US Army Corps of Engineers
Alaska District

2015 LANDFILL PERIODIC VISUAL INSPECTION REPORT

Final

Northeast Cape Formerly Used Defense Site (FUDS)
Northeast Cape, St. Lawrence Island, Alaska

Contract No. W911KB-14-D-0006
Task Order 0002

FUDS No. F10AK0969-05

April 2016

F10AK096905_07.11_0507_p
200-1f

2015 LANDFILL PERIODIC VISUAL INSPECTION REPORT

Final

Northeast Cape Formerly Used Defense Site (FUDS)
Northeast Cape, St. Lawrence Island, Alaska

Contract No. W911KB-14-D-0006
Task Order 0002

FUDS No. F10AK0969-05

Prepared for

US Army Corps of Engineers Alaska District
Environmental Engineering Section, CEPOA-EN-EE
P.O. Box 6898
JBER, Alaska 99506-0898

Prepared by

Bristol Environmental Remediation Services, LLC
111 W. 16th Avenue, Third Floor
Anchorage, Alaska 99501

All services have been performed in accordance with the terms and conditions of the contract.

Tyler S. Ellingboe | 21 April 2016

Tyler Ellingboe
Project Manager

Date

F10AK096905_07.11_0507_p
200-1f

TABLE OF CONTENTS

SECTION **PAGE**

TABLES

FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
AAC	Alaska Administrative Code
AC&WS	Aircraft Control and Warning Station
ADEC	Alaska Department of Environmental Conservation
APP	accident prevention plan
Bristol	Bristol Environmental Remediation Services, LLC
CDQR	Chemical Data Quality Report
DRO	diesel range organics
FUDS	formerly used defense site
HSM	health and safety manager
HTRW	hazardous, toxic, and radioactive waste
MNA	monitored natural attenuation
MOC	Main Operations Complex
MWH	Montgomery Watson Harza Americas, Inc.
NE Cape	Northeast Cape
PCB	polychlorinated biphenyl
PM	project manager
POL	petroleum, oil, and lubricants
PPE	personal protective equipment
QC	quality control
RI	remedial investigation
RRO	residual range organics
SOW	scope of work
SS	site superintendent
SSHO	site safety and health officer
SSHP	site safety and health plan
USACE	US Army Corps of Engineers
USAF	U.S. Air Force
UTV	utility terrain vehicle

1.0 INTRODUCTION

This *2015 Landfill Periodic Visual Inspection Report* documents the results of 2015 visual inspection activities performed at the Site 7 Cargo Beach Road and Site 9 Housing and Operations Landfills located at the Northeast Cape (NE Cape) Formerly Used Defense Site (FUDS), NE Cape, Saint Lawrence Island, Alaska. This report also summarizes previously conducted landfill inspection observations and provides recommendations for future landfill maintenance activities. Bristol Environmental Remediation Services, LLC (Bristol) was tasked to perform the scoped work on behalf of the US Army Corps of Engineers (USACE), Alaska District, under contract number W911KB-14-D-0006, Task Order 0002.

(Intentionally blank)

2.0 SITE DESCRIPTION

2.1 LOCATION

Saint Lawrence Island is located in the northern Bering Sea off the western coast of Alaska. NE Cape lies approximately 135 air miles southwest of Nome, Alaska (Figure 1). The project site, which originally encompassed 4,800 acres, falls between Kitnagak Bay to the northeast, Kangighsak Point to the northwest, and the Kinipaghulghat Mountains to the south (Figure 2). The site is located at 63 degrees 20 minutes north latitude and 168 degrees 59 minutes west longitude, in Township 25 South, Range 54 West, Kateel River Meridian. The site is not connected to the surrounding communities by road and is only accessible via air, water, or all-terrain vehicle (USACE, 2009a).

The locations of the work sites discussed in this report are shown on Figure 3.

2.2 CLIMATE

Saint Lawrence Island has a cool, moist, subarctic maritime climate, with some continental influences during winter when much of the Bering Sea is capped with ice pack. Winds and fog are common, and precipitation occurs approximately 300 days per year as light rain, mist, or snow. Annual snowfall is approximately 80 inches per year. Total annual precipitation is about 16 inches per year, and more than half falls as light rain between June and September. Summer temperatures average between 34 degrees Fahrenheit (°F) and 48°F, with a record high of 65°F. Winter temperatures range from -2°F to 10°F, with an extreme low of -30°F (Montgomery Watson Harza Americas, Inc. [MWH], 2003). Freeze-up normally occurs in October or November, and breakup normally occurs in June.

Winds are generally northerly to northeasterly from September to June and southwesterly in July and August. Winds exceed 11 miles per hour 70 percent of the time and the average wind speed is 18 miles per hour. Gusts in the NE Cape area have measured as high as 110 miles per hour (USACE, 2002).

2.2.1 Weather Conditions during the Project Field Season

Weather conditions during the 2015 field season were typical of a summer/fall subarctic maritime climate. Variable winds, light precipitation or fog, and temperatures ranging from 35 – 45°F were typical of the daily weather in lowland and lower mountain areas.

2.3 TOPOGRAPHY

The lower mountain area consists mainly of flat coastal plains that gradually turn into rolling tundra toward the base of the Kinipaghulghat Mountains. The mountains rise abruptly to a maximum elevation of approximately 1,850 feet above mean sea level. Elevations across the work areas ranged from sea level to approximately 300 feet above mean sea level.

2.4 GEOLOGY

The geology of Saint Lawrence Island consists of isolated bedrock highlands of igneous, metamorphic, and older sedimentary rocks surrounded by unconsolidated surficial deposits overlying a relatively shallow erosional bedrock surface. In the immediate vicinity of the lower mountain area south of the main operations complex (MOC), shallow, unconsolidated surficial materials overlie quartz monzonitic rocks of the Kinipaghulghat Pluton. The pluton forms the mountainous work area south of the MOC, including Kangukhsam Mountain. The Suqitughneq River drainage in the Kinipaghulghat Pluton has created an erosional valley and alluvial fan of unconsolidated sediments. Granitic bedrock materials are exposed at the coast north of Kitnagak Bay, suggesting that quartz monzonitic bedrock underlies the unconsolidated materials at a relatively shallow depth on a wave-cut erosional platform (USACE, 2009a).

The unconsolidated materials exhibit an alluvial soil profile in areas that have not been disturbed by man. In general, silts near the surface, which overlie more sand-dominated soils, characterize the soil stratigraphy at the site. The silt may contain varying quantities of clay, sand, and gravel and may vary from zero to 10 feet in thickness. The silt is dark brown to dark green and sometimes exhibits a mottled texture. In some areas, the silt exhibits an aqua green or blue color. Dark brown silts were observed in outcrops. The sand at depth contains varying degrees of silt, gravel, and cobbles and it varies from 2 feet to more than 20 feet in thickness. Deeper, coarse-grained materials are generally unsorted and are likely to be of glaciofluvial origin. The depth to bedrock at the lower elevation areas of the site is unknown (USACE, 2009a). Beach material is primarily cobble (1-inch stones), with some sand and intermittent large boulders and rocks (USACE, 2002).

2.5 Surface Water and Groundwater

Saint Lawrence Island is relatively remote and undeveloped and regional groundwater data is limited (MWH, 2003). Bedrock materials south of the site (and underlying the unconsolidated deposits) are not expected to store and transmit significant quantities of groundwater. Typically, these types of granitic rocks are impermeable and transmit groundwater only through localized fractures and weathered soil zones at the surface. However, historical reports concerning water supply wells suggest that this deep, fractured bedrock aquifer supplied sufficient water to sustain the installation during operation (MWH, 2003). Multiple production wells accompanied by storage tanks used to supply the installation during its operation and were drilled to depths of 50 to 70 feet into a fractured bedrock aquifer. It is noted in the MWH report (2003) that the use of multiple water supply wells may indicate that groundwater availability was inconsistent and variable throughout the aquifer during different times of the year and that there are insufficient data to determine the aquifer’s extent across the site.

The primary potential aquifer at the NE Cape site is the unconsolidated alluvial material that underlies the area. Regions where blocks of the bedrock are breaking off to form the talus fields that flank the Kinipaghulghat Mountains are likely capable of transmitting large volumes of groundwater (MWH, 2003). The mountainous area to the south of the former installation provides an ideal recharge area for these unconsolidated materials, providing runoff from rain and snowmelt during the summer that permeates the broken bedrock, alluvial, and glacial deposits. Based on the topography and geology of the site, the regional groundwater flow direction is expected to be from the mountainous recharge area south of the site, flowing north, eventually discharging to the Bering Sea (MWH, 2003).

Groundwater elevations fluctuate both from year to year and throughout the course of the field season. Water elevations for late July/ early August at the F/G plume were 4 feet higher in 2012 than 2013. In 2011, 2012, and 2013 groundwater elevations at the MOC increased by several feet from late July to early September. In August 2011, the groundwater elevation at the H plume excavation rose 3 feet in 3 days during a precipitation event. Groundwater elevation in excavations may also demonstrate large spatial variability; simultaneous excavations conducted in 2012, located 25 feet apart, contained water elevations that varied by 3.2 feet.

Key factors influencing the flow of groundwater at the site are the permafrost and frozen soils, which render the unconsolidated materials effectively impermeable in some areas (MWH, 2003). The U.S. Geological Survey has classified Saint Lawrence Island as an area of moderately thick to thin permafrost (Ferrians, 1965). Although the depth of permafrost at Saint Lawrence Island is unknown, the base of permafrost on the mainland at Nome (135 air miles northeast) is estimated to be at a depth of 120 feet. The deeper, unconsolidated deposits at the site are probably permanently frozen, and the shallow soils represent the active layer where soils thaw during portions of the year. Frozen soils have an effect in retarding groundwater flow most of the year.

In addition to the Bering Sea north of the NE Cape facility, surface water in the vicinity of the work area consists of small streams, small- to moderate-sized lakes, and marshy areas (MWH, 2003). Surface water generally flows northward from the more southerly located highland areas of the Kinipaghulghat Mountains. Small surface water bodies are common throughout the area. The primary stream drainage in the area, the Suqitughneq River, is fed by runoff from the Kinipaghulghat Mountain valley in the lower mountain area, south of the former installation. Several smaller tributaries, originating from two small, unnamed lakes (MWH, 2003), feed this stream drainage as it flows north to Kitnagak Point. Surface water flow in the area is highly dynamic; these changes occur over short and long periods of time and have been observed over the life of remedial activity (MWH, 2003). Bristol observed significant changes in surface water characteristics at multiple locations across the site, most notably at a location directly south (uphill) from Site 26 where surface water runs through a culvert underneath the road that runs from the MOC to the borrow source. This drainage originated in the Kinipaghulghat Mountain valley and exhibited variable flow in late spring/early summer in previous years. The drainage would flow for days at a time, but would run dry later in the summer during drier periods.

