deployed on August 16, 2014; however, they were not used.

The connex shipping containers were shipped to the site using a 140-foot landing craft. They were unloaded from the vessel by Northland Services using a Caterpillar 980 loader equipped with forks.

The empty connexes were filled with approximately 20 tons of POL-contaminated soil each. Approximately 786 tons of soil was loaded into 41 connexes. The weight of contaminated soil in each connex based on field measurements and landfill measurements is summarized in Table G-1 in Appendix G. Although there were some individual discrepancies, overall the total field weights and the total landfill weights varied by 980 pounds (0.49 tons), a difference of less than 1 percent.

11.2 Transport and Disposal of POL-Contaminated Soil

A total of 41 connexes filled with POL-contaminated soil were loaded onto landing crafts and removed from the site. A total of 16 connexes were removed on August 14, 2014, 12 connexes were removed on August 16, 2014, and the remaining 13 connexes were removed on September 8, 2014. After leaving the site, the full connexes were then unloaded and staged in Kotzebue or Nome, Alaska.

At the end of the field season, the connexes were loaded onto two barges also operated by Northland Services. Barge Voyage W1408 arrived in Seattle, Washington, on October 13, 2014; the majority of the POL-contaminated soil (36 of the 41 connexes) was on that trip. Voyage W1409 arrived in Seattle around November 10, 2014 with the final five connexes.

The filled connex boxes were transported overland via truck and rail to the Columbia Ridge Landfill in Arlington, Oregon, where the bagged soils were disposed in a landfill. Copies of the signed shipping manifests and disposal certificates are included in Appendix G.

11.3 Disposal of Debris and Ashes

Debris and ashes from on-site incineration activities were loaded onto the landing craft and transported to Kotzebue on September 8, 2014. The bagged ashes and debris were subsequently transported to and disposed of in the Kotzebue Landfill. One electrical connector from the thermistor cable removed from the Test Hole Charlie site and a piece of braided steel cable from the Test Hole Baker site were retained at the request of Jack Schaefer, Mayor of Point Hope, and will be relinquished to the USACE.

12.0 CONCUSIONS AND RECOMMENDATIONS

Five test hole casings were decommissioned and approximately 786 tons of POL-contaminated soil was excavated from four test hole sites. Contaminated soil was transported to Oregon and disposed in a permitted landfill. Based on field observations and laboratory results, all accessible soil contamination was removed during remedial action efforts. Sampling and analysis were conducted in accordance with the Work Plan, and remedial action objectives were met. Site closure is recommended for all five Project Chariot sites as follows.

Test Hole Able

There was no evidence of contamination at the Test Hole Able site, and Cleanup Complete status is recommended for this site.

Test Hole Baker

A total of 15.5 tons of diesel-contaminated soil was removed from adjacent the Test Hole Baker casing. The northwest corner of the 130 foot excavation was excavated to permafrost (approximately 40 inches deep). Although the sample from within the casing exceeded the Method One cleanup level for DRO, confirmation sample results collected from the limits of the soil excavation were below soil cleanup levels. The casing was decommissioned and sealed to prevent further contact with the contaminated soil. Cleanup Complete with Institutional Controls (ICs) is recommended for this site due to the residual soil contamination noted within the casing, and the presumed soil contamination located along the depth of the 1,172-foot Test Hole Baker borehole.

Test Hole Charlie

Diesel-contaminated soil was excavated from the Test Hole Charlie site until permafrost was encountered (a depth of approximately 36 inches). A total of 248 tons of diesel-contaminated soil was removed from the approximately 2,100 square foot excavation; contamination extended beyond the drill pad approximately 10 feet southeast into the tundra. Excavation confirmation sample results were below soil cleanup levels except for one floor sample located closest to the casing which was at permafrost preventing further excavation. Elevated DRO and RRO concentrations were present in remaining soils especially on the eastern edge of the excavation; however, the concentrations were below cleanup levels. Diesel-contamination is likely present in subsurface soils adjacent to the Test Hole Charlie casing. Cleanup Complete with ICs is recommended for this site due to the residual soil contamination noted next to the casing, and the presumed soil contamination located along the depth of the 1,002-foot Test Hole Charlie borehole.

Test Hole Dog

About 255 tons of POL-contaminated soil was removed from the Test Hole Dog site. The approximately 2,300 square foot excavation was excavated to permafrost, a depth of approximately 24 inches. Excavation confirmation sample results were below soil cleanup levels. Cleanup Complete with Institutional controls is recommended for this site based on the presumed soil contamination located along the depth of the 1,202-foot Test Hole Dog borehole.

Test Hole X-1

The Test X-1 Charlie site, located on a hilltop, was vertically excavated to permafrost to a depth of approximately 66 inches. A total of 267 tons of POL-contaminated soil was removed from the approximately 1,100 square foot excavation. Excavation confirmation sample results were below soil cleanup levels except for one floor sample located closest to the casing. Cleanup Complete with ICs is recommended for this site due to the residual soil contamination noted below the former casing location. We do not know if a boring was installed at this location.

13.0 REFERENCES

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APPENDIX A

SITE PHOTOGRAPHS

Field Camp and Site Mobilization

Photograph 1 – Setting up camp on July 12; West Staging Area in background. Camp materials and equipment arrived via barge on July 8. View to the southwest.

Photograph 2 – The main tent shown being erected housed the kitchen and dining room on the east side, and the laundry and showers on the west side. View to the southeast.

Photograph 3 – View of finished camp from West Staging Area. Tan tents were sleeping quarters. Food, tools, and parts were stored in the connex shipping containers in background. View to the northeast.

Photograph 4 – View of camp from the airplane window. View to the south.

Photograph 5 – Sample coolers were shipped from the site to Kotzebue via fixed-wing plane, where they were put on a commercial flight to the project laboratory in Anchorage. View to the northwest.

Photograph 6 – Field personnel and gear were transported to the site via fixed-wing plane capable of carrying 800 pounds. Additional super sacks are shown in this photograph.

Test Hole Able

Photograph 7 – Approximately 4.5 gallons of water were pumped from the Test Hole Able casing. View to the northwest.

Photograph 8 – Approximately 9 gallons of casing water was treated collectively with granular activated carbon prior to surface discharge. Representative samples were collected pre- and post-treatment. View to the west.

Photograph 9 – The area surrounding Test Hole Able casing was excavated so it could be cut and capped below grade. View to the south.

Photograph 10 – The casing interiors were sealed with a bentonite plug. A ground wire was attached to a bolt welded onto the left side of casing to allow welding of cap.

Photograph 11 – Caps were welded onto the top of the cut casings. View to the southeast.

Photograph 12 – Close-up of Test Hole Able before it was buried.

Photograph 13 – Test Hole Able pad was re-contoured following the decommissioning of the casing. Orange pin flag represents the casing location. View to the northwest.

Photograph 14 – The pads were fertilized and re-seeded at the end of the project.

Test Hole Baker

Photograph 15 – Test Hole Baker prior to decommissioning. View to northeast

Photograph 16 – Water was pumped from the casing prior to decommissioning. View to the northwest.

Photograph 17 – The northwest corner of the Test Hole Baker was excavated to a depth of 40 inches. A small, towable backhoe was used due to site access and small excavation size. View to the northwest.

Photograph 18 – Confirmation and footprint sample locations were marked with orange pin flags so they could be surveyed. View to the north.

Photograph 19 – View of Test Hole Baker excavation immediately after backfilling and re-contouring. Casing was cut and capped below grade. View to northeast.

Photograph 20 – The Test Hole Baker pad was fertilized and re-seeded on August 25. View to the southeast.

Test Hole Charlie

Photograph 21 – Surface soils at Test Hole Charlie were screened with a PID to estimate the area with POL-contamination (marked with spray paint). Casing is shown on left. View to the southeast.

Photograph 22 – Standing water was pumped from the Test Hole Charlie casing prior to decommissioning and excavation activities. View to northwest.

Photograph 23 – POL-contaminated soil was placed in super sacks. View to the southeast.

Photograph 24 – View of buried items (overcasing, timbers, and Marsden mats) removed during the Test Hole Charlie excavation. View to the northwest.

Photograph 25 – Screening samples in sealable plastic bags were heated in a water bath prior to measuring headspace with a PID. Excavations were guided using PID screening results.

Photograph 26 – Close up of PID shown in the Photograph 25.

Photograph 27 – Sampler collecting excavation guidance sample 14PCC026SO and field duplicate 14PCC027SO. Laboratory results were below ADEC Method One cleanup levels and excavation activities were curtailed to the north. View to the west.

Photograph 28 – Due to frozen soils and standing water, several floor samples on the southern side of Test Hole Charlie were collected with a hand-driven probe as shown in this photograph. View to southeast.

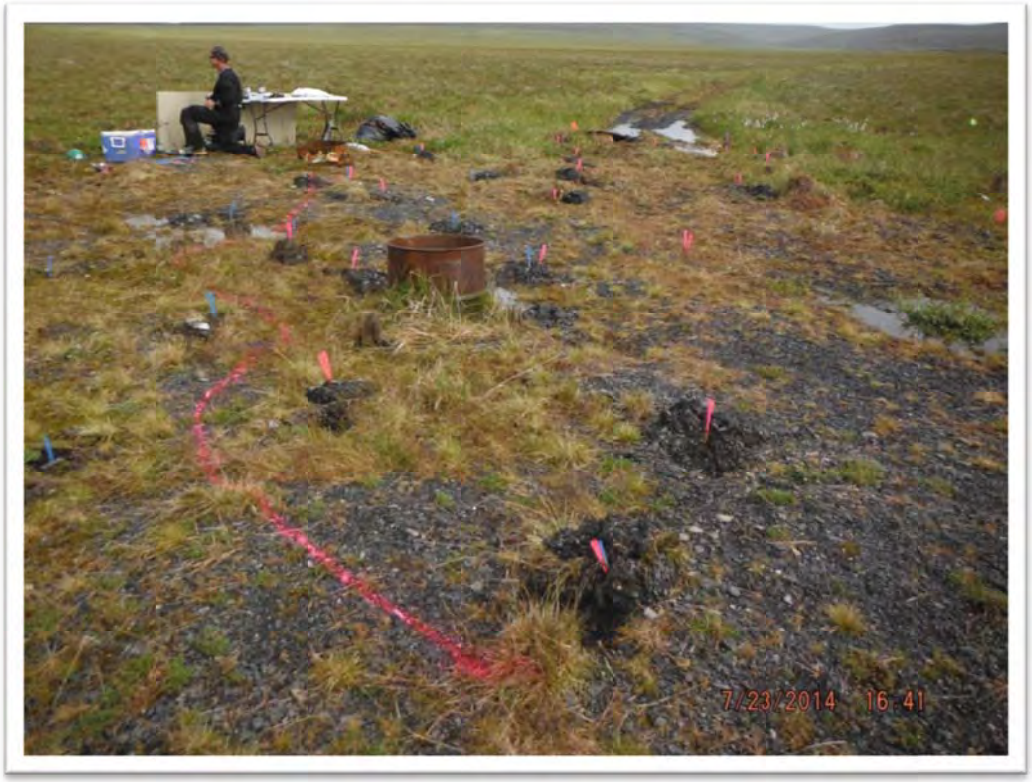
Photograph 29 – Northern half of Test Hole Charlie excavation. Yellow flags represent PID screening locations. Orange flags represent PID screening and laboratory sample locations. View to the west.

Photograph 30 – Test Hole Charlie excavation looking southeast. Yellow flags represent PID screening locations. Orange flags represent PID screening and laboratory sample locations. Casing is to the right of photograph.

Photograph 31 – Seed and fertilizer were spread on test hole pads following re-contouring. Orange pin flags denote laboratory sample locations with were surveyed on August 27. View to the northeast.

Photograph 32 – View of Test Hole Charlie following Remedial Action. View to north.

Test Hole Dog



Photograph 33 – The extent of POL-contaminated surface soil was estimated with PID screening samples, and the approximate area to be excavated was marked with spray paint prior to excavation. View to the northeast.

Photograph 34 – Improvements, including the addition of gravel and mud mats, were required to access and remove the filled super sacks from the Test Hole Dog site (site shown in distance). View to the west.

Photograph 35 – Loading super sacks within the Test Hole Dog excavation (see pink spray paint). Note excavator on mats to reduce contact with POL-contaminated soil within excavation. View to the south.

Photograph 36 – Filled super sacks were stockpiled adjacent the Test Hole Dog excavation prior to arrival of additional mud mats. View to the southwest.

Photograph 37 – Sampler collecting a pre-loading area footprint sample 14PCD019SO located outside the limits of the Test Hole Dog excavation. View to the south

Photograph 38 – Limits of Test Hole Dog excavation with pin flags marking the floor and wall PID screening locations. View to the west.

Photograph 39 – The last super sack from Test Hole Dog (and the project) with field crew. View to the east.

Photograph 40 – Final limits of Test Hole Dog excavation. Pin flags denote laboratory confirmation sample locations to be surveyed. View to the northeast.

Photograph 41 – Re-contouring of Test Hole Dog excavation following ADEC approval. View to the southwest.

Photograph 42 – Test Hole Dog site following fertilization and re-seeding and just prior to surveying confirmation sample locations marked by pin flags. View to the southeast.

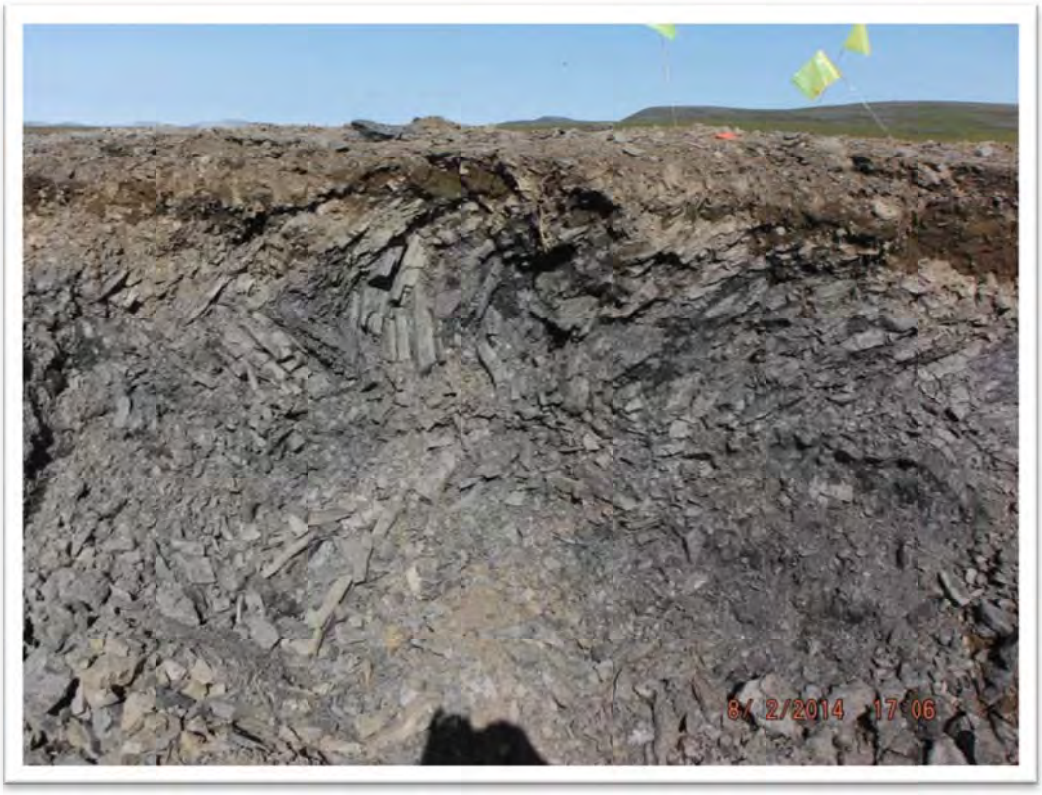
Test Hole X-1

Photograph 43 – POL-contamination in surface soil at Test Hole X-1 was marked with spray paint. The actual excavation extended further than the surface contamination. The site is located on a sparsely vegetated hilltop. View to south.

Photograph 44 – The 6-foot-long Test Hole X-1 casing was completely removed. Stockpiled surface soils are shown on far side of excavation. View to the west.

Photograph 45 – Soils closest to the Test Hole X-1 casing appeared to have been previously disturbed. A soil screen, wood debris, gasket and plug were unearthed. View to south.

Photograph 46 – Rock size increased with depth of excavation; rocks up to 10 inches in diameter were encountered. Permafrost was encountered at approximately 5 feet below ground surface and limited vertical excavation.



Photograph 47 – The northwestern sidewall (fractured bedrock) was previously undisturbed as shown in this photograph. View to west.

Photograph 48 – Breathing air was monitored with a PID during excavation activities. The Test Hole X-1 excavation had the highest PID readings, but breathing air never exceeded the 15 part per million safety limit. View to the northwest.

Photograph 49 – Final limits of the Test Hole X-1 excavation. Pin flags mark confirmation sample locations. A total of four stockpiles were constructed around the excavation. View to south.

Photograph 50 – Sampler collecting soil samples from a stockpile. Five locations from each stockpile were field screened, and laboratory samples were collected from the location with the highest PID result.

Photograph 51 – Test Hole X-1 was backfilled and contoured to match the existing grade using both excavators and the skid steer and local material. View to northeast.

Photograph 52 – Test Hole X-1 following remedial action efforts. Pin flags marking confirmation samples locations were re-installed using swing-ties. View to southeast.

POL-Contaminated Soil Handling

Photograph 53 – Filled super sacks were transported to staging area on trailers pulled by ATVs or UTVs (shown here). View to south.

Photograph 54 – Filled super sacks were weighed using a crane scale suspended from an excavator at the staging areas. View to the southwest.

Photograph 55 – View of labeled and weighed super sacks at the East Staging Area. View to southeast.

Photograph 56 – Filled super sacks being loaded into the connex shipping containers using an extended boom forklift. Approximately 20 tons of POL-contaminated soil was loaded into each connex.

Photograph 57 – A 980C-4 Caterpillar equipped with forks was used to move this container from the West Staging Area onto the landing craft. View to north.

Photograph 58 – Loading connex boxes onto 140-foot landing craft. A total of 41 connexes filled with POL-contaminated soil were removed from the site. View to southeast.

APPENDIX B

FIELD SCREENING RESULTS TABLES

Table B1 - Field Screening Results, Test Hole Baker
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Number	Date	PID Number	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
1	7/18/2014	001B	gravel	6	NE	confirmation-wall	0.4
2	7/18/2014	002B	gravel	26	NE	confirmation-wall	0.3
3	7/18/2014	003B	gravel	12	NE	confirmation-wall	0.3
4	7/18/2014	004B	gravel	10	SE	confirmation-wall	2.0
5	7/18/2014	005B	gravel	12	SE	confirmation-wall	1.3
6	7/18/2014	006B*	gravel	8	SW	confirmation-wall	2.3
7	7/18/2014	007B	gravel	8	NW	confirmation-wall	1.5
8	7/18/2014	008B	gravel	20	NW	excavation guidance	596
9	7/18/2014	009B	gravel	32	NE	confirmation-floor	0.1
10	7/18/2014	010B	gravel	16	Center	confirmation-floor	2.7
11	7/18/2014	011B*	gravel	15	SW	confirmation-floor	2.4
12	7/18/2014	012B	gravel	17	SE	confirmation-floor	0.2
13	7/19/2014	013B	gravel with fines	20	NW	excavation guidance	2.7
14	7/19/2014	014B	gravel with fines	36	NW	excavation guidance	5.3
15	7/19/2014	015B	gravel with fines	30	NW	excavation guidance	23.6
16	7/19/2014	016B*	gravel with fines	32	NW	excavation guidance	8.0
17	7/19/2014	017B	gravel with fines	20	NW	excavation guidance	44.9
18	7/19/2014	018B	gray clay	36	NW	excavation guidance	22.2
19	7/19/2014	019B	gray clay	40	NW	excavation guidance	19.2
20	7/19/2014	020B	gravel with fines	32	NW	excavation guidance	4.3
21	7/19/2014	021B	gravel with fines	30	NW	excavation guidance	38.7
22	7/19/2014	022B*	gray clay	40	NW	confirmation-floor	1.6
23	7/19/2014	023B*	gray clay	26	NW	confirmation-wall	3.8
24	7/19/2014	024B	gravel with fines	32	NW	excavation guidance	12.4
25	7/19/2014	025B	gravel with fines	36	NW	excavation guidance	9.5
26	7/19/2014	026B	gravel with fines	36	NW	excavation guidance	8.5
27	7/19/2014	027B	gray clay	36	NW	excavation guidance	1.9
28	7/19/2014	028B*	gray clay	42	NW	confirmation-floor	4.4
29	7/19/2014	029B*	gray clay	48	NW	confirmation-wall	1.8
30	7/19/2014	030B	gray fines with peat	40	NW	confirmation-floor	1.7
31	7/19/2014	031B*	gravel with fines	30	NW	confirmation-wall	2.0
32	7/19/2014	032B*	gravel with fines	5	NW	post-loading area	2.2
33	7/19/2014	033B*	gravel with fines	6	NW	post-loading area	1.4
34	7/22/2014	034B*	gravel	NA	NW	casing interior	372.1

* indicates a laboratory sample was also collected from this location

PID - photoionization detector (field screening instrument)

ppm - parts per million

Table B2 - Field Screening Results, Test Hole Charlie
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Number	Date	PID Number[1]	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
1	6/26/2014	001C*	sandy gravel	10	NE	characterization	strong odor
2	6/26/2014	002C*	sandy gravel	10	NW	characterization	strong odor
3	6/26/2014	003C*	sandy gravel	10	NW	pre-excavation delineation	2.0
4	6/26/2014	004C*	sandy gravel	10	NE	pre-excavation delineation	0.5
5	6/26/2014	005C	PID number not used				
6	6/26/2014	006C*	sandy gravel	14	NW	pre-excavation delineation	0.7
7	6/26/2014	007C*	sandy gravel	14	SW	pre-excavation delineation	2.8
8	6/26/2014	008C*	sandy gravel	11	SW	pre-excavation delineation	4.2
9	7/17/2014	009C	sandy gravel	12	NW	pre-excavation delineation	3.8
10	7/17/2014	010C	sandy gravel	14	NW	pre-excavation delineation	4.2
11	7/17/2014	011C	sandy gravel	7	NW	pre-excavation delineation	3.3
12	7/17/2014	012C*	sandy gravel	10	NW	pre-excavation delineation	9.5
13	7/17/2014	013C	sandy gravel	8	NW	pre-excavation delineation	4.1
14	7/17/2014	014C	sandy gravel	14	NW	pre-excavation delineation	5.0
15	7/17/2014	015C	sandy gravel	9	NW	pre-excavation delineation	1.3
16	7/17/2014	016C	sandy gravel	10	NW	pre-excavation delineation	0.1
17	7/17/2014	017C	sandy gravel	19	SW	pre-excavation delineation	4.1
18	7/17/2014	018C	sandy gravel	9	SW	pre-excavation delineation	4.3
19	7/17/2014	019C	sandy gravel	8	SE	pre-excavation delineation	56.3
20	7/17/2014	020C	sandy gravel	13	NW	pre-excavation delineation	5.5
21	7/17/2014	021C	sandy gravel	10	NW	pre-excavation delineation	2.1
22	7/17/2014	022C	sandy gravel	9	NW	pre-excavation delineation	3.0
23	7/17/2014	023C	sandy gravel	9	NE	pre-excavation delineation	2.9
24	7/17/2014	024C	sandy gravel	18	NE	pre-excavation delineation	4.3
25	7/17/2014	025C	sandy gravel	8	NE	pre-excavation delineation	7.1
26	7/17/2014	026C	sandy gravel	10	NW	pre-excavation delineation	2.1
27	7/17/2014	027C	sandy gravel	10	NW	pre-excavation delineation	1.5
28	7/17/2014	028C	sandy gravel	10	NW	pre-excavation delineation	3.5
29	7/17/2014	029C	sandy gravel	12	NW	pre-excavation delineation	1.1
30	7/17/2014	030C	sandy gravel	8	NW	pre-excavation delineation	3.7
31	7/17/2014	031C	sandy gravel	11	NE	pre-excavation delineation	1.3
32	7/17/2014	032C	sandy gravel	8	SE	pre-excavation delineation	1.3
33	7/17/2014	033C	sandy gravel	9	SE	pre-excavation delineation	3.3
34	7/17/2014	034C	sandy gravel	11	NW	pre-excavation delineation	304.1
35	7/17/2014	035C*	sandy gravel	9	NE	pre-excavation delineation	19.3
36	7/17/2014	036C	sandy gravel	10	NE	pre-excavation delineation	9.0
37	7/17/2014	037C	sandy gravel	8	NE	pre-excavation delineation	3.1
38	7/17/2014	038C	sandy gravel	15	NE	pre-excavation delineation	5.1
39	7/17/2014	039C	sandy gravel	10	SE	pre-excavation delineation	4.2
40	7/17/2014	040C	sandy gravel	15	SE	pre-excavation delineation	11.1
41	7/17/2014	041C	sandy gravel	10	SE	pre-excavation delineation	342.1
42	7/18/2014	042C	sandy gravel	bucket	NW	excavation guidance	4.8
43	7/18/2014	043C	sandy gravel	bucket	NW	excavation guidance	23.5
44	7/18/2014	044C	sandy gravel	18	NW	excavation guidance	0.2
45	7/18/2014	045C	sandy gravel	20	NW	excavation guidance	0.1
46	7/18/2014	046C	sandy gravel	20	NW	excavation guidance	0.1
47	7/19/2014	047C	sandy gravel	22	SW	excavation guidance	0.2
48	7/19/2014	048C	sandy gravel	24	NW	excavation guidance	55.2
49	7/19/2014	049C	sandy gravel	bucket	NW	excavation guidance	89.3
50	7/19/2014	050C	sandy gravel	18	NW	excavation guidance	6.2
51	7/19/2014	051C	sandy gravel	24	NW	excavation guidance	5.8
52	7/19/2014	052C	sandy gravel	18	NW	excavation guidance	1.7
53	7/19/2014	053C*	sandy gravel	27	NE	excavation guidance	12.8
54	7/19/2014	054C	sandy gravel	32	NW	excavation guidance	6.5
55	7/19/2014	055C	sandy gravel	24	NE	excavation guidance	18.5
56	7/19/2014	056C	sandy gravel	30	NE	excavation guidance	19.7
57	7/20/2014	057C	sandy gravel	36	NE	excavation guidance	1.7
58	7/20/2014	058C	sandy gravel	30	NE	excavation guidance	8.9
59	7/20/2014	059C	sandy gravel	32	NE	excavation guidance	16.5
60	7/20/2014	060C	sandy gravel	18	NE	excavation guidance	105.2
61	7/20/2014	061C	sandy gravel	13	NE	excavation guidance	0.8

Table B2 - Field Screening Results, Test Hole Charlie
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Number	Date	PID Number[1]	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
62	7/20/2014	062C	sandy gravel	20	NE	excavation guidance	1.8
63	7/21/2014	063C	sandy gravel	26	NW	excavation guidance	5.5
64	7/21/2014	064C	sandy gravel	30	NW	excavation guidance	2.1
65	7/21/2014	065C	sandy gravel	26	NW	excavation guidance	1.4
66	7/21/2014	066C	sandy gravel	25	NW	excavation guidance	3.9
67	7/21/2014	067C	gray clay	30	NW	excavation guidance	21.7
68	7/21/2014	068C*	peat, clay	32	NW	excavation guidance	47.1
69	7/21/2014	069C	gray clay	26	NW	excavation guidance	19.5
70	7/21/2014	070C	sandy gravel	30	NW	excavation guidance	2.8
71	7/21/2014	071C	sandy gravel	23	NW	confirmation-wall	1.1
72	7/21/2014	072C	sandy gravel	27	NW	confirmation-wall	1.9
73	7/21/2014	073C	sandy gravel	23	NW	confirmation-wall	2.8
74	7/21/2014	074C	sandy gravel	20	NW	confirmation-wall	1.1
75	7/21/2014	075C	gravel and brown fines	23	NW	confirmation-wall	2.5
76	7/21/2014	076C	sandy gravel	21	NE	confirmation-wall	3.0
77	7/21/2014	077C	gravel and peat	20	NE	confirmation-wall	1.7
78	7/21/2014	078C	gravel and peat	16	NE	confirmation-wall	3.3
79	7/21/2014	079C	sandy gravel	9	NE	excavation guidance	107
80	7/21/2014	080C	sandy gravel	16	NE	confirmation-wall	1.6
81	7/21/2014	081C	gray clay and peat	24	NE	confirmation-wall	5.6
82	7/21/2014	082C	brown fines and peat	10	NE	confirmation-wall	2.7
83	7/21/2014	083C	brown fines and peat	9	NE	confirmation-wall	5.7
84	7/21/2014	084C	sandy gravel	5	NE	confirmation-wall	1.8
85	7/21/2014	085C	sandy gravel	10	NE	excavation guidance	201
86	7/22/2014	086C	gray clay	28	NE	excavation guidance	54
87	7/22/2014	087C	gray clay	30	NE	excavation guidance	86
88	7/22/2014	088C	gray clay and peat	6	SE	excavation guidance	32
89	7/22/2014	089C*	brown fines and gray clay	12	SE	excavation guidance	125
90	7/22/2014	090C	brown fines and gray clay	12	SE	excavation guidance	7.2
91	7/22/2014	091C	brown fines and gray clay	12	SE	excavation guidance	40.5
92	7/22/2014	092C	brown fines and gray clay	8	SE	excavation guidance	192.1
93	7/22/2014	093C	brown fines and gray clay	8	SE	excavation guidance	281.3
94	7/22/2014	094C*	gray clay	10	SE	excavation guidance	4.6
95	7/22/2014	095C	vegetation mat	6	SE	excavation guidance	8.6
96	7/22/2014	096C	gray clay	36	NW	excavation guidance	9.2
97	7/22/2014	097C	gravel and gray clay	28	NW	excavation guidance	3.9
98	7/22/2014	098C	sandy gravel	20	NW	excavation guidance	2.7
99	7/22/2014	099C	gravel and gray clay	30	SW	excavation guidance	67.9
100	7/22/2014	100C	sandy gravel	20	SW	excavation guidance	5.0
101	7/22/2014	101C	sandy gravel	10	SW	excavation guidance	5.0
102	7/22/2014	102C	sandy gravel	12	SW	excavation guidance	16.5
103	7/22/2014	103C	sandy gravel	18	SW	excavation guidance	8.3
104	7/22/2014	104C	gravel and gray clay	23	SW	excavation guidance	5.5
105	7/22/2014	105C	peat, clay	32	SW	excavation guidance	3.9
106	7/22/2014	106C*	sandy gravel	20	SW	excavation guidance	27.1
107	7/22/2014	107C	sandy gravel	20	SW	excavation guidance	5.7
108	7/22/2014	108C	sandy gravel	18	SW	excavation guidance	5.8
109	7/22/2014	109C	sandy gravel	6	NW	excavation guidance	1.3
110	7/22/2014	110C	gray clay	18	SW	excavation guidance	125.9
111	7/22/2014	111C	gray clay	18	SW	excavation guidance	173.2
112	7/22/2014	112C	peat, clay	18	NE	excavation guidance	284.2
113	7/22/2014	113C*	gray clay	18	NE	excav. guidance/confirmation-wall	87.1
114	7/22/2014	114C	gray clay	24	NE	excavation guidance	168
115	7/22/2014	115C	gray clay	22	NE	excavation guidance	171.2
116	7/22/2014	116C	gray clay	22	NE	excavation guidance	160.4
117	7/22/2014	117C	gray clay	22	NE	excavation guidance	424
118	7/22/2014	118C	gray clay	22	NE	excavation guidance	175
119	7/22/2014	119C	gray clay	22	SE	excavation guidance	73
120	7/22/2014	120C	gray clay	22	SE	excavation guidance	28.5
121	7/22/2014	121C	gray clay	20	SE	excavation guidance	17.2
122	7/22/2014	122C	gray clay	18	NE	confirmation-wall	278.8

Table B2 - Field Screening Results, Test Hole Charlie
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Number	Date	PID Number[1]	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
123	7/22/2014	123C*	gray clay	17	NE	confirmation-wall	452.1
124	7/22/2014	124C*	gray clay	16	NE	confirmation-wall	304.6
125	7/22/2014	125C*	gray clay	16	NE	confirmation-wall	66.2
126	7/22/2014	126C*	gray clay	16	NE	confirmation-wall	44.2
127	7/22/2014	127C	gray clay	15	SE	confirmation-wall	25.2
128	7/22/2014	128C*	gray clay	10	SE	confirmation-wall	100.8
129	7/22/2014	129C	gray clay	10	SE	confirmation-wall	84.8
130	7/23/2014	130C	sandy gravel	24	NW	confirmation-wall	2.9
131	7/23/2014	131C	sandy gravel	28	NW	confirmation-wall	2.1
132	7/23/2014	132C	sandy gravel	33	NW	excavation guidance	138
133	7/23/2014	133C	sandy gravel	27	NW	excavation guidance	69.1
134	7/23/2014	134C	sandy gravel	27	NW	excavation guidance	15.7
135	7/23/2014	135C	gravel and gray clay	25	NW	confirmation-wall	2.9
136	7/23/2014	136C	sandy gravel	26	NW	confirmation-wall	19.8
137	7/23/2014	137C*	gravel and gray clay	36	NW	confirmation-wall	24.5
138	7/23/2014	138C*	sandy gravel	28	NW	confirmation-wall	33.1
139	7/23/2014	139C	gravel and gray clay	28	NW	confirmation-wall	17.6
140	7/23/2014	140C	sandy gravel	36	NW	confirmation-wall	8.8
141	7/23/2014	141C	sandy gravel	28	NW	confirmation-wall	4.5
142	7/23/2014	142C	sandy gravel	25	NW	confirmation-wall	0.9
143	7/24/2014	143C*	gray clay	27	NW	confirmation-floor	41.1
144	7/24/2014	144C	gray clay	30	NW	confirmation-floor	12.0
145	7/24/2014	145C*	gray clay	31	NW	confirmation-floor	975.6
146	7/24/2014	146C	gray clay	32	NW	confirmation-floor	13.2
147	7/24/2014	147C	gray clay	36	NW	confirmation-floor	12.4
148	7/24/2014	148C	gray clay	32	NW	confirmation-floor	26.4
149	7/24/2014	149C	gray clay	34	NW	confirmation-floor	15.2
150	7/24/2014	150C	gray clay	36	NW	confirmation-floor	24.4
151	7/24/2014	151C	gray clay	36	NW	confirmation-floor	30.3
152	7/24/2014	152C	gray clay	38	NW	confirmation-floor	29.9
153	7/24/2014	153C	gray clay	25	NW	confirmation-floor	14.1
154	7/24/2014	154C*	gray clay	35	NW	confirmation-floor	30.4
155	7/24/2014	155C	gray clay	35	NW	confirmation-floor	27.9
156	7/24/2014	156C*	gray clay	38	NE	confirmation-floor	37.2
157	7/24/2014	157C*	gray clay	32	NW	confirmation-floor	49
158	7/24/2014	158C*	peat	32	NW	confirmation-floor	69.2
159	7/24/2014	159C	gray clay	13	SW	excavation guidance	213.7
160	7/24/2014	160C	gray clay	9	SW	excavation guidance	171
161	7/24/2014	161C	sandy gravel	10	SW	excavation guidance	79.8
162	7/24/2014	162C	sandy gravel	16	SW	excavation guidance	99
163	7/24/2014	163C	sandy gravel	8	SW	excavation guidance	15.3
164	7/24/2014	164C	sandy gravel	10	SW	excavation guidance	19
165	7/24/2014	165C	sandy gravel	12	SW	excavation guidance	24.1
166	7/24/2014	166C	sandy gravel	14	SW	excavation guidance	13.2
167	7/24/2014	167C	sandy gravel	14	SW	excavation guidance	21.6
168	7/24/2014	168C	sandy gravel	19	SW	excavation guidance	53.5
169	7/24/2014	169C	sandy gravel	20	SW	excavation guidance	38
170	7/24/2014	170C	sandy gravel	14	SW	excavation guidance	37.5
171	7/24/2014	171C	sandy gravel	10	SW	excavation guidance	68.1
172	7/24/2014	172C	sandy gravel	8	SW	excavation guidance	20.8
173	7/24/2014	173C	sandy gravel	14	SW	excavation guidance	40.3
174	7/24/2014	174C	sandy gravel	19	SW	confirmation-wall	8.7
175	7/24/2014	175C	sandy gravel	24	SW	excavation guidance	44.4
176	7/24/2014	176C	sandy gravel	15	SW	excavation guidance	53.5
177	7/24/2014	177C	sandy gravel	24	SW	excavation guidance	52.8
178	7/24/2014	178C	sandy gravel	10	SW	confirmation-wall	6.4
179	7/24/2014	179C	sandy gravel	15	SW	confirmation-wall	6.8
180	7/24/2014	180C	sandy gravel	18	SW	confirmation-wall	6.8
181	7/24/2014	181C	sandy gravel	19	SW	confirmation-wall	10.1
182	7/24/2014	282C	sandy gravel	12	SW	pre-loading footprint	3.5
183	7/24/2014	283C	sandy gravel	12	SW	pre-loading footprint	2.8

Table B2 - Field Screening Results, Test Hole Charlie
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Number	Date	PID Number[1]	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
184	7/25/2014	284C	sandy gravel	24	NW	confirmation-wall	5.6
185	7/25/2014	285C	sandy gravel	26	NW	confirmation-wall	3.8
186	7/25/2014	286C	sandy gravel	32	NW	confirmation-wall	7.6
187	7/25/2014	287C*	sandy gravel	36	NW	confirmation-wall	11.2
188	7/25/2014	288C	sandy gravel	36	NW	confirmation-wall	8.7
189	7/25/2014	289C	sandy gravel	20	SW	confirmation-wall	4.1
190	7/25/2014	290C	sandy gravel	28	SW	confirmation-wall	3.6
191	7/25/2014	291C	sandy gravel	29	SW	excavation guidance	25.9
192	7/25/2014	292C	sandy gravel	24	SW	excavation guidance	19.1
193	7/25/2014	293C	sandy gravel	22	SW	excavation guidance	16.1
194	7/25/2014	294C*	sandy gravel	24	SW	confirmation-wall	9.7
195	7/25/2014	295C	sandy gravel	13	SW	excavation guidance	43.2
196	7/25/2014	296C	sandy gravel	12	SW	excavation guidance	45.9
197	7/25/2014	297C	sandy gravel	12	SW	excavation guidance	44.2
198	7/25/2014	298C	sandy gravel	28	SW	confirmation-wall	4.1
199	7/25/2014	299C	sandy gravel	30	NW	confirmation-wall	4.0
200	7/25/2014	300C	sandy gravel	26	NW	confirmation-wall	4.6
201	7/25/2014	301C	sandy gravel	25	SW	confirmation-wall	8.5
202	7/25/2014	302C*	sandy gravel	23	SW	confirmation-wall	11.3
203	7/25/2014	303C	sandy gravel	24	SW	confirmation-wall	9.7
204	7/25/2014	304C*	sandy gravel	18	SW	confirmation-wall	14.6
205	7/25/2014	305C*	sandy gravel	15	SW	confirmation-wall	15.0
206	7/25/2014	306C	gray clay	24	NW	confirmation-floor	5.1
207	7/25/2014	307C	gray clay	27	NW	confirmation-floor	5.6
208	7/25/2014	308C	gray clay	30	NW	confirmation-floor	3.5
209	7/25/2014	309C	gray clay	21	NE	confirmation-floor	235.3
210	7/25/2014	310C	gray clay	29	NE	confirmation-floor	275.4
211	7/25/2014	311C	gray clay	28	NE	confirmation-floor	33.0
212	7/25/2014	312C	gray clay	24	SW	confirmation-floor	8.5
213	7/25/2014	313C	gray clay	25	NE	confirmation-floor	95.8
214	7/25/2014	314C*	gray clay	25	NE	confirmation-floor	39.2
215	7/25/2014	315C	gray clay	24	SW	confirmation-floor	101
216	7/25/2014	316C	gray clay	26	SW	confirmation-floor	20.6
217	7/25/2014	317C	gray clay	24	NE	confirmation-floor	62.2
218	7/25/2014	318C*	gray clay	22	SE	confirmation-floor	45.1
219	7/25/2014	319C	gray clay	19	SE	confirmation-floor	8.9
220	7/25/2014	320C*	gray clay	18	SW	confirmation-floor	97.1
221	7/25/2014	321C*	gray clay	22	SE	confirmation-floor	47.9
222	7/25/2014	322C	gray clay	20	SE	confirmation-floor	60.1
223	7/25/2014	323C*	sandy gravel	10	SW	post-loading footprint	2.8
224	7/25/2014	324C*	sandy gravel	9	SW	post-loading footprint	3.7
225	7/26/2014	325C	gray clay frozen	28	SW	confirmation-floor	2.7
226	7/26/2014	326C	gray clay frozen	30	SE	confirmation-floor	12.3
227	7/26/2014	327C	gray clay frozen	34	NE	confirmation-floor	11.0
228	7/26/2014	328C	gray clay frozen	34	NE	confirmation-floor	23.2
229	7/26/2014	329C*	gray clay frozen	34	SW	confirmation-floor	50.1
230	7/26/2014	330C*	gray clay frozen	37	NE	confirmation-floor	94.4
231	7/26/2014	331C*	gray clay frozen	31	NE	confirmation-floor	52.4
232	7/26/2014	332C	sandy gravel	33	NW	confirmation-wall	5.7
233	7/26/2014	333C	sandy gravel	23	NW	confirmation-wall	4.5
234	7/26/2014	334C	sandy gravel	28	NW	confirmation-wall	3.5
235	7/26/2014	335C	sandy gravel	30	NW	confirmation-wall	3.5
236	7/26/2014	336C	sandy gravel	21	NW	confirmation-wall	2.4
237	7/26/2014	337C	sandy gravel	21	NE	confirmation-wall	3.9

[1] PID location numbers 182C through 281C were inadvertently skipped. No data were affected.

* indicates a laboratory sample was also collected from this location

PID - photoionization detector (field screening instrument)

ppm - parts per million

Table B3 - Field Screening Results, Test Hole Dog
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Number	Date	PID Number	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
1	7/20/2014	001D	gravel with fines	6	NE	pre-excavation delineation	0.4
2	7/20/2014	002D	gravel with fines	6	NE	pre-excavation delineation	0.6
3	7/20/2014	003D	gravel with fines	6	NW	pre-excavation delineation	0.5
4	7/20/2014	004D	gravel with fines	6	NW	pre-excavation delineation	0.5
5	7/20/2014	005D	gravel with fines	6	SW	pre-excavation delineation	0.7
6	7/20/2014	006D	gravel with fines	6	SW	pre-excavation delineation	0.4
7	7/20/2014	007D	gravel with fines	6	SW	pre-excavation delineation	16.5
8	7/20/2014	008D	gravel with fines	6	NE	pre-excavation delineation	0.3
9	7/20/2014	009D*	gravel with fines	6	NW	pre-excavation delineation	21.1
10	7/20/2014	010D	gravel with fines	6	NW	pre-excavation delineation	0.6
11	7/20/2014	011D	gravel with fines	6	NW	pre-excavation delineation	6.1
12	7/20/2014	012D	gravel with fines	6	NW	pre-excavation delineation	0.4
13	7/20/2014	013D	gravel with fines	6	SW	pre-excavation delineation	0.5
14	7/20/2014	014D	gravel with fines	6	SW	pre-excavation delineation	0.3
15	7/23/2014	015D	gravel with fines	6	NW	pre-excavation delineation	0.9
16	7/23/2014	016D	gravel with fines	8	NW	pre-excavation delineation	5.9
17	7/23/2014	017D	gravel with fines	8	NE	pre-excavation delineation	9.0
18	7/23/2014	018D	gravel with fines	8	NE	pre-excavation delineation	161.2
19	7/23/2014	019D	gravel with fines	8	NE	pre-excavation delineation	118.1
20	7/23/2014	020D	gravel with fines	8	NE	pre-excavation delineation	15.5
21	7/23/2014	021D	gravel with fines	8	NE	pre-excavation delineation	10.1
22	7/23/2014	022D	gravel with fines	8	NE	pre-excavation delineation	23.0
23	7/23/2014	023D	gravel with fines	8	NE	pre-excavation delineation	124.9
24	7/23/2014	024D	gravel with fines	8	NE	pre-excavation delineation	78.9
25	7/23/2014	025D	gravel with fines	8	NE	pre-excavation delineation	14.5
26	7/23/2014	026D	gravel with fines	8	NE	pre-excavation delineation	16.6
27	7/23/2014	027D	gravel with fines	8	NE	pre-excavation delineation	14.3
28	7/23/2014	028D	gravel with fines	8	NE	pre-excavation delineation	41.0
29	7/23/2014	029D	gravel with fines	8	NE	pre-excavation delineation	31.1
30	7/23/2014	030D	gravel with fines	8	NE	pre-excavation delineation	11.7
31	7/23/2014	031D	gravel with fines	8	SE	pre-excavation delineation	144.3
32	7/23/2014	032D	gravel with fines	8	SE	pre-excavation delineation	155
33	7/23/2014	033D	gravel with fines	8	SW	pre-excavation delineation	11.3
34	7/23/2014	034D	gravel with fines	8	SW	pre-excavation delineation	17.1
35	7/23/2014	035D	gravel with fines	8	SW	pre-excavation delineation	22.4
36	7/23/2014	036D	gravel with fines	8	SE	pre-excavation delineation	26.5
37	7/23/2014	037D	gravel with fines	8	SE	pre-excavation delineation	17.1
38	7/23/2014	038D	gravel with fines	8	SE	pre-excavation delineation	429.3
39	7/23/2014	039D	gravel with fines	8	SE	pre-excavation delineation	165.3
40	7/23/2014	040D	gravel with fines	8	SE	pre-excavation delineation	263.1
41	7/23/2014	041D*	gravel with fines	8	SE	pre-excavation delineation	22.5
42	7/23/2014	042D	gravel with fines	8	SE	pre-excavation delineation	40.8
43	7/23/2014	043D	gravel with fines	8	SW	pre-excavation delineation	76.5
44	7/23/2014	044D	gravel with fines	8	SW	pre-excavation delineation	32.6
45	7/23/2014	045D	gravel with fines	8	SW	pre-excavation delineation	31.1
46	7/23/2014	046D	gravel with fines	8	SW	pre-excavation delineation	21.4
47	7/23/2014	047D	gravel with fines	8	NW	pre-excavation delineation	9.9
48	7/23/2014	048D	gravel with fines	8	NW	pre-excavation delineation	42.8
49	7/23/2014	049D	gravel with fines	8	SE	pre-excavation delineation	10.1
50	7/23/2014	050D	gravel with fines	8	SE	pre-excavation delineation	12.6
51	7/23/2014	051D	gravel with fines	8	SE	pre-excavation delineation	5.3
52	8/6/2014	052D	gravel with fines	6	NE	test pit #1	176.9
53	8/6/2014	053D	gravel with gray clay	18	NE	test pit #1	108.8
54	8/6/2014	054D	tan clay	30	NE	test pit #1	53.1
55	8/6/2014	055D*	gravel with fines	6	NE	test pit #2	118.7
56	8/6/2014	056D*	gravel with gray clay	18	NE	test pit #2	76.6

Table B3 - Field Screening Results, Test Hole Dog
2014 Remedial Action
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Number	Date	PID Number	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
57	8/6/2014	057D*	tan clay	30	NE	test pit #2	109.3
58	8/14/2014	058D*	gravel with gray clay	8	SE	pre-excavation delineation	110
59	8/14/2014	059D	tan clay	8	SE	excavation guidance	5.12
60	8/14/2014	060D	tan clay	8	SE	excavation guidance	61.9
61	8/14/2014	061D	gravel with gray clay	12	SE	excavation guidance	99.6
62	8/14/2014	062D	tan clay	20	SE	excavation guidance	385.7
63	8/14/2014	063D	gravel with fines	12	SE	excavation guidance	25.9
64	8/14/2014	064D	gravel with fines	12	SE	excavation guidance	147.6
65	8/14/2014	065D	gravel with fines	12	SE	excavation guidance	750
66	8/14/2014	066D	gravel with fines	12	SE	excavation guidance	333.6
67	8/14/2014	067D	tan clay	24	SE	confirmation-floor	50.4
68	8/14/2014	068D*	tan clay	24	SE	confirmation-floor	47.8
69	8/14/2014	069D	tan clay	24	SE	confirmation-floor	27.0
70	8/14/2014	070D	gravel with fines	12	SE	excavation guidance	27.8
71	8/15/2014	071D*	gravel with fines	6	NW	excavation guidance	1.8
72	8/15/2014	072D	gravel with fines	12	SW	excavation guidance	9.0
73	8/15/2014	073D	gravel with fines	12	SW	excavation guidance	8.2
74	8/15/2014	074D*	gravel with fines	12	SE	excavation guidance	328.6
75	8/15/2014	075D*	gravel with fines	12	SE	excavation guidance	>500
76	8/15/2014	076D	gravel with fines	12	SE	excavation guidance	>500
77	8/16/2014	077D*	brown organics with gravel	6	NW	pre-loading footprint	2.3
78	8/17/2014	078D	gravel with fines	12	SW	excavation guidance	2.5
79	8/17/2014	078D	gravel with fines	12	SW	excavation guidance	141.2
80	8/17/2014	080D	gravel with fines	12	SE	excavation guidance	399.1
81	8/17/2014	081D	tan clay	24	SE	confirmation-floor	198.2
82	8/17/2014	082D	gravel with fines	12	SE	excavation guidance	382.8
83	8/17/2014	083D	gravel with fines	12	NE	excavation guidance	136.7
84	8/17/2014	084D	gravel with fines	12	NE	excavation guidance	54.9
85	8/17/2014	085D	gravel with clay	18	NE	excavation guidance	106.1
86	8/17/2014	086D	gravel with clay	18	NE	excavation guidance	289.7
87	8/17/2014	087D	gravel with fines	6	NE	excavation guidance	6.5
88	8/17/2014	088D	gravel with fines	12	NE	excavation guidance	9.0
89	8/17/2014	089D	gravel with fines	12	NE	excavation guidance	14.8
90	8/17/2014	090D	brown clay	6	NE	excavation guidance	18.2
91	8/17/2014	091D	gravel with fines	12	NE	excavation guidance	17.4
92	8/17/2014	092D	gravel with fines	6	NE	excavation guidance	40.8
93	8/17/2014	093D	gravel with fines	6	NE	excavation guidance	37.6
94	8/17/2014	094D	gravel with fines	6	NE	excavation guidance	13.6
95	8/17/2014	095D	gravel with fines	6	NE	excavation guidance	95.5
96	8/17/2014	096D*	gravel with fines	12	NW	excavation guidance	76.8
97	8/17/2014	097D	gravel with fines	12	NW	excavation guidance	43.1
98	8/17/2014	098D	gravel with fines	12	SW	excavation guidance	73.9
99	8/17/2014	099D	gravel with fines	12	SW	excavation guidance	24.9
100	8/17/2014	100D	gravel with fines	12	SW	excavation guidance	115.7
101	8/17/2014	101D	gravel with fines	12	SW	excavation guidance	331.1
102	8/17/2014	102D	gravel with fines	16	NW	excavation guidance	106.5
103	8/17/2014	103D	tan clay	16	NW	excavation guidance	14.8
104	8/17/2014	104D	gravel with fines	12	NW	excavation guidance	213.9
105	8/18/2014	105D	gravel with fines	8	NW	excavation guidance	1.5
106	8/18/2014	106D	gravel with fines	12	NW	excavation guidance	210.7
107	8/18/2014	107D	gravel with fines	12	NW	excavation guidance	241.8
108	8/18/2014	108D	gravel with fines	12	NW	excavation guidance	226.9
109	8/18/2014	109D	gray clay	26	NW	confirmation-floor	73.7
110	8/18/2014	110D	gravel with fines	12	NW	excavation guidance	176.5
111	8/18/2014	111D*	gravel with fines	12	NW	excavation guidance	55.5
112	8/18/2014	112D	gravel with fines	12	NE	excavation guidance	325.5

Table B3 - Field Screening Results, Test Hole Dog
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Number	Date	PID Number	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
113	8/18/2014	113D	gravel with fines	12	NW	excavation guidance	13.1
114	8/18/2014	114D	gravel with fines	12	NW	excavation guidance	145.2
115	8/18/2014	115D	gravel with fines	12	NE	excavation guidance	446.2
116	8/18/2014	116D	gravel with fines	12	NW	excavation guidance	152.0
117	8/18/2014	117D	gray clay	26	NE	confirmation-floor	273.8
118	8/18/2014	118D	gravel with fines	12	NE	excavation guidance	465.5
119	8/18/2014	119D	gravel with fines	12	NW	excavation guidance	127.0
120	8/18/2014	120D	gravel with fines	12	NW	excavation guidance	66.8
121	8/18/2014	121D	gravel with fines	12	NW	excavation guidance	150.8
122	8/18/2014	122D	gravel with fines	12	NW	excavation guidance	150.5
123	8/18/2014	123D	gravel with fines	12	NW	excavation guidance	36.5
124	8/18/2014	124D	gravel with fines	12	NW	excavation guidance	16.1
125	8/18/2014	125D	gravel with fines	12	NW	excavation guidance	15.3
126	8/18/2014	126D	gravel with fines	12	NW	excavation guidance	5.5
127	8/18/2014	127D	gravel with fines	12	NE	excavation guidance	177.0
128	8/18/2014	128D	gravel with fines	12	NE	excavation guidance	11.8
129	8/18/2014	129D	gravel with fines	12	NE	excavation guidance	213.6
130	8/18/2014	130D	gravel with fines	12	NE	excavation guidance	348.6
131	8/18/2014	131D	gravel with fines	12	NE	excavation guidance	232.0
132	8/18/2014	132D	gravel with fines	12	NE	excavation guidance	80.6
133	8/18/2014	133D	gravel with fines	12	NE	excavation guidance	167.4
134	8/19/2014	134D*	gravel with fines	9	NE	pre-loading footprint	7.1
135	8/19/2014	135D	gravel with fines	12	NE	excavation guidance	5.2
136	8/19/2014	136D	gravel with fines	12	NE	excavation guidance	282.9
137	8/19/2014	137D	gravel with fines	12	NE	excavation guidance	13.9
138	8/19/2014	138D	gravel with fines	12	NE	excavation guidance	8.2
139	8/19/2014	139D*	gravel with fines	12	NE	excavation guidance	132.5
140	8/19/2014	140D	gravel with fines	12	NE	excavation guidance	46.6
141	8/19/2014	141D	gravel with fines	12	NE	excavation guidance	10.4
142	8/19/2014	142D	gravel with fines	12	NE	excavation guidance	133.4
143	8/19/2014	143D	gravel with fines	12	NE	excavation guidance	51.5
144	8/19/2014	144D	gravel with fines	12	NE	excavation guidance	14.4
145	8/19/2014	145D	gravel with fines	12	NE	excavation guidance	9.1
146	8/19/2014	146D	gravel with fines	12	NE	excavation guidance	20.7
147	8/19/2014	147D	gravel with fines	12	NE	excavation guidance	107.8
148	8/19/2014	148D	gravel with fines	12	NE	excavation guidance	129.5
149	8/19/2014	149D	gravel with fines	12	NE	excavation guidance	46.5
150	8/19/2014	150D	gravel with fines	10	NE	excavation guidance	124.2
151	8/19/2014	151D	gravel with fines	10	NE	excavation guidance	10.8
152	8/19/2014	152D	gravel with fines	10	NE	excavation guidance	35.8
153	8/19/2014	153D*	tan clay	24	SW	confirmation-floor	86.3
154	8/19/2014	154D	tan clay	24	SE	confirmation-floor	34.0
155	8/19/2014	155D*	tan clay	24	SE	confirmation-floor	81.7
156	8/19/2014	156D	tan clay	24	SW	confirmation-floor	30.0
157	8/19/2014	157D	tan clay	24	SW	confirmation-floor	18.9
158	8/19/2014	158D	tan clay	30	SW	confirmation-floor	34.7
159	8/19/2014	159D*	tan clay	24	SE	confirmation-floor	85.1
160	8/19/2014	160D	tan clay	24	SE	confirmation-floor	49.9
161	8/19/2014	161D*	tan clay	24	SW	confirmation-floor	192.7
162	8/19/2014	162D	tan clay	24	SW	confirmation-floor	32.6
163	8/19/2014	163D	tan clay	24	SE	confirmation-floor	44.0
164	8/19/2014	164D	tan clay	24	SE	confirmation-floor	41.2
165	8/19/2014	165D	tan clay	24	SW	confirmation-floor	41.2
166	8/19/2014	166D	tan clay	24	SW	confirmation-floor	45.4
167	8/19/2014	167D*	tan clay	24	NE	confirmation-floor	126.0
168	8/19/2014	168D*	tan clay	24	NE	confirmation-floor	88.7

Table B3 - Field Screening Results, Test Hole Dog
2014 Remedial Action
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Number	Date	PID Number	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
169	8/19/2014	169D*	tan clay	24	NE	confirmation-floor	361.8
170	8/19/2014	170D	tan clay	24	NW	confirmation-floor	29.2
171	8/19/2014	171D	tan clay	24	NW	confirmation-floor	37.2
172	8/19/2014	172D	tan clay	24	NE	confirmation-floor	20.2
173	8/19/2014	173D*	tan clay	24	NE	confirmation-floor	91.5
174	8/19/2014	174D*	tan clay	24	NE	confirmation-floor	128.0
175	8/19/2014	175D	tan clay	24	NW	confirmation-floor	15.3
176	8/19/2014	176D	tan clay	24	NW	confirmation-floor	27.2
177	8/19/2014	177D*	tan clay	24	NE	confirmation-floor	146.0
178	8/19/2014	178D	tan clay	24	NE	confirmation-floor	40.4
179	8/19/2014	179D	tan clay	24	NE	confirmation-floor	24.7
180	8/19/2014	180D*	tan clay	12	SE	confirmation-wall	12.6
181	8/19/2014	181D*	tan clay	12	SE	confirmation-wall	61.4
182	8/19/2014	182D*	tan clay	12	SE	confirmation-wall	395.0
183	8/19/2014	183D*	tan clay	12	SW	confirmation-wall	127.5
184	8/19/2014	184D*	tan clay	12	SW	confirmation-wall	15.5
185	8/19/2014	185D*	tan clay	12	SW	confirmation-wall	16.1
186	8/19/2014	186D	tan clay	12	SW	confirmation-wall	12.9
187	8/19/2014	187D*	tan clay	12	SW	confirmation-wall	30.5
188	8/19/2014	188D*	gravel with fines	12	NW	confirmation-wall	14.5
189	8/19/2014	189D	gravel with fines	12	NW	confirmation-wall	11.6
190	8/19/2014	190D	gravel with fines	12	NW	excavation guidance	62.6
191	8/19/2014	191D	gravel with fines	12	NW	confirmation-wall	10.5
192	8/19/2014	192D	gravel with fines	12	NE	excavation guidance	214.9
193	8/19/2014	193D	gravel with fines	12	NE	confirmation-wall	10.1
194	8/19/2014	194D	gravel with fines	12	NE	excavation guidance	69.0
195	8/19/2014	195D*	gravel with fines	12	NE	confirmation-wall	30.4
196	8/19/2014	196D	gravel with fines	12	NE	confirmation-wall	7.9
197	8/19/2014	197D	gravel with fines	12	SW	confirmation-wall	8.0
198	8/19/2014	198D	gravel with fines	12	SW	confirmation-wall	6.1
199	8/19/2014	199D	gravel with fines	12	SW	confirmation-wall	10.4
200	8/19/2014	200D	gravel with fines	12	SW	excavation guidance	181.4
201	8/19/2014	201D	gravel with fines	12	SW	excavation guidance	230.5
202	8/19/2014	202D	gravel with fines	12	SW	excavation guidance	194.3
203	8/19/2014	203D	gravel with fines	12	SW	excavation guidance	99.9
204	8/19/2014	204D	gravel with fines	12	SW	excavation guidance	185.2
205	8/19/2014	205D	gravel with fines	12	SW	excavation guidance	16.8
206	8/19/2014	206D	gravel with fines	12	SW	excavation guidance	27.2
207	8/19/2014	207D	gravel with fines	12	SW	excavation guidance	161.4
208	8/19/2014	208D	gravel with fines	12	SW	excavation guidance	224.1
209	8/19/2014	209D	tan clay	26	SW	excavation guidance	40.5
210	8/20/2014	210D	gravel with fines	12	SW	excavation guidance	11.9
211	8/20/2014	211D*	tan clay	24	SW	confirmation-floor	36.9
212	8/20/2014	212D	gravel with fines	12	NE	excavation guidance	187.1
213	8/20/2014	213D	gravel with fines	12	NW	excavation guidance	240.1
214	8/20/2014	214D	gravel with fines	12	NW	excavation guidance	97.3
215	8/20/2014	215D*	gravel with fines	12	NW	confirmation-wall	16.7
216	8/20/2014	216D	gravel with fines	12	NW	excavation guidance	81.9
217	8/20/2014	217D	gravel with fines	12	NW	excavation guidance	300.1
218	8/20/2014	218D	gravel with fines	12	NW	excavation guidance	6.3
219	8/20/2014	219D	gravel with fines	12	NW	excavation guidance	40.1
220	8/20/2014	220D	gravel with fines	12	NW	excavation guidance	26.3
221	8/20/2014	221D	gravel with fines	12	NW	excavation guidance	188.3
222	8/20/2014	222D*	gravel with fines	12	NW	confirmation-wall	11.4
223	8/20/2014	223D	gravel with fines	12	SW	excavation guidance	141.3
224	8/20/2014	224D*	gravel with fines	12	SW	confirmation-wall	18.7

Table B3 - Field Screening Results, Test Hole Dog
2014 Remedial Action
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Number	Date	PID Number	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
225	8/20/2014	225D*	tan clay	24	SW	confirmation-floor	230.3
226	8/20/2014	226D	gravel with fines	12	SW	excavation guidance	24.3
227	8/20/2014	227D	tan clay	24	SW	confirmation-floor	12.5
228	8/20/2014	228D*	gravel with fines	12	SW	confirmation-wall	12.1
229	8/20/2014	229D	gravel with fines	12	SW	confirmation-wall	8.1
230	8/20/2014	230D	gravel with fines	12	SW	confirmation-wall	10.8
231	8/20/2014	231D	gravel with fines	12	SW	confirmation-wall	7.9
232	8/20/2014	232D	gravel with fines	12	SW	excavation guidance	232.9
233	8/20/2014	233D	gravel with fines	12	SW	excavation guidance	150.9
234	8/20/2014	234D*	tan clay	24	SW	confirmation-floor	22.2
235	8/20/2014	235D	gravel with fines	12	NW	confirmation-wall	6.7
236	8/20/2014	236D*	gravel with fines	12	NW	confirmation-wall	12.4
237	8/20/2014	237D*	tan clay	24	NW	confirmation-floor	55.6
238	8/20/2014	238D*	gravel with fines	12	NW	confirmation-wall	13.3
239	8/21/2014	239D*	brown organics with gravel	6	NW	post-loading footprint	3.9
240	8/21/2014	240D*	brown organics with gravel	6	NW	post-loading footprint	2.6
241	8/21/2014	241D*	gravel with fines	6	NE	post-loading footprint	6.5
242	8/19/2014	300D	gravel with fines	12	NE	excavation guidance	60.9
243	8/19/2014	301D	gravel with fines	10	NE	excavation guidance	37.8
244	8/19/2014	302D	gravel with fines	10	NE	excavation guidance	12.8

* indicates a laboratory sample was also collected from this location

PID - photoionization detector (field screening instrument)

ppm - parts per million

Table B4 - Field Screening Results, Test Hole X-1
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Number	Date	PID Number[1]	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
1	7/20/2014	001X*	brown fines	6-8	Center	pre-excavation delineation	24.5
2	7/20/2014	002X	brown fines	6-8	SE	pre-excavation delineation	0.8
3	7/20/2014	003X	brown fines	6-8	SE	pre-excavation delineation	1.0
4	7/20/2014	004X	brown fines	6-8	SW	pre-excavation delineation	1.6
5	7/20/2014	005X	brown fines	6-8	SW	pre-excavation delineation	0.7
6	7/20/2014	006X*	brown fines	6-8	SW	pre-excavation delineation	7.7
7	7/20/2014	007X	brown fines	6-8	NW	pre-excavation delineation	1.3
8	7/20/2014	008X	brown fines	6-8	NE	pre-excavation delineation	152
9	7/20/2014	009X	brown fines	6-8	NE	pre-excavation delineation	0.4
10	7/20/2014	010X	brown fines	6-8	NE	pre-excavation delineation	1.7
11	7/20/2014	011X	brown fines	6-8	SE	pre-excavation delineation	1.0
12	7/20/2014	012X	brown fines	6-8	SE	pre-excavation delineation	0.7
13	7/20/2014	013X	brown fines	6-8	SW	pre-excavation delineation	0.9
14	7/20/2014	014X	brown fines	6-8	SW	pre-excavation delineation	0.9
15	7/20/2014	015X	brown fines	6-8	NW	pre-excavation delineation	0.7
16	7/20/2014	016X	brown fines	6-8	NW	pre-excavation delineation	1.1
17	7/20/2014	017X	brown fines	6-8	Center	pre-excavation delineation	0.4
18	7/20/2014	018X	brown fines	6-8	NW	pre-excavation delineation	12
19	7/20/2014	019X	brown fines	6-8	SE	pre-excavation delineation	1
20	7/20/2014	020X	brown fines	6-8	SE	pre-excavation delineation	75
21	7/20/2014	021X	brown fines	6-8	NE	pre-excavation delineation	7.9
22	7/20/2014	022X	brown fines	6-8	NE	pre-excavation delineation	1.1
23	7/20/2014	023X	brown fines	6-8	NE	pre-excavation delineation	1.2
24	7/20/2014	024X	brown fines	6-8	NE	pre-excavation delineation	10.4
25	7/20/2014	025X	brown fines	6-8	SE	pre-excavation delineation	18.1
26	7/20/2014	026X	brown fines	6-8	NW	pre-excavation delineation	0.5
27	7/20/2014	027X	brown fines	6-8	NE	pre-excavation delineation	0.5
28	7/20/2014	028X	brown fines	6-8	NE	pre-excavation delineation	4.7
29	7/20/2014	029X	brown fines	6-8	SE	pre-excavation delineation	5.5
30	7/20/2014	030X	brown fines	6-8	SE	pre-excavation delineation	0.4
31	7/20/2014	031X	brown fines	6-8	NW	pre-excavation delineation	0.6
32	7/20/2014	032X	brown fines	6	NE	pre-excavation delineation	0.7
33	7/26/2014	LF1*	angular rock with fines	6-Jan	NW	pre-loading footprint	1.6
34	7/26/2014	001X	angular rock with fines	22	Center	excavation guidance	366.1
35	7/26/2014	002X	angular rock with fines	16	Center	excavation guidance	301.3
36	7/26/2014	003X	angular rock with fines	bucket	Center	excavation guidance	154.7
37	7/26/2014	004X	angular rock with fines	bucket	Center	excavation guidance	197.3
38	7/26/2014	005X	angular rock with fines	bucket	Center	excavation guidance	131.7
39	7/26/2014	006X	angular rock with fines	30	Center	excavation guidance	320.1
40	7/26/2014	007X*	angular rock with fines	24	Center	excavation guidance	65.3
41	7/26/2014	008X	angular rock with fines	26	SW	excavation guidance	405.3
42	7/26/2014	009X	angular rock with fines	26	SW	excavation guidance	236.1
43	7/26/2014	010X	angular rock with fines	14	SE	excavation guidance	46.6
44	7/26/2014	011X	angular rock with fines	34	Center	excavation guidance	410.1
45	7/26/2014	012X	angular rock with fines	bucket	SE	excavation guidance	294.7
46	7/26/2014	013X	angular rock with fines	36	Center	excavation guidance	155.3
47	7/26/2014	014X	angular rock with fines	bucket	Center	excavation guidance	465.7
48	7/26/2014	015X	angular rock with fines	bucket	Center	excavation guidance	203.5
49	7/26/2014	016X	angular rock with fines	36	SE	excavation guidance	213.7
50	7/26/2014	017X	angular rock with fines	22	SW	excavation guidance	391.6
51	7/26/2014	018X	angular rock with fines	14	SW	excavation guidance	157.5
52	7/26/2014	019X	angular rock with fines	20	SW	excavation guidance	341.7
53	7/26/2014	020X	angular rock with fines	29	SW	excavation guidance	551.9
54	7/26/2014	021X	angular rock with fines	30	Center	excavation guidance	497.8
55	7/26/2014	022X	angular rock with fines	bucket	SW	excavation guidance	329.8
56	7/26/2014	023X	angular rock with fines	28	SW	excavation guidance	461.4
57	7/26/2014	024X	angular rock with fines	18	SW	excavation guidance	92.8
58	7/26/2014	025X	angular rock with fines	36	SW	excavation guidance	478.4
59	7/26/2014	026X	angular rock with fines	14	SW	excavation guidance	7.9
60	7/26/2014	027X	angular rock with fines	14	SW	excavation guidance	79.3

Table B4 - Field Screening Results, Test Hole X-1
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Number	Date	PID Number[1]	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
61	7/26/2014	028X	angular rock with fines	16	SW	excavation guidance	5.1
62	7/26/2014	029X	angular rock with fines	16	SW	excavation guidance	18.6
63	7/26/2014	030X	angular rock with fines	16	SW	excavation guidance	210.7
64	7/26/2014	031X	angular rock with fines	46	SW	excavation guidance	467.1
65	7/26/2014	032X	angular rock with fines	30	SW	excavation guidance	235
66	7/26/2014	033X	angular rock with fines	48	Center	excavation guidance	576
67	7/26/2014	034X	angular rock with fines	48	Center	excavation guidance	401.2
68	7/26/2014	035X*	angular rock with fines	15	NW	excavation guidance	287.1
69	7/26/2014	036X	angular rock with fines	14	NW	excavation guidance	185
70	7/26/2014	037X	angular rock with fines	14	NW	excavation guidance	191.9
71	7/26/2014	038X	angular rock with fines	48	SE	excavation guidance	115
72	7/26/2014	039X	angular rock with fines	16	SW	excavation guidance	7.1
73	7/26/2014	040X	angular rock with fines	28	SW	excavation guidance	151.1
74	7/26/2014	041X	angular rock with fines	18	SW	excavation guidance	6.6
75	7/26/2014	042X	angular rock with fines	16	SW	excavation guidance	6.6
76	7/26/2014	043X	angular rock with fines	16	SW	excavation guidance	4.5
77	7/26/2014	044X	angular rock with fines	16	SW	excavation guidance	4.3
78	7/29/2014	045X	angular rock with fines	bucket	SE	excavation guidance	75.7
79	7/29/2014	046X	angular rock with fines	16	SW	excavation guidance	2.8
80	7/29/2014	047X	angular rock with fines	bucket	SE	excavation guidance	174.7
81	7/29/2014	048X	angular rock with fines	bucket	SE	excavation guidance	78.1
82	7/29/2014	049X	angular rock with fines	30	SW	excavation guidance	122.3
83	7/29/2014	050X	angular rock with fines	42	SE	excavation guidance	67.3
84	7/29/2014	051X	angular rock with fines	44	NW	excavation guidance	243.1
85	7/29/2014	052X	angular rock with fines	46	SW	excavation guidance	212.7
86	7/29/2014	053X*	angular rock with fines	20	SW	excavation guidance	10.4
87	7/29/2014	054X	angular rock with fines	42	SW	excavation guidance	220.3
88	7/29/2014	055X	angular rock with fines	24	SE	excavation guidance	2.8
89	7/29/2014	056X	angular rock with fines	12	SE	excavation guidance	2.2
90	7/29/2014	057X	angular rock with fines	12	SE	excavation guidance	27.5
91	7/29/2014	058X	angular rock with fines	44	SE	excavation guidance	>500
92	7/29/2014	059X*	angular rock with fines	8	NE	pre-loading footprint	2.2
93	7/29/2014	060X	angular rock with fines	40	SE	excavation guidance	>500
94	7/29/2014	061X	angular rock with fines	55	NE	confirmation-floor	301
95	7/29/2014	062X	angular rock with fines	60	SW	confirmation-floor	>500
96	7/29/2014	063X	angular rock with fines	20	SW	confirmation-wall	4.7
97	7/29/2014	064X	angular rock with fines	20	SW	confirmation-wall	8.9
98	7/29/2014	065X	angular rock with fines	20	SE	excavation guidance	4.5
99	7/29/2014	066X	angular rock with fines	36	SW	confirmation-wall	6.7
100	7/29/2014	067X	angular rock with fines	36	SW	confirmation-wall	42.2
101	7/29/2014	068X	angular rock with fines	36	SE	excavation guidance	135.2
102	7/29/2014	069X	angular rock with fines	66	SW	confirmation-floor	>500
103	7/29/2014	070X	angular rock with fines	12	SE	confirmation-wall	5.1
104	7/29/2014	071X	angular rock with fines	12	SW	confirmation-wall	3.6
105	7/29/2014	072X	angular rock with fines	30	SE	excavation guidance	260.7
106	7/29/2014	073X	angular rock with fines	12	SW	excavation guidance	6
107	7/29/2014	074X	angular rock with fines	12	SW	excavation guidance	10.6
108	7/29/2014	075X	angular rock with fines	45	Center	excavation guidance	185.9
109	7/29/2014	076X	angular rock with fines	12	SW	excavation guidance	1
110	7/29/2014	077X	angular rock with fines	24	Center	excavation guidance	262.3
111	7/29/2014	078X	angular rock with fines	28	Center	excavation guidance	>500
112	7/29/2014	079X*	angular rock with fines	40	Center	excavation guidance	>500
113	7/29/2014	080X	angular rock with fines	24	Center	excavation guidance	211.2
114	7/29/2014	081X	angular rock with fines	24	NW	excavation guidance	624.9
115	7/29/2014	082X	angular rock with fines	24	NW	excavation guidance	>500
116	7/29/2014	083X	angular rock with fines	36	NW	excavation guidance	>500
117	7/29/2014	084X	angular rock with fines	65	NW	confirmation-floor	405
118	7/29/2014	085X	angular rock with fines	38	NW	excavation guidance	312
119	7/29/2014	086X	angular rock with fines	36	NE	excavation guidance	370.5
120	7/29/2014	087X	angular rock with fines	34	NE	excavation guidance	>500

Table B4 - Field Screening Results, Test Hole X-1
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Number	Date	PID Number[1]	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
121	7/29/2014	088X	angular rock with fines	40	SW	excavation guidance	>500
122	7/29/2014	089X	angular rock with fines	46	SE	excavation guidance	>500
123	7/29/2014	090X	angular rock with fines	40	SE	excavation guidance	36.3
124	7/29/2014	091X	angular rock with fines	40	SE	excavation guidance	>500
125	7/29/2014	092X	angular rock with fines	46	NW	excavation guidance	>500
126	7/29/2014	093X	angular rock with fines	36	NE	excavation guidance	>500
127	7/29/2014	094X*	angular rock with fines	24	NE	excavation guidance	193
128	7/29/2014	095X	angular rock with fines	36	NE	excavation guidance	291.7
129	7/29/2014	096X	angular rock with fines	bucket	NE	excavation guidance	252.3
130	7/29/2014	097X	angular rock with fines	bucket	NE	excavation guidance	27.6 [2]
131	7/29/2014	098X	angular rock with fines	60	NE	confirmation-floor	379.1
132	7/29/2014	099X	angular rock with fines	30	NW	excavation guidance	310.7
133	7/29/2014	100X	angular rock with fines	24	NE	excavation guidance	234.3
134	7/29/2014	101X	angular rock with fines	24	NE	excavation guidance	148.4
135	7/29/2014	102X	angular rock with fines	20	NE	excavation guidance	7.5
136	7/29/2014	103X*	angular rock with fines	20	NE	excavation guidance	28.3
137	7/29/2014	104X	angular rock with fines	24	NE	excavation guidance	2.9
138	7/29/2014	105X	angular rock with fines	26	NE	excavation guidance	205.2
139	7/29/2014	106X	angular rock with fines	24	NE	excavation guidance	95.2
140	7/29/2014	107X	angular rock with fines	50	NE	excavation guidance	500+
141	7/29/2014	108X	angular rock with fines	60	NE	confirmation-floor	101.7
142	7/29/2014	109X	angular rock with fines	64	NE	confirmation-floor	>500
143	7/29/2014	110X	angular rock with fines	68	SE	confirmation-floor	400.1
144	7/29/2014	111X	angular rock with fines	61	SE	confirmation-floor	451.8
145	7/29/2014	112X	angular rock with fines	54	NE	confirmation-floor	39.6
146	7/29/2014	113X	angular rock with fines	24	NE	excavation guidance	3.9
147	7/29/2014	114X	angular rock with fines	24	SE	excavation guidance	>500
148	7/29/2014	115X	angular rock with fines	24	SE	excavation guidance	67.8
149	7/29/2014	116X	angular rock with fines	24	SE	excavation guidance	423.2
150	7/29/2014	117X	angular rock with fines	36	SW	excavation guidance	>500
151	7/29/2014	118X	angular rock with fines	30	SW	excavation guidance	209.1
152	7/29/2014	119X	angular rock with fines	28	SW	excavation guidance	231.8
153	7/29/2014	120X	angular rock with fines	48	SW	excavation guidance	>500
154	7/29/2014	121X	angular rock with fines	55	SW	excavation guidance	500+
155	7/29/2014	122X*	angular rock with fines	20	SW	excavation guidance	17.6
156	7/29/2014	123X	angular rock with fines	55	SW	excavation guidance	275.1
157	7/29/2014	124X	angular rock with gray clay	75	SW	confirmation-floor	>500
158	7/29/2014	125X	angular rock with gray clay	60	SW	confirmation-floor	383
159	7/29/2014	126X	angular rock with fines	60	NW	confirmation-floor	>500
160	7/29/2014	127X	angular rock with fines	28	NE	excavation guidance	12.9
161	7/29/2014	128X	angular rock with fines	36	NW	excavation guidance	390.5
162	7/29/2014	129X	angular rock with fines	48	NW	excavation guidance	97.2
163	7/29/2014	130X	angular rock with fines	36	NW	excavation guidance	30.8
164	7/29/2014	131X	angular rock with gray clay	64	NW	confirmation-floor	391.2
165	7/29/2014	132X	angular rock with gray clay	60	NW	confirmation-floor	263
166	7/29/2014	133X	angular rock with gray clay	44	NW	excavation guidance	181.3
167	7/29/2014	134X	angular rock with gray clay	24	NW	excavation guidance	>500
168	7/29/2014	135X	angular rock with fines	55	NW	excavation guidance	489
169	7/29/2014	136X	angular rock with fines	36	NW	excavation guidance	41.2
170	7/29/2014	137X	angular rock with fines	51	NW	excavation guidance	58.5
171	7/29/2014	138X	angular rock with fines	26	NW	excavation guidance	42.3
172	7/29/2014	139X	angular rock with fines	54	NW	excavation guidance	202
173	7/29/2014	140X	angular rock with fines	25	NW	excavation guidance	30.3
174	7/29/2014	141X	angular rock with fines	55	NW	excavation guidance	85.4
175	7/29/2014	142X	angular rock with fines	28	SE	excavation guidance	18.8
176	7/29/2014	143X*	angular rock with fines	44	SE	excavation guidance	97.1
177	7/29/2014	144X	angular rock with fines	28	SE	excavation guidance	25.2
178	7/29/2014	145X	angular rock with fines	54	SE	excavation guidance	>500
179	7/29/2014	146X	angular rock with fines	30	SW	excavation guidance	260
180	7/29/2014	147X	angular rock with fines	60	SW	confirmation-floor	>500