2.6 AIR QUALITY

Air quality in the area is good. There are minimal sources of air emissions at the site because of its remote nature. The occasional boat motor, vehicle engine, or fire has a negligible effect. In the past air emissions at the site increased during remedial action work because more equipment and vehicles were operating at the site; in 2015 vehicle use was minimized to the charter planes and a small utility terrain vehicle (UTV). Winds typical of the area aid in dispersing emissions (USACE, 2002).

2.7 VEGETATION

The NE Cape area has several major habitat types, including moist tundra dominated by heaths, grasses, sedges, mosses, and lichens, with shrubs that include bearberry, dwarf birch, narrow-leaf Labrador tea, and willow. These plants typically grow in 1 to 3 feet of undecayed organic mat over saturated and frozen soil. Alpine tundra plants (dwarf, prostrate plants that include heaths and tundra species adapted to dry, thin soil conditions) grow on the slopes and exposed ridges of nearby mountains. The NE Cape area has many low-lying areas with lakes, bogs, and poorly drained soils (USACE, 2002).

2.8 FISH AND WILDLIFE

Large mammals are generally not abundant on Saint Lawrence Island. Polar bears may be on the island any time during the year but are most often present when the ice pack is near shore. Some years, polar bears become stranded on the island throughout the summer when the ice pack moves out earlier than usual. There have been no polar bear sightings in the past seven seasons of operations.

A population of approximately 1,000 reindeer inhabit the island. Arctic foxes, cross foxes, red foxes (less common), wolves (rarely), and several small mammals (tundra shrews, arctic ground squirrels, Greenland collared lemmings, red-backed voles, and tundra voles) also inhabit the island (MWH, 2003). Animals usually seen in or around the work sites are small mammals such as ground squirrels and foxes.

Marine mammals are present in the vicinity of the NE Cape area as seasonal migrants in the offshore and near shore marine waters, at haul-out sites, and in association with the advancing and retreating ice pack. No haul-out sites are within the work area. During the summer, walrus, sea lions, and spotted seals may be present in offshore waters. During the ice season, ringed seals, bearded seals, walrus, and spotted seals can be found in nearshore and offshore leads and open water. Bowhead, gray, minke, killer, right, humpback, blue, and beluga whales inhabit offshore waters (MWH, 2003).

The only breeding seabird colony known to exist at the NE Cape facility consists of about 60 glaucous gulls and 60 herring gulls at Seevookhan Mountain, approximately 5 miles southeast of the NE Cape site. Several other species of birds have been sighted in the vicinity of the NE Cape site, including common ravens, snow buntings, snowy owls, whistling swans, Lapland longspurs, jaegers, sand hill cranes, and emperor geese.

Ten primary species of fish reside in the streams and tundra ponds of Saint Lawrence Island. These include blackfish, nine-spined stickleback, grayling, whitefish, and Dolly Varden trout. Five of the six species of Pacific salmon occur around the island and rear in many of the larger drainages (MWH, 2003).

2.9 Community Profile and Land Use

The nearest community on Saint Lawrence Island to the project site is the Village of Savoonga, approximately 60 miles northwest of the site, with an estimated population of 671 people, according to the United States Census Bureau Website (accessed 5 January 2016) (USCB, 2016). Savoonga locals estimate that the population exceeds 800 people. There are no permanent residents at the NE Cape site, but there is a small subsistence hunting and fishing camp near Cargo Beach that is frequently inhabited in the summer by residents of Savoonga and Gambell. Snow machine travel during the winter months provides residents of Gambell and Savoonga relatively easy access to the site. The NE Cape site property is currently owned jointly by the two local native corporations, Sivuqaq, Inc., in Gambell and Kukulget, Inc., in Savoonga. The island is accessible by boat, regularly scheduled airlines (to Gambell and Savoonga), and chartered air flights out of Nome. There is no regularly scheduled commercial access to the project site.

2.9.1 Subsistence Activities

Savoonga is a traditional St. Lawrence Island Yup'ik village, with a subsistence lifestyle. Whale, seal, walrus, and reindeer compose 80 percent of islanders' diets. The economy is largely based on subsistence hunting of walrus, seal, fish, and whale, with some cash income. Berries, edible and medicinal plants are also harvested. Savoonga residents fish for halibut in the vicinity of NE Cape for subsistence and commercial purposes.

2.10 History

Saint Lawrence Island was established as a reindeer reserve by Executive Order on January 7, 1903. The U.S. Air Force (USAF) constructed an aircraft control and warning station (AC&WS) at NE Cape during 1950 and 1951 (USACE, 2009a). The present project site was acquired by the USAF on January 16, 1952, under Public Land Order 970, which removed 21,013 acres from the reserve. In 1952, the USAF AC&WS was formally activated by assignment of the 712th AC&WS Squadron and the 698th Security Squadron. The original site was designed to support 212 personnel. Throughout its existence, the NE Cape facility has been a surveillance station, providing radar coverage for the Alaskan Air Command and, later, for the North American Air Defense Command, as part of an Alaska-wide system constructed to reduce potential vulnerability to bomber attacks across the polar regions.

The White Alice Station area remained in operation with minimal military staff until 1972. All lands were then withdrawn from the military under Public Land Order 5187 for classification under Section 17(d)(1) of the Alaska Native Claims Settlement Act of 1971, which entitled local community village corporations to select and receive specific tracts of federal land. Interim Conveyance No. 203 (June 1979) conveyed unsurveyed lands of Saint Lawrence Island to Sivuqaq, Inc., and Savoonga Native Corporation, known today as Kukulget, Inc. Surveyed land, easements, and land-use permits effective before conveyance were excluded from the transfer.

In 1982, transfer of the White Alice Station area, south of the MOC, to the U.S. Department of the Navy was initiated. However, this transaction was not formally completed and was superseded by Alaska Native Claims Settlement Act. The Navy conducted remedial actions under its Comprehensive Long-Term Environmental Action Navy program. The action included removal of specified hazardous items and containerized hazardous and toxic waste.

In 2000, the White Alice Station was reclassified as a FUDS-eligible property. In response, the USACE included the area in the ongoing cleanup program for NE Cape (USACE, 2002).

2.10.1 Previous Studies and Actions

Environmental investigations and cleanup activities at NE Cape began in the mid-1980s, with the goal of locating and identifying areas of contamination and gathering enough information to develop a cleanup plan. The URS Corporation conducted preliminary assessments in 1985, and Ecology and Environment, Inc. did follow-up assessments in 1991, 1992, and 1993.

Remedial investigations (RIs) were initiated at NE Cape during the summer of 1994, when MWH, performed a Phase I RI. Soil, sediment, groundwater, and surface water samples were collected during the Phase I RI (Montgomery Watson, 1995). Additional sampling was performed during subsequent investigations: MWH conducted Phase II RI in 1996, 1998, and 1999; MWH conducted Phase III RI in 2001 and 2002; and Shannon &Wilson, Inc., conducted Phase IV RI in 2004 (Shannon and Wilson, 2005). A feasibility study was conducted by USACE in March 2007, which summarized historical sampling results and removal actions and evaluated a range of alternatives for complying with the criteria prescribed by the Comprehensive Environmental Response, Compensation, and Liability Act. The studies divided the concerns among 34 separate sites. The results of the RIs showed that contaminants were present at some, but not all, sites (USACE, 2009a).

Several removal and remedial actions have taken place at the NE Cape FUDS:

- URS Corporation, 1990: Removal of transformers, drums, tanks, and other containerized hazardous wastes
- Northwest Enviro Service, Inc., 1994: Removal of 16 electrical transformers and their contents
- MWH, 1997: Removal of communication wires and cables from the tundra
- Nugget Construction Inc., 2000: Removal of building demolition and debris, drums, antenna poles, and a fuel pipeline
- Nugget Construction Inc., 2001: Removal of building demolition debris, polychlorinated biphenyl- (PCB-) contaminated soil, petroleum, oil, and lubricants- (POL-) contaminated soil, and miscellaneous debris
- Bristol Environmental & Engineering Services Corporation (Bristol Environmental and Engineering Services Corporation), 2003: Removal of building demolition debris, other miscellaneous debris, drums, tanks, communications poles, wires, cables, and fuel lines
- Bristol Environmental and Engineering Services Corporation, 2005: Demolition and removal of tramway towers, wires, and cables, metal poles, communications wire and cable
- Bristol Environmental Remediation Services, LLC, 2009: Removal of POL-containing drums, landfill cap construction at Site 7, trial study of in-situ chemical oxidation treatment of POL-contaminated soils at the MOC
- Bristol Environmental Remediation Services, LLC, 2010: Removal of POL-contaminated soils from Sites 1, 3, 6, and 32; PCB-contaminated soils from Sites 13, 16, 21, and 31; and arsenic-contaminated soils from Site 21; landfill cap construction at Site 9; and monitored natural attenuation (MNA) at Site 8
- Bristol Environmental and Engineering Services Corporation, 2011: Removal of POL-contaminated soil from the MOC and PCB-contaminated soil from Sites 13 and 31; MNA at Site 8 and in groundwater wells at the MOC; debris removal; and roofing tar removal
- Bristol Environmental Remediation Services, 2012: Removal of 8,594.91 tons of POL-contaminated soil from the MOC; 4,884.73 tons of PCB-contaminated soil from Sites 13 and 31; 102.72 tons of arsenic-contaminated soil from Site 21; 59.40 tons of ethylene glycol- and tetrachloroethene-contaminated soil and over 1,000 gallons of liquid from Site 10; 20.6 bank cubic yards of sediment from Site 28; 15 tons of debris from areas across the site; 158 poles from across the site; continuation of MNA at Site 8 and in groundwater wells at the MOC;

abandonment/decommissioning of six monitoring wells across the site; and collection of soil samples along the road leading to the radar dome

- Bristol Environmental Remediation Services, 2013: Removal of 10,601.24 tons of POL-contaminated soil from the MOC; 243.8 bank cubic yards of sediment from Site 28; 305.13 tons of arsenic-contaminated soil from Site 21; 290.4 tons of contaminated soil from Site 10; 0.29 tons of drums from Site 10; 28.45 tons of debris from areas across the site; 1 ton of drums from areas across the site; 30 pole stumps from areas across the site; continuation of MNA sampling; abandonment of 12 monitoring wells across the site.
- In 2014 Bristol excavated 4,489.92 tons of petroleum-contaminated soil; collected soil samples from 40 soil borings at Site 21 and excavated 107.35 tons of arsenic-contaminated soil; sampled and installed seven new monitoring wells at the MOC; abandoned two monitoring wells at the MOC; reconditioned eight monitoring wells at the MOC; removed 10.97 tons of debris from across the NE Cape site and the vicinity of the Site 7 landfill; removed tar and tar-contaminated soil from Site 10's buried drums and shipped the material off site for disposal; loaded 1.27 tons of material into two 85-gallon drums and shipped them off site for disposal; excavated two test pits at Site 6 corresponding to historical sample locations and analyzed soil samples for PCB concentrations; collected two surface water samples at Site 8; collected soil samples corresponding with Site 10's historical sample locations and analyzed the samples for contaminants; subsequently excavated, containerized, and shipped 265.6 tons of contaminated soil from Site 10; collected soil samples from Site 27 to test for naphthalene and had the samples analyzed by a fixed laboratory; investigated Site 32 for petroleum-contaminated soil; encountered diesel range organics- (DRO)-contamination resulting in the excavation of 53.13 tons of soil; removed an open grate at Site 31 concrete foundation and backfilled the resulting concrete void with clean material, as it posed a safety risk.

The USACE produced the *NE Cape Hazardous, Toxic, and Radioactive Waste (HTRW) Decision Document* (USACE, 2009a), which presented the selected remedies for NE Cape in accordance with Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act and the National Oil and Hazardous Substances Pollution Contingency Plan. Remedial actions were determined for each site of concern at NE Cape. The selected remedies and their current status are provided in Table 2-1. A second decision document was also developed that was specific to the Site 7 Cargo Beach Road Landfill (USACE, 2009b).

Table 2-1 Decision Document Selected Remedies for Northeast Cape Sites

Decision Document Site Remedy	Status[1]
No Further Action at sites 2, 4, 5, 12, 14, 17, 18, 20, 22, 23, 24, 25, 26, 33, and 34	Complete
Excavation and removal of petroleum-contaminated soils at Site 1 Airstrip	Completed in 2010
Excavation and removal of petroleum-contaminated soils at Site 3 Fuel Pumphouse	Completed in 2010
Excavation and removal of petroleum-contaminated soils at Site 6 Former Drum Field	Completed in 2010
Excavation and removal of petroleum-contaminated soils at Site 32 Lower Tramway	Completed in 2014
Excavation and removal of PCB-contaminated soils at sites 13, 16, 21, and 31	Completed in 2013
Excavation and removal of arsenic-contaminated soil at Site 21 Wastewater Treatment Tank	Conducted in 2011, 2012, 2013 and 2014; Under review
Removal of partially submerged debris	Conducted in 2014
Excavation and removal of petroleum, metals, and PCB-contaminated sediment at Site 28 Drainage Basin, including removal of near-surface sediments from the narrow channel upgradient of the Suqitughneq River	Under review
Construction of sedimentation pond or other appropriate controls at Site 28 Drainage Basin	Under review
MNA of petroleum-contaminated sediment at Site 8 POL Spill Site	Under review
Capping of the Site 9 Housing and Operations Landfill	Completed in 2010

Table 2-1 Decision Document Selected Remedies for Northeast Cape Sites (continued)

Decision Document Site Remedy	Status[1]
Chemical oxidation at the Main Operations Complex, with remedy of MNA for groundwater, excavation and removal of petroleum-contaminated soils to a depth of 15 feet at sites 10, 11, 13, 15, 19, and 27, and land use controls	Chemical oxidation was initiated in 2009 for the purposes of treating POL-contaminated soils and was unsuccessful; MNA is in progress for groundwater; POL-contaminated soils that could be removed without causing a release of POL contaminated water into or distrubing the Site 28 wetland and/or Suqitughneq River were completed in 2014.
Land use controls to limit future drinking water uses for groundwater at the MOC (Sites 10–20, 22, 26, 27), designate areas not suitable for drinking water (Sites 3, 4, 6, 7, 9), prevent construction of buildings on top of landfills	In progress
5-Year Reviews at sites with hazardous substances remaining above cleanup levels, as necessary until cleanup levels are met. Periodic reviews of POL-contaminated sites (e.g., Site 8) with residual contamination will be included in conjunction with evaluation of the MOC	In progress
Periodic visual monitoring for 5 years of the capped area at the Site 9 Housing and Operations Landfill and Site 7 Cargo Beach Road Landfill for settlement and erosion	In progress
Additional visual monitoring of the Site 9 and Site 7 landfill caps, up to 30 years, may be conducted if deemed necessary based on the results of 5 Year or Periodic Reviews	To be determined by the results of the 5 Year or Periodic Reviews.
Removal of dangerous poles, wires, and other miscellaneous debris from tundra areas site-wide, where identified	Pole removal conducted in 2009, 2010, 2011, 2012 and 2013. Wire and miscellaneous debris removal in 2009, 2010, 2011, 2012, 2013 and 2014. All identified wire and debris has been removed from the site.
Removal of partially submerged debris from streams in the vicinity of Site 9 Housing and Operations Landfill and Site 29 Suqitughneq River	Completed in 2010

Notes:

Gray shading indicates specific remedies related to the Site 7 and Site 9 landfills discussed in this report.

[1]The Alaska Department of Environmental Conservation (ADEC) has not issued formal decisions regarding completion of work and/or cleanup complete status for any of the subject sites.

MNA = monitored natural attenuation
MOC = Main Operations Complex
PCB = polychlorinated biphenyl
POL = petroleum, oil, and lubricants

(Intentionally blank)

3.0 CONTRACT SPECIFICATIONS

3.1 SCOPE OF WORK

The 2015 Scope of Work (SOW) was established under contract W911KB-14-D-0006, Task Order 0002 and consisted of the following:

- Preparation of planning documentation;
- Performance of landfill cap visual inspections and associated surface water sampling; and
- Preparation of a 2015 Landfill Periodic Visual Inspection Report.

(Intentionally blank)

4.0 PROJECT PLANNING, KEY PERSONNEL, AND SUBCONTRACTORS

4.1 PROJECT PLANNING

Bristol received Contract Amendment No. P0003 from the USACE on 31 March 2015 and submitted a draft work plan addendum to the *2014 Work Plan* (Bristol, 2014) to the USACE on 23 June 2015. The USACE provided work plan addendum comments on 26 June 2015. The final work plan addendum (Bristol, 2015) was submitted on 7 August 2015.

This section describes project planning activities, key personnel, and subcontractors utilized during the 2015 field effort discussed in this report.

4.1.1 Planning Documents

Bristol prepared one document that was accepted by the USACE: *Northeast Cape HTRW Remedial Actions Work Plan Addendum* (Bristol, 2015).

4.1.2 Permits and Regulatory Notifications

Federal and state permits required for this project were included in the *Northeast Cape HTRW Remedial Actions Work Plan* (Bristol, 2014). A copy of the current right-of-entry permit for the NE Cape site is provided in Appendix A.

4.2 KEY OFFICE PERSONNEL

4.2.1 Project Manager – Tyler Ellingboe

Tyler Ellingboe served as project manager (PM) and ensured that project tasks were completed on schedule and within budget, implemented methods of tracking materials and resources, coordinated work with subcontractors, and complied with normal safety procedures and regulatory requirements. The PM submitted monthly status reports (Appendix B) to the USACE to keep the project team informed about work progress.

4.2.2 Health and Safety Manager – Wayne McDaniel

Wayne McDaniel served as the Health and Safety Manager (HSM) and reviewed Bristol's Safety and Health Program for this project. As the HSM, he monitored project compliance with Bristol's Corporate Safety and Health Program. Mr. McDaniel helped Bristol's site safety and health officers (SSHOs) develop and implement an effective accident prevention plan (APP) and site safety and health plan (SSHP). He is based in Bristol's San Antonio, Texas, office. For this project, Mr. McDaniel was responsible for key health and safety tasks:

- Reviewed and edited the APP and SSHP
- Remained available for emergencies
- Provided consultation as needed to ensure that the APP and SSHP were fully implemented
- Coordinated any modification to the APP and SSHP with the site superintendent (SS) and SSHO

4.2.3 Project Chemist – Marty Hannah

Marty Hannah had the responsibility of supervising all project quality aspects related to sample collection and chemical analysis. Mr. Hannah oversaw data development, the data review process, and all subcontracted laboratories.

4.2.4 Regulatory Compliance Manager / Transportation and Disposal Coordinator – Tyler Ellingboe

Tyler Ellingboe served as the regulatory compliance manager and transportation disposal coordinator. He oversaw the air shipment of hazardous materials to and from the site during the 2015 field effort.

4.2.5 Occupational Physician Alexander T. Baskous

Bristol designated Occupational Physician Alexander T. Baskous for the NE Cape HTRW Remedial Actions project. Dr. Baskous was familiar with the project hazards and scope. He determined medical surveillance protocols and reviewed examination and test results in a manner that complied with Title 29 of the *Code of Federal Regulations* Part 1910.120(f). Dr. Baskous is board certified in occupational medicine, with an M.D. and Master of Public Health from Harvard University. He is the director of the Northwest Segment of the American College of Occupational and Environmental Medicine, a diplomat of the American Board of Family Practice, and is on the active staff of both Providence Alaska Medical Center and Alaska Regional Hospital in Anchorage.

4.3 KEY FIELD PERSONNEL

4.3.1 Site Superintendent – Eric Barnhill

Eric Barnhill served as the SS and was responsible for management of scheduling, coordination, and execution of Bristol's onsite activities in accordance with the contract specifications. He reported directly to the PM.