Table B4 - Field Screening Results, Test Hole X-1
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Number	Date	PID Number[1]	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
181	7/29/2014	148X	angular rock with fines	58	SW	confirmation-floor	200.4
182	7/29/2014	149X	angular rock with fines	60	SW	confirmation-floor	>500
183	7/29/2014	150X	angular rock with fines	52	NW	excavation guidance	>500
184	7/29/2014	151X	angular rock with fines	68	NW	confirmation-floor	406.1
185	7/29/2014	152X	angular rock with fines	60	SE	confirmation-floor	382.2
186	7/29/2014	153X	angular rock with fines	63	SE	confirmation-floor	>500
187	7/30/2014	154X*	brown fines	4	NW	excavation guidance	5.4
188	7/30/2014	155X	angular rock with fines	36	NE	excavation guidance	185.4
189	7/30/2014	156X	angular rock with fines	36	NE	excavation guidance	120.2
190	7/30/2014	157X	angular rock with fines	18	NE	excavation guidance	11.3
191	7/30/2014	158X*	angular rock with clay	60	NW	confirmation-floor	451.2
192	7/30/2014	159X	angular rock with fines	10	NW	excavation guidance	9.9
193	7/30/2014	160X	angular rock with fines	60	NW	confirmation-floor	>500
194	7/30/2014	161X	angular rock with fines	60	NW	confirmation-floor	>500
195	7/30/2014	162X	angular rock with fines	60	NW	confirmation-floor	520
196	7/30/2014	163X	angular rock with fines	55	SW	excavation guidance	295
197	7/30/2014	164X	angular rock with fines	51	SW	excavation guidance	251.9
198	7/30/2014	165X	angular rock with fines	66	SW	confirmation-floor	>500
199	7/30/2014	166X	angular rock with fines	24	SW	excavation guidance	125.3
200	7/30/2014	167X	angular rock with fines	36	SW	excavation guidance	137.1
201	7/30/2014	168X	angular rock with fines	42	NW	excavation guidance	>500
202	7/30/2014	169X	angular rock with fines	48	NW	excavation guidance	>500
203	7/30/2014	170X	angular rock with fines	55	NW	confirmation-floor	>500
204	7/30/2014	171X	angular rock with fines	52	NW	excavation guidance	>500
205	7/30/2014	172X	angular rock with fines	50	SW	excavation guidance	398.7
206	7/30/2014	173X	angular rock with fines	55	SW	confirmation-floor	>500
207	7/30/2014	174X	angular rock with fines	50	SW	excavation guidance	468.3
208	7/30/2014	175X*	angular rock with fines	40	NE	confirmation-wall	21.8
209	7/30/2014	176X	angular rock with fines	24	SW	excavation guidance	225.1
210	7/30/2014	177X	angular rock with fines	36	SW	excavation guidance	307.3
211	7/30/2014	178X	angular rock with fines	55	SW	confirmation-floor	468.3
212	7/30/2014	179X	angular rock with fines	43	SE	excavation guidance	>500
213	7/30/2014	180X	angular rock with fines	65	SW	confirmation-floor	>500
214	7/30/2014	181X	angular rock with fines	27	SW	excavation guidance	237.4
215	7/30/2014	182X	angular rock with fines	38	NW	excavation guidance	401.7
216	7/30/2014	183X	brown fines	6	NW	excavation guidance	6
217	7/30/2014	184X	angular rock with fines	12	NW	excavation guidance	22.4
218	7/30/2014	185X	angular rock with fines	29	NW	excavation guidance	21.1
219	7/30/2014	186X	angular rock with fines	36	NW	excavation guidance	17.8
220	7/30/2014	187X*	angular rock with fines	48	NW	excavation guidance	29.3
221	7/30/2014	188X	angular rock with fines	16	NW	excavation guidance	21.2
222	7/30/2014	189X	brown fines	6	NW	excavation guidance	14.0
223	7/30/2014	190X	brown fines	6	NW	excavation guidance	17.8
224	7/30/2014	191X	angular rock with fines	bucket	NW	excavation guidance	>500
225	7/30/2014	192X	angular rock with fines	bucket	NW	excavation guidance	>500
226	7/30/2014	193X*	brown fines	6	NW	excavation guidance	27.3
227	7/30/2014	194X	brown fines	4	NW	excavation guidance	13.4
228	7/30/2014	195X	angular rock with clay	60	NW	confirmation-floor	260.1
229	7/30/2014	196X	angular rock with fines	36	NW	excavation guidance	>500
230	7/30/2014	197X	angular rock with clay	60	NW	confirmation-floor	>500
231	7/30/2014	198X	angular rock with clay	60	NW	confirmation-floor	>500
232	7/30/2014	199X	angular rock with fines	bucket	NW	excavation guidance	12.9
233	7/30/2014	200X	angular rock with fines	bucket	NW	excavation guidance	>500
234	7/30/2014	201X	angular rock with fines	40	NW	excavation guidance	251
235	7/30/2014	202X	angular rock with fines	45	NW	excavation guidance	239.5
236	7/30/2014	203X	angular rock with fines	34	NW	excavation guidance	350.6
237	7/30/2014	204X*	angular rock with fines	36	NW	excavation guidance	241.2
238	7/30/2014	205X	angular rock with fines	60	NW	confirmation-floor	>500
239	7/30/2014	206X	angular rock with fines	50	NW	excavation guidance	125
240	7/30/2014	207X	angular rock with fines	47	NW	excavation guidance	>500

Table B4 - Field Screening Results, Test Hole X-1
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Number	Date	PID Number[1]	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
241	7/30/2014	208X	angular rock with fines	40	NW	excavation guidance	95.7
242	7/30/2014	209X	angular rock with fines	40	NW	excavation guidance	43.3
243	7/30/2014	210X	angular rock with fines	62	NW	confirmation-floor	>500
244	7/30/2014	211X	angular rock with fines	30	NW	excavation guidance	105.7
245	7/30/2014	212X	angular rock with fines	60	NW	confirmation-floor	>500
246	8/1/2014	213X*	angular rock with fines	12	NW	excavation guidance	71.4
247	8/1/2014	214X	angular rock with fines	12	NW	excavation guidance	51
248	8/1/2014	215X	angular rock with fines	12	NW	excavation guidance	4.8
249	8/1/2014	216X	angular rock with fines	12	NW	pre-stockpile footprint	54.3
250	8/1/2014	217X	angular rock with fines	12	NW	excavation guidance	4.3
251	8/1/2014	218X	angular rock with fines	12	NW	excavation guidance	4.2
252	8/1/2014	219X	angular rock with fines	12	NW	excavation guidance	3.9
253	8/1/2014	220X	angular rock with fines	12	NW	excavation guidance	3.6
254	8/1/2014	221X	angular rock with fines	12	NW	excavation guidance	22.9
255	8/1/2014	222X*	angular rock with fines	12	NW	excavation guidance	9.6
256	8/2/2014	223X*	brown fines	6	NW	excavation guidance	12.1
257	8/2/2014	224X	angular rock with fines	44	NW	excavation guidance	130.3
258	8/2/2014	225X	angular rock with fines	42	NW	excavation guidance	19.2
259	8/2/2014	226X	angular rock with fines	36	SW	confirmation-wall	93.9
260	8/2/2014	227X	angular rock with fines	30	NW	confirmation-wall	11.6
261	8/2/2014	228X*	angular rock with clay	48	NW	confirmation-wall	159.9
262	8/2/2014	229X	angular rock with clay	48	NW	excavation guidance	218.3
263	8/2/2014	230X	angular rock with clay	48	NW	excavation guidance	288.4
264	8/2/2014	231X	angular rock with fines	6	NE	pre-stockpile footprint	2.9
265	8/2/2014	232X	angular rock with fines	30	NW	excavation guidance	174.1
266	8/2/2014	233X	angular rock with fines	36	NW	excavation guidance	40.4
267	8/2/2014	234X	angular rock with clay	40	NW	excavation guidance	135.5
268	8/2/2014	235X	angular rock with fines	36	NW	excavation guidance	>500
269	8/2/2014	236X	angular rock with fines	48	NW	excavation guidance	236.7
270	8/2/2014	237X	angular rock with fines	50	NE	excavation guidance	200.3
271	8/2/2014	238X	angular rock with fines	45	NW	excavation guidance	20.1
272	8/2/2014	239X	angular rock with fines	60	NE	confirmation-floor	326.9
273	8/2/2014	240X	angular rock with clay	56	NE	excavation guidance	184.2
274	8/2/2014	241X	angular rock with clay	52	SW	excavation guidance	152.9
275	8/2/2014	242X	angular rock with clay	60	SW	confirmation-floor	>500
276	8/2/2014	243X	brown fines	6	SE	excavation guidance	13.1
277	8/2/2014	244X	angular rock with fines	36	SE	excavation guidance	391
278	8/2/2014	245X	angular rock with fines	30	SE	excavation guidance	228.1
279	8/2/2014	246X	angular rock with fines	48	SE	excavation guidance	289.7
280	8/2/2014	247X*	angular rock with fines	40	SE	excavation guidance	>500
281	8/2/2014	248X	angular rock with clay	54	SE	confirmation-floor	>500
282	8/2/2014	249X*	brown fines	6	SE	pre-stockpile footprint	24.2
283	8/2/2014	250X	angular rock with fines	12	SE	excavation guidance	>500
284	8/2/2014	251X	angular rock with fines	14	SE	excavation guidance	328.4
285	8/2/2014	252X	angular rock with fines	14	SE	excavation guidance	24.2
286	8/2/2014	253X	angular rock with fines	bucket	SE	excavation guidance	>500
287	8/2/2014	254X	angular rock with fines	bucket	SE	excavation guidance	>500
288	8/2/2014	255X	angular rock with fines	48	SE	excavation guidance	>500
289	8/2/2014	256X	angular rock with fines	bucket	SE	excavation guidance	>500
290	8/2/2014	257X	angular rock with fines	bucket	SE	excavation guidance	56.1
291	8/2/2014	258X	angular rock with clay	60	SE	confirmation-floor	>500
292	8/2/2014	259X	angular rock with fines	36	SE	excavation guidance	394.3
293	8/2/2014	260X	angular rock with fines	38	SE	excavation guidance	124
294	8/2/2014	261X	angular rock with fines	32	SE	excavation guidance	57.1
295	8/2/2014	262X	angular rock with fines	32	SE	excavation guidance	393
296	8/2/2014	263X	angular rock with fines	32	SE	excavation guidance	25.9
297	8/2/2014	264X	angular rock with fines	32	SE	excavation guidance	16.3
298	8/2/2014	265X	angular rock with fines	32	SE	excavation guidance	395
299	8/2/2014	266X	angular rock with fines	32	SE	excavation guidance	488.2
300	8/2/2014	267X*	angular rock with fines	24	SE	excavation guidance	8.2

Table B4 - Field Screening Results, Test Hole X-1
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Number	Date	PID Number[1]	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
301	8/2/2014	268X	angular rock with fines	36	SE	excavation guidance	365.3
302	8/2/2014	269X*	angular rock with fines	48	SE	excavation guidance	142.1
303	8/2/2014	270X	angular rock with fines	53	SE	confirmation-floor	207.0
304	8/2/2014	271X	angular rock with fines	48	SE	excavation guidance	153.0
305	8/2/2014	272X	angular rock with fines	48	SE	excavation guidance	231.1
306	8/2/2014	273X	angular rock with fines	43	SE	excavation guidance	14.3
307	8/2/2014	274X	angular rock with fines	53	SE	excavation guidance	319.9
308	8/2/2014	275X	angular rock with fines	53	SE	excavation guidance	437.3
309	8/2/2014	276X	angular rock with fines	bucket	SE	excavation guidance	32.7
310	8/2/2014	277X	angular rock with fines	bucket	SE	excavation guidance	32.5
311	8/2/2014	278X	angular rock with fines	40	SE	excavation guidance	395.2
312	8/2/2014	279X	angular rock with fines	48	SE	excavation guidance	334
313	8/2/2014	280X	angular rock with fines	50	SW	confirmation-floor	17.5
314	8/2/2014	281X	angular rock with fines	15	SW	excavation guidance	248
315	8/2/2014	282X	angular rock with fines	40	SW	excavation guidance	39.8
316	8/4/2014	283X*	brown fines	6	SW	pre-loading footprint	9.3
317	8/4/2014	284X	angular rock with fines	18	SW	excavation guidance	389.9
318	8/4/2014	285X	angular rock with fines	24	SE	confirmation-wall	3.1
319	8/4/2014	286X	angular rock with fines	bucket	SE	excavation guidance	15.8
320	8/4/2014	287X	angular rock with clay	60	SE	confirmation-floor	220.1
321	8/4/2014	288X	angular rock with fines	36	SE	confirmation-wall	5.0
322	8/4/2014	289X	angular rock with fines	36	SE	confirmation-wall	4.4
323	8/4/2014	290X*	angular rock with fines	36	SE	confirmation-wall	7.1
324	8/4/2014	291X*	angular rock with clay	60	SE	confirmation-floor	>500
325	8/4/2014	292X	angular rock with fines	48	SE	excavation guidance	389.1
326	8/4/2014	293X	angular rock with fines	40	SE	excavation guidance	>500
327	8/4/2014	294X	angular rock with fines	52	SE	confirmation-floor	19.5
328	8/4/2014	295X	angular rock with fines	50	SE	excavation guidance	>500
329	8/4/2014	296X	angular rock with fines	48	SE	confirmation-wall	53.6
330	8/4/2014	297X	angular rock with fines	50	SE	confirmation-floor	26.9
331	8/4/2014	298X	angular rock with fines	50	SE	confirmation-floor	184.2
332	8/4/2014	299X	angular rock with fines	18	SE	confirmation-wall	56.1
333	8/4/2014	300X	angular rock with fines	50	SE	confirmation-floor	92.3
334	8/4/2014	301X	angular rock with fines	53	SE	confirmation-floor	337.0
335	8/4/2014	302X	angular rock with fines	58	SE	confirmation-floor	310.1
336	8/4/2014	303X	angular rock with fines	53	SE	confirmation-wall	49.0
337	8/4/2014	304X	angular rock with fines	42	SE	confirmation-wall	74.4
338	8/4/2014	305X	angular rock with fines	40	SE	confirmation-wall	37.1
339	8/4/2014	306X	angular rock with fines	56	SE	confirmation-wall	51.5
340	8/4/2014	307X	angular rock with fines	48	SE	confirmation-wall	65.6
341	8/4/2014	308X	angular rock with fines	36	SE	confirmation-wall	31.1
342	8/4/2014	309X	angular rock with fines	50	SE	confirmation-wall	25.9
343	8/4/2014	310X*	brown fines	6	SW	pre-stockpile footprint	7.7
344	8/4/2014	311X*	brown fines	6	SW	pre-loading footprint	3.1
345	8/4/2014	312X	angular rock with fines	50	SW	excavation guidance	231.1
346	8/4/2014	313X	angular rock with fines	32	SW	excavation guidance	2.4
347	8/4/2014	314X	angular rock with clay	48	SW	excavation guidance	>500
348	8/4/2014	315X	angular rock with fines	24	SW	confirmation-wall	16.6
349	8/4/2014	316X	angular rock with fines	40	SW	confirmation-wall	8.5
350	8/4/2014	317X	angular rock with fines	24	SW	confirmation-wall	5.1
351	8/4/2014	318X	angular rock with fines	30	SW	excavation guidance	384.3
352	8/4/2014	319X	angular rock with fines	42	SW	excavation guidance	389.7
353	8/4/2014	320X	angular rock with fines	45	SW	excavation guidance	144.0
354	8/4/2014	321X	angular rock with fines	38	SW	excavation guidance	241.7
355	8/4/2014	322X	angular rock with fines	40	SW	excavation guidance	324.2
356	8/4/2014	323X	angular rock with fines	36	SW	confirmation-wall	8.8
357	8/4/2014	324X	angular rock with fines	53	NW	confirmation-floor	288.1
358	8/4/2014	325X	angular rock with fines	42	NW	confirmation-wall	56.6
359	8/4/2014	326X	angular rock with fines	42	NW	confirmation-wall	15.5
360	8/4/2014	327X*	angular rock with fines	48	NW	confirmation-wall	39.9

Table B4 - Field Screening Results, Test Hole X-1
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Number	Date	PID Number[1]	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
361	8/4/2014	328X	angular rock with fines	48	NW	confirmation-wall	49.7
362	8/5/2014	329X	angular rock with clay	58	NW	confirmation-floor	399
363	8/5/2014	330X	angular rock with clay	60	NW	confirmation-floor	87.2
364	8/5/2014	331X	angular rock with clay	64	NW	confirmation-floor	386
365	8/5/2014	332X	angular rock with clay	64	NW	confirmation-floor	710.3
366	8/5/2014	333X	angular rock with clay	64	NW	confirmation-floor	281.4
367	8/5/2014	334X*	angular rock with clay	62	SW	confirmation-floor	998.7
368	8/5/2014	335X	angular rock with clay	60	SW	confirmation-floor	640.1
369	8/5/2014	336X*	angular rock with clay	65	NE	confirmation-floor	983.4
370	8/5/2014	337X	angular rock with clay	65	NW	confirmation-floor	588.6
371	8/5/2014	338X*	angular rock with clay	66	SW	confirmation-floor	1196
372	8/5/2014	339X	angular rock with clay	62	SW	confirmation-floor	648.0
373	8/5/2014	340X	angular rock with clay	54	NE	confirmation-floor	796.3
374	8/5/2014	341X*	angular rock with clay	70	SE	confirmation-floor	1616
375	8/5/2014	342X*	angular rock with clay	68	SW	confirmation-floor	1120
376	8/5/2014	343X	angular rock with clay	62	SW	confirmation-floor	469.2
377	8/5/2014	344X	angular rock with clay	62	SE	confirmation-floor	807.3
378	8/5/2014	345X*	angular rock with clay	60	SE	confirmation-floor	1105
379	8/5/2014	346X	angular rock with clay	58	SW	confirmation-floor	818.8
380	8/5/2014	347X	angular rock with clay	63	SE	confirmation-floor	701.4
381	8/5/2014	348X*	angular rock with fines	62	SE	confirmation-floor	1547
382	8/5/2014	349X*	angular rock with fines	58	SE	confirmation-floor	1213
383	8/5/2014	350X	angular rock with fines	64	SE	confirmation-floor	647.2
384	8/5/2014	351X	angular rock with fines	62	SE	confirmation-floor	387.1
385	8/5/2014	352X	angular rock with fines	58	SE	confirmation-floor	356.0
386	8/5/2014	353X*	angular rock with fines	63	SE	confirmation-floor	527.8
387	8/5/2014	354X	angular rock with fines	62	SE	confirmation-floor	176.1
388	8/5/2014	355X	angular rock with fines	48	NW	confirmation-sidewall	90.3
389	8/5/2014	356X*	angular rock with fines	48	NW	confirmation-sidewall	159.6
390/391	8/5/2014	357X*	angular rock with fines	36/48	NW	confirmation-sidewall	33.5/381.4
392/393	8/5/2014	358X*	angular rock with fines	36/48	NE	confirmation-sidewall	34.7/365.5
394	8/5/2014	359X*	angular rock with fines	48	NE	confirmation-sidewall	148.1
395/396	8/5/2014	360X*	angular rock with fines	36/48	SE	confirmation-sidewall	29.9/392.7
397	8/5/2014	361X	angular rock with fines	48	SE	confirmation-sidewall	48.9
398	8/5/2014	362X	angular rock with fines	48	SE	confirmation-sidewall	71.0
399	8/5/2014	363X*	angular rock with fines	48	SE	confirmation-sidewall	208.2
400	8/5/2014	364X*	angular rock with fines	48	SE	confirmation-sidewall	167.4
401	8/5/2014	365X	angular rock with fines	48	SE	confirmation-sidewall	60.2
402/403	8/5/2014	366X*	angular rock with fines	36/48	SW	confirmation-sidewall	20.0/349.4
404	8/5/2014	367X	angular rock with fines	48	SW	confirmation-sidewall	64.3
405	8/5/2014	368X	angular rock with fines	48	SW	confirmation-sidewall	370.1
406	8/5/2014	369X	angular rock with fines	48	NW	confirmation-sidewall	426.0
407	8/5/2014	370X	angular rock with fines	48	NW	confirmation-sidewall	632.4
408	8/5/2014	371X	angular rock with fines	48	NW	confirmation-sidewall	650.6
409	8/5/2014	372X*	angular rock with fines	12	SE	stockpile	304.3
410	8/5/2014	373X	angular rock with fines	12	SE	stockpile	93.0
411	8/5/2014	374X	angular rock with fines	12	SE	stockpile	27.6
412	8/5/2014	375X	angular rock with fines	12	SE	stockpile	81.9
413	8/5/2014	376X	angular rock with fines	12	SE	stockpile	193.0
414	8/5/2014	377X	angular rock with fines	12	SE	stockpile	14.3
415	8/5/2014	378X*	angular rock with fines	12	SE	stockpile	16.8
416	8/5/2014	379X	angular rock with fines	12	SE	stockpile	16.2
417	8/5/2014	380X	angular rock with fines	12	SE	stockpile	14.7
418	8/5/2014	381X	angular rock with fines	12	SE	stockpile	13.6
419	8/12/2014	382X*	angular rock with fines	6	SW	confirmation-sidewall (368X	343.9
420	8/12/2014	383X*	angular rock with fines	6	NW	confirmation-sidewall (369X	548.8
421	8/12/2014	384X*	angular rock with fines	6	NW	confirmation-sidewall (370X	427.7
422	8/12/2014	385X*	angular rock with fines	6	NW	confirmation-sidewall (371X	712.0
423	8/16/2014	386X*	brown fines	6	NE	post-loading footprint	3.8
424	8/16/2014	387X*	brown fines	6	SE	post-stockpile footprint	8.9

Table B4 - Field Screening Results, Test Hole X-1
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Number	Date	PID Number[1]	Soil Type	Depth (inches)	Excavation Quadrant	Activity	PID Result (ppm)
425	8/16/2014	388X*	brown fines	6	NW	post-loading footprint	4.5
426	8/16/2014	389X*	brown fines	6	SE	post-stockpile footprint	5.9
427	8/16/2014	390X*	brown fines	6	SE	post-loading footprint	5.2
428	8/16/2014	391X*	brown fines	6	SE	post-loading footprint	6.2
429	8/16/2014	392X*	brown fines	6	NE	post-stockpile footprint	4.5
430	8/16/2014	393X*	brown fines	6	NW	post-stockpile footprint	1.3
431	8/16/2014	394X*	brown fines	6	NW	post-loading footprint	0.6
432	8/16/2014	395X*	brown fines	6	NW	post-stockpile footprint	2.2
433	8/16/2014	396X*	angular rock with clay	6	Center	confirmation-floor	1136

[1] The first 32 PID location numbers (001X through 031X) were inadvertently duplicated. Both sets of results are presented.

[2] The PID result was from soil in bucket - no sample was placed in bag.

* indicates a laboratory sample was also collected from this location

PID - photoionization detector (field screening instrument)

APPENDIX C

CDQR AND ADEC CHECKLISTS

Final

CHEMICAL DATA QUALITY REVIEW

Project Chariot
Cape Thompson, Alaska

2014 Remedial Action Report

NPDL # 14-039

Prepared: November 2014 (Revised February 2015)

Prepared for
U.S. Department of Energy
and
Army Corps of Engineers - Alaska District

Prepared by

Arctic Data Services, LLC for
Fairbanks Environmental Services, Inc.

I certify that all data quality review criteria described in Section 1.1 were assessed, and that qualifications were made according to the criteria outlined in the site-specific Quality Assurance Project Plan (QAPP).

Rodney Guritz
Arctic Data Services, LLC
Chemist

Michael Boese
Fairbanks Environmental Services, Inc.
Project Chemist

LIST OF ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ADS	Arctic Data Services, LLC
BTEX	benzene, toluene, ethylbenzene, and total xylenes
°C	degrees Celsius
CCV	continuing calibration verification
CDQR	Chemical Data Quality Review
COC	chain-of-custody
DL	detection limit
DoD	Department of Defense
DQO	data quality objectives
DRO	diesel range organics
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency
FES	Fairbanks Environmental Services
GRO	gasoline range organics
LCS/LCSD	laboratory control sample/laboratory control sample duplicate
LOD	limit of detection
LOQ	limit of quantitation
mg/kg	milligrams per kilogram
MS/MSD	matrix spike/matrix spike duplicate
ND	non-detect
PAH	polycyclic aromatic hydrocarbons
PMP	Pipeline Milepost
ppm	parts per million
QC	quality control
QSM	Quality Systems Manual
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RPD	relative percent difference
RRO	residual range organics
SDG	Sample Data Group
SGS	SGS-North America Inc.
SIM	Select Ion Monitoring
TAH	Total Aromatic Hydrocarbons
TAqH	Total Aqueous Hydrocarbons
TCLP	Toxicity Characteristic Leaching Procedure
USACE	U.S. Army Corps of Engineers
VOC	volatile organic compound

1.0 INTRODUCTION

This Chemical Data Quality Review (CDQR) presents the findings of data quality review of soil and casing water samples collected by Fairbanks Environmental Services (FES) during the June 2014 initial delineation and the July - August 2014 Remedial Action (RA) at the Project Chariot site, Cape Thompson, Alaska. All documents cited in the CDQR are listed in Section 4.

Arctic Data Services, LLC (ADS), on behalf of FES, performed a data quality review of project and quality control (QC) data in order to assess whether analytical data met data quality objectives (DQOs) and were acceptable for use. The project data were reviewed for deviations to the requirements presented in the Final 2014 Remedial Action Work Plan (FES, 2014), Alaska Department of Environmental Conservation (ADEC) Technical Memo 06-002, and the Department of Defense (DoD) Quality Systems Manual (QSM), Version 4.2. The review included evaluation of the following: sample collection and handling, holding times, blanks (to assess cross-contamination), project sample and laboratory QC sample duplicates (to assess precision), laboratory control samples (LCSs) and sample surrogate recoveries (to assess accuracy), and matrix spike (MS) recoveries and relative percent differences (RPD) between MS and matrix spike duplicate (MSD) samples (to assess matrix effects). Calibration curves, continuing calibration verification (CCV) recoveries, internal standard response, chromatograms, and other instrument-level QC were not reviewed; however, issues pertaining to these QC elements identified in the case narrative are discussed in the ADEC Laboratory Data Review Checklists. Quality control deviations that do not impact data quality (e.g., high LCS recovery associated with non-detect results) are not discussed in this CDQR. More detailed data quality descriptions are reported in the ADEC Laboratory Data Review Checklists, which are included at the end of Appendix C.

Soil-sample limits of detection (LODs) were compared to the relevant Method One (gravel pad) or Method Two (native tundra) soil cleanup levels presented in Title 18 Alaska Administrative Code (AAC) 75 for petroleum hydrocarbons, and to the most stringent Method Two, Table B1 Arctic Zone soil cleanup levels for other analytes. Water-sample LODs were compared to surface water criteria presented in 18 AAC 70.

Soil and casing water sample data quality are discussed in Sections 2 and 3, respectively. Data that did not meet acceptance criteria have been described and the associated samples and data-quality implications or qualifications are summarized.

1.1 Analytical Methods and Data Quality Objectives

The analytical methods and DQOs used for this review were presented in the Work Plan (FES, 2014). The DQOs represent the minimum acceptable QC limits and goals for analytical measurements and are used as comparison criteria during data quality review to determine both the quality and usability of the analytical data. The following tables summarize the DQO goals for surface water and soil samples, respectively. Note that only those analytes included in the Work Plan are listed; there were no project-specific DQOs for other analyses that were added following

issuance of the Work Plan. For these analyses, method-specific DQOs or laboratory control limits were used to evaluate data quality.

Summary of Data Quality Objectives for Soil Samples

Parameter	Preparation Method	Analytical Method	Limit of Detection	Precision (%RPD)	Accuracy (%)	Completeness (%)
DRO	3550B	AK102	10 mg/kg	20	75-125	90
RRO	3550B	AK103	10 mg/kg	20	60-120	90
BTEX (TCLP)	1311	8260B	0.0002 – 0.001 mg/L	20	Analyte specific[a]	90
RCRA Metals (TCLP)	1311	6020A	0.005 – 0.5 mg/L	30	80-120	90

[a] – Benzene (75-125%), Toluene (70-125%), Ethylbenzene (75-125%), m,p-Xylenes (80-125%), o-Xylene (75-125%).
BTEX – Benzene, Toluene, Ethylbenzene, and Xylenes; DRO – Diesel Range Organics; RRO – Residual Range Organics; TCLP – Toxic Characteristic Leaching Procedures; mg/kg – milligrams per kilogram; RPD – relative percent difference

Summary of Data Quality Objectives for Water Samples

Parameter	Preparation Method	Analytical Method	Limit of Detection (mg/L)	Precision (%RPD)	Accuracy (%)	Completeness (%)
GRO	5030B	AK101	0.05	20	60-120	90
BTEX	5030B	8260B	0.0002-0.001	30	Analyte specific[a]	90
PAHs	3520C	8270D SIM	0.000025-0.00005	30	Analyte specific[c]	90

[a] – Benzene (80-120%), Toluene (75-120%), Ethylbenzene (75-125), m,p-Xylenes (75-130%), o-Xylene (80-120%), 1,2-DCA (70-130%)
[c] – The analyte-specific LODs, precisions, and accuracies are presented in the 2014 Work Plan.
BTEX – Benzene, Toluene, Ethylbenzene, and Xylenes; GRO – Gasoline Range Organics; RPD – relative percent difference; SIM – Select Ion Monitoring; mg/L – milligrams per liter

The six DQO categories evaluated during this review were accuracy, precision, representativeness, comparability, sensitivity, and completeness.

- *Accuracy* measures the correctness, or the closeness, between the true value and the quantity detected. It is measured by calculating the percent recovery of known concentrations of spiked compounds that were introduced into the appropriate sample matrix. Surrogate, LCS, and MS sample recoveries were used to measure accuracy for this project. LCS and surrogate recovery criteria are defined in the QSM.
- *Precision* measures the reproducibility of repetitive measurements. It is measured by calculating the RPD between duplicate samples. Laboratory duplicate samples, field duplicate samples, MS and MSD pairs, and LCS and laboratory control sample duplicate (LCSD) pairs were used to measure precision for this project. LCS/LCSD precision criteria are defined in the QSM and field duplicate precision criteria are defined in the ADEC Laboratory Data Review Checklist (water: 30%; soil: 50%).
- *Representativeness* describes the degree to which data accurately and precisely represents site characteristics.

- *Comparability* describes whether two data sets can be considered equivalent with respect to the project goal.
- *Sensitivity* describes the lowest concentration that the analytical method can reliably quantitate, and is evaluated by verifying that the detected results and/or LODs meet the applicable cleanup levels.
- *Completeness* describes the amount of valid data obtained from the sampling event(s). It is calculated as the percentage of valid measurements compared to the total number of measurements. The completeness goal for this project was set at 90%.

In addition to these criteria for the six DQOs described above, sample collection and handling procedures and blank samples were reviewed to ensure overall data quality. Sample collection forms were reviewed by FES to verify that representative samples were collected and samples were properly preserved and were without headspace (if applicable). Sample handling was reviewed to assess parameters such as chain-of-custody (COC) documentation, the use of appropriate sample containers and preservatives, shipment cooler temperature, and method-specified sample holding times. Blank samples were analyzed to detect potential field or laboratory cross-contamination. Each of these parameters contributes to the general representativeness and comparability of the project data. Combining evaluation of the above-mentioned parameters leads to a determination of the overall project-data completeness.

1.2 Data Qualifiers

Table B2 (below) outlines general flagging criteria used for this project, to indicate QC deficiencies. Data were qualified pursuant to findings determined in the review of project data.

Data Qualifier Definitions

Qualifier	Definition
J	Analytical result is considered an estimated value because the concentration is less than the laboratory LOQ.
MN, MH, ML	Analytical result is considered an estimated value (N-unknown bias, H-high bias, L-low bias) due to matrix interference.
B	Analytical result is considered a high estimated value due to contamination present in a related blank sample.
QN, QH, QL	Analytical result is considered an estimated value (N-unknown bias, H-high bias, L-low bias) due to a related quality control failure.
R	Analytical result is rejected and is not suitable for project use.

LOQ – limit of quantitation

1.3 Summary of Soil Samples

A total of 180 primary soil samples were collected during the course of the project. Of these, 58 were collected from gravel-pad soils, and 122 were collected from native tundra soils. In addition to these primary samples, 22 field-duplicate samples were submitted. Additional volume was

submitted for seven samples for MS/MSD analysis, from a variety of locations throughout the site. One trip blank was submitted for volatile analysis in sample delivery group (SDG) 1143866. Soil samples were analyzed by one or more of the following analytical methods:

- Gasoline range organics (GRO) by Alaska (AK) Method 101
- Diesel range organics (DRO) by AK Method 102
- Residual range organics (RRO) by AK Method 103
- U.S. Environmental Protection Agency (EPA) Toxic Characteristic Leaching Procedure (TCLP) Preparation Method 1311 for analysis of:
    - Resource Conservation and Recovery Act (RCRA) Metals by EPA Method SW6020A
    - Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) by EPA Method SW8260B
- Polychlorinated Biphenyls (PCBs) by EPA Method SW8082A
- Volatile Organic Compounds (VOCs) by EPA Method SW8260B
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method SW8270D

Additionally, select soil samples from tundra locations were analyzed for DRO and RRO following silica-gel cleanup, in order to differentiate between biogenic and petroleum sources.

All project and QC samples were analyzed by SGS North America, Inc. (SGS) of Anchorage, Alaska. The laboratory is approved by the State of Alaska through the Contaminated Sites Program and is certified through the DoD Environmental Laboratory Accreditation Program (ELAP) for the methods listed above (as applicable).

Soil samples were shipped in 12 SDGs and assigned the SGS report numbers 1143274, 1143374, 1143333, 1143385, 1143960, 1143470, 1143517, 1143634, 1143815, 1143866, 1142724, and 1144035. Sample tracking tables (Tables 6-1, 7-1, 8-1, 9-1, and 10-1) and analytical results tables (Tables 6-2, 7-2, 7-3, 8-2, 8-3, 8-4, 9-2, 9-4, 9-5, 10-2, 10-3, 10-4, 10-5, and 10-6) are included in the report.

1.4 Summary of Water Samples

Water samples were collected from the casing of test holes Able, Baker, Charlie, and Dog (X-1 was dry) before and after treatment by granular activated carbon (GAC) and discharge to the ground surface. Additionally, one rinsate sample was collected for the stainless steel probe used to collect soil samples from the floor of excavation for test-hole Charlie; data quality implications related to the rinsate sample are discussed in Section 2.3, as it is relevant to soil data quality. One water trip blank sample was submitted for volatile analysis. Water samples were analyzed by one or more of the following analytical methods:

- GRO by Alaska (AK) Method 101
- Polynuclear aromatic hydrocarbons (PAHs) by Environmental Protection Agency (EPA) Method SW8270D-Select Ion Monitoring (SIM)

- Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) by EPA Method SW8260B

All project and QC samples were analyzed by SGS of Anchorage, Alaska. The laboratory is approved by the State of Alaska through the Contaminated Sites Program and is certified through the DoD ELAP for the methods listed above (as applicable).

Casing water samples were submitted along with soil samples in SDG 1143274. The rinsate sample was submitted along with soil samples in SDG 1143385; as noted above, this sample is addressed with soil-sample results in Section 2.3. Sample tracking tables (Table 4-3) and analytical results tables (Tables 4-2 and 4-4) are included in the report.

2.0 SOIL SAMPLE DATA QUALITY REVIEW

This section presents the findings of the data quality review and the resulting data qualifications for soil samples. Samples were analyzed by SGS and are included in twelve SDGs (1143274, 1143374, 1143333, 1143385, 1143960, 1143470, 1143517, 1143634, 1143815, 1143866, 1142724, and 1144035).

2.1 Sample Collection

Soil samples were collected using disposable stainless-steel spoons, with the exception of samples collected from the base of excavation of test-hole Charlie where a stainless-steel core sampler was used. A rinsate sample was collected following decontamination of the core sampler to check for potential cross-contamination; the rinsate sample is discussed further in Section 2.3. There was one sample collection anomaly:

- VOC sample 14PCX010SO was not preserved with methanol in the field. VOC analysis on a highly contaminated soil sample from Test Hole X-1 was requested by the ADEC (to investigate the pungent odor), and the analysis was added after the sample had been submitted to the laboratory. The VOC sample was extracted by the laboratory several days after collection, and consequently the detected results are low biased and were qualified QL, and non-detected results were rejected (R). A new sample kit was ordered, and a representative VOC sample was collected in duplicate (samples 14PCX076SO/14PCX077SO) using proper preparation techniques. Results from sample pair 14PCX076SO/14PCX077SO should be used to evaluate site conditions at the Test Hole X-1 site.

2.2 Sample Handling

The evaluation of proper sample handling procedures include verification of the following: correct COC documentation, appropriate sample containers and preservatives, cooler temperatures maintained at 4 degrees Celsius (°C) (±2°C), and sample analysis within method-specified holding times. Cooler temperatures below the acceptable temperature range were not considered to have affected soil-sample results. The following discrepancies were noted in the data packages:

Documentation Discrepancies

- Seven sample names were incorrect on the COC for SDG 1143960. The sample names were corrected in an e-mail to the laboratory, and the corrections reflected in a revised laboratory report. Also, sample times for 10 samples were not included on the COC; sample times were transcribed from sample bottles. Data quality and usability were not affected by these discrepancies.
- For SDG 1144035, the matrix indicated on the COC was water, but the samples in this SDG were soil. The laboratory identified the error; data quality and usability was not affected by this discrepancy.

Temperature, Preservation, and Sample-Condition Discrepancies

- The cooler for SDG 1142724 was received with its temperature blank measuring 7.1 °C, above the acceptable temperature range of 2 °C to 6 °C. Results for all samples in this SDG are considered effected and qualified 'QL' indicating the potential low bias.
- The jar for sample 14PCC013SO was received broken in SDG 1143274; the sample was transferred to a new jar for storage. The DRO/RRO results for this sample are considered estimated, biased low (flagged 'QL') due to potential loss of analyte during shipment.

2.3 Blanks

Method blanks, trip blanks, and equipment blanks were utilized to detect potential cross-contamination of project samples. Method blanks assess laboratory cross-contamination. Trip blanks assess field, shipment, and storage cross-contamination. Equipment blanks assess cross-contamination due to contact with reusable sampling equipment. Blank contamination that did not affect project data is not listed below but is addressed in the ADEC checklists.

Method Blanks

No analytes were detected above limits of quantitation (LOQs) in the method blanks. However, there were several method blank detections below the LOQ. The following samples had analyte detections within ten times the method blank concentration and were qualified (B) to indicate potential laboratory contamination.

- DRO result for rinsate sample 14PCC043SO (SDG 1143385).
- RRO results for soil samples 14PCX008SO, 14PCX012SO, 14PCX011SO, 14PCX013SO, and 14PCX015SO (SDG 1143470) and 14PCX076SO (SDG 1143866).
- RRO by silica-gel cleanup for soil sample 14PCX054SO (SDG 1143634).

Impact to data usability is minor as the affected results are two to three orders of magnitude below the relevant soil cleanup levels.

Trip Blanks

One solid-matrix (soil) trip blank was submitted for GRO and VOC analysis with soil samples in SDG 1143866. No analytes were detected in the trip blank.

Equipment Blanks

Rinsate (equipment blank) sample 14PCC043SO was submitted in SDG 1143385. The equipment blank was collected by pouring distilled water over the stainless steel core sampler used to collect soil samples from the base of excavation at test-hole Charlie. The equipment blank was analyzed for the same methods as the soil samples (DRO and RRO).

DRO and RRO were detected in the rinsate sample below the LOQ. The DRO result was associated with a method-blank detection, and is considered attributable to laboratory-based contamination, as discussed above. RRO results for corresponding samples (14PCC036SO through 14PCC042SO)

collected with the core sampler were greater than 10 times the concentration detected in the equipment blank (on a parts per million [ppm] basis), and are therefore unaffected.

2.4 Surrogate Recovery

Surrogate compounds were added to each project sample by the laboratory prior to analysis of organic analytes (GRO, DRO, RRO, BTEX, VOCs, SVOCs, and PCBs) as a measure of analytical extraction efficiency. Surrogate recoveries were then calculated as percentages and reported with the sample results. Surrogate recoveries can also be used to evaluate matrix effects; high surrogate recoveries generally indicate matrix interference, as opposed to extraction inefficiency. Surrogate recoveries that did not affect project data are not listed below but are discussed in the ADEC checklists. All surrogate recoveries were within acceptable tolerance limits or did not affect project samples, except those noted below.

- GRO surrogate 4-bromofluorobenzene was recovered above laboratory control limits for samples 14PCX076SO and 14PCX077SO, due to matrix interference. These results are considered estimated, biased high, and flagged 'QH.' GRO results were an order of magnitude below the relevant soil cleanup level, so impact to data usability was minor.
- DRO surrogate 5a-androstane was recovered above laboratory control limits for sample 14PCD014SO, due to matrix interference. This result is considered estimated, biased high, and flagged 'QH.' The result (1,880 mg/kg) was over twice the relevant cleanup level (500 mg/kg), and the surrogate recovery (151%) was only marginally above the laboratory control limit (150%), so impact to data usability is minor.

2.5 Laboratory Control Samples

Spike compounds were added to blank samples to assess laboratory extraction and instrumentation performance. LCS and LCSD samples that did not affect project data are not listed below but are discussed in the ADEC checklists. LCS and/or LCS/LCSD samples were analyzed and reported at the proper frequency (one per QC batch and for every analyte). LCSs and LCSDs had acceptable recoveries and RPDs between LCS/LCSD sample results (when applicable) were within laboratory control limits or did not affect project samples, except those noted below.

- The LCS/LCSD RPD for RRO was 20.5%, above the control limit of 20%, for preparatory batch XXX31482 in SDG 1143274. Associated RRO results (samples 14PCB001SO – 14PCB006SO, 14PCC009SO – 14PCC018SO) are qualified 'QN' for imprecision. Impact to data usability is minor, given the exceedance was minor and the results are at least one order of magnitude below the RRO cleanup level in each case.

2.6 Matrix Spike Samples and Duplicates

Spike compounds were added to project samples to assess potential matrix interference. MS and MSD samples that did not affect project data are not listed below but are included in the ADEC checklists. MS and MSD samples were collected at the proper frequency (a minimum of 1 for every 20 samples), and were performed for every analysis and QC batch, per QSM requirements. MS and MSD recoveries and MS/MSD RPDs were within laboratory control limits or did not affect project samples, with the exceptions noted below. MS and/or MSD recovery and precision discrepancies that affect project samples are listed below.

- MS/MSD analysis was not performed for the following batches:
    - DRO/RRO batches XXX31539 and XXX31638
    - DRO/RRO silica-gel batch XXX31637
    - PCB batch XXX31594

  Impact to data usability is minor, as LCS/LCSD recoveries and RPDs were within laboratory control limits for these batches, and each batch only contained one project sample.
- MS/MSD RPD for DRO was above the laboratory control limit for the MS/MSD of sample 14PCC025SO. The DRO result for this sample is considered estimated, and qualified 'QN' for lack of precision. Impact to data usability is minor, as the result (154 mg/kg) is two orders of magnitude below the cleanup level of 12,500 mg/kg.
- MS/MSD recovery of DRO was below laboratory control limits for the MS/MSD of sample 14PCD050SO. The DRO result for this sample is considered estimated, biased low due to matrix interference, and qualified 'ML.' The affected, low-biased DRO result (473 mg/kg) is only slightly below the applicable Method One soil cleanup level of 500 mg/kg. In an abundance of caution, this sample may be considered as potentially exceeding the cleanup level for project decision making.
- MS/MSD recoveries of 4-isopropyltoluene and naphthalene were above laboratory control limits for the MS/MSD of sample 14PCX010SO. Results for these analytes in the parent sample are considered estimated, biased high due to matrix interference, and qualified 'MH.' Impact to data usability is minor as the results are well below relevant cleanup levels.
- There were numerous analyte recovery failures for the MS/MSD of sample 14PCX076SO. The following analytes were recovered below laboratory control limits in the MS and MSD:
    - Diesel Range Organics (AK102)
    - DRO Silica Gel (AK102 SG)
    - 1,2-Dichlorobenzene (8260B)
    - 1,3-Dichlorobenzene (8260B)
    - 1,4-Dichlorobenzene (8260B)
    - 4-Chlorotoluene (8260B)
    - 2,4-Dinitrophenol (8270D)
    - 2-Nitrophenol (8270D)
    - 4-Nitroaniline (8270D)
    - Aniline (8270D)

- Benzoic acid (8270D)
- Hexachlorocyclopentadiene (8270D)

Results for these analytes in the parent sample are considered estimated, biased low due to matrix interference, and qualified 'ML,' with the exception of DRO and DRO Silica Gel. These two analytes were spiked at less than twice the native concentration of the analyte, and are therefore not considered affected, in accordance with United States Army Corps of Engineers (USACE) Engineering Manual (EM) 200-1-10. Impact to data usability is minor, as the affected analytes were not detected and LODs are well below relevant cleanup levels.

Numerous analytes were recovered above laboratory control limits in the same MS and/or MSD. Of the analytes with high recoveries, the following analytes were detected in the parent sample (14PCX076SO) and are considered effected:

- 1,2,4-Trimethylbenzene (8260B)
- 4-Isopropyltoluene (8260B)
- Naphthalene (8260B)
- o-Xylene (8260B)
- P & M -Xylene (8260B)
- Toluene (8260B)
- Xylenes (total) (8260B)
- 2-Methylnaphthalene (8270D)

Results for these analytes in the parent sample are considered estimated, biased high due to matrix interference, and qualified 'MH.' Impact to data usability is minor as the results are below cleanup levels in each case.

2.7 Field Duplicates

Field duplicate sample results for soil samples are summarized in the tables below. The duplicate frequency met the 10% requirement in the Work Plan for the soil-sample data set. Overall, 22 field duplicates were collected for 180 primary soil samples (frequency of 12%). LOD values were used in lieu of ND results for RPD calculation purposes. The analytes that did not meet the ADEC precision requirement (≤50%) for soil-matrix samples are identified in dark-grey highlight (light grey indicates native tundra soils (identifying relevant cleanup levels).

Summary of Project Chariot Soil Sample Field Duplicates

Sample ID			**ADEC Method One Cleanup Level[1]**	**ADEC Method Two Cleanup Level[1]**	**14PCB006SO**		**14PCB007SO**		
Test Hole Site					**BAKER**		**BAKER**		
Location ID					**B006WEC**		**B007DEC**		
Collection Date					**7/19/2014**		**7/19/2014**		
Sample Type					**Primary**		**Dup. (-B006SO)**		
Matrix					**TUNDRA**		**TUNDRA**		RPD
Analyte	**Method**	**Units**			**Result [LOD]**		**Result [LOD]**		
Diesel Range Organics	AK102	mg/Kg	500	12,500	35.3	[14.1]	145	[14.2]	122%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	299	[14.1]	1140	[57]	117%
Total Solids	A2540G	Percent	-	-	70.8	[0]	70.1	[0]	

		Sample ID	**ADEC Method One Cleanup Level[1]**	**ADEC Method Two Cleanup Level[1]**	**14PCC004SO**		**14PCC005SO**		
		Test Hole Site			**CHARLIE**		**CHARLIE**		
		Location ID			**C004NPE**		**C005DPE**		
		Collection Date			**6/25/2014**		**6/25/2014**		
		Sample Type			**Primary**		**Dup. (-C006SO)**		
		Matrix			**Soil - Pad**		**Soil - Pad**		RPD
Analyte	**Method**	**Units**			**Result [LOD]**		**Result [LOD]**		
Diesel Range Organics	AK102	mg/Kg	500	12,500	ND	[10.3]	ND	[10.3]	N/A
Residual Range Organics	AK103	mg/Kg	13,700	13,700	ND	[10.3]	ND	[10.3]	N/A
Total Solids	A2540G	Percent	-	-	97.2	[0]	97.1	[0]	

		Sample ID	**ADEC Method One Cleanup Level[1]**	**ADEC Method Two Cleanup Level[1]**	**14PCC023SO**		**14PCC024SO**		
		Test Hole Site			**CHARLIE**		**CHARLIE**		
		Location ID			**C023NEG**		**C024DEG**		
		Collection Date			**7/22/2014**		**7/22/2014**		
		Sample Type			**Primary**		**Dup. (-C023SO)**		
		Matrix			**TUNDRA**		**TUNDRA**		RPD
Analyte	**Method**	**Units**			**Result [LOD]**		**Result [LOD]**		
Diesel Range Organics	AK102	mg/Kg	500	12,500	4900	[187]	5360	[195]	9%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	5320	[187]	4630	[195]	14%
Total Solids	A2540G	Percent	-	-	53.4	[0]	50.6	[0]	

		Sample ID	**ADEC Method One Cleanup Level[1]**	**ADEC Method Two Cleanup Level[1]**	**14PCC026SO**		**14PCC027SO**		
		Test Hole Site			**CHARLIE**		**CHARLIE**		
		Location ID			**C026WEC**		**C027DEC**		
		Collection Date			**7/23/2014**		**7/23/2014**		
		Sample Type			**Primary**		**Dup. (-C026SO)**		
		Matrix			**Soil**		**Soil**		RPD
Analyte	**Method**	**Units**			**Result [LOD]**		**Result [LOD]**		
Diesel Range Organics	AK102	mg/Kg	500	12,500	ND	[11]	ND	[10.7]	N/A
Residual Range Organics	AK103	mg/Kg	13,700	13,700	ND	[11]	ND	[10.7]	N/A
Total Solids	A2540G	Percent	-	-	90.3	[0]	91.1	[0]	

		Sample ID	**ADEC Method One Cleanup Level[1]**	**ADEC Method Two Cleanup Level[1]**	**14PCC041SO**		**14PCC042SO**		
		Test Hole Site			**CHARLIE**		**CHARLIE**		
		Location ID			**C041FEC**		**C042DEC**		
		Collection Date			**7/26/2014**		**7/26/2014**		
		Sample Type			**Primary**		**Dup. (-C041SO)**		
		Matrix			**TUNDRA**		**TUNDRA**		RPD
Analyte	**Method**	**Units**			**Result [LOD]**		**Result [LOD]**		
Diesel Range Organics	AK102	mg/Kg	500	12,500	447	[55]	586	[13.7]	27%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	906	[55]	414	[13.7]	75%
Total Solids	A2540G	Percent	-	-	72.8	[0]	73.1	[0]	

		Sample ID	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCC047SO		14PCC048SO		
		Test Hole Site			CHARLIE		CHARLIE		
		Location ID			C047WEC		C048DEC		
		Collection Date			7/26/2014		7/26/2014		
		Sample Type			Primary		Dup. (-C047SO)		
		Matrix			TUNDRA		TUNDRA		RPD
Analyte	**Method**	**Units**			**Result**	**[LOD]**	**Result**	**[LOD]**	
Diesel Range Organics	AK102	mg/Kg	500	12,500	401	[12.9]	1480	[51.5]	115%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	207	[12.9]	571	[51.5]	94%
Total Solids	A2540G	Percent	-	-	77.3	[0]	77.5	[0]	

		Sample ID	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCD015SO		14PCD016SO		
		Test Hole Site			DOG		DOG		
		Location ID			D015NEG		D016DEG		
		Collection Date			8/14/2014		8/14/2014		
		Sample Type			Primary		Dup. (-D015SO)		
		Matrix			Soil		Soil		RPD
Analyte	**Method**	**Units**			**Result**	**[LOD]**	**Result**	**[LOD]**	
Diesel Range Organics	AK102	mg/Kg	500	12,500	**776**	**[58]**	**850**	**[58]**	9%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	833	[58]	851	[58]	2%
Total Solids	A2540G	Percent	-	-	68.1	[0]	68	[0]	

		Sample ID	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCD036SO		14PCD037SO		
		Test Hole Site			DOG		DOG		
		Location ID			D036WEC		D037DEC		
		Collection Date			8/19/2014		8/19/2014		
		Sample Type			Primary		Dup. (-D036SO)		
		Matrix			TUNDRA		TUNDRA		RPD
Analyte	**Method**	**Units**			**Result**	**[LOD]**	**Result**	**[LOD]**	
Diesel Range Organics	AK102	mg/Kg	500	12,500	1980	[61.5]	999	[15.4]	66%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	398	[61.5]	384	[15.4]	4%
Total Solids	A2540G	Percent	-	-	64.3	[0]	64	[0]	

		Sample ID	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCD032SO		14PCD033SO		
		Test Hole Site			DOG		DOG		
		Location ID			D032FEC		D033DEC		
		Collection Date			8/19/2014		8/19/2014		
		Sample Type			Primary		Dup. (-D032SO)		
		Matrix			TUNDRA		TUNDRA		RPD
Analyte	**Method**	**Units**			**Result**	**[LOD]**	**Result**	**[LOD]**	
Diesel Range Organics	AK102	mg/Kg	500	12,500	53.4	[13.9]	169	[13.9]	104%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	202	[13.9]	417	[13.9]	69%
Total Solids	A2540G	Percent	-	-	71.6	[0]	71.6	[0]	

		Sample ID	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCD044SO		14PCD045SO		
		Test Hole Site			DOG		DOG		
		Location ID			D044FEC		D045DEC		
		Collection Date			8/20/2014		8/20/2014		
		Sample Type			Primary		Dup. (-D044SO)		
		Matrix			TUNDRA		TUNDRA		RPD
Analyte	**Method**	**Units**			**Result [LOD]**		**Result [LOD]**		
Diesel Range Organics	AK102	mg/Kg	500	12,500	82.5	[13.4]	103	[13.4]	22%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	593	[13.4]	721	[13.4]	19%
Total Solids	A2540G	Percent	-	-	74.3	[0]	73.8	[0]	

		Sample ID	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCD057SO		14PCD058SO		
		Test Hole Site			DOG		DOG		
		Location ID			D057NLF		D058DLF		
		Collection Date			8/21/2014		8/21/2014		
		Sample Type			Primary		Dup (-D057SO)		
		Matrix			Soil		Soil		RPD
Analyte	**Method**	**Units**			**Result [LOD]**				
Diesel Range Organics	AK102	mg/Kg	500	12,500	41.3	[11.1]	43.9	[10.9]	6%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	131	[11.1]	117	[10.9]	11%
Total Solids	A2540G	Percent	-	-	89.7	[0]	91	[0]	

		Sample ID	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCD048SO		14PCD049SO		
		Test Hole Site			DOG		DOG		
		Location ID			D048WEC		D049DEC		
		Collection Date			8/20/2014		8/20/2014		
		Sample Type			Primary		Dup (-D048SO)		
		Matrix			TUNDRA		TUNDRA		RPD
Analyte	**Method**	**Units**			**Result [LOD]**		**Result [LOD]**		
Diesel Range Organics	AK102	mg/Kg	500	12,500	18.3	[14.8] J	60.1	[14.7]	107%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	91.8	[14.8]	253	[14.7]	94%
Total Solids	A2540G	Percent	-	-	67.5	[0]	67.3	[0]	

		Sample ID	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCX014SO		14PCX015SO		
		Test Hole Site			X-1		X-1		
		Location ID			X014NEG		X015DEG		
		Collection Date			7/29/2014		7/29/2014		
		Sample Type			Primary		Dup (-X014SO)		
		Matrix			TUNDRA		TUNDRA		RPD
Analyte	**Method**	**Units**							
Diesel Range Organics	AK102	mg/Kg	500	12,500	941	[44]	309	[10.9]	101%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	117	[11]	30.6	[10.9]	117%
Total Solids	A2540G	Percent	-	-	90.7	[0]	91.1	[0]	

		Sample ID	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCX034SO		14PCX035SO		
		Test Hole Site			X-1		X-1		
		Location ID			X034FEG		X035DEG		
		Collection Date			8/4/2014		8/4/2014		
		Sample Type			Primary		Dup (-X034SO)		
		Matrix			TUNDRA		TUNDRA		RPD
Analyte	**Method**	**Units**							
Diesel Range Organics	AK102	mg/Kg	500	12,500	4400	[227]	3280	[115]	29%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	66.7	[11.4]	57.1	[11.4]	16%
Total Solids	A2540G	Percent	-	-	87.2	[0]	86.2	[0]	

		Sample ID	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCX030SO		14PCX031SO		
		Test Hole Site			X-1		X-1		
		Location ID			X030NEG		X031DEG		
		Collection Date			8/2/2014		8/2/2014		
		Sample Type			Primary		Dup (-X030SO)		
		Matrix			TUNDRA		TUNDRA		RPD
Analyte	**Method**	**Units**							
Diesel Range Organics	AK102	mg/Kg	500	12,500	12.3	[11.2] J	49.5	[10.9]	120%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	ND	[11.2]	ND	[10.9]	N/A
Total Solids	A2540G	Percent	-	-	88.5	[0]	91	[0]	

		Sample ID	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCX042SO		14PCX043SO		
		Test Hole Site			X-1		X-1		
		Location ID			X042FEC		X043DEC		
		Collection Date			8/5/2014		8/5/2014		
		Sample Type			Primary		Dup (-X042SO)		
		Matrix			TUNDRA		TUNDRA		RPD
Analyte	**Method**	**Units**							
Diesel Range Organics	AK102	mg/Kg	500	12,500	7150	[585]	11100	[610]	43%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	171	[11.7]	209	[49]	20%
Total Solids	A2540G	Percent	-	-	84.9	[0]	81.3	[0]	

		Sample ID	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCX057SO		14PCX058SO		
		Test Hole Site			X-1		X-1		
		Location ID			X057WEC		X058DEC		
		Collection Date			8/5/2014		8/5/2014		
		Sample Type			Primary		Dup (-X057SO)		
		Matrix			TUNDRA		TUNDRA		RPD
Analyte	**Method**	**Units**							
Diesel Range Organics	AK102	mg/Kg	500	12,500	2530	[106]	2180	[106]	15%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	93.5	[10.6]	74.5	[10.6]	23%
Total Solids	A2540G	Percent	-	-	94	[0]	94	[0]	

		Sample ID	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCX076SO		14PCX077SO		
		Test Hole Site			X-1		X-1		
		Location ID			X076FEC		X077DEC		
		Collection Date			8/16/2014		8/16/2014		
		Sample Type			Primary		Dup (-X076SO)		
		Matrix			TUNDRA		TUNDRA		RPD
Analyte	Method	Units							
Diesel Range Organics	AK102	mg/Kg	500	12,500	**16200**	**[1440]**	9,200	[289]	55%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	155	[230] J	ND	[232]	N/A
Total Solids	A2540G	Percent	-	-	86.9	[0]	86	[0]	

		Sample ID	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCC010SO		14PCC011SO		
		Test Hole Site			CHARLIE		CHARLIE		
		Location ID			C010NPE		C011DPE		
		Collection Date			7/17/2014		7/17/2014		
		Sample Type			Primary		Primary		
		Matrix			Soil		Soil		RPD
Analyte	Method	Units			Result [LOD]		Result [LOD]		
Diesel Range Organics	AK102	mg/Kg	500	12,500	40.8	[10.3]	53.4	[10.3]	27%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	20.3	[10.3] J	32.3	[10.3]	46%
Total Solids	A2540G	Percent	-	-	96	[0]	96.1	[0]	

		Sample ID	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCD002SO		14PCD003SO		
		Test Hole Site			DOG		DOG		
		Location ID			D002NPE		D003NPE		
		Collection Date			7/20/2014		7/20/2014		
		Sample Type			Primary		Dup (-D002SO)		
		Matrix			TUNDRA		TUNDRA		RPD
Analyte	Method	Units			Result [LOD]		Result [LOD]		
Diesel Range Organics	AK102	mg/Kg	500	12,500	757	[15.3]	377	[15.4]	67%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	1200	[61]	476	[15.4]	86%
Total Solids	A2540G	Percent	-	-	65.1	[0]	65.2	[0]	

		Sample ID	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCX018SO		14PCX019SO		
		Test Hole Site			X-1		X-1		
		Location ID			X018NEG		X019DEG		
		Collection Date			7/30/2014		7/30/2014		
		Sample Type			Primary		Dup (-X018SO)		
		Matrix			TUNDRA		TUNDRA		RPD
Analyte	Method	Units							
Diesel Range Organics	AK102	mg/Kg	500	12,500	13.3	[10.9] J	16.4	[10.8] J	21%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	ND	[10.9]	ND	[10.8]	N/A
Total Solids	A2540G	Percent	-	-	91.9	[0]	92.6	[0]	

		Sample ID	ADEC Method One Cleanup Level[1]	ADEC Method Two Cleanup Level[1]	14PCX064SO		14PCX065SO		
		Test Hole Site			X-1		X-1		
		Location ID			X064WEC		X065WEC		
		Collection Date			8/12/2014		8/12/2014		
		Sample Type			Primary		Dup (-X064SO)		
		Matrix			TUNDRA		TUNDRA		RPD
Analyte	**Method**	**Units**							
Diesel Range Organics	AK102	mg/Kg	500	12,500	4640	[118]	3750	[115]	21%
Residual Range Organics	AK103	mg/Kg	13,700	13,700	113	[118] J	95.6	[115] J	17%
Total Solids	A2540G	Percent	-	-	85.1	[0]	86	[0]	

	Sample ID		14PCX076SO		14PCX077SO		
	Location		X076FEC		X077DEC		
	Collection Date		8/16/2014		8/16/2014		
	Sample Type		Primary		Field Duplicate		
	Matrix		TUNDRA		TUNDRA		RPD
Analyte	**Method**	**Units**	**Result [LOD]**		**Result [LOD]**		
Gasoline Range Organics	AK101	mg/Kg	123	[1.92]	97.3	[1.99]	23%
Diesel Range Organics	AK102	mg/Kg	16200	[1440]	9200	[289]	60%
Residual Range Organics	AK103	mg/Kg	155	[230]	ND	[232]	40%
1,2,4-Trimethylbenzene	SW8260B	mg/Kg	2.01	[0.0383]	2.04	[0.0398]	1%
1,3,5-Trimethylbenzene	SW8260B	mg/Kg	7.75	[0.192]	7.51	[0.199]	3%
2-Butanone	SW8260B	mg/Kg	0.125	[0.192] J	ND	[0.199]	46%
4-Isopropyltoluene	SW8260B	mg/Kg	0.667	[0.0192]	0.573	[0.0199]	15%
Benzene	SW8260B	mg/Kg	0.0958	[0.0096]	0.0815	[0.01]	16%
Ethylbenzene	SW8260B	mg/Kg	0.187	[0.0192]	0.14	[0.0199]	29%
Isopropylbenzene	SW8260B	mg/Kg	0.0475	[0.0192]	0.0386	[0.0199] J	21%
Naphthalene	SW8260B	mg/Kg	1.93	[0.0383]	1.98	[0.0398]	3%
Toluene	SW8260B	mg/Kg	0.743	[0.0192]	0.587	[0.0199]	23%
Xylene, Isomers m & p	SW8260B	mg/Kg	1.04	[0.0383]	0.791	[0.0398]	27%
Xylenes	SW8260B	mg/Kg	2.05	[0.0575]	1.68	[0.0595]	20%
n-Propylbenzene	SW8260B	mg/Kg	0.0778	[0.0192]	0.064	[0.0199]	19%
o-Xylene	SW8260B	mg/Kg	1.01	[0.0192]	0.89	[0.0199]	13%
2-Methylnaphthalene	SW8270D	mg/Kg	21	[0.705] CI	9.06	[0.72]	79%
Naphthalene	SW8270D	mg/Kg	4.01	[0.705] CI	1.91	[0.144]	71%
Phenanthrene	SW8270D	mg/Kg	8.61	[0.705] CI	3.57	[0.144]	83%

Results highlighted in dark gray do not meet the 50% RPD criterion for soil matrix samples.
Results in **bold** font exceed the ADEC Method One Cleanup Level
Results in red highlight exceed the ADEC Method Two Cleanup Level
J – Result is considered an estimate since it is reported below the LOQ.
ND – Not detected
mg/Kg – milligrams per kilogram
RPD – relative percent difference

In most cases, impact to data usability was minor because non-comparable field-duplicate results were well below cleanup levels. However, impact to data usability for one field-duplicate pair was significant:

- The DRO result for sample 14PCX076SO exceeded the tundra-soil cleanup level of 12,500 mg/kg; the DRO result for its duplicate 14PCX077SO was below this cleanup level. Therefore we cannot conclusively determine whether DRO exceeds the cleanup level at the sample location. The higher of the two results is conservatively used to represent the DRO concentration for the sample location.

2.8 Continuing Calibration Verification Samples

Evaluation of CCV samples is beyond the scope of review for this project; however, the laboratory included comments about CCV samples in some report case narratives. No CCV recovery exceptions were listed that affected groundwater project samples. CCV recovery exceptions that did not affect project data are not discussed here, but are included in the ADEC checklists. Additionally, in the event the laboratory made errant CCV case narrative comments either for methods or target compounds not related to this project, these are also discussed in the ADEC checklists.

2.9 Analytical Sensitivity

Several project data analytes were identified as estimations by the laboratory due to reporting results between the Detection Limit (DL) and LOQ. Results reported above the DL but below the LOQ are qualified as estimates due to the unknown accuracy of the analytical method at those concentrations. These data qualifications are not reported again in this Chemical Data Quality Review, but they are noted with a "J" in associated results tables.

Analytical sensitivity was evaluated by verifying that LODs were below the applicable cleanup levels for non-detect results. Relevant ADEC Method One or Method Two soil cleanup levels listed in 18 AAC 75 were met, with exceptions listed below.

- LODs for the following analytes exceeded Method Two Arctic Zone soil cleanup levels for sample 14PCX076SO: benzo[a]pyrene, dibenzo[a,h]anthracene, and N-nitrosodimethylamine. We cannot determine if these analytes were present above cleanup levels in this sample. Impact to data usability is minimal as the field duplicate results were ND with adequate analytical sensitivity that met the cleanup levels, and the DRO result for this sample was well above the cleanup level.

2.10 Summary of Qualified Results

Overall, the review process deemed the soil project data acceptable for use. Multiple results were qualified; however, impact to data quality is minor and no data were rejected. A tabular Summary of Qualified Results is provided as Attachment 1; this table provides a summary of sample results qualified based on the review describe above, including the associated sample numbers, analytes and the reason for qualification.

2.11 Completeness and Summary of Data Quality

All soil data were considered usable (reported with adequate sensitivity and no data were rejected), so a completeness score of 100% was calculated for this project. Therefore, the 90% completeness criterion in the Work Plan was met for the project.

Overall, the review process deemed the soil project data acceptable for use. Multiple results were qualified; however, the impact to data quality for the majority of the samples was minor. Data quality issues that may have significantly impacted project soil data usability are summarized below:

- The cooler for SDG 1142724 was received with its temperature blank measuring 7.1 °C, above the acceptable temperature range of 2 °C to 6 °C. Results for all samples in this SDG are considered effected, and qualified 'QL' indicating the potential low bias. This SDG included six pre-excavation samples for DRO/RRO analysis, and two samples for waste characterization TCLP analysis of RCRA metals and BTEX.
- MS/MSD recovery of DRO was below laboratory control limits for the MS/MSD of sample 14PCD050SO. The DRO result for this sample is considered estimated, biased low due to matrix interference, and qualified 'ML.' The effected low-biased DRO result (473 mg/kg) is only slightly below the applicable Method One soil cleanup level of 500 mg/kg. In an abundance of caution, this wall confirmation sample may be considered as potentially exceeding the cleanup level for project decision making.
- The DRO result for sample 14PCX076SO exceeded the tundra-soil cleanup level of 12,500 mg/kg; the DRO result for its duplicate 14PCX077SO was below this cleanup level. Therefore we cannot conclusively determine whether DRO exceeds the cleanup level at the sample location. The higher of the two results was conservatively used to represent the DRO concentration for the sample location.

3.0 WATER SAMPLE DATA QUALITY REVIEW

This section presents the findings of the data quality review and the resulting data qualifications for project water samples. Water matrix samples were analyzed by SGS and were included in SDG 1143274 (casing water) and 1143385 (equipment blank).

3.1 Sample Collection

All water samples were collected according to Work Plan requirements. There were no sample-collection anomalies.

3.2 Sample Handling

The evaluation of proper sample handling procedures include verification of the following: correct COC documentation, appropriate sample containers and preservatives, cooler temperatures maintained at 4 degrees °C (±2°C), and sample analysis within method-specified holding times. The following discrepancies were noted in the data packages:

Temperature Discrepancies

- The coolers associated with both SDGs including water samples (1143274 and 1143385) were received with temperature blanks measured below the acceptable temperature range but above 0 °C. No ice was observed in the water samples, so results are considered unaffected by the low sample temperature.

3.3 Blanks

Method blanks and trip blanks were utilized to detect potential cross-contamination of project samples. Method blanks assess laboratory cross-contamination. Trip blanks assess field, shipment, and storage cross-contamination. Water samples were collected using disposable sampling equipment, so no equipment blank was necessary. There were no detections of analytes in method blanks or trip blanks that affected data quality for this project.

3.4 Surrogate Recovery

Surrogate compounds were added to each project sample by the laboratory prior to analysis of organic analytes (GRO, BTEX, and PAHs) as a measure of analytical extraction efficiency. Surrogate recoveries were then calculated as percentages and reported with the sample results. Surrogate recoveries can also be used to evaluate matrix effects; high surrogate recoveries generally indicate matrix interference, as opposed to extraction inefficiency. Surrogate recoveries that did not affect project data are not listed below but are discussed in the ADEC checklists. All surrogate recoveries were within acceptable tolerance limits or did not affect project samples.

3.5 Laboratory Control Samples

Spike compounds were added to blank samples to assess laboratory extraction and instrumentation performance. LCS and/or LCS/LCSD samples were analyzed and reported at the proper frequency (one per QC batch and for every analyte). All LCSs and LCSDs had acceptable recoveries, and all RPDs between LCS/LCSD sample results (when applicable) were within acceptable limits or did not affect project samples.

3.6 Matrix Spike Samples and Duplicates

Spike compounds were added to project samples to assess potential matrix interference. MS and MSD samples that did not affect project data are not listed below but are discussed in the ADEC checklists. MS and MSD samples were collected at the proper frequency (a minimum of 1 for every 20 samples), and were performed for every analysis and QC batch, per QSM requirements, with one exception noted below. Additionally, MS and/or MSD recovery and precision were within acceptable limits or did not affect project samples.

- There was no MS/MSD reported for the PAH preparatory batch including water samples 14PCW001WX and 14PCW002WX. We are unable to evaluate potential matrix effects on the PAH analysis for these samples, other than by evaluating surrogate recovery. Surrogate recoveries were within control limits; impact to data usability is considered minor.
- Recovery of o-xylene was below laboratory control limits for the MSD of sample 14PCW002WX. The o-xylene result for the parent sample is considered estimated, biased low due to matrix interference, and qualified 'ML.' Impact to data usability is minor as the analyte was not detected and the LOD was reported with adequate sensitivity for TAH/TAqH determination.

3.7 Field Duplicates

No field duplicates were submitted for the water samples. The water samples were collected for waste-characterization purposes only, and field-duplicate samples were not required, per the Work Plan.

3.8 Analytical Sensitivity

Several project data analytes were identified as estimations by the laboratory due to reporting results between the DL and LOQ. Results reported above the DL but below the LOQ are qualified as estimates due to the unknown accuracy of the analytical method at those concentrations. These data qualifications are not reported again in this Chemical Data Quality Review, but they are noted with a "J" in associated results tables.

Analytical sensitivity was evaluated to verify that the LODs met the applicable cleanup levels. All LODs were sensitive enough to calculate surface water criteria that met cleanup levels listed in 18 AAC 70.020, so data were reported with adequate sensitivity for project purposes.

3.9 Summary of Qualified Results

Overall, the review process deemed the water sample project data acceptable for use. One result was qualified; however, impact to data quality is minor and no data were rejected. A tabular Summary of Qualified Results is provided as Attachment 1; this table provides a summary of water-sample results qualified based on the review describe above, including the associated sample numbers, analytes and the reason for qualification.

3.11 Completeness and Summary of Data Quality

All surface water data were considered usable (reported with adequate sensitivity and no data were rejected), so a completeness score of 100% was calculated for this project. Therefore, the 90% completeness criterion in the Work Plan was met for the project. Therefore, the 90% completeness criterion in the Work Plan was met for the project.

Overall, the review process deemed the project water-sample data acceptable for use. One result was qualified; however, the impact to data quality and usability was minor. There were no data quality issues that significantly impacted water-sample data usability.

4.0 REFERENCES

Alaska Department of Environmental Conservation (ADEC), 2014, October 1. *18 AAC 75, Oil and Other Hazardous Substances Pollution Control*.

ADEC, 2012, April 8. *18 AAC 75, Water Quality Standards.*

ADEC, 2009, March. *Technical Memorandum 06-002, Environmental Laboratory Data and Quality Assurance Requirements.*

Department of Defense (DoD), June 5, 2003. *DoD Quality Systems Manual for Environmental Laboratories, Version 4.2.*

Fairbanks Environmental Services (FES), 2014, June. *Final 2014 Remedial Action Work Plan*, *Project Chariot, Cape Thompsons, Alaska*.