4.3.2 Site Safety and Health Officer – Eric Barnhill

Eric Barnhill also served as the SSHO and was responsible for overall planning and compliance with safety and health requirements. He conducted daily safety meetings and addressed worker safety concerns. As SSHO, Mr. Barnhill was responsible for communicating safety issues and concerns, reporting safety incidents to the PM, and other safety-related duties:

- Remained on site on a full-time basis for the duration of field activities
- Assisted with onsite training and represented the HSM during the day-to-day onsite implementation and enforcement of the APP and the SSHP
- Performed a daily safety and health inspection and documented results on the Daily Safety Inspection Log
- Ensured site compliance with federal, state, USACE Engineer Manual 385-1-1, and Occupational Safety & Health Administration safety and health requirements; also ensured compliance with all aspects of the APP and SSHP, including, but not limited to, activity hazard analyses, air monitoring, use of personal protective equipment (PPE), decontamination, site control, Standard Operating Procedures, and the safe use of engineering controls

- Maintained the emergency response plan, confined space entry procedures, and the spill containment program
- Prepared all safety-related records
- Stopped work if unacceptable health or safety conditions existed and took necessary action to reestablish and maintain safe working conditions
- Consulted with and coordinated any modifications to the APP and SSHP with the HSM, the SS, and the contracting officer or the contracting officer's representative
- Served as a member of Bristol's quality control (QC) staff on matters relating to safety and health, and was prepared to conduct accident investigations, and accident reports
- Reviewed results of safety QC inspections and documented safety and health findings in the Daily Safety Inspection Log
- Recommended and oversaw corrective actions for identified deficiencies, in coordination with site management and the HSM.

4.3.3 Contractor Quality Control System Manager – Eric Barnhill

Eric Barnhill managed contractor quality control and had the authority to act in all contractor quality control matters for the project.

4.3.4 Field Staff

Surface water sample collection was performed by Ms. Lyndsey Kleppin and Mr. Eric Barnhill, who meet the definition of "qualified persons" as defined in *Title 18 of the Alaska Administrative Code (AAC), Chapter 75, Section 990 – Definitions (18 AAC 75.990) Oil and Other Hazardous Substances Pollution Control* (Alaska Department of Environmental Conservation [ADEC], 2014). Visual landfill inspections were performed by Mr. Eric Barnhill with support from Mr. Noyuk Peacock.

4.3.5 Subcontractors

The two subcontractors used during the course of work are listed in Table 4-1. Planning and safety documents were available to all site workers. Field scientists were supplied with the information, instructions, and emergency response actions contained in the APP and SSHP, and they were responsible for complying with the rules, regulations, and procedures therein.

Table 4-1 Major Subcontractors

Subcontractor	Assignment
Bering Air	Charter flights to and from the island
TestAmerica Laboratories, Inc.	Fixed-based analytical testing laboratory and field laboratory

(Intentionally blank)

5.0 LOGISTICS AND FIELD INVESTIGATION METHODS

5.1 MOBILIZATION/DEMOBILIZATION

The landfill visual inspection was performed in concert with the 2015 annual groundwater sampling event. Equipment and materials for the 2015 field effort were collected and staged at the Bristol equipment yard prior to shipment to Bering Air located in Nome, Alaska. All materials were shipped to Bering Air in August of 2015.

Three Bristol personnel mobilized to and from the NE Cape site on Bering Air charter flights on the 11th and 13th through 15th of August 2015.

The three person crew demobilized back to Anchorage on 16 - 17 August 2015.

5.2 AIR SUPPORT

Bering Air, of Nome, Alaska, provided air support services during the 2015 season. A total of four round-trip flights were required to complete the 2015 field effort.

5.3 EQUIPMENT

No heavy equipment was used during the 2015 field season. Motorized vehicle use was limited to one Arctic Cat "Wildcat" side by side UTV.

5.4 SITE ACCESS

Approximately 5.5 miles of gravel roads connect the various work areas at the site and have, in the past, required a small amount of maintenance each year, generally consisting of grading and adding minor amounts of fill. The roads are beginning to show the wear and tear of the freeze/thaw action that occurs annually but are still useable. There are four stream crossings (three culverts and one bridge) within the work areas at NE Cape. Bristol did not perform any maintenance on the road, bridge, or culverts during 2015 operations.

In prior years Bristol maintained the runway with a grader. The last maintenance on the runway was performed during the 2014 season. The runway seemed to be in good condition during the 2015 season.

5.5 Site Visitors

Visitors arrived periodically throughout the duration of the project in 2015. Site visitors were limited to one family from Savoonga. The family would come to the site to get fresh water from a spring in the mountains and to retrieve personal supplies and fuel that were stored at the site.

5.6 Health and Safety

Health and safety plays a fundamental role in all of Bristol's jobs, without exception. The three man crew carried with them, at all times, a satellite phone and a first aid kit. Bristol conducted safety meetings on a daily basis, and all onsite personnel were encouraged to take a proactive role in addressing safety concerns and questions.

The SS/SSHO briefed field personnel daily on general site hazards. Part of Bristol's safety routine involved the daily Toolbox Safety Meetings, held each morning before work began. These meetings were about project-related work on the NE Cape site. Safety topics were chosen based on the day's activities or general project safety. Topics included weather conditions, footing conditions, UTV safety, housekeeping, and PPE.

Minimum safety gear for all personnel included hard hat, reflective vest, steel-toe boots, safety glasses, and work gloves.

The Bristol SSHO performed safety and health walk-through inspections each day at the landfill and MOC work sites. These inspections enabled the SSHO to remain aware of site activities and conditions, look for existing or potential site safety issues/concerns, ensure appropriate use of PPE, and reinforce safe work practices. The daily safety inspections also provided material for the daily Toolbox Safety Meetings. Copies of Safety Meeting Sign-In Sheets are included in Appendix C.

No lost-time accidents occurred during the 2015 season.

5.7 DECONTAMINATION

Decontamination procedures are instituted to protect the environment and personnel and to maintain the quality and integrity of environmental samples. Bristol incorporated decontamination procedures during all sampling events.

Sampling for the landfill monitoring event was limited to three surface water samples at the Site 9 Landfill. Samples were collected by dipping a clean 1-liter jar into the surface water; the 1-liter container was then used to fill sterile sample containers with the appropriate amount of water. Clean 1-liter jars and nitrile gloves were used during the collection of each sample.

5.8 WATER SAMPLE COLLECTION

Bristol collected surface water samples into new, clean sample containers. Collectors slowly dipped a 1-liter jar into water sources at the Site 9 Housing and Operations Landfill and then transferred water into appropriate sample containers for the specified analyses. TestAmerica Laboratories, Inc. analyzed surface water samples.

(Intentionally blank)

6.0 TASK-ORIENTED FIELD ACTIVITIES

This section details Bristol's 2015 site work as set in the SOW. As part of the SOW, Bristol performed visual landfill inspections at both the Site 7 Cargo Beach Road and Site 9 Housing and Operations Landfills. Additionally, three surface water samples were collected at the Site 9 Housing and Operations Landfill. Copies of project personnel field notebooks are included in Appendix C.

6.1 DESCRIPTION AND HISTORY

6.1.1 Site 7 Cargo Beach Road Landfill

The Cargo Beach Road Landfill (Site 7) was an unpermitted landfill that was used as the installation's main solid waste disposal area from 1965 until closure in 1974. The landfill contains a wide variety of unknown materials. The landfill appears to have been created by dumping debris off the sides of a topographic mound. In 2009 Bristol performed a drum removal and placed a gravel cap on the Site 7 Cargo Beach Road Landfill.

6.1.2 Site 9 Housing and Operations Landfill

The Site 9 Housing and Operations Landfill is an old dump site located approximately 1,000 feet east-northeast of the MOC and is shown on Figure 3. This site served as a waste disposal area from 1952 until 1965. Exposed drums, debris, and batteries were removed from the site and surrounding vicinity in 2001, 2005, and 2010. The landfill covers an area approximately 2.1 acres and is intersected by several surface water drainages, which flow from a southern-located valley to the Suqitughneq River located approximately one-quarter mile to the north.

Soil, sediment, surface water, and shallow groundwater environmental samples have been collected from Site 9 during previous investigations. Contaminants of concern at Site 9 have been previously identified in the *2009 HTRW Decision Document* (USACE, 2009a). In soils, arsenic and DRO are identified as contaminants of concern. DRO, residual range organics (RRO), and lead are the contaminants of concern in shallow groundwater. In surface water, contaminants of concern were either not detected, or did not exceed drinking water criteria. Past RI activities suggest that no significant contamination exists surrounding or migrating from the site. Additionally, shallow groundwater in the area is not a current or reasonably expected potential drinking water source.

In 2010, the landfill was capped and the stream flowing from the landfill towards the Suqitughneq River was sampled; none of the 2010 Site 9 surface water samples contained contaminant concentrations above cleanup levels at four locations prior, during, and after the landfill capping task (Bristol, 2011).

6.1.3 2015 Field Activities

6.1.3.1 Site 7 Cargo Beach Road Landfill Inspection

Bristol performed a visual landfill inspection of the Site 7 Cargo Beach Road Landfill on 11 August 2015. No issues were encountered that would necessitate further action. A copy of the 2015 Site 7 landfill visual inspection form, including a photograph log documenting the landfill inspection effort, is located in Appendix D. All 2015 project photographs are provided electronically in the supplemental folder. Copies of inspection forms from previous years are included in Appendix E.

6.1.3.2 Site 9 Housing and Operations Landfill Inspection and Surface Water Sample Collection

Bristol performed a visual landfill inspection of the Site 9 Housing and Operations Landfill on 11 August 2015. No issues were encountered that would necessitate further action. A copy of the 2015 Site 9 landfill visual inspection form and photograph log is located in Appendix D and past inspection forms are included in Appendix E. As part of the landfill inspection, three primary and one duplicate surface water samples were collected from ponds and a small stream adjacent to the Site 9 landfill.