U.S. Army Corps of Engineers (USACE), June 2005. *Engineering Manual (EM) 200-1-10, Guidance for Evaluating Performance-Based Chemical Data.*

Attachment 1 - Summary of Qualified Data

Sample Delivery Group	Sample	Analytical Method	Analyte	Limit of Detection (LOD)	Result	Units	Lab Flag	QC Flag	QC Note
1142724	14PCC001SO	SW6020A TCLP	Arsenic	0.125	0	mg/L	U	QL	High sample temperature
1142724	14PCC001SO	SW6020A TCLP	Barium	0.075	0.538	mg/L	=	QL	High sample temperature
1142724	14PCC001SO	SW6020A TCLP	Cadmium	0.05	0	mg/L	U	QL	High sample temperature
1142724	14PCC001SO	SW6020A TCLP	Chromium	0.1	0	mg/L	U	QL	High sample temperature
1142724	14PCC001SO	SW6020A TCLP	Lead	0.025	0	mg/L	U	QL	High sample temperature
1142724	14PCC001SO	SW6020A TCLP	Mercury	0.005	0	mg/L	U	QL	High sample temperature
1142724	14PCC001SO	SW6020A TCLP	Selenium	0.5	0	mg/L	U	QL	High sample temperature
1142724	14PCC001SO	SW6020A TCLP	Silver	0.05	0	mg/L	U	QL	High sample temperature
1142724	14PCC001SO	SW8260B TCLP	Benzene	0.01	0	mg/L	U	QL	High sample temperature
1142724	14PCC001SO	SW8260B TCLP	Ethylbenzene	0.025	0	mg/L	U	QL	High sample temperature
1142724	14PCC001SO	SW8260B TCLP	o-Xylene	0.025	0	mg/L	U	QL	High sample temperature
1142724	14PCC001SO	SW8260B TCLP	P & M -Xylene	0.05	0	mg/L	U	QL	High sample temperature
1142724	14PCC001SO	SW8260B TCLP	Toluene	0.025	0.0265	mg/L	J	QL	High sample temperature
1142724	14PCC002SO	SW6020A TCLP	Arsenic	0.125	0	mg/L	U	QL	High sample temperature
1142724	14PCC002SO	SW6020A TCLP	Barium	0.075	0.644	mg/L	=	QL	High sample temperature
1142724	14PCC002SO	SW6020A TCLP	Cadmium	0.05	0	mg/L	U	QL	High sample temperature
1142724	14PCC002SO	SW6020A TCLP	Chromium	0.1	0	mg/L	U	QL	High sample temperature
1142724	14PCC002SO	SW6020A TCLP	Lead	0.025	0.0883	mg/L	=	QL	High sample temperature
1142724	14PCC002SO	SW6020A TCLP	Mercury	0.005	0	mg/L	U	QL	High sample temperature
1142724	14PCC002SO	SW6020A TCLP	Selenium	0.5	0	mg/L	U	QL	High sample temperature
1142724	14PCC002SO	SW6020A TCLP	Silver	0.05	0	mg/L	U	QL	High sample temperature
1142724	14PCC002SO	SW8260B TCLP	Benzene	0.01	0.039	mg/L	=	QL	High sample temperature
1142724	14PCC002SO	SW8260B TCLP	Ethylbenzene	0.025	0	mg/L	U	QL	High sample temperature
1142724	14PCC002SO	SW8260B TCLP	o-Xylene	0.025	0.0205	mg/L	J	QL	High sample temperature
1142724	14PCC002SO	SW8260B TCLP	P & M -Xylene	0.05	0.0445	mg/L	J	QL	High sample temperature
1142724	14PCC002SO	SW8260B TCLP	Toluene	0.025	0.109	mg/L	=	QL	High sample temperature
1142724	14PCC003SO	AK102	Diesel Range Organics	10.4	658	mg/kg	=	QL	High sample temperature
1142724	14PCC003SO	AK103	Residual Range Organics	10.4	313	mg/kg	=	QL	High sample temperature
1142724	14PCC004SO	AK102	Diesel Range Organics	10.3	0	mg/kg	U	QL	High sample temperature
1142724	14PCC004SO	AK103	Residual Range Organics	10.3	0	mg/kg	U	QL	High sample temperature
1142724	14PCC005SO	AK102	Diesel Range Organics	10.3	0	mg/kg	U	QL	High sample temperature
1142724	14PCC005SO	AK103	Residual Range Organics	10.3	0	mg/kg	U	QL	High sample temperature
1142724	14PCC006SO	AK102	Diesel Range Organics	10.4	325	mg/kg	=	QL	High sample temperature
1142724	14PCC006SO	AK103	Residual Range Organics	10.4	68.4	mg/kg	=	QL	High sample temperature
1142724	14PCC007SO	AK102	Diesel Range Organics	10.2	0	mg/kg	U	QL	High sample temperature
1142724	14PCC007SO	AK103	Residual Range Organics	10.2	0	mg/kg	U	QL	High sample temperature
1142724	14PCC008SO	AK102	Diesel Range Organics	11.4	154	mg/kg	=	QL	High sample temperature
1142724	14PCC008SO	AK103	Residual Range Organics	11.4	22.2	mg/kg	J	QL	High sample temperature
1143274	14PCB001SO	AK103	Residual Range Organics	12.2	26.8	mg/kg	=	QN	LCS/LCSD RPD Failure
1143274	14PCB002SO	AK103	Residual Range Organics	12.1	500	mg/kg	=	QN	LCS/LCSD RPD Failure
1143274	14PCB003SO	AK103	Residual Range Organics	11.6	165	mg/kg	=	QN	LCS/LCSD RPD Failure
1143274	14PCB004SO	AK103	Residual Range Organics	56.5	1080	mg/kg	=	QN	LCS/LCSD RPD Failure
1143274	14PCB005SO	AK103	Residual Range Organics	55.5	1780	mg/kg	=	QN	LCS/LCSD RPD Failure
1143274	14PCB006SO	AK102	Diesel Range Organics	14.1	35.3	mg/kg	=	QN	Field-duplicate RPD failure
1143274	14PCB006SO	AK103	Residual Range Organics	14.1	299	mg/kg	=	QN	LCS/LCSD RPD Failure
								QN	Field-duplicate RPD failure
1143274	14PCB007SO	AK102	Diesel Range Organics	14.2	145	mg/kg	=	QN	Field-duplicate RPD failure
1143274	14PCB007SO	AK103	Residual Range Organics	57	1140	mg/kg	=	QN	Field-duplicate RPD failure
1143274	14PCC009SO	AK103	Residual Range Organics	11.9	104	mg/kg	=	QN	LCS/LCSD RPD Failure
1143274	14PCC010SO	AK103	Residual Range Organics	10.3	20.3	mg/kg	J	QN	LCS/LCSD RPD Failure
1143274	14PCC011SO	AK103	Residual Range Organics	10.3	32.3	mg/kg	=	QN	LCS/LCSD RPD Failure
1143274	14PCC012SO	AK103	Residual Range Organics	50	1030	mg/kg	=	QN	LCS/LCSD RPD Failure
1143274	14PCC013SO	AK102	Diesel Range Organics	12.9	316	mg/kg	=	QL	Broken jar
1143274	14PCC013SO	AK103	Residual Range Organics	51.5	1530	mg/kg	=	QN	LCS/LCSD RPD Failure
								QL	Broken jar

Attachment 1 - Summary of Qualified Data

Sample Delivery Group	Sample	Analytical Method	Analyte	Limit of Detection (LOD)	Result	Units	Lab Flag	QC Flag	QC Note
1143274	14PCC014SO	AK103	Residual Range Organics	60.5	2620	mg/kg	=	QN	LCS/LCSD RPD Failure
1143274	14PCC015SO	AK103	Residual Range Organics	68	2840	mg/kg	=	QN	LCS/LCSD RPD Failure
1143274	14PCC016SO	AK103	Residual Range Organics	12.5	359	mg/kg	=	QN	LCS/LCSD RPD Failure
1143274	14PCC017SO	AK103	Residual Range Organics	10.4	114	mg/kg	=	QN	LCS/LCSD RPD Failure
1143274	14PCC018SO	AK103	Residual Range Organics	12.9	485	mg/kg	=	QN	LCS/LCSD RPD Failure
1143274	14PCD002SO	AK102	Diesel Range Organics	15.3	757	mg/kg	=	QN	Field-duplicate RPD failure
1143274	14PCD002SO	AK103	Residual Range Organics	61	1200	mg/kg	=	QN	Field-duplicate RPD failure
1143274	14PCD003SO	AK102	Diesel Range Organics	15.4	377	mg/kg	=	QN	Field-duplicate RPD failure
1143274	14PCD003SO	AK103	Residual Range Organics	15.4	476	mg/kg	=	QN	Field-duplicate RPD failure
1143274	14PCW002WX	SW8260B	o-Xylene	0.5	0	ug/L	U	ML	MSD Recovery
1143374	14PCC025SO	AK102	Diesel Range Organics	11.1	154	mg/kg	=	QN	MS/MSD RPD failure
1143385	14PCC041SO	AK103	Residual Range Organics	55	906	mg/kg	=	QN	Field-duplicate RPD failure
1143385	14PCC042SO	AK103	Residual Range Organics	13.7	414	mg/kg	=	QN	Field-duplicate RPD failure
1143385	14PCC043SO	AK102	Diesel Range Organics	0.3	0.295	mg/L	J	B	MB detection
1143385	14PCC047SO	AK102	Diesel Range Organics	12.9	401	mg/kg	=	QN	Field-duplicate RPD failure
1143385	14PCC047SO	AK103	Residual Range Organics	12.9	207	mg/kg	=	QN	Field-duplicate RPD failure
1143385	14PCC048SO	AK102	Diesel Range Organics	51.5	1480	mg/kg	=	QN	Field-duplicate RPD failure
1143385	14PCC048SO	AK103	Residual Range Organics	51.5	571	mg/kg	=	QN	Field-duplicate RPD failure
1143470	14PCX008SO	AK103	Residual Range Organics	10.9	23.7	mg/kg	=	B	MB detection
1143470	14PCX010SO	SW8260B	Detected VOCs	Varies	Detected	mg/kg	=	QL	Improper preservation
1143470	14PCX010SO	SW8260B	Non-detected VOCs	Varies	ND	mg/kg	U	R	Improper preservation
1143470	14PCX010SO	SW8260B	4-Isopropyltoluene	0.172	1.97	mg/kg	=	MH	MS/MSD recovery failure
1143470	14PCX010SO	SW8260B	Naphthalene	0.345	1.2	mg/kg	=	MH	MS/MSD recovery failure
1143470	14PCX011SO	AK103	Residual Range Organics	10.9	49.8	mg/kg	=	B	MB detection
1143470	14PCX012SO	AK103	Residual Range Organics	10.8	6.86	mg/kg	J	B	MB detection
1143470	14PCX013SO	AK103	Residual Range Organics	10.9	10.1	mg/kg	J	B	MB detection
1143470	14PCX014SO	AK102	Diesel Range Organics	44	941	mg/kg	=	QN	Field-duplicate RPD failure
1143470	14PCX014SO	AK103	Residual Range Organics	11	117	mg/kg	=	QN	Field-duplicate RPD failure
1143470	14PCX015SO	AK102	Diesel Range Organics	10.9	309	mg/kg	=	QN	Field-duplicate RPD failure
1143470	14PCX015SO	AK103	Residual Range Organics	10.9	30.6	mg/kg	=	QN	Field-duplicate RPD failure
								B	MB detection
1143517	14PCX030SO	AK102	Diesel Range Organics	11.2	12.3	mg/kg	J	QN	Field-duplicate RPD failure
1143517	14PCX031SO	AK102	Diesel Range Organics	10.9	49.5	mg/kg	=	QN	Field-duplicate RPD failure
1143634	14PCX054SO	AK103	RRO Silica Gel	22.5	35.3	mg/kg	J	B	MB detection
1143866	14PCD014SO	AK102	Diesel Range Organics	44.1	1880	mg/kg	=	QH	Surrogate recovery failure
1143866	14PCX076SO	AK101	Gasoline Range Organics	1.92	123	mg/kg	=	QH	Surrogate recovery failure
1143866	14PCX076SO	AK102	Diesel Range Organics	1150	16200	mg/kg	=	QN	Field-duplicate RPD failure
1143866	14PCX076SO	AK103	Residual Range Organics	230	155	mg/kg	J	B	MB detection
1143866	14PCX076SO	SW8260B	1,2,4-Trimethylbenzene	0.0383	2.01	mg/kg	=	MH	MS/MSD recovery failure
1143866	14PCX076SO	SW8260B	1,2-Dichlorobenzene	0.0192	0	mg/kg	U	ML	MS/MSD recovery failure
1143866	14PCX076SO	SW8260B	1,3-Dichlorobenzene	0.0192	0	mg/kg	U	ML	MS/MSD recovery failure
1143866	14PCX076SO	SW8260B	1,4-Dichlorobenzene	0.0192	0	mg/kg	U	ML	MS/MSD recovery failure
1143866	14PCX076SO	SW8260B	4-Chlorotoluene	0.0192	0	mg/kg	U	ML	MS/MSD recovery failure
1143866	14PCX076SO	SW8260B	4-Isopropyltoluene	0.0192	0.667	mg/kg	=	MH	MS/MSD recovery failure
1143866	14PCX076SO	SW8260B	Naphthalene	0.0383	1.93	mg/kg	=	MH	MS/MSD recovery failure
1143866	14PCX076SO	SW8260B	o-Xylene	0.0192	1.01	mg/kg	=	MH	MS/MSD recovery failure
1143866	14PCX076SO	SW8260B	P & M -Xylene	0.0383	1.04	mg/kg	=	MH	MS/MSD recovery failure
1143866	14PCX076SO	SW8260B	Toluene	0.0192	0.743	mg/kg	=	MH	MS/MSD recovery failure
1143866	14PCX076SO	SW8260B	Xylenes (total)	0.0575	2.05	mg/kg	=	MH	MS/MSD recovery failure
1143866	14PCX076SO	SW8270D	1,2-Dichlorobenzene	0.705	0	mg/kg	U	ML	MS/MSD recovery failure
1143866	14PCX076SO	SW8270D	1,3-Dichlorobenzene	0.705	0	mg/kg	U	ML	MS/MSD recovery failure
1143866	14PCX076SO	SW8270D	1,4-Dichlorobenzene	0.705	0	mg/kg	U	ML	MS/MSD recovery failure
1143866	14PCX076SO	SW8270D	2,4-Dinitrophenol	8.5	0	mg/kg	U	ML	MS/MSD recovery failure
1143866	14PCX076SO	SW8270D	2-Nitrophenol	0.705	0	mg/kg	U	ML	MS/MSD recovery failure
1143866	14PCX076SO	SW8270D	4-Nitroaniline	8.5	0	mg/kg	U	ML	MS/MSD recovery failure

Attachment 1 - Summary of Qualified Data

Sample Delivery Group	Sample	Analytical Method	Analyte	Limit of Detection (LOD)	Result	Units	Lab Flag	QC Flag	QC Note
1143866	14PCX076SO	SW8270D	Aniline	5.65	0	mg/kg	U	ML	MS/MSD recovery failure
1143866	14PCX076SO	SW8270D	Benzoic acid	4.25	0	mg/kg	U	ML	MS/MSD recovery failure
1143866	14PCX076SO	SW8270D	Hexachlorocyclopentadiene	1.98	0	mg/kg	U	ML	MS/MSD recovery failure
1143866	14PCX076SO	SW8270D	2-Methylnaphthalene	0.705	21	mg/kg	=	MH	MS/MSD recovery failure
								QN	Field-duplicate RPD failure
1143866	14PCX076SO	SW8270D	Naphthalene	0.705	4.01	mg/kg	=	QN	Field-duplicate RPD failure
1143866	14PCX076SO	SW8270D	Phenanthrene	0.705	8.61	mg/kg	=	QN	Field-duplicate RPD failure
1143866	14PCX077SO	AK101	Gasoline Range Organics	1.99	97.3	mg/kg	=	QH	Surrogate recovery failure
1143866	14PCX077SO	AK102	Diesel Range Organics	232	9200	mg/kg	=	QN	Field-duplicate RPD failure
1143866	14PCX077SO	SW8270D	2-Methylnaphthalene	0.72	9.06	mg/kg	=	QN	Field-duplicate RPD failure
1143866	14PCX077SO	SW8270D	Naphthalene	0.144	1.91	mg/kg	=	QN	Field-duplicate RPD failure
1143866	14PCX077SO	SW8270D	Phenanthrene	0.144	3.57	mg/kg	=	QN	Field-duplicate RPD failure
1143960	14PCD032SO	AK102	Diesel Range Organics	13.9	53.4	mg/kg	=	QN	Field-duplicate RPD failure
1143960	14PCD032SO	AK103	Residual Range Organics	13.9	202	mg/kg	=	QN	Field-duplicate RPD failure
1143960	14PCD033SO	AK102	Diesel Range Organics	13.9	169	mg/kg	=	QN	Field-duplicate RPD failure
1143960	14PCD033SO	AK103	Residual Range Organics	13.9	417	mg/kg	=	QN	Field-duplicate RPD failure
1143960	14PCD036SO	AK102	Diesel Range Organics	61.5	1980	mg/kg	=	QN	Field-duplicate RPD failure
1143960	14PCD037SO	AK102	Diesel Range Organics	15.4	999	mg/kg	=	QN	Field-duplicate RPD failure
1143960	14PCD048SO	AK102	Diesel Range Organics	14.8	18.3	mg/kg	J	QN	Field-duplicate RPD failure
1143960	14PCD048SO	AK103	Residual Range Organics	14.8	91.8	mg/kg	=	QN	Field-duplicate RPD failure
1143960	14PCD049SO	AK102	Diesel Range Organics	14.7	60.1	mg/kg	=	QN	Field-duplicate RPD failure
1143960	14PCD049SO	AK103	Residual Range Organics	14.7	253	mg/kg	=	QN	Field-duplicate RPD failure
1143960	14PCD050SO	AK102	Diesel Range Organics	11	473	mg/kg	=	ML	MS/MSD recovery failure

Notes:

- mg/kg milligrams per kilogram
- mg/L milligrams per liter
- LOD limit of detection
- LOQ limit of quantitation

Laboratory flags:

- U analyte not detected
- J estimated value; detected below the LOQ
- = quantitative result; detected above the LOQ

QC flags:

- B Reported value is similar in concentration to the result of a related blank sample (i.e. result is biased high or attributable to cross contamination)
- QL Reported result is an estimated value (bias low) due to a deficiency in related quality criteria
- QN Reported result is an estimated value (bias unknown) due to a deficiency in related quality criteria
- QH Reported result is an estimated value (bias high) due to a deficiency in related quality criteria
- ML Result may be biased (low) due to an inherent matrix effect present in the sample
- MH Result may be biased (high) due to an inherent matrix effect present in the sample
- R Rejected; result is considered unusable due to improper preservation or serious QC failure

Laboratory Data Review Checklist

Completed by: Rodney Guritz

Title: Chemist Date: October 13, 2014

CS Report Name: Remedial Action Report – Project Chariot Report Date: October 2014

Consultant Firm: Arctic Data Services, LLC for Fairbanks Environmental Services, Inc.

Laboratory Name: SGS Anchorage, AK Laboratory Report Number: 1142724

ADEC File Number: 475.38.008 ADEC RecKey Number:

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

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

      No samples were transferred or sub-contracted to a different laboratory.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ■Yes No NA (Please explain.) Comments:

   b. Correct analyses requested?
      ■Yes No NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      Yes ■No NA (Please explain.) Comments:

      The cooler associated with this work order was received with its temperature blank at 7.1 °C, above the accepted temperature range (4°±2°C). Results for all samples in this work order are considered affected, and qualified 'QL' indicating the potential low bias.

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

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

Other than the elevated temperature, the samples were received in good condition.

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

■Yes No NA (Please explain.) Comments:

Sample-receiving discrepancies (elevated temperature) were documented; see above for details.

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

Comments:

All sample results for this sample deliver group were affected by elevated sample temperature, and are flagged 'QL.'

4. Case Narrative

a. Present and understandable?

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

The laboratory noted a high CCV recovery for tetrachloroethene, and a LCS/LCSD RPD failure for MEK. These analytes are not reported in this work order, so these QC anomalies are not relevant and do not affect project-sample data quality.
Remaining comments were regarding chromatographic patterns observed in select samples, and do not indicate issues with data quality.

c. Were all corrective actions documented?

Yes No ■NA (Please explain.) Comments:

There were no corrective actions performed/reported.

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

Comments:

The lab did not indicate an impact to data quality or usability related to the QC anomalies noted.

5. Samples Results
   a. Correct analyses performed/reported as requested on COC?
      ■Yes No NA (Please explain.) Comments:

   b. All applicable holding times met?
      ■Yes No NA (Please explain.) Comments:

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

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

Analytical sensitivity was evaluated by checking that analytical LODs met applicable regulatory limits. LODs were below cleanup levels for each non-detect result.

   e. Data quality or usability affected?
      Comments:

Data quality and usability were not affected.

6. QC Samples
   a. Method Blank
      i. One method blank reported per matrix, analysis and 20 samples?
      ■Yes No NA (Please explain.) Comments:

Additionally, a leaching blank (LB) was reported for each TCLP analysis.

      ii. All method blank results less than PQL?
      ■Yes No NA (Please explain.) Comments:

Yes, however, several analytes were detected in method blank samples at concentrations below the LOQ. See below for details.

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

Mercury was detected below the LOQ in the method blank associated with TCLP metals prep batch MXT5078. Mercury was not detected in the associated project samples, so results are not affected.
Barium was detected below the LOQ in the leaching blank associated with TCLP metals prep batch MXT5078. Barium results for associated project samples were over 10 times the concentration detected in the blank, so results are not affected.
No other analytes were detected in method- or leaching-blank samples.

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

No samples were affected.

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

Data quality and usability was not affected (see above).

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

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
■Yes No NA (Please explain.) Comments:

A LCS/LCSD and MS/MSD were reported for the TCLP VOC analysis. A LCS/LCSD and MS/MSD were reported for the DRO/RRO analysis.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
■Yes No NA (Please explain.) Comments:

A LCS and MS/MSD were reported for the TCLP metals analysis.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
■Yes No NA (Please explain.) Comments:

All LCS, LCSD, MS, and MSD recoveries were within laboratory control limits for reported analytes.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
■Yes No NA (Please explain.) Comments:

All LCS/LCSD and MS/MSD RPDs were within laboratory control limits.

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

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No ■NA (Please explain.) Comments:

No samples were affected.

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

Recoveries and RPDs were within control limits; data quality and usability were not affected.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
■Yes No NA (Please explain.) Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)
■Yes No NA (Please explain.) Comments:

Surrogates were recovered within laboratory control limits for each sample/analysis.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
Yes No ■NA (Please explain.) Comments:

No samples were affected.

iv. Data quality or usability affected? (Use the comment box to explain.)
Comments:

Surrogate recoveries were within control limits; data quality and usability were not affected.

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

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

Trip blanks are not required for TCLP VOC analysis.

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

iii. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

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

Comments:

N/A; there was no trip blank for this sample-delivery group.

e. Field Duplicate

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

■Yes No NA (Please explain.) Comments:

Sample 14PCC005SO was submitted as a field-duplicate sample of 14PCC004SO.
Field duplicates were collected at 12.5% of the total number of projects samples, meeting the minimum frequency of 10% for the project.

ii. Submitted blind to lab?

■Yes No NA (Please explain.) Comments:

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes No ■NA (Please explain.) Comments:

No analytes were detected in the field-duplicate pair; RPDs could not be calculated.

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

Comments:

There were no field-duplicate RPD failures; data quality and usability were not affected.

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

Yes No ■NA (Please explain.) Comments:

Samples were collected with disposable sampling equipment; no decontamination- or equipment-blank samples were required.

i. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

ii. If above PQL, what samples are affected?

Comments:

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

Comments:

N/A; there was no equipment blank for this sample delivery group.

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

a. Defined and appropriate?

Yes No ■NA (Please explain.) Comments:

There were no other data flags or qualifiers.

Laboratory Data Review Checklist

Completed by: Rodney Guritz

Title: Chemist Date: October 13, 2014

CS Report Name: Remedial Action Report – Project Chariot Report Date: October 2014

Consultant Firm: Arctic Data Services, LLC for Fairbanks Environmental Services, Inc.

Laboratory Name: SGS Anchorage, AK Laboratory Report Number: 1143274

ADEC File Number: 475.38.008 ADEC RecKey Number:

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

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

      No samples were transferred or sub-contracted to a different laboratory.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ■Yes No NA (Please explain.) Comments:

   b. Correct analyses requested?
      ■Yes No NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      Yes ■No NA (Please explain.) Comments:

      The cooler associated with this work order was received with its temperature blank below the accepted temperature range (4°±2°C) but above 0 °C. No ice was observed in the water samples. Results are not affected by the low sample temperatures.

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

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

Sample 14PCC013SO was received broken; the sample was transferred to a new jar for storage. The DRO/RRO results for this sample are considered estimated, biased low (flagged 'QL') due to potential loss of analyte during shipment.

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

■Yes No NA (Please explain.) Comments:

Sample-receiving discrepancies were documented; see above for details.

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

Comments:

Results for sample 14PCC013SO are qualified 'QL' as estimated, biased low. Impact to data usability is minor, as results are well below soil cleanup levels.

4. Case Narrative

a. Present and understandable?

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

The laboratory noted surrogate recovery failures and MSD recovery failures; see Sections 6.c. and 6.b. for discussion of these QC failures.
Remaining comments were regarding chromatographic patterns observed in select samples, and do not indicate issues with data quality.

c. Were all corrective actions documented?

Yes No ■NA (Please explain.) Comments:

There were no corrective actions performed/reported.

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

Comments:

The lab did not indicate an impact to data quality or usability related to the QC anomalies noted.

5. Samples Results
   a. Correct analyses performed/reported as requested on COC?
      ■Yes No NA (Please explain.) Comments:

   b. All applicable holding times met?
      ■Yes No NA (Please explain.) Comments:

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

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

      Analytical sensitivity was evaluated by checking that analytical LODs met applicable regulatory limits. LODs were below cleanup levels for each non-detect result.

   e. Data quality or usability affected?
      Comments:

      Data quality and usability were not affected.

6. QC Samples
   a. Method Blank
      i. One method blank reported per matrix, analysis and 20 samples?
         ■Yes No NA (Please explain.) Comments:

      ii. All method blank results less than PQL?
         ■Yes No NA (Please explain.) Comments:

         No analytes were detected in method-blank samples

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

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

         No samples were affected.

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

Comments:

Data quality and usability was not affected (see above).

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

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

■Yes No NA (Please explain.) Comments:

A LCS/LCSD and MS/MSD were reported for the water VOC and GRO analyses. A LCS/LCSD was reported for the water PAH analysis. An LCS/LCSD and at least one MS/MSD were reported for each preparatory batch for the DRO/RRO analysis.

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

Yes No ■NA (Please explain.) Comments:

No metals/inorganic analyses were performed/reported

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

Yes ■No NA (Please explain.) Comments:

LCS, LCSD, MS, and MSD recoveries were within laboratory control limits for reported analytes, with one exception noted below (Section 6.b.v.)

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

Yes ■No NA (Please explain.) Comments:

LCS/LCSD and MS/MSD RPDs were within laboratory control limits, with one exception noted below (Section 6.b.v.)

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

Comments:

Recovery of o-xylene was below laboratory control limits for the MSD of sample 14PCW002WX. LCS/LCSD RPD for RRO was above laboratory control limits for prep batch XXX31482.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
■Yes No NA (Please explain.) Comments:

The o-xylene result for sample 14PCW002WX is considered estimated, biased low, and flagged 'ML.' Detectable RRO results for prep batch XXX31482 are considered estimated, and flagged 'QN.' All 16 samples in the batch were affected.

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

Impact to data quality and usability is minimal; o-xylene was not detected in the one affected water sample, and RRO results are all well below the soil cleanup level of 13,700 mg/kg.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
■Yes No NA (Please explain.) Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)
Yes ■No NA (Please explain.) Comments:

DRO surrogate 5a-androstane and RRO surrogate n-triacontane were recovered below laboratory control limits for two or more samples. In each case, the recovery failures were due to sample dilution (surrogates were diluted out of the sample). In accordance with USACE EM 200-1-10, surrogate recovery failures caused by sample dilution do not affect sample data quality.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
Yes No ■NA (Please explain.) Comments:

No samples were affected.

iv. Data quality or usability affected? (Use the comment box to explain.)
Comments:

Surrogate recovery failures were due to sample dilution; data quality and usability was not affected.

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

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

Water trip blank sample 14PCW003WX was submitted for GRO and BTEX analysis.

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

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

No analytes were detected in the trip blank.

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

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

No analytes were detected; data quality and usability were not affected.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
■Yes No NA (Please explain.) Comments:

The following field-duplicate pairs were submitted in this sample delivery group:
14PCB006SO/14PCB007SO
14PCC010SO/14PCC011SO
14PCD002SO/14PCD003SO
Field duplicates were collected at 12.5% of the total number of projects samples, meeting the minimum frequency of 10% for the project.

ii. Submitted blind to lab?

■Yes No NA (Please explain.) Comments:

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

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Yes ■No NA (Please explain.) Comments:

For field duplicate pair 14PCB006SO/14PCB007SO and 14PCD002SO/14PCD003SO, DRO and RRO RPDs exceeded the DQO of 50%.

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

Comments:

DRO and RRO results for samples 14PCB006SO/14PCB007SO and 14PCD002SO/14PCD003SO are considered estimated, and flagged 'QN.' Impact to data usability is minimal as results were well below applicable cleanup levels.

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

Yes No ■NA (Please explain.) Comments:

Samples were collected with disposable sampling equipment; no decontamination- or equipment-blank samples were required.

i. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

ii. If above PQL, what samples are affected?

Comments:

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

Comments:

N/A; there was no equipment blank for this sample delivery group.

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

There were no other data flags or qualifiers.

Laboratory Data Review Checklist

Completed by: Rodney Guritz

Title: Chemist Date: October 13, 2014

CS Report Name: Remedial Action Report – Project Chariot Report Date: October 2014

Consultant Firm: Arctic Data Services, LLC for Fairbanks Environmental Services, Inc.

Laboratory Name: SGS Anchorage, AK Laboratory Report Number: 1143333

ADEC File Number: 475.38.008 ADEC RecKey Number:

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

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

      No samples were transferred or sub-contracted to a different laboratory.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ■Yes No NA (Please explain.) Comments:

   b. Correct analyses requested?
      ■Yes No NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      Yes ■No NA (Please explain.) Comments:

      The cooler associated with this work order was received with its temperature blank below the accepted temperature range (4°±2°C) but above 0 °C. Soil-sample results are not affected by the low sample temperatures.

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

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

Samples were received in good condition.

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

Yes No ■NA (Please explain.) Comments:

There were no discrepancies.

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

Comments:

Samples were received in good condition; data quality and usability are not affected.

4. Case Narrative

a. Present and understandable?

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

The laboratory noted surrogate recovery failures and MS/MSD recovery failures; see Sections 6.c. and 6.b. for discussion of these QC failures.
Remaining comments were regarding chromatographic patterns observed in select samples, and do not indicate issues with data quality.

c. Were all corrective actions documented?

Yes No ■NA (Please explain.) Comments:

There were no corrective actions performed/reported.

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

Comments:

The lab did not indicate an impact to data quality or usability related to the QC anomalies noted.

5. Samples Results
   a. Correct analyses performed/reported as requested on COC?
      ■Yes No NA (Please explain.) Comments:

   b. All applicable holding times met?
      ■Yes No NA (Please explain.) Comments:

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

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

      Analytical sensitivity was evaluated by checking that analytical LODs met applicable regulatory limits. LODs were below cleanup levels for each non-detect result.

   e. Data quality or usability affected?
      Comments:

      Data quality and usability were not affected.

6. QC Samples
   a. Method Blank
      i. One method blank reported per matrix, analysis and 20 samples?
         ■Yes No NA (Please explain.) Comments:

      ii. All method blank results less than PQL?
         ■Yes No NA (Please explain.) Comments:

         No analytes were detected in method-blank samples

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

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

         No samples were affected.

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

Comments:

No analytes were detected in method blanks; data quality and usability were not affected.

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

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

■Yes No NA (Please explain.) Comments:

An LCS/LCSD and at least one MS/MSD were reported for each preparatory batch for the DRO/RRO analysis.

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

Yes No ■NA (Please explain.) Comments:

No metals/inorganic analyses were performed/reported

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

Yes ■No NA (Please explain.) Comments:

LCS, LCSD, MS, and MSD recoveries were within laboratory control limits for reported analytes, with exceptions noted below (Section 6.b.v.)

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

■Yes No NA (Please explain.) Comments:

LCS/LCSD and MS/MSD RPDs were within laboratory control limits.

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

Comments:

Recovery of DRO and RRO were below laboratory control limits for the MS of sample 14PCC020SO. The concentration spiked for each analyte was less than twice the native concentration. In accordance with USACE EM 200-1-10, results should not be qualified based on MS/MSD recovery failures unless the spike amount was at least twice the native concentration in the sample. Results are not considered affected by the MS/MSD recovery failures.

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

Yes No ■NA (Please explain.) Comments:

No sample results were affected.

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

Data quality and usability were unaffected.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
■Yes No NA (Please explain.) Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)
Yes ■No NA (Please explain.) Comments:

DRO surrogate 5a-androstane and RRO surrogate n-triacontane were recovered below laboratory control limits for two samples. In each case, surrogate recovery failures were due to sample dilution (surrogates were diluted out of the samples). In accordance with USACE EM 200-1-10, surrogate recovery failures caused by sample dilution do not affect sample data quality.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
Yes No ■NA (Please explain.) Comments:

No samples were affected.

iv. Data quality or usability affected? (Use the comment box to explain.)
Comments:

Surrogate recovery failures were due to sample dilution; data quality and usability was not affected.

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

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

No samples were submitted for volatile analysis in this work order.

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

iii. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

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

Comments:

N/A; no trip blank was analyzed/reported for this work order.

e. Field Duplicate

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

■Yes No NA (Please explain.) Comments:

The following field-duplicate pair was submitted in this sample delivery group:
14PCC023SO/14PCC024SO
Field duplicates were collected at 12.5% of the total number of projects samples, meeting the minimum frequency of 10% for the project.

ii. Submitted blind to lab?

■Yes No NA (Please explain.) Comments:

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

■Yes No NA (Please explain.) Comments:

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

Comments:

RPDs were within DQOs; data quality and usability were not affected.

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

Yes No ■NA (Please explain.) Comments:

Samples were collected with disposable sampling equipment; no decontamination- or equipment-blank samples were required.

i. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

ii. If above PQL, what samples are affected?

Comments:

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

Comments:

N/A; there was no equipment blank for this sample delivery group.

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

a. Defined and appropriate?

Yes No ■NA (Please explain.) Comments:

There were no other data flags or qualifiers.

Laboratory Data Review Checklist

Completed by: Rodney Guritz

Title: Chemist Date: October 13, 2014

CS Report Name: Remedial Action Report – Project Chariot Report Date: October 2014

Consultant Firm: Arctic Data Services, LLC for Fairbanks Environmental Services, Inc.

Laboratory Name: SGS Anchorage, AK Laboratory Report Number: 1143374

ADEC File Number: 475.38.008 ADEC RecKey Number:

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

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

      No samples were transferred or sub-contracted to a different laboratory.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ■Yes No NA (Please explain.) Comments:

   b. Correct analyses requested?
      ■Yes No NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      Yes ■No NA (Please explain.) Comments:

      The cooler associated with this work order was received with its temperature blank below the accepted temperature range (4°±2°C) but above 0 °C. Soil-sample results are not affected by the low sample temperatures.

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

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

Samples were received in good condition.

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

Yes No ■NA (Please explain.) Comments:

There were no discrepancies.

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

Comments:

Samples were received in good condition; data quality and usability are not affected.

4. Case Narrative

a. Present and understandable?

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

The laboratory noted surrogate recovery failures and MS/MSD recovery failures; see Sections 6.c. and 6.b. for discussion of these QC failures.
Remaining comments were regarding chromatographic patterns observed in select samples, and do not indicate issues with data quality.

c. Were all corrective actions documented?

Yes No ■NA (Please explain.) Comments:

There were no corrective actions performed/reported.

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

Comments:

The lab did not indicate an impact to data quality or usability related to the QC anomalies noted.

5. Samples Results
   a. Correct analyses performed/reported as requested on COC?
      ■Yes No NA (Please explain.) Comments:

   b. All applicable holding times met?
      ■Yes No NA (Please explain.) Comments:

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

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

      Analytical sensitivity was evaluated by checking that analytical LODs met applicable regulatory limits. LODs were below cleanup levels for each non-detect result.

   e. Data quality or usability affected?
      Comments:

      Data quality and usability were not affected.

6. QC Samples
   a. Method Blank
      i. One method blank reported per matrix, analysis and 20 samples?
         ■Yes No NA (Please explain.) Comments:

      ii. All method blank results less than PQL?
         ■Yes No NA (Please explain.) Comments:

         No analytes were detected in method-blank samples

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

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

         No samples were affected.

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

Comments:

Data quality and usability were not affected.

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

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

■Yes No NA (Please explain.) Comments:

An LCS/LCSD and at least one MS/MSD were reported for each preparatory batch for the DRO/RRO analysis.

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

Yes No ■NA (Please explain.) Comments:

No metals/inorganic analyses were performed/reported

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

Yes ■No NA (Please explain.) Comments:

LCS, LCSD, MS, and MSD recoveries were within laboratory control limits for reported analytes, with exceptions noted below (Section 6.b.v.).

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

Yes ■No NA (Please explain.) Comments:

LCS/LCSD and MS/MSD RPDs were within laboratory control limits, with one exception noted below (Section 6.b.v.).

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

Comments:

Recovery of DRO was below laboratory control limits for the MS of sample 14PCC025SO. The concentration spiked was less than twice the native concentration. In accordance with USACE EM 200-1-10, results should not be qualified based on MS/MSD recovery failures unless the spike amount was at least twice the native concentration in the sample. MS/MSD RPD for DRO was above laboratory control limits for the MS/MSD of sample 14PCC025SO. DRO results for this sample are considered estimated, and flagged 'QN' for imprecision.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
■Yes No NA (Please explain.) Comments:

See above.

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

Impact to data usability is minor, as the affected result is two orders of magnitude below the applicable soil cleanup level.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
■Yes No NA (Please explain.) Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)
Yes ■No NA (Please explain.) Comments:

DRO surrogate 5a-androstane and RRO surrogate n-triacontane were recovered below laboratory control limits for one or more samples. In each case, surrogate recovery failures were due to sample dilution (surrogates were diluted out of the samples). In accordance with USACE EM 200-1-10, surrogate recovery failures caused by sample dilution do not affect sample data quality.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
Yes No ■NA (Please explain.) Comments:

No samples were affected.

iv. Data quality or usability affected? (Use the comment box to explain.)
Comments:

Surrogate recovery failures were due to sample dilution; data quality and usability were not affected.

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

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

No samples were submitted for volatile analysis in this work order.

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

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

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

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

N/A; no trip blank was analyzed/reported for this work order.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
■Yes No NA (Please explain.) Comments:

The following field-duplicate pair was submitted in this sample delivery group:
14PCC026SO/14PCC027SO
Field duplicates were collected at 12.5% of the total number of projects samples, meeting the minimum frequency of 10% for the project.

ii. Submitted blind to lab?

■Yes No NA (Please explain.) Comments:

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

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Yes No ■NA (Please explain.) Comments:

No analytes were detected; RPDs could not be calculated.

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

Comments:

RPDs were not calculable; data quality and usability were not affected.

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

Yes No ■NA (Please explain.) Comments:

Samples were collected with disposable sampling equipment; no decontamination- or equipment-blank samples were required.

i. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

ii. If above PQL, what samples are affected?

Comments:

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

Comments:

N/A; there was no equipment blank for this sample delivery group.

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

There were no other data flags or qualifiers.

Laboratory Data Review Checklist

Completed by: Rodney Guritz

Title: Chemist Date: October 13, 2014

CS Report Name: Remedial Action Report – Project Chariot Report Date: October 2014

Consultant Firm: Arctic Data Services, LLC for Fairbanks Environmental Services, Inc.

Laboratory Name: SGS Anchorage, AK Laboratory Report Number: 1143385

ADEC File Number: 475.38.008 ADEC RecKey Number:

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

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

      No samples were transferred or sub-contracted to a different laboratory.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ■Yes No NA (Please explain.) Comments:

   b. Correct analyses requested?
      ■Yes No NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      Yes ■No NA (Please explain.) Comments:

      The cooler associated with this work order was received with its temperature blank below the accepted temperature range (4°±2°C) but above 0 °C. No ice was observed in the one water sample. Results are not considered affected by the low sample temperatures.

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

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

Samples were received in good condition.

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

Yes No ■NA (Please explain.) Comments:

There were no discrepancies.

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

Comments:

Samples were received in good condition; data quality and usability are not affected.

4. Case Narrative

a. Present and understandable?

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

The laboratory noted surrogate recovery failures and method-blank detections; see Sections 6.c. and 6.a. for discussion of these QC failures.
Remaining comments were regarding chromatographic patterns observed in select samples, and do not indicate issues with data quality.

c. Were all corrective actions documented?

Yes No ■NA (Please explain.) Comments:

There were no corrective actions performed/reported.

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

Comments:

The lab did not indicate an impact to data quality or usability related to the QC anomalies noted.

5. Samples Results
   a. Correct analyses performed/reported as requested on COC?
      ■Yes No NA (Please explain.) Comments:

   b. All applicable holding times met?
      ■Yes No NA (Please explain.) Comments:

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

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

Analytical sensitivity was evaluated by checking that analytical LODs met applicable regulatory limits. LODs were below cleanup levels for each non-detect result.

   e. Data quality or usability affected?
      Comments:

Data quality and usability were not affected.

6. QC Samples
   a. Method Blank
      i. One method blank reported per matrix, analysis and 20 samples?
      ■Yes No NA (Please explain.) Comments:

      ii. All method blank results less than PQL?
      ■Yes No NA (Please explain.) Comments:

However, DRO was detected below the LOQ in the method blank associated with water prep batch XXX31563, at 0.410 J mg/L.

      iii. If above PQL, what samples are affected?

DRO was detected in associated project sample 14PCC043SO (rinsate sample/equipment blank) within 10 times the concentration detected in the blank.

Comments:

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

The affected result is qualified 'B' as potentially attributable to laboratory-based contamination.

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

Data usability was not affected; the affected sample is a rinsate/equipment-blank sample (see Section 6.f.).

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

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
■Yes No NA (Please explain.) Comments:

An LCS/LCSD was reported for each preparatory batch for the DRO/RRO analyses (soil and water). In some cases, an MS/MSD were also reported. However, an MS/MSD was not reported for soil prep batches XXX31539 and both water prep batches (XXX31529 and XXX31563).

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
Yes No ■NA (Please explain.) Comments:

No metals/inorganic analyses were performed/reported

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
■Yes No NA (Please explain.) Comments:

All LCS, LCSD, MS, and MSD recoveries were within laboratory control limits for reported analytes.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
■Yes No NA (Please explain.) Comments:

All LCS/LCSD and MS/MSD RPDs were within laboratory control limits.

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

Comments:

There were no recovery or RPD failures.

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

Yes No ■NA (Please explain.) Comments:

See above.

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

Comments:

Data quality and usability were not affected. However, we cannot evaluate potential matrix interference for prep batches XXX31539, XXX31529, and XXX31563.

c. Surrogates – Organics Only

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

■Yes No NA (Please explain.) Comments:

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

Yes ■No NA (Please explain.) Comments:

DRO surrogate 5a-androstane and RRO surrogate n-triacontane were recovered below laboratory control limits for one or more samples. In each case, surrogate recovery failures were due to sample dilution (surrogates were diluted out of the samples). In accordance with USACE EM 200-1-10, surrogate recovery failures caused by sample dilution do not affect sample data quality.

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

Yes No ■NA (Please explain.) Comments:

No samples were affected.

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

Comments:

Surrogate recovery failures were due to sample dilution; data quality and usability were not affected.

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

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

Yes No ■NA (Please explain.) Comments:

No samples were submitted for volatile analysis in this work order.

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

Yes No ■NA (Please explain.) Comments:

iii. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

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

Comments:

N/A; no trip blank was analyzed/reported for this work order.

e. Field Duplicate

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

■Yes No NA (Please explain.) Comments:

The following field-duplicate pair was submitted in this sample delivery group: 14PCC041SO/14PCC042SO 14PCC047SO/14PCC048SO Field duplicates were collected at 12.5% of the total number of projects samples, meeting the minimum frequency of 10% for the project.

ii. Submitted blind to lab?

■Yes No NA (Please explain.) Comments:

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes ■No NA (Please explain.) Comments:

For field-duplicate pair 14PCC041SO/14PCC042SO, RRO RPD exceeded the DQO of 50%.
For field-duplicate pair 14PCC047SO/14PCC048SO, DRO and RRO RPDs exceeded the DQO of 50%.
Each affected result is qualified 'QN' as estimated.

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

Comments:

Impact to data usability was minimal in each case, as results were well below applicable soil cleanup levels.

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

■Yes No NA (Please explain.) Comments:

Rinsate sample 14PCC043SO was submitted in this work order to check for potential cross-contamination from the reusable stainless steel core sampler.

i. All results less than PQL?

■Yes No NA (Please explain.) Comments:

However, DRO and RRO were detected below the LOQ, at 0.295 J mg/L and 0.234 J mg/L, respectively. The DRO result is attributable to laboratory-based contamination (see Section 6.a.).

ii. If above PQL, what samples are affected?

Comments:

RRO results for corresponding samples (14PCC036SO through 14PCC042SO) were greater than 10 times the concentration detected in the equipment blank (on a ppm basis), and are therefore unaffected.

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

Comments:

Data quality and usability were not affected (see above).

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

There were no other data flags or qualifiers.

Laboratory Data Review Checklist

Completed by: Rodney Guritz

Title: Chemist Date: October 13, 2014

CS Report Name: Remedial Action Report – Project Chariot Report Date: October 2014

Consultant Firm: Arctic Data Services, LLC for Fairbanks Environmental Services, Inc.

Laboratory Name: SGS Anchorage, AK Laboratory Report Number: 1143470

ADEC File Number: 475.38.008 ADEC RecKey Number:

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

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

      No samples were transferred or sub-contracted to a different laboratory.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ■Yes No NA (Please explain.) Comments:

   b. Correct analyses requested?
      ■Yes No NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      Yes ■No NA (Please explain.) Comments:

      The cooler associated with this work order was received with its temperature blank below the accepted temperature range (4°±2°C) but above 0 °C. Soil-sample results are not affected by the low sample temperatures.

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

■Yes No NA (Please explain.) Comments:

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

■Yes ■No NA (Please explain.) Comments:

Samples were received in good condition. However, VOC (8260B) analysis was requested on sample 14PCX010SO after the samples were submitted to the laboratory, and the fact that no methanol preserved sample used for VOC analysis was not documented. The results for detected VOCs were qualified as low estimates (QL), and ND results were rejected (R) and should not be used for decision making. A sample kit containing methanol was subsequently ordered, and properly preserved VOC samples were analyzed under SDG 1143866. Data from that report should be used for evaluated VOC concentrations at Test Hole X-1.

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

Yes No ■NA (Please explain.) Comments:

There were no discrepancies.

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

Comments:

Samples were received in good condition; data quality and usability are not affected.

4. Case Narrative

a. Present and understandable?

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

The laboratory also noted LCS and MS/MSD recovery failures for the VOC analysis; see Sections 6.c. and 6.b. for discussion of these QC failures.
CCV failures (biased high) were reported for the following analytes in analytical batch VMS 14325:
Bromomethane
Chloroethane
Hexachlorobutadiene
n-Butylbenzene
Trichlorofluoromethane
None of these analytes were detected in the corresponding project samples, so results were unaffected.
Remaining comments were regarding chromatographic patterns observed in select samples, and do not indicate issues with data quality.

c. Were all corrective actions documented?

Yes No ■NA (Please explain.) Comments:

There were no corrective actions performed/reported.

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

Comments:

The lab did not indicate an impact to data quality or usability related to the QC anomalies noted.

5. Samples Results

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

■Yes No NA (Please explain.) Comments:

b. All applicable holding times met?

■Yes No NA (Please explain.) Comments:

c. All soils reported on a dry weight basis?

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

Analytical sensitivity was evaluated by checking that analytical LODs met applicable regulatory limits (for VOC results, the most stringent Arctic Zone soil cleanup level). LODs were below cleanup levels for each non-detect result.

e. Data quality or usability affected?

Comments:

Data quality and usability were not affected.

6. QC Samples

a. Method Blank

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

■Yes No NA (Please explain.) Comments:

ii. All method blank results less than PQL?

■Yes No NA (Please explain.) Comments:

However RRO was detected below the LOQ in the method blank for prep batch XXX31566, at 6.30 mg/kg. The RRO result in the method blank was the LOQ (J flagged).

iii. If above PQL, what samples are affected?

Comments:

RRO was detected in the following project samples at less than 10 times the concentration in the method blank, and are considered affected: 14PCX008SO, 14PCX012SO, 14PCX015SO, 14PCX011SO, and 14PCX013SO.

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

■Yes No NA (Please explain.) Comments:

Affected results are qualified 'B' to indicate the result may be attributable to laboratory-based contamination.

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

Comments:

Impact to data usability was minimal as affected results were several orders of magnitude below the cleanup level.

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

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

■Yes No NA (Please explain.) Comments:

An LCS/LCSD and at least one MS/MSD were reported for each DRO/RRO preparatory batch. An LCS and an MS/MSD were reported for each VOC preparatory batch.

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

Yes No ■NA (Please explain.) Comments:

No metals/inorganic analyses were performed/reported

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

Yes ■No NA (Please explain.) Comments:

LCS, LCSD, MS, and MSD recoveries were within laboratory control limits for reported analytes, with exceptions noted below (Section 6.b.v.). There were also several CCV recovery failures reported by the laboratory.

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

Yes ■No NA (Please explain.) Comments:

LCS/LCSD and MS/MSD RPDs were within laboratory control limits, with one exception noted below (Section 6.b.v.).

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

Comments:

LCS recovery of chloroethane was above laboratory control limits (preparatory batch VXX26197). Chloroethane was not detected in the corresponding project samples, so results were unaffected.
Recovery of the following VOC analytes were above laboratory control limits for the MS/MSD of sample 14PCX010SO, likely due to matrix interference from the high concentration of DRO/RRO in the sample:
1,2,4-Trichlorobenzene
1,2-Dibromo-3-chloropropane
4-Isopropyltoluene
Chloroethane
Hexachlorobutadiene
Naphthalene
n-Butylbenzene
Results for these analytes, where detected in the original sample (4-isopropyltoluene and naphthalene only), are qualified 'MH' as potentially biased high due to matrix interference.

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

■Yes No NA (Please explain.) Comments:

See above.

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

Comments:

Impact to data usability is minor, as the affected results are well below the applicable soil cleanup levels.

c. Surrogates – Organics Only

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

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

Surrogate recoveries were within laboratory control limits.

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

Yes No ■NA (Please explain.) Comments:

No samples were affected.

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

Comments:

Surrogate recoveries were within laboratory control limits; data quality and usability were not affected.

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

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

Yes ■No NA (Please explain.) Comments:

The VOC analysis reported in this work order was added following a request once samples were shipped; no trip blank sample was submitted.

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

Yes No ■NA (Please explain.) Comments:

iii. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

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

Comments:

No trip blank was analyzed/reported for this work order; we cannot determine whether cross-contamination of samples may have occurred during sample shipment/storage.

e. Field Duplicate

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

■Yes No NA (Please explain.) Comments:

The following field-duplicate pair was submitted in this sample delivery group:
14PCX014SO/14PCX015SO
Field duplicates were collected at 12.5% of the total number of projects samples, meeting the minimum frequency of 10% for the project.

ii. Submitted blind to lab?

■Yes No NA (Please explain.) Comments:

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes ■No NA (Please explain.) Comments:

For field-duplicate pair 14PCX014SO/14PCX015SO, DRO and RRO RPDs exceeded the DQO of 50%.
Each affected result is qualified 'QN' as estimated.

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

Comments:

Impact to data usability is minor as results were well below relevant cleanup levels in each case.

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

Yes No ■NA (Please explain.) Comments:

Samples were collected with disposable sampling equipment; no decontamination- or equipment-blank samples were required.

i. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

ii. If above PQL, what samples are affected?

Comments:

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

Comments:

N/A; there was no equipment blank for this sample delivery group.

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

There were no other data flags or qualifiers.

Laboratory Data Review Checklist

Completed by: Rodney Guritz

Title: Chemist Date: October 13, 2014

CS Report Name: Remedial Action Report – Project Chariot Report Date: October 2014

Consultant Firm: Arctic Data Services, LLC for Fairbanks Environmental Services, Inc.

Laboratory Name: SGS Anchorage, AK Laboratory Report Number: 1143517

ADEC File Number: 475.38.008 ADEC RecKey Number:

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

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

      No samples were transferred or sub-contracted to a different laboratory.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ■Yes No NA (Please explain.) Comments:

   b. Correct analyses requested?
      ■Yes No NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      ■Yes No NA (Please explain.) Comments:

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?
      ■Yes No NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
■Yes No NA (Please explain.) Comments:

Samples were received in good condition.

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

There were no discrepancies.

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

Samples were received in good condition; data quality and usability are not affected.

4. Case Narrative
a. Present and understandable?
■Yes No NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
■Yes No NA (Please explain.) Comments:

The laboratory noted MS/MSD and surrogate recovery failures; see Sections 6.b. and 6.c. for discussion of these QC failures. Remaining comments were regarding chromatographic patterns observed in select samples, and do not indicate issues with data quality.

c. Were all corrective actions documented?
Yes No ■NA (Please explain.) Comments:

There were no corrective actions performed/reported.

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

The lab did not indicate an impact to data quality or usability related to the QC anomalies noted.

5. Samples Results
a. Correct analyses performed/reported as requested on COC?
■Yes No NA (Please explain.) Comments:

b. All applicable holding times met?

■Yes No NA (Please explain.) Comments:

c. All soils reported on a dry weight basis?

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

Analytical sensitivity was evaluated by checking that analytical LODs met applicable regulatory limits. LODs were below cleanup levels for each non-detect result.

e. Data quality or usability affected?

Comments:

Data quality and usability were not affected.

6. QC Samples

a. Method Blank

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

■Yes No NA (Please explain.) Comments:

ii. All method blank results less than PQL?

■Yes No NA (Please explain.) Comments:

No analytes were detected in the method blanks.

iii. If above PQL, what samples are affected?

Comments:

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

Yes No ■NA (Please explain.) Comments:

No samples were affected

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

Comments:

Data quality and usability were not affected (see above).

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

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

■Yes No NA (Please explain.) Comments:

An LCS/LCSD and at least one MS/MSD were reported for each DRO/RRO preparatory batch. An LCS was reported for the PCB analysis, but only two analytes (Aroclors 1016 and 1260) were reported. No LCSD, MS/MSD, or sample duplicates were reported for the PCB analysis.

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

Yes No ■NA (Please explain.) Comments:

No metals/inorganic analyses were performed/reported

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

Yes ■No NA (Please explain.) Comments:

LCS, LCSD, MS, and MSD recoveries were within laboratory control limits for reported analytes, with exceptions noted below (Section 6.b.v.).

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

■Yes No NA (Please explain.) Comments:

All LCS/LCSD and MS/MSD RPDs were within laboratory control limits.

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

Comments:

Recovery of DRO was below laboratory control limits for the MS and MSD of sample 14PCX017SO. The concentration spiked was less than twice the native concentration. In accordance with USACE EM 200-1-10, results should not be qualified based on MS/MSD recovery failures unless the spike amount was at least twice the native concentration in the sample.

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

Yes No ■NA (Please explain.) Comments:

No results were affected (see above).

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

Data quality and usability were not affected by the MS/MSD recovery failures. We cannot evaluate the analytical precision of the PCB analysis; no PCBs were detected in project samples, so data usability is not considered affected.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
■Yes No NA (Please explain.) Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)
Yes ■No NA (Please explain.) Comments:

DRO surrogate 5a-androstane and RRO surrogate n-triacontane were recovered below laboratory control limits for one or more samples. In each case, surrogate recovery failures were due to sample dilution (surrogates were diluted out of the samples). In accordance with USACE EM 200-1-10, surrogate recovery failures caused by sample dilution do not affect sample data quality.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
Yes No ■NA (Please explain.) Comments:

No samples were affected.

iv. Data quality or usability affected? (Use the comment box to explain.)
Comments:

Surrogate recovery failures were due to sample dilution; data quality and usability was not affected.

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

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

No samples were submitted for volatile analysis in this work order.

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

iii. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

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

Comments:

No trip blank was analyzed/reported for this work order.

e. Field Duplicate

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

■Yes No NA (Please explain.) Comments:

The following field-duplicate pairs were submitted in this sample delivery group:
14PCX018SO/14PCX019SO
14PCX030SO/14PCX031SO
Field duplicates were collected at 12.5% of the total number of projects samples, meeting the minimum frequency of 10% for the project.

ii. Submitted blind to lab?

■Yes No NA (Please explain.) Comments:

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes ■No NA (Please explain.) Comments:

For field-duplicate pair 14PCX030SO/14PCX031SO, DRO RPD exceeded the DQO of 50%. Affected results are qualified ‘QN’ as estimates.

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

Comments:

Impact to data usability was minimal in each case, as results were well below applicable soil cleanup levels.

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

Yes No ■NA (Please explain.) Comments:

Samples were collected with disposable sampling equipment; no decontamination- or equipment-blank samples were required.

i. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

See above.

ii. If above PQL, what samples are affected?

Comments:

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

Comments:

N/A; there was no equipment blank for this sample delivery group.

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

a. Defined and appropriate?

Yes No ■NA (Please explain.) Comments:

There were no other data flags or qualifiers.

Laboratory Data Review Checklist

Completed by: Rodney Guritz

Title: Chemist Date: October 13, 2014

CS Report Name: Remedial Action Report – Project Chariot Report Date: October 2014

Consultant Firm: Arctic Data Services, LLC for Fairbanks Environmental Services, Inc.

Laboratory Name: SGS Anchorage, AK Laboratory Report Number: 1143634

ADEC File Number: 475.38.008 ADEC RecKey Number:

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

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

      No samples were transferred or sub-contracted to a different laboratory.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ■Yes No NA (Please explain.) Comments:

   b. Correct analyses requested?
      ■Yes No NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      ■Yes No NA (Please explain.) Comments:

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?
      ■Yes No NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
■Yes No NA (Please explain.) Comments:

Samples were received in good condition.

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

There were no discrepancies.

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

Samples were received in good condition; data quality and usability are not affected.

4. Case Narrative
a. Present and understandable?
■Yes No NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
■Yes No NA (Please explain.) Comments:

The laboratory noted a method-blank detection, MS/MSD recovery and RPD failures, and surrogate recovery failures; see Sections 6.a., 6.b. and 6.c. for discussion of these QC failures. Remaining comments were regarding chromatographic patterns observed in select samples, and do not indicate issues with data quality.

c. Were all corrective actions documented?
Yes No ■NA (Please explain.) Comments:

There were no corrective actions performed/reported.

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

The lab did not indicate an impact to data quality or usability related to the QC anomalies noted.

5. Samples Results
a. Correct analyses performed/reported as requested on COC?
■Yes No NA (Please explain.) Comments:

b. All applicable holding times met?

■Yes No NA (Please explain.) Comments:

c. All soils reported on a dry weight basis?

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

Analytical sensitivity was evaluated by checking that analytical LODs met applicable regulatory limits. LODs were below cleanup levels for each non-detect result.

e. Data quality or usability affected?

Comments:

Data quality and usability were not affected.

6. QC Samples

a. Method Blank

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

■Yes No NA (Please explain.) Comments:

ii. All method blank results less than PQL?

■Yes No NA (Please explain.) Comments:

However, DRO and RRO were detected below the LOQ in the method blank for the silica-gel cleanup batch, at 20.3 and 14.1 mg/kg, respectively.

iii. If above PQL, what samples are affected?

Comments:

The RRO (silica gel) result for sample 14PCX054SO was within 10 times the concentration detected in the method blank. This result is considered potentially attributable to laboratory-based contamination, and is flagged 'B.'

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

■Yes No NA (Please explain.) Comments:

See above.

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

Comments:

Impact to data usability is minor, as the affected result is several orders of magnitude below the cleanup level

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

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

■Yes No NA (Please explain.) Comments:

An LCS/LCSD was reported for each DRO/RRO prep batch. Each DRO/RRO prep batch also had an MS/MSD, with the exception of batches XXX31637 (silica gel) and XXX31638. An LCS and MS/MSD were reported for the SVOC prep batch.

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

Yes No ■NA (Please explain.) Comments:

No metals/inorganic analyses were performed/reported

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

Yes ■No NA (Please explain.) Comments:

LCS, LCSD, MS, and MSD recoveries were within laboratory control limits for reported analytes, with exceptions noted below (Section 6.b.v.).

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

Yes ■No NA (Please explain.) Comments:

LCS/LCSD and MS/MSD RPDs were within laboratory control limits, with exceptions noted below (Section 6.b.v.).

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

Comments:

Numerous SVOC analytes were recovered above laboratory control limits for the MS/MSD of sample 14PCX042SO. None of these analytes were detected in the parent sample, so results were not affected. MS/MSD RPD for isophorone was above laboratory control limits; this analyte was not detected in the parent sample (14PCX042SO) so results were not affected. Recovery of DRO was above laboratory control limits for the MSD of sample 14PCX053SO. The concentration spiked was less than twice the native concentration. In accordance with USACE EM 200-1-10, results should not be qualified based on MS/MSD recovery failures unless the spike amount was at least twice the native concentration in the sample. Results are not affected.

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

Yes No ■NA (Please explain.) Comments:

No results were affected (see above).

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

Comments:

Data quality and usability were not affected by the MS/MSD recovery or RPD failures. We were unable to evaluate potential matrix effects for prep batches XXX31637 (silica gel) or XXX31638.

c. Surrogates – Organics Only

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

■Yes No NA (Please explain.) Comments:

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

Yes ■No NA (Please explain.) Comments:

DRO surrogate 5a-androstane and/or RRO surrogate n-triacontane were recovered below laboratory control limits for multiple samples. In each case, surrogate recovery failures were due to sample dilution (surrogates were diluted out of the samples). In accordance with USACE EM 200-1-10, surrogate recovery failures caused by sample dilution do not affect sample data quality.

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

Yes No ■NA (Please explain.) Comments:

No samples were affected.

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

Comments:

Surrogate recovery failures were due to sample dilution; data quality and usability was not affected.

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

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

Yes No ■NA (Please explain.) Comments:

No samples were submitted for volatile analysis in this work order.

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

Yes No ■NA (Please explain.) Comments:

iii. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

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

Comments:

No trip blank was analyzed/reported for this work order.

e. Field Duplicate

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

The following field-duplicate pairs were submitted for DRO/RRO analysis in this sample delivery group: 14PCX034SO/14PCX035SO 14PCX042SO/14PCX043SO 14PCX057SO/14PCX058SO Field duplicates were collected at 12.5% of the total number of projects samples, meeting the minimum frequency of 10% for the project. SVOC analysis was also requested on sample 14PCX042SO (at the request of ADEC), but SVOCs were not requested on field duplicate sample 14PCX043SO.

■Yes No NA (Please explain.) Comments:

ii. Submitted blind to lab?

■Yes No NA (Please explain.) Comments:

See above.

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

■Yes No NA (Please explain.) Comments:

RPDs were within the DQO of 50%.

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

Comments:

Data quality and usability were not affected.

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

Yes No ■NA (Please explain.) Comments:

Samples were collected with disposable sampling equipment; no decontamination- or equipment-blank samples were required.

i. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

See above.

ii. If above PQL, what samples are affected?

Comments:

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

Comments:

N/A; there was no equipment blank for this sample delivery group.

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

There were no other data flags or qualifiers.

Laboratory Data Review Checklist

Completed by: Rodney Guritz

Title: Chemist Date: October 13, 2014

CS Report Name: Remedial Action Report – Project Chariot Report Date: October 2014

Consultant Firm: Arctic Data Services, LLC for Fairbanks Environmental Services, Inc.

Laboratory Name: SGS Anchorage, AK Laboratory Report Number: 1143815

ADEC File Number: 475.38.008 ADEC RecKey Number:

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

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

      No samples were transferred or sub-contracted to a different laboratory.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ■Yes No NA (Please explain.) Comments:

   b. Correct analyses requested?
      ■Yes No NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      ■Yes No NA (Please explain.) Comments:

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?
      ■Yes No NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
■Yes No NA (Please explain.) Comments:

Samples were received in good condition.

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

There were no discrepancies.

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

Samples were received in good condition; data quality and usability are not affected.

4. Case Narrative
a. Present and understandable?
■Yes No NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
■Yes No NA (Please explain.) Comments:

The laboratory noted MS/MSD and surrogate recovery failures; see Sections 6.b. and 6.c. for discussion of these QC failures. Remaining comments were regarding chromatographic patterns observed in select samples, and do not indicate issues with data quality.

c. Were all corrective actions documented?
Yes No ■NA (Please explain.) Comments:

There were no corrective actions performed/reported.

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

The lab did not indicate an impact to data quality or usability related to the QC anomalies noted.

5. Samples Results
a. Correct analyses performed/reported as requested on COC?
■Yes No NA (Please explain.) Comments:

b. All applicable holding times met?

■Yes No NA (Please explain.) Comments:

c. All soils reported on a dry weight basis?

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

Analytical sensitivity was evaluated by checking that analytical LODs met applicable regulatory limits. LODs were below cleanup levels for each non-detect result.

e. Data quality or usability affected?

Comments:

Data quality and usability were not affected.

6. QC Samples

a. Method Blank

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

■Yes No NA (Please explain.) Comments:

ii. All method blank results less than PQL?

■Yes No NA (Please explain.) Comments:

No analytes were detected in the method blanks.

iii. If above PQL, what samples are affected?

Comments:

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

Yes No ■NA (Please explain.) Comments:

See above.

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

Comments:

No analytes were detected in the method blanks; data quality and usability were not affected.

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

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

■Yes No NA (Please explain.) Comments:

An LCS/LCSD and at least one MS/MSD were reported for each DRO/RRO prep batch.

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

Yes No ■NA (Please explain.) Comments:

No metals/inorganic analyses were performed/reported

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

Yes ■No NA (Please explain.) Comments:

LCS, LCSD, MS, and MSD recoveries were within laboratory control limits for reported analytes, with exceptions noted below (Section 6.b.v.).

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

■Yes No NA (Please explain.) Comments:

All LCS/LCSD and MS/MSD RPDs were within laboratory control limits.

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

Comments:

Recovery of DRO was above laboratory control limits for the MS/MSD of sample 14PCX061SO. The concentration spiked was less than twice the native concentration. In accordance with USACE EM 200-1-10, results should not be qualified based on MS/MSD recovery failures unless the spike amount was at least twice the native concentration in the sample. Results are not affected.
Remaining MS/MSDs with recovery failures were not associated with project samples reported in this work order.

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

Yes No ■NA (Please explain.) Comments:

No results were affected (see above).

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

Comments:

Data quality and usability were not affected by the MS/MSD recovery failures.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
■Yes No NA (Please explain.) Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)
Yes ■No NA (Please explain.) Comments:

DRO surrogate 5a-androstane and/or RRO surrogate n-triacontane were recovered below laboratory control limits for multiple samples. In each case, surrogate recovery failures were due to sample dilution (surrogates were diluted out of the samples). In accordance with USACE EM 200-1-10, surrogate recovery failures caused by sample dilution do not affect sample data quality.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
Yes No ■NA (Please explain.) Comments:

No samples were affected.

iv. Data quality or usability affected? (Use the comment box to explain.)
Comments:

Surrogate recovery failures were due to sample dilution; data quality and usability was not affected.

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

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

No samples were submitted for volatile analysis in this work order.

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

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

iv. If above PQL, what samples are affected?

Comments:

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

Comments:

No trip blank was analyzed/reported for this work order.

e. Field Duplicate

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

■Yes No NA (Please explain.) Comments:

The following field-duplicate pair was submitted in this sample delivery group:
14PCX064SO/14PCX065SO
Field duplicates were collected at 12.5% of the total number of projects samples, meeting the minimum frequency of 10% for the project.

ii. Submitted blind to lab?

■Yes No NA (Please explain.) Comments:

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

■Yes No NA (Please explain.) Comments:

RPDs were within the DQO of 50%.

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

Comments:

Data quality and usability were not affected.

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

Yes No ■NA (Please explain.) Comments:

Samples were collected with disposable sampling equipment; no decontamination- or equipment-blank samples were required.

i. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

See above.

ii. If above PQL, what samples are affected?

Comments:

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

Comments:

N/A; there was no equipment blank for this sample delivery group.

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

a. Defined and appropriate?

Yes No ■NA (Please explain.) Comments:

There were no other data flags or qualifiers.

Laboratory Data Review Checklist

Completed by: Rodney Guritz

Title: Chemist Date: October 13, 2014

CS Report Name: Remedial Action Report – Project Chariot Report Date: October 2014

Consultant Firm: Arctic Data Services, LLC for Fairbanks Environmental Services, Inc.

Laboratory Name: SGS Anchorage, AK Laboratory Report Number: 1143866

ADEC File Number: 475.38.008 ADEC RecKey Number:

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

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

      No samples were transferred or sub-contracted to a different laboratory.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ■Yes No NA (Please explain.) Comments:

   b. Correct analyses requested?
      ■Yes No NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      ■Yes No NA (Please explain.) Comments:

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?
      ■Yes No NA (Please explain.) Comments:

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
■Yes No NA (Please explain.) Comments:

Samples were received in good condition.

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

There were no discrepancies.

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

Samples were received in good condition; data quality and usability are not affected.

4. Case Narrative
a. Present and understandable?
■Yes No NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
■Yes No NA (Please explain.) Comments:

The laboratory noted LCS recovery failures, MS/MSD recovery and RPD failures, and surrogate recovery failures; see Sections 6.b. and 6.c. for discussion of these QC failures. The LCS recovery failure was noted in error; the affected batch was reanalyzed and the LCS with the failure not reported. Remaining comments were regarding chromatographic patterns observed in select samples, and do not indicate issues with data quality.

c. Were all corrective actions documented?
Yes No ■NA (Please explain.) Comments:

There were no corrective actions performed/reported.

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

The lab did not indicate an impact to data quality or usability related to the QC anomalies noted.

5. Samples Results
a. Correct analyses performed/reported as requested on COC?
■Yes No NA (Please explain.) Comments:

b. All applicable holding times met?

■Yes No NA (Please explain.) Comments:

c. All soils reported on a dry weight basis?

■Yes No NA (Please explain.) Comments:

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

Yes ■No NA (Please explain.) Comments:

Analytical sensitivity was evaluated by checking that analytical LODs met applicable regulatory limits. LODs were below cleanup levels for each non-detect result, with the exception of the following analytes for sample 14PCX076SO:
Benzo[a]pyrene
Dibenzo[a,h]anthracene
N-Nitrosodimethylamine
We cannot determine if these analytes were present above cleanup levels in this sample. Impact to data usability is minimal, as DRO was well above the cleanup level.

e. Data quality or usability affected?

Comments:

Impact to data quality and usability is minimal (see above).

6. QC Samples

a. Method Blank

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

■Yes No NA (Please explain.) Comments:

ii. All method blank results less than PQL?

■Yes No NA (Please explain.) Comments:

However, RRO was detected below the LOQ at 16.3 mg/kg in the method blank for prep batch XXX31754.

iii. If above PQL, what samples are affected?

The RRO result for sample 14PCX076SO was within 10 times the concentration detected in the method blank. This result is considered potentially attributable to laboratory-based contamination, and is flagged 'B.'

Comments:

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

See above.

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

Impact to data usability is minimal, as the affected result was several orders of magnitude below the cleanup level.

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

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
■Yes No NA (Please explain.) Comments:

An LCS/LCSD and at least one MS/MSD were reported for each DRO/RRO prep batch (including the silica gel batch). An LCS and MS/MSD were reported for each VOC, PCB, and SVOC prep batch.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
Yes No ■NA (Please explain.) Comments:

No metals/inorganic analyses were performed/reported

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
Yes ■No NA (Please explain.) Comments:

LCS, LCSD, MS, and MSD recoveries were within laboratory control limits for reported analytes, with exceptions noted below (Section 6.b.v.).

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
■Yes No NA (Please explain.) Comments:

All LCS/LCSD and MS/MSD RPDs were within laboratory control limits.

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

Comments:

There were numerous analyte recovery failures for the MS/MSD of sample 14PCX076SO. The following analytes were recovered below laboratory control limits in the MS and MSD:
Diesel Range Organics (AK102)
DRO Silica Gel (AK102 SG)
1,2-Dichlorobenzene (8260B)
1,3-Dichlorobenzene (8260B)
1,4-Dichlorobenzene (8260B)
4-Chlorotoluene (8260B)
2,4-Dinitrophenol (2870D)
2-Nitrophenol (2870D)
4-Nitroaniline (2870D)
Aniline (2870D)
Benzoic acid (2870D)
Hexachlorocyclopentadiene (2870D)
Results for these analytes in the parent sample are considered estimated, biased low due to matrix interference, and flagged 'ML,' with the exception of DRO and DRO Silica Gel (both small spikes on a high native concentration).
The following analytes were recovered above laboratory control limits in the MS and/or MSD:
1,1,2-Trichloroethane (8260B)
1,2,4-Trimethylbenzene (8260B)
4-Isopropyltoluene (8260B)
Hexachlorobutadiene (8260B)
Naphthalene (8260B)
n-Butylbenzene (8260B)
o-Xylene (8260B)
P & M -Xylene (8260B)
Toluene (8260B)
Xylenes (total) (8260B)
1-Chloronaphthalene (8270D)
2,4,6-Trichlorophenol (8270D)
2,4-Dichlorophenol (8270D)
2,6-Dichlorophenol (8270D)
2,6-Dinitrotoluene (8270D)
2-Methylnaphthalene (8270D)
4-Chloro-3-methylphenol (8270D)
4-Chloroaniline (8270D)
Acenaphthene (8270D)
Bis(2-Chloroethoxy)methane (8270D)
Dibenzofuran (8270D)
Fluorene (8270D)
Hexachloroethane (8270D)
Isophorone (8270D)
N-Nitrosodiphenylamine (8270D)

v. continued

Of these analytes, the following were detected in the parent sample, and are considered affected. 1,2,4-Trimethylbenzene (8260B) 4-Isopropyltoluene (8260B) Naphthalene (8260B) o-Xylene (8260B) P & M -Xylene (8260B) Toluene (8260B) Xylenes (total) (8260B) 2-Methylnaphthalene (8270D) These results are qualified 'MH' as estimated, biased high due to matrix interference. Remaining MS/MSDs with recovery failures were not associated with project samples reported in this work order.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
■Yes No NA (Please explain.) Comments:

See above.

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

Impact to data usability is minimal as the affected results were well below applicable cleanup levels in each case.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
■Yes No NA (Please explain.) Comments:

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

Yes ■No NA (Please explain.) Comments:

GRO surrogate 4-bromofluorobenzene was recovered above laboratory control limits for samples 14PCX076SO and 14PCX077SO, due to matrix interference. These results are considered estimated, biased high, and flagged 'QH.'
DRO surrogate 5a-androstane was recovered above laboratory control limits for sample 14PCD014SO, due to matrix interference. This results is considered estimated, biased high, and flagged 'QH.'
DRO surrogate 5a-androstane was recovered below laboratory control limits for sample 14PCD018SO, due to sample dilution. In accordance with USACE EM 200-1-10, surrogate recovery failures caused by sample dilution do not affect sample data quality.
There were also some surrogate recovery failures for QC samples (LCS, MB, MS/MSD); these failures did not affect data quality, as individual analyte recoveries (for LCS and MS/MSDs) were acceptable, as were surrogate recoveries in associated project samples (with the exception of those samples identified above).

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

■Yes No NA (Please explain.) Comments:

See above.

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

Comments:

Data quality affected as described above. Impact to data usability is minimal, as GRO results were an order of magnitude below the GRO cleanup level (1,400 mg/kg), while the DRO result was an order of magnitude above the Method One cleanup level of 500 mg/kg.

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

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

■Yes No NA (Please explain.) Comments:

Trip-blank sample 14PCX078SO was submitted with samples for volatile analysis in this work order.

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

■Yes No NA (Please explain.) Comments:

iii. All results less than PQL?

■Yes No NA (Please explain.) Comments:

No analytes were detected in the trip blank.

iv. If above PQL, what samples are affected?

Comments:

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

Comments:

No analytes were detected in the trip blank; data quality and usability were not affected.

e. Field Duplicate

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

■Yes No NA (Please explain.) Comments:

The following field-duplicate pairs were submitted in this sample delivery group: 14PCD015SO/14PCD016SO 14PCX076SO/14PCX077SO Field duplicates were collected at 12.5% of the total number of projects samples, meeting the minimum frequency of 10% for the project.

ii. Submitted blind to lab?

■Yes No NA (Please explain.) Comments:

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

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Yes ■No NA (Please explain.) Comments:

DRO, 2-methylnaphthalene, naphthalene, and phenanthrene RPDs exceeded the DQO of 50% for field duplicate pair 14PCX076SO/14PCX077SO. Affected results are qualified 'QN' as estimates.

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

Comments:

Data quality is affected as described above. Impact to data usability was minimal for affected PAH analytes, as each affected result was well below soil cleanup levels. The DRO result for sample 14PCX076SO exceeded the tundra-soil cleanup level of 12,500 mg/kg; the DRO result for sample 14PCX077SO was below this cleanup level. Therefore we cannot conclusively determine whether DRO exceeds the cleanup level at the sample location. The higher of the two results is conservatively used to represent the DRO concentration for the sample location.

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

Yes No ■NA (Please explain.) Comments:

Samples were collected with disposable sampling equipment; no decontamination- or equipment-blank samples were required.

i. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

See above.

ii. If above PQL, what samples are affected?

Comments:

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

Comments:

N/A; there was no equipment blank for this sample delivery group.

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

a. Defined and appropriate?

Yes No ■NA (Please explain.) Comments:

There were no other data flags or qualifiers.

Laboratory Data Review Checklist

Completed by: Rodney Guritz

Title: Chemist Date: October 13, 2014

CS Report Name: Remedial Action Report – Project Chariot Report Date: October 2014

Consultant Firm: Arctic Data Services, LLC for Fairbanks Environmental Services, Inc.

Laboratory Name: SGS Anchorage, AK Laboratory Report Number: 1143960_rev_1

ADEC File Number: 475.38.008 ADEC RecKey Number:

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

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

      No samples were transferred or sub-contracted to a different laboratory.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ■Yes No NA (Please explain.) Comments:

   b. Correct analyses requested?
      ■Yes No NA (Please explain.) Comments:

      However, some sample names were incorrect on the original COC. The sample names were corrected in an email to the lab, and the corrections reflected in the revised laboratory report. Also, sample times for some samples were not included on the original COC; sample times were transcribed from sample bottles.
      Data quality and usability were not affected by these discrepancies.

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      Yes ■No NA (Please explain.) Comments:

      The cooler associated with this work order was received with its temperature blank below the accepted temperature range (4°±2°C) but above 0 °C. No ice was observed in the water samples. Results are not affected by the low sample temperatures.

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

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

Samples were received in good condition.

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

Yes No ■NA (Please explain.) Comments:

There were no discrepancies.

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

Comments:

Samples were received in good condition; data quality and usability are not affected.

4. Case Narrative

a. Present and understandable?

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

The laboratory noted MS/MSD and surrogate recovery failures; see Sections 6.b. and 6.c. for discussion of these QC failures.
The laboratory noted the sample-naming revisions (see Section 2.b.).
Remaining comments were regarding chromatographic patterns observed in select samples, and do not indicate issues with data quality.

c. Were all corrective actions documented?

Yes No ■NA (Please explain.) Comments:

There were no corrective actions performed/reported.

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

Comments:

The lab did not indicate an impact to data quality or usability related to the QC anomalies noted.

5. Samples Results
   a. Correct analyses performed/reported as requested on COC?
      ■Yes No NA (Please explain.) Comments:

   b. All applicable holding times met?
      ■Yes No NA (Please explain.) Comments:

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

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

Analytical sensitivity was evaluated by checking that analytical LODs met applicable regulatory limits. LODs were below cleanup levels for each non-detect result.

   e. Data quality or usability affected?
      Comments:

Data quality and usability were not affected.

6. QC Samples
   a. Method Blank
      i. One method blank reported per matrix, analysis and 20 samples?
      ■Yes No NA (Please explain.) Comments:

      ii. All method blank results less than PQL?
      ■Yes No NA (Please explain.) Comments:

No analytes were detected in the method blanks.

      iii. If above PQL, what samples are affected?

Comments:

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

No samples were affected.

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

No analytes were detected in the method blank; data quality and usability were not affected.

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

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
■Yes No NA (Please explain.) Comments:

An LCS/LCSD and an MS/MSD were reported for each DRO/RRO preparatory batch.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
Yes No ■NA (Please explain.) Comments:

No metals/inorganic analyses were performed/reported

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
Yes ■No NA (Please explain.) Comments:

LCS, LCSD, MS, and MSD recoveries were within laboratory control limits, with exceptions noted in 6.b.v. below.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
■Yes No NA (Please explain.) Comments:

All LCS/LCSD and MS/MSD RPDs were within laboratory control limits.