6.1.4 Site 9 Housing and Operations Landfill Surface Water Sampling Results

A total of three primary surface water samples (15NC09SW001, 15NC09SW002, and 15NC09SW003) and one duplicate surface water sample (15NC09SW004) were collected from Site 9 during the 2015 landfill inspection effort. The surface water samples collected were intended to be representative of shallow groundwater. Surface water sample 15NC09SW004 was a duplicate of primary surface water sample 15NC09SW002. The samples were sent to TestAmerica Laboratories, Inc. for analysis of benzene, toluene, ethylbenzene, and xylenes, gasoline range organics, DRO/RRO, PCB, polynuclear aromatic hydrocarbons, and total and dissolved Resource Conservation and Recovery Act 8 metals plus nickel, vanadium, and zinc. Surface water analytical results were compared to groundwater cleanup levels identified in the *2009 HTRW Decision Document* (USACE, 2009a) and to groundwater cleanup levels identified in *Table C – Groundwater Cleanup Levels found in 18 AAC 75.345* (ADEC, 2014). None of the 2015 surface water samples collected at the Site 9 landfill contained analytes with concentrations that exceeded either ADEC groundwater cleanup levels or the alternative site-specific cleanup levels identified in the *2009 HTRW Decision Document* (USACE, 2009a). A Chemical Data Quality Report (CDQR) has been prepared by the project chemist which is located in Appendix F. Attachments to the CDQR include a sample summary table, a completed ADEC Data Review Checklist, project laboratory variance requests, and current laboratory certifications.

2015 surface water sampling results are presented in Table 6-1. Sample locations are depicted on Figure 4.

(Intentionally blank)

Table 6-1 2015 Site 9 Housing and Operations Landfill Surface Water Sampling Results

		Sample ID			15NC09SW001	15NC09SW002	15NC09SW004	15NC09SW003
		Laboratory ID			580-52566-18	580-52566-19	580-52566-21	580-52566-20
		Location ID			SW001	SW002	SW004	SW003
		Collection Date			8/11/2015 14:00	8/11/2015 14:30	8/11/2015 14:35	8/11/2015 14:50
Analytical Method	Analyte	Units	ADEC Groundwater Cleanup Levels[1]	2009 Decision Document Groundwater Cleanup Levels[2]			Field Duplicate	
6020A	Total Arsenic	mg/L	0.01	0.01	ND [0.0040]	ND [0.0040]	ND [0.0040]	ND [0.0040]
6020A	Total Barium	mg/L	2.0	NE	0.009	0.0072	0.007	0.01
6020A	Total Cadmium	mg/L	0.005	NE	ND [0.00030]	ND [0.00030]	ND [0.00030]	ND [0.00030]
6020A	Total Chromium	mg/L	0.1	NE	ND [0.0015]	ND [0.0015]	ND [0.0015]	ND [0.0015]
6020A	Total Lead	mg/L	0.015	0.015	ND [0.00050]	ND [0.00050]	ND [0.00050]	ND [0.00050]
6020A	Total Nickel	mg/L	0.1	NE	ND [0.0050]	ND [0.0050]	ND [0.0050]	ND [0.0050]
6020A	Total Selenium	mg/L	0.05	NE	ND [0.0040]	ND [0.0040]	ND [0.0040]	ND [0.0040]
6020A	Total Silver	mg/L	0.1	NE	ND [0.00035] QL	ND [0.00035]	ND [0.00035]	ND [0.00035]
6020A	Total Vanadium	mg/L	0.26	NE	ND [0.010]	ND [0.010]	ND [0.010]	ND [0.010]
6020A	Total Zinc	mg/L	5.0	NE	ND [0.020]	ND [0.020]	ND [0.020]	ND [0.020]
7470A	Total Mercury	mg/L	0.002	NE	ND [0.00010] QL	ND [0.00010]	ND [0.00010]	ND [0.00010]
6020A	Dissolved Arsenic	mg/L	0.01	0.01	ND (0.0040)	ND (0.0040)	ND (0.0040)	ND (0.0040)
6020A	Dissolved Barium	mg/L	2.0	NE	0.0070	0.0061	0.0065	0.0063
6020A	Dissolved Cadmium	mg/L	0.005	NE	0.00030 J B	0.00041 J B	0.00042 J B	0.00027 J B
6020A	Dissolved Chromium	mg/L	0.1	NE	ND (0.0015)	ND (0.0015)	0.00076 J	ND (0.0015)
6020A	Dissolved Lead	mg/L	0.015	0.015	ND (0.00050)	ND (0.00050)	ND (0.00050)	ND (0.00050)
6020A	Dissolved Nickel	mg/L	0.1	NE	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)

Table 6-1 2015 Site 9 Housing and Operations Landfill Surface Water Sampling Results (continued)

		Sample ID			15NC09SW001	15NC09SW002	15NC09SW004	15NC09SW003
		Laboratory ID			580-52566-18	580-52566-19	580-52566-21	580-52566-20
		Location ID			SW001	SW002	SW004	SW003
		Collection Date			8/11/2015 14:00	8/11/2015 14:30	8/11/2015 14:35	8/11/2015 14:50
Analytical Method	**Analyte**	**Units**	**ADEC Groundwater Cleanup Levels[1]**	**2009 Decision Document Groundwater Cleanup Levels[2]**			**Field Duplicate**	
6020A	Dissolved Selenium	mg/L	0.05	NE	ND (0.0040)	ND (0.0040)	ND (0.0040)	ND (0.0040)
6020A	Dissolved Silver	mg/L	0.1	NE	ND (0.00035)	ND (0.00035)	ND (0.00035)	ND (0.00035)
6020A	Dissolved Vanadium	mg/L	0.26	NE	ND (0.010)	ND (0.010)	ND (0.010)	ND (0.010)
6020A	Dissolved Zinc	mg/L	5.0	NE	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.020)
7470A	Dissolved Mercury	mg/L	0.002	NE	0.000067 J	ND (0.00010)	ND (0.00010)	0.00017 J
8082A	PCB-1016	mg/L	0.0005	NE	ND [0.000083] QN	ND [0.000091]	ND [0.000088]	ND [0.000085]
8082A	PCB-1221	mg/L	0.0005	NE	ND [0.000062] QN	ND [0.000068]	ND [0.000066]	ND [0.000063]
8082A	PCB-1232	mg/L	0.0005	NE	ND [0.0001] QN	ND [0.00011]	ND [0.00011]	ND [0.00011]
8082A	PCB-1242	mg/L	0.0005	NE	ND [0.0001] QN	ND [0.00011]	ND [0.00011]	ND [0.00011]
8082A	PCB-1248	mg/L	0.0005	NE	ND [0.000083] QN	ND [0.000091]	ND [0.000088]	ND [0.000085]
8082A	PCB-1254	mg/L	0.0005	NE	ND [0.000062] QN	ND [0.000068]	ND [0.000066]	ND [0.000063]
8082A	PCB-1260	mg/L	0.0005	NE	ND [0.000083] QN	ND [0.000091]	ND [0.000088]	ND [0.000085]
8260C	Benzene	mg/L	0.005	0.005	ND [0.001]	ND [0.001]	ND [0.001]	ND [0.001]
8260C	Ethylbenzene	mg/L	0.7	0.7	ND [0.001]	ND [0.001]	ND [0.001]	ND [0.001]
8260C	Toluene	mg/L	1.0	NE	ND [0.001]	ND [0.001]	ND [0.001]	ND [0.001]
8260C	Xylene, Isomers m & p	mg/L	10	NE	ND [0.0005]	ND [0.0005]	ND [0.0005]	ND [0.0005]
8260C	o-Xylene	mg/L	10	NE	ND [0.001]	ND [0.001]	ND [0.001]	ND [0.001]

Table 6-1 2015 Site 9 Housing and Operations Landfill Surface Water Sampling Results (continued)

		Sample ID			15NC09SW001	15NC09SW002	15NC09SW004	15NC09SW003
		Laboratory ID			580-52566-18	580-52566-19	580-52566-21	580-52566-20
		Location ID			SW001	SW002	SW004	SW003
		Collection Date			8/11/2015 14:00	8/11/2015 14:30	8/11/2015 14:35	8/11/2015 14:50
Analytical Method	Analyte	Units	ADEC Groundwater Cleanup Levels[1]	2009 Decision Document Groundwater Cleanup Levels[2]			Field Duplicate	
8270DSIM	1-Methylnaphthalene	mg/L	0.15	NE	ND [0.0000052] H	ND [0.0000057] H	ND [0.0000055] H	ND [0.0000056] H
8270DSIM	2-Methylnaphthalene	mg/L	0.15	NE	ND [0.00001] H	ND [0.000011] H	ND [0.000011] H	ND [0.000011] H
8270DSIM	Acenaphthene	mg/L	2.2	NE	ND [0.00001] H	ND [0.000011] H	ND [0.000011] H	ND [0.000011] H
8270DSIM	Acenaphthylene	mg/L	2.2	NE	ND [0.00001] H	ND [0.000011] H	ND [0.000011] H	ND [0.000011] H
8270DSIM	Anthracene	mg/L	11	NE	ND [0.0000052] H QL	ND [0.0000057] H QL	ND [0.0000055] H QL	ND [0.0000056] H QL
8270DSIM	Benzo(a)anthracene	mg/L	0.0012	NE	ND [0.00001] H	ND [0.000011] H	ND [0.000011] H	ND [0.000011] H
8270DSIM	Benzo(a)pyrene	mg/L	0.0002	NE	ND [0.00001] H QL	ND [0.000011] H QL	ND [0.000011] H QL	ND [0.000011] H QL
8270DSIM	Benzo(b)fluoranthene	mg/L	0.0012	NE	ND [0.00001] H	ND [0.000011] H	ND [0.000011] H	ND [0.000011] H
8270DSIM	Benzo(g,h,i)perylene	mg/L	1.1	NE	ND [0.00001] H	ND [0.000011] H	ND [0.000011] H	ND [0.000011] H
8270DSIM	Benzo(k)fluoranthene	mg/L	0.012	NE	ND [0.00001] H	ND [0.000011] H	ND [0.000011] H	ND [0.000011] H
8270DSIM	Chrysene	mg/L	0.12	NE	ND [0.00001] H	ND [0.000011] H	ND [0.000011] H	ND [0.000011] H
8270DSIM	Dibenzo(a,h)anthracene	mg/L	0.00012	NE	ND [0.00001] H	ND [0.000011] H	ND [0.000011] H	ND [0.000011] H
8270DSIM	Fluoranthene	mg/L	1.5	NE	ND [0.00001] H	ND [0.000011] H	ND [0.000011] H	ND [0.000011] H
8270DSIM	Fluorene	mg/L	1.5	NE	ND [0.00001] H	ND [0.000011] H	ND [0.000011] H	ND [0.000011] H
8270DSIM	Indeno(1,2,3-cd)pyrene	mg/L	0.0012	NE	ND [0.00001] H	ND [0.000011] H	ND [0.000011] H	ND [0.000011] H

Table 6-1 2015 Site 9 Housing and Operations Landfill Surface Water Sampling Results (continued)

				Sample ID	15NC09SW001	15NC09SW002	15NC09SW004	15NC09SW003
				Laboratory ID	580-52566-18	580-52566-19	580-52566-21	580-52566-20
				Location ID	SW001	SW002	SW004	SW003
				Collection Date	8/11/2015 14:00	8/11/2015 14:30	8/11/2015 14:35	8/11/2015 14:50
Analytical Method	Analyte	Units	ADEC Groundwater Cleanup Levels[1]	2009 Decision Document Groundwater Cleanup Levels[2]			Field Duplicate	
8270DSIM	Naphthalene	mg/L	0.73	NE	ND [0.00001] H	ND [0.000011] H	ND [0.000011] H	ND [0.000011] H
8270DSIM	Phenanthrene	mg/L	11	NE	ND [0.00001] H	ND [0.000011] H	ND [0.000011] H	ND [0.000011] H
8270DSIM	Pyrene	mg/L	1.1	NE	ND [0.00001] H	ND [0.000011] H	ND [0.000011] H	ND [0.000011] H
AK101	GRO (C6-C10)	mg/L	2.2	1.3	ND [0.044]	ND [0.044]	ND [0.044]	ND [0.044]
AK102	DRO (C10-C25)	mg/L	1.5	1.5	0.15	0.1	0.1	0.13
AK103	RRO (C25-C36)	mg/L	1.1	1.1	0.079 J	0.049J	0.045 J	0.081 J
Field Tested	Turbidity	NA	NTU	NE	25.6	1.19	1.14	1.19

Notes:
[1]ADEC Table C Groundwater Cleanup Levels identified in *Title 18 Alaska Administrative Code (AAC) Chapter 75, Section 345* (ADEC, 2014)
[2]Northeast Cape Alternative Site-Specific Groundwater Cleanup Levels identified in Table 1 of *2009 HTRW Decision Document* (USACE, 2009a)

AK = Alaska Test Method
B= Analyte detected in a QC blank, sample result may have potential high bias
Field Duplicate = Sample is a duplicate of the preceeding sample
H = Holding time exceeded with potential low bias
J = Result is estimate

mg/L = milligrams per liter
NA = Not applicable
ND = Result is non-detect with Limit of Detection (LOD) in parentheses
NE = not established
NS = not specified in the 2009 Decision Document or ADEC regulations

QL = Quality issue with potential low bias
QN = One or more quality parameters was out of control with no directional bias.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Bristol was successful in the completion of the scoped 2015 Site 7 Cargo Beach Road and Site 9 Housing and Operations Landfill caps visual inspection and surface water sampling event that was performed August 11 - 15, 2015. None of the analytical results for the three primary and one duplicate surface water samples that were collected at the Site 9 Housing and Operations Landfill site during the 2015 landfill inspection effort exceeded applicable surface water cleanup levels.

Both the Site 7 Cargo Beach Road and Site 9 Housing and Operations Landfills remain stable, with no obvious signs of degradation. Bristol recommends continued periodic landfill visual inspections at the Site 7 Cargo Beach Road Landfill as stated in the *Site 7 Periodic Review Report* (USACE, 2015). Bristol also recommends continued periodic landfill visual inspections at the Site 9 Housing and Operations Landfill as stated in the *HTRW Decision Document* (USACE, 2009a). Long-term monitoring of surface water at Site 9 Housing and Operations Landfill in accordance with the *HTRW Decision Document* (USACE, 2009a) is also recommended to demonstrate that shallow groundwater meets the remedial action objectives for a non-drinking water source.

(Intentionally blank)

8.0 REFERENCES

Alaska Department of Environmental Conservation. (ADEC). (2014). *Title 18 Alaska Administrative Code, Chapter 75 – Oil and Other Hazardous Substances Pollution Control*. October 1.

Bristol Environmental Remediation Services, LLC. (Bristol). (2011) *Northeast Cape HTRW Remedial Actions Final Report.* Northeast Cape, Saint Lawrence Island, Alaska: USACE. FIIP No. F10AK096903_07.08_0502_a; 200-1e. July.

Bristol. (2014). *Northeast Cape HTRW Remedial Action Work Plan* (Revision 1). Northeast Cape, Saint Lawrence Island, Alaska: USACE. FIIP Nos. F10AK096903_07.04_0511_p; 200-1f and F10AK096905_07.04_0512_p; 200-1f. December.

Bristol. (2015). *2014 Northeast Cape HTRW Remedial Actions Work Plan Addendum* (Revision 1). Northeast Cape, Saint Lawrence Island, Alaska: USACE. FIIP Nos. F10AK096903_07.04_0512_p; 200-1f and F10AK096905_07.04_0513_p; 200-1f. August.

Ferrians, O.J. Jr. (1965). Permafrost Map of Alaska: U.S. Geological Survey Miscellaneous Geologic Investigations. Map 445, 1 sheet, scale 1:2,500,000.

Medical Surveillance. (2014). Title 29 *Code of Federal Regulations,* Part 1910.120(f).

Montgomery Watson. (1995). *Remedial Investigation.* Northeast Cape, St. Lawrence Island, Alaska: USACE. FIIP No. F10AK096903_03.10_0001_a; 200-1e. January.

Montgomery Watson Harza Americas, Inc. (MWH). (2003). *Phase III Remedial Investigation* (Final). Northeast Cape, St. Lawrence Island, Alaska: USACE. March.

Shannon & Wilson, Inc. (2005). *Phase IV Remedial Investigation* (final). Northeast Cape, Saint Lawrence Island, Alaska: USACE. June.

US Army Corps of Engineers – Alaska District. (USACE). (2002). *Engineering Evaluation and Cost Analysis, Environmental Assessment and Finding of No Significant Impact, White Alice Site Removal Action.* Northeast Cape, Saint Lawrence Island, Alaska. March.

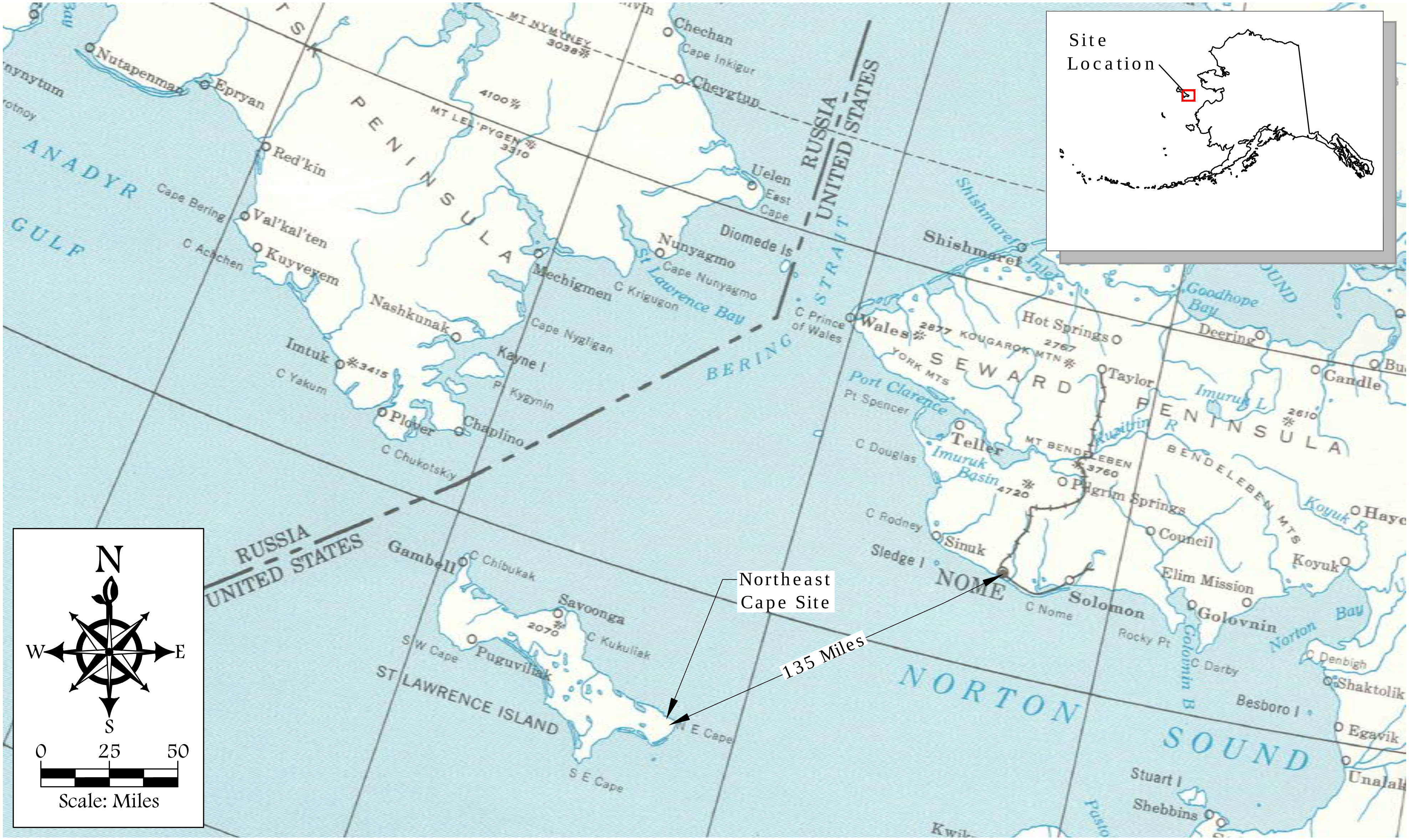
USACE. (2009a). *Decision Document, Hazardous, Toxic, and Radioactive Waste (HTRW).* Northeast Cape Formerly Used Defense Site (FUDS), St. Lawrence Island, Alaska. Project #F10AK096903. FIIP No. F10AK096903_05.09_0500_a; 200-1e. January.

USACE. (2009b). *Decision Document, Site 7 Cargo Beach Road Landfill, Containerized Hazardous, Toxic, and Radioactive Waste (CON-HTRW).* Northeast Cape Formerly Used Defense Site (FUDS), St. Lawrence Island, Alaska. Project #F10AK096905. FIIP No. F10AK096905_05.09_0500_a; 200-1e. June.