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

DRO was recovered below laboratory control limits for the MSD of sample 14PCD050SO. The DRO result for this sample is considered estimated, biased low due to matrix interference, and flagged ‘ML.’

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

■Yes No NA (Please explain.) Comments:

See above.

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

Comments:

The affected, low-biased DRO result (473 mg/kg) is only slightly below the applicable Method One soil cleanup level of 500 mg/kg. In an abundance of caution, this sample may be considered as potentially exceeding the cleanup level for project decision making.

c. Surrogates – Organics Only

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

■Yes No NA (Please explain.) Comments:

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

Yes ■No NA (Please explain.) Comments:

DRO surrogate 5a-androstane was recovered below laboratory control limits for sample 14PCD026SO, due to dilution of the sample extract. In accordance with USACE EM 200-1-10, surrogate recovery failures caused by sample dilution do not affect sample data quality.

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

Yes No ■NA (Please explain.) Comments:

No samples were affected.

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

Comments:

The only surrogate recoveries were attributable to sample dilution; data quality and usability was not affected.

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

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

Yes No ■NA (Please explain.) Comments:

No samples were submitted for volatile analysis in this work order.

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

Yes No ■NA (Please explain.) Comments:

iii. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

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

Comments:

No trip blank was analyzed/reported for this work order.

e. Field Duplicate

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

■Yes No NA (Please explain.) Comments:

The following field-duplicate pairs were submitted in this sample delivery group: 14PCD032SO/14PCD033SO 14PCD036SO/14PCD037SO 14PCD044SO/14PCD045SO 14PCD048SO/14PCD049SO Field duplicates were collected at 12.5% of the total number of projects samples, meeting the minimum frequency of 10% for the project.

ii. Submitted blind to lab?

■Yes No NA (Please explain.) Comments:

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

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Yes ■No NA (Please explain.) Comments:

For field-duplicate pair 14PCD032SO/14PCD033SO, DRO and RRO RPDs exceeded the DQO of 50%.
For field-duplicate pair 14PCD036SO/14PCD037SO the DRO RPD exceeded the DQO.
For field-duplicate pair 14PCD048SO/14PCD049SO, DRO and RRO RPDs exceeded the DQO.
RPDs for field-duplicate pair 14PCD044SO/14PCD045SO met the DQO.
Results associated with RPD failures (noted above) are qualified 'QN' as estimates.

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

Comments:

Data quality affected as described above; impact to data usability is minor as the results were well below cleanup levels in each case.

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

Yes No ■NA (Please explain.) Comments:

Samples were collected with disposable sampling equipment; no decontamination- or equipment-blank samples were required.

i. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

See above.

ii. If above PQL, what samples are affected?

Comments:

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

Comments:

N/A; there was no equipment blank for this sample delivery group.

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

There were no other data flags or qualifiers.

Laboratory Data Review Checklist

Completed by: Rodney Guritz

Title: Chemist Date: October 13, 2014

CS Report Name: Remedial Action Report – Project Chariot Report Date: October 2014

Consultant Firm: Arctic Data Services, LLC for Fairbanks Environmental Services, Inc.

Laboratory Name: SGS Anchorage, AK Laboratory Report Number: 1144035

ADEC File Number: 475.38.008 ADEC RecKey Number:

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

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

      No samples were transferred or sub-contracted to a different laboratory.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ■Yes No NA (Please explain.) Comments:

   b. Correct analyses requested?
      ■Yes No NA (Please explain.) Comments:

      Matrix indicated on COC is water, but samples in this work order are soil samples; data quality and usability are not affected.

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      ■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

Samples were received in good condition.

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

Yes No ■NA (Please explain.) Comments:

There were no discrepancies.

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

Comments:

Samples were received in good condition; data quality and usability are not affected.

4. Case Narrative

a. Present and understandable?

■Yes No NA (Please explain.) Comments:

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

■Yes No NA (Please explain.) Comments:

Comments were regarding chromatographic patterns observed in select samples, and do not indicate issues with data quality.

c. Were all corrective actions documented?

Yes No ■NA (Please explain.) Comments:

There were no corrective actions performed/reported.

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

Comments:

The lab did not indicate an impact to data quality or usability related to the QC anomalies noted.

5. Samples Results
   a. Correct analyses performed/reported as requested on COC?
      ■Yes No NA (Please explain.) Comments:

   b. All applicable holding times met?
      ■Yes No NA (Please explain.) Comments:

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

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

DRO and RRO were detected in each sample; no LODs were relevant to compare.

   e. Data quality or usability affected?
      Comments:

Data quality and usability were not affected.

6. QC Samples
   a. Method Blank
      i. One method blank reported per matrix, analysis and 20 samples?
         ■Yes No NA (Please explain.) Comments:

      ii. All method blank results less than PQL?
         ■Yes No NA (Please explain.) Comments:

No analytes were detected in the method blank.

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

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

No samples were affected.

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

No analytes were detected in the method blank; data quality and usability were not affected.

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

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
■Yes No NA (Please explain.) Comments:

An LCS/LCSD and an MS/MSD were reported for each DRO/RRO preparatory batch.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
Yes No ■NA (Please explain.) Comments:

No metals/inorganic analyses were performed/reported

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
■Yes No NA (Please explain.) Comments:

All LCS, LCSD, MS, and MSD recoveries were within laboratory control limits.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
■Yes No NA (Please explain.) Comments:

All LCS/LCSD and MS/MSD RPDs were within laboratory control limits.

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

There were no recovery or RPD failures.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No ■NA (Please explain.) Comments:

See above.

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

Recoveries and RPDs were within control limits; data quality and usability were not affected.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
■Yes No NA (Please explain.) Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)
■Yes No NA (Please explain.) Comments:

Surrogate recoveries were within laboratory control limits for each sample/analysis.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
Yes No ■NA (Please explain.) Comments:

No samples were affected.

iv. Data quality or usability affected? (Use the comment box to explain.)
Comments:

Surrogate recoveries were within control limits; data quality and usability was not affected.

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

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

No samples were submitted for volatile analysis in this work order.

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

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

iv. If above PQL, what samples are affected?

Comments:

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

Comments:

No trip blank was analyzed/reported for this work order.

e. Field Duplicate

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

■Yes No NA (Please explain.) Comments:

The following field-duplicate pair was submitted in this sample delivery group: 14PCD057SO/14PCD058SO Field duplicates were collected at 12.5% of the total number of projects samples, meeting the minimum frequency of 10% for the project.

ii. Submitted blind to lab?

■Yes No NA (Please explain.) Comments:

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

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

■Yes No NA (Please explain.) Comments:

Field-duplicate RPDs met the DQO of 50%.

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

Comments:

Field-duplicate RPDs were acceptable; data quality and usability were not affected.

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

Yes No ■NA (Please explain.) Comments:

Samples were collected with disposable sampling equipment; no decontamination- or equipment-blank samples were required.

i. All results less than PQL?

Yes No ■NA (Please explain.) Comments:

See above.

ii. If above PQL, what samples are affected?

Comments:

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

Comments:

N/A; there was no equipment blank for this sample delivery group.

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

a. Defined and appropriate?

Yes No ■NA (Please explain.) Comments:

There were no other data flags or qualifiers.

APPENDIX D

FIELD NOTES

Book 1

Project Chariot
2014 Remedial Action

Rite in the Rain.
ALL-WEATHER
FIELD
Nº 351

Tanch Contract #
W911KB-14-C-0002

Fairbanks Environmental
Services - Mike Boere 441-
1346

Start date 6/25/14

10/25/14

0510 arrive TSAIA. Check in luggage, security, gate CS - meet w/ Bill Jim and Ken Ressen.
0625 boarding
0800 land in OTZ
0830 call NWestern for ride with all our luggage/gear.
weather hold - check out barge docks
1100 weather looks good. load plane
1125 take off
1235 Land on west airstrip park By cabin
evaluate potential Camp locations on either side of Runway.
Also evaluate proposed West Fitzgerald area and then need to beach. Evaluate Beach conditions and

MD

6/25/14 cont

Potential (staging areas for Connexs above high tide line).

Weather 38°F, high clouds (~1000 ft), light steady wind from the North.

Trek to Test Hole Chuck. Use gps to identify 2010 previous Supple. location. Dig a test pit ~12' SE of pipe in dirty area to estimate depth to permafrost and evaluate confirmation w/ Depth. Top 3" are rocks - fines distant ~ 3" and increase w/ depth. Soil is contaminated ~ 6" based on odor + visual observation. Ken digs to a depth of 3' and still hasn't hit frost. Note that the pad is not smooth and that this is the ~~thickest~~ highest point (worst case scenario)

JB

6/25/14 con't

Shallow.

We dig ~25-30 test pits on pad and adjacent tundra. The Tundra near the edge of pad are black stained and do appear to be impacted. depth to permafrost in tundra is 0.6' to 1' - uneven terrain. Install test pits ~12 to 15' out and tundra does not appear to be impacted. for visual reference, we marked visually contaminated test holes w pink whiskers and non contaminated w/ Blue. Dig another test pit in a low lying location on pad Northeast corner to evaluate depth to permafrost. ~2.5' bgs at that location.

Decide to collect Lab Samples for Waste Characterization and to conduct field observations. Also collect 2 Ziplock Samples for field Screening

MD

6

6/25/14 cont

Charlie pad

N

PIPE

original alt.

based on field observ.

Tundra

PID
~~001C~~
~~002C~~
003C
004C
~~006C~~
007C
008C

MB

7

6/25/14 cont

Sample Location

Charlie pad

PIPE

C002

C03

C04 / C05 (DUP)

C06

C01

C07

C08

	Dist to pipe	Depth	Time
C01	53'	4"	1425
C02	12'	12"	1445
C03	23'	10"	1500
C04/5	36'	10"	1505/10
C06	19'	14"	1515
C07	41'	14"	1520
C08	59'	11"	1525

MB

8

6/25/14

Mark all Sample locations w/ pin flag w/ location IDs

C01 - C001NWC } TCLP RCRA Metals + TCLP BTEX (8021)
C02 - C002NWC }

C03 - C003NPE DRO/RRO
C04/5 - C004NPE / C005DPE (1402)
C06 - C006NPE
C07 - C007NPE
C08 - C008NPE

C01 + C02 were collected from gray stained fines (worst case scenario) for Waste Characterization.

C003-C008 were collected to verify edge of "plume"

all Sample were collected using new 55 Sampling Spoons and new gloves.

Bill and Ken evaluated Creek Crossing and East Beach + proposed East Staging area while I collected Lab Samples

9

6/25/14

Pilot (Anthony) noted fog was increasing along Cross Bill Bull and indicated that we needed to leave Soon. No time to GPS the Sample locations.

1530 Pilot helped me carry Sample gear back to plane. Load gear in plane and fly down Bill + Ken.

1545 take off from Chant and fly back to Kotz w/ fair wind.

1650 land in Kotz. Was very nice fun Kivalina to Kotz.

1710 check in w Alaska Air

1830 boarding starts.

~1900 take off - fly to some long layover Full plane

2200 land in Anchorage and get bags + Lab Sample Kit.

MB

8/20/14

1200 unpack field gear and fill out COC for

1300 relinquish samples to SGS for analysis – std TAT.

1400 turn on water & bath & propane grill and funky pan filled w water. Heated water and samples for 25 minutes – and read headspace w/ PID. Calibrate PID w/ 100 ppm 150butylene – reads 100.0ppm. Lot#H4-4896

Sample	PID
C003NPE	2.0 ppm
C004/5	0.5
C006	0.7
C007	2.8
C008	4.2

all samples in bags had a very high water content. all samples were sandy gravels

MB

8/15/14

815 cab ride to TSAIA. check in for flight to Kotzebue

850 get call from NAC – they can't ship PID cal. stds because paperwork is missing the words "150 butylene in air" and they can't add it – & I have to. They will fax it to Jack in OTZ and I can sign it upon my arrival in OTZ.

0855 Bryan texted from FBX – his plane is late but just about to take off – he may not make our flight to OTZ.

0915 – call from Linda @ Nicholson "weather is bad and supposed to get worse"

1030 take off for OTZ

1150 arrived in OTZ

MB

7/15/14 cont

1200 – 1300 get luggage talk to NAC – revise Shippers Declarat for Dangerous good – faxed back to Anchorage – said it was good to go.

1300 Northwestern p/u and take all our gear to hangar. weigh + prioritize gear weather stand by

1330 go to AC store – buy propane and lighters

1400 Lunch

1430 Stand by

1430 called Bibbins for room – no answer + can't leave message

1900 – end of day – no flight but – weather hold.

MB

7/16/14

0830 got a call from Aaron Sherman regarding attending the weekly conference call. Aaron gave me numbers and I called in.
1-877-336-1839
access 8853203
Security code 10316693 2

0845 Checked in with NWestern Aviation – on weather hold.

0900 got call from Bill – need Switch + Bell housing for AC + DC Bear fences. found them @ AC hardware store + purchased

1000-1100 talked w/ Bill – weather may be improving between Chant and Kivalina. Bill said they removed 5 bags of contaminated soil from Baker and put them in connex + tank adding gravel to Road to Dog.

MB

14 Diggins

7/16/14 cont

~~Sara~~

↳ This would be a work plan deviate and, it is unknown if H+S plan has been signed. No screening of Breathing zone etc, photos? if they started digging. Digging Baker was apparently discussed during weekly meeting prior to my call in. We will need to label super sacks and collect soil samples from side walls and floor of Baker excavation

1200 Call from Bill - needs 22 mm Deep Socket - Kubota was sunk in creek and need to pull injectors.

1230 need Seafoam diesel or diesel 911 - #2 injector plugged

1300 - 1330 NAPA/ACE buy 2 cans Seafoam and Socket set. Still on weather hold Stand by

1800 done for day

2100 Bill called - needs a toothbrush

MB

7/17/14

15

0745 Bill called for Chant, weather is good - 700' ceiling + good clearance

0800 go to store to buy toothbrush

0830 Call from Linda - we are going 1st thing weather is good.

0840 load plane

0905 leave Kotz

1030 land at Chant. Sign HSP (APP) following safety meeting put personal items in tent and work items in corner

talk w/ Bill about priorities - he wants us to work out contaminated area at Chandler put propane stove together for water bath. get supplies all previous pin flags were moved by strong winds

MB

16

7/17/14 cont

1245 dig several holes - collect PID samples from most - See PID log - marked out contaminated area on chuckie w/ spray paint based on PID > 10 ppm.

1720 collect > 5% lab samples for correlation purposes from PID=0.35C (C009NPE) and PID=0.12C (C010NPE)

1740 also collected 5 lab samples from tundra from outside the area w/ visual staining - approx 10' onto tundra from PAD (from C009NPE → C016NPE)

1840 make to Baker - Tank has excavated a 10x10 hole centered on pipe - take photos - excavation is filled with several inches of water we need to do confirmation sampling - supersacks were taken to connex near camp.

MB

17

7/17/14 cont

1910 Dinner.

2000 organize all sampling / manifestos etc. in connex. fill out COC form

2200 finish

MB

7/18/14

800 Safety meeting
also discuss today activities
900 pump ~2 gallons water for Charlie pipe - prior to excavation activities - discussed dabbing suprasorbs
1000 prep for pumping water and continue sampling at Bake
Calibrate both PIDs w/ 100 ppm Isobutylene
Yellow (rental) = 101.1 ppm
green = 99.6 ppm
head out to Bake - collect 7 sidewall samples for PID Screening - Results ranged from 0.3 - 2.8 ppm. collect for B001WEC + B002WEC BC Stove from 004B + 005B + 006B. ~1½ gallons
1215 Collect 5 floor samples (PID) 4 corners and 1 in middle near pipe. All were low, except NW corner: Gray stained silt was very high PID. Decide not to collect floor samples until we excavate it.
MB less than ½ gallon water removed.

7/18/14 cont

1330 ~~lunch~~ lunch ~~make to~~
1330 make to Charlie - see how operation is going take photos. Collect samples from Charlie excav. for PID analysis
042C + 043C were from inside excavation limits, had elevated PID + odor. Samples 044C, 045C, and 046C were from exterior sidewall and had very low PID Readings and no odor.

We had to head PID readings back at camp. a large blonde brown bear was on beach 100 yds away - apparently trying to get to walrus carcass notify everyone at camp.

1400 make to able - pump pipe dry - removed 4½ to 5 gallons. Noted other crew members cannot get to Charlie. Bear on walrus MB

7/18/14 cont

1500 finish up Able. Make to X1.

1515 @ X1. no water. Bryan takes photo - move on to Dog.
Dog had almost 1' of water - removed 2 gallons and contemerized w/ other water.
approx 8 gallons total were removed from Able, Baker, Charlie, and Dog.
Make back to camp - tank is weighing bags. observe. -

1640 Call Emerald regarding renumbering manifest # on non haz waste labels - Rhonda said it is fine as long as waste profile is the same. Good.

1700 make to Charlie - pull flags and get equipment retrieved. when we had the bear

MB

7/18/14 cont

1800 prepare to collect pre-GAC water Samples 14PCW001WX (from ABLE, Baker, Charlie, Dog)

1815 collect pre-GAC Samples

1825 pump water through GAC Slowly.

1930 Dinner

2030 collect post-GAC Samples (used 2100 on labels) - done with fieldwork

2200-2300 prepare DQCR for 7/17 + 7/18

MB

22

7/19/14

0745 Safety meeting
0800 prepare for overseeing the over-excavation of the NW corner of Baker excav. we had a high PID hit in a floor confirmation sample there. Calibrate PIDs YELLOW 99 PPM GREEN 104 PPM
0845 remove ~1000 lbs and take PID Samples (see log) still elevated PID on floor and western side wall
0850 Breathing Zone PID = 0.0
0945 Crew takes 2 supersacks back to west staging area
1020 Return and Dig 2 more Super sacks. PID readings still elevated on floor and western edge - make 2 back to staging area.
1145 return to site
1155 resume digging - remove 2 more bags (6 total)
MB

23

7/19/14 cont

1200 Breathing Zone on 0.0 PPM PID = 12.4 in one corner decide to take out another bag.
See PID log for results. (7 total)
remove 1 more bag - PID readings are all < 10 PPM pretty much excavated to permanent west cap casing ~40" bgs.

Return to camp - figure out which Baker Samples to send to lab
1700
return to Baker - remeasure excavation dimensions need 2 floor + 3 sidewall based on size. also need 2 Loading footprint Samples
MB

24 7/19/14 cont

PID Location 010B was excavated. use 011B instead

Figure out Samples to send to lab — prepare labels — discard unused Samples. Reice and bubble wrap all jars from Baker, Charlie, water. prepare all COC forms.

Return to Site w/ Pin flags for Survey

2200 finish up notes

MB

7/20/14

25

high clouds 30°F. 30 mph winds from west.

8 Safety meeting

830 get ready for work. Calibrate PID. Green = 98.2 ppm yellow reads 102.

Make to Charlie - PID some locations that were cleared yesterday + look at Breathing air — Sea logs

Bill repositions excavator to east so he can reach further east. The area we marked previously appears to be accurate except 006/c seems to be too low — 035c - out is elevated. though.

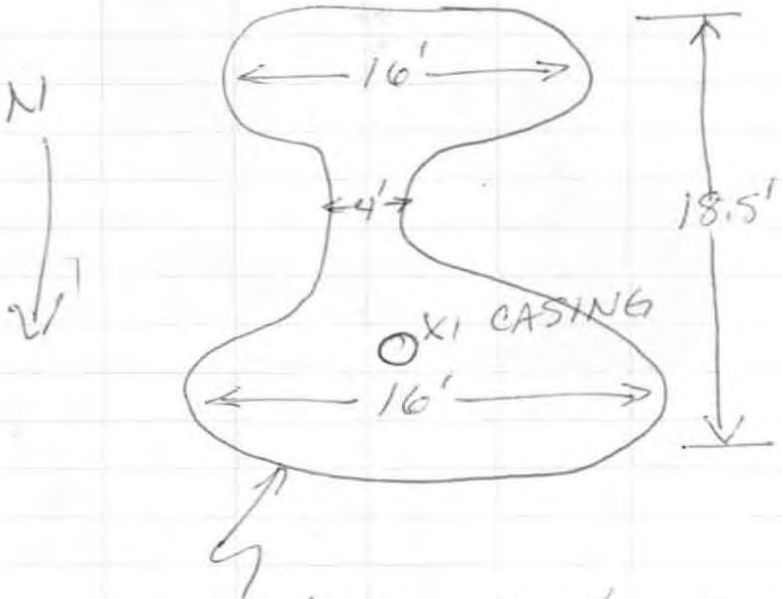
0940 talk w/ Bill. He has a pile that will keep him busy all day — we will delineate X1.

1030 arrive @ X1 — use GPS to mark out old (2010) Sample locations and proposed PID Sample locations.

MB

7/20/14 cont

collect + screen PID Samples - always used Sample bath to warm Bag Samples prior to screening. Delineate X1 - 1300 pm out



all X1 Samples were collected from a depth of 6" - bedrock underneath.

MB

7/20/14 cont

Lunch @ 1315

1400 return to Chuckie - check on progress + perform air monitoring. They are digging in the most contamted area on east edge of pad.

1430 encountered Brown Bear on way back from Chuckie near walrus carcass.

1530 arrive @ Dog - use GPS to mark out 2010 Arcadis Sample locations and proposed PID Screening locations along perimeter of ~~the~~ Contamted Soil. Dig along east edge of pad to scope out where to collect Tundra Samples. gravel pad extends out further east than previously shown on maps. also noted that pad and tundra are POL Stained all along eastern edge. move out and collect non-stained soil in MB tundra. See tracking log.

7/20/14 Cont

1700 Collect PID Samples from DOG PAD. Rough in limits of contamted soil. Need to do more.

1830 Pack up and go back to camp.
Fill out COC forms, tracking logs, etc. before dinner. Sample ice is still good. "Extreme" coolers work well.

1930-2013 Dinner

2015 Pack Samples collected today and then fill out timesheet.

2100 fill out Daily QC report and catch up on notes. Talk to Bill about sending Dailys to USACE. need some scans.

MB

7/21/14 42°F overcast 10mph winds from NE.

0800 Safety Meeting

0815 Cargo Dark Brown Bear on ~~other~~ east side of Ogotoruk Creek. He moved east. Have Bill scan my tracking and COC forms. Call Emerald - regarding filling out manifest. Calibrate Both PIDs

0900 Head out to Thule a/Bryan Screen sidewalls and floor (PID bag samples) to verify they have excavated far enough. See PID log + figure with locations. Looks good except for small section near Thule needs to be further excavated. Bottom of excavation ~~Hoo retun to~~ is in to light Olive-Silt gray (Tundra), so Method 2 levels would apply.

1100 return to camp - Verify with Hilary that no plans today - one scheduled for tomorrow. Pack all Samples into one cooler - get it ready for Shipment

MB

7/21/14 cont SAME weather

1200 Return to Charlie
PID Screen Samples collected for NE wall of excavation near edge of pad. Find area with black stunning + high PID nearest edge of pad mark out area on tundra presumed to be contamted (based on visual observation + olfactory) with yellow/greenish pin flags (note Lab samples were collected approx 5 feet further out.) also, tundra only appears to be impacted near surface on eastern fringe. it is pretty easy to delineate ~~visually~~ hot soil visually (shiny gray/black stain)

1400 Back for lunch — email Melanie back — try to call her on Sat phone but had no luck.
Call Northwestern — call to discuss flights + gear. to send up.
Email Justin @ SAS regarding cooler of Samples for tomorrow.

7/21/14 cont

1445 Back to Charlie
Try to call Melanie — sat phone still won't work.

1515 Talk w/ Bill about daily's. Water ponding in low area has black oil floating 3'x12' Wind pushed it to southern edge Tank filling bags for excav.

1530 Return to camp — Bryan downloads pics — el work on scanning sheets — create spreadsheet for corner weights, prepare daily reports in pdf.

1900 Dinner

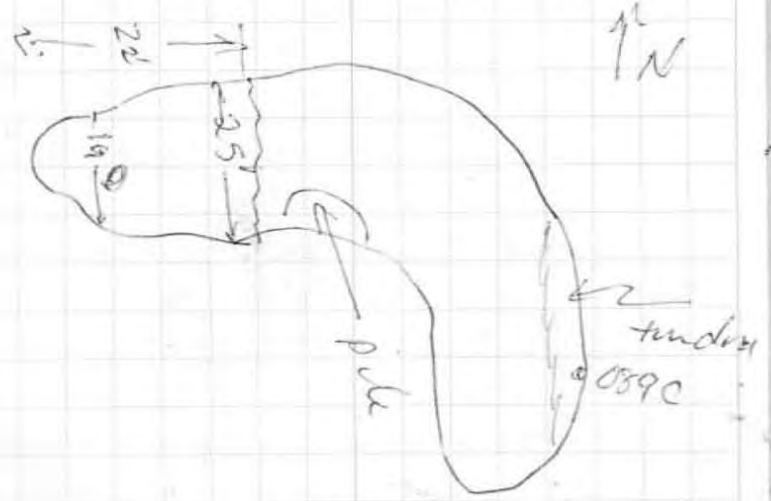
2000 done w/ daily report.

MB

7/22/14

0800. Safety Meeting
give Bel all our photos and daily reports on a thumb drive
Call Northwestern - they will arrive ~1015 this morning -
weather is good all the way
Weather @ Cape Thompson - high clouds 10-15 MPH wind from North - Blue sky to coastal mountains. Talk to Linda about ~~field~~ treating our sample coolers. "One cooler address on it. Keep Cool - Do not freeze + forward me waybill so I can track to Lab"
Have Bryan take cooler to airstrip after inserting/signed COC forms + Custody Seals
0830 walk to Chukie - talk to Jim (operator) about where to excavate into tundra and southern extent. Clean light gray sands @ 20" depth immediately

7/22/14
filled with water. Trying to figure out what to do to excavate in dry area.



tundra area is stained on surface but is not stained deep as esp. go out further east. take lab
0945 sample for light gray clay about 1 foot down at top edge of permafrost. (089C = 125 ppm) will use for correlating Method 2 anoxic zone
1020 plane arrives - drop off cooler

7/22/14

1040 Cut Charlie casing frozen. Sand 6" down. tried to collect sample but it was actually just an ice lense - bottom was 14" down. Tried to get sample with driven probe - no recovery - ice? fill with bentonite pellets and hydrate. Weld cap on - small generator not big enough go get big generator
continue to map out tundra contamination - have operator remove grossly contaminated soils
1200 take PID samples along southern edge of excavation - see PID logs - for details.
Check breathing zone air for bug loaders - 0.1 ppm. Good
10 MPH Breeze from North
1300 work on evaluating tundra to be excavated.

tundra
- 0-4" Vegetation
- 4-12" Black stained soil + roots
- 12-18" PEAT LAYER
- 18-20" LIGHT GRAY CLAY
- 20+" FROZEN

MB

7/22/14 cont

guide tundra excavation. Per contractor extends to permafrost. Collect floor samples along perimeter - pretty high PID results in some locations (see PID log)
Collect PID samples on sidewall at permafrost interface - still pretty high readings (up to 400+)
collect some ~~QC~~ PID/Lab Correlation samples to help determine potential limits of excavation - Method TRO soil cleanup level is 12,500 mg/kg - We are approx. 5' from where tundra samples were collected previously.
1715 pack up and head back to camp. fill out sample tracking sheets + COC for. poor Coolers. ~~of~~ Call Linda

MB

7/22/14 cont

at Northwestern to get Coldstream tracking # for cooler shipped earlier today. Call Justin Nelson I left to coordinate shipment + TAT.

[5 day TAT for Water
[3 day TAT for Soil.

Daily report and paperwork 2130 done.

Dinner

— talked to Ken about scales "Check weight dead on" — both scales reading exactly the same.

MB

7/23/14

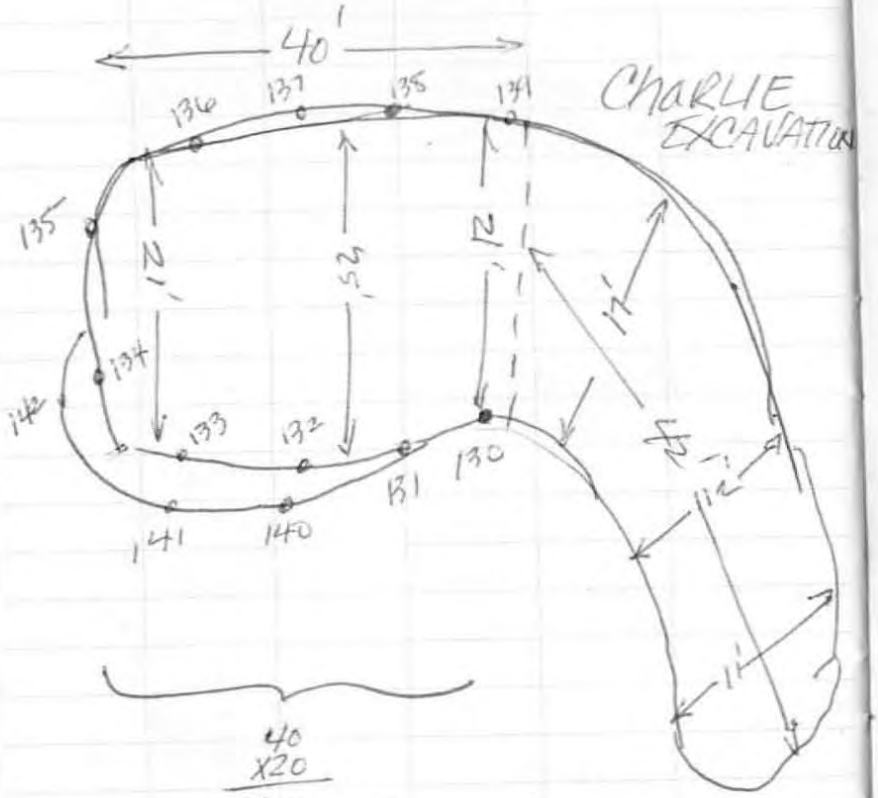
0800 Safety Meeting
0815 Call NWestern w/ weather update
0830 — weekly meeting w/ Client discussed what has been completed and what we plan to do in upcoming week. Talk to Rich about logistics and schedule, weather, flights, resupplying.
900 prepare Coolers for shipment — Sign COC and custody seals — ice is still rock hard. weather — deteriorating
915 Call NWestern — weather report. Jami (Medic) is at Lo Bay — will fly now as it's only getting worse.
930 prep + pack Hovde + trailer Tannik is fueling + swapping Camp generator; pumping water
1020 Plane + Medic arrives. Ship out 2ND Supply cooler and Peri Pump rental.

MB

38

7/23/14 cont

mobe to Charlie – Measure excavation w/ Bryan (see below)



39

7/23/14 cont

Collected Sidewall Samples for PID Screens (130C – 139C)

133C – 135C ← over excavate 4' South

Collect lab samples from marginal location on N side

137C + 138C (plus field dup)

(24.5 PPM) 14PCC02550 @ 1145 MS/MSD

(33.1 PPM) 14PCC02650 @ 1200 + field dup 14PCC02750 @ 1210

1230 Lunch

1300 talk to Ken about estimating extent of POL contamination

1400 Dig. Mobe to Dig. take several PID samples to delineate. Collect PID

1500 Correlation Samples

PID-021D	PID-041D
14PCD00950	14PCD01050
@ 1525	@ 1645
PID = 10.1 ppm	PID = 22.5 ppm

Mark out rough limits w/ paint

look around site → measured 41' X 51' = 2100 ft² ÷ X 2' deep

→ 25' available for maneuvering LHV w/ trailer MB

7/23/14 cont

try to pull up landing mats out of tundra w/ 4 wheeler unsuccessful - will take some digging or heavier equipment

1800 pack up and make

1830 back to ~~Site~~ Camp

unload — paperwork

Dinner

2115 Finish Daily Report

Note that PID read 127 PPM at end of day so PID readings may have been elevated.

MB

7/24/14

8 AM Breakfast + Safety meeting

3' calibrate PID — 100 PPM Isobutylene reads 98.7 PPM.

9 Drive to Chunlin, note that they started filling bags outside of excavation.

Collect 2 PID Location Soil for lab analysis → put samples after peeling back liner at 0945 to 0950 on gravel pad

LF1 PID = 2.0

LF2 PID = 2.0

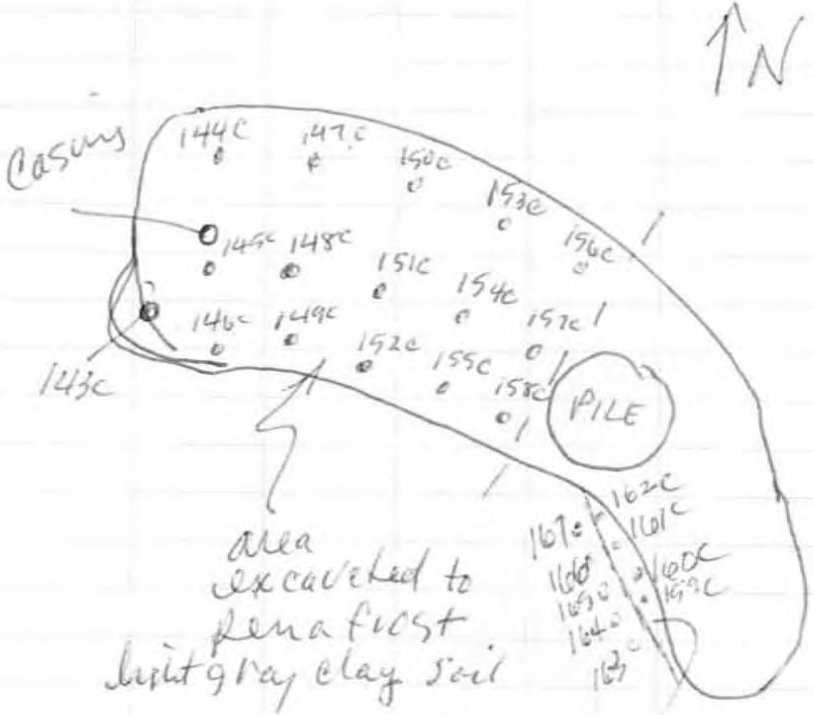
NO

Weather 39°F and humid light intermittent rain ~10 MPH wind from North

MB

7/24/14 cont

1000 Collect 16 floor samples from 900 sq ft - North section of Chamber Excavation



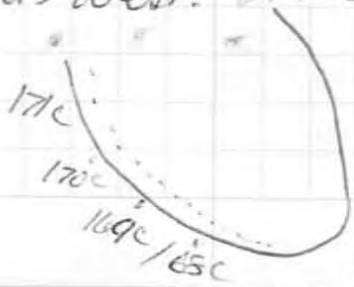
Lab samples from
143c
145c
154
156
157
158

MB

7/24/14 cont

1310 return to site - Tanner fills more supersacks
PID - (B breathing Zone = 0.0
10-15 mph wind from Northwest
1325 Plane lands - unload weekly groceries ship out
winds increased to ~20 mph
Standby while crew moves filled bags to west staging area.

Collect PID Samples 159c - 162c.
all 4 are elevated - hmm
Jimmy excavate 2½' to west (to the Northern Loading area foot print flag)
Collect PID Samples 163c - 167c
Results ranged 13 - 24 PPM -
1520 Have Jimmy take 4th 1 more ft. towards west. LF1 excavated



1540 Collect another Loading Foot Print Sample LF3

MB

7/24/14 cont

PID 168C - 171C were elevated excavate another 2' to west. note LF2 was exc.

Lower

Collect loading footprint surfaces @ 1650 + 1700
(LF4) (LF5)

return to camp.

Book 2

Proj Chant

2014 Remedial action

Rite in the Rain.
ALL-WEATHER
LEVEL
№ 311

Tank Contract #
W911KB-14-C-0002

Mike Boese
Fairbanks Environmental
Services

Start date 7/25/14

7/25/14

745 Safety meeting
Spot 2 Grizzlies on east side of Creek

0800 pack coolers for Sample Shipment #3. contact Linda and let her know about coolers. Call Lab - left message talked to Craig Martin regarding progress + what to invoice. also about lab results and a tentative plan to request ADEC Closure of Baker pending lab results (due today).

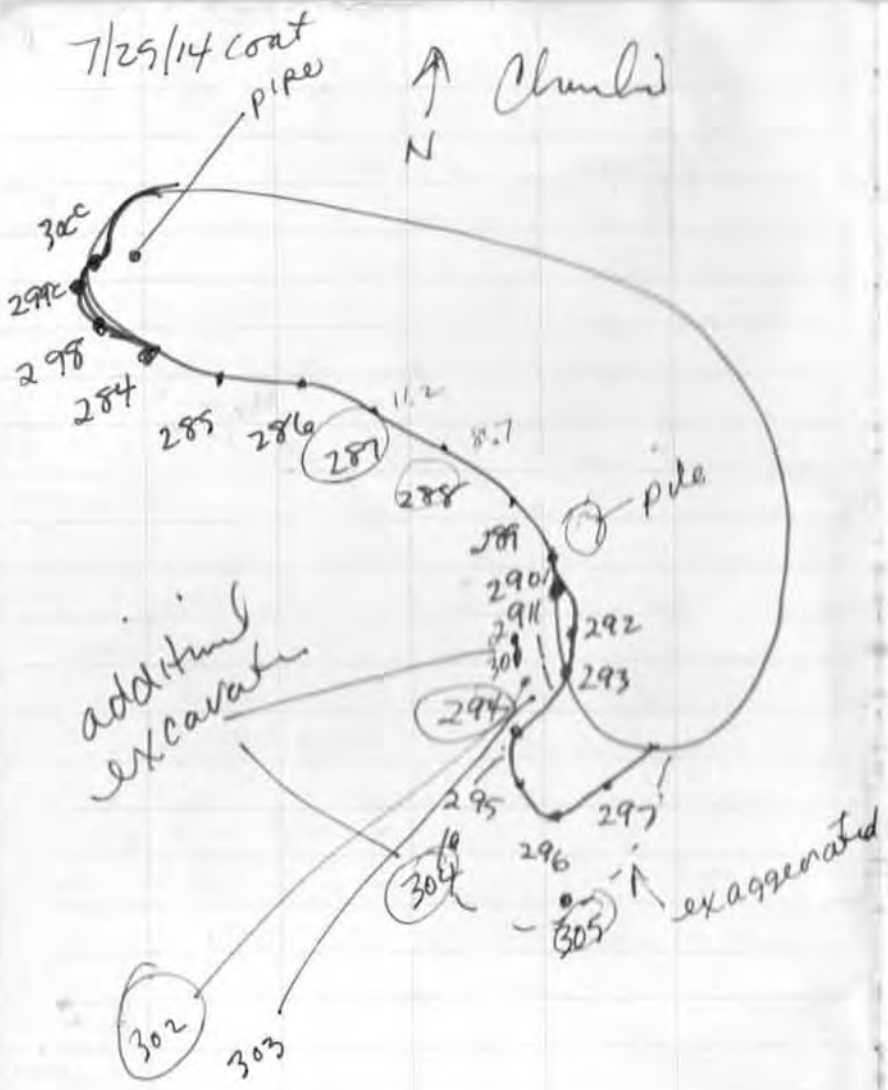
1000 plane arrives - Ship Supplies. Unload food, etc..

1030 talk to Bill regarding estimated ~~Amounts~~ quantities of POL soil @ X1 and Dog, and plan to get more connexes, if needed.

1045 work @ Charlie excavation w/ Bryan - PID sidewalls - remove additional soil on inner mat sidewall

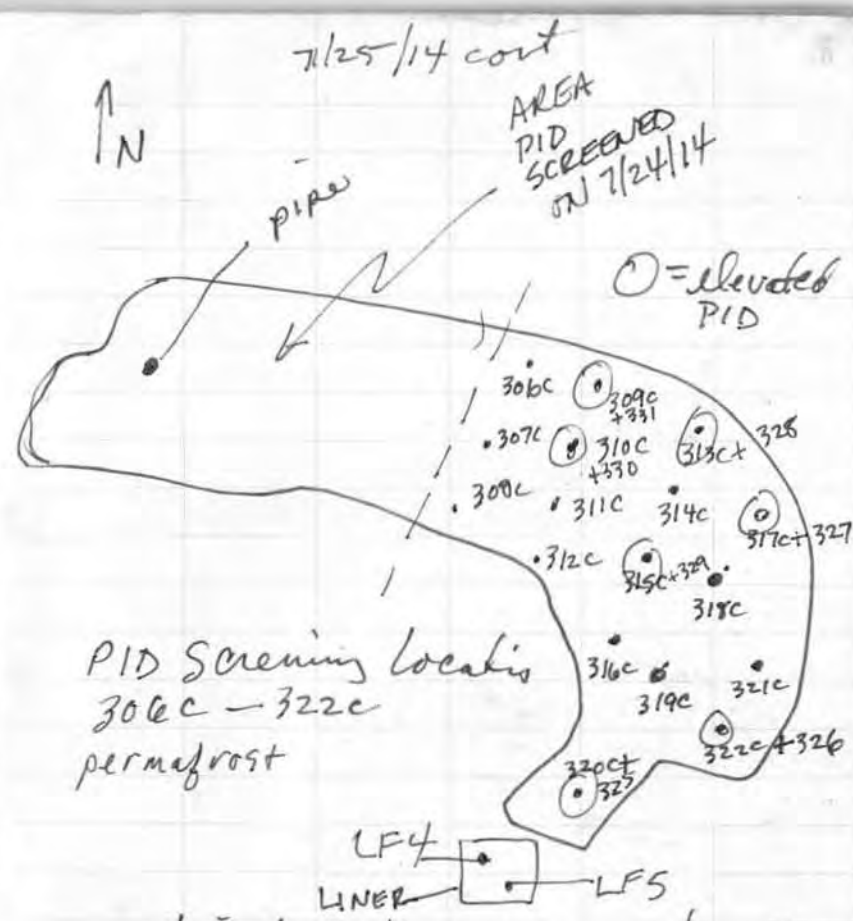
MB

7/25/14 cont



1245 lunch
- after lunch we resumed floor PID screening after Tank finished loading/removing soil from excavation MB

7/25/14 cont



PID Screening locations
306c – 322c
permafrost

estimated the excavation to be ~2000 square ~~yards~~ ft.

AFTERNOON

Collected post loading footprint samples from LF4 and LF5.

→ PRE-EX DELINEATION OF DOG 40×52×2 = 150 cy's
Daily Report Sent 8:30 PM

MB — Based on Surface Screening

7/26/14

Send Baker field auto to Clary

Calibrated both PIDs – both read ~103 ppm using a 100ppm Isobutylene std.

8:10 Make to Charlie's at Bayou Res Screen, elevated floor, locate PID ident/find yesterday (Nupheat 7) using slide hammer coring device to get below slough.

	old		New	
324C	97.1	325C	2.7
322C	60.1	326C	12.3
317C	62.2	327C	11.0
313C	95.8	328C	23.2
315C	101.0	329C	50.1
310C	275.1	330C	94.4
309C	235.3	331C	52.4

Collect 6 additional floor samples for Lab comparison from Nupheat PID

314C, 317C, 321C, 329, 330, 331C

Collected 6 earlier from other half of excavation

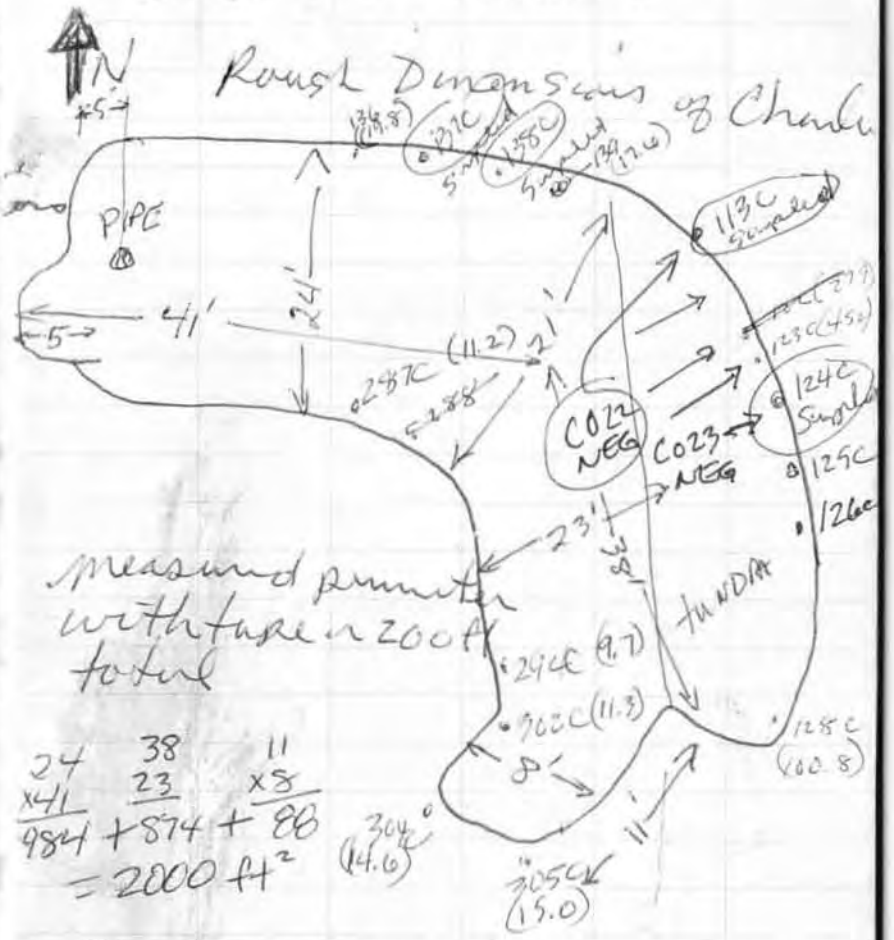
Total 12 floor samples

(ADEC required only 9 based on 2000 ft²) MB

7/26/14 cont'

Bugs are horrible

Roust Dimensions of Charlie



measured perimeter with tape in 200A total

24 × 41 = 984

38 × 23 = 874

11 × 8 = 88

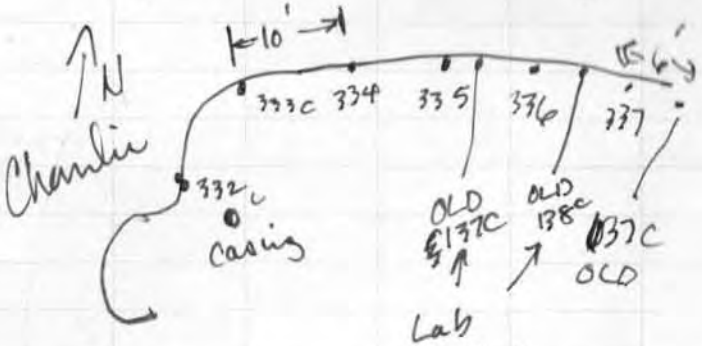
984 + 874 + 88 = 2000 ft²

1200 lunch

1250 collect Rusalate from SS driven probe used to collect floor samples at Charlie MB

7/26/14 Cont

1300: Decided to re-PID North wall of excavation to Determine sidewall Sample location NOTE that we need to lab Samples and we have collected 4 more per state guidelines



MB

7/26/14 Cont

1500 arrive at X1. excavate to 4' depth - Very high PID readings
enlarge excavation taking several samples - still elevated in all directions. Temp
prepare Stockpile Area of excavation to place patent clear overburden - prepared earthen berm around edges

MB

10

7/27/14

745 Safety Meeting

800 Calibrate PID. Hexane = 100.8
Yellow 100.1
finish COC bins and packing Cooler

820 Call Northwrecker

850 place Cooler w edge of airstrip.
work on Baker Fig. for ADEC Closure

1030 plane arrives - picks up cooler of Supplies and drops off propane + gel ice that we requested.

1200 Send Craig tables + Sketches for Baker
lunch

— organize paperwork - awaiting award of options before any additional excavation. Bryan double checks weight of soils we are ___ tons Shy of base 272 ton limit.

— Map out Chemlic excavation for ADEC report/approval

MB

11

7/27/14 Cont

talk w/ Craig about contents of XL (high PID readings and depth) and possibility of options being awarded or not.

send emails to Bill to request priorities if contract doesn't cover it all. options

MB

14

7/29/14 cont

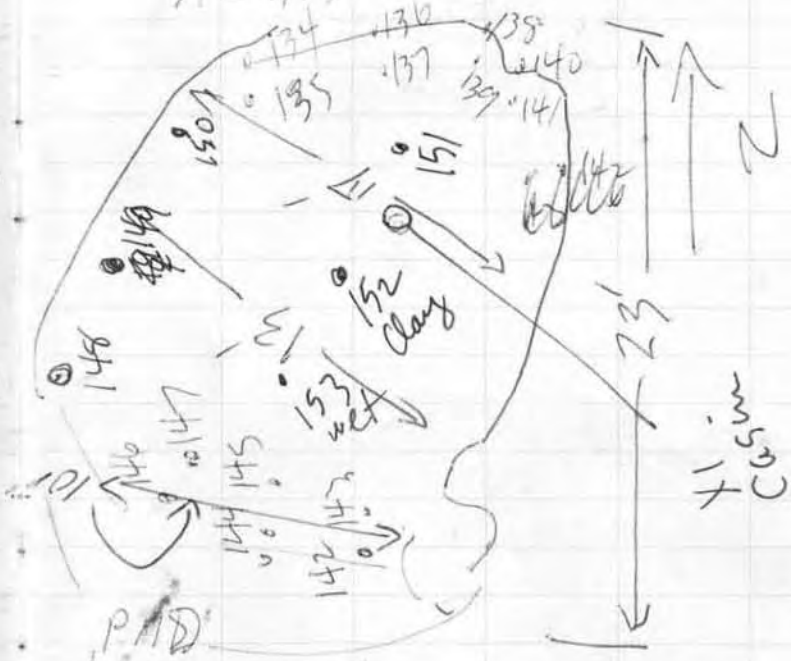
Removed overburden

Put on stockpile

MB

15

7/29/14 cont



Loc	Depth
134	24
135	55
136	36
137	51
138	20
139	54
140	25
141	55

PID

142	28
143	44
144	28
145	54
146	30
147	60
148	58
149	60
150	52

MB

18

7/29/14 cont

1830 done digging
1850 back at camp
1900 Dinner
2114 Send Daily Report

MB

17

7/30/14

0730 Pack cooler w/ X1 PID Correlation Samples
0830 Weekly meeting w/ USACE 233 tons in options have been awarded.
0910 Calibrate PIDs
Green = 100.1
Yellow = 99.3
} w/ 100 PPM Isobutylene std.
0945 arrive at X1 w/ Bryan. Collect pre-loading area footprint samples since they moved loading area #XLF3 PID = 5.4 no petroleum odor - organic Take photos of rocks encountered in excavation
1030 Rick Hutton arrives - offload gear + EMT gear. Crew settled, Glenn Rick Charley, Baker, Abler, X1, and Dog Sites. X1 is still growing.
1300 Lunch
Call Melanie (not there) then Aaron Sherman MB

7/30/14 cont

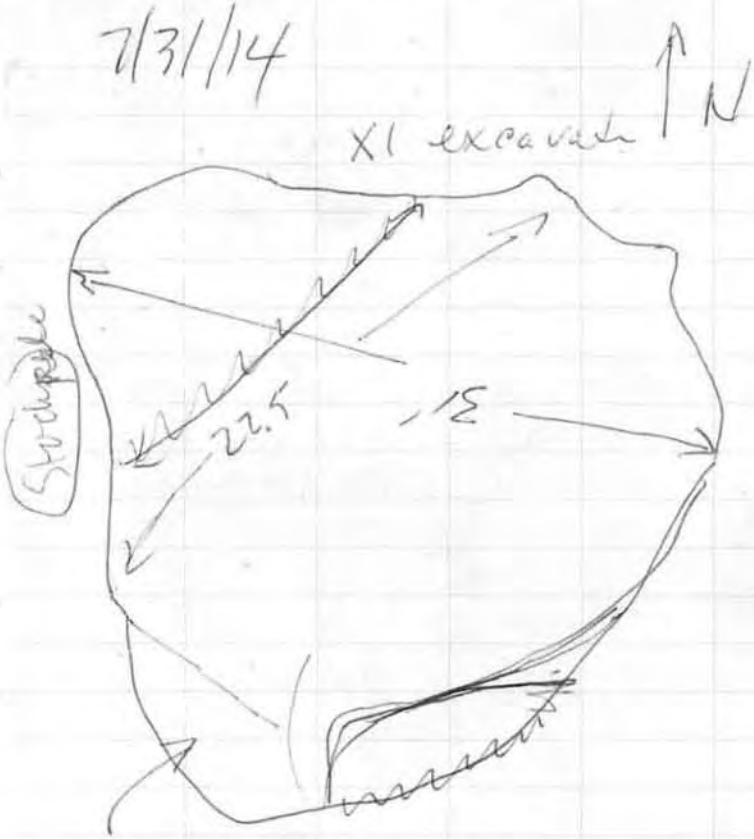
1400 – 1845 with X1 excav. and trs to identify chan limits.
Excavate ~18-20' NW of X1 and readings @ 36" bgs begin to drop.

1900 Return to camp.
talk w/ Rich + Dennis

2200 Send DOCR out

MB

7/31/14



measure X1 excavation with Rich.

evaluate conditions of Chamlin excavation w/ Rich
look at old Navy Radio Mon Chamlin.

MB

7/31/14 cont

1300 receive lab results for chunks

4PM — Send all summaries & Chunks intv to Adam. Shannon + Melanie finalize tomorrow

Prepare DACK. → Send out DACK after Diner. Summarize status of all assoc. sites

TTT Package still hasn't shipped out of anchorage 027-5155-7236

MB

8/1/14

0750 calibrate yellow PID. 100 ppm isobutylene reads 99.8. Cal check on green PID — 100ppm reads 1049 ✓

800 call Northwestern w/ weather update — foggy w/ no visibility — will update Northwestern later today — they have weekly food shipment.

815 prep for fieldwork. Tank is driving Trex to east side of creek. and will place X1 bag into the empty connex on the east side of creek.

830 — drive Trex across

box → arrived in OTZ last night about 8PM. Nwestern will pick them up and ferry them to Chunt on next flight

MB

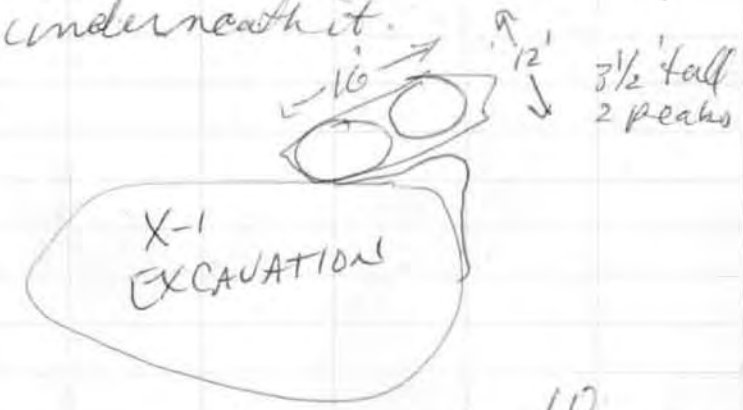
8/1/14 Cont

1030 tcecon w/ USACE.
Discuss newly constructed trail ~~road~~ needed to get Terex to East side. Melanie is checking on regs. Discussed VOC reporting from X-1 Stockpile – Due this afternoon. Also requested USACE review Navy Cargo Reports to see if they document unused fuel etc because size & soil contamination at X-1 does not seem to be consistent with a drilling operation. Lastly ADEC closed Chandler exc. if Samples CO3950 + CO4050 were in tundra – which they were.
Requested TCC per Melanie
1110 emailed photo of ~~road~~ trail to Melanie + Adam

MB

8/1/14 cont

1300 – decide to sample existing stockpile at X-1 in case we need to dig underneath it.



Decided to treat as 2 stockpiles based on segregation + PID results

MB

24

8/1/14 Cont

LOCATION	PID	PID
SP1 (213X)	71.4	Lab
SP2 (214X)	51.0	
SP3 (215X)	4.8	
SP4 (216X)	54.7	
SP5 217X	4.3	
SP6 218X	4.2	
SP7 219X	3.9	
SP8 220X	3.6	
SP9 (221X)	22.9	PID
SP10 (222X)	9.4 PPM	PID

X SP 1

X SP 2

Lab Sample 14PCX02350

Lab Sample 14PCX02450

Cleaned out ice in cooler added 2 stockpile samples to COC form. Placed some non-frozen gel ice in freezer prepared DQCR.

received X-1 results and prepared DRO to PID correlation table - Data matches much better than first two samples for X-1

25

8/1/14 Cont

FOR X-1:

250-300 ppm PID = 10,000 mg/kg DRO

Finished DQCR after dinner.

FOGGY ALL DAY - FOOD PLANE COULD NOT FLY IN. 10 MPH WIND FROM NORTH 45-53°F

MB

8-2-14

Calibration Check

Green PID – 100ppm Std = 103.9V

Yellow PID – 100 Std = ~~118.7~~

recalibrate at 100 = 100.3V

Reconcile weights of bags loaded into Connex so to date. Noted last 2 exceeded 42,000 lbs gross — added tonnage to get them less than 42,000.

1000 collect loading arm Foot print Swipe (PID 223x) Start digging West side of excavation

Foot moved in - Cold

Excavate NW Corner to below 200 ppm. Excavate N wall ~2' till pid reading were <200. start working on ~~EE~~ Wall

1230 lunch

1330 return to work on ~~EE~~ Wall

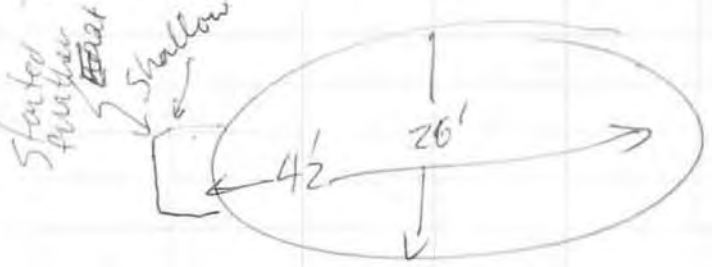
MB

8-2-14 cont

1345 Collect PM - Stockpile Swipe XSP3 install 10 mil clean NE corner of excavation. Place ~1' overburden on plastic

Excavate further to east (on east side of storm pipe location) 2-3' foot sections of 2x4" (wood) and a 1½" piece of steel channel was excavated approx 12' east of X-1 casing at 2½-3' bgs

1728 Excavation measures 42 x 26



1730 unearthed a workman's glove used for fuel

MB

8-2-14 cont

excavated further to east. may have found eastern extent, but we aren't done to remove & get entire

1815 install liners around stockpile

1830 back @ camp. log samples in.

1900 Dinner

1930 pack coolers w/ soil — plane will be here around 7AM tomorrow. w/ food. prepare DQCReport.

2100 Send out DQCR

MB

8/3/14

0710 plane arrives w/ weekly food shipment. Also received supplies from TTT and 1/4 coolers from SES. Breakfast.

0740 Call for Barge Company — they will be @ Chart around 1030 w/ extra connexes.

0800 Calibrate PIDs:

Yellow - 100 ppm reads 102.5 ✓

Green - 100 ppm reads 95 — needs recalibration. 100 ppm Std reads 99.7

prep for Barge - get manifest ready so if they take a full connex, we will be ready

1040 Barge lands on east side. unload 16 empties on east airstrip. Move to west side - grab 4 empties and 1 connex w/ fuel.

1310 transport the 5 connexes to east side

lunch

MB

8/3/14 cont

1430 weigh last 39 bass.
both scales 100lbs = 100lbs
also added 100lbs to
a bag and it registered
correctly 2892 → 2992

1600 Start loading weighed
sacks into commies

1700 – a fitting busted on forklift hydraulic line – minor release of fluid – scooped into bag and wiped up with absorbents. Less than 1/2 gallon so not reportable

stained soil

daily paperwork after dinner

MB

8/4/14

0800 calibrate PIDs
Yellow 100ppm reads 100.1ppm ✓
Green 100ppm reads 90 – recal
100ppm reads 100.0ppm
call Lab – samples made it and temps were good.
RUSH Results by Tuesday 5 p.m.
Call Nweather w/ weather report good to fly.
Weather – clear 49 °F
15 mph wind out of North
NO Bugs & No Bees
0840 @ X1 – Set up Sampling table. excavation looks same but there is more water in bottom
excavated further to SE
found soil screen ~~and gasket~~ in top 1½' overburden. found 6" blk rubber gasket @ 5½' depths. Further SE soil was contaminated @ 6" bgs so no overburden.
collected

MD

8/4/14 cont

continued excavation towards SE – pinching down in width. Collect 4 PID samples at end wall – and all were below 50 ppm. Stop advancement in that direction. Soils are layered and appear to have never been disturbed. (end wall @ SE extent)

1230 lunch

1300 call lab – nothing (lab results tomorrow) and Aaron Shum @ USACE.

① – where are we with contract options – don't know.

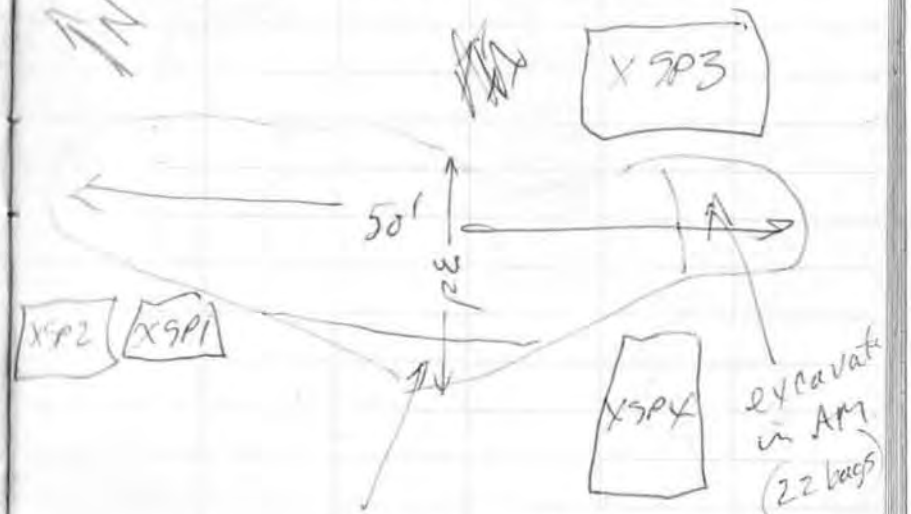
② Aaron requests that we estimate out our logistic + capacity if DoE wants to onward even more. Back to XI 4

1515 Bill Lang arrived via Northwestern 206

excavate the Southern edge (22 sacks before lunch) MB

8/4/14 cont

Collect pre stock-pile footprint and pre loading area footprint samples and we put clean overburden in stockpile prior to excavating contaminated soil. XSP5 + XLF6



Stop @ contractual limits

1730 return to camp MB

34

Jenson 8/4/14 cont

Labeling samples - fill out COC
- bubble wrap + baggie sample jars.

4 new Coolers arrived for Sara.

Dinner

Prep DAGR - Send out to USACE, etc.

Calculate # of side wall and floor samples based on size of excavation ~1600 sq ft + 164 linear feet circumference

	Screen	Lab
FLOOR	24	8
Wall	~17	9

MB

35

8/5/14

ReCalibrate both PIDs after Safety Mtg
Yellow 100 ppm Std reads 99.9
Green 100 ppm Std reads 99.5

845 arrive @ X-1.
Set up 24 floor Samples

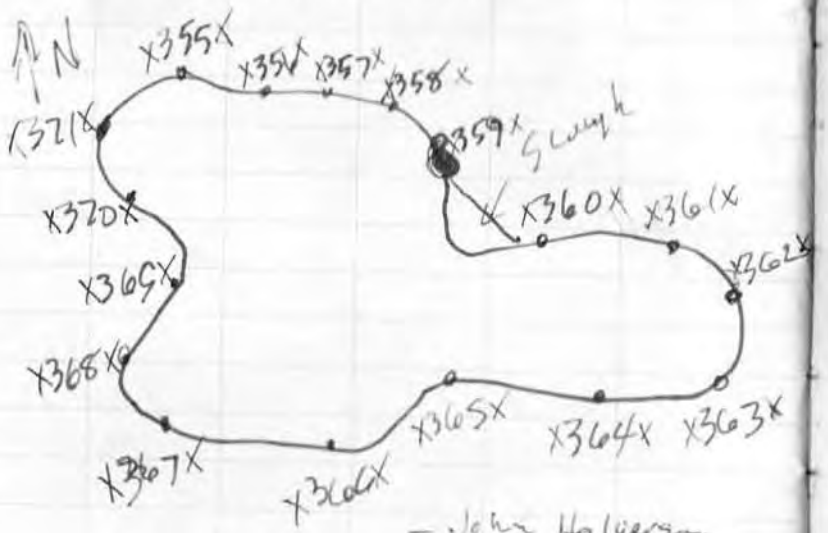
Lab Samples - See PID Log

334X	349X
336X	353X
338X	
341X	
342X	
345X	
348X	

MB

8/5/14 cont

Collect screening samples from sidewalls



- John Halverson
- Judy Miller
- Mark Kautsky

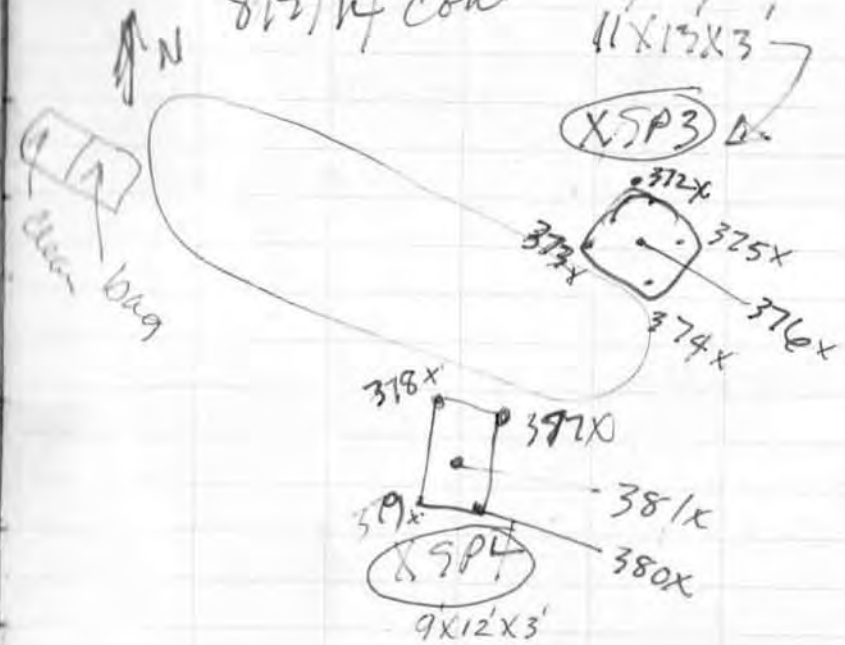
1215 Lunch

1315 — escort DOE + ADEC to Baker - explain work performed there

357X
358X
360X
366X
363X
364X
356X
359X

↖ Return to X-1 and collect sidewall samples from 48" bgs - some were elevated @ 48" but low @ 36" ←

8/5/14 cont



1600 Collect stockpile XSP3 Sample for 372X = 304.3 ppm

1630 collect stockpile XSP4 sample for 378X = 16.8

John Halversen indicated arctic zone cleanup levels apply to X-1 - but use 500 mg/kg for Stockpiles (yesterday) for samples X051 + X052 from 358X in PID Log book

- see sample PID locations in PID field book

MS

8/5/14 cont

1045 @ test hole Chunks SWINGTIES

prep for back filling Chunks on 8/6/14.

1700 Return to camp. Label all sample jars and fill out COC forms. Bryan bubble wrapped + placed samples in baggies - prepped Coolers for shipment (tomorrow)

1930 Prepared DOCK + emailed to ASICS.

& MB

8/6/14

0745 Safety MTG

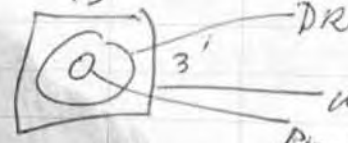
800 Calibrate both PIDs Yellow + green = 99.9 ppm with 100 ppm std.

0830 Weekly meeting - phone down - Backup @ 0837. call in.

0930 arrive @ Dog - excavate around casing - remove drum and wooden crib. Water ponding @ ~~the bags~~ - 2 ft bgs tundra clay @ 22" bgs - frozen

test pit @ Northeast side of Dog casing 3' bgs - collect 3 PID samples for Sample Interval 0-1', 1'-2' and 2'-3' - wood crib to 2' bgs

Depth	PPM
0-1	176.9
1-2	103.8
2-3	53.1



dig a second test ~~hole~~ pit 25-30' east of pipe locate @ edge of pad - grab sample @ 1' bgs -

MB

8/6/14 Cont

Surface — 0"
Vegetation mat
— 3"
Gravel.
— 18"
tundra
clay
frozen @ 24"

Called PID for

		PPM
0-1'	PID -	0550-118.7
1-2'	Loc.	0560-76.0
2-3"		0570-109.3

Collect lab samples from 3 horizons 14PCD01150, 1250, 1350 @ 1050, 1055, + 1100.

Plane w/ Media @ 1050 + 1100.
Update COCs and add 3 samples for DUP + add them to cooler

MB

8/6/14 Cont

1140 Interviewed By Bob Gallus aka Dispatch

1200 lunch
1300 talk w/ John Halvorsen briefly.
1330 Media depot site Email from USACE regarding status of DRO silica gel analysis — requested it for lab on Sample X0545D.
1400 Bryan goes to cut pipe @ Dog — no soil - so no soil sample.
1530 Reliable orange pin flags with Sample LOC ID number @ X1 excavation w/ Bryan
1630 perform Survey tie on all orange pin flags (Sample locations) because Tank wants to backfill the excavation. Installed Control points and measured all locations for at least 2.

See page 46 + 47

MB

8/6/14 cont

1730 Back to camp – talk to Ken about removing fir flags in tundra – nests. DO not disturb these – they are outside of pad.

daily paperwork after dinner

MB

8/7/14

1500 Safety Meeting
prep for cleaning. Pack up sleeping quarters and work convex
– Emailed Angela – ordered more labels + magnets
1015 Northwind arrives – stands on east side due to north winds.
weather – sunny – 20 mph North winds ~55°F. No bugs!

1100 leave Cape Thompson fly to Kotzy
1200 arrive in Kotzy.
2100 leave OTZ
2230 arrive in ANC.

MB

8-12-14

840 Check in w AK airlines talk to Sean Benjamin about VOC results from X-1

1020-1200 Fly to Koty

1240 Load 206 - fly to Chariot.

1335 Land w site on 2nd airstrip due to 30 mph winds from SE. Unload gear & camp. Lunch

1430 Make to Charlie replace all pin flags for survey using swingties from 8/6/14

1630 Stapled all Waste Profiles to existing Manifests - put all NON-HAZ labels in order. Bryan installs new printer/ scanner in our tent

1700 Dinner

1800 Go to Able + Baker to photograph contoured sites

MB

8/12/14 cont.

1900 Decide to collect Smpls from far wall of X-1 excav based on PID / Lab DRO. Results for the other confirmation Smpls from X-1 - prep for Samplings, prelabel Smple Jars except for times

1940 Make to X-1. Collect Smpls from 4 locations

OLD	PPM	NEW	PPM	Lab Smple
~~3607X~~				
3608X	378.1	352X	712.0	X001
3609X	426.0	353X	427.7	X002
370X	632.4	354X	548.8	X003
371X	650.6	355X	343.9	X004+65

↑ FIELD DUP

Smple times

01	1950
02	1948
03	2000
04	2005
05	2010

MB

8/6/14 SWING TIES – CHARLIE

LOC	CP1	CP2	CP3
PIPE	41.5	51.5	
C029	38.0	56.5	
C028	43.5	50.5	
C049	57.5	44.0	
C030	66.0	39.5	
C031	73.5	20.5	
C026	71.5	20.5	
C032	73.0	25.5	
C033	71.0	34.5	
C025	60.5	31.5	
C012		17.0	42.0
C022		24.0	35.5
C044		26.5	33.5
C023		29.5	30.5
C045		33.5	26.0
C046		37.0	23.0
C013		27.0	34.0
C014		35.5	25.0
C015		47.0	13.0
C038		45.0	15.0
C047		50.0	11.5
C037		41.5	21.0
C039		41.0	24.5
C034		36.5	25.5
C040		29.0	36.0
C041		23.0	38.5

SWING TIES CONTINUED

Loc	CP2	CP3
C050	44.5	32.0
C051	48.5	29.5
C052	53.5	29.0
C053	56.0	23.0
C054	61.5	26.0
C055	64.0	28.0

Book 3

Proj Chariot
2014 Remedial Action

"Rite in the Rain"®
ALL-WEATHER
LEVEL
No. 311

Tanik Construction #
CONTRACT # W911KB-14-C-0002

MIKE BOESE
FAIRBANKS ENVIRONMENTAL SERVICES

START DATE 8/13/14

8/13/14

745 Safety meeting

8 pack cooler completed - prepped for flight + loaded into

810 Call Northwestern - Jim indicated that they will be @ Chant around 1000 to pick up Gretchen - el indicated that we are sending a cooler of soil samples to be galdstreaked to Anchorage

830 Weekly Chant meeting - Verbal for USACE that we can dig. Melanie needs an email from me indicating John Halverson concurred w/ arctic zone clean levels for X-1. Bill wanted increase in comex weights allowed by Emerald in writting.

9-1030 email. Info about Sample Shipment, melanie about arctic zone levels @ X-1 per ADEC, and Paul @ Emerald about extra

MB

8/13/14 cont

comex weights allowed. Paul Responded and el forwarded his response to Tamik and USACE.

Weather Mostly ~45°F + Sunny, 10-15 mph winds from North. No Bugs

1050 arrive @ X-1 - XSP1+ XSP3 are above 500 ms/kg and need to be placed in sacks - XSP2 + XSP4 are below 500 ms/kg and will be used @ backfill. Tamik removes soil for XSP2+4 from liner.

PUSH Stockpile XSP1, soils into ~~hole~~ X-1 excavation, ~~that~~ so as to not puncture liner upon soil removal.

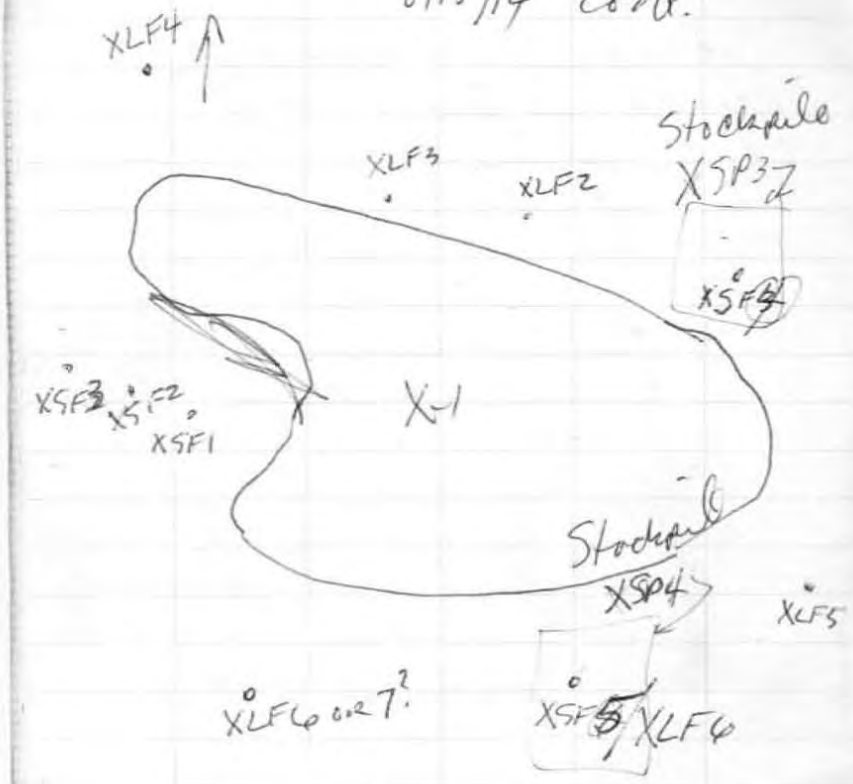
1215 lunch

Remove and bag XSP1 soils

Place tarp / load out XLF7 8 Bags total from XSP1

MB

8/13/14 cont.



Note XLF1 was excavated

1410. Move to XSP3. place soils in Super sacks. XSF4 is used for the loading area footprint.

1630 pack up and head back to camp.

MB

8/13/14 cont.

Send Rich photos & able prepare DQCR.

1315 Dinner

1815 finish up w/ DQCR

1940 email DQCR

1950 email USACE about whether el should analyze one soil sample for X-1 for additional analyses.

Done

MB

8/14/14

0745 Safety Meeting.
800 email from Bill indicating Barge arrives tonight ~5pm to pick up 15 connexs. Tank weighs and loads of bags filled yesterday into previously loaded connexes since both Emerald + Northland Services will allow more weight. (≤ 40000 lbs Net)
1020 Calibrate PIDs
100ppm std reads 99.9 (green)
100ppm std reads 100.1 (yellow)
Make to Dock w/ Ken - Show him location of trench Sample - Discuss plan + strategy. ~300 ft of road is still very soft - Tank sent matting to Kotz on NAC. Contact Northwestern aviation - they have availability and will fly them up to site. NEED Waybill # - send Bill email w/ request for Waybill #.

MB

8/14/14 Cont

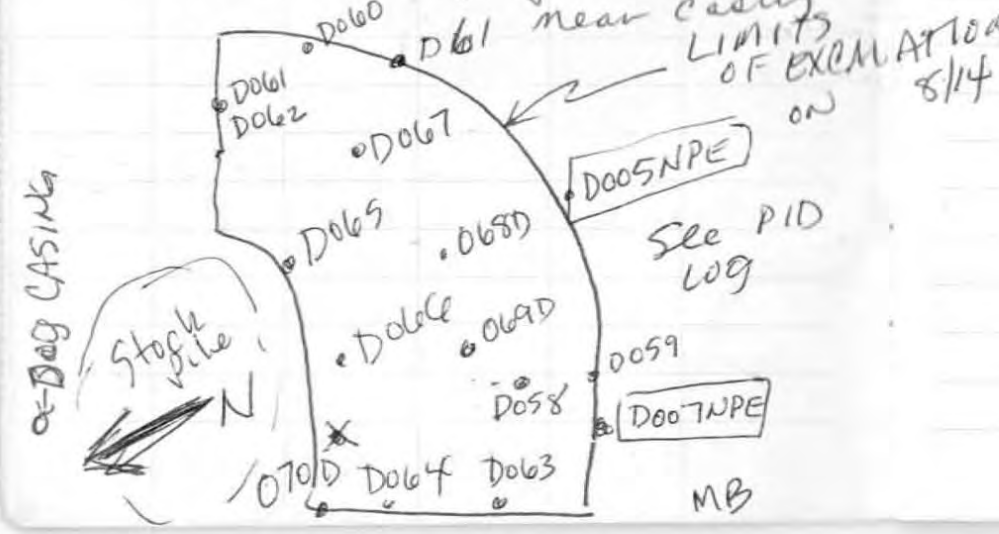
talk to Justin 2 SGS. Cooler was bumped - they can't get it till noon today. Hopefully we will still get results by the weekend.
Priority now is to update spreadsheets w/ new weights and bag quantities so we can fill out manifests for connexes slated to be put on barge tonight.
Clarion Requested additional analyses (VOC, GRO, PCB, SVOC, silica gel on DRO) be performed all on one soil sample w/ elevated PID values. Ordered methanol preserved jars from Lab to be shipped to Northwestern aviation in Kotz.
Bill emailed over bill #s - forwarded them to NW Aviation.
1230 MB + Jamie (EGS) make to Dock - pull back gravel off trench ~ eastern edge of pad. Pile in area to be excavated.

MB

8/14/14 cont

1300 plane arrives on west airstrip — unloads groceries
Weather: Sunny ~60-65°F
5-10 mph wind from North
some mosquitos are out

1400 Start digging eastern edge of Dog — to edge of gravel pad to a depth of ~2' bgs. Vegetation was removed also. Excavated up to D005NPE + D007NPE pin flags. Contaminated gravels were dark gray and tundra underneath was light gray. Stockpile



8/14/14 Cont

1700 Landing Craft arrives
Sign 16 manifests — Ships Captain also signed them as the containers were loaded — kept a copy
— plane arrives w/ supersacks while on band SAMTAALIK

1830 Landing craft departs
eat dinner
prepare DOCK

2030 Send DOCK via email

8/15/14

745 Safety meeting
8 Call Northwestern - let them know that landing mats shipped @ 0630 so they should arrive in Katy around 8 - and that they are priority.
Respond to Melanie's email regarding where samples were collected for the additional analyses for X-1 - and that Aaron Shemwell has requested another soil sample be collected for all the analyses for floor location with elevated PID. (1616 ppm).
Sample Kit ordered and will include Methanol for VOC/GRO preservation.
845 make to Dog - Tank is loading the excavation pile into Supersacks
0900 Collect loading area footprint Sample for DLF1 (PID = 1.8 ppm).
Collect several PID samples from around perimeter of excavation.

MB

8/15/14 Cont

Bryan measured swing ties to Boca casing.
Weather
53°F Sunny winds from N
Very light buggy -
1100 winds shifting from South
Very light.
1130 break for lunch
1230 Return to Dog - water
then load more supersacks
1400 make to X-1 w/ Bryan measure swing ties (See pages 12 + 13 for measurements)
1500 make back to camp.
Call NAC - locate matting
Call Northwestern email to coordinate shipment of matting
Call lab - get tracking # for sample cooler - Call NW again w/ waybill # and request pickup
prep Nameplates for 12 connexes slated for demob

MB

8/15/14 cont

CP1

X055 WEC	9.0
XLF5	18.0
X056 WEC	16.5
XSF5	29
X057 WEC	31
XLF7	49
XSF1	46
XSF2	~~47~~ (51)
XSF3	62
XLF4	58
X049 WEC	45
X050 WEC	36.5
XLF3	42
XLF2	34.5
X051 WEC	28.5
X053 WEC	20.5
XSF4	18.5
X054 WEC	13
X048 FEC	8
X046 FEC	18
X047 FEC	18
X045 FEC	27
X044 FEC	27
X042 FEC	26
X-1 Casing	27
X041 FEC	31.5
X040 FEC	30.5
X039 FEC	39
X061 WEC	42.5
X062 WEC	41
X063 WEC	46
X064 WEC	51.5

MB

8/15/14 cont

CP2

X055 WEC	51.5
XLF5	65
X056 WEC	46.5
XSF5	51.5
X057 WEC	39.5
XLF7	46
XSF1	26
XSF2	23.5
XSF3	23.5
XLF4	12.5
X049 WEC	7.5
X050 WEC	16.5
XLF3	12
XLF2	22
X051 WEC	25
X053 WEC	32
XSF4	39
~~X060 WEC~~	
X048 FEC	45
X046 FEC	38
X047 FEC	39.5
X045 FEC	34
X044 FEC	31.5
X042 FEC	29
X-1 Casing	26
X041 FEC	26
X040 FEC	21.5
X039 FEC	20.
X061 WEC	26.5
X062 WEC	21.5
X063 WEC	15
X064 WEC	11
CP1	53

X054 40'

MB

8/15/14 Cont

review new
~~Address~~ Lab data - all X-1
Sidewall Results data are below
ADEC Action Zone Cleanup
levels.
Dinner
prepare DQCR
9PM 1st plane arrives w/ Mud Mats
910PM 2nd plane arrives w/ Mats
and sample cooler.
1000 PM finish and email DQCR.

MB

8/16/14

6AM barge lands
Sign manifest w/ Capt
of San M. Tralala.
Load 12 connexes.
845 Done loading
prep for sampling @ X-1
footprint Samples and
Comprehensive sample for
(VOC, SVOC, PCB, GRO, + Subinged)
945 arrive @ X-1
1000-1100 collect all the POST-Loading +
Stockpile footprint samples
1100 Collect comprehensive
Glistening Waste oil Sample for floor ~~Cement~~
Scenario location 336X - near X-1
Casing and N of Inlet
DRO Result in pump Sample
1115 measure swing ties to
CP1 + CP2 unless they
get destroyed/moved.
Calibrate yellow PID - 100 PPM
Isobutylene std reads 99.9
then measure PID bags.
See PID log.

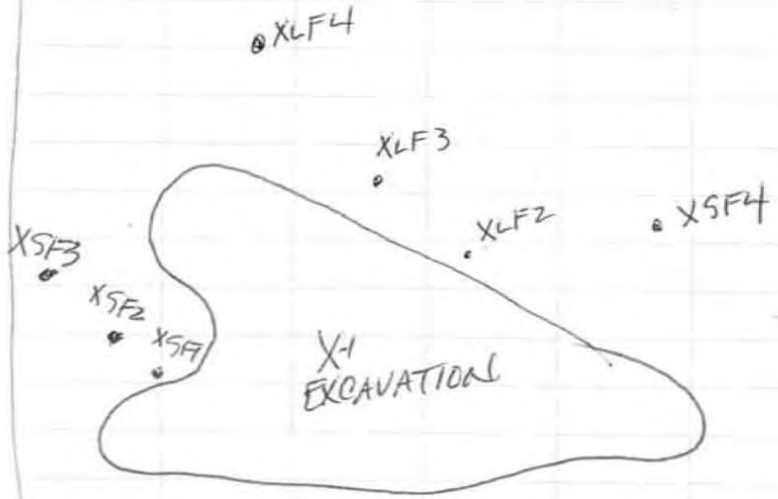
MB

CP5 8/16/14 cont

1200 Lunch
1230 finish Labelling all the Sample jars and bubble wrapping / baggie them and package for shipment. Complete COC for.
1400 make to Dock at Bryan. Take photos of ~~boom~~ mud mats installed on access Road. Photosynth work being performed at Dock. Breathing zone air = 0.1 ppm, but immediately North of Stockpile PID = 1.8 ppm.

MB

N 8/16/14 cont

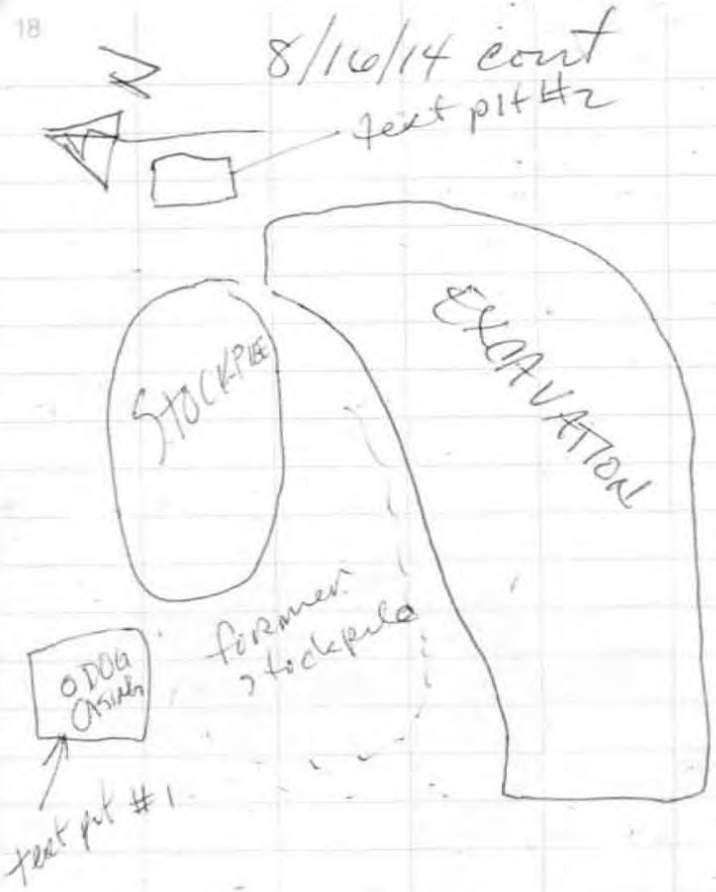


Sketch of loading area and stockpile FOOTPRINT sample locations at X-1.

Tania is loading stockpiled soils from 8/14/14 into supersacks.
Weather: Sunny, some clouds, 0-10 mph winds from SE. - winds were 0-10 from N earlier today temp = 105°F

MB

8/16/14 cont



DLF2

DLF1

DOG.

Leave site @ 4:30 PM. Complete field notes, log extra DOG Smiley, prepare DACR after Dinner 1945 end DACR MB

8/17/14

0745 Safety meeting
0800 Calibrate PID
Green: 100 ppm std reads 100.1
Yellow: 100 ppm std reads 99.8

0845 onsite (DOG). prep for excavation. finish bagging Stockpile
weather 50°F. 10 mph wind from North - high fog approaching
NO BUGS!
Dig out east side - easily delineated by color - Dark gray / black soils had high PID readings and strong odor.
excavation depth only 1' bgs in extreme east edge
1200-1230 lunch - Call Nikesha
plan is to taped up cooler for back haul - arrive w/ mat & mud mats and take sample cooler back to KOF2 → could start to anch. Dropped off cooler @ east end stop

MB

8/17/14 cont

Return to Dog + continue excavation ~70 bags prior to lunch (21 before lunch)

1400 winds shift - 5 mph from west - increased odor from excavation. Air monitoring in breathing zone below threshold.

1600 plane arrive on east airstrip with mud mats. Jim lands on west airstrip with Super Cub. Jim + Backhauls Sample cooler — hopefully in time for Gold Streak. "Keep Refrigerated" if not in time for plane.

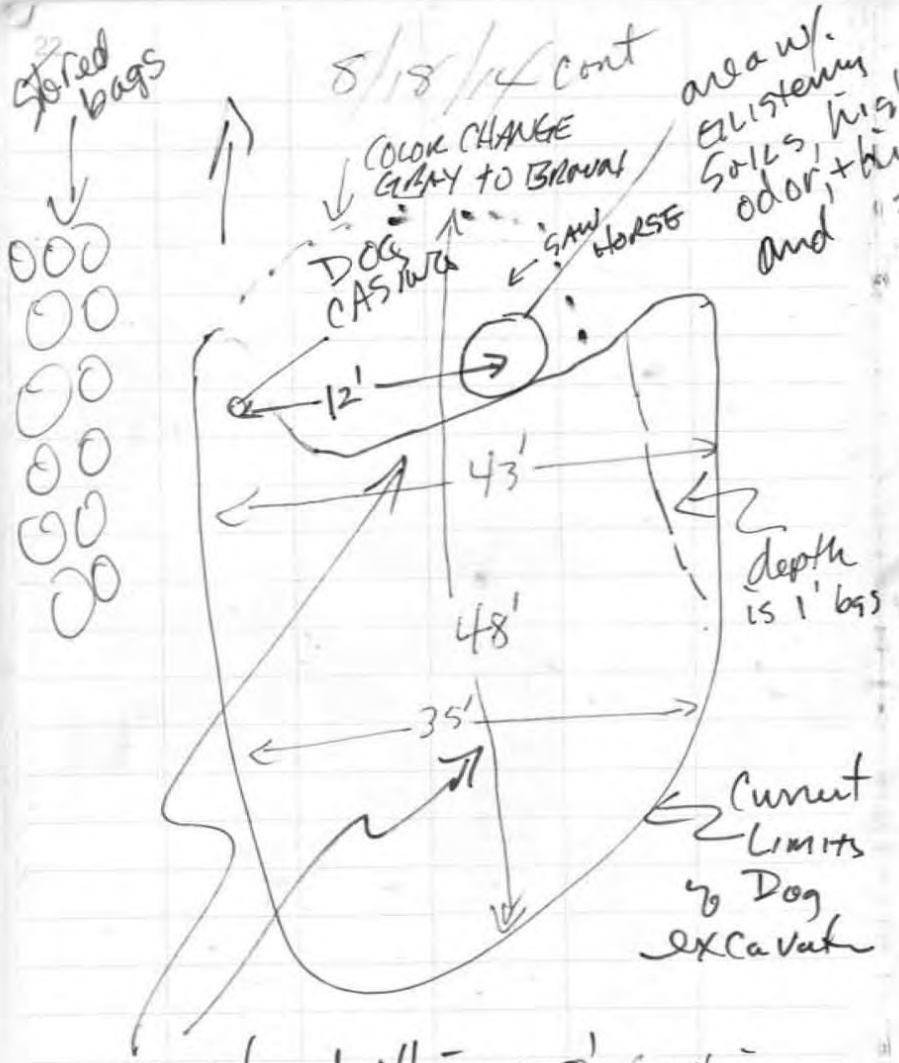
1700 Dinner
1745 prepare DOCK
1830 remind DOCK

MB

8/18/14

0745 Safety Meeting
0800 Calib rate @ IID's
Green: 100 ppm Isobutylene std - 99.9
Yellow: " " " " = 99.9
Call Northwestern aviation with weather report - good visability and ceiling.
0830 make to site Dog. lay down mud mats all the way to Dog pad. cover connections w/ gravel.
0930 Start loading bags into trailer while Skid Steer places gravel on connections.
945 Start loading bags
1000 Start hauling bags to East Staging area
fill + haul bags - screen soils while excavating
1130 collect soil sample for lab from IID (55.5 ppm)
weather partly sunny 50°F
buss just appeared. flight mid to North MB

8/18/14 cont



excavation depth is 2.0' (2.5' in some isolated areas)

MB

8/18/14 cont

1845 Leave Dog – excavated all but NW corner. We filled ~45 bags today

1900 Dinner

1945 – log Lab samples and prepare DOCR. Tomik returns to site to move bags from Dog pad.

2100 email DOCR after Ken signs it.

MB

8/19/14

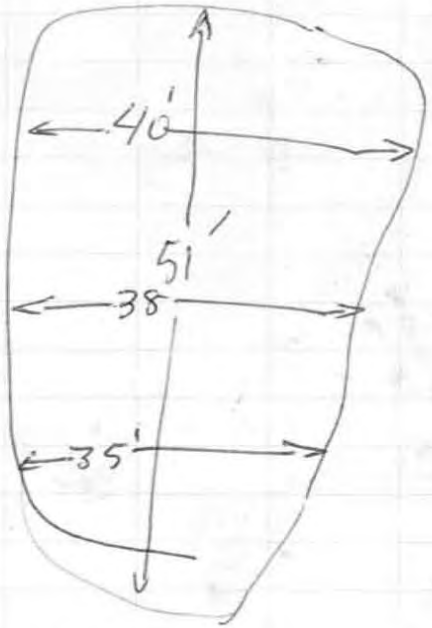
~~Monday~~ Tuesday - overcast ~45°F

0745 Safety Meeting

0800 Calibrate PIDS — both read 99.9 w/ 100ppm std.

9-1200 excavate N + NW corner

1200 plane arrives lunch

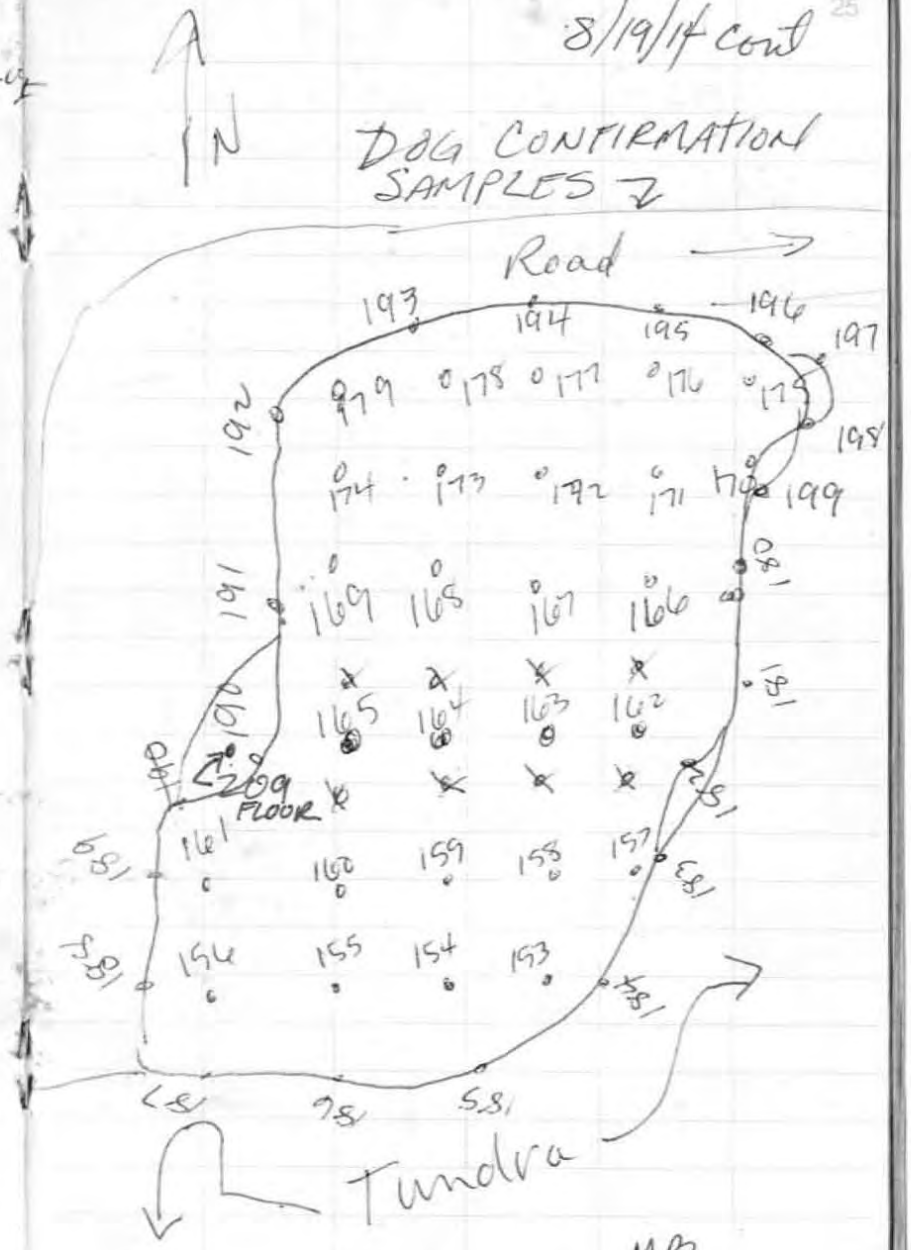


38 x 51 ≅ 2000 sq ft

MB

8/19/14 cont'd

DOG CONFIRMATION SAMPLES 2



MB

8/19/14 cont

Sidewall samples
190D, ~~192D, 194D~~ were 750 ppm and were over excavated following Dmuser
1800 – 2100 over excavat @ 190D and move bags to access area further to west. Clean limits were met ~~to~~ tonight.
2100 Return to camp. Log Samples
2245 Send DACR

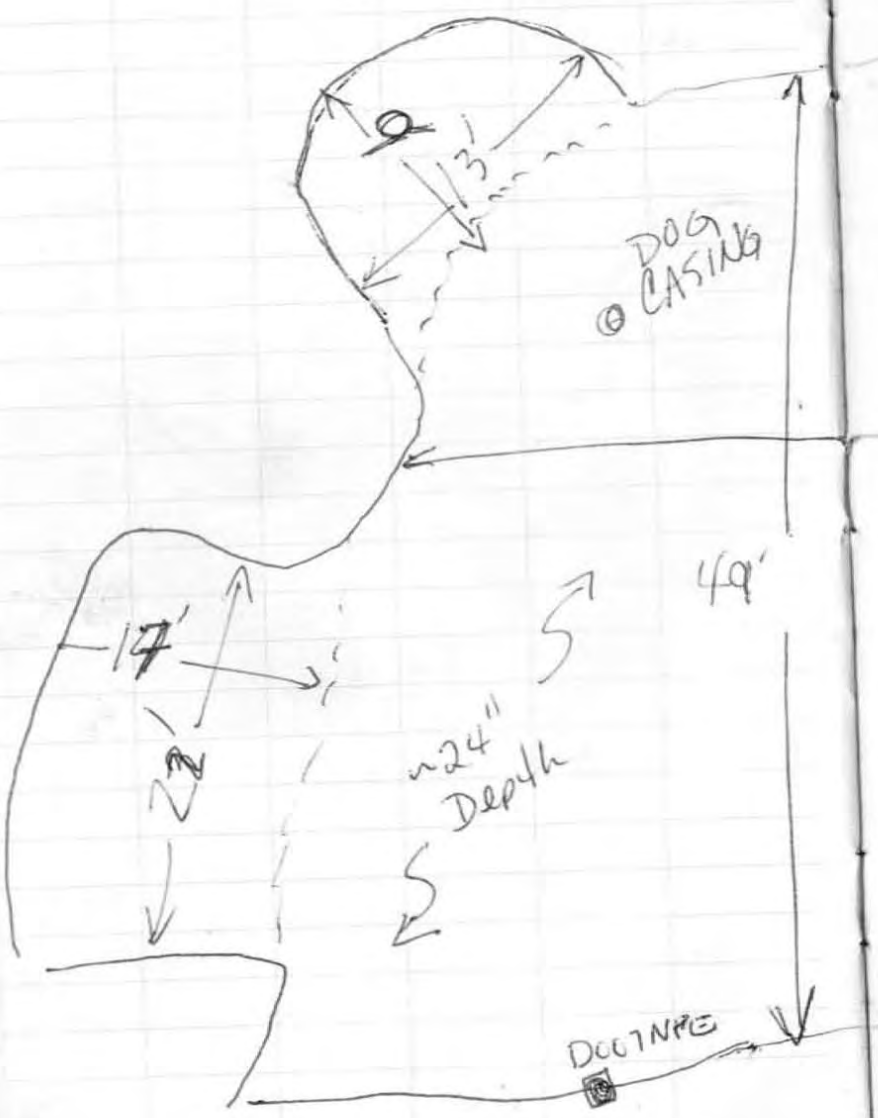
8/20/14

745 Safety meeting
800 Calibrate PIDs
green 100 ppm = 99.9
yellow 100 ppm = 98.9
0830 Weekly teleconference
0915 call lab asd for full results – not just hits.
0930 make to Dog – Set up PID screening station plan is to overexcavate and leave soils inside excavation so we can collect lab samples today

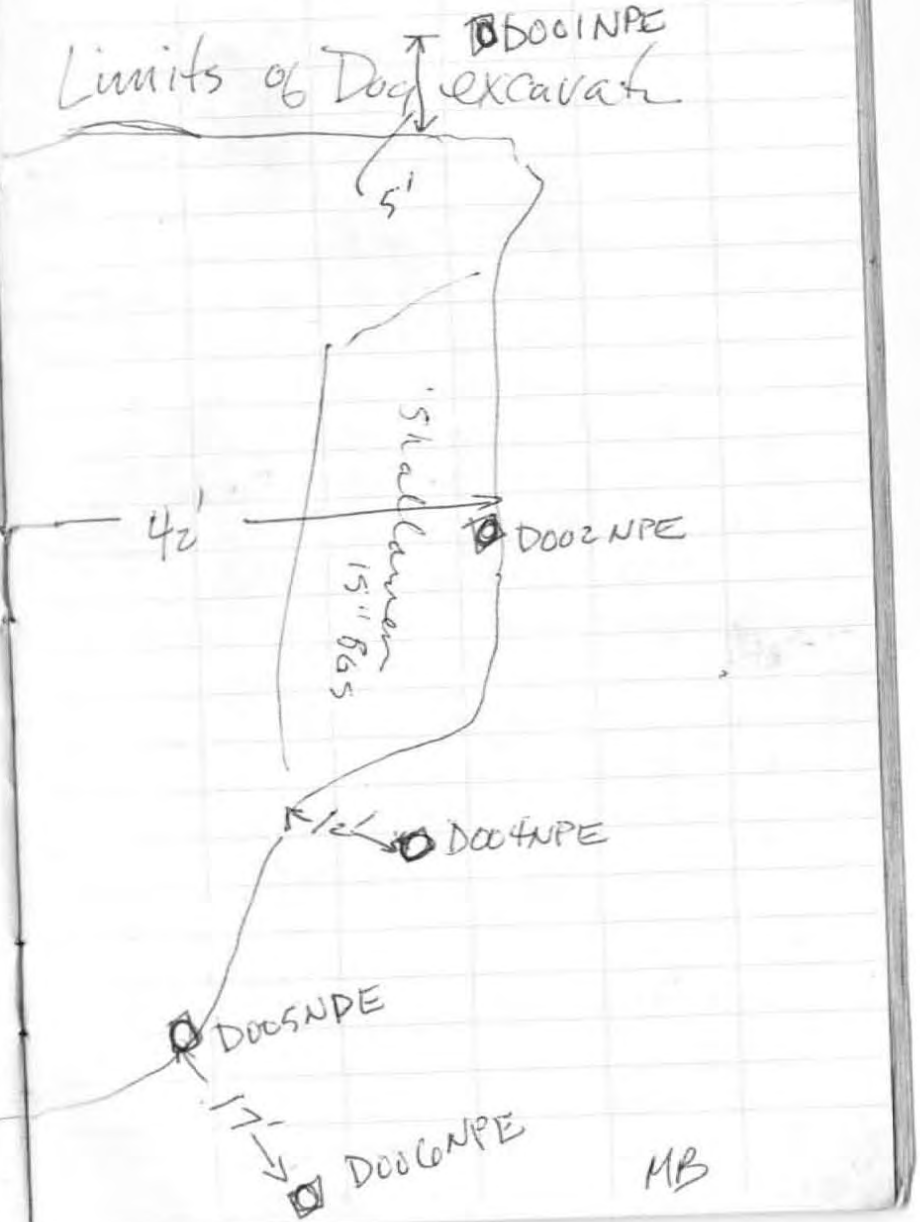
overexcavation
Dug 194D back 1' North and collected 215D = 16.7 ppm
Collect lab sample (sidewall confirmation)

Will excavate North to Dog casing approx 5' out from 200D – Collect another floor + wall lab sample after PID limits drop 224D & 225D

8/20/14 cont



8/20/14 cont



MB

8/20/14 cont

1130 plane arrives w/ John Halderson and DOE. Continue collecting side wall and floor CONFIRMATION Samples for Dog excavation limits. Come back to camp and fill out sample labels and COC forms. Log samples, wrap them, and add to cooler.
1330 Seal up cooler
1400 talk to John and Mark from DOE (and April + Judy)
1430 plane leaves w/ cooler of samples + VIS/Toorg. Call lab to let them know that ~35 samples (RUSH) are headed their way. Need Results by Friday.
1500-1700 load bags @ Dog.
1700 Dinner
1800-1945 X-1 footprint sample table preparation and DQCR preparation.

MB

8/21/14

0745 Safety Meeting USACE
0800 call Melanie — ~~they~~ has all the info they need for X-1.
Call Lab — they are picking up coolers. we can have all DRO/RRO results by Friday COB.
prepare
Call N'Western about flights scheduled to come to Chant area next week. Schedule flights for Surveyor for next week.
0930 Make to Dog — help load bags + fill bags measure excavation/ replace pin flags along grid location
1200 Lunch.
1300 Talk to Ken about schedule
1400 make to X-1 — replace ripped pin flags — get ready for Surveying.

MB

8/21/14 cont

1500 make to Chuckluk re measure casing location swing ties

1530 pick up equipment @ Dog and collect 3X loading area footprint Samples DLF1, DLF2, + DLF3. for DRO/RRO.

1700 back for dinner

1745 fill out coc for after logging Samples

Weather today was Cool 50°F + foggy 600 - 700' Ceiling. Wind from South

1800 fill out DQCR

Bryan adds up supersack weights

212 bags ≈ 255 tons.

2000 add info to DQCR and email it out to USACE.

MB

8/22/14

0745 Safety Meeting

0800 pack up camp clean up for visitors

0900 prepare figures with results for Dog Excavation - waiting for confirmation Sample results. add PID Values and Sample #s + locations.

1030 plane lands w/ DOE and ADEC folks. John H, Mark, April, Judy.

1120 plane returns with 4 people from Pt. Hope Village corporation

1200 lunch

1300 call lab regarding Dog results. Justin is leaving @ 1430 today but will send what he has before he leaves. another PM will provide us with results if they are not complete @ 1430

MB

8/22/14 cont

Plane takes visitors back to Point Hope + returns takes ADEC + DOE reps back to Kotzebue

1400 Observe the Backhoe operating X-1 excavation

1700 Dinner
Prepare DOCR.

MB

8/23/14

0745 Safety Meeting

Tanks loads last 96 bags into connexes.

0900 replace all pin flags and X-1 using surveyors with Bayer

return to camp. Pack up gear — prep for Deadhorse. Try to set surveyor here prior to Tuesday, but he has other obligations.

- assist w/ camp cleanup and burning of paper/wood debris.

Data entry - prep sample coolers
Prepare DOCR.

MB

8/24/14

0745 Safety meeting
0800 Re-ice and seal Sample Coolers. Call Nikiaten aviation 2 planes will arrive @ ~1130. 1 with food and 1 with fertilizer + Seed. 3 people will demobe today (Bryan from FES and 2 tanik Laborers.)

Prepare manifests for final 13 connexes of POL-contamted soil

1100 Stage backhaul gear by airstrip
1140 2 planes arrive, unload groceries + fertilizer, load up 3 folks and a bunch of gear - personal and medical gear + some FES gear.
1200 planes leave to Koty

MB

8/25/14

0745 Safety Meeting
0830 load up seed and fertilizer - photograph seeding activities @ Chenlin, Baker, Able, and X-1, also reseeded Wiat staging area and tundra location unexplod. to cross creek.
1130 lunch [illegible] USACE front quit until we could Backfill DOG.
1200 Jeff helps some meadow sowing tie @ DOG - See pages 38+39 for data
1300 start backfilling DOG with ESO.

VMB

38

CP1 | DOG SWING TIES | 8/~~25~~

DO5 SWEC	33'	DO28F	63.5
DLF2	33'	26F	65.5
DLF1	31'	25F	66
DO56WEC	34'	39W	66
DO53WEC	35'	07	71
DO52WEC	43.5	48	76.5
DO42 FEC	39'	24	75.5
WEC	43	~~007~~	79
DO 32+33FEC	44	005	80
DO30 FEC	49	38	78.5
DO 44 FEC	39	34	79
DO 41 FEC	45.5	37	82
DO 43 FEC	44.5	002	80
DO 54 WEC	53	46	80.5
DO 50 WEC	58.5	001	71
DO 27 FEC	51.5	LF3	85
DO 29 FEC	56		
DO 31 FEC	51		
DO 51 WEC	53.5		
DO 40 WEC	62		
~~105D~~	~~54~~		
~~116D~~	59		
DO 34FEC	58		

39

CP2 | DOG SWING TIES | 8/~~25~~

DO5 5	~~53.5~~ 52.5	28	45.5
DLF2	51	26	62
DLF1	42.5	25	72.5
DO56	~~51~~ 41	39	79.5
DO53	36.5	07	76
DO52	30	48/49	~~49~~ 74.5
DO42	35.5	24	70
CASING	41.5	47	70
32/33	44.5	005	70.5
30	50	38	60.5
49	61.5	34/37	54.5
41	~~49~~ 60	35	50.5
43	70	02	46.5
54	73	46	45
50	72.5	01	20.5
27	64.5	DLF3	37.5
29	46		
31	41		
51	25.5		
40	24		
~~105D~~	~~56~~	Not sampled	
~~104D~~	~~53.5~~	" "	
34	29		

MB

8/25/14 Cont

weather - morning 48°F + mostly cloudy. winds 2-10 from N. afternoon sunny 55°F winds 10-15mph from West.

1530 finish up containing Dog. let Dry overnight - Very wet currently

1600 Return to camp - pack up surplus gear for demobe

1700 Dinner prepare DOCR after dinner

MB

8/26/14 simplis

pack gear - stage - early stg up and ready for Backhaul

clean camp - gather all burnable trash

8/26/14

1230 Trash finishes containing Dog. then tent dries and seeds site.

1300 replace pin flags at DOG

1400 plane arrives w/ Eric the Surveyor. Load all gear in empty plane for backhaul.

Ken Giveserie safety briefing unload Eric's gear in his tent. prep for 4 base stations.

1500 - 1800 install all 4 base stations - move one to North of Baker after collecting data near Dog.

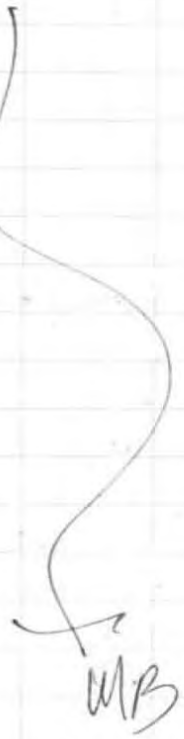
MB

8/26/14 cont

1800 Dinner
~~prepare DACR after dinner~~

1900-2100 go back and collect all survey equipment collecting static control data

2100 prepare DACR



MB

8/~~27~~28/14

next page

8/27/14

0830 weekly teleconference
0900 Sunday all supply location w/ Eric.
~~1230~~ 1300 lunch
Call Northwestern aviation - they have availability will pick us up this afternoon.
Pack up - start to airstrip
1410 plane arrives - Eric and Mike exit.
1530 arrive OTZ.
collect all Gear and palletize - call NAC and ship it back to anchorage.
AK Airlines flights are full - can't get out tonight.

MB

8/28/14

0815 - try to fly out standby
- no luck
prepare spreadsheet for Tarik - Coordinate back haul w/ Northland Barge company. Bad weather
Barge - Sun Talbah is on weather hold - Aug. 30th exit may be delayed.

talk to Ken & Carp. let him know barge update

1200 Check in & ate airlines

talk to Jeff Price regarding visitors (on 8/29/14) from ASRC
1300 lunch

1650 airport
1830 - fly back to ANC from OTZ
2130 - arrive in ANC

MB

Project Chariot
Cape Thompson

Rite in the Rain.
ALL-WEATHER
JOURNAL
№ 393N

Tank Count
FOS
Mission Start – 8/3/14

CONTENTS

PAGE	REFERENCE	DATE

Bibbers 442-2693
NW Aviation 442-3525
442-6692
Linda Kincaid cell 412-0385
Jim Kincaid cell 995-2692

Chariot Camp 273-6339

NWA9876@ wifi pwd

7/15/14

0700 Arrive at Fairbanks airpot 2 action packers, 1 water bag and gun case. Flight to Anchorage is scheduled to depart at 0830 and is delayed until 0900. Arrive Anchorage at 1000 - flight to Kotzebue is scheduled to depart at 1020am. 1015 on plane to Kotzebue - arrive at 1145. Move all luggage to NW Aviation and on weather steady for Cape T. Large bank of fog is sitting at Cape T. Run errands to AC store
1400-1430 Lunch - on steady due to weather.
1430 Bibbers has availability
1900 end of day - last phone call from Cape T was weather is deteriorating.

12hr
DD

7/16/14

0830 Arrive at NW airport weather is bad in Kivalina and Point Hope - Mike is on conference call with project team. I head to AC store to pickup items we will need, arrive back at NW, and Cayet needs switches for bear fences, we head to Napa for switches and paint. On standby due to weather.

1800 end of day - couldn't get out due to weather. High pressure system is coming

BJ

7/17/14

0830 Arrive at NWA - weather is good to fly - high pressure system has moved in good weather. follow Noatak river to coast, spotted grizzly, moose, 30 seals on Noatak and Chukchi.

1030 Land at Cape Thompson move gear to camp - organize gear

1200 Mike and I sign APP Form. Bill wants us to start at Chaulie with PIDs.

1245 organized gear briefly and arrive at Chaulie, the walrus carcass is a few hundred from the site, setup and strategize to collect PIDs.

1500 Second plane arrives onsite - almost all of Fes field gear is onsite, 2 tables and roll of bubblewrap + 3 cases ice remain in Kotz.

1720 collect 2 PID/DRO correlation lab soil samples

1740 collect 5 lab soil samples BJ

7/17/14
from the tundra locations
1840 Drive to Baker to see tank excavation of 10'x10' confirmed on pipe @ 3' bgs to 10.5' bgs. the excavation is filled with water supersacks from excavation are in a compound each sack 1/8-1/4 full.
1915 Dinner
2000 organize FES connex of sampling gear and over living quarters
2200 end of day

TSJ

7/18/14 40° windy, no rain.
0800 Daily safety meeting conducted, discussed AHP, phone #'s, OSHA posters, excavation procedures, PPE level, remote site/kitchen concerns. Discuss monitoring of tanks with LEL main medical kit is in shower tent.
0900 Arrive at Charlie to pump water from well.
Charlie well is 3.5" OD, 3.0" ID depth to water is 10" TOC. Minor sheen noted on water from well.
TD 56 3/4" TOC, stickup 22"
≈ 1 3/4 gallons removed.
1030 At Baker with water & soil gear Baker well 3.5" OD 3" ID WL 5.5" TOC, frozen ice/gravel at 17" TOC less than 1 gallon collected, manned on North side of excavation at Baker @ 2', standing water in excavation at @ 6" in entire excavation. Setup up PID locations for sidewall screening, 0018-0078.
Sheen noted on water in excavation

TSJ

7/18/14 continued

1130 Northwest aviation flights arrives. checked out in Smokey kubota ATV. OK

collected 3 sidewall samples at Baker 004, 005, 006 PID locations, 1145, 1155 and 1210

1215 Layout 5 floor samples for field screening. Bear 100 yards from chevron, blonde grizzly, wind is blowing towards us, as he was heading to walrus, he went north, circled around - we get in kubota and leave site.

1300 At camp let crew know of bear, we take PID reading at camp, load up truck -

1400 head to Able to pump water well is 7" OD 6 3/8 ID wl is 27" TOC and stickup is 39 1/2". Total depth is 58"

1515 At X-1 10 3/4 OD 10 1/4 ID 14" stickup, TD 60 1/2" low water in well. Heading to Dog

#137

7/18/14 cont.

1545 at Dog - well is 3.5" OD ID is 3.25" wl is 8" TOC stickup is 15" BTOC TD is 82" BTOC. 10 landing mats at Dog to use.

1630 Arrive back at camp - Tarik is weighing supersacks using forklift. Mike calls Emerald regarding manifests and 15 bags per connex and 36,000 lbs, it is ok to hand write manifest #.

1700 Arrive at Charlie, PSTL is walking excavator out to camp, the excavation is going well, the loading area looks great

1730 Back at camp, more bones of walrus carcass exposed. Tarik is loading connex with sacks, 18 bags = ~26,000 lbs.

1800 Setting up water sampling gear on UTV for Pre GAC Samples

1850 Samples collected for pre GAC treatment, setup method to pump water slowly from pre barrel using peristaltic pump, through GAC

#138

7/18/14 cont
pumping at a slow rate.
1930 dinner
2,015 Turn of pump to pump remains water through GAC - sample time for Post GAC is 2100, fill up kubota with fuel + 1/2 bottle of Sea Foam for engines, put together last water bath for pids, do misc paperwork
End of Day
2200

#35

7/19/14 partly cloudy 38°
0800 Split crew today, conducted safety meeting, numerous bears near charlie remote, 2 new guys in camp showed safety gear, gear to finish Baker departs at 0830 - mike is going with them. I remain in camp, will remove bags from temporary connex, label, weigh and manifest into connex, sort from Baker or 4 sacks from charlie.
First Connex
CAXU 336240
max gross 30,480 kg
67,200 #s
Tare 2160 kg
4760 #s
Net 28,320 kg
62,440 #
22 sacks from Charlie inside
35,649 # manifest # 22557A
The remaining 4 sacks from the excavation Charlie yesterday are in the next connex

↓ 30

7/19/14 cont

0900 Next Connex with 4 sacks is NSIN 203498

17 bags removed from connex to be weighed and placed into connex of manifested

1000 2 bags from Baker arrive they are weighed at put in connex, today 21 sacks in connex manifest # 22557C, ≈ 27,000# so far in connex.

1030 Bill heads to charlie in excavator,

1130 Ken, Bill, Cody and I head to Charlie, the rest of crew back to Baker. Setup for sampling. They are dressing up site.

1200 An attempt is made to remove casing, hooked on couple with excavator, no luck will try chain later today.

1230 Air monitor at charlie well hole along side well, 2.4 ppm, low others Zero 0.0 ppm, setup base for bags of 17

7/19/14 cont.

1300 continue to fill bags, checking sidewalls, pile and air monitoring wind is picking up

1330 PID Correlation sample at 053C ≈ 36" NW of well on sidewall / floor gravel.

1345 2nd Kubota breaks down on way back to site empty, heavy duty spring on driver side rear comes undone and up. Terex brings back Kubota to camp, I use the other Kubota (smokey) to get all my field gear at charlie

1400 - 1430 lunch.

1430 back at camp, helping Mike process samples,

1530 Back at charlie with Bill, Cody, Kallen and myself stockpiling super sacks, conducting air monitoring and field screening.

1630 11 large full super sacks on liner west side of charlie well. Mike calls to head to Baker, the kubota is fixed

7/9/14 cont.
and ken wants us to try to pull a 3000# sack from charlie with Smokey,
1700 - we switch out Smokey for 4 wheeler so Tank can move rest of sacks. Head to Baker to collect final excavation and swell samples.
1900 Back at camp, organize our sampling comers, clean, decon shovels etc.
1900-1930 Dinner
1930 Head back to Baker to replace all pinflags with sample pin flags
2000 Rubber band, baggie all water and soil samples collected to date, fresh ice in coolers,
2100 charging PID's, camera batteries, file paperwork
2130 / end of day

BJ

7/10/14 Scattered clouds/background 38°
0800 Safety meeting discussed escape routes in convoy and loading bags, set plane for Dog, level D
country backing up forklift to bear fence while loading comexs.
Mike and Cody setup tags, I fix Bill's computer. Talked to Ken he would like us to ensure charlie has a pile of soil to be loaded then delineate X-Y then Dog. ATV is fueled. split crews again one crew loading sacks from Charlie, one crew loading comexs. Mike is calibrating PIDs.
0900 At Charlie, Mike, Cody, Kelen and Bill, Conduct air monitoring 0.0 ppm, wind is from the west this morning, it has been from the north, excavator is repositioning on liner to the east, bag filling area will be in excavation NE of Charlie. excavator is smoothing the site to lay down liner to place sacks prior to transport

BJ

7/20/14 cont.
to Camp using The kubotas.
0930 Head to Camp, load table and cups for field screening at X-1, Ken, Jim and John are loading convex.
1015 Arrive at X-1, fire up water bath, Strong wind and shifted and is now from SE. use cups to locate 2010 lab samples, orange flags were hot green are cold. Note uncorrected cups coordinates appear to have shifted ± 4 feet based on well locations
1045 Collect 8 prelim field screening locations, added 2 PID locs around well.
1115 01x at 7.7 ppm, 06x 24.5 ppm collected PID correlation samples 08x at 152 ppm is to hot. Continue to delineate.
1245 Packed up and head back to camp for lunch
1315-1345 lunch got fitters and more sample flags ✦130

7/20/14 cont.
Talk to ken we are heading up to Dog to delineate plume, stop by Charlie to conduct air monitoring.
1400 excavated gravel to tundra edge on east side of Charlie, air monitoring in breathing Zone is 0.1 ppm, along ground surface between rocks 4.4 ppm. Tank continues to move seeks to camp.
1430 on way from Charlie to Camp the blonde grizzly was coming from north the house towards walrus carcass, Hillary was notified by radio, the bear turned and headed back up the hill, we proceed to Dog.
1500 ATV stuck tube in soft Sand from creek mouth to access road.
1530 Arrive at Dog, Cups location of 2010 sample results. Set out pin flags, determine where to sample tundra soil. ✦135

7/20/14

1615 - Dig tundra sample at Dog collected 7 tundra on the east, South east side.

1700 Begin to delineate N, and west side of Dog well. - Radio call from Bill, Polar bear is near Charlie on west runway, another bear on carcass. Continue to delineate walking on west side of well,

1815 Begin to pack up our gear to head to camp.

1900 Arrive at camp, did get stuck once on the way back. Starting to rain pretty hard, the storm surge is ongoing.

1930 - 2000 dinner

2000 process samples, rubber, bone baggie, paperwork and submit time sheet.

BJ

North wind

7/21/14 39° partly cloudy, mists, 15mph wind Storm surge is still hitting back

0745 safety meeting, storm surge filled up lagoon, water pump is now in standby water. Bear fence is inoperational still, electrical issue due to storms I ask Bill about east gates he said he would call again. Tank is changing out in excavator, mike and I will head to Charlie.

0815 Large dark grizzly is passing through on east side of creek/lagoon.

0900 arrive at Charlie, conduct air monitoring at excavation 0 ppm in breathing zone, water from last nights storm has accumulated in excavation.

0915 we begin to collect PCBs from floor and sidewalls to verify contamination.

1000 All filled sacks from yesterday are transported to camp. The walrus carcass was pushed higher up the beach from the storm

BJ

7/21/14

1030 Continued collecting PJDs, and Bill, Kalen and Cody start to fill bags with soil, the remainder of crew is weighing sacks and placing in connex.

1100 Back at Camp to get Sample cooler ready in case plane comes in.

1130 22 connexs to be filled with soil, 6 connexs equipment connexs, 1 messhall/shower/laundry tents, 7 sleeping wall tents, 2 latrines, bear fence around the camp, 1 excavator E85 Bobcat, 1 excavator 4 wheel drive high lift fork lift, 2 Kubotas, 2 Honda ATVs, multiple small trailers. On other side of Creek, 6 connexs, 1 with E50 excavator and one with skid steer.

1200 Air Monitor Charlie 0.0 ppm in excavation

collect PJDs along east gravel and tundra interface, Bill, Cody and Kalen head to lunch. BJ

7/21/14

1300 Head back to camp for lunch,

1315-1345 lunch.

1345 Trying to use satellite phone to call Melanie, sat phone won't connect.

1430 ATV loaded for site, I'm staying in camp to work on organizing photos, create photo logs for Dalies, peperecot and clean connex

1600 I drive ATV to Charlie to check on status of excavation, vacs has stopped. Conducted air monitoring at excavation, 0.0 ppm

1630 Continue on paperwork at camp, transfer all photos from my camera to my computer, do the same with Mikes, after photo logs completed transfer all to Mikes thumb drive

1730 AT Charlie excavation 13 soil well, lots of water from the storm. ~22 bags filled today, 3.5 connexs also loaded, I get a picture of mouth of creek, it's hot bad now

2100 end of day, 1 hr lunch/dinner

#BJ

7/22/14 38° partly cloudy high clouds
wind 10-15 mph from north
0785 Safety meeting, Level D
as usual, AHA excavation and cutting
wells (Baker maybe today), watch for
bears, slips trips and fall, each
team has walkie talkies, switch
installed on fence to safely
turn it off.
0830 Arrive onsite at Charlie -
they want to haul bags to camp
Mike and I setup PID station,
conduct air monitoring, Jim
IB cleans up hole between
loading sacks.
0900 digging tundra area, noticeable
hydrocarbon odor, not detected
on PID in breathing zone
0945 at SE end at tundra/permafrost
interface
1020 Plane arrives to pick up samples
and Bill.
1030 Conduct air monitoring, 0.0ppm
wind from N, on south side of
excavation odor is noted but
0.0ppm on PID, DJ

7/22/14° cont.
1045 Ken and John cut Charlie
well with electric bandsaw
preparing to well cap on top
An attempt was made to collect
soil sample from within pipe
and was just an ice lens.
1100 - pipe filled with bentonite
and hydrated. Tried welding
with 2000k Honda generator, it
doesn't have enough power.
1130 completed welding of well
at Charlie. Load up for
cutting Baker well, John, BJ
and me.
1200 arrive at Baker, John uses
electric band saw to cut pipe
off ± 7" above water level,
and ± 8" below ground surface
on west side, 10" below ground
surface on east + south side
and 3' below ground surface on
mounded north side. The pipe
was cut 35 1/2" from TOC, and
thermistor cable also, the pipe
contains fine gravelly soil with
+ PID

7/22/14 Cont.

1200 Cont. a hydrocarbon odor. The well is sampled and a PID bag is collected. Sample time is 1215. The cut pipe contains soil. I tape 2 zip lock baggies on the end of the bag to keep contaminized. The soil will be placed into a super sack for disposal

1230 Ken welds on bolt to side of well for ground, and has a pre cut steel plate to cap the well. After sampling and field screening the bentonite is added to ~ 8" below TOC and hydrated with potable water from camp.

1245 The 3/4" diameter cable on NE side of excavation is cut.

1315 Back at camp (lunch)

1345 pack up gear head back to Chariot. Bake well PID 372.1

1400 they are transporting sacks to camp, we continue to sample. Field screening

1445 PID field correlation sample 106C

#87

7/22/14 cont.

27.1 ppm, fine gravels, Collect background PID field screen at charlie, NW of well 1.3 ppm

1500 Air monitoring at SE end of excavation near the old pile of rope.

1530 collect tundra sample 113C 87.1 ppm

1615 The kubota and trailer heads to camp stopped because of the load shifted and fell partially out. The forklift and an extra bag containerized the load. The forex hauled the box to camp.

1645 Ken, Cody and Kalen move diffused along bad spots along road.

1706 collect lab correlation sample

1715 Pack up gear at camp, excavator is making on road to camp.

1730 Back at camp, start to pack cooler, rubber band baggie samples

1800 cooler is ready, work on photo log for daily

1900-1930 dinner

1930 continue on photo log

#87

7/22/14
1900 and paperwork, finish connex summary sheet, prepare for safety meeting in morning
2000 End of Day

BJ

7/23/14 39° raining 15mph wind
0745 Safety meeting, reviewed level D, use of smart rash, inclement, bear safety
0830 Jobs 7/30-8/8 Rick coming up, Aug 6 meeting, he will be replaced a week at a time.
Project meetings continued
0900 Notes - 4 passes through schedule of tasks, current status, Basin to ready for charlie screening.
1000 time at Charlie, Jim in excavator IS working on wall
1025 NWA place loads, we one sample COC/er and pump (TT) leaving the site
1030 passing time (am), wind from SSW, 15mph, air monitor excavation 0.0ppm
1200 Field PID results on sidewalls in large excavation, directed operator Jim to remove additional in ~20' of sidewall
1230 lunch 1300 - discuss afternoon jobs
1330 loading gear from Charlie to load to Dog, Ken marks estimate of Quantities

BJ

7/23/14

1350 conduct air monitoring during change in excavation area 0.0 ppm

1415 Arrive at DOG, continue from a few days ago to work on the preliminary delineation to estimate extent of contamination, collected 37 pids, and 2 lab confirmation samples.

1800 finished with delineation approximate size is 41x51x2 feet bgs.

1830 Back at camp, unload trailer

1900-1930 power is restored, dinner

1930-2100 paperwork, daflies, talk to Ken about tomorrow

2100 end of day.

BJ

7/24/14 High 88°, low 62°

0745 Safety meeting — level D, heat safety, transportation, good communications with radio reviewed for Tami.

0815 load up gear to complete DOG

0900 note at [illegible] main generators went down last night at 11:00pm using Honda 7kw currently.

0945 collect 2 pine samples, Tank has moved loading dock over to a clean area, 0945 and 0950 sample time. excavator (JM) is working on road rest of crew loading sacks into corners.

100 been asked Mike regarding next flight sample status because they need parts for generators, Mike replies probably not until Sunday.

1015 JM jumps in excavator, Cody and Kalen and Dana tasks, in camp, no bags are being filled, we are collecting field screening samples from floor of excavation that has been cleared up.

BJ

7/24/14

1320 Mike is collecting a PID/lab sample from field screening location near the Charlie well. PID was 975.1 ppm at permafrost interface

1100-1130 - collect 5 floor samples from upper excavation. Tami/Ken assist

1200-1280 lunch

1330 waiting on NWA Plane w/ Food run. After that Ken, John and I will go to Able to cut the well down.

1400 at Able, excavate down with E50, stinger is 63" TOC, refusal inside is 58" TOC. Attempting to cut with electric bandsaw, Jon goes back to get new blades, acetylene wheel is used to make the cut. Excavation is approximately 36" bgs, no hydrocarbon noted around entire excavation

1430 pipe is removed ≈ 6" above centroid of well or ≈ 52" TOC. using spoon and trowels remove fines from well, found pieces of wood, rocks, & TJ

7/24/14

1430 cont.

A carbon bone and a carbon hoof, just the toe nail portion, there is fine gravel in well. A bag is collected for PID, and a soil sample is collected.

1445 Ken is grinding on top of well for welding. A bolt is welded to side of casing for a ground.

1515 welding is complete, begin to recontour surface with excavator.

1530 Arrive at Charlie to help Mike delineate the sidewall nearest the loading area will need to excavate additionally.

1645 all filled bags are at camp, begin to fill sacks, collect GPS's

1730 Back at camp, unload, process samples, paperwork, begin to work on photo log and camex summary.

1900-1930 dinner.

1945 Back at Charlie work on field screening on SE side of excavation

2200 end of Day

TJ

30

7/25/14 31° clear sunny frost 10:15 SE wind
0745 Safety meeting level D, hand tools, gear forge, oxy/acetylene torch, remote sites X-1 + Dog discussed.
0830 loading gear, ken & markus on road near X-1 with sled steer. Cody, Kalon and Jim at Charlie. Large boar dark grizzly is spotted heading straight up Crow Bill pass. Two grizzlies (blonde) were spotted on far side of lagoon feeding North, Southward yearling cub.
1000 plane comes in with food, our sample shipment goes out. Unload food in camp
1030 Back at Charlie, finished loading socks.
1100 Begin to transport bags to camp, we continue to field screen excavation walls.
1130 wrap sling with duct tape where it is in contact with O-ring. Shovel Jim where sidewalls need additional excavation based on PID results

#B)

31

7/25/14
1200 Kenai taxi arrive onsite to check things out.
1270 - 1300 lunch.
1300 place order with TTT for supplies hand to charlie
1315 very sunny 47°, mosquitos are out.
1330 conduct air monitoring 0 ppm
1500 digging at excavation is complete until the entire flow is reticle screened.
1615 Tarik has filled bags at camp then leave Charlie site.
1730 At camp review first shipment
1800 unload trailer, charging PIDS, work on photo log, daily etc.
1900 Dinner
1930 pepperoncle
2100 End of day

#B)

7/24/14 33° 15' E crust
0845 Safety meeting ATV safety, Bear watch/safety, loading canoes with skid steer, getting stuck
0915 At Chukie with Mike
used soil sidehenge to get into permafrost for Frisch Screening purposes
0945 warming up samples. — Ken calls Fadue to go to X-1 — head to camp to load up gear.
1000 Arrive at X-1, collect sample from underneath liner where they are loading sacks soon.
1030 First sack is loaded into trailer 3 scoops from E50 excavator. Cabin air monitoring 0.0 ppm they are loading directly into super sacks on trailer and then
1100 very black soil layer, strong hydrocarbon odor.
1130 Begin excavating again, John and Cody return
1200 noticeable stained, strong hydrocarbon layer 10" bgs to 22" bgs. 410 ppm

TBJ

7/26/14
1230 continue to excavate, 36" bgs 5' South of X-1 155.3 ppm
1300-1330 lunch
1330 Back onsite, increase size of excavation, max depth is 48" currently 3 Hack starkey/Loders 2 ATV pass through camp from Chukiara to Point Hope, 6 ATVs last night at ~ 1200 am
1430 continue to excavate, on east side of casing a wet looking layer of black contaminated soil, above this is a brown fine dry material with angular rocks.
1500 continue to excavate more and Terri have arrived from Chukie
1600 Sample 4' N of casing 035X 287.1 ppm. Tank lays out 10 mil liner to stockpile overburden ITS located on the NW side of the casing ~ 30' from casing They borrow the liner and will cover it.
NW skid steer B stuck, excavator goes down to pull him out

TBJ

34 7/26/14

1730 - Done excavating for day - The excavator and skidsteer are loaded into conexs - head to camp - unload samples, gear, work on OneDaily, photo log and rubber band bag/tie samples for shipment tomorrow

1900-1930 Dinner

1930 continue on paperwork

2100 end of Day

BJ

35 7/27/14

0745 safety meeting, ATV safety, X-1 excavation depth and odds issues, remote site (X-1) pinch/escape routes, pump, bags loading and loading bags in conexs.

0830 load up to conduct cleanup at Charlie white tent and John are loading conex across creek with X-1 bags and weights. The only gear at Charlie is a steel frame for bags, our folding stool.

0930 Back at camp Charlie is cleaned up for now.

1030 plane arrives, Sample cooler goes out, Anthony brings in one case of frozen gelice and 10 propane cylinders for us.

1100 Jon weighed sacks from X-1 it's raining hard, they return to camp

1130-1200 lunch

1200 entering PID data from all sites to date

BJ

7/27/14

1500 Enter all Sack weights and Connex weights, tare and serial numbers into a spreadsheet

1700 Mike and J head up to Charlie, label all Sample flags, take pictures of site, and look for spot where the radioactive soil was removed in 1993.

1900-1930 Dinner

1930 finish paperwork, data entry

2000 end of day

7/28/14 Clear Sunny 41° 10mph NW

0715 Safety meeting, Ken wants to haul supersacks from across creek to load into connex near camp, so ATV/UTV safety, creek crossings, pinch points etc.

0830 ready to document. Building a bridge across a mud area utilizing 10x10 and plywood

0930 began to transport Sacks using kubotas and trailers to camp

1200 lunch - 1330

1330 Go to Baker for measurements

1370 Head up to Charlie for additional measurements.

1430 Summarize all pipe casing data for Mike, enter and update data for connex loading.

1700, pack field cooler with field gear, ATV, fans

1900-1930 Dinner

1930 Complete photo log, meeting with Ken on project duties upcoming

end of day

7/29/14 clear sunny 43° 11 mph NE
0745 Safety meeting — excavation depth, ATV/UTV safety level D, very buggy day anticipated
0815 Sampling gear is loaded into trailer & head to X-4, Mike is making phone calls.
0830 Arrive at X-4 set up gear.
0845 Begin to fill bags from soil pile within excavation on 7/28. excavation is 36" deep currently
0930 Mike arrives at X-1
1015 excavator moves to north side of excavation, at 66" deep, dark rock, rock appears to be increasing in size
1030 removing 3x12" deep overburden off of south side of excavation
1115 placed 3 turkey butts to switch tie to X-1, 6'1½" is the total length of X-1 casing, the pipe is removed and placed on a liner. pile of soil adjacent to pipe is 262 lbs. ppm ✓ DT

7/29/14
1130 continued; soil around location of X-1 is glistening, wet on fractured rock, tried to capture in a picture. Wind changes directions to S, SE.
1150 5.5' down at location of former X-1, perched water is noted.
1220 Head to camp
1230-1300 lunch, all workers are fed at camp
1310 on site at X-1, continue to excavate NW of X-1 and N of X-1, black soil, strong hydrocarbon noted in excavation. The E85 excavator is walked across the creek to the conexs on east side of creek to unload supersacks that were filled at X-1
1415 Blackhawk helicopter comes from N over hill, buzzed us at X-1
1500 workers on N side of excavation
1600 Removing overburden from west side and placed on stockpile.
1700 continue to excavate at X-1 soil is more plastic feeling and colder ✓ DT

7/24/14

1200 counts on the floor of excavations

1800 Tami B does dryness for the day, Mike and I collect PIDs, measure excavation and depths.

1845 Head back to camp -

1900-1930 Dinner

1930 in office, data entry, photos, pack field cooler for tomorrow and prepare for Wednesday Morning meeting.

2100 end of day.

BS

7/25/14

0745 - Safety Meeting ATV safety and directions, odors, visitors to site. Preparing for morning project team meeting at 830.

0830 X-1 tonnage 77 bags on pallets ≈ 70 ton

0910 meeting complete, calibrate PID's for site work

0930 Jim/Tami spot grizzly south of X-1 that is heading towards site then veers to north away from site.

0950 Begin to excavate N wall, overburden is ≈ 1.5 feet thick. Tami maps loading area, we collect a LF sample prior to tarp placement.

1045 plane arrives, Mike and Tami take sample to meet plane with Rick (DOE) and Travis medical gear.

1050 sample overburden 9.9 ppm - keep D stockpiling.

1110 begin filling sacks again

1140 Continue to excavate jaw

BS

7/30/14

1200 Mike and Rick are at Charlie no radio or gun. Got word from Camp Mike has a shotgun

1230–1300 lunch

1330 meeting with Ken, Mike me and Rick regarding digging test pits at X-1 to determine extents of contamination. Mike and Rick are eating lunch, the decision is to continue to fill bags with soil from excavation until they arrive onsite.

1330 Air monitoring at site

1400 Sample 175x 218ppm and duplicate 157xy

1415 Duplicate taken time continue to excavate in the west direction

1430 Mike and Rick arrive onsite

1500 A small test pit was dug ≈40' from X-1, changed to frost bucket

1540 change bucket back to smooth edge bucket, to resume digging in excavation. DT

7/30/14

1600 Crew is back from weighing bags to resume digging.

1630 Mike collects liner sample.

1645 Check PID calibration, collect background sample. 13.4ppm

1745 collect ad confirmation sample west wall 220 ppm.

1845 excavator heads down to complex large excavator is walked across creek to camp, done excavating today, ATVs/utv haul to camp. Load small excavator into trailer.

1930–2000 Dinner. Generator went down dinner is delayed.

2000 finish up photo logs, dashes etc

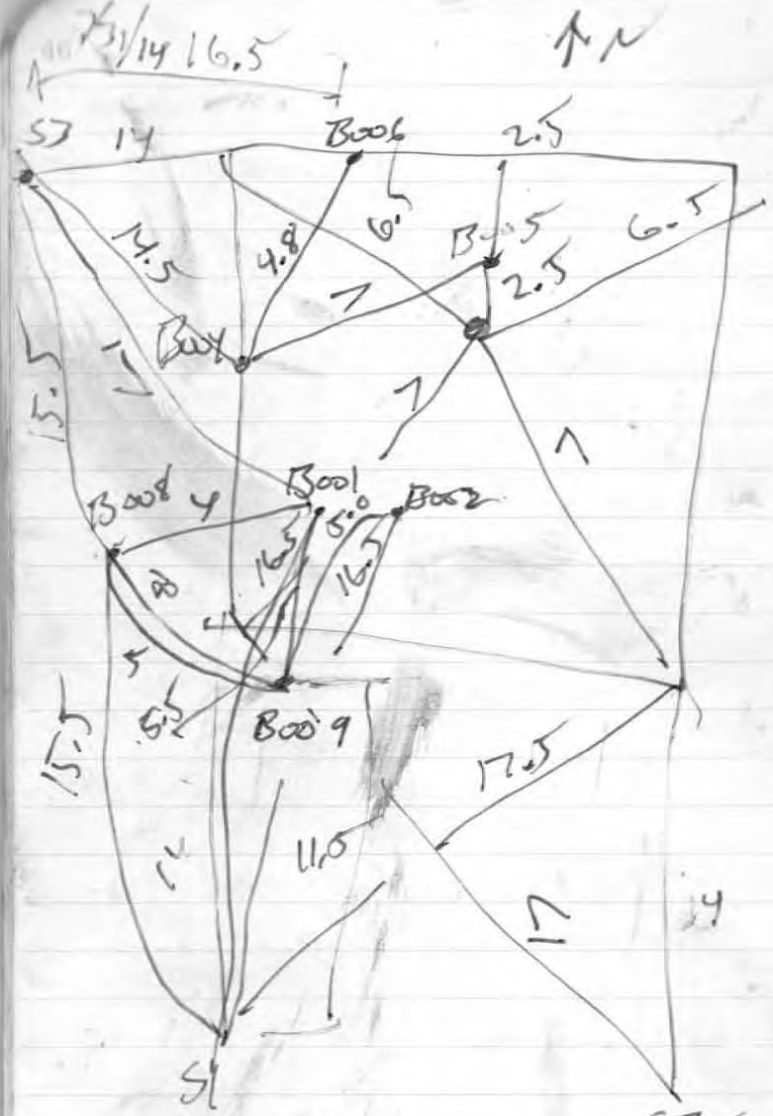
2100 enter data

DT

7/31/14 45° 10 mph and S.SW [illegible]
0745 Safety meeting, ATV/UTV Safety, Escape routes, phone points, bear safety in 2 groups, Rick presents site history.
0830 Gear up for documentation of weighing bags, road conditions. Head to camera on east side of creek. Jim is doing road maintenance and developing a new route instead of the current route with wooden bridge.
0900 Arrive onsite, setting up scales and calibrate, both scales are checked with cables, hooks rigging weigh 6 pounds, attach 100 lbs to rigging both scales show 106 pounds. Johnny Cody, Ron and Kaleon are on site, myself and Tami are watching for bears.
0930 Weighing bags, used test weights to verify calibration bag weighs 2295, placed 100 pounds weights on and read 2395 pounds

7/31/14
1000 Large excavator arrives onsite after doing road maintenance, Jim is operator
Calibration check on small excavator scale - bag weighs 2260, added 100 pounds, weighed 2359 pounds on the large excavator and scales
1015 Calibration check on large excavator and bag - bag weighed 3371 pounds added 100 pounds combo weighed 3470 pounds
1100 all bags are weighed on the east side of the creek
1200 - 1230 lunch
1230 Gear up for Baker bucket #1, working on tow behind excavator welding minor repairs
1300 Arrive at Baker run sorting trees to relocate flags and

Casing location [B]



1330 Jim IS moving bentonite closer to excavation, flags are pulled BD there IS not any sheen

7/31/14

1300 continues
notes on the water within the excavations
1500 Konrad Tani arrive to check out the site.
1630 Dave with excavator, pull back pin flags, key arrive at 1700 with track to repair tongue on tow behind trailer, it makes it back to camp.
1800 Back at Camp - unload gear
1900-1930 Dinner.
1930 working on photo log, & duties and paperwork
2100 End of day

BD

8/1/14 Cloudy 49°, foggy 7-8 mph SSE wind

0745 Safety meeting- foggy, bear watch, creek crossings, ATV/UTV Safety, Escape routes when lifting sacks and in convex

0830 Equipment is being fueled up, and all ATV/UTVs.

0900 2 excavators, Terex forklift, 2 ATVs, and kubota depart from camp to head to east side of convexs, across the creek

0930 Arrive at east side, all equipment.

0940 First sack goes in convex 0.0ppm, they reangle convexs with them to make entry easier.

0950 Mike and Rick arrive onsite to check things out.

1015 0.0ppm inside convex, 45°

1045 0.0 ppm inside convex

1115 first convex is filled

1130 Fog is trying to lift.

1150 2nd convex 0.0ppm

1215-1245 lunch BJ

8/1/14

1300 Arrive back onsite, The east side convexes to continue to fill convexes with full super sacks.

1315 The 4x4 wooden pieces are broken behind the forks of Terex, The small pipe piece from Charlie is strapped to back of forks which creates a better angle for the stinger on the front of the forklift.

1330 opened up second filled convex and took PID reading of 6.1 ppm, the door has been shut for approximately 1 hour

1345 beginning to fill 3rd convex, Mike and Rick head up to X-1 to gather soil samples

1445 Mike and Rick return from X-1 activities and head to camp

1530- I brought back 2 fiberglass mats and 4x4's to put on top of tundra in the bear fence so the skid steer won't sink.

1545 4th convex is fully doors open 0.0 ppm

1600 on 4th convex 0.1

8/1/14
1630 4th connex is full, Tank is making bear fence off of the tundra where the skid steer and forklift would damage it, I show Ken an area farther up existing gravel road at the left hand corner, a large flat gravel pad. Supplies are getting up and the fence is re-installed at that location both excavators, forklift and skid steer are inside of it.
1815 Back at camp, unload.
1900-1930 dinner
1930 working on photo log, daily and paperwork.
2100 end of day

BJ

45°

8/2/14 clear sunny Temp Normal
0745 Safety meeting, work plan is to fill last connex, then move equipment to X-1 and resume drilling. Safety topics include: ATV/UTV safety, odors, nausea symptoms, wind direction and loading areas, bear safety, creek crossings
0830 load up gear for sampling, calibrate PID's,
0900 Arrive at east side connexes, to load the 6th connex.
The bear fence generator apparently went off on the east side sometime during the night and went through the fence wires leaving a tuft of hair on the wires, The pallet of empty super sacks was strewn about and no heavy equipment was damaged.
0930 6th connex is loaded, walk small excavator to X-1 and prepare to drill.
1000 Conduct air monitoring at bag

BJ

8/2/14

1000 cont.
loading area 0.0 ppm, 15 mph N wind and bag loading area is upwind and east of excavation
1045 move excavator to east to dig, Musk ox, single bell moving to north on top of mountain to east
1230 – 1300 lunch
1315 Back on site to continue to dig.
1345 setup liner to remove overburden from east side of excavation, collect soil sample from where the liner is going. the bucket is cleaned prior to removing overburden.

BJ

8/2/14

1400 continue to dig in SE direction
1500 wind shifts and is coming from the west.
1715 – 2 ATVs are noted from Fairlie headed towards the trail to Point Hope, 2 more ATVs are 2 minutes behind the first two.
1800 Done digging, working on loading gear, burning and covering stockpiles, moving gear to bear fence.
1845 at Camp unloading gear
1900 – 1930 dinner
1930 packing samples for shipment on 7am flight Tomorrow
paperwork, photologs and debrief
2100 end of Day

BJ

8/3/14 50° partly cloudy 15 mph wind
0745 Safety meeting, ATV/UTV safety, speeds, getting in and out of vehicles, excavation walls and safety, stay away from edges, the sides are showing cracks that are marked with pink flags but don't trust any walls.
0815 phone call from Northland barge will be onsite at 10:30 to drop up to 16 conexes and reposition conexes currently on site. Plane from Kotz (Jim) arrived at 0715 and dropped off food, our TTT shipment and took a cooler of X-1 samples for shipment to Anchorage today.
0830 working on generator the generator shut off again at the bear fence for equipment, spark plug was really black, maybe running too rich
0900 Mike, Rick and I head up creek to look for former radiation soil stockpile located at Snowbank creek and Ogoturuk creek confluence.

8/3/14
0930 We think we found the former soil stockpile, take pictures head back to camp.
0945 the landing craft is visible on horizon
1030 Landing craft arrives on east side of creek, they begin to unload 16 empty conexes. The landing craft reloads loader and small dozer and moves to west side of creek to load 5 empty conexes and conex with fuel to east side of creek.
1300 lunch - 1330
1330 the landing craft is finishing up relocating conexes to east side and reloads all their equipment and departs. Rick has a rash on his arm and a lot of mosquito bites on his back, shows everyone, he takes a benadryl and takes it easy in his tent.
1500 the tank crew is loading sacks into conexes, Mike is cleaning

8/3/14 hot mid 70's buggy
1500 cont.
Jim entering PZD data into excel.
1700 - working on photos and photo log
1900-1930 Dinner
2000 end of day

BJ

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8/4/14 Book Start

8/4/14

0745 Safety meeting, topics, edge of excavation, odors ATV/UTV safety, slips trips and falls

0815 load up gear for sampling and excavation at X-1

0845 arrive on site at X-1 Two parts (conduit) are visible in ground at portion of excavation that is cracking, caution tape is placed on top of parts.

0915 Overburden (clean) is removed and placed on stockpile.

0930 begin to fill super sacks

1045 found 12" diameter soil screening tool in overburden at a depth of 20".

1230-1300 lunch -

1315 Mike + Rick talk to USGS Aaron Shenman about current tonnage status forecast get ahold of SWS.

1515 plane arrives from Kotzebue, with Bill and supplies

BJ

8/4/14

1600 Bill arrives on site. Continue to excavate at X-1 NW site. Continue to excavate west, near Stockpile #2.

1715 Done excavating today, cover stockpiles and load gear in 4 ATVs - head back to camp -

1730 unload gear, process samples

1900-1930 Dinner

2000 end of Day

BJ

8/5/14 50° sunny, 15 mph NE wind
0745 Safety Meeting - Split crews, bear safety, communications, odors in canyon, visitors.
0815 Load up for sampling at X-1
0845 Arrive on site at X-1. Setup grid for floor samples first then sidewall.
1130 Finished the floor samples, 9 total.
1140 Setup locations for sidewall samples every 10 feet along sidewall. The area near stockpile 1, 2 still needs to be excavated. Lab samples will not along that wall.
1200 Ken calls - lunch time - meet Judy, Mark from Doe and John Helvagn from ADEC - their plane arrived onsite at 1040, and will remain onsite to transport them back to Kotzebue.
1230 regear up for sampling at X-1
1300 Head up to X-1, meet John H, Judy, Mark and Rick coming down they request Mike and I

1337

8/5/14
1300 cont.
to accompany them to Baker to discuss status and work completed.
1345 Head up to airport show them the grave, the lead excavation and briefly discuss the upcoming meeting
1415 Back at camp - talking to the Doe and ADEC - they would like the pipe remnants and thermistor cables, placed into an area more visible for tomorrows meeting.
1500 Arrive at X-1 collect sidewall samples
1600 collect stockpiles from stockpile 3 and 4, load up gear. Main tour would like to partially backfill charlie tomorrow.
1645 arrive at Charlie to see how to accomplish this the west side near the charlie casing has 3 pin flags we swing tire to so

1700

8/5/14

1645 cont.
The flags can be removed during the backfilling and accurately replaced for the land surveyor to survey in at a later date.

1715 Back at camp, processing samples, do photo log

1745 Camp generator goes down.

1815 generator refueled and running again.

1900-1930

1930 all samples processed, rubber bands and baggies in cooler. Update the Corner Summary sheet with all bags processed to date, 513.2 tons stacked

2100 end of Day

8/6/14 51° HH high scattered clouds 10 mph NW

0745 Safety Meeting - Medical Evac - Bears, communications, fence, buddy system, communicating excavation safety.

0815 load up gear for test pits at Dog and exposing casing for it to be cut and welded. Jim has EJO excavator onsite.

0830 PDT Conference call - discussed project status, estimated for remaining at X-1 and Dog, corners, contract money transfer, Rick talks about site restoration currently onsite only 1 bag of fertilizer, and grass seed. Sow was 500 lbs fertilizer per acre and 1 pound seed per 1000 feet for grass seed, showed BJ11 and Kobuk the requirements, no response from BJ11,

1000 onsite at Dog, Jim dug up the steel landing mats on North side of Dog, approximately 12 mats, there are a few on east side to be dug up

8/6/14

1015 Dug around 2 feet bgs around Dog casing. Used 2x8 cribs around casings at ≈24" bgs. Tundra layer starts at 22" bgs - permafrost ≈ at 36" bgs. Collect 3 pits at 0-1', 1-2', 2-3' bgs. Jim digs up steel mats from east side.

TP2 0-3" vegetation
3-10" gravel
10"+ clay
permafrost ≈ 24"

1045 Test pits completed - Jim works on roadway - we head back to camp to process samples for shipment.

1050 First plane arrives on site,

1100 Second plane arrives on site

8/9/14

1130 Place the 3 samples collected THIS morning at Dog at Test pit 2, in the cooler for shipment to Anchorage

1145 Alaska Dispatch takes photos of us in canvas and asks us a few questions.

1200 Media group heads out to Chukchi Site

1200-1230 lunch

1230 Media in camp

1300 Media departs with Jim and Mike.

1330 Doe ADec depart with Anthony leave for Kotz. we load up to Head to Dog to cut casings.

1415 At Dog casing - cut casing with electric handsaw and removed 15 feet down from cut-head - no sample was able to be collected due to depth - Filled with bentonite pellets, hydrated with potable water

1700

8/6/14

1445 Casing has 4 bolt welded to ground and casing has a steel plate on top that is welded completely around it.

1515 Depart Dog with Tom and head to camp.

1530 Mike and I head up to X-1 to label PJD flag locations with sample numbers.

1615 Joey wants to backfill Charlie,

1630 we head to Charlie set 3 control points and conduct Sun shots to all Soil Sample locations and pulled the Soil Sample flags except the Tundra Sample flags were left on site.