USACE. (2015). *First Periodic Review Report, Site 7 Cargo Beach Road Landfill*, Final Northeast Cape FUDS, Northeast Cape, St. Lawrence Island, Alaska. Formerly Used Defense Site No. F10AK0969-05. FIIP No. F10AK096905_07.11_0506_p; 200-1f. February.

United States Census Bureau. (USCB). (2016). 2010 Population Finder. Retrieved from: http://www.census.gov/popfinder/. U.S. Department of Commerce.

FIGURES

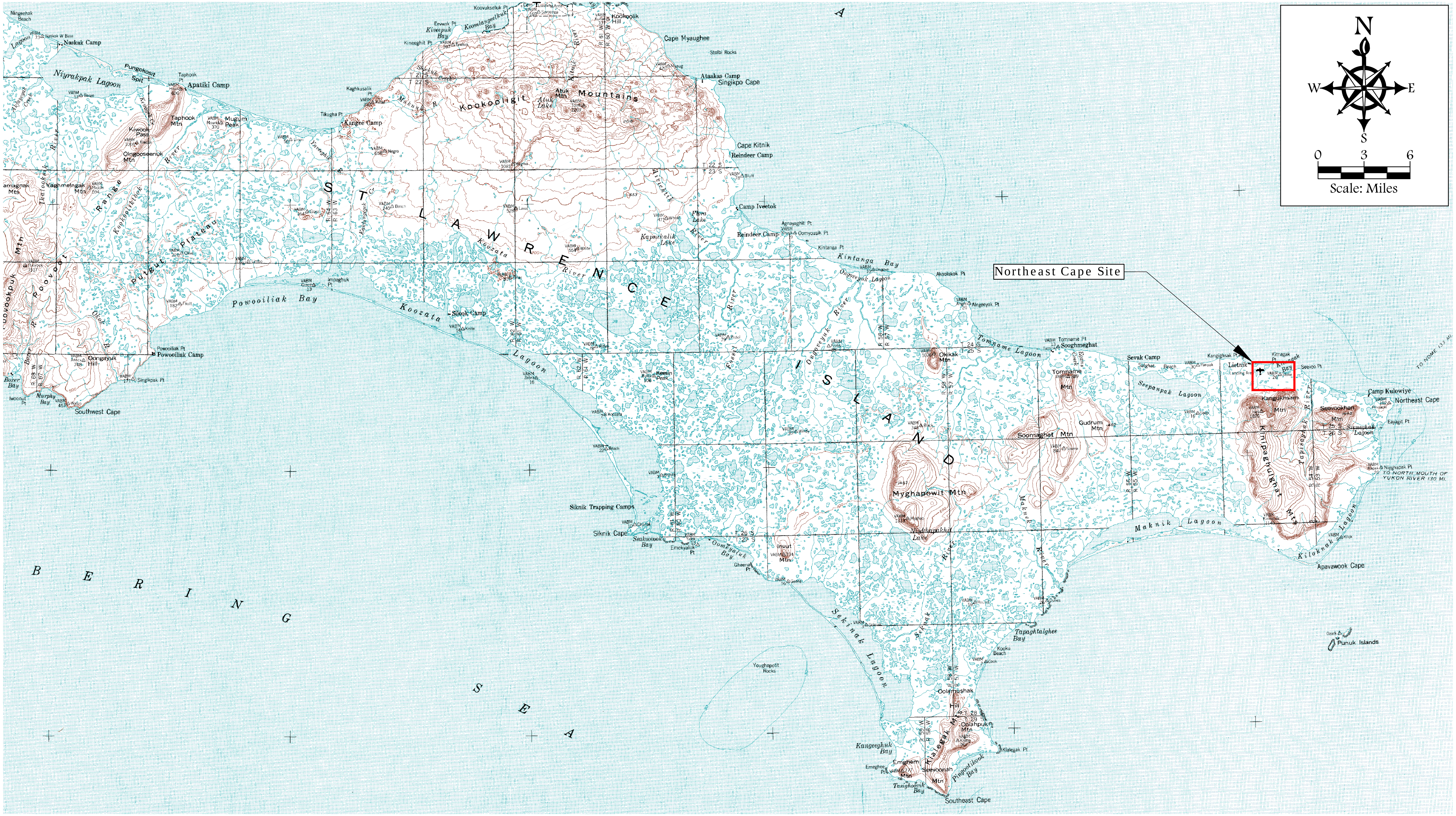


Note:
FUDS formerly used defense site

Source:
USGS National Atlas Sheet Number 42-43

FIGURE 1
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA
NORTHEAST CAPE FUDS
VICINITY MAP

DATUM: N/A	PROJECTION: N/A	Project No. 34140087
DATE 02/13/2014	DWN. NAP	SCALE 1" = 50 mi
APPRVD. EB		



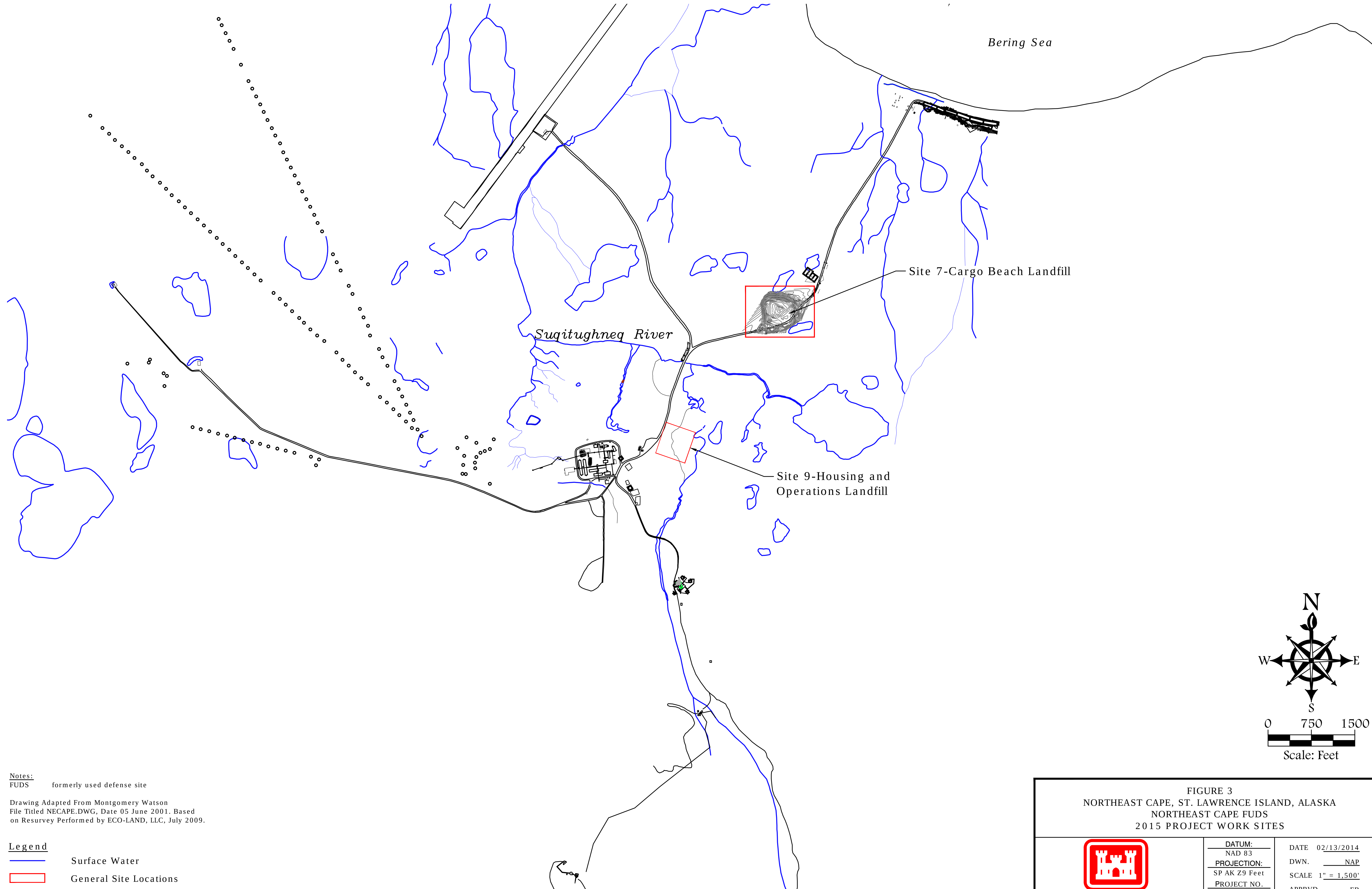
Note:

FUDS	formerly used defense site

FIGURE 2
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA
NORTHEAST CAPE FUDS
LOCATION MAP

DATUM: NAD 27	DATE	02/13/2014
PROJECTION: UTM 2N M	DWN.	NAP
Project No. 34140087	SCALE	1" = 6 mi
	APPRVD.	EB

Drawing: G:\JOBS\34140087_NORTHEAST_CAPE\LANDFILL CAP REPORT_REV1\MAPS\FIGURE2.DWG - Layout: 11 X 17
User: NPEACOCK Mar 10, 2016 - 1:50pm Xrefs: - Images: SAINT_LAWRENCE_QUAD.TIF



Notes:
FUDS formerly used defense site

Drawing Adapted From Montgomery Watson
File Titled NECAPE.DWG, Date 05 June 2001. Based
on Resurvey Performed by ECO-LAND, LLC, July 2009.