1730 Back at Camp, let Konrad Tim know Charlie is ready

1900-1920 Dinner

1930 paperwork, darting shovel and Bill washtips

2100 End of day

8/7/14 50° 20mph Winds Sunny

0745 Safety meeting - communication, bears, Split crew at Dog and Charlie

0815 Pack up gear for flight out

1020 MWA arrives the Doe rep Gretchen, Ricks replacement go over safety issues on site including site tour

1115 Mike, I, and Rick leave site for Kotzebue

1900 Flight from Kotzebue to Anchorage

2030 Arrive in Anchorage

2100 Done for day

12

8/12/14
0630 Arrive at FDX airport for flight to Anchorage
930 Arrive Anchorage
1030 Flight to Kotzebue
215 Airtaxi picks us up - I get tent from BAC
1230 Board 206 for flight to Capet
1345 Arrive at Capet, unpack gear load up to replace flags at Charlie
180 Back at camp, Charlie site looks great with the backfill and smoothing.
1700 Dinner time has been moved to 1900.
1730 Done with dinner, unpack,
1830 Head to Baker and Able with Coretcher for final pictures of these sites before the leaves.
1930 Back cooler with sample gear
2100 Done for the day

DJ

8/13/14 45° 15mph winds N, sunny
0745 Safety meeting - ATV/site safety, bears, creek crossing, hand tools
0830 Project meeting - Melanie says many things have Contracting officer is talking on it. need to get them using the wetland and emerald weights for coolers, AVEC acceptance of 12,500 wts/kg at X-1
0910 Meeting Completed, staff meeting to strategize priorities and tasks.
0945 plane arrives for Coretcher and Sample cooler.
1000 - load cooler with gear and sampling equipment for dealing with stockpiles at X-1
1030 ATX-1 moving stockpile 2 off of liner
1115 moving soil from stockpile 4 off of liner.
1215 - 1245 lunch
300 Onsite at X-1 super sackers suit

DJ

8/13/14
from Stockpile 2.
1410 completed sacking stockpile1, move to Stockpile3 to place Phyto Super Sacks.
1500 wind stops bags are out.
1630 stockpile 3 gone, back at Camp unload gear.
1700 - 1730 Dinner
1730 paperwork, phyto logs, field notes and dailies
2100 Done for Day

DD

8/14/14 46° Cloudy/Mixed Sunny
0745 safety meeting, excavating odors, limited loading areas, slip, trips, fall, warm/buggy.
0830 Barge maybe arriving this afternoon, got word from B&H weight of soil in each conex can be increased from 36k to 40k.
0900 John, Jim, Cody, Karl and Tom are weighing the 17 bags from the stockpiles at X-1 and moving them to the westside of creek to place into the already loaded conexes now that the net weights increased. Mike, Kenard & I head to Dog to strategize operations that will occur there. NWA has availability to fly bamboo mats and super sacks to site once the material reaches Katzebue.
1130 - 1200 lunch
all Sacks are weighed, maintenance on ATV/utvs

DD

8/14/14 65° 5 mph wind buggy
1300 NWA plane arrives with food, 1 yes 55-gallon barrel
Mike and Jim heading up to Dog using small E50 excavator to begin to stockpile contaminated soil. I remain in camp to load the 17 supersacks from stockpiles into connexes on west side of creek for pickup by barge tonight.
1500 Connexes reloaded, I begin to update connex summary sheets with added weights.
1600 Ken and I head up to Dog to see the progress.
We meet Mike ~ 100 yards from site headed back to camp, the barge has rounded the point at Cape Thompson, and they have excavated as much as they can.
1645 Barge arrives

8/14/14
1715 Plane arrives (NWA) with a load of supersacks.
Barge continues to load full connexes.
1730-1800 Dinner
1830 Barge departs with all 16 connexes from the west side, They will return Saturday morning to pickup connexes from east side of creek.
2100 Done for Day

8/15/14 50° Scattered clouds
0745 safety meeting - 2 crews,
1 filling bags at Dog, 2nd reloading
connexes for barge on Saturday.
Escape routes, Odor, loading areas,
bear safety.
0815 load up sampling gear for
Dog, Tank, Mike, Cody, Kaleen
and myself heading to fill
sacks. Keegan John reload
connexes
0900 loading foot prints at Dos and
MS/MD.
0 set 2 control points to
use swing ties to locate
Dog casing.
1000 Excavator needs hydraulic oil,
Kaleen heads back to camp
1130 Tank is draining fluid from
E85 to use in E50.
1200 lunch complete Head back up to
Site, Tank is using hydraulic fluid
from E85 for E50.
1300 E50 is back in operation, filling
Super sacks at Dog

120

8/15/14
1415 Mike and I head up to X-Y
2 bear or muskox were spotted
by Shoalbank creek.
we collect swing ties for X-1
on all floor, wall, loading footprint
and stockpile footprints. Kenand John
notice a large dead seal washed
up near camp, near the barge
landing location yesterday - They
have carcass further down
beach for bear safety, it's
decomposing.
1615 AT camp updating manifests
for reloaded connexes, 10
will be picked up tomorrow
morning by the barge company.
1700 1730 Dinner
1730 Paperwork, photo log
2400 planes come in with
landing mats, cooler and gear.
2130 Done for the day

203

8/16/14 clear 54° wind 10 mph E
0745 safety meeting split crews X-1 and Dog, bear safety, communications, bags, transport. Mike and Ken are onboard still.
0930 Dave leading Large - they depart - load Sample gear for X-1 sampling.
0945 Arrive at X-1 - for sampling all loading footprints and stockpile footprints.
1100 collect floor Sample for GRO/PRO/SVOCs and PCBs.
1115 Set 4 more control points to move CP1 + CP2 out of backfill activities.
1130-1200 Lunch
1200 prepare samples for shipment out Sunday by NWA
1330 Head up to Dog conduct air monitoring. the bamboo mud mats that arrived ~~yesterday~~ are laid out and are ~ 100 feet short of site
BJ

8/16/14
1500 still bagging soil
1630 Ken arrives, shutting down gear, 50 sacks onsite filled, 29 today. Still need to be transported to camp 6.
Hopefully NWA flight arrives tomorrow with the remaining mud mats. We have a couple going out.
1700-1730 Dinner
1730 photo log, paperwork, clean camera, gather gear for backhaul by NWA.
2100 end of Day

BJ

8/18/14 clear skies, 46° 5 mph wind
0730 Kept meeting safety meeting to 730. Road building, transporting sacks to conexes, continue excavating at Dog are the planned activities. Jeff Price with Doe B expected to arrive onsite today.
0815 loading sampling gear, head to site, stop at east runway and pickup 2 mud mats and take to Dog.
0900 EJ50 excavator J walked in to the site, the remaining 7 mud mats are installed along with gravel from borrow pit installed at joints of mudmats, via skidsteer
0930 EJ50 B safety to dig and load filled super sacks at Dog.
1100 Ken and kubota load shifted and need to be rearranged. Continue to fill sacks. Hillary calls and lets us know that Jeff will arrive until 4-5pm.
1215-1245 lunch

DJ

8/18/14
1245 working on hauling trailers so sacks don't rub on tires, kubota rear shock on good kubota B replaced with the set Mike brought out last week
1430 resume hauling sacks to conexes, filling super sacks. J is working with Kalen on holding sacks open, Cody, John and Ken handling sacks, Mike and Tom onsite, Jim operating excavator
1900-1930 Dinner, 45 bags filled today, ~ 75-80 remain at Dog to be transported to conexes. Tomik goes onsite after dinner just to transport sacks to conexes
1930 Paperwork, COC samples, devices
2100 ews - Jim, Doe Jeff Price did not make it to the site today from Kotzebue.

DJ

8/19/14

0730 Safety meeting ATV/UTV safety and turning around near excavation, odors, wind direction slips + trips and falls. Jeff Price is washing further gear in Katzebue today prior to flying out with NWA.

0815 loading sampling gear, head up to site. Tank is at equipment bear fence repairing and maintenance

0930 Pin flags are placed in current excavation on sidewalls and on floor preparing for PID and confirmation samples. Excavation arrives onsite, skid steer moves more gravel to mud pits. Continue to excavate and haul sacks to conex.

1145 plane arrives from Kotz with Jeff representing DOE

1200–1230 lunch

1230 conduct maintenance on trailers and air pressures etc.

130 Arrive onsite at DOG.

↓ BJ

8/19/14

1500 Continue to haul bags – excavation is preliminary completed collect

1680 floor samples and floor PID's –

1630 collect wall PID samples – 3 places need additional excavation

1700–1730 Dinner

1745 Back at DOG, hauling sacks and prepares to do additional excavation.

2100 Back at camp, processing Samples, duties, photolog

2200 End of Day

★ BJ

8/20/14 50° partly cloudy
0730 Safety meeting creek crossing due to storm surge, ATV/uTV safety, bears
0830 Conference call with project team,
0945 Mike and Jamie onsite to collect last of confirmatory samples, Jim, Mike and I at Dog excavation.
1130 Plane arrives with Jody, Mark, April all Doe and John Halvesen ADec for a site visit.
1230 Done collecting wall + floor samples from Dog Head to camp. Process samples and coolers for transport on plane to Kotz. Grab quick lunch.
1430 Plane leaves for Kotz with samples,
1530 At Dog, filling and hauling sacks from stockpile with excavation done this morning.
1700 Head to camp

↓DJ

8/20/14
1715 - 1745 Dinner
1800 Tanik heads back to Dog to haul sacks to the East staging area.
Continue with packing equipment for a backhaul to Kotz if AWS makes a food run tomorrow.
55 gallon barrel, water pump, hole spikes, turkey butts markers, ziplocs, and 5 gallon bucket.
1900 Begin duties, photo log, forms etc.
2100 End of day

↓DJ

30

8/21/14 48° cloudy 10 mph S wind
0730 Safety meeting - ATV/UTV hauling bags, filling bags, adding magnesium filling cones, eliptic routes.
0815 Jeff and I look at 1993 radiation excavating lead sample area, 2 nuclear underground bunkers radio gear and grave
0930 Drive Jeff to Dog head back to pickup mike
1015 Arrive at Dog, start to haul bags to east staging area.
1215-1245 lunch
1245 Tentative schedule phone calls with Bill, Ken and Barge people. possibly August 30, or September ~~30~~ 13 for final load.
1430 Head to X-1, flag all sample points.
1500 AT charlie checking the survey flags.
1530 Head to Dog to pickup mil

[illegible]

8/21/14
field gear and collect the loading footprint soil samples
1700-1730 Dinner
1730 Send email with photos for Jeff to Rick with Due. water depths, photo log paperwork, and process samples. Clean up Camp areas and our compound.
2100 end of day

[illegible]

8/22/14

0730 Safety meeting — visitors today, ATV crossing bear safety, near excavation sidewalls.

0830 Packing up Fes fred gear

1030 NWA Plane arrives with 3 DOE, and John Halverson, Matthew departs to head to Point Hope to bring back loads for a site visit.

1115 Plane arrives back from Point Hope with 3 women and I men. I conducted a brief safety briefing and collect signatures from todays visitors.

1200 lunch - 1230

1200 working on data entry and Dog data comes in.

1530 Plane takes residents of Point Hope back to Point Hope

1600 DOE and NWA heads back to base,

1700 DMOT to 1730

1730 rafting, gear up to head to BJ

8/22/14

1730 cont.

to X-1 and see status of back filling the excavation, then head to Dog to remove pin flags that were not soil sample locations, then head back to X-1 for photos

1930 stop at East staging area to see how the connex loading process is going-

1930 Return to camp, paperwork, data, photologs are completed

2100 End of day

BJ

8/23/14 50° partly cloudy 10 mph winds
0730 Safety meeting - creek crossing, loading buggy into convey, fertilizer application.
0815 load up gear to replace sample flags at X-1, Tank completed backfill last night.
0900 Mike returns to camp to collect far plot flags.
1130 Done replacing flags at X-1
1200-1230 lunch
1230 Data entry on convex summary sheets - all Super sacks are loaded into 13 convexs
1530 785.6 tons removed, 1.57 million pounds of soil. Breaking down our FEL gear for backhauls to KOTZ when available
1700-1730 Dinner - paperwork, diaries and photo log.
1800 End of Day

#137

8/17/14 cloudy 50° N wind 0-15 mph
0745 Safety meeting, split crews, Ken and Cody in camp working on roads, John on trash, the rest of crew heads to Dog, bear safety, odors, symptoms of nausea, dizzy, UTV safety.
0845 Mike and I onsite waiting for EJ50 excavator to arrive
0915 Begin to sack soil.
1030 Ken and Cody arrive onsite Cody helps Kaleen sack
1045 Move excavator to the east side of excavation, right below the timber; dark black high odor high PID results, right below the dark black is brown to grey grey
1145 Head back to camp
1200-1230 lunch, Seal Sample cooler drop off at airport (uppa)
1245 Arrive at Dog - continue to excavate and fill sacks
1300 Air monitor, wind shift from west.

8/18/14
1400 Air monitoring, John arrives onsite, continue digging excavation
1600 Anthony arrives at upper east runway with the remainder of bamboo mud mats. John arrives at West runway with super sacks and picks up our sample cooler and 2 actsm packers for backhaul
1700 - 1730 Dinner
1730 peer review debrief, created excel sheet to calculate per site the amount of tons from each site on the convex summary excel sheet.
2100 Done for day.

APPENDIX E

CORRESPONDENCE WITH USACE/ADEC REGARDING EXCAVATION CLOSURES

Test Hole Baker

Shewman, Aaron F POA

From: Morris, Jessica A (DEC) [jessica.morris@alaska.gov]
Sent: Tuesday, July 29, 2014 1:45 PM
To: Shewman, Aaron F POA
Cc: Halverson, John E (DEC); Peterson, Melanie A POA
Subject: [EXTERNAL] RE: Project Chariot Test Hole Baker - POL-Soil Excavation is Complete (UNCLASSIFIED)

Aaron,

Assuming that the sampling and analysis was conducted in accordance with the work plan, it looks like the area can be backfilled and recontoured.

Thanks for keeping us in the loop.

Jessi

-----Original Message-----
From: Shewman, Aaron F POA [mailto:Aaron.F.Shewman@usace.army.mil]
Sent: Monday, July 28, 2014 1:58 PM
To: Morris, Jessica A (DEC)
Cc: Halverson, John E (DEC); Peterson, Melanie A POA
Subject: Project Chariot Test Hole Baker - POL-Soil Excavation is Complete (UNCLASSIFIED)
Importance: High

Classification: UNCLASSIFIED
Caveats: NONE

Jessi,

As I mentioned in my voicemail, I am sending you a site sketch, lab data spreadsheet, and site photographs for Test Hole Baker at Project Chariot (Cape Thompson).

Review of the data indicates all soil confirmation sample DRO results were below 500 mg/Kg, which indicates POL-contaminated soil excavation is complete. As a result, we would like to give our contractor the go-ahead to recontour the area around the test hole and continue work at the other test holes at this site.

We would like your concurrence before we do so. Please call me at your earliest convenience to discuss.

Thank you.

Aaron Shewman, P.E.
Environmental Engineer
USACE Alaska District (EN-EE)
Joint Base Elmendorf-Richardson, Alaska
(907) 753-5558 (voice)
(907) 753-2829 (fax)

-----Original Message-----
From: Peterson, Melanie A POA
Sent: Monday, July 28, 2014 10:15 AM
To: Shewman, Aaron F POA

Cc: Benjamin, Sean P POA
Subject: FW: Baker Results (UNCLASSIFIED)
Importance: High

Classification: UNCLASSIFIED
Caveats: NONE

Aaron

Please take the lead on this.

Melanie

-----Original Message-----
From: Michael Boese [mailto:MBoese@fesalaska.com]
Sent: Monday, July 28, 2014 10:06 AM
To: Peterson, Melanie A POA; bill@tanikco.com; julie@tanikco.com; Craig Martin
Subject: [EXTERNAL] Baker Results

Melanie-
Attached are figures, photos, and lab results for the Baker excavation. We removed 15.5 tons and confirmation samples met the Method 1 cleanup levels. Please forward the information to ADEC for closure concurrence so we can complete the Baker excavation. Let me know if you need anything else.

Mike Boese
(907) 441-1346 - Cell
(907) 277-7111
Fairbanks Environmental Services

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Michael Boese

From: Shewman, Aaron F POA [Aaron.F.Shewman@usace.army.mil]
Sent: Tuesday, July 29, 2014 2:24 PM
To: Bill Jury
Cc: Michael Boese; Peterson, Melanie A POA
Subject: RE: Project Chariot Test Hole Baker - POL-Soil Excavation is Complete (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Bill,

I had a telecon with Jessi Morris and John Halverson at ADEC re: soil confirmation sample DRO results indicating POL-contaminated soil excavation is complete at Test Hole Baker.

Jessi agree Tanik can go ahead and recontour the area around Test Hole Baker.

She looks forward to receiving similar information for Test Hole Charlie soon.

Please let me know if you have any questions.

Aaron Shewman, P.E.
Environmental Engineer
USACE Alaska District (EN-EE)
Joint Base Elmendorf-Richardson, Alaska
(907) 753-5558 (voice)
(907) 753-2829 (fax)

Classification: UNCLASSIFIED
Caveats: NONE

Test Hole Charlie

Shewman, Aaron F POA

From: Morris, Jessica A (DEC) [jessica.morris@alaska.gov]
Sent: Wednesday, August 06, 2014 1:48 PM
To: Shewman, Aaron F POA
Subject: [EXTERNAL] RE: Project Chariot - Test Hole Charlie POL-Soil Excavation is Complete (UNCLASSIFIED)

Aaron,

Assuming that the sampling and analysis was conducted in accordance with the work plan, it looks like the area can be backfilled and recontoured.

Thanks,

Jessica A. Morris
Alaska Department of Environmental Conservation
Contaminated Sites Program
555 Cordova Street
Anchorage, Alaska 99501
Phone: 907-269-3077
jessica.morris@alaska.gov

-----Original Message-----
From: Shewman, Aaron F POA [mailto:Aaron.F.Shewman@usace.army.mil]
Sent: Friday, August 01, 2014 10:53 AM
To: Morris, Jessica A (DEC)
Cc: Peterson, Melanie A POA
Subject: RE: Project Chariot - Test Hole Charlie POL-Soil Excavation is Complete (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Jessi,

To follow-up on our phone conversation earlier this morning regarding Test Hole Charlie confirmation soil sample locations C039SO and C040SO, both locations were collected from tundra soil. The field team confirmed this via telephone and explained the entire excavation floor is tundra soil with permafrost.

Please let me know if you have any questions.

Aaron Shewman, P.E.
Environmental Engineer
USACE Alaska District (EN-EE)
Joint Base Elmendorf-Richardson, Alaska
(907) 753-5558 (voice)
(907) 753-2829 (fax)

-----Original Message-----
From: Shewman, Aaron F POA
Sent: Friday, August 01, 2014 8:15 AM
To: Morris, Jessica A (DEC)
Cc: Peterson, Melanie A POA

Subject: Project Chariot - Test Hole Charlie POL-Soil Excavation is Complete (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Jessi,

Attached are site sketches, associated lab data, and site photographs for Test Hole Charlie at Project Chariot (Cape Thompson).

Review of the data indicates all soil confirmation sample DRO results were below 500 mg/Kg except for one collected from the floor in permafrost (83,300 mg/Kg DRO in tundra soil), which indicates POL-contaminated soil excavation is complete. As a result, we would like to give our contractor the go-ahead to recontour the area around the test hole and continue work at the other test holes at the Chariot site.

We would like your concurrence before we do so. Please call me at your earliest convenience to discuss.

Thank you.

Aaron Shewman, P.E.

Environmental Engineer

USACE Alaska District (EN-EE)

Joint Base Elmendorf-Richardson, Alaska

(907) 753-5558 (voice)

(907) 753-2829 (fax)

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Michael Boese

From: Shewman, Aaron F POA [Aaron.F.Shewman@usace.army.mil]
Sent: Friday, January 23, 2015 2:54 PM
To: bill@tanikco.com; Michael Boese
Cc: Peterson, Melanie A POA
Subject: FW: Chariot Test Hole Charlie Status (UNCLASSIFIED)
Attachments: 1143274_Crosstab.xls; 1143333_Crosstab.xls; 1143374_Crosstab.xls; 1143385_Prelim_HS.PDF; Chalie Excavation Photos.pdf; Charlie Sketches.pdf

Classification: UNCLASSIFIED
Caveats: NONE

Gentleman,

As part of my comments to the draft 2014 Remedial Action Report, I am forwarding you the email dated August 13, 2014, confirming ADEC concurrence with backfill and recontouring of Test Hole Charlie on July 31, 2014, for inclusion in Appendix E of the final report.

FYSA USACE comments on the draft report will be separately transmitted at a later date.

Thank you.

Aaron Shewman, P.E.
Environmental Engineer
USACE Alaska District (EN-EE)
Joint Base Elmendorf-Richardson, Alaska
(907) 753-5558 (voice)
(907) 753-2829 (fax)

-----Original Message-----
From: Peterson, Melanie A POA
Sent: Wednesday, August 13, 2014 7:23 AM
To: Mark Kautsky DOE-PM; Hutton, Rick (CONTR)
Cc: Gretchen Baer; Jeffrey Price; Miller, Judy (CONTR); Morgan, Christopher L POA; Shewman, Aaron F POA; Peterson, Melanie A POA
Subject: Chariot Test Hole Charlie Status (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

All

Please find attached the results for Test Hole Charlie. The Corps has coordinated with ADEC about closing this site. ADEC as of 31 July 2014, has concurred that the site is good to close for backfill and re-contouring.

The contractor was given the go ahead to close this site on the July 31.

Sorry for the delay on providing this information.

Melanie Peterson
Project Manager
Alaska District
U.S. Army Corps of Engineers

Work: (907) 753-5694
Fax: (907) 753-2829

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Test Hole Dog

From:	Morris, Jessica A (DEC)
To:	Shewman, Aaron F POA
Cc:	Halverson, John E (DEC); Peterson, Melanie A POA
Subject:	[EXTERNAL] RE: Project Chariot Test Hole Dog - POL-Soil Excavation is Complete (UNCLASSIFIED)
Date:	Monday, August 25, 2014 10:57:52 AM

Aaron,

Based on the information you provided, I would concur that the area around the test hole can be backfilled.

Thanks,

Jessi

Jessica A. Morris

Alaska Department of Environmental Conservation

Contaminated Sites Program

555 Cordova Street

Anchorage, Alaska 99501

Phone: 907-269-3077

jessica.morris@alaska.gov

From: Shewman, Aaron F POA [mailto:Aaron.F.Shewman@usace.army.mil]
Sent: Monday, August 25, 2014 8:49 AM
To: Morris, Jessica A (DEC)
Cc: Halverson, John E (DEC); Peterson, Melanie A POA
Subject: Project Chariot Test Hole Dog - POL-Soil Excavation is Complete (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Jessi,

Attached are pertinent site sketches, lab data, and site photographs for POL-contaminated soil excavation from Test Hole Dog at Project Chariot (Cape Thompson).

The sidewall samples within the area represented by the dark line were collected from tundra. Sidewall samples collected outside the area of the dark line were in the gravel pad so they are subject to the 500 mg/kg cleanup level. All floor samples were collected from tundra so they are subject to tundra arctic zone cleanup levels. All results were below the applicable cleanup levels.

Loading area pre-and post-soil samples were also collected. The highest PID measurement was 7 ppm. Laboratory results should be available tomorrow.

There were no soil stockpiles associated with this excavation.

We would like to give our contractor the go-ahead to backfill/recontour the area around the test hole as soon as possible. We would like your concurrence. Please call me at your earliest convenience if you would like to discuss.

Thank you.

Aaron Shewman, P.E.

Environmental Engineer

USACE Alaska District (EN-EE)

Joint Base Elmendorf-Richardson, Alaska

(907) 753-5558 (voice)

(907) 753-2829 (fax)

Classification: UNCLASSIFIED
Caveats: NONE

Michael Boese

From: Shewman, Aaron F POA [Aaron.F.Shewman@usace.army.mil]
Sent: Monday, August 25, 2014 11:08 AM
To: Michael Boese; ken.rissew@gmail.com
Cc: Peterson, Melanie A POA; Kautsky, Mark; rick.hutton@lm.doe.gov; julie@tanikco.com; bill@tanikco.com; Craig Martin
Subject: Okay to Backfill/Recontour Test Hole Dog! (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

All,

Moments ago Jessi Morris with ADEC agreed we can backfill/recontour Dog!

Thank you for all of your good work. Please be safe as you demobilize from the site. We look forward to receiving the draft Remedial Action Report.

Aaron Shewman, P.E.
Environmental Engineer
USACE Alaska District (EN-EE)
Joint Base Elmendorf-Richardson, Alaska
(907) 753-5558 (voice)
(907) 753-2829 (fax)

-----Original Message-----
From: Michael Boese [mailto:MBoese@fesalaska.com]
Sent: Sunday, August 24, 2014 7:55 PM
To: Shewman, Aaron F POA; Peterson, Melanie A POA; Craig Martin; bill@tanikco.com; julie@tanikco.com; ken.rissew@gmail.com; rick.hutton@lm.doe.gov
Subject: [EXTERNAL] Chariot Daily Report for Aug 24

Melanie-
Attached is the DQCR for Aug 24. We started the demobe process today. Please let me know when we can backfill the DOG excavation, and if you need any additional information for site closure. Surveyor is scheduled to arrive onsite Tuesday.

Thanks,
Mike

Mike Boese
(907) 441-1346 - Cell
(907) 277-7111
Fairbanks Environmental Services

Classification: UNCLASSIFIED
Caveats: NONE

Test Hole X-1

Shewman, Aaron F POA

From: Morris, Jessica A (DEC) [jessica.morris@alaska.gov]
Sent: Friday, August 22, 2014 9:59 AM
To: Shewman, Aaron F POA
Cc: Halverson, John E (DEC); Peterson, Melanie A POA
Subject: [EXTERNAL] RE: Project Chariot Test Hole X-1 - POL-Soil Excavation is Complete (UNCLASSIFIED)

Aaron,

Thanks for sending the lab reports; that cleared things up. Assuming that the sampling and analysis was conducted in accordance with the work plan, I think the contractor can backfill/recontour the area around the test hole.

Thanks,
Jessi

-----Original Message-----
From: Shewman, Aaron F POA [mailto:Aaron.F.Shewman@usace.army.mil]
Sent: Friday, August 22, 2014 9:03 AM
To: Morris, Jessica A (DEC)
Cc: Halverson, John E (DEC); Peterson, Melanie A POA
Subject: RE: Project Chariot Test Hole X-1 - POL-Soil Excavation is Complete (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Good morning Jessi,

I apologize, all the lab data reports are attached to this message. The field team informed me this morning:

Excavated soil samples are 1143278 to 1143470.

Excavation limit samples are in 1143517, 1143634, and 1143815.

The full suite analysis sample from the excavation, and pre- and post-soil samples from loading and stockpile areas are in 1143866 Prelim 2 (sent to you with a different title via email yesterday).

Please let me know if you need anything else.

Aaron Shewman, P.E.
Environmental Engineer
USACE Alaska District (EN-EE)
Joint Base Elmendorf-Richardson, Alaska
(907) 753-5558 (voice)
(907) 753-2829 (fax)

-----Original Message-----
From: Shewman, Aaron F POA
Sent: Thursday, August 21, 2014 10:21 AM
To: Morris, Jessica A (DEC)
Cc: Halverson, John E (DEC); Peterson, Melanie A POA

Subject: Project Chariot Test Hole X-1 - POL-Soil Excavation is Complete (UNCLASSIFIED)
Importance: High

Classification: UNCLASSIFIED
Caveats: NONE

Jessi,

Attached are pertinent site sketches, lab data, and site photographs for POL-contaminated soil excavation from Test Hole X-1 at Project Chariot (Cape Thompson).

In summary:

- DRO/RRO confirmation samples from the floor and sidewalls are below ADEC Method Two Arctic Zone soil cleanup levels.

- One exception to the above is results for the additional soil sample analyzed for silica gel cleanup DRO/RRO, GRO, VOC, SVOC, and PCBs collected from the floor (permafrost) of the excavation near the test hole casing indicated DRO above Method Two. No other analytes were above Method Two levels.

- Pre- and post-soil samples from loading and stockpile areas for DRO/RRO were below ADEC Method One Arctic Zone soil cleanup levels.

As a result, we would like to give our contractor the go-ahead to backfill/recontour the area around the test hole. We would like your concurrence. Please call me at your earliest convenience if you would like to discuss.

Thank you.

Aaron Shewman, P.E.
Environmental Engineer
USACE Alaska District (EN-EE)
Joint Base Elmendorf-Richardson, Alaska
(907) 753-5558 (voice)
(907) 753-2829 (fax)

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Michael Boese

From: Shewman, Aaron F POA [Aaron.F.Shewman@usace.army.mil]
Sent: Friday, August 22, 2014 10:05 AM
To: Michael Boese; bill@tanikco.com; Craig Martin; julie@tanikco.com; ken.rissew@gmail.com
Cc: Peterson, Melanie A POA; rick.hutton@lm.doe.gov
Subject: RE: Chariot Daily Report for Aug 21 (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

All,

Moments ago Jessi Morris with ADEC agreed we can backfill/recontour X-1.

Aaron Shewman, P.E.
Environmental Engineer
USACE Alaska District (EN-EE)
Joint Base Elmendorf-Richardson, Alaska
(907) 753-5558 (voice)
(907) 753-2829 (fax)

-----Original Message-----
From: Peterson, Melanie A POA
Sent: Friday, August 22, 2014 9:46 AM
To: Michael Boese; bill@tanikco.com; Shewman, Aaron F POA; Craig Martin; julie@tanikco.com; ken.rissew@gmail.com; rick.hutton@lm.doe.gov
Cc: Peterson, Melanie A POA
Subject: RE: Chariot Daily Report for Aug 21 (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Mike

No word yet, Aaron has followed up with Jessi all ready this morning to get a response. He will be on top of following up with her.

Melanie

-----Original Message-----
From: Michael Boese [mailto:MBoese@fesalaska.com]
Sent: Thursday, August 21, 2014 7:26 PM
To: Peterson, Melanie A POA; bill@tanikco.com; Shewman, Aaron F POA; Craig Martin; julie@tanikco.com; ken.rissew@gmail.com; rick.hutton@lm.doe.gov
Subject: [EXTERNAL] Chariot Daily Report for Aug 21

Melanie-
Attached is the Daily QC report for Aug 21. Any word on site closure for the X-1 excavation? Apparently John Halverson, DOE personnel, and representatives from Point Hope will be visiting tomorrow. Also, we will be getting confirmation sample results from DOG tomorrow!

Thanks,
Mike

Mike Boese
(907) 441-1346 - Cell
(907) 277-7111
Fairbanks Environmental Services

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Michael Boese

From: Peterson, Melanie A POA [Melanie.A.Peterson@usace.army.mil]
Sent: Friday, August 15, 2014 10:07 AM
To: Michael Boese; ken@tanikco.com
Cc: Craig Martin; Shewman, Aaron F POA; rick.hutton@lm.doe.gov; julie@tanikco.com; bill@tanikco.com; Mark Kautsky DOE-PM; Peterson, Melanie A POA; Benjamin, Sean P POA; Morgan, Christopher L POA
Subject: RE: Arctic Zone Cleanup Levels Apply to X-1 (UNCLASSIFIED)

Importance: High

Classification: UNCLASSIFIED
Caveats: NONE

Gentlemen

ADEC has confirmed that using Method Two Arctic Zone Soil Clean Levels for X-1 is acceptable.

Melanie

-----Original Message-----
From: Michael Boese [mailto:MBoese@fesalaska.com]
Sent: Wednesday, August 13, 2014 10:07 AM
To: Peterson, Melanie A POA; rick.hutton@lm.doe.gov; julie@tanikco.com; ken@tanikco.com; Shewman, Aaron F POA; bill@tanikco.com
Cc: Craig Martin
Subject: [EXTERNAL] Arctic Zone Cleanup Levels Apply to X-1

Melanie-
Rick Hutton (DOE contractor) and I asked John Halverson about using the Method Two Arctic Zone Soil Cleanup Levels (DRO=12,500 mg/kg) for X-1 excavation during his site visit on August 4th, 2014. John concurred with the Method Two Cleanup Level based on the fact that no drill pad gravels were ever installed at the site, and that the site is underlain by permafrost. He did request that we use the Method One level of 500 mg/kg for evaluating the four overburden stockpiles at X-1, however. I did not document this information in the DQCR as I had indicated in the teleconference we had this morning.

Thanks,
Mike

Mike Boese
(907) 441-1346 - Cell
(907) 277-7111
Fairbanks Environmental Services

Classification: UNCLASSIFIED
Caveats: NONE

Michael Boese

From: Shewman, Aaron F POA [Aaron.F.Shewman@usace.army.mil]
Sent: Saturday, August 16, 2014 12:25 PM
To: Michael Boese
Subject: RE: X-1 Excavation Results (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

No worries. It is great news the barge has come and gone with all the conex!

Did Northland deliver empty conex for Chariot?

Aaron Shewman, P.E.
Environmental Engineer
USACE Alaska District (EN-EE)
Joint Base Elmendorf-Richardson, Alaska
(907) 753-5558 (voice)
(907) 753-2829 (fax)

-----Original Message-----
From: Michael Boese [mailto:MBoese@fesalaska.com]
Sent: Saturday, August 16, 2014 12:04 PM
To: Shewman, Aaron F POA
Subject: [EXTERNAL] Re: X-1 Excavation Results (UNCLASSIFIED)

Aaron-
Unfortunately the barge arrived at 6 AM this morning and removed all the filled connexes from the site.

-Mike

Fairbanks Environmental Services
Mboese@fesalaska.com
907-441-1346

On Aug 16, 2014, at 10:49 AM, "Shewman, Aaron F POA" <Aaron.F.Shewman@usace.army.mil> wrote:

> Classification: UNCLASSIFIED
> Caveats: NONE
>
> Mike,
>
> John Halverson with DEC stated if the stockpile results were > 500 mg/kg DRO and < 12,500 mg/kg DRO, that soil could be used as backfill in areas that are more than 2' below the ground surface and then covered with at least 2 feet of "clean" soil.
>
> If results were as described above, then if you kept track of the soil bags that contain the formerly stockpiled soil you can empty the bags back into the bottom of the excavation to save tonnage going off site.
>
> Aaron Shewman, P.E.
> Environmental Engineer
> USACE Alaska District (EN-EE)

> Joint Base Elmendorf-Richardson, Alaska
> (907) 753-5558 (voice)
> (907) 753-2829 (fax)
>
>
> -----Original Message-----
> From: Michael Boese [mailto:MBoese@fesalaska.com]
> Sent: Friday, August 15, 2014 8:00 PM
> To: Peterson, Melanie A POA; Shewman, Aaron F POA; bill@tanikco.com; julie@tanikco.com; Craig Martin; ken.rissew@gmail.com; rick.hutton@lm.doe.gov
> Subject: [EXTERNAL] X-1 Excavation Results
>
> Melanie-
> We received the preliminary sidewall results today, and they were below ADEC Method Two Arctic Zone soil cleanup levels. All confirmation samples from the floor and sidewalls are below ADEC Method Two Arctic Zone soil cleanup levels. There is no further excavation planned for X-1, however, FES still need to collect post footprint samples from loading and stockpile areas, and the additional sample for VOC, GRO, SVOC, PCB, and silica gel cleanup DRO/RRO. We will collect those samples this weekend and include those results upon receiving them. Attached are the preliminary results from X-1. Please review and comment.
>
> Thanks,
> Mike
>
>
> Mike Boese
> (907) 441-1346 - Cell
> (907) 277-7111
> Fairbanks Environmental Services
>
> Classification: UNCLASSIFIED
> Caveats: NONE
>
>

Classification: UNCLASSIFIED
Caveats: NONE

APPENDIX F

INSPECTION CHECKLIST

~~DRAFT~~ MB 3/17/15

FINAL INSPECTION CHECKLIST
CHARIOT PROJECT
CAPE THOMPSON, ALASKA
CONTRACT NO. W911KB-14-C-0002

TEST HOLE ABLE	Date: 8/27/2014		
Item	Yes	No	Comment
Has the POL-contaminated water from Test Hole Able been sampled prior to removal, removed, treated, sampled following treatment, confirmed below ADEC surface water cleanup criteria, and discharged on site prior to test hole casing removal?	✓		
Have all water sample results been submitted to the Government?	✓		
Has Test Hole Able been filled with bentonite in pellet form in a manner that avoids bridging?	✓		~~Mike?~~
Has Test Hole Able casing been removed to a depth of at least 4 feet or permafrost?	✓		
Has the Test Hole Able casing been capped?	✓		
Is the final grading around Test Hole Able complete?	✓		
Has the required surveying been completed?	✓		
Has the final grade around Test Hole Able been scarified, fertilized, and seeded?	✓		

Notes: Document personnel present using the backside of this form.
Attach additional sheets for additional comments.

Key personell on site

Ken Rissew
Mike Boose

J. E. Price (SM Stoller)
8/27/14

~~DRAFT~~ MB 3/17/15

FINAL INSPECTION CHECKLIST
CHARIOT PROJECT
CAPE THOMPSON, ALASKA
CONTRACT NO. W911KB-14-C-0002

TEST HOLE BAKER	Date: 8/27/2014		
Item	Yes	No	Comment
Has the POL-contaminated water from Test Hole Baker been sampled prior to removal, removed, treated, sampled following treatment, confirmed below ADEC surface water cleanup criteria, and discharged on site prior to test hole casing removal?	✓		
Have all water sample results been submitted to the Government?	✓		
Has Test Hole Baker been filled with bentonite in pellet form in a manner that avoids bridging?	✓		
Has Test Hole Baker casing been removed to a depth of at least 4 feet or permafrost?	✓		
Has the Test Hole Baker casing been capped?	✓		
Has the DRO/RRO-contaminated gravel pad and/or tundra soil around Test Hole Baker been removed and confirmed to be below ADEC Method Two Arctic Zone Cleanup Levels with soil sampling in accordance with ADEC requirements?	✓		
Have all soil sample results been submitted to the Government?	✓		
Has ADEC concurred the DRO/RRO-contaminated gravel pad and/or tundra soil around Test Hole Baker has been removed and confirmed to be below ADEC Method Two Arctic Zone Cleanup Levels with soil sampling in accordance with ADEC requirements and the area in the vicinity of the Test Hole can be recontoured/backfilled? * Please note the date of ADEC concurrence in the comment box.	✓		29 JULY 14
Has the required surveying been completed?	✓		
Is the final grading around Test Hole Baker complete?	✓		
Has the required surveying been completed?	✓		
Has the final grade around Test Hole Baker been scarified, fertilized, and seeded?	✓		
Has all contracted work related to Test Hole Baker been completed?	✓		

} Mike?

← Mike * ?

Notes: Document personnel present using the backside of this form.
Attach additional sheets for additional comments.

Key Personnel on site:
Ken Rissow
Mike Boese

T. E. Pace 8/27/14

~~DRAFT~~ MB 3/17/15

FINAL INSPECTION CHECKLIST
CHARIOT PROJECT
CAPE THOMPSON, ALASKA
CONTRACT NO. W911KB-14-C-0002

TEST HOLE CHARLIE	Date: 8/27/2014		
Item	Yes	No	Comment
Has the POL-contaminated water from Test Hole Charlie been sampled prior to removal, removed, treated, sampled following treatment, confirmed below ADEC surface water cleanup criteria, and discharged on site prior to test hole casing removal?	✓		
Have all water sample results been submitted to the Government?	✓		
Has Test Hole Charlie been filled with bentonite in pellet form in a manner that avoids bridging?	✓		
Has Test Hole Charlie casing been removed to a depth of at least 4 feet or permafrost?	✓		
Has the Test Hole Charlie casing been capped?	✓		
Has the DRO/RRO-contaminated gravel pad and/or tundra soil around Test Hole Charlie been removed and confirmed to be below ADEC Method Two Arctic Zone Cleanup Levels with soil sampling in accordance with ADEC requirements?	✓		
Have all soil sample results been submitted to the Government?	✓		
Has ADEC concurred the DRO/RRO-contaminated gravel pad and/or tundra soil around Test Hole Charlie has been removed and confirmed to be below ADEC Method Two Arctic Zone Cleanup Levels with soil sampling in accordance with ADEC requirements and the area in the vicinity of the Test Hole can be recontoured/backfilled? * Please note the date of ADEC concurrence in the comment box.	✓		1 Aug 14 ~~1~~ Aug 14 MB
Has the required surveying been completed?	✓		
Is the final grading around Test Hole Charlie complete?	✓		
Has the required surveying been completed?	✓		
Has the final grade around Test Hole Charlie been scarified, fertilized, and seeded?	✓		
Has all contracted work related to Test Hole Charlie been completed?	✓		

Mike ?

* - Mike !

Notes: Document personnel present using the backside of this form.
Attach additional sheets for additional comments.

Key personell on site:
Ken Rissew
Mike Boese

T. E. Price 8/27/14

~~DRAFT~~ MB 3/17/15

FINAL INSPECTION CHECKLIST
CHARIOT PROJECT
CAPE THOMPSON, ALASKA
CONTRACT NO. W911KB-14-C-0002

TEST HOLE DOG	Date: 8/27/2014		
Item	Yes	No	Comment
Has the POL-contaminated water from Test Hole Dog been sampled prior to removal, removed, treated, sampled following treatment, confirmed below ADEC surface water cleanup criteria, and discharged on site prior to test hole casing removal?	✓		
Have all water sample results been submitted to the Government?			
Has Test Hole Dog been filled with bentonite in pellet form in a manner that avoids bridging?	✓		
Has Test Hole Dog casing been removed to a depth of at least 4 feet or permafrost?	✓		
Has the Test Hole Dog casing been capped?	✓		
Has the DRO/RRO-contaminated gravel pad and/or tundra soil around Test Hole Dog been removed and confirmed to be below ADEC Method Two Arctic Zone Cleanup Levels with soil sampling in accordance with ADEC requirements?	✓		
Have all soil sample results been submitted to the Government?	✓		
Has ADEC concurred the DRO/RRO-contaminated gravel pad and/or tundra soil around Test Hole Dog has been removed and confirmed to be below ADEC Method Two Arctic Zone Cleanup Levels with soil sampling in accordance with ADEC requirements and the area in the vicinity of the Test Hole can be recontoured/backfilled? * Please note the date of ADEC concurrence in the comment box.	✓		25 Aug 14
Has the required surveying been completed?	✓		
Is the final grading around Test Hole Dog complete?	✓		
Has the required surveying been completed?	✓		
Has the final grade around Test Hole Dog been scarified, fertilized, and seeded?	✓		
Has all contracted work related to Test Hole Dog been completed?	✓		

Mike?

Mike?

Notes: Document personnel present using the backside of this form.
Attach additional sheets for additional comments.

Key personell on site:
Ken Rissow
Mike Boese

T. E. Rice
8/27/14

~~DRAFT~~ MB 3/17/15

FINAL INSPECTION CHECKLIST
CHARIOT PROJECT
CAPE THOMPSON, ALASKA
CONTRACT NO. W911KB-14-C-0002

TEST HOLE X1	Date: 8/27/2014		
Item	Yes	No	Comment
Has the POL-contaminated water from Test Hole X1 (if present) been sampled prior to removal, removed, treated, sampled following treatment, confirmed below ADEC surface water cleanup criteria, and discharged on site prior to test hole casing removal?	✓		
Have all water sample results been submitted to the Government, if applicable?	NA		No water in casing
Has Test Hole X1 been filled with bentonite in pellet form in a manner that avoids bridging?	NA		No hole to fill
Has Test Hole X1 casing been removed to a depth of at least 4 feet or permafrost?	NA		← Entire length of casing removed (6 feet) - nothing left in ground.
Has the Test Hole X1 casing been capped?			N/A
Has the required surveying been completed?	✓		
Has the DRO/RRO-contaminated gravel pad and/or tundra soil around Test Hole X1 been removed and confirmed to be below ADEC Method Two Arctic Zone Cleanup Levels with soil sampling in accordance with ADEC requirements?	✓		
Have all soil sample results been submitted to the Government?	✓		
Has ADEC concurred the DRO/RRO-contaminated gravel pad and/or tundra soil around Test Hole X1 has been removed and confirmed to be below ADEC Method Two Arctic Zone Cleanup Levels with soil sampling in accordance with ADEC requirements and the area in the vicinity of the Test Hole can be recontoured/backfilled? * Please note the date of ADEC concurrence in the comment box.	✓		21 AUG 14 * - Mike ?
Has the required surveying been completed?	✓		
Is the final grading around Test Hole X-1 complete?	✓		
Has the required surveying been completed?	✓		
Has the final grade around Test Hole X1 been scarified, fertilized, and seeded?	✓		
Has all contracted work related to Test Hole X1 been completed?	✓		

Mike ?

6" CASING WAS REMOVED FROM SITE - MLB

Notes: Document personnel present using the backside of this form.
Attach additional sheets for additional comments.

Key Personell on site:
Ken Rissew
Mike Boese

T. E. Pu
9/27/14

~~DRAFT~~ MD 3/17/15

FINAL INSPECTION CHECKLIST
CHARIOT PROJECT
CAPE THOMPSON, ALASKA
CONTRACT NO. W911KB-14-C-0002

OVERALL SITE	Date: 9/27/2014		
Item	Yes	No	Comment
Have all of the items identified on the Master Deficiency Tracking System/Rework Item List been corrected and verified?			NA
Has the contractor performed a site-wide clean-up and has all debris/Trash been removed?	✓		
Has all generated waste, and investigative derived waste (IDW) brought to the site or generated at the site during the work been removed?	✓		
Have the camp facilities been removed?	✓		EXCEPT FOR WOODEN FOUNDATIONS WHICH WERE LEFT FOR PT. HOPE VILLAGERS
Has the equipment and excess material been removed from the site?	✓		Last demobe on 9-9-14

Notes: Document personnel present using the backside of this form.
Attach additional sheets for additional comments.

Acknowledgement:

Michael R Baer 8/27/14
Quality Assurance Representative (print and sign/date)

Ken Rissen 8/29/14
Contractor Representative (print and sign/date)

APPENDIX G

DISPOSAL CERTIFICATES AND WASTE MANIFESTS

Table G1 - Connex Summary
2014 Remedial Action
Project Chariot, Cape Thompson, Alaska

Manifest Number	Connex Number	Date Removed from Cape Thompson	Number of Filled SuperSacks	Weight of Filled Super Sacks in Field (Pounds)	Weight of Filled Super Sacks - Landfill (Pounds)	Difference (Pounds)
22557A	CAXU 336240	8/14/2014	22	35,649	35,580	69
22557B	NSIU 201344	9/8/2014	17	39,974	39,960	14
22557C	TTNU 385220	8/14/2014	26	35,993	35,240	753
22557D	NSIU 203498	8/14/2014	16	39,860	39,780	80
22557E	CHAU 182662	8/14/2014	15	39,632	39,540	92
22557F	NSIU 263675	8/14/2014	14	38,355	38,300	55
22557G	NSIU 265213	8/14/2014	14	38,325	38,260	65
22557H	TTNU 247161	8/14/2014	14	38,268	38,180	88
22557I	TTNU 363404	8/14/2014	14	38,264	37,940	324
22557J	NSIU 203025	8/14/2014	14	38,021	37,200	821
22557K	TRIU 150299	8/14/2014	13	39,273	38,760	513
22557L	NSIU 265219	8/14/2014	13	35,773	37,580	-1,807
22557M	CMCU 205113	8/14/2014	15	35,929	34,580	1,349
22557N	TTNU 276914	8/14/2014	15	39,835	38,880	955
22557O	CMCU 205568	8/14/2014	14	35,761	35,020	741
22557P	CAXU 259023	8/14/2014	15	35,958	34,900	1,058
22557Q	PNEU 244462	8/14/2014	20	39,907	40,700	-793
22557R	NSIU 265280	8/16/2014	12	38,708	38,260	448
22557S	CMCU 205974	8/16/2014	14	38,676	38,280	396
22557T	TTNU 195351	8/16/2014	15	37,803	37,820	-17
22557U	CHAU 182601	8/16/2014	16	38,788	38,620	168
22557V	NSIU 203068	8/16/2014	18	38,185	38,120	65
22557W	NSIU 202268	8/16/2014	17	38,109	38,040	69
22557X	TTNU 261039	8/16/2014	13	38,670	38,620	50
22557Y	NSIU 201553	8/16/2014	14	37,587	37,400	187
22557Z	NSIU 202496	8/16/2014	15	38,570	38,480	90
22557AA	NSIU 201678	8/16/2014	19	38,810	38,820	-10
22557BB	NSIU 202266	8/16/2014	13	35,795	40,000	-4,205
22557CC	NSIU 203211	8/16/2014	13	35,560	39,880	-4,320
22557DD	TRIU 3103223	9/8/2014	17	39,983	39,900	83
22557EE	NSIU 202851	9/8/2014	16	39,982	39,980	2
22557FF	TTNV 141622	9/8/2014	17	39,993	39,980	13
22557GG	AKCU 901928	9/8/2014	17	39,985	39,740	245
22557HH	CAXV 315138	9/8/2014	16	39,954	39,940	14
22557II	CRSU 146684	9/8/2014	16	39,990	39,900	90
22557JJ	PNEU 244400	9/8/2014	16	39,662	39,560	102
22557KK	TRIU 291752	9/8/2014	16	40,000	39,900	100
22557LL	TRIU 396120	9/8/2014	18	39,976	39,920	56
22557MM	AMLU 203803	9/8/2014	16	39,982	39,000	982
22557NN	NSIU 265103	9/8/2014	18	39,984	39,980	4
22557OO	NSIU 202869	9/8/2014	13	31,751	29,760	1,991
TOTAL WEIGHT (Pounds)				**1,571,280**	**1,570,300**	**980**

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 *** 95-914-AK-22557-MP

NON-HAZARDOUS WASTE MANIFEST

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

NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No. EXEMPT	Manifest Document No. 22557A	2. Page 1 of 1
3. Generator's Name and Mailing Address: US DEPARTMENT OF ENERGY, 3538 INTERNATIONAL STREET, FAIRBANKS, AK 99701	Site Address: US DEPARTMENT OF ENERGY, PROJECT CHARIOT, CAPE THOMPSON, AK 99766	MIKE OBERG	
4. Generator's Phone: (907) 452-1006			
5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.	6. US EPA ID Number: WAH000011486	A. State Transporter's ID	
		B. Transporter 1 Phone: (800) 426-3113	
7. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL Erika S. of t	8. US EPA ID Number: WAH000011486	C. State Transporter's ID	
		D. Transporter 2 Phone: (541) 454-2030	
9. Designated Facility Name and Site Address: COLUMBIA RIDGE RECY. & LNDFL. 18177 CEDAR SPRINGS LANE ARLINGTON, OR 97812	10. US EPA ID Number: ORD987173457	E. State Facility's ID	
		F. Facility's Phone: (541) 454-2030	

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated By DOT	22	CF	35649	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above: 1) 115926 OR POL SOIL

H. Handling Codes for Wastes Listed Above:

15. Special Handling Instructions and Additional Information: This is to certify that the above-named materials are properly classifiad, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

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

Printed/Typed Name	Signature	Date (Month / Day / Year)
MICHAEL L. RICE		8 / 14 / 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)
BRIAN EKSTROM		8 / 14 / 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)

FACILITY

19. Discrepancy Indication Space:

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Date (Month / Day / Year)
Sarah Mashiana	Sarah Mashiana	11 / 04 / 14

NON-HAZARDOUS WASTE

CAX(1 33e240

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number EXEMPT	22. Page 2 of 2	23. Manifest Tracking Number 22557A

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARLEY
(907) 432-1000 CAPE THOMPSON, AK 99760

25. Transporter 3 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED007122510

26. Transporter 4 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

32. Special Handling Instructions and Additional Information

GENERATOR

TRANSPORTER

33. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sothea — Signature: [signature] — Month: 10 Day: 27 Year: 14

34. Transporter 4 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Mathiesen — Signature: Sarah Mathiesen — Month: 10 Day: 28 Year: 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 235590

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 11/04/2014
Payment Type Credit Account
Manual Ticket# 813049
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier CAXU
Vehicle# 336240
Container 336240
Billing # 0000290
Manifest 22557 A
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/28/2014 08:53:27	Front Scale	SMastrio		Gross	81000 lb*
Out	11/04/2014 08:53:27	Front Scale	SMastrio		Tare	45420 lb*
		* Manual Weight			Net	35580 lb
					Tons	17.79

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS--	100	17.79	Tons				AK-CAPE TH
	FEA T SPW-FUEL,ENV	100	17.79	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

2014 NOV 4 PM 12:13

Nº 813049

DATE/TIME:
LOAD DATE:
CUSTOMER: Emerald AK / Dept of Energy
PROFILE NUMBER: 1159260R
TRUCK NUMBER: CAXU 336240
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557A
CUSTOMER INVOICE NO.:

GROSS WEIGHT: 81000
TARE WEIGHT-TRACTOR: 45420
TARE WGT.-TRAILER/CONTAINER:
NET WEIGHT: 35580

GATEHOUSE: JK
DRIVER: FTroid
TRAIN ID: Wed 27 ORIGIN: Outsrc
WASTE TYPE:
DISPOSAL: CM DC BU GRID SEGREGATE
REMARKS:

HAULER:

02-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 6, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 4, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 A
Container #:	CAXU336240
Weight Disposed:	35,580 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST NSIU 201344

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. EXEMPT

Manifest Document No. 22557 B

2. Page 1 of 1

3. Generator's Name and Mailing Address
US DEPARTMENT OF ENERGY
3538 INTERNATIONAL STREET
FAIRBANKS, AK 99701
(907) 452-1006

Site Address
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99766

MIKE BOOSE

4. Generator's Phone ( )

5. Transporter 1 Company Name NORTHWEST SERVICES, INC.

6. US EPA ID Number WAH 1 4 8 6

A. State Transporter's ID (800) 426-3117

B. Transporter 1 Phone

7. Transporter 2 Company Name R TRANSPORT

8. US EPA ID Number ORD 0 9 8 1 7 3 4 5 7 WAH0000 28335

C. State Transporter's ID 360) 452-1030

D. Transporter 2 Phone

9. Designated Facility Name and Site Address
WASTE MGMT. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number ORD 9 8 7 1 7 3 4 5 7

E. State Facility's ID

F. Facility's Phone (541) 454 2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. ~~Material Not Regulated By DOT~~	17	CF	39974	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1)1159260R POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Shipper's Certification: this is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name MICHAEL L. BOOSE

Signature Michael L Boose on behalf of DOE

Date: Month 9 Day 7 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name BRIAN EKSTRAND

Signature

Date: Month 9 Day 7 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name William P. Ward Sr

Signature William P. Ward Sr

Date: Month 10 Day 29 Year 2014

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name Sarah Mastriona

Signature Sarah Mastriona

Date: Month 11 Day 05 Year 14

NON-HAZARDOUS WASTE

NMU 201344

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number EXEMPT	22. Page 2 of 2	23. Manifest Tracking Number 22557B

24. Generator's Name: DOE DEPARTMENT OF ENERGY
PROJECT CHAPTER
(307) 472 1000 CAPE THOMPSON, AR 99766

25. Transporter 2 Company Name: UNION PACIFIC — U.S. EPA ID Number: NEDG0177[illegible]

26. Transporter 4 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [illegible] Month 10 Day 29 Year 14

34. Transporter 4 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [illegible] Month 10 Day 31 Year 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete. DESIGNATED FACILITY TO GENERATOR

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original Ticket# 229914

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 11/03/2014
Payment Type Credit Account
Manual Ticket# 813193
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier NSIU
Vehicle# 201344
Container 201344
Billing # 0000290
Manifest 22557B
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/31/2014 09:40:49	MANUAL WT	vmckinne		Gross	86040 lb*
Out	11/03/2014 09:40:49		vmckinne		Tare	46080 lb*
			* Manual Weight		Net	39960 lb
					Tons	19.98

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	19.98	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.98	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

2014 NOV 3 PM 01:22

N° 813193

DATE/TIME:
LOAD DATE:
CUSTOMER: Emerald AK IDOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER: NSIU 201344
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557 B
CUSTOMER INVOICE NO.:
GROSS WEIGHT: 86,040
TARE WEIGHT-TRACTOR: 46,080
TARE WGT.-TRAILER/CONTAINER:
NET WEIGHT: 39,960
GATEHOUSE: JK
DRIVER: Emerald
TRAIN ID: Load 30 ORIGIN: Cont Sol
WASTE TYPE:
DISPOSAL: CM DC BU GRID SEGREGATE
REMARKS:
HAULER:

2-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 4, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 3, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 B
Container #:	NSIU201344
Weight Disposed:	39,960 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 *** 95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST JNNK TTNU 385220

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

NON-HAZARDOUS WASTE MANIFEST US DEPARTMENT OF ENERGY	1. Generator's US EPA ID No.	Manifest Document No. 22557C	2. Page 1 1
3. Generator's Name and Mailing Address 3538 INTERNATIONAL STREET FAIRBANKS, AK 99701 (907) 452-1006	US DEPARTMENT OF ENERGY PROJECT CHARIOT CAPE THOMPSON, AK 99765	BOESE	
4. Generator's Phone ( )			
5. Transporter 1 Company Name NORTHLAND SERVICES, INC.	6. US EPA ID Number WAH000121486	A. State Transporter's ID	(800) 428-3113
7. Transporter 2 Company Name COLUMBIA RIDGE LANDFILL	8. US EPA ID Number WA1000022338	B. Transporter 1 Phone C. State Transporter's ID D. Transporter 2 Phone	(541) 454-2050
9. Designated Facility Name and Site Address COLUMBIA RIDGE REC. & LNDFL. 18177 CEDAR SPRINGS LANE ARLINGTON, OR 97812	10. US EPA ID Number ORD987173457	E. State Facility's ID F. Facility's Phone	(541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material not regulated by DOT	20	CF	35993	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above: 1)11592608 POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information: Shipper's certification: this is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

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

Printed/Typed Name	Signature	Date (Month / Day / Year)
MICHAEL L. BOESE	Michael L Boese for J Doe	12 / 19 / 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)
BRIAN EKSTROM		12 / 19 / 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Date (Month / Day / Year)
Sarah Mastriona	Sarah Mastriona	11 / 24 / 14

NON-HAZARDOUS WASTE — GENERATOR

95-314-AK22557-MP

TTNU 385220

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number EXEMPT	22. Page 2/ 2	23. Manifest Tracking Number 22557C

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 452-1006 CAPE THOMPSON, AK 99766

25. Transporter 3 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED001792910

26. Transporter 4 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (Including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

32. Special Handling Instructions and Additional Information

GENERATOR

TRANSPORTER

33. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: Smith — Signature: [signature] — Month 1 / Day 1 4 / Year 1 4

34. Transporter 4 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Mastriona — Signature: Sarah Mastriona — Month 1 1 / Day 1 7 / Year 1 4

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

Nº 813956

2014 NOV 24 AM 6:53:18

DATE:/TIME:
LOAD DATE:
CUSTOMER: Emerald Alaska / DOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER:
TRAILER/CONTAINER NUMBER: TTNU 385220
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557 C

GROSS WEIGHT: 83,220
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 47,980
NET WEIGHT: 35,240

GATEHOUSE: NR
DRIVER: Arnold
TRAIN ID: USEGL16 ORIGIN:
WASTE TYPE: Cont Soil
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS:

HAULER: RT

902-ARLINGTON

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 2387736

Customer Name EMERALD ALASKA INC EMERALD AL Carrier TTNU
Ticket Date 11/24/2014 Vehicle# 385220 Volume
Payment Type Credit Account Container 385220
Manual Ticket# 813956 Billing # 00000890
Hauling Ticket# Manifest 22557 C
Destination LF/R TRANSPORT PO 1159260R
Profile 1159260R (BPH-POL SOIL "EMERALD ALASKA "DEPARTMENT OF ENERGY"1159260R)
Generator DA-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Ties	Scale Operator	Inbound Gross	83220 lbs
In 11/17/2014 11:01:54	Front Scale SMaestrio	Tare	47980 lbs
Out 11/24/2014 11:01:54	SMaestrio	Net	35240 lbs
Comments	* Manual Weight	Tons	17.62

	Product	Qty	UOM	Rate	Tax	Amount	Origin
1	CONTAMINATED SOIL - 100	17.62	Tons				AK-CAPE TH
2	FEA T BPH-FUEL, ENV 100	17.62	Tons				AK-CAPE TH
3	RAIL 20FT BPH-RAIL 100	1	Load				AK-CAPE TH
4	DEL U BPH-DELIVERY 100	1	Each				AK-CAPE TH
5	LDC U BPH-LOCAL TR 100	1	Load				AK-CAPE TH
6	CD BPH $35-Cert of 100	1	Each				AK-CAPE TH

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 25, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 24, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 C
Container #:	TTNU385220
Weight Disposed:	35,240 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST

NSN 2c3498

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No: EXEMPT

Manifest Document No. 22557D

2. Page 1 of 1

3. Generator's Name and Mailing Address: US DEPARTMENT OF ENERGY, 3538 INTERNATIONAL STREET, FAIRBANKS, AK 99701

Site Address: US DEPARTMENT OF ENERGY, PROJECT CHARIOT, CAPE THOMPSON, AK 99766

MIKE DOESE Boese

4. Generator's Phone: (907) 452-1006

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.

6. US EPA ID Number: WAH000011486

A. State Transporter's ID

B. Transporter 1 Phone: (800) 426-3113

7. Transporter 2 Company Name: ATLANTA COLUMBIA RIDGE LANDFILL

8. US EPA ID Number: GAD980519370

C. State Transporter's ID: 26040138102

D. Transporter 2 Phone: (541) 454-2030

9. Designated Facility Name and Site Address: COLUMBIA RIDGE RECY. & LNDFL., 18177 CEDAR SPRINGS LANE, ARLINGTON, OR 97812

10. US EPA ID Number: ORD987173457

E. State Facility's ID

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated By DOT	16	CF	39860	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above: 1)115926OR POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information: Shipper's certification: this is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name: MICHAEL L. BOESE

Signature: Michael L Boese on behalf of DOE

Date: Month 8 Day 14 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EKSTRAND

Signature

Date: Month 8 Day 14 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: Shane Brack

Signature

Date: Month 10 Day 30 Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name: Sarah Mastriona

Signature: Sarah Mastriona

Date: Month 11 Day 04 Year 14

NON-HAZARDOUS WASTE

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number: EXEMPT
22. Page: 2 of 2
23. Manifest Tracking Number: 22557D

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 452-1006 CAPE THOMPSON, AK 99766

25. Transporter 2 Company Name: UNION PACIFIC — U.S. EPA ID Number: NEB000179916

26. Transporter 3 Company Name: CHAMBTA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173453

GENERATOR

27a. HM	27b. U.S. DOT Description (Including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 1 Acknowledgment of Receipt of Materials
Printed/Typed Name: Cindi Creep (UP) Signature: Cindi Creep Month: 10 Day: 12 Year: 14

34. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Whatley Signature: Sarah Whatley Month: 10 Day: 31 Year: 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete. DESIGNATED FACILITY TO GENERATOR

Columbia Ridge
10177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 235593

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 11/04/2014
Payment Type Credit Account
Manual Ticket# 813195
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier NSIU
Vehicle# 203498
Container 203498
Billing # 0000290
Manifest 22557 D
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/31/2014 08:57:37	Front Scale	SMastrio		Gross	86380 lb*
Out	11/04/2014 08:57:37	Front Scale	SMastrio		Tare	46600 lb*
			* Manual Weight		Net	39780 lb
					Tons	19.89

Comments

	Product	LDx	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	19.89	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.89	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

WASTE MANAGEMENT

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

2014 NOV 4 AM 10:59:01

Nº 813195

DATE/TIME: _____
LOAD DATE: _____
CUSTOMER: Emerald AK I DOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER: NSIU 203498
TRAILER/CONTAINER NUMBER: _____
SEAL NUMBER: 22557 D
CUSTOMER INVOICE NO.: _____
GROSS WEIGHT: 86380
TARE WEIGHT-TRACTOR: 46600
TARE WGT.-TRAILER/CONTAINER: _____
NET WEIGHT: 39780

GATEHOUSE: JK
DRIVER: Arnold
TRAIN ID: Unimog 30 ORIGIN: Cantsoil
WASTE TYPE: _____
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS: _____
HAULER: _____

902-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 6, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 4, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 D
Container #:	NSIU203498
Weight Disposed:	39,780 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 *** 95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST CHAU 18260Z

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. EXEMPT

Manifest Document No. 22557E 2. Page 1 of 1

3. Generator's Name and Mailing Address: DEPARTMENT OF ENERGY, 3538 INTERNATIONAL STREET, FAIRBANKS, AK 99701, (907) 452-1006

Site Address: US DEPARTMENT OF ENERGY, PROJECT CHARIOT, CAPE THOMPSON, AK 99766

MIKE BOESE 8052

4. Generator's Phone ( )

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.

6. US EPA ID Number: WAH000001486

A. State Transporter's ID

B. Transporter 1 Phone (800) 426-3111

7. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL

8. US EPA ID Number: ORD987173457

C. State Transporter's ID (363) 463-6112

D. Transporter 2 Phone (541) 454-2030

9. Designated Facility Name and Site Address: COLUMBIA RIDGE RECY. & LNDFL., 18177 CEDAR SPRINGS LANE, ARLINGTON, OR 97812

10. US EPA ID Number: ORD987173457

E. State Facility's ID

F. Facility's Phone (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated by DOT	15	CF	396 32	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above

1)115926OR POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

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

Printed/Typed Name: MICHAEL L. BOESE Signature: [signature] w/ DOE Date: Month 8 Day 14 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EKSTRAND Signature: [signature] Date: Month 8 Day 14 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: Jeff LaMoureaux Signature: [signature] Date: Month 12 Day 26 Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19

Printed/Typed Name: Sarah Mastricia Signature: Sarah Mastricia Date: Month 10 Day 03 Year 14

NON-HAZARDOUS WASTE

95-914-AK22557-MP

CHARIOT 2.

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number EXEMPT	22. Page 2 / 2	23. Manifest Tracking Number 22557E

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 452-1005 CAPE THOMPSON, AK 99766

25. Transporter 1 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED001792410

26. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

GENERATOR

37. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 1 Acknowledgment of Receipt of Materials
Printed/Typed Name: Cindi Cregg (4) | Signature: Cindi Cregg | Month 10 | Day 28 | Year 14

34. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Mattivera | Signature: Sarah Mattivera | Month 10 | Day 31 | Year 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original Ticket# 229913

Customer Name EMERALD ALASKA INC EMERALD AL Carrier CHAU
Ticket Date 11/03/2014 Vehicle# 182662 Volume
Payment Type Credit Account Container 182662
Manual Ticket# 813191 Billing # 0000290
Hauling Ticket# Manifest 22557E
Destination UP/R TRANSPORT PO 1159260R
Profile 1159260R (SPW-POL SOIL^EMERALD ALASKA^DEPARTMENT OF ENERGY^1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

	Time	Scale	Operator	Inbound		
In	10/31/2014 09:39:30	MANUAL WT	vmckinne		Gross	84780 lb*
Out	11/03/2014 09:39:30		vmckinne		Tare	45240 lb*
					Net	39540 lb
			* Manual Weight		Tons	19.77

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	19.77	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.77	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

N° 813191

DATE/TIME: 2014 NOV 03 PM 12:15
LOAD DATE:
CUSTOMER: Emerald AK | DOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER: CHAU 182662
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557E
CUSTOMER INVOICE NO.:
GROSS WEIGHT:
TARE WEIGHT-TRACTOR: 45840
TARE WGT.-TRAILER/CONTAINER:
NET WEIGHT: 39540
GATEHOUSE: JR Pymid
DRIVER:
TRAIN ID: Load 30 ORIGIN: 4 Corners
WASTE TYPE:
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS:
HAULER:

12-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 4, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 3, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 E
Container #:	CHAU182662
Weight Disposed:	39,540 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 *** 95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST NSLU 263675

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: EXEMPT

Manifest Document No.: 22557F | 2. Page 1 of 1

3. Generator's Name and Mailing Address: US DEPARTMENT OF ENERGY, 3538 INTERNATIONAL STREET, FAIRBANKS, AK 99701

Site Address: US DEPARTMENT OF ENERGY, PROJECT CHARIOT, CAPE THOMPSON, AK 99766

MIKE GOOSE BOE 5E

4. Generator's Phone: (907) 452-1006

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.

6. US EPA ID Number: WAH000011486

A. State Transporter's ID:

B. Transporter 1 Phone: (800) 426-3113

7. Transporter 2 Company Name: ~~COLUMBIA RIDGE LANDFILL~~ TEXAS PORT

8. US EPA ID Number: ~~ORD982173457~~

C. State Transporter's ID:

D. Transporter 2 Phone: ~~(541) 454-2030~~

9. Designated Facility Name and Site Address: COLUMBIA RIDGE RECY. & LNDFL., 18177 CEDAR SPRINGS LANE, ARLINGTON, OR 97812

10. US EPA ID Number: ~~BCA HSB 28338~~ ORD987173457

E. State Facility's ID: ~~360-905-8102~~

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol
a. Material Not Regulated By DOT	14	CF	38355	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above: 1)115926OR POL SOIL

H. Handling Codes for Wastes Listed Above:

15. Special Handling Instructions and Additional Information: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

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

Printed/Typed Name: MICHAEL L. COOSE | Signature: Michael L Goose BOE | Date: Month 8 Day 14 Year 14

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EKSTRAND | Signature: Brian Ekstrand | Date: Month 8 Day 14 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: William P. Wood | Signature: William P. Wood Sr | Date: Month 11 Day 29 Year 14

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name: Sarah Mastriona | Signature: Sarah Mastriona | Date: Month 11 Day 03 Year 14

GENERATOR / TRANSPORTER / FACILITY

NON-HAZARDOUS WASTE

NSN 7540-00-634-4248

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number: EXEMPT

22. Page: 2 of 3

23. Manifest Tracking Number: 22557F

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARTOT
(907) 452-1005 CAPE THOMPSON, AK 99766

25. Transporter 3 Company Name: UNION PACIFIC — U.S. EPA ID Number: NEDO017928 30

26. Transporter 4 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987172457

27a. HM	27b. U.S. DOT Description (Including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

32. Special Handling Instructions and Additional Information

GENERATOR

TRANSPORTER

33. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: William R. Wood SR — Signature: [signature] — Month: 10 — Day: 28 — Year: 2014

34. Transporter 4 Acknowledgment of Receipt of Materials
Printed/Typed Name: ~~F Hill~~ Sarah Mastrina — Signature: ~~[signature]~~ Sarah Mastrina — Month: ~~10~~ 10 — Day: ~~29~~ 31 — Year: ~~14~~ 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original Ticket# 229918

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 11/03/2014
Payment Type Credit Account
Manual Ticket# 813199
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier NSIU
Vehicle# 263675
Container 263675
Billing # 0000290
Manifest 22557F
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/31/2014 09:44:55	MANUAL WT	vmckinne		Gross	83840 lb*
Out	11/03/2014 09:44:55		vmckinne		Tare	45540 lb*
					Net	38300 lb
			* Manual Weight		Tons	19.15

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	19.15	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.15	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

2014 NOV 3 AM 11:12:03

N° 813199

DATE/TIME:
LOAD DATE:
CUSTOMER: Emerald AK / DOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER:
TRAILER/CONTAINER NUMBER: NSIU 263675
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557 F

GROSS WEIGHT: 83,840
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 45,540
NET WEIGHT: 38,300

GATEHOUSE: JR
DRIVER: farmed
TRAIN ID: USEGL 30 ORIGIN: Cont Soil
WASTE TYPE:
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS:

HAULER:

102-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 4, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 3, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 F
Container #:	NSIU263675
Weight Disposed:	38,300 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 *** 95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST NSIU 265213

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: EXEMPT

Manifest Document No.: 22557G | 2. Page 1 of 1

3. Generator's Name and Mailing Address: US DEPARTMENT OF ENERGY, 3538 INTERNATIONAL STREET, FAIRBANKS, AK 99701

Site Address: US DEPARTMENT OF ENERGY, PROJECT CHARIOT, CAPE THOMPSON, AK 99766 — MIKE BOESE

4. Generator's Phone: (907) 452-1006

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC. — US EPA ID Number: WAH000011486

A. State Transporter's ID

B. Transporter 1 Phone: (800) 426-3113

7. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL — US EPA ID Number: ORD981734577

C. State Transporter's ID

D. Transporter 2 Phone: (541) 454-2030

9. Designated Facility Name and Site Address: COLUMBIA RIDGE RECY. & LNDFL., 18177 CEDAR SPRINGS LANE, ARLINGTON, OR 97812 — US EPA ID Number: ORD981734577

E. State Facility's ID: 360-403-8112

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt/Vol.
a. Material Not Regulated by DOT	14	CF	38325	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above: 1)115926OR POL SOIL

H. Handling Codes for Wastes Listed Above:

15. Special Handling Instructions and Additional Information: Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name: MICHAEL L. BOESE — Signature: Michael L Boese on behalf of DOE — Date: Month 8 Day 14 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EKSTRAND — Signature: B Ekstrand — Date: Month 8 Day 14 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: William R. Wood Sr — Signature: WR Wood Sr — Date: Month 10 Day 29 Year 2014

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name: Sarah Mastriona — Signature: Sarah Mastriona — Date: Month 11 Day 04 Year 14

NON-HAZARDOUS WASTE

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
[illegible]	2 / 2	225576

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARLIE
(907) 486-1006 CAPE THOMPSON, AK 99766

25. Transporter 1 Company Name: DUTCH PACIFIC — U.S. EPA ID Number: [illegible]

26. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD087172457

27a. HM	27b. U.S. DOT Description (Including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 1 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] (4) — Signature: [illegible] — Month 10 Day 29 Year 14

34. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Mastriona — Signature: Sarah Mastriona — Month 10 Day 31 Year 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 235601

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 11/04/2014
Payment Type Credit Account
Manual Ticket# 813200
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier NGIU
Vehicle# 265213
Container 265213
Billing # 0000290
Manifest 22557 G
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/31/2014 09:01:30	Front Scale	SMastrio		Gross	83780 lb*
Out	11/04/2014 09:01:30	Front Scale	SMastrio		Tare	45520 lb*
					Net	38260 lb
			* Manual Weight		Tons	19.13

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	19.13	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.13	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

N° 813200

DATE/TIME: 2310/2014 @ 10:23:30
LOAD DATE:
CUSTOMER: Emerald AK / DOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER: NSTL 265213
TRAILER/CONTAINER NUMBER:
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557G
GROSS WEIGHT: 83780
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 45520
NET WEIGHT: 38260
GATEHOUSE:
DRIVER: Emerald
TRAIN ID: WAG 30 ORIGIN: Cut Soil
WASTE TYPE:
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS:
HAULER:

902.ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 6, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 4, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 G
Container #:	NSIU265213
Weight Disposed:	38,260 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 *** 95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST TTNU 247161

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

NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No. EXEMPT	Manifest Document No 22557H	2. Page 1 of 1

3. Generator's Name and Mailing Address		State Generator's ID
US DEPARTMENT OF ENERGY 3538 INTERNATIONAL STREET FAIRBANKS, AK 99701	US DEPARTMENT OF ENERGY PROJECT CHARIOT CAPE THOMPSON, AK 99765	
4. Generator's Phone: (907) 452-1006		

5. Transporter 1 Company Name	6. US EPA ID Number	A. State Transporter's ID
NORTHLAND SERVICES, INC.	WAH000011486	B. Transporter 1 Phone (800) 426-3113
7. Transporter 2 Company Name	8. US EPA ID Number	C. State Transporter's ID
COLUMBIA RIDGE LANDFILL	[illegible]	D. Transporter 2 Phone

9. Designated Facility Name and Site Address	10. US EPA ID Number	E. State Facility's ID
COLUMBIA RIDGE RECY. & LNDFL. 16177 CEDAR SPRINGS LANE ARLINGTON, OR 97812	ORD987173457	F. Facility's Phone (541) 454-2050

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated By DOT	14	CF	38268	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above	H. Handling Codes for Wastes Listed Above
1) 115926OR POL SOIL	

15. Special Handling Instructions and Additional Information: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name	Signature	Date (Month / Day / Year)
MICHAEL L. BOESE	Michael L Boese on behalf of DOE	8 / 14 / 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)
BRIAN EKSTRAND	[signature]	8 / 14 / 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)
Mike Boese	[signature]	11 / 14 / 14

FACILITY

19. Discrepancy Indication Space 11-14-14

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Date (Month / Day / Year)
Sarah Mastriona	Sarah Mastriona	11 / 24 / 14

NON-HAZARDOUS WASTE

95-914-AK22557-MP

TTNU 247161

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number EXEMPT	22. Page 2 / 2	23. Manifest Tracking Number 22557H

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 452-1006 CAPE THOMPSON, AK 99766

25. Transporter 2 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED001792910

26. Transporter 3 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

32. Special Handling Instructions and Additional Information

GENERATOR

TRANSPORTER

33. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: Cinch Crisp — Signature: Cinch Crisp — Month: 11 — Day: 14 — Year: 14

34. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Mastriona — Signature: Sarah Mastriona — Month: 11 — Day: 17 — Year: 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete. DESIGNATED FACILITY TO GENERATOR

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 238735

Customer Name EMERALD ALASKA INC EMERALD AL Carrier TTNU
Ticket Date 11/24/2014 Vehicle# 247161 Volume
Payment Type Credit Account Container 247161
Manual Ticket# 813955 Billing # 0000290
Hauling Ticket# Manifest 22557 H
Destination UP/R TRANSPORT PO 1159260R
Profile 1159260R (BPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

	Time	Scale	Operator	Inbound		
In	11/17/2014 11:00:52	Front Scale	BMastrio		Gross	86160 lb*
Out	11/24/2014 11:00:52		BMastrio		Tare	47980 lb*
			* Manual Weight		Net	38180 lb
					Tons	19.09

Comments

	Product	LDX	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP BPWPCB-	100	19.09	Tons				AK-CAPE TH
2	FEE T BPW-FUEL,ENV	100	19.09	Tons				AK-CAPE TH
3	RAIL SEPT BPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U BPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U BPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD BPW 435-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

N° 813955

DATE/TIME: 2014 NOV 24 07:47:03
LOAD DATE:
CUSTOMER: Emerald Alaska IDOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER: TTNU 247161
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557 H
CUSTOMER INVOICE NO.:
GROSS WEIGHT: [redacted]
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER:
NET WEIGHT: 38,180
GATEHOUSE: DW
DRIVER: 1 RD
TRAIN ID: USEGL 16 ORIGIN: Cont Soil
WASTE TYPE:
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS:
HAULER: RT

802-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 25, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 24, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 H
Container #:	TTNU247161
Weight Disposed:	38,180 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

95-914-AK27557-MP

NON-HAZARDOUS WASTE MANIFEST

TTAK 36344

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. EXEMPT

Manifest Document No. 22557 JJ

2. Page 1 of 1

3. Generator's Name and Mailing Address ENERGY
3535 INTERNATIONAL STREET
FAIRBANKS, AK 99701

Site Address: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99766

4. Generator's Phone ((907) 452-1006

5. Transporter 1 Company Name NORTHLAND SERVICES, INC.

6. US EPA ID Number AAK000011480

A. State Transporter's ID

B. Transporter 1 Phone (907) 426-3113

7. Transporter 2 Company Name COLUMBIA RIDGE LANDFILL

8. US EPA ID Number ORD987173457

C. State Transporter's ID

D. Transporter 2 Phone (541) 454-2030

9. Designated Facility Name and Site Address
COLUMBIA RIDGE RECY. & LNDFL.
38177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number ORD987173457

E. State Facility's ID

F. Facility's Phone (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material not Regulated by DOT	14	CF	38264	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1) 1159268R POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation

GENERATOR

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

Printed/Typed Name	Signature	Date Month	Day	Year
MICHAEL L. BUCIE	Michael L Bucie on behalf of DOE	8	14	14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month	Day	Year
DEAN EASTMAN		8	14	14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month	Day	Year
Jeff LaMoureaux		10	22	14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Date Month	Day	Year
Vicky McKinney		10	22	14

NON-HAZARDOUS WASTE

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
EXEMPT	2 / 2	22557

24. Generator's Name: US DEPARTMENT OF ENERGY, PROJECT CHARIOT, CAPE THOMPSON, AK 99756 (907) 462-3906

25. Transporter 3 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED981782910

26. Transporter 4 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

GENERATOR

27a HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: T Hill — Signature: [signature] — Month: 10 — Day: 22 — Year: 14

34. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Nicholson — Signature: [signature] — Month: 10 — Day: 23 — Year: 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete. DESIGNATED FACILITY TO GENERATOR

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

Nº 812814

2014 OUT 27 PM 12:13:18

DATE:/TIME:
LOAD DATE:
CUSTOMER: Emerald Alaska / Dept. of Energy
PROFILE NUMBER: 1159260R
TRUCK NUMBER:
TRAILER/CONTAINER NUMBER: TTNU 363404
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557 I

GROSS WEIGHT: 81180
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 43240
NET WEIGHT: 37940

GATEHOUSE: DW
DRIVER: Dan
TRAIN ID: USeagl 22 ORIGIN:
WASTE TYPE: Cont. Soil
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS:

HAULER:

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 233996

Customer Name EMERALD ALASKA INC EMERALD AL Carrier TTNU
Ticket Date 10/27/2014 Vehicle# 363404 Volume
Payment Type Credit Account Container 363404
Manual Ticket# 812814 Billing # 00000290
Hauling Ticket# Manifest 22557 I
Destination LP/R TRANSPORT PO 1159260R
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

	Time	Scale	Operator	Inbound	Gross	
In	10/23/2014 07:31:48	Front Scale	SMestrio	Tare	81180 lb*	
Out	10/27/2014 07:31:48	SMestrio		Net	43240 lb*	
Comments		* Manual Height		Tons	37940 lb	
					18.97	

	Product	LDX	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPARCS- 100		18.97	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV 100		18.97	Tons				
3	RAIL 20FT SPW-RAIL 100		1	Load				
4	DEL U SPW-DELIVERY 100		1	Each				
5	LOC U SPW-LOCAL TR 100		1	Load				
6	CD SPW 135-Cert of 100		1	Each				

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 28, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 27, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 I
Container #:	TTNU363404
Weight Disposed:	37,940 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 *** 95-914-AK22557-HP

NON-HAZARDOUS WASTE MANIFEST NSIU 203025

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. EXEMPT

Manifest Document No 225573 2. Page 1 of 1

3. Generator's Name and Mailing Address: US DEPARTMENT OF ENERGY, 3538 INTERNATIONAL STREET, FAIRBANKS, AK 99701

Site Address: US DEPARTMENT OF ENERGY, PROJECT CHARIOT, CAPE THOMPSON, AK 99755

4. Generator's Phone: (907) 452-1006

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.

6. US EPA ID Number: W A H 0 0 0 0 1 1 4 8 6

A. State Transporter's ID

B. Transporter 1 Phone: (800) 420-3815

7. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL

8. US EPA ID Number: [illegible]

C. State Transporter's ID

D. Transporter 2 Phone

9. Designated Facility Name and Site Address: COLUMBIA RIDGE RECY. & LNDFL., 18177 CEDAR SPRINGS LANE, ARLINGTON, OR 97812

10. US EPA ID Number: O R D 9 8 7 1 7 3 4 5 7

E. State Facility's ID

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated By DOT	14	CF	38021	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above: 1)115026OR POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information: Shipper's certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

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

Printed/Typed Name: MICHAEL L. BOESE

Signature: Michael L Boese on behalf of DOE

Date: Month 8 Day 14 Year 14

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EKSTRAND

Signature: [signature]

Date: Month 8 Day 14 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: KRISTA

Signature: [signature]

Date: Month 11 Day 14 Year 14

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19.

Printed/Typed Name: Sarah Mastriona

Signature: Sarah Mastriona

Date: Month 11 Day 24 Year 14

GENERATOR

TRANSPORTER

FACILITY

NON-HAZARDOUS WASTE

95-914-AK22557-MP

NSIU 203022

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number EXEMPT	22. Page 2 / 2	23. Manifest Tracking Number 225573

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 452-1006 CAPE THOMPSON, AK 99766

25. Transporter 3 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED001792910

26. Transporter 4 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (Including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

32. Special Handling Instructions and Additional Information

GENERATOR

TRANSPORTER

33. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: See pg 1, line 18 — Signature: — Month / Day / Year:

34. Transporter 4 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Mastriona — Signature: Sarah Mastriona — Month / Day / Year: 11 / 17 / 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 238733

Customer Name EMERALD ALASKA INC EMERALD AL Carrier NBIU
Ticket Date 11/24/2014 Vehicle# 203025 Volume
Payment Type Credit Account Container 203025
Manual Ticket# 813953 Billing # 0000290
Hauling Ticket# Manifest 22557 J
Destination UP/R TRANSPORT PO 1159260R
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

	Time	Scale	Operator	Inbound		
In	11/17/2014 10:55:35	Front Scale	Bmastric		Gross	86320 lb*
Out	11/24/2014 10:55:36		Bmastric		Tare	49120 lb*
			# Manual Weight		Net	37200 lb
					Tons	18.60

Comments:

	Product	LDX	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCB-	100	18.60	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	18.60	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

2014 NOV 24 AM 8:08:36

N° 813953

DATE/TIME:
LOAD DATE:
CUSTOMER: Emerald Alaska / DOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER: NSIU 203025
TRAILER/CONTAINER NUMBER:
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557 J
GROSS WEIGHT: 86,320
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 49,120
NET WEIGHT: 37,200
GATEHOUSE: VKS
DRIVER: Tom
TRAIN ID: USEGLO ORIGIN: Cont Soil
WASTE TYPE:
DISPOSAL: CM DC BU GRID SEGREGATE
REMARKS:
HAULER: RT

902-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 25, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 24, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 J
Container #:	NSIU203025
Weight Disposed:	37,200 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 *** 95-914-AK22557-NP

NON-HAZARDOUS WASTE MANIFEST TRIU 150299

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

NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No. EXEMPT	Manifest Document No. 22557K	2. Page 1 of 1

3. Generator's Name and Mailing Address: US DEPARTMENT OF ENERGY, 3538 INTERNATIONAL STREET, FAIRBANKS, AK 99701	US DEPARTMENT OF ENERGY, PROJECT CHARIOT, CAPE THOMPSON, AK 99756
4. Generator's Phone: (907) 452-1008	
5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.	6. US EPA ID Number: WAH000011486
7. Transporter 2 Company Name: [illegible] Transport	8. US EPA ID Number: [illegible]
9. Designated Facility Name and Site Address: COLUMBIA RIDGE RECY. & LNDFL., 18177 CEDAR SPRINGS LANE, ARLINGTON, OR 97812	10. US EPA ID Number: ORD987173457

A. State Transporter's ID	
B. Transporter 1 Phone	(800) 426-9119
C. State Transporter's ID	360-402-5[illegible]
D. Transporter 2 Phone	(360) 414-5[illegible]
E. State Facility's ID	
F. Facility's Phone	(541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated By DOT	13	CF	39273	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above	H. Handling Codes for Wastes Listed Above
1) 115926OR POL SOIL	

15. Special Handling Instructions and Additional Information: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

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

Printed/Typed Name	Signature	Date (Month / Day / Year)
MICHAEL L. BOECE	Michael L Boece on behalf of DOE	8 / 14 / 14

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)
BRIAN EKSTRAND	[signature]	8 / 14 / 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)
Shane Bruscl	[signature]	11 / 14 / 14

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Date (Month / Day / Year)
Sarah Mastriona	Sarah Mastriona	11 / 25 / 14

NON-HAZARDOUS WASTE — GENERATOR — TRANSPORTER — FACILITY

NON-HAZARDOUS WASTE MANIFEST (Continuation Sheet)	19. Generator ID Number CESQG	20. Page 2 of 2	21. Waste Tracking Number 22557K

22. Generator's Name: US Dept of Energy

23. Transporter 3 Company Name: Union Pacific Railroad | U.S. EPA ID Number: NED001792910

24. Transporter _____ Company Name | U.S. EPA ID Number

	25. Waste Shipping Name and Description	26. Containers No.	26. Containers Type	27. Total Quantity	28. Unit Wt./Vol.

29. Special Handling Instructions and Additional Information

TRIU 150299

GENERATOR

TRANSPORTER

30. Transporter _____ Acknowledgment of Receipt of Materials

Printed/Typed Name: [illegible] | Signature: [signature] | Month: 11 | Day: 14 | Year: 14

31. Transporter _____ Acknowledgment of Receipt of Materials

Printed/Typed Name | Signature | Month | Day | Year

DESIGNATED FACILITY

32. Discrepancy

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 239074

Customer Name EMERALD ALASKA INC EMERALD AL Carrier TRIU
Ticket Date 11/25/2014 Vehicle# 156299 Volume
Payment Type Credit Account Container 156299
Manual Ticket# 813952 Billing # 0000290
Hauling Ticket# Manifest 22557 K
Destination UP/R TRANSPORT PO 1159260R
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

	Time	Scale	Operator	Inbound		
In	11/17/2014 11:08:36	Front Scale	SMastrio		Gross	82080 lb*
Out	11/25/2014 11:08:30		SMastrio		Tare	43320 lb*
			* Manual Weight		Net	38760 lb
					Tons	19.38

Comments

	Product	LDX	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCB-	100	19.38	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.38	Tons				AK-CAPE TH
3	RAIL 28FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW 035-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

2014 NOV 25 AM 10:29:32

WASTE MANAGEMENT

N° 813952

DATE/TIME:
LOAD DATE:
CUSTOMER: Emerald Alaska / DOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER: TRIU 150299
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557K
CUSTOMER INVOICE NO.:
GROSS WEIGHT: 82,080
TARE WEIGHT-TRACTOR: 43,320
TARE WGT.-TRAILER/CONTAINER:
NET WEIGHT: 38,760
GATEHOUSE: VKS
DRIVER: Dusty
TRAIN ID: USEG 116 ORIGIN:
WASTE TYPE: Cont Soil
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS:
HAULER:

CONFIDENTIAL

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 26, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 25, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 K
Container #:	TRIU150299
Weight Disposed:	38,760 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST

NSIU 265217

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: EXEMPT

Manifest Document No.: 22557L

2. Page 1 of 1

3. Generator's Name and Mailing Address: DOE ENERGY
3538 INTERNATIONAL STREET
FAIRBANKS, AK 99701

Site Address: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99766

MIKE BOESE

4. Generator's Phone: (907) 452-1006

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.

6. US EPA ID Number: W A H 0 0 0 0 1 1 4 8 6

A. State Transporter's ID

B. Transporter 1 Phone: (800) 426-3113

7. Transporter 2 Company Name: COLUMBIA PACIFIC TRANSPORT, INC.

8. US EPA ID Number: [illegible]

C. State Transporter's ID: [illegible]

D. Transporter 2 Phone: (541) 454-2030

9. Designated Facility Name and Site Address: COLUMBIA RIDGE RECY. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number: O R D 9 8 7 1 7 3 4 5 7

E. State Facility's ID

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated By DOT	13	CF	35773	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1)115926OR POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

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

Printed/Typed Name: MICHAEL L. BOESE
Signature: Michael L Boese for DOE
Date: Month 8 Day 14 Year 14

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EKSTRAND
Signature: [signature]
Date: Month 8 Day 14 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: Jerry LaMoureaux
Signature: [signature]
Date: Month 10 Day 28 Year 14

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name: Sarah Mastrian
Signature: Sarah Mastrian
Date: Month 11 Day 04 Year 14

GENERATOR

TRANSPORTER

FACILITY

NON-HAZARDOUS WASTE

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
EXEMPT	2 / 2	22557L

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 452-1067 CAPE THOMPSON, AK 99706

25. Transporter 3 Company Name: UNION PACIFIC — U.S. EPA ID Number: NEDOOU702310

26. Transporter 4 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (Including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (If any))	28 Containers No.	28 Containers Type	29 Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: Cindi Cregg — Signature: Cindi Cregg — Month/Day/Year: 10/25/14

34. Transporter 4 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Mastriona — Signature: Sarah Mastriona — Month/Day/Year: 10/31/14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 235602

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 11/04/2014
Payment Type Credit Account
Manual Ticket# 813201
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY PROJECT CHARIOT

Carrier NSIU
Vehicle# 265219
Container 265219
Billing # 0000290
Manifest 22557 L
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/31/2014 09:02:41	Front Scale	SMastrio		Gross	82880 lb*
Out	11/04/2014 09:02:41	Front Scale	SMastrio		Tare	45300 lb*
			* Manual Weight		Net	37580 lb
					Tons	18.79

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	18.79	Tons				AK-CAPE TH
2	T SPW-FUEL,ENV	100	18.79	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

N° 813201

DATE/TIME: 2014 NOV 4 AM 9:43
LOAD DATE:
CUSTOMER: Emerald AK | DOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER: NSIU 265219
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557 L
CUSTOMER INVOICE NO.:
GROSS WEIGHT: 82880
TARE WEIGHT-TRACTOR: 45300
TARE WGT.-TRAILER/CONTAINER: 37580
NET WEIGHT:
GATEHOUSE: CWW
DRIVER: RD
TRAIN ID: Weigh 30 ORIGIN: Cont 5011
WASTE TYPE:
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS:
HAULER:

02-ARLINGTON

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 6, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 4, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 L
Container #:	NSIU265219
Weight Disposed:	37,580 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 *** 95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST CMCU 205113

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. EXEMPT

Manifest Document No. 22557M 2. Page 1 of 1

3. Generator's Name and Mailing Address
~~US DEPARTMENT OF ENERGY~~
3538 INTERNATIONAL STREET
FAIRBANKS, AK 99701
(907) 452-1006

Site Address
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99766

MIKE ORBSE BOESE

4. Generator's Phone ( )

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.

6. US EPA ID Number: W A H 0 0 0 0 0 1 1 4 8 6

A. State Transporter's ID
B. Transporter 1 Phone (800) 426-3113

7. Transporter 2 Company Name: ~~COLUMBIA RIDGE LANDFILL~~ R-TRANSPORT

8. US EPA ID Number: ~~O R D 9 8 7 1 7 3 4 5 7~~ WAH000028338

C. State Transporter's ID
D. Transporter 2 Phone (541) 454-2030

9. Designated Facility Name and Site Address
COLUMBIA RIDGE RECY. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number: O R D 9 8 7 1 7 3 4 5 7

E. State Facility's ID

F. Facility's Phone (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated by DOT	15	CF	35929	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1) 115926OR POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name: MICHAEL L BOESE Signature: Michael L Boese on behalf of DOE Date: Month 8 Day 14 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EKSTRAND Signature: Brian Ekstrand Date: Month 8 Day 14 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: William R WOOD SR Signature: William R Wood Sr Date: Month 10 Day 29 Year 2014

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19

Printed/Typed Name: Sarah Mastriona Signature: Sarah Mastriona Date: Month 11 Day 03 Year 14

NON-HAZARDOUS WASTE

95-914-AK22557-MP

CMCM 20513

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number EXEMPT	22. Page 2 of 2	23. Manifest Tracking Number 22557M
24. Generator's Name	US DEPARTMENT OF ENERGY PROJECT CHARIOT CAPE THOMPSON, AK 99766		
(907) 452-1066			
25. Transporter 3 Company Name	UNION PACIFIC	U.S. EPA ID Number	NED063792510
26. Transporter 4 Company Name	COLUMBIA RIDGE LANDFILL	U.S. EPA ID Number	ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

32. Special Handling Instructions and Additional Information

GENERATOR

33. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: Scott | Signature: [signature] | Month 10 | Day 29 | Year 14

34. Transporter 4 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Mastriano | Signature: Sarah Mastriano | Month 10 | Day 31 | Year 14

TRANSPORTER

35. Discrepancy

DESIGNATED FACILITY

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original Ticket# 229916

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 11/03/2014
Payment Type Credit Account
Manual Ticket# 813196
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier CMCU
Vehicle# 205113
Container 205113
Billing # 0000290
Manifest 22557M
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/31/2014 09:42:39	MANUAL WT	vmckinne		Gross	80360 lb*
Out	11/03/2014 09:42:39		vmckinne		Tare	45780 lb*
			* Manual Weight		Net	34580 lb
					Tons	17.29

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	17.29	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	17.29	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

2014 NOV 3 PM 2:43:41

N° 813196

DATE/TIME:
LOAD DATE:
CUSTOMER: Emerald AK / DOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER: CMCU 205113
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557M
CUSTOMER INVOICE NO.:
GROSS WEIGHT: 80360
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 45780
NET WEIGHT: 34580
GATEHOUSE:
DRIVER:
TRAIN ID: ORIGIN:
WASTE TYPE: (CM) DC BU GRID SEGREGATE
DISPOSAL:
REMARKS:
HAULER:

12-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 4, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 3, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 M
Container #:	CMCU205113
Weight Disposed:	34,580 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 *** 95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST TTNU 276914

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. EXEMPT

Manifest Document No. 22557N | 2. Page 1 of 1

3. Generator's Name and Mailing Address
US DEPARTMENT OF ENERGY
3538 INTERNATIONAL STREET
FAIRBANKS, AK 99701
(907) 452-1006

Site Address
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99726

MIKE QUIGG DOE/F

4. Generator's Phone ( )

5. Transporter 1 Company Name NORTHLAND SERVICES, INC.

6. US EPA ID Number WAHU000014886

A. State Transporter's ID (800) 426-3119

B. Transporter 1 Phone

7. Transporter 2 Company Name RTRANSPORT

8. US EPA ID Number WAH000078338

C. State Transporter's ID (541) 454-2030

D. Transporter 2 Phone 360-403-8102

9. Designated Facility Name and Site Address
ROOSEVELT REGIONAL LANDFILL
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number ORD987173457

E. State Facility's ID

(541) 454-2030

F. Facility's Phone

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated By DOT	15	CF	39835	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1)1159260R POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Shipper's Certification: This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

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

Printed/Typed Name MICHAEL L. BIESE | Signature Michael L Biese on behalf of DOE/F | Date Month 8 Day 14 Year 14

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name BRIAN EKSTRAND | Signature B. Ekstrand | Date Month 8 Day 14 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name William R. Wood Sr | Signature William R. Wood Sr | Date Month 10 Day 29 Year 2014

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name Sarah Madrona | Signature Sarah Madrona | Date Month 11 Day 03 Year 14

GENERATOR | TRANSPORTER | FACILITY | NON-HAZARDOUS WASTE

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number EXEMPT	22. Page 2 / 2	23. Manifest Tracking Number 22557N
24. Generator's Name	US DEPARTMENT OF ENERGY PROJECT CHARIOT		
(907) 452-1000	CAPE THOMPSON, AK 99676		
25. Transporter 3 Company Name	UNION PACIFIC	U.S. EPA ID Number	NED001732913
26. Transporter 4 Company Name	COLUMBIA RIDGE LANDFILL	U.S. EPA ID Number	ORD987173457

27a. HM	27b. U.S. DOT Description (Including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 3 Acknowledgment of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
T Hill		10	29	14

34. Transporter 4 Acknowledgment of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Sarah Masters		10	31	14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original Ticket# 229919

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 11/03/2014
Payment Type Credit Account
Manual Ticket# 813202
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR~DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier TINU
Vehicle# 276914
Container 276914
Billing # 0000290
Manifest 22557N
PO 1159250R

Volume

	Time	Scale	Operator	Inbound		
In	10/31/2014 09:45:54	MANUAL WT	vmckinne		Gross	84620 lb*
Out	11/03/2014 09:45:54		vmckinne		Tare	45740 lb*
			* Manual Weight		Net	38880 lb
					Tons	19.44

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS~	100	19.44	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.44	Tons				AK-CAPE TH
3	RAIL 20FT SPW RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

2014NOV3 AM11:31

N° 813202

DATE/TIME: _____
LOAD DATE: _____
CUSTOMER: Emerald AK IDOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER: TINU 276914
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557N
CUSTOMER INVOICE NO.:
GROSS WEIGHT: 84,620
TARE WEIGHT-TRACTOR: 45,740
TARE WGT.-TRAILER/CONTAINER:
NET WEIGHT: 38,880

GATEHOUSE: JK
DRIVER: TRUCK
TRAIN ID: _____ ORIGIN: Wright 30 Contract
WASTE TYPE: _____
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS: _____
HAULER: _____

02-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 4, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 3, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 N
Container #:	TTNU276914
Weight Disposed:	38,880 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7815 [illegible] 95-914-AM2337-MP

NON-HAZARDOUS WASTE MANIFEST CMCU 215568

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. EXEMPT

Manifest Document No. 225570 2. Page 1 of 1

3. Generator's Name and Mailing Address
US DEPARTMENT OF ENERGY
3338 INTERNATIONAL STREET
FAIRBANKS, AK 99701
(907) 452-3006

Site Address
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99766

MIKE OBERG

4. Generator's Phone ( )

5. Transporter 1 Company Name
NORTH AND SERVICES, INC.

6. US EPA ID Number
A N D [illegible] 1 4 8 6

A. State Transporter's ID (800) 426-3113

B. Transporter 1 Phone

7. Transporter 2 Company Name
WASTE RIDGE LANDFILL
& TRANSPO.

8. US EPA ID Number
WA1100002837B

C. State Transporter's ID

D. Transporter 2 Phone

9. Designated Facility Name and Site Address
CHUBBS RIDGE DISP. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number
O R D 9 8 7 1 7 3 4 5 7

E. State Facility's ID

(541) 454-2030

F. Facility's Phone

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material not regulated by DOT	14	CY	35761	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
[illegible] FOR DOT

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

Shipper's certification: This is to certify that the above-named materials are properly packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

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

Printed/Typed Name	Signature	Date (Month / Day / Year)
MICHAEL L. BOGE	Michael Boge on behalf of DOE	8 / 20 / 14

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)
BRIAN EASTRAND	[signature]	8 / 14 / 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)
Shane Bressler	[signature]	10 / 23 / 14

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19.

Printed/Typed Name	Signature	Date (Month / Day / Year)
Vicky McKinnon	Vicky McKinnon	10 / 27 / 14

NON-HAZARDOUS WASTE

GENERATOR

TRANSPORTER

FACILITY

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
EXEMPT	2 of 2	225570

24. Generator's Name: US DEPARTMENT OF ENERGY, PROJECT CHARLIE, CAPE THOMPSON, AK 99766

(907) 852-1006

25. Transporter 3 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED001152913

26. Transporter 4 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

GENERATOR

TRANSPORTER

33. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [illegible] Month: 12 Day: 23 Year: 14

34. Transporter 4 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [illegible] Month: 12 Day: 24 Year: 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 234000

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 10/27/2014
Payment Type Credit Account
Manual Ticket# 812921
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL^EMERALD ALASKA^DEPARTMENT OF ENERGY^1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier CMCU
Vehicle# 205568
Container 205568
Billing # 0000290
Manifest 22557 D
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/24/2014 07:33:49	Front Scale	SMastrio		Gross	78060 lb*
Out	10/27/2014 07:33:49		SMastrio		Tare	43040 lb*
			* Manual Weight		Net	35020 lb
					Tons	17.51

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCB-	100	17.51	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	17.51	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LDC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW 035-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

N° 812921

DATE/TIME: 2014 OCT 27 PM 12:30:14
LOAD DATE:
CUSTOMER: Emerald Alaska Dept. of Energy
PROFILE NUMBER: 1159260R
TRUCK NUMBER: CMCU
TRAILER/CONTAINER NUMBER: 205568
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557 D

GROSS WEIGHT: 78060
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 43040
NET WEIGHT: 35020

GATEHOUSE: DW
DRIVER: Adam
TRAIN ID: 15691 23 ORIGIN:
WASTE TYPE: Cont. Soil
DISPOSAL: CM DC BU GRID SEGREGATE
REMARKS:

HAULER:

2-ARLINGTON

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 28, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 27, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 O
Container #:	CMCU205568
Weight Disposed:	35,020 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 *** 95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST (AK) 259023

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.

Manifest Document No. 22557 P | 2. Page 1 of 1

3. Generator's Name and Mailing Address
US DEPARTMENT OF ENERGY
1835 INTERNATIONAL STREET
FAIRBANKS, AK 99701
(907) 452-1006

Site Address
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99766

MIKE CHESE of Pace

4. Generator's Phone ( )

5. Transporter 1 Company Name
NORTHLAND SERVICES, INC.

6. US EPA ID Number
M A R 0 0 0 0 1 4 8 6

A. State Transporter's ID (800) 426-3333

B. Transporter 1 Phone

7. Transporter 2 Company Name
COLUMBIA RIDGE LANDFILL

8. US EPA ID Number
O R D 0 9 8 7 1 7 3 4 5 7

C. State Transporter's ID (541) 454-2090

D. Transporter 2 Phone

9. Designated Facility Name and Site Address
COLUMBIA RIDGE REGY. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number
O R D 0 9 8 7 1 7 3 4 5 7

E. State Facility's ID (541) 454-2090

F. Facility's Phone

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
Material Not Regulated By DOT				
a.	15	CF	35958	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
Disposal for 2011

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Shipper's certification. This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

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

Printed/Typed Name	Signature	Date (Month / Day / Year)
MICHAEL L. CHESE	Michael Chese on behalf of DOE	8 / 14 / 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)
BRIAN EASTMAN		8 / 14 / 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)
Jerry LaMoureaux		10 / 22 / 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Date (Month / Day / Year)
Vicky McKinnies		10 / 27 / 14

NON-HAZARDOUS WASTE

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
EXEMPT	2 of 2	22557B

24. Generator's Name: US DEPARTMENT OF ENERGY, PROJECT CHARLIE, CAPE THOMPSON, AK 99758

(907) 412-1096

25. Transporter 1 Company Name: UNION PACIFIC — U.S. EPA ID Number: NSD001792563

26. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987137457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 1 Acknowledgment of Receipt of Materials

Printed/Typed Name: Cindi Cargo — Signature: Cindi Cargo — Month: 10 — Day: 28 — Year: 14

34. Transporter 2 Acknowledgment of Receipt of Materials

Printed/Typed Name: Sarah Martinez — Signature: Sarah Martinez — Month: 10 — Day: 29 — Year: 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 234003

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 10/27/2014
Payment Type Credit Account
Manual Ticket# 812924
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier CAXU
Vehicle# 259023
Container 259023
Billing # 0000290
Manifest 22557 P
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/24/2014 07:35:45	Front Scale	SMastrio		Gross	78300 lb*
Out	10/27/2014 07:35:45		SMastrio		Tare	43400 lb*
			* Manual Weight		Net	34900 lb
					Tons	17.45

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	17.45	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	17.45	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LDC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WM WASTE MANAGEMENT

N° 812924

DATE:/TIME: 2014 OCT 27 PM 1:32:37
LOAD DATE:
CUSTOMER: Emerald Alaska dept of energy
PROFILE NUMBER: 1159260R
TRUCK NUMBER: CAXU 259023
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557 P
CUSTOMER INVOICE NO.:
GROSS WEIGHT: 78300
TARE WEIGHT-TRACTOR: 43400
TARE WGT.-TRAILER/CONTAINER:
NET WEIGHT: 34900
GATEHOUSE: DW
DRIVER: Adam
TRAIN ID: USCC23 ORIGIN: Port Sol
WASTE TYPE:
DISPOSAL: CM DC BU GRID SEGREGATE
REMARKS:
HAULER:

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 28, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 27, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 P
Container #:	CAXU259023
Weight Disposed:	34,900 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

PNEW 244462
~~PNEW 205568~~

NON-HAZARDOUS WASTE MANIFEST

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. EXEMPT

Manifest Document No. 22557Q

2. Page 1 of 1

3. Generator's Name and Mailing Address ~~DEPARTMENT OF ENERGY~~
3538 INTERNATIONAL STREET
FAIRBANKS, AK 99701
(907) 452-1006

Site Address
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99766

~~MIKE OBLEE~~ BOESE

4. Generator's Phone ( )

5. Transporter 1 Company Name NORTHLAND SERVICES, INC.

6. US EPA ID Number WAH000001486

A. State Transporter's ID

B. Transporter 1 Phone (800) 426-5113

7. Transporter 2 Company Name ~~COLUMBIA RIDGE LANDFILL~~ R Transport

8. US EPA ID Number ~~ORD987173457~~ WAH000028238

C. State Transporter's ID ~~80-66-2783~~

D. Transporter 2 Phone ~~(541) 454-2030~~

9. Designated Facility Name and Site Address
COLUMBIA RIDGE RECY. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number ORD987173457

E. State Facility's ID

F. Facility's Phone (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated by DOT	20	CF	39907	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1) 115926OR POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

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

Printed/Typed Name MICHAEL L. BOESE

Signature Michael L Boese on behalf of DOE

Date Month 8 Day 14 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name BRIAN EKSTRAND

Signature

Date Month 8 Day 14 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name Shane Boese

Signature

Date Month 12 Day 14 Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name Sarah Mastriona

Signature Sarah Mastriona

Date Month 11 Day 24 Year 14

95-914-AK22557-MP
PNEU 244462

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number EXEMPT	22. Page 2 / 2	23. Manifest Tracking Number 225570

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 452-1006 CAPE THOMPSON, AK 99766

25. Transporter 3 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED001792910

26. Transporter 4 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

32. Special Handling Instructions and Additional Information

GENERATOR

TRANSPORTER

33. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: Cindi Cresp — Signature: Cindi Cresp — Month 11 Day 11 Year 14

34. Transporter 4 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Mastriona — Signature: Sarah Mastriona — Month 11 Day 17 Year 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete. DESIGNATED FACILITY TO GENERATOR

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 238734

Customer Name EMERALD ALASKA INC EMERALD AL Carrier PNEU
Ticket Date 11/24/2014 Vehicle# 244462 Volume
Payment Type Credit Account Container 244462
Manual Ticket# 813954 Billing # 0000290
Hauling Ticket# Manifest 22557 0
Destination UP/R TRANSPORT PO 1159260R
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

	Time	Scale	Operator	Inbound		
In	11/17/2014 10:59:55	Front Scale	BMastrio		Gross	88420 lb*
Out	11/24/2014 10:59:55		BMastrio		Tare	47720 lb*
			* Manual Weight		Net	40700 lb
					Tons	20.35

Comments

	Product	LDX	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	20.35	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	20.35	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW 438-Cart of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

2014 NOV 24 AM 7:16:54

Nº 813954

DATE/TIME:
LOAD DATE:
CUSTOMER: Emerald Alaska / DOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER:
TRAILER/CONTAINER NUMBER: PNEU 244462
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557 0
GROSS WEIGHT: 88,420
TARE WEIGHT-TRACTOR: 47,720
TARE WGT.-TRAILER/CONTAINER: 40,700
NET WEIGHT:
GATEHOUSE: NR
DRIVER: Arnold
TRAIN ID: Useagle ORIGIN: Contsoil
WASTE TYPE:
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS:
HAULER: RT

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 25, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 24, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 Q
Container #:	PNEU244462
Weight Disposed:	40,700 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 *** 95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST NSIU 265280

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Site Address: US DEPARTMENT OF ENERGY	Manifest Document No. 22557R	2. Page 1
3. Generator's Name and Mailing Address: US DEPARTMENT OF ENERGY, 3338 INTERNATIONAL STREET, FAIRBANKS, AK 99701 (907) 452-1006	PROJECT CHARIOT, CAPE THOMPSON, AK 99766		
4. Generator's Phone ( )			
5. Transporter 1 Company Name: NORTH AMERICAN SERVICES, INC.	6. US EPA ID Number: W A N 0 0 0 0 1 4 8 6	A. State Transporter's ID: (800) 426-3113	
7. Transporter 2 Company Name: COLUMBIA RIVER LANDFILL Transport	8. US EPA ID Number: WAH000028338	B. Transporter 1 Phone	
		C. State Transporter's ID: (541) 454-2030	
		D. Transporter 2 Phone	
9. Designated Facility Name and Site Address: COLUMBIA RIDGE REGY. & LNDFL. 18177 CEDAR SPRINGS LANE, ARLINGTON, OR 97812	10. US EPA ID Number: O R D 9 8 7 1 7 3 4 5 7	E. State Facility's ID: (541) 454-2030	
		F. Facility's Phone	

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated By DOT	12	CF	38708	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above: 1)115926CR PCL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information: Shipper's certification: This is to certify that the above-named materials are properly classified, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

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

Printed/Typed Name: MICHAEL L. BOESE | Signature: Michael L Boese on behalf of DOE | Date: Month 8 Day 26 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EKSTRAND | Signature: B. Ekstrand | Date: Month 8 Day 26 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: Shanebrest L | Signature: [illegible] | Date: Month 10 Day 27 Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19.

Printed/Typed Name: Sarah Mastriona | Signature: Sarah Mastriona | Date: Month 11 Day 03 Year 14

NON-HAZARDOUS WASTE

PO 456990

NSN 265280

Please print or type (Form designed for use on elite (12-pitch) typewriter.) Form Approved OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number EXEMPT	22. Page 2 of 2	23. Manifest Tracking Number 22557R

24. Generator's Name: DEPARTMENT OF ENERGY
PROJECT CHARLOT
(907) 452-1063 CAPE THOMPSON, AK 99769

25. Transporter 2 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED001792913

26. Transporter 3 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

GENERATOR

27a. HM	27b. U.S. DOT Description (Including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: S. Hitt — Signature: [signature] — Month: 10 Day: 27 Year: 14

34. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Mattson — Signature: Sarah Mattson — Month: 10 Day: 28 Year: 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

229910

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 235430

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 11/03/2014
Payment Type Credit Account
Manual Ticket# 813051
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier NSIU
Vehicle# 265280
Container 265280
Billing # 0000290
Manifest 22557R
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/28/2014 08:51:25	MANUAL WT	vmckinne		Gross	84100 lb*
Out	11/03/2014 08:51:25		vmckinne		Tare	45840 lb*
					Net	38260 lb
			* Manual Weight		Tons	19.13

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	19.13	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.13	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD RDU $25 Cent of 100		1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

N° 813051

DATE/TIME: 10/28/2014 08:51:25
LOAD DATE: 11/3/14
CUSTOMER: Emerald AK / Dept of Energy
PROFILE NUMBER: 1159260R
TRUCK NUMBER: NSIU 265280
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557 R
CUSTOMER INVOICE NO.:
GROSS WEIGHT: 84,100
TARE WEIGHT-TRACTOR: 45,840
TARE WGT.-TRAILER/CONTAINER: 38,260
NET WEIGHT:
GATEHOUSE: DW RD
DRIVER:
TRAIN ID: ORIGIN:
WASTE TYPE: Yard Soil
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS:
HAULER: RT

2-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 4, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 3, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 R
Container #:	NSIU265280
Weight Disposed:	38,260 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST

CMCU 205974

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: EXEMPT

Manifest Document No.: 22557S

2. Page 1 of 1

3. Generator's Name and Mailing Address:
US DEPARTMENT OF ENERGY
3538 INTERNATIONAL STREET
FAIRBANKS, AK 99701

4. Generator's Phone: (907) 452-1006

Site Address:
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99766

MIKE OBESE
BOETE

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.

6. US EPA ID Number: WAH000011486

A. State Transporter's ID:

B. Transporter 1 Phone: (800) 426-3113

7. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL

8. US EPA ID Number: ORD987173457

C. State Transporter's ID:

D. Transporter 2 Phone: (541) 454-2030

9. Designated Facility Name and Site Address:
COLUMBIA RIDGE RECY. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number: ORD987173457

E. State Facility's ID:

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated By DOT	14	CF	38676	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above:
1) 115926 OR POL SOIL

H. Handling Codes for Wastes Listed Above:

15. Special Handling Instructions and Additional Information:
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name: MICHAEL L. BOETE
Signature: Michael L Boete on behalf of DOE
Date: Month 8 Day 16 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EKSTRAND
Signature:
Date: Month 8 Day 16 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: Jerry LaMoureaux
Signature:
Date: Month 10 Day 28 Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19.

Printed/Typed Name: Sarah Mastriona
Signature: Sarah Mastriona
Date: Month 11 Day 04 Year 14

NON-HAZARDOUS WASTE

Pro 456691

05-914-AE22557-MF

CMCU 205174

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number EXEMPT	22. Page 2 / 2	23. Manifest Tracking Number 22557S

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 452-1006 CAPE THOMPSON, AK 99766

25. Transporter 3 Company Name: UNION PACIFIC — U.S. EPA ID Number: NEDO01752810

26. Transporter 4 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

GENERATOR

TRANSPORTER

33. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: Signature: Month 10 Day 28 Year 14

34. Transporter 4 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Mastriona Signature: Sarah Mastriona Month 10 Day 31 Year 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 237698

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 11/04/2014
Payment Type Credit Account
Manual Ticket# 813197
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier CMCU
Vehicle# 205974
Container 205974
Billing # 0000290
Manifest 22557 S
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/31/2014 08:59:03	Front Scale	SMastrio		Gross	84040 lb*
Out	11/04/2014 08:59:03	Front Scale	SMastrio		Tare	45760 lb*
			* Manual Weight		Net	38280 lb
					Tons	19.14

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	19.14	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.14	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

N° 813197

DATE/TIME: 10/31/2014 8:59:43
LOAD DATE: 10/31/14
CUSTOMER: Emerald AK IDOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER: CMCU 205974
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557S
CUSTOMER INVOICE NO.:
GROSS WEIGHT: 84040
TARE WEIGHT-TRACTOR: 45760
TARE WGT.-TRAILER/CONTAINER: 38280
NET WEIGHT:
GATEHOUSE: JR
DRIVER: Armold
TRAIN ID: USEQ130 ORIGIN: Colusa
WASTE TYPE: (CM) DC BU GRID SEGREGATE
DISPOSAL:
REMARKS:
HAULER:

102-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 6, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 4, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 S
Container #:	CMCU205974
Weight Disposed:	38,280 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST

TTNU 195351

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: EXEMPT

Manifest Document No.: 22557T

2. Page 1 of 1

3. Generator's Name and Mailing Address
US DEPARTMENT OF ENERGY
3538 INTERNATIONAL STREET
FAIRBANKS, AK 99701

Site Address
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99766

MIKE OBESE
Reese

4. Generator's Phone: (907) 452-1006

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.

6. US EPA ID Number: WAH000011486

A. State Transporter's ID

B. Transporter 1 Phone: (800) 426-3115

7. Transporter 2 Company Name: ~~BURNS PORT INC~~ COLUMBIA RIDGE LANDFILL

8. US EPA ID Number: ~~AKD000028338~~ ORD987173457

C. State Transporter's ID

D. Transporter 2 Phone: ~~(360) 403-9121~~ (541) 454-2030

9. Designated Facility Name and Site Address
COLUMBIA RIDGE RECY. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number: ORD987173457

E. State Facility's ID

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated By DOT	15	CF	37803	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1)115926OR POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name: MICHAEL L. OBESE
Signature: Michael L Burson on behalf of DOE
Date: Month 8 Day 16 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EKSTRAND
Signature:
Date: Month 8 Day 16 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: Jerry LaMoureaux
Signature:
Date: Month 10 Day 28 Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19.

Printed/Typed Name: Sarah Mastriana
Signature: Sarah Mastriana
Date: Month 11 Day 04 Year 14

PO 456693

05-114-AK-0537-M1

TTNU 19535

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number EXEMPT	22. Page 2 of 2	23. Manifest Tracking Number 22557T

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 452-1006 CAPE THOMPSON, AK 99766

25. Transporter 3 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED001792910

26. Transporter 4 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

32. Special Handling Instructions and Additional Information

GENERATOR

TRANSPORTER

33. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: Cindi Cizz (sp) Signature: Cindi Cizz (sp) Month 10 Day 28 Year 14

34. Transporter 4 Acknowledgment of Receipt of Materials
Printed/Typed Name: Carol Mortimore Signature: Carol Mortimore Month 10 Day 31 Year 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 235592

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 11/04/2014
Payment Type Credit Account
Manual Ticket# 813192
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-PDL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier TTNU
Vehicle# 195351
Container 195351
Billing # 0000290
Manifest 22557 T
PO 1159260R

Volume

	Time	Scale	Operator	Inbound	Gross	82940 lb*
In	10/31/2014 08:55:26	Front Scale	SMastrio		Tare	45120 lb*
Out	11/04/2014 08:55:26	Front Scale	SMastrio		Net	37820 lb
			* Manual Weight		Tons	18.91

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	18.91	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	18.91	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

2014 NOV 4 AM 7:58:23

Nº 813192

DATE:/TIME:
LOAD DATE:
CUSTOMER: Emerald AK / DOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER:
TRAILER/CONTAINER NUMBER: TTNU 195351
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557 T
GROSS WEIGHT: 82940
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 45120
NET WEIGHT: 37820
GATEHOUSE: DW
DRIVER: AD
TRAIN ID: ORIGIN: Wash ok 30 Cont Sand
WASTE TYPE:
DISPOSAL: CM DC BU GRID SEGREGATE
REMARKS:
HAULER:

902-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 6, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 4, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 T
Container #:	TTNU195351
Weight Disposed:	37,820 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY, CALL 1-800-424-9300 Contract# 7619 *** 95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST CHAU 182601

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: EXEMPT

Manifest Document No.: 22557U 2. Page 1 of 1

3. Generator's Name and Mailing Address: ~~95 DEPARTMENT OF ENERGY~~ 3538 INTERNATIONAL STREET, FAIRBANKS, AK 99701

Site Address: US DEPARTMENT OF ENERGY, PROJECT CHARIOT, CAPE THOMPSON, AK 99766

MIKE REESE BOISE

4. Generator's Phone: (907) 452-1006

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC

6. US EPA ID Number: WAH000011486

A. State Transporter's ID

B. Transporter 1 Phone: (800) 426-3113

7. Transporter 2 Company Name: ~~ROLL~~ COLUMBIA RIDGE LANDFILL

8. US EPA ID Number: ~~ORN987173457~~ ORD987173457

C. State Transporter's ID

D. Transporter 2 Phone

9. Designated Facility Name and Site Address: COLUMBIA RIDGE RECY. & LNDFL., 18177 CEDAR SPRINGS LANE, ARLINGTON, OR 97812

10. US EPA ID Number: ORD987173457

E. State Facility's ID

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated By DOT	16	CF	38788	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above: 1)1159260R POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name: MICHAEL L. REESE Signature: Michael L Reese on behalf of DOE Date: Month 8, Day 16, Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EKSTRAND Signature: B. Ekstrand Date: Month 8, Day 16, Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: Jerry LaMoureaux Signature: Jerry LaMoureaux Date: Month 10, Day 28, Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name: Sarah Mastriona Signature: Sarah Mastriona Date: Month 11, Day 03, Year 14

NON-HAZARDOUS WASTE

PO 456694

05-914-AR22557-MP

CHAU 182601

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number	22. Page	23. Manifest Tracking Number
	EXEMPT	2 / 2	22557U

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARLOT
(907) 452-1003 CAPE THOMPSON, AK 99766

25. Transporter 3 Company Name: UNION PACIFIC — U.S. EPA ID Number: NEDOO[illegible]820

26. Transporter 4 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

GENERATOR

TRANSPORTER

33. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [signature] Month 10 Day 27 Year 14

34. Transporter 4 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Mastiona Signature: [signature] Month 10 Day 31 Year 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original Ticket# 229912

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 11/03/2014
Payment Type Credit Account
Manual Ticket# 813190
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier CHAU
Vehicle# 182601
Container 182601
Billing # 0000290
Manifest 22557U
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/31/2014 09:36:40	MANUAL WT	vmckinne		Gross	84280 lb*
Out	11/03/2014 09:36:40		vmckinne		Tare	45660 lb*
			* Manual Weight		Net	38620 lb
					Tons	19.31

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	19.31	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.31	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

N° 813190

DATE/TIME: 11/3/14 0936
LOAD DATE: 11/3/14
CUSTOMER: Emerald AK DOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER: CHAU 182601
TRAILER/CONTAINER NUMBER:
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557U

GROSS WEIGHT: 84,280
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 45,660
NET WEIGHT: 38,620

GATEHOUSE: OMD AD
DRIVER:
TRAIN ID: Usegal 32 ORIGIN: U Cent Sal
WASTE TYPE:
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS:

HAULER:

ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 4, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 3, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 U
Container #:	CHAU182601
Weight Disposed:	38,620 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9500 Contract# 7619 ***

95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST

NSEM 23065

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: EXEMPT

Manifest Document No.: 22557 V

2. Page 1 of 1

3. Generator's Name and Mailing Address: US DEPARTMENT OF ENERGY, 3538 INTERNATIONAL STREET, FAIRBANKS, AK 99701

Site Address: US DEPARTMENT OF ENERGY, PROJECT CHARLIE, CAPE THOMPSON, AK 99765

MIKE OBESE

4. Generator's Phone: (907) 452-1006

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.

6. US EPA ID Number: WAH000011486

A. State Transporter's ID

B. Transporter 1 Phone: (800) 426-3113

7. Transporter 2 Company Name: R Transport COLUMBIA RIDGE LANDFILL

8. US EPA ID Number: ORD988173457

C. State Transporter's ID: 360 462 3001

D. Transporter 2 Phone: (800) 452-4000

9. Designated Facility Name and Site Address: COLUMBIA RIDGE RECY. & LNDFL., 16177 CEDAR SPRINGS LANE, ARLINGTON, OR 97812

10. US EPA ID Number: ORD988173457

E. State Facility's ID

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated by DOT	18	CF	38185	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above: 1) 115926 CR FOR SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information: Shipper's certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name: MICHAEL L. OBESE

Signature: Michael L. Obese for DOE

Date: Month 8 Day 16 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EKSTRAND

Signature: B. Ekstrand

Date: Month 8 Day 16 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: Shane Bruscl

Signature: S Bruscl

Date: Month 10 Day 24 Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name: Sarah Mathias

Signature: Sarah Mathias

Date: Month 10 Day 28 Year 14

NON-HAZARDOUS WASTE

PO 4506696

NSTU 203062

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
EXEMPT	2 of 2	225570

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 452-1008 CAPE THOMPSON, AK 99766

25. Transporter ____ Company Name: UNION PACIFIC — U.S. EPA ID Number: MNR000792410

26. Transporter ____ Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

GENERATOR

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 1 Acknowledgment of Receipt of Materials
Printed/Typed Name: Cindy Cargo (4) — Signature: Cindy Cargo — Month: 10 Day: 24 Year: 14

34. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: Frank Worker — Signature: Frank Worker — Month: 10 Day: 27 Year: 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 234098

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 10/28/2014
Payment Type Credit Account
Manual Ticket# 813012
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier NSIU
Vehicle# 203068
Container 203068
Billing # 0000290
Manifest 22557 V
PO 1159260R

Volume

	Time	Scale	Operator
In	10/27/2014 10:57:12	Front Scale	SMastrio
Out	10/28/2014 10:57:12		SMastrio
			* Manual Weight

Inbound

Gross	81920 lb*
Tare	43800 lb*
Net	38120 lb
Tons	19.06

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	19.06	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.06	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW #35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WM WASTE MANAGEMENT

2014 OCT 28 AM 10:08:53

N° 813012

DATE/TIME:
LOAD DATE:
CUSTOMER: Emerald Alaska/100E
PROFILE NUMBER: 1159260R
TRUCK NUMBER: NSIU 203068
TRAILER/CONTAINER NUMBER:
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557 V
GROSS WEIGHT: 81920
TARE WEIGHT-TRACTOR: 43800
TARE WGT.-TRAILER/CONTAINER:
NET WEIGHT: 38120
GATEHOUSE: JR
DRIVER: Rita
TRAIN ID: Uoyg26 ORIGIN: Cont. Sand
WASTE TYPE:
DISPOSAL: CM DC BU GRID SEGREGATE
REMARKS:
HAULER: RT

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 29, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 28, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 V
Container #:	NSIU203068
Weight Disposed:	38,120 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 *** 95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST NSIU 202268

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. EXEMPT

Manifest Document No. 22557W 2. Page 1 of 1

3. Generator's Name and Mailing Address: US DEPARTMENT OF ENERGY
3538 INTERNATIONAL STREET
FAIRBANKS, AK 99701

Site Address: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99[illegible]

HIKE OPER: BOESE

4. Generator's Phone: (907) 452-1006

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.

6. US EPA ID Number: W A H 0 0 0 0 0 1 1 4 8 6

A. State Transporter's ID

B. Transporter 1 Phone: (800) 426-3113

7. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL

8. US EPA ID Number: O R D 9 8 7 1 7 3 4 5 7

C. State Transporter's ID

D. Transporter 2 Phone: (541) 454-2030

9. Designated Facility Name and Site Address: COLUMBIA RIDGE RECY. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number: O R D 9 8 7 1 7 3 4 5 7

E. State Facility's ID

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated By DOT	17	CF	38109	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1)115926OR POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name: MICHAEL L. BOESE Signature: Michael L Boese on behalf of DOE Date: Month 8 Day 16 Year 19

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EKSTRAND Signature: [signature] Date: Month 8 Day 16 Year 19

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: [illegible] Signature: Date: Month 10 Day 28 Year 19

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19.

Printed/Typed Name: Sarah Mastriona Signature: Sarah Mastriona Date: Month 11 Day 03 Year 19

NON-HAZARDOUS WASTE

PO 456697

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number	22. Page	23. Manifest Tracking Number
	EXEMPT	2 / 2	22557W

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 452-1006 CAPE THOMPSON, AK 99768

25. Transporter 2 Company Name: UNION PACIFIC — U.S. EPA ID Number: NEB001792910

26. Transporter 3 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: Seth — Signature: [signature] — Month: 10 Day: 28 Year: 14

34. Transporter 4 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Mastriona — Signature: [signature] — Month: 10 Day: 31 Year: 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
10177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-1030

Original Ticket# 229915

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 11/03/2014
Payment Type Credit Account
Manual Ticket# 813194
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier NSIU
Vehicle# 202268
Container 202268
Billing # 0000290
Manifest 22557W
PO 1159260R

Volume

	Time	Scale	Operator
In	10/31/2014 09:41:42	MANUAL WT	vmckinne
Out	11/03/2014 09:41:42		vmckinne
			* Manual Weight

Inbound

Gross	85020 lb*
Tare	46980 lb*
Net	38040 lb
Tons	19.02

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	19.02	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.02	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

2014 NOV 3 AM 10:07

N° 813194

DATE:/TIME: _____
LOAD DATE: _____
CUSTOMER: Emerald AK IDOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER: NSIU 202268
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557W
CUSTOMER INVOICE NO.: _____
GROSS WEIGHT: 85080
TARE WEIGHT-TRACTOR: 46980
TARE WGT.-TRAILER/CONTAINER: 38040
NET WEIGHT: JR
GATEHOUSE: FTRONICI
DRIVER: _____
TRAIN ID: Unit 630 ORIGIN: Cook Sold
WASTE TYPE: _____
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS: _____
HAULER: _____

302-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 4, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 3, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 W
Container #:	NSIU202268
Weight Disposed:	38,040 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST

TTNU 261039

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

NON-HAZARDOUS WASTE

GENERATOR

NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1
	EXEMPT	22557X	

3. Generator's Name and Mailing Address
US DEPARTMENT OF ENERGY
3538 INTERNATIONAL STREET
FAIRBANKS, AK 99701

Site Address
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99766

MIKE BOESE

4. Generator's Phone (907) 452-1006

5. Transporter 1 Company Name	6. US EPA ID Number	A. State Transporter's ID
NORTHLAND SERVICES, INC.	WAH000011486	B. Transporter 1 Phone (800) 426-3113
7. Transporter 2 Company Name K Transport COLUMBIA RIDGE LANDFILL	8. US EPA ID Number WAH000077838	C. State Transporter's ID 306402BAL D. Transporter 2 Phone (541) 454-2030

9. Designated Facility Name and Site Address	10. US EPA ID Number	E. State Facility's ID
COLUMBIA RIDGE RECY. & LNDFL. 18177 CEDAR SPRINGS LANE ARLINGTON, OR 97812	ORD987173457	F. Facility's Phone (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated By DOT	13	CF	38670	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
125 40' 1256926OR POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

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

Printed/Typed Name	Signature	Date Month	Day	Year
MICHAEL L BOESE	Michael L Boese on behalf of DOE	8	16	14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month	Day	Year
BRIAN EKSTRAND		8	16	14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month	Day	Year
Gene Bruesch		10	28	14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Date Month	Day	Year
Sarah Mastriona	Sarah Mastriona	11	03	14

Pro 456698

95-214-AR22557-MP

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number EXEMPT	22. Page 2 / 2	23. Manifest Tracking Number 22557X
24. Generator's Name (907) 452-1006	US DEPARTMENT OF ENERGY PROJECT CHARIOT CAPE THOMPSON, AK 99766		
25. Transporter 3 Company Name UNION PACIFIC		U.S. EPA ID Number	NED001792910
26. Transporter 4 Company Name COLUMBIA RIDGE LANDFILL		U.S. EPA ID Number	ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

32. Special Handling Instructions and Additional Information

GENERATOR

TRANSPORTER

33. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: Signature: Month 10 Day 24 Year 14

34. Transporter 4 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah McAtyeon Signature: Sarah McAtyeon Month 10 Day 31 Year 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original Ticket# ~~229442~~ 229917

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 11/03/2014
Payment Type Credit Account
Manual Ticket# 813198
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY PROJECT CHARIOT

Carrier TTNU
Vehicle# 261039
Container 261039
Billing # 0000290
Manifest 22557X
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/31/2014 09:43:49	MANUAL WT	vmckinne		Gross	84500 lb*
Out	11/03/2014 09:43:49		vmckinne		Tare	45880 lb*
			* Manual Weight		Net	38620 lb
					Tons	19.31

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	19.31	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.31	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

2014 NOV 3 AM 10:12:05

Nº 813198

DATE/TIME:
LOAD DATE:
CUSTOMER: Emerald AK / DOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER:
TRAILER/CONTAINER NUMBER: TTNU 261039
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557X

GROSS WEIGHT: 84,500
TARE WEIGHT-TRACTOR: 45,880
TARE WGT.-TRAILER/CONTAINER:
NET WEIGHT: 38,620

GATEHOUSE: JR
DRIVER: Arnold
TRAIN ID: USEG130 ORIGIN: Cut Soil
WASTE TYPE:
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS:

HAULER:

02-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 4, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 3, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 X
Container #:	TTNU261039
Weight Disposed:	38,620 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST

NSIU 201553

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: EXEMPT

Manifest Document No.: 22557Y

2. Page 1 of 1

3. Generator's Name and Mailing Address:
US DEPARTMENT OF ENERGY
3538 INTERNATIONAL STREET
FAIRBANKS, AK 99701

Site Address:
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99766

MIKE BOESE
BOESE

4. Generator's Phone: (907) 452-1006

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.

6. US EPA ID Number: WAH000011486

A. State Transporter's ID:

B. Transporter 1 Phone: (800) 426-3113

7. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL

8. US EPA ID Number: ORD987173457

C. State Transporter's ID:

D. Transporter 2 Phone: (541) 454-2030

9. Designated Facility Name and Site Address:
COLUMBIA RIDGE RECY. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number: ORD987173457

E. State Facility's ID:

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated By DOT	14	CF	37587	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above:
1) 115926OR POL SOIL

H. Handling Codes for Wastes Listed Above:

15. Special Handling Instructions and Additional Information:
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name: MICHAEL L. BOESE
Signature: [signature] for DOE
Date: Month 8 Day 16 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EKSTRAND
Signature: [signature]
Date: Month 8 Day 16 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: Shane Bruscel
Signature: [signature]
Date: Month 10 Day 27 Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name: Sarah Mastrinna
Signature: Sarah Mastrinna
Date: Month 11 Day 03 Year 14

NON-HAZARDOUS WASTE

PO 456699

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number EXEMPT	22. Page 2 / 2	23. Manifest Tracking Number 22557Y

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 442-3906 CAPE THOMPSON, AK 99766

25. Transporter 3 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED981792810

26. Transporter 4 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (Including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (If any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

32. Special Handling Instructions and Additional Information

GENERATOR

TRANSPORTER

33. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [signature] Month 10 Day 29 Year 14

34. Transporter 4 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Mastriano Signature: Sarah Mastriano Month 10 Day 29 Year 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete. DESIGNATED FACILITY TO GENERATOR

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original Ticket# 229911

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 11/03/2014
Payment Type Credit Account
Manual Ticket# 813112
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier NSIU
Vehicle# 201553
Container 201553
Billing # 0000290
Manifest 22557Y
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/29/2014 08:53:39	MANUAL WT	vmckinne		Gross	84320 lb*
Out	11/03/2014 08:53:39		vmckinne		Tare	46920 lb*
			* Manual Weight		Net	37400 lb
					Tons	18.70

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	18.70	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	18.70	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

N° 813112

DATE:/TIME: 10/29/14 08:53:39
LOAD DATE: 11/3/14
CUSTOMER: Emerald Alaska Dept. of Energy
PROFILE NUMBER: 1159260R
TRUCK NUMBER: ABU 201553
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557Y
CUSTOMER INVOICE NO.:
GROSS WEIGHT: 84,320
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 46,920
NET WEIGHT: 37,400

GATEHOUSE: COAL
DRIVER: ED
TRAIN ID: USKGL 1553 ORIGIN: COH SOIL
WASTE TYPE:
DISPOSAL: CM DC BU GRID SEGREGATE
REMARKS:
HAULER:

02-ARLINGTON

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
8177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 4, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 3, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 Y
Container #:	NSIU201553
Weight Disposed:	37,400 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 *** 05-914-AK22557-NP

NON-HAZARDOUS WASTE MANIFEST

NSN 202-4496

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: EXEMPT

Manifest Document No.: 225572

2. Page 1 of 1

3. Generator's Name and Mailing Address:
US DEPARTMENT OF ENERGY
3558 INTERNATIONAL STREET
FAIRBANKS, AK 99701

Site Address:
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99766

MIKE GROSE
DOE

4. Generator's Phone: (907) 452-1006

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.

6. US EPA ID Number: WAH000011486

A. State Transporter's ID

B. Transporter 1 Phone: (800) 426-5113

7. Transporter 2 Company Name: RETRACTED
COLUMBIA RIDGE LANDFILL

8. US EPA ID Number: ORD982173457

C. State Transporter's ID

D. Transporter 2 Phone: (541) 454-2030

9. Designated Facility Name and Site Address:
COLUMBIA RIDGE RECY. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number: ORD982173457

E. State Facility's ID

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated by DOT	15	CF	38570	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1) 111998OR POLYSOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name: MICHAEL L. BOESE
Signature: Michael L Boese on behalf of DOE
Date: Month 10 Day 16 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EKSTRAND
Signature:
Date: Month 10 Day 16 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: Steve Bruesch
Signature:
Date: Month 10 Day 24 Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name: Sarah Nesheim
Signature: Sarah Nesheim
Date: Month 10 Day 23 Year 14

NON-HAZARDOUS WASTE

PO 456700

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
EXEMPT	2 of 2	225572

24. Generator's Name: US DEPARTMENT OF ENERGY, PROJECT CHARIOT, CAPE THOMPSON, AK 99766 (907) 452-1000

25. Transporter 1 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED001732910

26. Transporter 2 Company Name: COLUMBIA RIVER LIMITED — U.S. EPA ID Number: ORD987373457

27a. HM	27b. U.S. DOT Description (Including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

GENERATOR

TRANSPORTER

33. Transporter 1 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [signature] Month: 10 Day: 30 Year: 14

34. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [signature] Month: 10 Day: 30 Year: 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete

DESIGNATED FACILITY TO GENERATOR

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

Nº 813011

DATE:/TIME: 2014 OCT 28 AM 10:05:37
LOAD DATE:
CUSTOMER: Emerald Alaska / DOE
PROFILE NUMBER: 115926 OR
TRUCK NUMBER:
TRAILER/CONTAINER NUMBER: NSIU 202496
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557 Z

GROSS WEIGHT: 82380
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 43900
NET WEIGHT: 38480

GATEHOUSE: JR
DRIVER: Bud
TRAIN ID: Usage 26 ORIGIN:
WASTE TYPE: Cont. Soil
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS:

HAULER: RT

902-ARLINGTON

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 234697

Customer Name EMERALD ALASKA INC EMERALD AL Carrier NSIU
Ticket Date 10/28/2014 Vehicle# 202496 Volume
Payment Type Credit Account Container 202496
Manual Ticket# 813011 Billing # 00000290
Hauling Ticket# LP/R TRANSPORT Manifest 22557 Z
Destination PO 115926OR
Profile 115926OR (SPW-POL SOIL"EMERALD ALASKA"DEPARTMENT OF ENERGY"115926OR)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

	Time	Scale	Operator	Inbound Gross	82380 lb*
In	10/27/2014 10:55:45	Front Scale	SMastrio	Tare	43900 lb*
Out	10/28/2014 10:55:45		SMastrio	Net	38480 lb
Comments			* Manual Weight	Tons	19.24

	Product	LDX	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWCS- 100		19.24	Tons				AK-CAPE TH
2	FEA T SPW-FUEL, ENV 100		19.24	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL 100		1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY 100		1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR 100		1	Load				AK-CAPE TH
6	CD SPW $35-Cert of 100		1	Each				AK-CAPE TH

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 29, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 28, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 Z
Container #:	NSIU202496
Weight Disposed:	38,480 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

95-914-MR22557-MP

NON-HAZARDOUS WASTE MANIFEST NSN 2016778

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. EXEMPT

Manifest Document No. 22557 MK

2. Page 1 of 3

3. Generator's Name and Mailing Address
US DEPARTMENT OF ENERGY
3538 INTERNATIONAL STREET
FAIRBANKS, AK 99701
(907) 452-1006

US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99761

MIKE BOESE
Teale

4. Generator's Phone ( )

5. Transporter 1 Company Name
NORTHLAND SERVICES, INC.

6. US EPA ID Number
W A H 0 0 0 0 1 1 4 5 6

A. State Transporter's ID

B. Transporter 1 Phone (866) 416-7117

7. Transporter 2 Company Name
COLUMBIA RIDGE LANDFILL & TRANSFER

8. US EPA ID Number
WAH000028338

C. State Transporter's ID

D. Transporter 2 Phone

9. Designated Facility Name and Site Address
COLUMBIA RIDGE RECY. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number
O R D 9 8 7 1 7 3 4 5 7

E. State Facility's ID

F. Facility's Phone (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material not regulated by DOT	19	CF	38810	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1)11582005 PO# 5011

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name: MICHAEL L. BOESE
Signature: Michael L. Boese
Date: Month 8 Day 16 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN OSTRAND
Signature:
Date: Month 8 Day 16 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: Steve Bnosch
Signature:
Date: Month 10 Day 23 Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name: Sarah Nicosia
Signature: Sarah Nicosia
Date: Month 10 Day 28 Year 14

NON-HAZARDOUS WASTE

Pro 456701

95-NH-RK23557-M

NSIU 2(

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number	22. Page	23. Manifest Tracking Number
	[illegible]	2 of 3	22557AA

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARLIE
CAPE THOMPSON, AK 99166
(907) 452-1000

25. Transporter 1 Company Name: UNION PACIFIC — U.S. EPA ID Number: NEN001792230

26. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987170447

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

GENERATOR

TRANSPORTER

33. Transporter 1 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] — Signature: [illegible] — Month 10 Day 23 Year 14

34. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] — Signature: [illegible] — Month 10 Day 25 Year 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 234093

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 10/28/2014
Payment Type Credit Account
Manual Ticket# 812991
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier NSIU
Vehicle# 201678
Container 201678
Billing # 0000290
Manifest 22557 AA
PO -1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/25/2014 10:49:56	Front Scale	SMastrio		Gross	82740 lb*
Out	10/28/2014 10:49:56		SMastrio		Tare	43920 lb*
			* Manual Weight		Net	38820 lb
					Tons	19.41

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCB-	100	19.41	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.41	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

2014 OCT 28 PM 1:17:28

N° 812991

DATE/TIME:
LOAD DATE:
CUSTOMER: Emerald Alaska/DOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER: NSIU 201678
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557 AA
CUSTOMER INVOICE NO.:
GROSS WEIGHT: 82740
TARE WEIGHT-TRACTOR: 43920
TARE WGT.-TRAILER/CONTAINER: 38820
NET WEIGHT:
GATEHOUSE: JR
DRIVER: Marshall
TRAIN ID: Loop 24 ORIGIN: Dept. Sal
WASTE TYPE:
DISPOSAL: CM DC BU GRID SEGREGATE
REMARKS:
HAULER: RT

302/ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 29, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 28, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 AA
Container #:	NSIU201678
Weight Disposed:	38,820 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST

NSN 202-2660

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.

Manifest Document No. 225578 2. Page 1 of 1

3. Generator's Name and Mailing Address
US DEPARTMENT OF ENERGY
3900 INTERNATIONAL STREET
FAIRBANKS, AK 99701
(907) 452-3006

Site Address
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99766

4. Generator's Phone ( )

5. Transporter 1 Company Name: NORTH ALASKA SERVICES, INC.

6. US EPA ID Number: W A H 0 0 0 1 4 8 6

A. State Transporter's ID (800) 426-3113

B. Transporter 1 Phone

7. Transporter 2 Company Name: ROBERTS ENVIRONMENTAL LANDFILL
Rossport

8. US EPA ID Number: WMH000038238

C. State Transporter's ID

D. Transporter 2 Phone

9. Designated Facility Name and Site Address: ROBERTS ENVIRONMENTAL LANDFILL
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number: O R D 9 8 7 1 7 3 4 5 7

E. State Facility's ID

(541) 454-2030

F. Facility's Phone

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
Material Not Regulated by DOT				
a.	13	CF	35795	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
CHARIOT VOL 2021

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

Shipper's certification: This is to certify that the above-named materials are properly packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name	Signature	Date Month	Day	Year
MICHAEL L. BEEK		8	10	19

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month	Day	Year
BRIAN EASTLAND		8	16	19

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month	Day	Year
Shane Bruso L		10	24	19

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Date Month	Day	Year
Sarah Mastriano		10	28	19

NON-HAZARDOUS WASTE

PIO 4/2702

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
AKCM12	4 of 7	2255795

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 452-1005 CAPE THOMPSON, AK 99766

25. Transporter 1 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED0017[illegible]

26. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD09[illegible]

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 1 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [illegible] Month: 10 Day: 24 Year: 11

34. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [illegible] Month: 10 Day: 27 Year: 11

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 234096

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 10/28/2014
Payment Type Credit Account
Manual Ticket# 813010
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier NSIU
Vehicle# 202266
Container 202266
Billing # 0000290
Manifest 22557 BB
PO 1159260R

Voluse

	Time	Scale	Operator	Inbound		
In	10/27/2014 10:54:51	Front Scale	SMastrio		Gross	84400 lb
Out	10/28/2014 10:54:51		SMastrio		Tare	44400 lb
			* Manual Weight		Net	40000 lb
					Tons	20.00

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCB-	100	20.00	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	20.00	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW #35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

2014 OCT 28 AM 9:44:50

WASTE MANAGEMENT

N° 813010

DATE/TIME:
LOAD DATE:
CUSTOMER: Emerald Alaska / 100E
PROFILE NUMBER: 1159260R
TRUCK NUMBER: NS 14 202266
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557 BB
CUSTOMER INVOICE NO.:

GROSS WEIGHT: 84400
TARE WEIGHT-TRACTOR: 44400
TARE WGT.-TRAILER/CONTAINER:
NET WEIGHT: 40000

GATEHOUSE: JR
DRIVER: Adam
TRAIN ID: Wagon 016 ORIGIN: Port. Sad
WASTE TYPE:
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS:
HAULER: RT

12-ARI INGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 29, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 28, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 BB
Container #:	NSIU202266
Weight Disposed:	40,000 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

IN CASE OF EMERGENCY WILL ATTEMPT TO CONTACT 1917

NSH 203211

NON-HAZARDOUS WASTE MANIFEST

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. EXEMPT

Manifest Document No. 22557CF

2. Page 1 of

3. Generator's Name and Mailing Address
US DEPARTMENT OF ENERGY
1550 INTERNATIONAL STREET
FAIRBANKS, AK 99701
(907) 452-1008

Site Address
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99766

4. Generator's Phone ( )

5. Transporter 1 Company Name
NORTH ARD SERVICES, INC.

6. US EPA ID Number
WAH000001446

A. State Transporter's ID (800) 426-1125

B. Transporter 1 Phone

7. Transporter 2 Company Name
R T Transport

8. US EPA ID Number
WAH000038535

C. State Transporter's ID

D. Transporter 2 Phone

9. Designated Facility Name and Site Address
ARLINGTON REGIONAL LANDFILL
38177 CEDAR SPRINGS LANE
ARLINGTON, OR 97832

10. US EPA ID Number
ORD987173457

E. State Facility's ID

(541) 454-2030

F. Facility's Phone

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated by DOT	13	CY	35560	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
Agricultural Soil

H. Handling Codes for Wastes Listed Above

Shipper's certification. This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

15. Special Handling Instructions and Additional Information

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

Printed/Typed Name	Signature	Date (Month / Day / Year)
Michael L. Biese	Michael Biese for DOE	10 / 16 / 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)
Brian Ekstrand	B. Ekstrand	10 / 16 / 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)
Steve Bausch	Steve Bausch	10 / 21 / 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Date (Month / Day / Year)
Sarah Mazzone	Sarah Mazzone	10 / 22 / 14

NON-HAZARDOUS WASTE

PO 436703

NSTU 203211

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
EXEMPT	2 of 2	225572C

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 452-1005 CAPE THOMPSON, AK 99766

25. Transporter 1 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED0017925I0

26. Transporter 2 Company Name: CROWLEY AIDE LANDFILL — U.S. EPA ID Number: GPD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [illegible] Month: 10 Day: 27 Year: 14

34. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [illegible] Month: 10 Day: 27 Year: 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 234099

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 10/28/2014
Payment Type Credit Account
Manual Ticket# 813013
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier NSIU
Vehicle# 203211
Container 203211
Billing # 0000290
Manifest 22557 CC
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/27/2014 10:57:55	Front Scale	SMastrio		Gross	83820 lb*
Out	10/28/2014 10:57:55		SMastrio		Tare	43940 lb*
			* Manual Weight		Net	39880 lb
					Tons	19.94

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	19.94	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.94	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

N° 813013

DATE/TIME: 2014 OUT 28 AM 9:39:07
LOAD DATE:
CUSTOMER: Emerald Alaska 1005
PROFILE NUMBER: 1159260R
TRUCK NUMBER: US14 803211
TRAILER/CONTAINER NUMBER:
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557cc
GROSS WEIGHT: 83820
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 43940
NET WEIGHT: 39880
GATEHOUSE: JK
DRIVER: Rita
TRAIN ID: Hayes 26 ORIGIN: Port Sal
WASTE TYPE: (CM) DC BU GRID SEGREGATE
DISPOSAL:
REMARKS:
HAULER: RT

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 29, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 28, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 CC
Container #:	NSIU203211
Weight Disposed:	39,880 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 *** 95-914-AK22557 MP

NON-HAZARDOUS WASTE MANIFEST TRIU 3103293

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. EXEMPT

Manifest Document No. 22557 D

2. Page 1 of 1

3. Generator's Name and Mailing Address
US DEPARTMENT OF ENERGY
3538 INTERNATIONAL STREET
FAIRBANKS, AK 99701

Site Address
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99766

MIKE BOESE

4. Generator's Phone ((907) 452-1006

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.

6. US EPA ID Number: W A H 0 0 0 0 1 1 4 8 6

A. State Transporter's ID

B. Transporter 1 Phone: (800) 426-3113

7. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL

8. US EPA ID Number: [illegible]

C. State Transporter's ID: 30 965-8762

D. Transporter 2 Phone: (541) 454-2030

9. Designated Facility Name and Site Address
COLUMBIA RIDGE RECY. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number: O R D 9 8 7 1 7 3 4 5 7

E. State Facility's ID

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated By DOT	1	CF	39983	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1) 115926 OR POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
SHIPPER'S CERTIFICATION: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

NON-HAZARDOUS WASTE

GENERATOR

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

Printed/Typed Name: MICHAEL L. BOESE
Signature: [signature] ON BEHALF OF DOE
Date: Month 9 Day 7 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EKSTRAND
Signature: [signature]
Date: Month 9 Day 7 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: Shane Bruscl
Signature: [signature]
Date: Month 10 Day 24 Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name: Sarah Mastriona
Signature: Sarah Mastriona
Date: Month 11 Day 04 Year 14

[illegible]-914-AK22557-MF

TRIU 21022

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
EXEMPT	2 / 2	22557DD

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 452-1006 CAPE THOMPSON, AK 99766

25. Transporter 1 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED001792910

26. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

32. Special Handling Instructions and Additional Information

(3)

GENERATOR

TRANSPORTER

33. Transporter 1 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] (1) — Signature: [illegible] (2) — Month 11 Day 21 Year 14

34. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Mastricola — Signature: Sarah Mastricola — Month 11 Day 25 Year 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 235589

Customer Name EMERALD ALASKA INC EMERALD AL Carrier TRIU
Ticket Date 11/04/2014 Vehicle# 310323 Volume
Payment Type Credit Account Container 310323
Manual Ticket# 812993 Billing # 0000290
Hauling Ticket# Manifest 2255/ DD
Destination UP/R TRANSPORT PO 1159260R
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

	Time	Scale	Operator	Inbound	Gross	85500 lb*
In	10/25/2014 08:51:20	Front Scale	SMastrio		Tare	45600 lb*
Out	11/04/2014 08:51:20	Front Scale	SMastrio		Net	39900 lb
			* Manual Weight		Tons	19.95

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS	100	19.95	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.95	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

2014 NOV 4 AM 10:48:11

N° 812993

DATE/TIME: _____
LOAD DATE: _____
CUSTOMER: Emerald Alaska Inc
PROFILE NUMBER: 1159260R
TRUCK NUMBER: T214 310323
TRAILER/CONTAINER NUMBER: _____
SEAL NUMBER: _____
CUSTOMER INVOICE NO.: 22557 DD
_____
GROSS WEIGHT: 85500
TARE WEIGHT-TRACTOR: 45000
TARE WGT.-TRAILER/CONTAINER: 39900
NET WEIGHT: _____
GATEHOUSE: FW NOVI
DRIVER: _____
TRAIN ID: _____ ORIGIN: _____
WASTE TYPE: Light Soil
DISPOSAL: CM DC BU GRID SEGREGATE
REMARKS: _____
HAULER: _____

102-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 6, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 4, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 DD
Container #:	TRIU310323
Weight Disposed:	39,900 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

95-914 AK 22557 MF

NON-HAZARDOUS WASTE MANIFEST

302 891
NO 214346

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

1 NON-HAZARDOUS WASTE MANIFEST	1. Generator's US EPA ID No. EXEMPT Site Address	Manifest Document No. 22557 E	2. Page 1 of 1
3. Generator's Name and Mailing Address US DEPARTMENT OF ENERGY 3538 INTERNATIONAL STREET FAIRBANKS, AK 99701 (907) 452-1006	US DEPARTMENT OF ENERGY PROJECT CHARIOT CAPE THOMPSON, AK 99666	MIKE OBRIEN Rec'd	
4. Generator's Phone: ( )			
5. Transporter 1 Company Name NORTHLAND SERVICES, INC.	6. US EPA ID Number WAH000011486	A. State Transporter's ID	(800) 426-2113
		B. Transporter 1 Phone	
7. Transporter 2 Company Name COLUMBIA RIDGE LANDFILL R TRANSPORT	8. US EPA ID Number ORD987173457 WAH000028338	C. State Transporter's ID	360-907-2900 (503) 454-2030
		D. Transporter 2 Phone	
9. Designated Facility Name and Site Address COLUMBIA RIDGE RECY. & LNDFL. 18177 CEDAR SPRINGS LANE ARLINGTON, OR 97812	10. US EPA ID Number ORD987173457	E. State Facility's ID	
		F. Facility's Phone	(541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated by DOT	16	CF	39982	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1)115926OR POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name	Signature	Date (Month / Day / Year)
Michael L. Boone	Michael L Boone on behalf of DOE	9 / 7 / 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)
BRIAN EKSTRAND		9 / 7 / 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)
SHANNON BROSCH		10 / 27 / 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Date (Month / Day / Year)
Sarah Mastriona	Sarah Mastriona	11 / 04 / 14

NON-HAZARDOUS WASTE

95-914-AK22557-MF

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)	21. Generator ID Number EXEMPT	22. Page 2 of 2	23. Manifest Tracking Number 22557EE

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 452-1006 CAPE THOMPSON, AK 99766

25. Transporter ___ Company Name: UNION PACIFIC — U.S. EPA ID Number: NED001792910

26. Transporter ___ Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (Including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		

32. Special Handling Instructions and Additional Information

GENERATOR

TRANSPORTER

33. Transporter 1 Acknowledgment of Receipt of Materials
Printed/Typed Name: David Lamb — Signature — Month: 10 Day: 27 Year: 14

34. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: Bonnie Shaw — Signature — Month: 10 Day: 27 Year: 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete. DESIGNATED FACILITY TO GENERATOR

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 235591

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 11/04/2014
Payment Type Credit Account
Manual Ticket# 813050
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY PROJECT CHARIOT

Carrier NSTU
Vehicle# 202851
Container 202851
Billing # 0000290
Manifest 22557 EE
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/28/2014 08:54:26	Front Scale	SMastrio		Gross	86840 lb*
Out	11/04/2014 08:54:26	Front Scale	SMastrio		Tare	46860 lb*
			* Manual Weight		Net	39980 lb
					Tons	19.99

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	19.99	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.99	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

2014 NOV 4 AM 11:22:36

WASTE MANAGEMENT

N° 813050

DATE/TIME:
LOAD DATE:
CUSTOMER: Emerald AK / Dept of Energy
PROFILE NUMBER: 1159260R
TRUCK NUMBER: NSTU 202851
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557 EE
CUSTOMER INVOICE NO.:

GROSS WEIGHT: 86840
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 46860
NET WEIGHT: 39980

GATEHOUSE:
DRIVER: JR Arnold
TRAIN ID: ORIGIN:
WASTE TYPE: Cont Soil
DISPOSAL: CM DC BU GRID SEGREGATE
REMARKS:

HAULER:

902-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

November 6, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	November 4, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 EE
Container #:	NSIU202851
Weight Disposed:	39,980 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

95-934-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST

TNV 141022

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. EXEMPT

Manifest Document No. 22557F

2. Page 1 of 1

3. Generator's Name and Mailing Address
U.S. DEPARTMENT OF ENERGY
3538 INTERNATIONAL STREET
FAIRBANKS, AK 99701

Site Address
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99766

MIKE GEESE
Barrie

4. Generator's Phone (907) 452-1006

5. Transporter 1 Company Name NORTHLAND SERVICES, INC.

6. US EPA ID Number WAH000114886

A. State Transporter's ID

B. Transporter 1 Phone (206) 426-9117

7. Transporter 2 Company Name COLUMBIA RIDGE LANDFILL

8. US EPA ID Number ORD987173457

C. State Transporter's ID

D. Transporter 2 Phone (541) 454-2030

9. Designated Facility Name and Site Address
COLUMBIA RIDGE RECY. & LNDFL.
29177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number ORD987173457

E. State Facility's ID

F. Facility's Phone (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Asbestos Not Regulated by DOT	17	CF	39993	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1)115926OR PCB SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name Michael L. Beese

Signature Michael L. Beese on behalf of DOE

Date: Month 9 Day 7 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name BOB BASTIANO

Signature

Date: Month 9 Day 9 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name Shan Brescia

Signature

Date: Month 10 Day 14 Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name Sarah Martinez

Signature Sarah Martinez

Date: Month 10 Day 28 Year 14

NON-HAZARDOUS WASTE

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
AKMPT	2 of 2	2255777

24. Generator's Name: US DEPARTMENT OF ENERGY, PROJECT CHARIOT, CAPE THOMPSON, AK 99765 (907) 452-1000

25. Transporter 1 Company Name: UNION PACIFIC — U.S. EPA ID Number: NEDO01792910

26. Transporter 2 Company Name: COLUMBIA RIVER ARMORED — U.S. EPA ID Number: ORD987170487

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 1 Acknowledgment of Receipt of Materials
Printed/Typed Name: Cwdh Cox — Signature: Cwdh Cox — Month: 10 — Day: 23 — Year: 14

34. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: Scott Wilson — Signature: [illegible] — Month: 10 — Day: 24 — Year: 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 234091

Customer Name EMERALD ALASKA INC EMERALD AL Carrier TTNU
Ticket Date 10/28/2014 Vehicle# 141622 Volume
Payment Type Credit Account Container 141622
Manual Ticket# 812922 Billing # 0000290
Hauling Ticket# Manifest 22557 FF
Destination UP/R TRANSPORT PO 1159260R
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

	Time	Scale	Operator	Inbound		
In	10/24/2014 10:48:04	Front Scale	SMastrio		Gross	83020 lb*
Out	10/28/2014 10:48:04		SMastrio		Tare	43040 lb*
			* Manual Weight		Net	39980 lb
					Tons	19.99

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	19.99	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.99	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW C35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

2014 OCT 28 PM 12:33:14

N° 812922

DATE/TIME: /
LOAD DATE:
CUSTOMER: Emerald Alaska IDP of Energy
PROFILE NUMBER: 1159260R
TRUCK NUMBER: TTWU
TRAILER/CONTAINER NUMBER: 141622
SEAL NUMBER: 22557 FF
CUSTOMER INVOICE NO.:
GROSS WEIGHT: 83020
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 43040
NET WEIGHT: 39980
GATEHOUSE: OR
DRIVER: Adam
TRAIN ID: Use623 ORIGIN:
WASTE-TYPE: Cont Soil
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS:
HAULER: RT

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 29, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 28, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 FF
Container #:	TTNU141622
Weight Disposed:	39,980 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7613 ***

95-814-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST

AKCU 901928

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.

Manifest Document No. 27557G

2. Page 1 of 1

3. Generator's Name and Mailing Address
US DEPARTMENT OF ENERGY
3558 INTERNATIONAL STREET
FAIRBANKS, AK 99701
(907) 452-1000

Site Address:
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99756

4. Generator's Phone ( )

5. Transporter 1 Company Name: NORTHWEST SERVICES, INC.

6. US EPA ID Number: N A N U 0 1 1 4 8 6

A. State Transporter's ID (800) 426-3113

B. Transporter 1 Phone

7. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL

8. US EPA ID Number: O R D 9 8 7 1 7 3 4 5 7

C. State Transporter's ID (541) 454-2030

D. Transporter 2 Phone

9. Designated Facility Name and Site Address: COLUMBIA RIDGE DISPOSAL & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number: O R D 9 8 7 1 7 3 4 5 7

E. State Facility's ID

F. Facility's Phone (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material not regulated by DOT	17	CF	39985	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1) 111522600 PCB SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Shipper's certification: This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name: MICHAEL L. BOOTE

Signature: Michael Boote on behalf of DOE

Date: Month 9 Day 7 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EASTMAN

Signature:

Date: Month 9 Day 7 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: Jerry LaMourreux

Signature:

Date: Month 10 Day 22 Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name: Vicky McKinney

Signature: Vicky McKinney

Date: Month 10 Day 27 Year 14

NON-HAZARDOUS WASTE

AK CU 961 929

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
AKKHPT	2 of 2	2255766

24. Generator's Name: US DEPARTMENT OF ENERGY, PROJECT CHARIOT, CAPE THOMPSON, AK 99756 (907) 652-1806

25. Transporter 1 Company Name: UNION PACIFIC — U.S. EPA ID Number: NEDOO[illegible]

26. Transporter 2 Company Name: COLUMBUS RIDGE LANDFILL — U.S. EPA ID Number: ORD[illegible]

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 1 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [illegible] Month: 10 Day: 22 Year: 14

34. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [illegible] Month: 10 Day: 24 Year: 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 234007

Customer Name EMERALD ALASKA INC EMERALD AL Carrier AKCU
Ticket Date 10/27/2014 Vehicle# 901928 Volume
Payment Type Credit Account Container 901928
Manual Ticket# 812927 Billing # 0000290
Hauling Ticket# Manifest 22557 GG
Destination UP/R TRANSPORT PO 1159260R
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

	Time	Scale	Operator	Inbound		
In	10/24/2014 07:38:18	Front Scale	SMastrio		Gross	87700 lb*
Out	10/27/2014 07:38:18		SMastrio		Tare	47960 lb*
			* Manual Weight		Net	39740 lb
					Tons	19.87

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCB-	100	19.87	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.87	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

2014 OCT 27 PM 12:26:31

N° 812927

DATE/TIME:
LOAD DATE:
CUSTOMER: Emerald Alaska Dept of Energy 1159260R
PROFILE NUMBER:
TRUCK NUMBER: 901928
TRAILER/CONTAINER NUMBER: AKCU
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557 GG
GROSS WEIGHT: 87700
TARE WEIGHT-TRACTOR: 47960
TARE WGT.-TRAILER/CONTAINER:
NET WEIGHT: 39740
GATEHOUSE: DW
DRIVER: AD
TRAIN ID: USGL 23 ORIGIN: Cont. Soil
WASTE TYPE: CM DC BU GRID SEGREGATE
DISPOSAL:
REMARKS:
HAULER:

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 28, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 27, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 GG
Container #:	AKCU901928
Weight Disposed:	39,740 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

95-914-AK2557-MP

NON-HAZARDOUS WASTE MANIFEST

CAXV 315138

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: EXEMPT

Manifest Document No.: 22557 H

2. Page 1 of 1

3. Generator's Name and Mailing Address: DOE ENERGY
3538 INTERNATIONAL STREET
FAIRBANKS, AK 99701

Site Address: US DEPARTMENT OF ENERGY
PROJECT CHAROT
CAPE THOMPSON, AK 99766

4. Generator's Phone: (907) 452-1006

5. Transporter 1 Company Name: NORTHERN SERVICES, INC.

6. US EPA ID Number: WAH000911486

A. State Transporter's ID

B. Transporter 1 Phone: (509) 428-2113

7. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL

8. US EPA ID Number: ORD987173457

C. State Transporter's ID

D. Transporter 2 Phone: (541) 454-2030

9. Designated Facility Name and Site Address: COLUMBIA RIDGE RECY. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number: ORD987173457

E. State Facility's ID

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material not regulated by DOT	10	cr	39954	P
b.				
c				
d.				

G. Additional Descriptions for Materials Listed Above
1) 1159760R POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation

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

Printed/Typed Name	Signature	Date (Month Day Year)
MICHAEL L. MOORE	Michael L. Moore	9 7 19

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
SAM EASTMAN		9 7 19

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
Jerry LaMoureaux		10 22 19

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Date (Month Day Year)
Vicky McCuiston	Vicky McC	10 27 19

NON-HAZARDOUS WASTE - GENERATOR - TRANSPORTER - FACILITY

CAXV 31312R

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
[illegible]	2 of 3	22357MK

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 442-2000 CAPE THOMPSON, AK 99726

25. Transporter ____ Company Name: UNION PACIFIC — U.S. EPA ID Number: [illegible]

26. Transporter ____ Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

GENERATOR

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter ____ Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] — Signature: [illegible] — Month: 10 — Day: 22 — Year: 14

34. Transporter ____ Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] — Signature: [illegible] — Month: 10 — Day: 24 — Year: 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 234006

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 10/27/2014
Payment Type Credit Account
Manual Ticket# 812926
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier CAXU
Vehicle# 315138
Container 315138
Billing # 0000290
Manifest 22557 HH
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/24/2014 07:37:28	Front Scale	SMastrio		Gross	82500 lb*
Out	10/27/2014 07:37:28		SMastrio		Tare	42560 lb*
			* Manual Weight		Net	39940 lb
					Tons	19.97

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	19.97	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.97	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

2014 OCT 27 PM 12:23:22

N° 812926

DATE/TIME:
LOAD DATE:
CUSTOMER Emerald Alaska dept of energy
PROFILE NUMBER: 1159260R
TRUCK NUMBER: CAXU
TRAILER/CONTAINER NUMBER: 315138
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557 HH
GROSS WEIGHT: 82500
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 42560
NET WEIGHT: 39940
GATEHOUSE: DW
DRIVER: RM
TRAIN ID: USEG 23 ORIGIN:
WASTE TYPE: Cont. Soil
DISPOSAL: CM DC BU GRID SEGREGATE
REMARKS:
HAULER:

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 28, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 27, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 HH
Container #:	CAXU315138
Weight Disposed:	39,940 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

05-914-AK22157-NP

NON-HAZARDOUS WASTE MANIFEST

CESU 14606 84

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. EXEMPT

Manifest Document No. 2255711

2. Page 1 of 1

3. Generator's Name and Mailing Address ENERGY
9538 INTERNATIONAL STREET
FAIRBANKS, AK 99701

Site Address
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99

MIKE SOESE

4. Generator's Phone ((907) 452-1006

5. Transporter 1 Company Name NORTHLAND SERVICES, INC.

6. US EPA ID Number WAH0500114886

A. State Transporter's ID

B. Transporter 1 Phone (800) 426-2115

7. Transporter 2 Company Name ~~COLUMBIA RIDGE LANDFILL~~ R-Transport

8. US EPA ID Number ORD987173457

C. State Transporter's ID

D. Transporter 2 Phone (541) 454-2030

9. Designated Facility Name and Site Address
COLUMBIA RIDGE RECY. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number ORD987173457

E. State Facility's ID

F. Facility's Phone (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. absorbent Not Regulated by DOT	16	CF	39990	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1) 1158960 POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name MICHAEL L. BOOTE

Signature Michael Boote for Robert J. Bell

Date Month 9 Day 7 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name BRIAN CRISWELL

Signature

Date Month 9 Day 7 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name JOSEPH MOURADIAN

Signature

Date Month 9 Day 10 Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name Chuck Madison

Signature

Date Month 10 Day 24 Year 14

NON-HAZARDOUS WASTE

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
EXEMPT	2 of 2	225371 I

24. Generator's Name: US DEPARTMENT OF ENERGY, PROJECT CHARIOT
(907) 452-1006 CAPE THOMPSON, AK 99761

25. Transporter ____ Company Name: ORION PACIFIC — U.S. EPA ID Number: NED001792810

26. Transporter ____ Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes
	E-Transport					

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter ____ Acknowledgment of Receipt of Materials
Printed/Typed Name: T Hall — Signature — Month: 10 — Day: 23 — Year: 04

34. Transporter ____ Acknowledgment of Receipt of Materials
Printed/Typed Name: Chris Ridgway — Signature — Month: 10 — Day: 23 — Year: 04

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

GENERATOR

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 233991

Customer Name EMERALD ALASKA INC EMERALD AL Carrier CRSU
Ticket Date 10/24/2014 Vehicle# 146684 Volume
Payment Type Credit Account Container 146684
Manual Ticket# 812813 Billing # 0000290
Hauling Ticket# Manifest 22557 II
Destination UP/R TRANSPORT PO 1159260R
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

	Time	Scale	Operator	Inbound		
In	10/23/2014 06:44:45	Front Scale	SMastrio		Gross	83740 lb*
Out	10/24/2014 06:44:45		SMastrio		Tare	43840 lb*
			* Manual Weight		Net	39900 lb
					Tons	19.95

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCB-	100	19.95	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.95	Tons				
3	RAIL 20FT SPW-RAIL	100	1	Load				
4	DEL U SPW-DELIVERY	100	1	Each				
5	LOC U SPW-LOCAL TR	100	1	Load				
6	CD SPW $35-Cert of	100	1	Each				

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

2014 OCT 24 PM 12:11:16

WASTE MANAGEMENT

N° 812813

DATE/TIME:
LOAD DATE:
CUSTOMER: Emerald Alaska Dept. of Energy
PROFILE NUMBER: 1159260R
TRUCK NUMBER: CRSU 146684
TRAILER/CONTAINER NUMBER:
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557 II
GROSS WEIGHT: 83740
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 43840
NET WEIGHT: 39900
GATEHOUSE: JR
DRIVER: Bud
TRAIN ID: Usen22 ORIGIN:
WASTE TYPE: Cont. Soil
DISPOSAL: CM DC BU GRID SEGREGATE
REMARKS:
HAULER:

2-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 27, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 24, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 II
Container #:	CRSU146684
Weight Disposed:	39,900 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7819 ***

95-914-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST

PNEU 244400

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.

Manifest Document No. 22557 JJ

2. Page 1 of 1

3. Generator's Name and Mailing Address
US DEPARTMENT OF ENERGY
3558 INTERNATIONAL STREET
FAIRBANKS, AK 99701
(907) 452-1005

Site Address
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99[illegible]

4. Generator's Phone ( )

5. Transporter 1 Company Name
NORTHLAND SERVICES, INC.

6. US EPA ID Number
W A H 0 8 9 0 1 1 4 8 6

A. State Transporter's ID

B. Transporter 1 Phone (907) 456-9113

7. Transporter 2 Company Name
COLUMBIA RIDGE LANDFILL

8. US EPA ID Number
O R D 9 8 0 7 3 4 5 7

C. State Transporter's ID

D. Transporter 2 Phone (541) 454-2030

9. Designated Facility Name and Site Address
COLUMBIA RIDGE REGY. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number
O R D 9 8 7 1 7 3 4 5 7

E. State Facility's ID

F. Facility's Phone (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material not regulated by DOT	10	CF	39662	P
b.				
c.				
d.				

GENERATOR

G. Additional Descriptions for Materials Listed Above
13115976CP POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Shipper's certification: this is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation

NON-HAZARDOUS WASTE

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

Printed/Typed Name	Signature	Date Month	Day	Year
MICHAEL L. BUESE	[signature] on behalf of DOE	9	7	14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month	Day	Year
BRIAN BJERSTRAND	[signature]	9	9	14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month	Day	Year
Jon LaMoureaux	[signature]	10	29	14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19.

Printed/Typed Name	Signature	Date Month	Day	Year
Willy Mackinnon	[signature]	10	27	14

PNC U 24144 00

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
PXSMIS	2 of 2	2255705

24. Generator's Name: US DEPARTMENT OF ENERGY, PANTEX COMPLEX, CAUB PANTEX, AK 99766
(907) 452-1000

25. Transporter 1 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED001752910

26. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987073451

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

GENERATOR

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 1 Acknowledgment of Receipt of Materials
Printed/Typed Name: Cindy Cregg — Signature: Cindy Cregg — Month: 10 — Day: 23 — Year: 14

34. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: Carl Watson — Signature: Carl Watson — Month: 10 — Day: 24 — Year: 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

Nº 812923

2014 OUT 27 PM 12:11:02

DATE:/TIME:
LOAD DATE:
CUSTOMER: Emerald Alaska Dept. of Energy
PROFILE NUMBER: 1159260R
TRUCK NUMBER:
TRAILER/CONTAINER NUMBER: PNEU 244400
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557 JJ

GROSS WEIGHT: 83000
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 43440
NET WEIGHT: 39560

GATEHOUSE: DEW
DRIVER: MW
TRAIN ID: USEG123 ORIGIN:
WASTE TYPE: CONTAM. SOIL
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS:

HAULER:

12-ARLINGTON

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 234662

Customer Name EMERALD ALASKA INC EMERALD AL Carrier PNEU
Ticket Date 10/27/2014 Vehicle# 244400 Volume
Payment Type Credit Account Container 244400
Manual Ticket# 812923 Billing # 00000290
Hauling Ticket# Manifest 22557 JJ
Destination UP/R TRANSPORT PO 1159260R
Profile 1159260R (SPH-POL SOIL*EMERALD ALASKA*DEPARTMENT OF ENERGY*1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

	Time	Scale	Operator	Inbound	Gross	
In	10/24/2014 07:34:45	Front Scale	SMastrio	Tare	43440 lb*	
Out	10/27/2014 07:34:46		SMastrio	Net	39560 lb	
			* Manual Weight	Tons	19.78	

Cosents

	Product	LD#	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPHPCS- 100		19.78	Tons				AK-CAPE TH
2	FEA T SPH-FUEL,ENV 100		19.78	Tons				AK-CAPE TH
3	RAIL 20FT SPH-RAIL 100		1	Load				AK-CAPE TH
4	DEL U SPH-DELIVERY 100		1	Each				AK-CAPE TH
5	LOC U SPH-LOCAL TR 100		1	Load				AK-CAPE TH
6	CD SPH #35-Cert of 100		1	Each				AK-CAPE TH

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 28, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 27, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 JJ
Container #:	PNEU244400
Weight Disposed:	39,560 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7613 ***

95-014-AK22557-NF

TRU 291752

NON-HAZARDOUS WASTE MANIFEST

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: EXEMPT

Manifest Document No.: 22557KK

2. Page 1 of 1

3. Generator's Name and Mailing Address: US DEPARTMENT OF ENERGY, 3535 INTERNATIONAL STREET, FAIRBANKS, AK 99701

Site Address: US DEPARTMENT OF ENERGY, PROJECT CHARIOT, CAPE THOMPSON, AK 99766

MIKE BOESE

4. Generator's Phone: (907) 452-1006

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.

6. US EPA ID Number: WAH000011486

A. State Transporter's ID

B. Transporter 1 Phone: (800) 426-5113

7. Transporter 2 Company Name: R Transport COLUMBIA RIDGE LANDFILL

8. US EPA ID Number: [illegible]

C. State Transporter's ID: 360 403-5610

D. Transporter 2 Phone: (503) [illegible]-2600

9. Designated Facility Name and Site Address: COLUMBIA RIDGE RECY. & LNDFL., 18177 CEDAR SPRINGS LANE, ARLINGTON, OR 97812

10. US EPA ID Number: ORD987173457

E. State Facility's ID

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated by DOT	16	CF	40000	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above: 1) 115926GK POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information: Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name: MICHAEL L. BOESE

Signature: Michael L Boese on behalf of DOE

Date: Month 9 Day 7 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EASTRAND

Signature: [signature]

Date: Month 9 Day 7 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: Shane Bruce

Signature: [signature]

Date: Month 10 Day 25 Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in Item 19

Printed/Typed Name: Sarah Westmore

Signature: Sarah Westmore

Date: Month 10 Day 25 Year 14

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
EXEMPT	2 of 2	2255785

24. Generator's Name: US DEPARTMENT OF ENERGY, PROJECT CHARIOT, CAPE THOMPSON, AK 99765 (907) 452-1005

25. Transporter 2 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED982792930

26. Transporter 3 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: Cindi Cregg — Signature: Cindi Cregg — Month 10 Day 23 Year 14

34. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: Signature: — Month 10 Day 24 Year 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 234092

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 10/28/2014
Payment Type Credit Account
Manual Ticket# 813044
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier TRIU
Vehicle# 291752
Container 291752
Billing # 0000290
Manifest 22557 KK
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/24/2014 10:49:06	Front Scale	SMastrio		Gross	83300 lb*
Out	10/28/2014 10:49:06		SMastrio		Tare	43400 lb*
			* Manual Weight		Net	39900 lb
					Tons	19.95

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCB-	100	19.95	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.95	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WM WASTE MANAGEMENT

N° 813044

DATE/TIME: 2014 OCT 28 PM 12:20:42
LOAD DATE:
CUSTOMER: Emerald Alaska Dept. of Energy
PROFILE NUMBER: 1159260R
TRUCK NUMBER: TRIU 291752
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557 KK
CUSTOMER INVOICE NO.:
GROSS WEIGHT: 83300
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 43400
NET WEIGHT: 39900
GATEHOUSE: Dew
DRIVER: Jonny
TRAIN ID: USCL231 ORIGIN:
WASTE TYPE: Cont. Soil
DISPOSAL: CM BU GRID SEGREGATE
REMARKS:
HAULER: RT

ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 29, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 28, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 KK
Container #:	TRIU291752
Weight Disposed:	39,900 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

95-910-AR22557-MF

NON-HAZARDOUS WASTE MANIFEST

TRM 3/6/20

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. EXEMPT

Manifest Document No. 22557 L

2. Page 1 of 1

3. Generator's Name and Mailing Address
US DEPARTMENT OF ENERGY
3558 INTERNATIONAL STREET
FAIRBANKS, AK 99701

Site Address
US DEPARTMENT OF ENERGY
PROJECT CHARLEY
CAPE THOMPSON, AK 99765

MIKE SOESE

4. Generator's Phone ((907) 452-1006

5. Transporter 1 Company Name NORTHLAND SERVICES, INC.

6. US EPA ID Number WAH000011486

A. State Transporter's ID

B. Transporter 1 Phone (800) 426-3113

7. Transporter 2 Company Name RTI ARS 2014

8. US EPA ID Number [illegible]

C. State Transporter's ID [illegible]

D. Transporter 2 Phone [illegible]

9. Designated Facility Name and Site Address
COLUMBIA RIDGE RECY. & LNDFL.
10177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number ORD987173457

E. State Facility's ID

F. Facility's Phone (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated By DOT	15	CF	39976	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1) 21592608 POL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

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

Printed/Typed Name MICHAEL L. BOGE

Signature [signature] on behalf of DOE

Date: Month 9 Day 9 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name BRIAN CASTANEDA

Signature [signature]

Date: Month 9 Day 9 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name SHANE BUSCH

Signature [signature]

Date: Month 10 Day 14 Year 14

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name [illegible]

Signature [signature]

Date: Month 10 Day 22 Year 14

NON-HAZARDOUS WASTE

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
EXEMPT	2 of 2	225571

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARLIE
(907) 452-1006 CAPE THOMPSON, AK 99769

25. Transporter 1 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED980792930

26. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987172457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

GENERATOR

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 1 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [signature] Month: 10 Day: 24 Year: 04

34. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: [illegible] Signature: [signature] Month: 10 Day: 27 Year: 04

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete. DESIGNATED FACILITY TO GENERATOR

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 234100

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 10/28/2014
Payment Type Credit Account
Manual Ticket# 813014
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier TRIU
Vehicle# 396120
Container 396120
Billing # 0000290
Manifest 22557 LL
PO 1159260R

Volume

	Time	Scale	Operator	Inbound#		
In	10/27/2014 10:58:50	Front Scale	SMastrio		Gross	84120 lb*
Out	10/28/2014 10:58:50		SMastrio		Tare	44200 lb*
			* Manual Weight		Net	39920 lb
					Tons	19.96

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	19.96	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.96	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

N° 813014

2014 OCT 28 AM 9:56:11

DATE/TIME:
LOAD DATE:
CUSTOMER: Emerald Alaska INC
PROFILE NUMBER: 1159260R
TRUCK NUMBER: TRIU 396120
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557 LL
CUSTOMER INVOICE NO.:
GROSS WEIGHT: 84120
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 44200
NET WEIGHT: 39920
GATEHOUSE: Jean
DRIVER: Wm
TRAIN ID: Largel 16 ORIGIN: Cont. Sal
WASTE TYPE:
DISPOSAL: CM DC BU GRID SEGREGATE
REMARKS:
HAULER: RT

02-ARLINGTON

WASTE MANAGEMENT

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 29, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 28, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 LL
Container #:	TRIU396120
Weight Disposed:	39,920 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7819 ***

95-314-AK22557-MP

NON-HAZARDOUS WASTE MANIFEST

AMLU 203803

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: EXEMPT

Manifest Document No.: 22557MK

2. Page 1 of 1

3. Generator's Name and Mailing Address:
US DEPARTMENT OF ENERGY
3538 INTERNATIONAL STREET
FAIRBANKS, AK 99701

4. Generator's Phone: (907) 452-1006

Site Address:
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99758

MIKE BOESE

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.

6. US EPA ID Number: WAH000011486

A. State Transporter's ID:

B. Transporter 1 Phone: (800) 426-3115

7. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL

8. US EPA ID Number: ORD987173457

C. State Transporter's ID: 30-403-810

D. Transporter 2 Phone: (541) 454-2030

9. Designated Facility Name and Site Address:
COLUMBIA RIDGE RECY. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number: ORD987173457

E. State Facility's ID:

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated by DOT	16	CF	39482	F
b.				
c.				
d.				

GENERATOR

G. Additional Descriptions for Materials Listed Above:
1911592EOR POL SOIL

H. Handling Codes for Wastes Listed Above:

15. Special Handling Instructions and Additional Information:
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

NON-HAZARDOUS WASTE

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

Printed/Typed Name: MICHAEL L. BOESE

Signature: Michael L Boese on behalf of DOE

Date: Month 9 Day 7 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EASTLAND

Signature: B. Eastland

Date: Month 9 Day 7 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name:

Signature:

Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name: Sarah Mastriona

Signature: Sarah Mastriona

Date: Month 10 Day 28 Year 14

95-R14-AR22557-MP
AMLC 202862

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
EXEMPT	2 of 2	22557MM

24. Generator's Name: US DEPARTMENT OF ENERGY, PROJECT CHARIOT, CAPE THOMPSON, AK 99766 (907) 452-1006

25. Transporter 1 Company Name: UNION PACIFIC — U.S. EPA ID Number: NED001792910

26. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

TRANSPORTER

33. Transporter 1 Acknowledgment of Receipt of Materials
Printed/Typed Name: Cindi Cripps — Signature: Cindi Cripps — Month 10 Day 23 Year 14

34. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Workman — Signature: Sarah Workman — Month 10 Day 25 Year 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR STATE (IF REQUIRED)

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

Nº 812992

DATE:/TIME: 2014 OUT 28 PM 1:12:42
LOAD DATE:
CUSTOMER: Emerald Alaska/DOE
PROFILE NUMBER: 1159260R
TRUCK NUMBER:
TRAILER/CONTAINER NUMBER: AMLU 203803
SEAL NUMBER:
CUSTOMER INVOICE NO.: 22557 MM

GROSS WEIGHT: 82600
TARE WEIGHT-TRACTOR:
TARE WGT.-TRAILER/CONTAINER: 43600
NET WEIGHT: 39000

GATEHOUSE: JE
DRIVER: SH
TRAIN ID: Ulaug 24 ORIGIN:
WASTE TYPE: Cont. Soil
DISPOSAL: (CM) DC BU GRID SEGREGATE
REMARKS:

HAULER: RT

009 ARLINGTON

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 234094

Customer Name EMERALD ALASKA INC EMERALD AL Carrier AMLU
Ticket Date 10/28/2014 Vehicle# 203803 Volume
Payment Type Credit Account Container 203803
Manual Ticket# 812992 Billing # 00000290
Hauling Ticket# Manifest 22557 MM
Destination UP/R TRANSPORT PO 1159260R
Profile 1159260R (SPW-POL SOIL"EMERALD ALASKA"DEPARTMENT OF ENERGY"1159260R)
Generator DR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

	Time	Scale	Operator	Inbound	Gross	82600 lb*
In	10/25/2014 10:50:53	Front Scale	SMastrio	Tare		43600 lb*
Out	10/28/2014 10:50:55		SMastrio	Net		39000 lb
			* Manual Weight	Tons		19.50

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCB-	100	19.50	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.50	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 29, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 28, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 MM
Container #:	AMLU203803
Weight Disposed:	39,000 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7619 ***

95-914-AK22557-NP

NSIU 265163

NON-HAZARDOUS WASTE MANIFEST

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: EXEMPT

Manifest Document No.: 22557NP

2. Page 1 of 1

3. Generator's Name and Mailing Address:
US DEPARTMENT OF ENERGY
3538 INTERNATIONAL STREET
FAIRBANKS, AK 99701

4. Generator's Phone: (907) 452-1006

Site Address:
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99756

MIKE BOESE

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.

6. US EPA ID Number: WAH000031486

A. State Transporter's ID:

B. Transporter 1 Phone: (509) 535-3617

7. Transporter 2 Company Name: R Transport 1
COLUMBIA RIDGE LANDFILL

8. US EPA ID Number: OR 333

C. State Transporter's ID:

D. Transporter 2 Phone: (541) 454-2030

9. Designated Facility Name and Site Address:
COLUMBIA RIDGE RECY. & LNDFL.
18177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number: ORD987173457

E. State Facility's ID:

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated by DOT		CF		P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above:
1) 1150286R POL SOIL

H. Handling Codes for Wastes Listed Above:

15. Special Handling Instructions and Additional Information:
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name: MICHAEL L. BOESE

Signature: Michael L Boese on behalf of Boese

Date: Month 1 Day 7 Year 14

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: BRIAN EASTRAND

Signature: B. Eastrand

Date: Month 1 Day 7 Year 14

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name:

Signature:

Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name: Vicky McKinney

Signature: Vicky McKinney

Date: Month 10 Day 31 Year 14

NON-HAZARDOUS WASTE

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
EXEMPT	2 of 2	22557MM

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 452-1001 CAPE THOMPSON, AK 99760

25. Transporter 1 Company Name: UNION PACIFIC — U.S. EPA ID Number: NEH0001792910

26. Transporter 2 Company Name: COLUMBIA RIVER TOWING — U.S. EPA ID Number: ORD987173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

GENERATOR

TRANSPORTER

33. Transporter 1 Acknowledgment of Receipt of Materials
Printed/Typed Name | Signature | Month 10 | Day 22 | Year 17

34. Transporter 2 Acknowledgment of Receipt of Materials
Printed/Typed Name: Carol Nielsen | Signature | Month 10 | Day 24 | Year 17

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 234005

Customer Name EMERALD ALASKA INC EMERALD AL Carrier NSIU
Ticket Date 10/27/2014 Vehicle# 265103 Volume
Payment Type Credit Account Container 265103
Manual Ticket# 812925 Billing # 0000290
Hauling Ticket# Manifest 22557 NN
Destination UP/R TRANSPORT PO 1159260R
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

	Time	Scale	Operator	Inbound		
In	10/24/2014 07:36:35	Front Scale	SMastrio		Gross	88060 lb*
Out	10/27/2014 07:36:35		SMastrio		Tare	48080 lb*
			* Manual Weight		Net	39980 lb
					Tons	19.99

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCS-	100	19.99	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	19.99	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

2014 OCT 27 PM 12:54:12

N° 812925

DATE/TIME:
LOAD DATE:
CUSTOMER: Emerald Alaska Dep of Energy
PROFILE NUMBER: 1159260R
TRUCK NUMBER: USIU 265103
TRAILER/CONTAINER NUMBER:
SEAL NUMBER: 22557 NN
CUSTOMER INVOICE NO.:
GROSS WEIGHT: 88060
TARE WEIGHT-TRACTOR: 48080
TARE WGT.-TRAILER/CONTAINER:
NET WEIGHT: 39980
GATEHOUSE:
DRIVER:
TRAIN ID: USEGL 23 ORIGIN: SDIC
WASTE TYPE: CM DC BU GRID SEGREGATE
DISPOSAL:
REMARKS:
HAULER:

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 28, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 27, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 NN
Container #:	NSIU265103
Weight Disposed:	39,980 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

*** IN CASE OF EMERGENCY CALL 1-800-424-9300 Contract# 7618 ***

95-914-AK22557-MP

NSN 202-369

NON-HAZARDOUS WASTE MANIFEST

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

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: EXEMPT

Manifest Document No.: 2255700 | 2. Page 1 of 1

3. Generator's Name and Mailing Address:
US DEPARTMENT OF ENERGY
3588 INTERNATIONAL STREET
FAIRBANKS, AK 99701

Site Address:
US DEPARTMENT OF ENERGY
PROJECT CHARIOT
CAPE THOMPSON, AK 99766

MIKE BOESE

4. Generator's Phone: (907) 452-1005

5. Transporter 1 Company Name: NORTHLAND SERVICES, INC.

6. US EPA ID Number: WAH000011486

A. State Transporter's ID

B. Transporter 1 Phone: (800) 426-3113

7. Transporter 2 Company Name: COLUMBIA RIDGE LANDFILL

8. US EPA ID Number: ORD987173457

C. State Transporter's ID

D. Transporter 2 Phone: (541) 454-2030

9. Designated Facility Name and Site Address:
COLUMBIA RIDGE RECY. & LNDFL.
19177 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

10. US EPA ID Number: ORD987173457

E. State Facility's ID

F. Facility's Phone: (541) 454-2030

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material Not Regulated by DOT	13	CF	31751	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
1) 11592605R FGL SOIL

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

GENERATOR

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

Printed/Typed Name	Signature	Date (Month / Day / Year)
MICHAEL L. BOESE		9 / 4 / 19

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)
BRIAN EASTMAN		9 / 4 / 19

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month / Day / Year)

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name	Signature	Date (Month / Day / Year)
Vicky McKinnis		10 / 21 / 19

NON-HAZARDOUS WASTE

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

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number	22. Page	23. Manifest Tracking Number
NRRMPT	2 of 2	2255700

24. Generator's Name: US DEPARTMENT OF ENERGY
PROJECT CHARIOT
(907) 452-1005 CAPE THOMPSON, AK 99760

25. Transporter 2 Company Name: UNION PACIFIC — U.S. EPA ID Number: NEG001793410

26. Transporter Company Name: COLUMBIA RIDGE LANDFILL — U.S. EPA ID Number: ORD981173457

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes

32. Special Handling Instructions and Additional Information

(3)

TRANSPORTER

33. Transporter Acknowledgment of Receipt of Materials
Printed/Typed Name: Chuck Cargo (9) Signature: Chuck Cargo Month: 10 Day: 23 Year: 14

34. Transporter Acknowledgment of Receipt of Materials
Printed/Typed Name: Sarah Whitmore Signature: Sarah Whitmore Month: 10 Day: 24 Year: 14

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

Columbia Ridge
18177 Cedar Springs Lane
Arlington, OR, 97812
Ph: (541) 454-2030

Original
Ticket# 233998

Customer Name EMERALD ALASKA INC EMERALD AL
Ticket Date 10/27/2014
Payment Type Credit Account
Manual Ticket# 812920
Hauling Ticket#
Destination UP/R TRANSPORT
Profile 1159260R (SPW-POL SOIL~EMERALD ALASKA~DEPARTMENT OF ENERGY~1159260R)
Generator OR-DEPARTMENT OF ENERGY DEPARTMENT OF ENERGY_PROJECT CHARIOT

Carrier NSIU
Vehicle# 202869
Container 202869
Billing # 0000290
Manifest 22557 00
PO 1159260R

Volume

	Time	Scale	Operator	Inbound		
In	10/24/2014 07:32:57	Front Scale	SMastrio		Gross	74800 lb*
Out	10/27/2014 07:32:57		SMastrio		Tare	45040 lb*
			* Manual Weight		Net	29760 lb
					Tons	14.88

Comments

	Product	LD%	Qty	UOM	Rate	Tax	Amount	Origin
1	ENVCLEANUP SPWPCB-	100	14.88	Tons				AK-CAPE TH
2	FEA T SPW-FUEL,ENV	100	14.88	Tons				AK-CAPE TH
3	RAIL 20FT SPW-RAIL	100	1	Load				AK-CAPE TH
4	DEL U SPW-DELIVERY	100	1	Each				AK-CAPE TH
5	LOC U SPW-LOCAL TR	100	1	Load				AK-CAPE TH
6	CD SPW $35-Cert of	100	1	Each				AK-CAPE TH

Oregon Waste Systems
A Waste Management Company
18177 Cedar Springs Lane
Arlington, Oregon 97812
(541) 454-2030

WASTE MANAGEMENT

N° 812920

DATE/TIME: 2014 OCT 27 PM 1:26:36
LOAD DATE:
CUSTOMER: Emerald Alaska Dept of Energy
PROFILE NUMBER: 1159260R
TRUCK NUMBER: USIU
TRAILER/CONTAINER NUMBER: 202869
SEAL NUMBER: 22557100
CUSTOMER INVOICE NO.:
GROSS WEIGHT: 74800
TARE WEIGHT-TRACTOR: 45040
TARE WGT.-TRAILER/CONTAINER:
NET WEIGHT: 29760

GATEHOUSE: DW
DRIVER: Marsh
TRAIN ID: USIG 23 ORIGIN:
WASTE TYPE: Cont. Soil
DISPOSAL: CM DC BU GRID SEGREGATE
REMARKS:
HAULER:

902-ARLINGTON

COLUMBIA RIDGE LANDFILL & RECYCLING CENTER
18177 Cedar Springs Lane
Arlington, OR 97812
541 454 2030
541 454 3312 Fax

October 28, 2014

Emerald Alaska, Inc.
7343 E Marginal Way S
Seattle, WA 98108-3513

CERTIFICATE OF DISPOSAL

Waste Management, Inc. dba Columbia Ridge Landfill has received NON HAZARDOUS Waste material from Emerald Alaska, Inc.

Date Disposed:	October 27, 2014
Generator:	US Dept. of Energy
Profile #:	115926OR
Manifest#:	22557 OO
Container #:	NSIU202869
Weight Disposed:	29,760 lbs.
Waste Description:	Contaminated Soil

I certify, on behalf of the above listed facility, that the above-described non hazardous waste was managed in compliance with all applicable laws.

Sarah Mastriona

Sarah Mastriona
Special Waste Scale Clerk

APPENDIX H

REVIEW COMMENTS

REVIEW COMMENTS

PROJECT: Chariot Project, Cape Thompson, Alaska
DOCUMENT: Draft Remedial Action Report, Chariot Project, Cape Thompson, Alaska

U.S. ARMY CORPS OF ENGINEERS CEPOA-EN-EE	DATE: January 2015 REVIEWER: Jessica Morris PHONE: 907-269-3077	Action taken on comment by:

Item No.	Drawing Sht. No., Spec. Para.	COMMENT	REVIEW CONFERENCE A - accepted W - withdrawn (if neither, explain)	RESPONSE	ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
1	General	Please have the document further reviewed for spelling and grammatical errors.	A	Spelling and grammatical errors will be rectified in final document.	A
2	Executive, Summary, Page ii, throughout	Please remove any statements that the ADEC agreed that all of the requirements of the work plan had been met during the field activities. The ADEC did review preliminary data and field notes, but can only determine if the requirements of the work plan have been met after reviewing the removal action report.	A	Text in ES (and throughout document) will be revised to state that ADEC approved excavation closures after reviewing preliminary analytical results and field data. Documentation of the ADEC approvals (via USACE) are provided in Appendix E. Copies of emails from ADEC will be included in Appendix E.	A – Please include the actual email from ADEC as well.
3	Section 4.4	Describe how the water samples were collected in the field, or reference the section where it is described.	A	Water samples were collected by pumping a portion of the containerized water directly into sample jars using a peristaltic pump (see Section 4.4.1, center paragraph on page 4-3). For clarity, the title of Section 4.4.1 will be revised to include sampling: "Casing Water Removal, Treatment, and Sampling."	A
4	Section 4.6	Please describe the process of collecting field screening samples, or reference the section where it is described.	A	The field screening sample collection process described in Section 5.1 will be referenced in Section 4.6.	A
5	Section 4.7	Was no soil stockpiled at Test Holes Charlie and Dog because clean overburden was not present? Please clarify the second sentence of the last paragraph on page 4-5.	A	Yes. Sentence will be revised for clarity: "No soil was stockpiled at Test Holes Charlie or Dog because screening and/or laboratory results indicated that clean overburden was not present at those sites."	A
6	Section 4.7	Were all stockpiles placed on liners and covered?	A	All stockpiles installed outside the limits of excavation were placed on liners and were	A

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				covered. This section will be revised to include this information.	
7	Section 5.2.1	Please include more detail regarding the confirmation sampling process. Who conducted the field work and sampling? Was it qualified person? How were the samples collected? How were the soil samples preserved? Where the samples collected from freshly exposed soil or was the excavation open for a period of time prior to sampling?	A	Additional detail will be added to Section 5.1. All sampling was conducted by Mike Boese or Bryan Johnson, both of whom are qualified persons. Samples were collected from freshly exposed soil, and were immediately placed in coolers containing frozen gel ice. This information will be added to text.	A
8	Section 5.2.1	The equipment blank sample wasn't a soil sample so shouldn't be included under this section header.	A	A new subsection will be added for "Quality Control Samples," and the equipment blank text will be moved to that subsection.	A
9	Section 5.2	Please describe how the samples were preserved and maintained in the field until they were shipped to the laboratory.	A	The second sentence in Section 5.2 states that samples were stored in sample coolers with frozen gel ice. Another sentence will be added to indicate that the coolers were stored in the sampler's sleeping tent at night, and that the condition of the ice in the sample coolers was checked each day and replenished with frozen gel ice as needed.	A
10	Section 5.3	Please remove this section, or revise to indicate that the ADEC reviewed preliminary data and field drawings. Provide further rationale for why the excavation was determined to be complete and was backfilled.	A	See response to Comment 2. The following rationale will be added to text: Excavation activities at each of the sites was curtailed once the requirements of the approved Work Plan had been met (the required number of screening and laboratory samples were collected from	A

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				limits of excavation, and preliminary laboratory results from confirmation samples were below applicable action levels and/or permafrost limited further vertical excavation).	
11	Section 5.4, 9.5	Please indicate the matrix spike recoveries and quality control limits for the DRO concentrations associated with Sample 14PCD050SO. If the sample was qualified and not rejected, the sample result is still usable for project decision making.	A	DRO was recovered at 78% and 19%, respectively, in MS/MSD samples. Only the MSD recovery was below acceptable QC limits of 75%-125%. These details will be added to the text, CDQR, and checklist.	A
12	Section 7.3, 7.4, 8.3, 8.4, 9.4, 9.5, 10.4, 10.5	Please list the final depth limits of excavation, number of field screening samples, and number of analytical samples. Please describe how the analytical samples were collected.	A	Requested details regarding depth of excavation limits and number of samples will be added to the aforementioned sections, as applicable. Analytical sample collection will be described or the section where it is described will be referenced.	A
13	Section 7.5, 8.6, 9.6, 10.7	Please list the size of the loading area, and how the number of analytical samples and locations were determined. From what depth were the soil samples collected? How were the samples collected? Please include the loading areas on the figures.	A	Loading areas were approximately 10' by 10' in size, and one set of pre/post footprint samples were collected from the center each loading area footprint. Footprint samples were collected from freshly exposed areas at depths of 6 inches and marked with a pin flag. These details will be added to text, and the sample collection procedure section will be referenced. Loading areas will be included on Figures 7-3, 8-4, 9.4, and 10-4.	A
14	Section 7.4 8.5. 9.5,	Please summarize the sample results, and explain why the excavations were considered complete if	A	Sample results are discussed Sections 7.4, 8.5, 9.5, and 10.5 (revised to Section 10.6).	A – Please also list out the

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	10.5	confirmation sample results were greater than the cleanup levels. Simply stating the USACE and ADEC agreed the excavations could be backfilled isn't sufficient explanation for a cleanup report.		As indicated in Section 7.4 and 9.5, all confirmation samples from Test Hole Baker and Dog, respectively, were below ADEC cleanup levels. As indicated in Sections. 8.5 and 10.5 for Test Hole Charlie and X1, respectively, each site had a single sample exceeding ADEC cleanup levels; both exceedences were associated with floor samples collected directly adjacent to the test hole casings. Excavations were considered complete at both of these sites because permafrost and/or bedrock restricted further soil removal. The information will be added to text. A summary of contaminant concentrations remaining after the RA efforts will be included for each site. Permafrost and/or bedrock restricted further soil removal and was the reason for curtailing excavation activities at Test Holes Charlie and X-1. The information will be added to text.	contaminant concentrations that were left in place, and the rationale in the text.
15	Section 10.6	Please state the sizes of each stockpile and its associated footprint. Please describe where and how the stockpile and footprint samples were collected. How can the reader determine if the samples were representative of the stockpile?	A	Details regarding the stockpiles installed at Test Hole X-1 will be added to text (Section 10.7). All four were less than 10 cubic yards in size and had footprints of approximately 80 to 140 square feet. Screening samples were collected from the four corners and the center of each stockpile (from freshly exposed soil approximately 1 foot below the surface), and one laboratory was collected from each	A

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				stockpile from the location with the highest PID result. One set of pre/post footprint samples was collected from the center of each of the four stockpile liners, and a fifth footprint sample was collected from where side-by-side stockpiles XSP1/XSP2 met. Footprint samples were collected from newly exposed soils from depths of 6 inches, and were collected for both field screening and laboratory analysis. Pin flags were used to mark footprint sample locations (shown on Figure 10-4).	
16	Figures	I would suggest using a different color than light blue to denote the sample ID. It is very difficult to read.	A	A darker shade of blue/purple will be used for figures. Note that per Shewman Comment #1, different colors were used to designate pad (dark blue) and tundra (purple) sample matrices/soil types.	A
17	General	Please include conclusions and recommendations.	A	A conclusions and recommendations section will be added. Cleanup Complete is recommended for Test Hole Able since there were no samples that exceeded cleanup levels and there is no evidence that diesel was used for the test hole drilling. Cleanup Complete with Land Use Controls / Institutional Controls is recommended for Test Holes Baker, Charlie, Dog, and X-1 (upon approval of a LUC/IC Plan) since sample results from remaining soils exceeded the DRO cleanup	A – Please include that LUCs will be required to document contamination left in place.

REVIEW COMMENTS

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U.S. ARMY CORPS OF ENGINEERS CEPOA-EN-EE	DATE: January 2015 REVIEWER: Jessica Morris PHONE: 907-269-3077	Action taken on comment by:

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				level and/or there is reasonable evidence that diesel contamination exists within the boreholes below the top of permafrost.	

■ End of Comments.

Record of Review

Due Date	Review No.	Project	Type of Review
01-29-14	01-28-14	Project Chariot	

Document Title and\or Number and Revision
Draft 2014 Remedial Action Report Project Chariot, Cape Thompson, Alaska

Author
Melanie Peterson

Author's Organization	Author's Phone
U. S. Army Corps of Engineers, Alaska District	(XXX) XXX-XXXX

Reviewer
Mark Kautsky, Rick Hutton

Reviewer's Organization	Reviewer's Phone
DOE- Office of Legacy Management , SM Stoller	(XXX) XXX-XXXX

Reviewers' Recommendation

- ☐ Release Without Comment
- ☒ Consider Comments
- ☐ Resolve Comments and Reroute for Review

_____
Signature of Reviewer and Date

- ☐ Comments Have Been Addressed

_____
Signature of Author and Date

- ☐ Comment Resolution Satisfactory
- ☐ Comment Resolution Unsatisfactory

_____
Signature of Reviewer and Date

Item No.	Reviewer's Comments and Recommendation	Reqd. (Y/N)	Item No.	Author's Response (if required)
1	RH, pg. i, par 3, 2nd sentence; (suggestions) "Historic information is not definitive as to the usage for Test Hole X-1", it may have been a dump site and not a drill site."	y	A	Text will be revised as suggested.
2	RH, pg. 1-1, par 2, 1st and 2nd sentence; The objective "of the remediation effort'---Project Chariot site and "remove contaminated soil to below ADEC action levels." were cut below grade and "a cap welded in place."	y	A	Text will be revised as follows: "The objective of the remediation effort was to abandon test holes at the former U.S. AEC Project Chariot site and remove contaminated soil to below ADEC action levels. POL-contaminated water was removed from test hole casings, and the casings were either completely removed or were cut below grade and a cap welded in place."
3	MK, pg. 1-2, par 1, 3rd sentence; --- The DOE "conducted"	y	A	Last sentence of Section 1.2 will be revised as follows: "The work conducted from July through September 2014 addressed impacts from AEC activities associated with Project Chariot and included . . . ." [see Shewman Comment #10 for further detail].
4	MK, pg. 1-4, 2nd par, 3rd sentence; is composed of	y	A	"comprised of component material" will be replaced with "composed of material"

Record of Review (continuation)

Review No.	Project

Item No.	Reviewer's Comments and Recommendation	Reqd. (Y/N)	Item No.	Author's Response (if required)
5	MK, pg 1-4, par 2, 3rd sentence; is composed	y	A	See response to comment #3
6	RH pg. 1-4, par 2, 3rd sentence; is composed of material	n	A	See response to comment #3
7	MK pg. 2-1, par 3, 2nd sentence; evaluated , as were	y	A	A comma will be added to sentence, as suggested.
8	MK pg. 2-2, par 5, 3rd sentence; unloaded from	y	A	The word “off” will be replaced with “from.”
9	MK pg. 2-2, par 7, 1st sentence; SM Stoller	y	A	“LM” will be changed to “SM.”
10	MK pg. 2-4, par 2, 4th sentence; SM Stoller	y	A	“LM” will be changed to “SM.”
11	MK pg. 2-4, par 3, 1st sentence; Field	y	A	The word “field” will be added before the word “camp.”
12	MK pg. 4-1, par 1, 3rd sentence; no excavation was required	y	A	The word “not” will be changed to “no”
13	MK pg. 4-1, par 3, 10th sentence; They	y	A	The word ‘There” will be changed to “They”
14	RH pg. 4-4, par 2, 1st sentence; After water was removed and sampled if possible, casings	n	A	The sentence will be revised as follows: “After water was removed and treated, casings were cut below grade. . . .”
15	RH pg. 4-4, par 6, 3-4th sentence; (3) The rough lateral extent; (4) insert—Determination of the vertical extent proved to be challenging using field screening techniques.	n	A/Noted	The word “lateral” will be added to the third sentence. The paragraph discusses initial boundaries based on surface contamination, so the suggested sentence will not be added.

Record of Review (continuation)

Review No.	Project

Item No.	Reviewer's Comments and Recommendation	Reqd. (Y/N)	Item No.	Author's Response (if required)
16	MK pg.4-4, par 7, 2nd sentence; requested change—Since Because	n	A	The word “Since” will be changed to “Because.”
17	RH pg.4-5, par 2, 7th sentence; screening and laboratory	y	A	The word “laboratory” will be added to sentence.
18	RH pg.4-5, par 3 4th sentence; Initially, a metal frame jig	n	A	The word “jig” will be added to sentence.
19	RH pg. 4-7 par 2, 2nd sentence; (recommend defining swing tie method)	y	A	The last sentence will be revised as follows: “The pin flags were then re-installed following the re-contouring efforts using the recorded distances from the control points to re-establish the sample locations.”
20	MK pg. 4-7 par 6, 1st sentence; SM Stoller	y	A	“LM” will be changed to “SM.”
21	RH pg. 5-3, par 1, 2nd sentence; (laboratory samples analyzing for DRO/ROR)	n	A	The following revision will be made to the sentence: “laboratory excavation confirmation sample results were used for determining or confirming the actual excavation limits.”
22	RH pg. 5-3 par 2 1st sentence; excavation activities, PID screening	y	A	The word “PID” will be added to sentence.
23	RH pg. 5-3, par 2, 3rd sentence; (please insert) Measurements were taken and recorded from points outside the excavation area to pin flags marking conformation sample locations. Once the excavated area was backfilled, previously collected measurement data was used to triangulate conformation sample locations.	y	A	The information will be added to text, as requested.
24	MK pg. 5-3, par 4, 1st, 2nd and 4th sentence; (1) Disposable---, (2) soil probe was used, (4) ROR.		A	Equipment Blank Sample section will be revised: “An equipment blank sample was collected for quality control purposes from a soil sampling device that was used to collect six confirmation samples from the floor of Test Hole Charlie. Disposable equipment was primarily used

Record of Review (continuation)

Review No.	Project

Item No.	Reviewer's Comments and Recommendation	Reqd. (Y/N)	Item No.	Author's Response (if required)
				for laboratory sample collection, and with this one exception, equipment blanks were unnecessary." The extra period and spaces will be deleted.
25	RH pg. 5-4, (table 5-1), 0^3 =^{3} No standing water was collected inside casing interior.	y	A	Table 5-1 summarized soil matrix samples. Footnote 3 will be added to Table 5-1 to indicate that soil samples were not collected from the casing interiors because soil was too deep at Test Holes Charlie and Dog, and the casing was completely removed from Test Hole X-1.
26	MK pg. 5-4, (table 5-1), ^{2} purpose because they	y	A	The word "since" will be changed to "because"
27	MK pg. 5-4 par1, 4th sentence; coolers ensured	y	A	The spelling of the word "ensured" will be corrected.
28	RH pg. 5-4, par 3, 1st sentence; Once field screening determined the--- further lateral and or vertical excavation.	y	A	The section will be revised as follows: "Excavation activities at each of the sites was curtailed once the requirements of the approved Work Plan had been met (the required number of screening and laboratory samples were collected from limits of excavation, and preliminary laboratory results from confirmation samples were below applicable action levels and/or permafrost limited further vertical excavation). The screening and preliminary laboratory results, site photographs, and field sketches were forwarded to the USACE and ADEC for review and comment. The excavations remained open pending ADEC concurrence." ADEC has requested that we remove all language regarding ADEC acceptance of excavation limits.
29	RH pg. 5-6, par 1, 3rd sentence; Vertical depth was measured and recorded from the top of the sidewall depth to the top of the sample location.	y	A	The following sentence will be added to the paragraph: "Sample depths were manually measured with a tape measure from the top of the sidewalls." Note, however, that the elevations of the top of the sidewalls decreased as a result of the re-contouring effort.
30	RH pg. 5-6, par 6, insert at the end of the 1st sentence; In order to minimize damage to the environment, a path	y	A	Suggested wording will be added to text and replace the word "Alternatively."
31	RH pg. 5-7, par 1, 3rd sentence; impact to final ADEC decision for closure of the sites.	n	A	The sentence will be modified as follows: "Pre-excavation tundra laboratory samples collected from the Test Hole Charlie and Dog sites were not field screened with a PID. While this is not specifically a Work Plan deviation, the information would have

Record of Review (continuation)

Review No.	Project

Item No.	Reviewer's Comments and Recommendation	Reqd. (Y/N)	Item No.	Author's Response (if required)
				been helpful to correlate PID readings to DRO concentrations in a tundra matrix at those sites. The pre-excavation tundra samples were analyzed for DRO and RRO; laboratory results were below cleanup levels and there was no impact to the closure determination of these sites." Note that the final closure decision has not yet been made by ADEC.
32	RH pg. 5-7, par 2 3rd sentence; Impact to the final closure decision for Test Hole Dog are minor. The Dog site was relatively---	y	A	The sentence will be modified as follows: "Impact to the closure decision for the Test Hole Dog site is minor. The Test Hole Dog site was relatively small. . . . "
33	RH pg. 6-1, par 3, 3rd sentence; ppm, and laboratory analysis	y	A	Suggested words will be added to sentence.
34	RH pg. 6-2 par 3, General comment: While historic records indicate "chilled diesel" was used at test holes Charlie and Dog, no historic information indicates the chilled diesel process being use at test holes Able and Baker. During this timeframe for drilling at the Chariot site, diesel was historically used as an additive to the drilling mud.	n	A	The sentence regarding chilled diesel will be removed from text in Section 6.1, and a new sentence with the suggested information will be added to Section 6.1 and 7.1.
35	RH pg. 6-2 map; Soil sample listed in table 6-2, does not have a 2014 location on the map	y	A	The 2014 result from the Test Hole Able casing will be added to Figure 6-1, and the title will be changed to "Laboratory Results of 2010 and 2014 Samples, Test Hole Able."
36	MK pg. 7-3, par 1, 4th sentence; 2014. Pin flags (insert a space after the period.	y	A	Space will be inserted.
37	Rh pg. 7-3 Table 7-1 (note, please define X in the table—I assume it means analysis were conducted?) [1] "Sandy Gravel" indicates imported pad material or minor amounts of drill cuttings.	y	A	X will be defined as "analysis was conducted." Sandy Gravel definition will be changed to include "or minor amounts of drill cuttings."
38	MK pg. 7-3, Table 7-2, Comment: Please explain in the text what the significance is of the red highlighted result. Does this indicate that the cleanup was not entirely successful? Did we leave some contamination behind that should have been cleaned up? Will ADEC approve	y	A	As described in the Table 7-2 footnote, the red highlight indicates that the result exceeded the applicable cleanup level and was left in place. The red highlighted result in Table 7.2 was from the sample collected from soils within the interior of the removed casing and was discussed in Section 7.2. The contaminated soil within the casing was placed in a supersack and disposed with the excavated contaminated soil. As noted in Section 7.4, all confirmation samples collected from remaining soil met ADEC cleanup levels. Note that the red highlights in tables will be changed to Bold as per Shewman Comment #2 to make it more legible.

Record of Review (continuation)

Review No.	Project

Item No.	Reviewer's Comments and Recommendation	Reqd. (Y/N)	Item No.	Author's Response (if required)
39	RH pg. 8-2, par 5, 4th sentence; southeast toward the ocean	n	A	Suggested wording will be added to sentence.
40	RH pg. 8-3 par 2, General comment: The description is somewhat confusing because pre-excavation indicated continuation 15 feet into the tundra. Excavation only went 10 feet into the tundra. May want to describe why	n	A	Pre-excavation tundra samples were collected approximately 15 feet into the tundra (from the drill pad) and results were an order of magnitude below the action level. Consequently, we did not have to excavate 15 feet into the tundra. Based on screening and laboratory results from samples collected from the final limits of excavation, clean limits (albeit barely) were met 10 feet into the tundra.
41	RH pg. 8-3, par 6, 2nd sentence; for the approximate 2100	y	A	The word "approximate" will be added to sentence.
42	MK pg. 8-3, table 8-3; Comment: Please explain in the text what the significance is of the red highlighted result. Does this indicate that the cleanup was not entirely successful? Did we leave some contamination behind that should have been cleaned up? Will ADEC approve	y	A	As described in the Table 8-3 footnote, the red highlight indicates that the result exceeded the applicable cleanup level and was left in place. The red highlighted result in Table 8.3 was from the sample collected from permafrost soil adjacent to the casing and was discussed in Section 8.5. The fact that the result was highlighted in Table 8-3 will be added to the text in Section 8.5. There was likely no impact to the site closure determination since permafrost limited further soil excavation at that location. Note that the red highlights in tables will be changed to Bold as per Shewman Comment #2 to make it more legible.
43	RH pg. 9-3, par 2; Comment please discuss the road status and the mud mats use for safety and environmental concerns.	y	A	The last sentence in the third paragraph will be revised as follows: "The mud mats were installed over the top of the access road on August 18, 2014, and allowed safe transport of the sacks from the site to the East Staging Area." The fact that the mud mats reduced impact to the environment will be added to Section 4.2.
44	RH pg. 10-1, par 8, 1st sentence; was evidence uncovered during excavation of debris at depth which indicates a trench or test pit at the site.	y	A	Suggested wording revision will be inserted into text.
45	MK pg. 10-2, table 102; status of ADEC with the results?	n	Noted	ADEC has not made a site closure determination. Based on the presence of permafrost limiting further vertical excavation at Test Hole X-1, the DRO exceedances in floor confirmation samples will not likely impact that decision.

Record of Review (continuation)

Review No.	Project

REVIEW COMMENTS **PROJECT: Project Chariot**
DOCUMENT: Draft 2014 RA report **Location: Cape Thompson, Alaska**

U.S. ARMY CORPS OF ENGINEERS	DATE: 26-Jan-2015 REVIEWER: Benjamin PHONE: 907-753-5514	Action taken on comment by:

Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
1.	ADEC checklist 1143385	Section 6.e.iii – I am not seeing DRO fail the Duplicate RPD.	Noted	The duplicate RPD failed in DRO samples 14PCCC047SO/14PCC048SO (115%) only. At 27%, the DRO RPD was acceptable in the other pair (14PCCC041SO/14PCC042SO) associated with the SDG.	
2.	ADEC checklist 1143470	Section 4.b – the CCV failures in the narrative should be noted in this section, with the affect noted in section 4.d (instead of section 6.b.iv).	A	CCV failure discussion will be removed from Section 6.b.iv and included in Section 4.b	
3.	ADEC checklist 1143470	Section 6.a.ii – do not put the J flag after the number, it is confusing. Instead, add some text to say that the result was J flagged.	A	The J will be removed from 6.30 J mg/kg, and a second sentence will be to indicate the MB detection was below the LOQ (J-flagged).	
4.	SEDD 1143470	In the SEDD files, it looks like 1-chlorohexane doesn't have an LCS or MS/MSD. This error does not show up in the COELT files. Pleas have a corrected SEDD generated by the lab.	A	The laboratory request has been made. Corrections will be made accordingly.	
5.	ADEC checklist 1143634	Section 6.e.i – Are 14PCX042SO/14PCX043SO a duplicate pair? I am not seeing the sVOCs for -43.	A	Samples 14PCX042SO/14PCX043SO are field duplicates for DRO/RRO only. SVOC analysis was requested on sample 14PCX042SO after the samples were submitted to laboratory. SVOC analysis was performed at the request of the ADEC and was not part of the Work Plan.	
6.	ADEC checklist 1143866	Section 5.d – the checkbox should be NO, and there are many more analytes that fail the PQL test than the three shown. There are 14 that fail the primary and dupe, there are 4 that fail all three samples, and there are 6 that fail the primary but not the dupe (these last you don't have to report)	A/Withdrawn	The NO box will be checked. Additional portion of comment withdrawn after talking to USACE Chemist; Arctic Zone cleanup levels (excluding migration to groundwater pathway) were used appropriately, so only the three results listed in the checklist failed the PQL test.	
7.	Report,	Second paragraph – rewrite the last sentence.	A	Sentence will be revised as per Shewman	

U.S. ARMY CORPS OF ENGINEERS	DATE: 26-Jan-2015 REVIEWER: Benjamin PHONE: 907-753-5514	Action taken on comment by:

Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
	section 2.7			comment #17.	
8.	Report, section 5.2	Equipment blank – double period in second to last sentence.	A	Typo will be corrected.	
9.		----- End of Comments ----			

REVIEW COMMENTS

PROJECT: Project Chariot 2014 Remedial Action W911KB-14-C-0002
DOCUMENT: Draft 2014 Remedial Action Report – December 2014

U.S. ARMY CORPS OF ENGINEERS CEPOA-EN-EE	DATE: 23 January 2015 REVIEWER: Aaron Shewman PHONE: (907) 753-5558	Action taken on comment by:

Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
1	General	Sections 6.0, 7.0, 8.0, 9.0 and 10.0. I think it would be helpful in the Site Description section to reference Figure 1-2 after the introductory sentence.	A	Figure 1-2 will be referenced as suggested.	
		In the Casing Decommissioning and Debris Removal sections, it would be more clear if it was stated the test hole casings (excluding X-1) were excavated [x] feet below ground surface before being cut and capped.	A	The sentence will be added to each section, as requested.	
		In the Re-Contouring, Revegetation, and Survey sections the approximate depth each capped test hole casing was buried below finished ground surface should be stated.	A	The approximate top of casing depths will be added to the appropriate sections.	
		On figures with confirmation sample results, it would be helpful to differentiate between samples collected from tundra and samples collected from gravel pad. This is important with regard to the applicable cleanup level.	A	A different color or symbol will be used to differentiate pad and tundra samples.	
2	Tables	Red highlight makes the black text difficult to read. Recommend instead using bold text (instead of red highlight) and italics (instead of yellow highlight). Check the footnotes for proper spacing between words.	A	The red and yellow highlights will be revised to bold and italic text. The spacing in footnotes will be corrected.	
3	Figures	7-1: Recommend deleting any information regarding the 2014 excavation because this figure is related to only 2010 samples at Test Hole Baker. Showing the 2014 excavation is misleading.	Noted/A	The purpose of showing the 2014 excavation boundaries on the figure (and Figures 8-1, 9-1, and 10-1) was to relate the excavation boundaries to pre-excavation (including 2010) sample results. For clarity the figure title will be changed to "Laboratory Results of Pre-Excavation (2010) Samples, Test Hole Baker"	
		7-2: Label the northwestern portion of the excavation as, "APPROXIMATE LIMITS OF 40-INCH DEPTH EXCAVATION"	A	Label will be added to the figure.	
		8-1: Change the "ESTIMATED EXTENT OF CONTAMINATION BASED ON PRE-EXCAVATION	A	Text and arrow color will be changed to match symbol.	

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		DATA" and the leader associated with it from black to pink. Change the line type used for "APPROXIMATE LIMITS OF TEST HOLE CHARLIE EXCAVATION" to only dashed lines. 9-1: Change the "ESTIMATED EXTENT OF CONTAMINATION BASED ON PRE-EXCAVATION DATA" and the leader associated with it from black to pink. 10-1: Change the "ESTIMATED EXTENT OF CONTAMINATION BASED ON PRE-EXCAVATION DATA" and the leader associated with it from black to pink.	A A A	Line type will be changed to dashed line only. Text and arrow color will be changed to match symbol. Text and arrow color will be changed to match symbol.	
4	Appendix A	Page A7: Photograph 10: Change "bold" to "bolt". Photograph 28: Clarify using "hand-driven". Photograph 56: States approximately 19 tons were loaded into each conex, but Section 11.1 on Page 11-1 states 20 tons. Choose one or the other but please be consistent.	A A A	The word will be corrected. The word revision will be made. Caption will be changed to "approximately 20 tons."	
5	Appendix E	Please add to this appendix the email dated 13 August 2014 regarding ADEC concurrence for backfill and re-contouring of Test Hole Charlie. I forwarded this email to Mr. Bill Jury of Tanik and Mr. Mike Boese of FES on 23 January 2015.	A	Email was received and will be added to Appendix E.	
6	Table of Contents	"Deviations to the Work Plan" should be "Deviations from the Work Plan". This would result in a change to the title of Section 5.6	A	Title revision will be made.	
7	ES, Page i	3rd paragraph, 3rd sentence: Please insert "steel test hole" between "the" and "casings", and "associated" between "and" and "debris".	A	Suggested word revisions will be made to text.	

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8	Section 1, Page 1-1	Recommend replacing "general" with "prime". The ES states the RA field work was conducted between July and September 2014. Please be consistent between this and the ES.	A A	Word revision will be made to text. RA field work was performed July to September. Text will be revised. (The site visit was performed in June)	
9	Section 1.2, Page 1-2	1st paragraph after Table 1-1: Recommend adding this sentence to the end of the paragraph, "The steel test-holes and associated diesel-contaminated soil remained at the site."	A	Recommended sentence will be added to the end of the paragraph.	
10	Section 1.2, Page 1-3	Recommend deleting the last paragraph and replacing with, "The work conducted from July through September 2014 included [briefly summarize Section 1.1 here].	A/Noted	Text will be revised to state that "The work conducted from July through September 2014 addressed impacts from AEC activities associated with Project Chariot and included [briefly summarize Section 1.1 here]." The reference to AEC activities is needed to differentiate it from all of the FUDS work performed at the former Navy site.	
11	Section 1.3, Page 1-3	Last sentence on page, insert "of" between "either" and "which".	A	The word will be added to sentence.	
12	Section 1.3, Page 1-4	1st paragraph, 5th sentence: Insert "thick" between "feet" and "at".	A	The word will be added to sentence.	
13	Section 2.3, Page 2-2	Please show "Airstrip 3" on Figure 1-2. You may choose to note Airstrip 3 was not a developed airstrip, but was a natural area that offered an experienced pilot a reasonable place to land and take-off in a Cessna 206. 4th paragraph, 2nd sentence: It appears, "additional" should be inserted between "Two" and "Tanik", but please confirm this before making this change.	Noted A	Airstrip 3 is shown on Figure 1-2 in upper right hand corner. Note that the airstrip was developed as it was shown on Figure 1-4 of the 1994 SA and RA report and Figure 2 of the 1986 EA report. The word "additional" is appropriate and will be added to sentence.	
14	Section 2.4,	1st paragraph, 2nd sentence: Insert "to" between "adjacent" and "an".	A	The word will be added to sentence.	

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	Page 2-3				
15	Section 2.5 Page 2-3	2nd paragraph, last sentence: Recommend rewriting to read, "The field camp was also equipped with satellite phones to enable communication and to allow for emergency notifications in the event the internet failed. The satellite phones were rarely needed."	A	Text will be revised, as suggested.	
16	Section 2.6, Page 2-3	1st sentence: Recommend rewriting to read, "Several scheduled visits were conducted to the site during remedial activities. Visitors arrived and departed via fixed wing aircraft."	A	Text will be revised, as suggested.	
17	Section 2.7, Page 2-4	2nd paragraph, last sentence: Recommend rewriting to read, "Field personnel did not accompany the barge company on September 12, 2014, during final barge loading."	A	Text will be revised, as suggested.	
18	Section 3.1, Page 3-1	Please state the bear fence was electrified.	A	The text "bear fence" will be changed to "electric bear fence."	
19	Section 3.2, Page 3-1	Recommend rewriting the last sentence to read, "Copies of the safety forms are included on the compact disk (CD) included with this report. Specifically, safety forms are located in the Supplemental Data folder."	A	Text will be revised, as suggested.	
20	Section 3.3, Page 3-1	1st paragraph, 2nd sentence: Recommend replacing "at" with "in the", and "that excavations" with "where excavation".	A	Text will be revised, as suggested.	
21	Section 4.1, Page 4-1	1st bullet, 1st sentence: Recommend replacing the first occurrence of "the" with "two" 2nd sentence: Insert "to" between "due" and "the". 2nd bullet, 1st sentence: Recommend replacing "The" with "A". Was the skidsteer used only on the east side of Ogotoruk Creek?	A A A	Suggested word revision will be made. Suggested word will be added to text. Suggested word revision will be made. The word "only" will be added to second sentence	
22	Section 4.1, Page 4-1	3rd bullet, 1st sentence: For clarity, insert, "excavation" between "hole" and "sites".	A	Suggested word addition will be made.	

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23	Section 4.4.2, Page 4.4.2	1st paragraph, 2nd sentence: Change "extract" to "extracting".	A	Suggested word revision will be made.	
24	Section 4.4.3, Page 4-4	Describe the "other metal, concrete, and wood debris"… Give examples.	A	Examples include modified 55-gallon drum overcasings, plastic piping, a fire extinguisher, braided steel cable attached to concrete anchor, thermistor cables, and will be added to text.	
25	Section 4.5, Page 4-4	1st paragraph, 3rd sentence: Replace "rough" with "approximate areal". 2nd paragraph, 2nd sentence: Insert "overburden stockpiles were utilized at that site" and delete "stockpiles were installed at that site."	A A	Suggested word revision will be made to text. Text will be revised, as suggested.	
26	Section 4.5, Page 4-5	1st sentence on the page: Insert "to" between "adjacent" and "Test".	A	Suggested word revision will be made.	
27	Section 4.5, Page 4.6	1st sentence: Replace "rough" with approximate".	A	Suggested word revision will be made.	
28	Section 4.7, Page 4-5	1st paragraph, 4th sentence: Insert "(jig)" between "frame" and "was". 4th paragraph: Recommend moving "Overburden soil from Test Hole X-1 was stockpiled during excavation activities." to after the second sentence.	A A	Suggested word addition will be made. Sentence order will be revised, as suggested.	
29	Section 4.8, Page 4-6	Were pre- and post-staging area samples collected? If not, then state no bags leaked material based on visual inspection.	A	No samples were collected from the staging areas. A sentence that states no bags leaked material based on visual inspection will be added to the end of the first paragraph.	
30	Section 4.9, Page 4-6	1st paragraph, last sentence on page: Replace "a" with an excavation" for clarity.	A	Suggested word revision will be made.	
31	Section 5.2.1,	Equipment Blank section: Delete double period in 2nd to last sentence.	A	Double period will be fixed.	

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	Page 5-3				
32	Section 5.6, Page 5-7	1st bullet on page, 2nd sentence: Replace "coordinate" with "correlate". 2nd bullet on page, 2nd sentence: was the 5 cy of soil excavated from immediately around the Test Hole Dog casing placed in soil supersacks and disposed off site? If so, please state this for clarity. 3rd bullet, 2nd sentence: Replace "remark" with re-mark". Last sentence: Replace "they" with "the excavations" for clarity.	A A A A	Suggested word revision will be made. The sentence will be revised to state that the 5 cy of excavated soil was placed in supersacks and disposed of off site. Suggested word revision will be made. Suggested word revision will be made.	
33	Section 7.1, Page 7-1	2nd paragraph: Break this paragraph into two paragraphs after "400 feet west of the pad." In the final paragraph of the section, if this is correct, state the records were inconclusive whether or not chilled diesel was used at Test Hole Baker.	A A	The paragraph will be split into two paragraphs. The records were inconclusive, and it will be stated.	
34	Section 7.3, Page 7-2	2nd paragraph, 3rd sentence: "samples" should be "sample".	A	Suggested word revision will be made to Section 7.4.	
35	Section 7.5, Page 7-2	3rd sentence: This should be added to Section 5.6	Noted	Lack of pre-loading footprint samples is discussed in second bullet, third sentence on page 5-7.	
36	Section 7.6, Page 7-3	4th sentence: Insert a double-space at the beginning of the sentence.	A	Spacing will be corrected.	
37	Section 8.5, Page 8-3	3rd paragraph: Describe why additional excavation at sample location 14PCC028SO was not conducted…Permafrost? Proximity to the test hole casing?	A	A sentence indicating that additional excavation was not conducted due to permafrost will be added.	
38	Section 9.2, Page 9-1	4th sentence: Insert "the" between "from" and "north".	A	Suggested word revision will be made.	
39	Section 9.3,	1st complete paragraph on page, last sentence:	A	Suggested word revision will be made.	

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	Page 9-2	Recommend rewriting to "The estimated dimensions of the area to be excavated was 40 feet by 50 feet based on preliminary delineation results." 2nd complete paragraph on page, 3rd sentence: "Baker" should be "Dog".	A	Test hole site will be corrected.	
40	Section 10.0, Page 10-1	2nd paragraph, 2nd sentence: "from" should be "for".	A	Suggested word revision will be made to text.	
41	Section 10.1, Page 10-1	2nd paragraph, 1st sentence: Recommend replacing "was more pungent than" with "had a more pungent odor". 2nd sentence: was this frozen layer permafrost? If so, then use the term "permafrost" as in Section 10.4 for consistency. 3rd paragraph, 1st sentence: I believe the term "soil test hole" would be more appropriate and consistent than introducing a new term (soil boring).	A A A	Text will be revised, as suggested. Frozen soil was permafrost. The sentence will be revised to state that the site was excavated to permafrost. Suggested word revision will be made to text.	
42	Section 10.3, Page 10-2	3rd sentence: Recommend rewriting to read, "The results of the pre-excavation delineation indicated the area with dimensions of 16-feet by 18-feet (less than 300 square feet) near the test hole casing was impacted by POL-contamination."	A	Text will be revised, as suggested.	
43	Section 10.4, Page 10-2	2nd paragraph, 2nd sentence: Replace "was" with "had a" and insert "odor" between "pungent" and "and".	A	Suggested word revisions will be made to text.	
44		End of Comments			