Legend

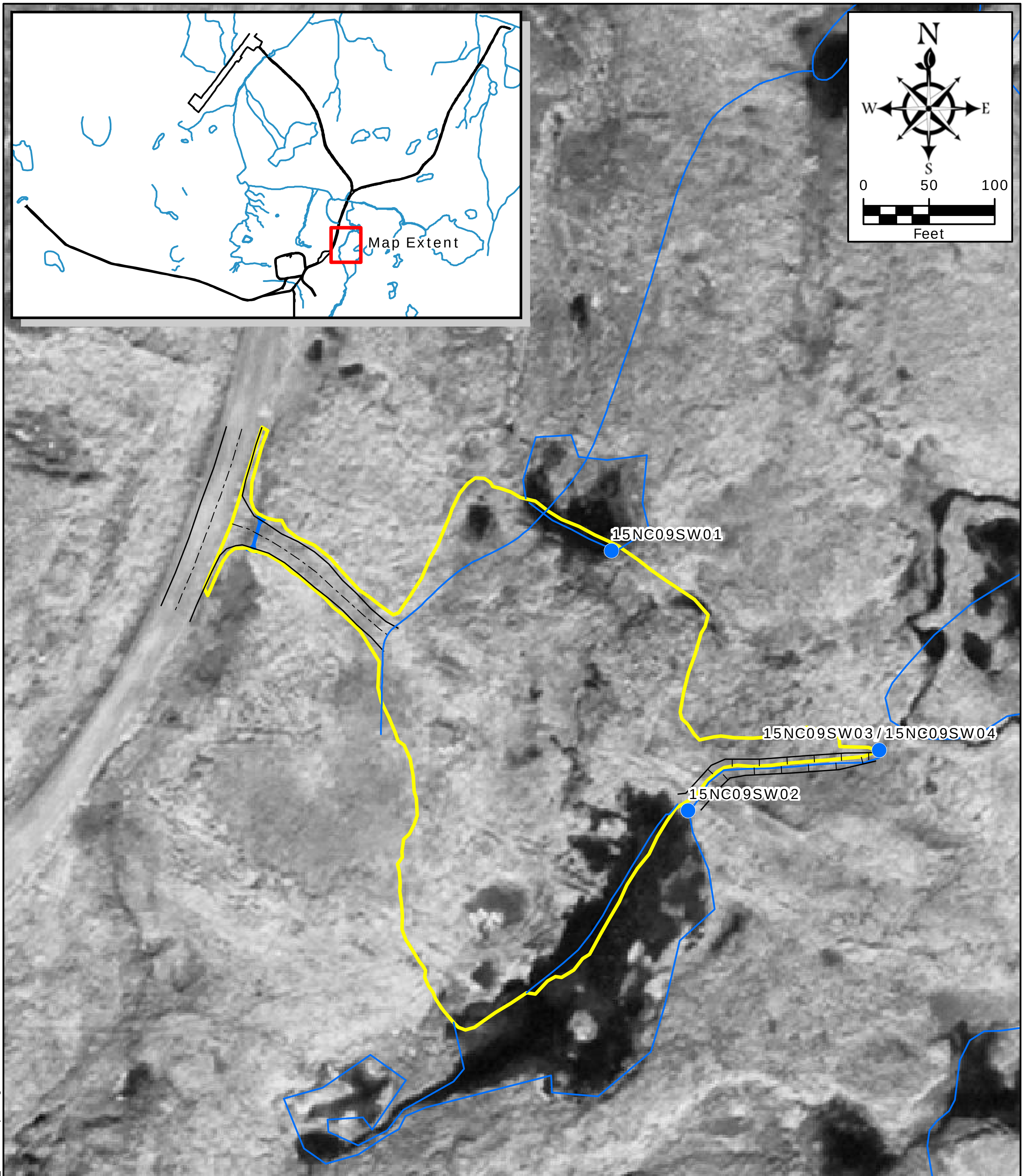
Surface Water

General Site Locations

FIGURE 3
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA
NORTHEAST CAPE FUDS
2015 PROJECT WORK SITES

DATUM: NAD 83	DATE	02/13/2014
PROJECTION: SP AK Z9 Feet	DWN.	NAP
PROJECT NO. 34140087	SCALE	1" = 1,500'
	APPRVD.	EB

Drawing: C:\USERS\NPEACOCK\DESKTOP\LANDFILL CAP REPORT_REV2\MAPS\FIGURE3.DWG - Layout: 11X17
User: NPEACOCK Apr 20, 2016 - 2:49pm Xrefs: - Images:



Notes:
FUDS formerly used defense site

Legend

Surface Water Sample	Road Centerline
Culvert	Road Edge
Cap Boundary	Trench Edge
Hydrology	Pond

FIGURE 4
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA
NORTHEAST CAPE FUDS
2015 SITE 9 SURFACE WATER SAMPLE LOCATIONS

DATUM: NAD 83
PROJECTION: SP AK Z9 FT
Project No. 34140087

DATE: 4/20/2016
DWN. NAP
SCALE 1" = 100'
APPRVD. EB

SHEET 1 of 1

Document Path: C:\Users peacock\Desktop\Landfill Cap Report_Rev2\Maps\Figure4.mxd

APPENDIX A

Right-of-Entry Permit

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
ENVIRONMENTAL ENGINEERING SECTION (EN-EE)
P.O. BOX 6898
JBER, ALASKA 99506-0898

REPLY TO
ATTENTION OF:

01 May 2013

Environmental Engineering Section C-0004

SUBJECT: Northeast Cape Right of Entry Documents, Contract W911KB-13-C-0004, NE Cape HTRW Remedial Action (FY13), Northeast Cape, St. Lawrence Island, Alaska

Bristol Environmental Remediation Services
111 W. 16th Avenue, Suite 301
Anchorage, AK 99501

Gentlemen:

The purpose of this letter is to deliver Northeast Cape Right of Entry (ROE) documents recently signed by members of Kukulget, Inc. and Sivuqaq, Inc. All personnel (contractor, subcontractors, government, and other visitors) working on the project should be made aware of and adhere to the conditions in the ROE documents. Please include the ROE documents in the 2013 Work Plan.

If you have any questions, please contact the undersigned at 753-5789.

Sincerely,

Ronald S. Broyles

Ronald S. Broyles
Contracting Officer's Representative

DEPARTMENT OF THE ARMY
RIGHT-OF-ENTRY FOR
ENVIRONMENTAL ASSESSMENT AND RESPONSE

The undersigned, hereinafter called the "**Owner**", in consideration of the mutual benefits of the work described below, hereby grants to the **UNITED STATES OF AMERICA**, hereinafter called the "Government", a right-of-entry upon the following terms and conditions:

1. The Owner hereby grants to the Government an irrevocable right to enter in, on, over and across the land described herein, for a period not to exceed five (5) years, **beginning June 1, 2013**, and terminating upon the earlier completion of remediation or the filling of a notice of termination in the local land records by the representative of the United States in charge of the Saint Lawrence Island remediation project, for use by the United States, its representatives, agents, contractors, and assigns, as a work area for environmental investigation and response**;** including the right to store, move, and remove equipment and supplies; erect and remove temporary structures on the land; investigate and collect samples; excavate and remove ordnance and explosive waste, pollutants, hazardous substances, contaminated soils, containerized waste, and replace with uncontaminated soil; excavate and remove all storage tanks (above, at and below ground level), contents and appurtenant piping; demolish and dispose of former military structures and debris; construct, operate, maintain, alter, repair and remove groundwater monitoring wells, groundwater purification and injection systems, appurtenances thereto and other devices for the monitoring and treatment of contamination in soil, air and water; and perform any other such work which may be necessary and incident to the Government's use for the environmental investigation and response on said lands; subject to existing easements for public roads and highways, public utilities, railroads and pipelines; reserving, however, to the landowner(s), their heirs, executors, administrators, successors and assigns, all such right, title, interest and privilege as may be used and enjoyed without interfering with or abridging the rights and right-of-entry hereby acquired.

2. The Owner also grants the right to enter and exit over and across any other lands of the Owner as necessary to use the described lands for the purposes listed above.

3. All tools, equipment, and other property taken upon or placed upon the land by the Government shall remain the property of the Government and may be removed by the Government at any time within a reasonable period after the expiration of this permit or right-of-entry.

4. Upon expiration or termination of this right-of-entry, the Government shall assure restoration of the ground contour and replace any pavement or other cover which was removed or damaged for this work, establish a groundcover of grass on areas not otherwise covered and reconnect any operating utility lines which were required to be disconnected or otherwise disrupted.

5. If any action of the Government's employees or agents in the exercise of this right-of-entry results in damage to the real property, the Government will, in its sole discretion, either repair such damage or make an appropriate settlement with the Owner. In no event shall such repair or settlement exceed the fair market value of the fee title to the real property at the time immediately preceding such damage. The Government's liability under this clause is subject to the availability of appropriations for such payment, and nothing contained in this agreement may be considered as implying that Congress will at a later date appropriate funds sufficient to meet any deficiencies. The provisions of this clause are without prejudice to any rights the Owner may have to make a claim under applicable laws for any damages other than those provided for herein.

6. The land affected by this right-of-entry is located in the State of Alaska, and is described as follows:

All surface and subsurface rights on Saint Lawrence Island, Alaska, within;
Township 25 South, Range 54 West, Kateel River Meridian

WITNESS MY HAND AND SEAL this 24 day of April, 2013.

Kukulget, Inc.

Authorized Signature

Morris Toolie, Jr. - President

P.O. Box 160
Savoonga, Alaska 99769

(907) 984-6184

Sivuqaq, Inc.

Authorized Signature

Rodney Ungwiluk, Jr. – President

P.O. Box 101
Gambell, AK 99742

907) 985-5826

UNITED STATES OF AMERICA

Thomas M. Kretzschmar
Chief, Real Estate Division
US Army Engineer District, AK
P.O. Box 6898
JBER, Alaska 99506-0898
FAX 907-753-1836

5. If any action of the Government's employees or agents in the exercise of this right-of-entry results in damage to the real property, the Government will, in its sole discretion, either repair such damage or make an appropriate settlement with the Owner. In no event shall such repair or settlement exceed the fair market value of the fee title to the real property at the time immediately preceding such damage. The Government's liability under this clause is subject to the availability of appropriations for such payment, and nothing contained in this agreement may be considered as implying that Congress will at a later date appropriate funds sufficient to meet any deficiencies. The provisions of this clause are without prejudice to any rights the Owner may have to make a claim under applicable laws for any damages other than those provided for herein.

6. The land affected by this right-of-entry is located in the State of Alaska, and is described as follows:

All surface and subsurface rights on Saint Lawrence Island, Alaska, within;
Township 25 South, Range 54 West, Kateel River Meridian

WITNESS MY HAND AND SEAL this 20th day of April, 2013.

Kukulget, Inc.

Authorized Signature

Morris Toolie, Jr. - President

P.O. Box 160
Savoonga, Alaska 99769

(907) 984-6184

Sivuqaq, Inc.

Authorized Signature

Archie Ungwiluk, President

P.O. Box 101
Gambell, AK 99742

907) 985-5826

UNITED STATES OF AMERICA

Thomas M. Kretzschmar
Chief, Real Estate Division
US Army Engineer District, AK
P.O. Box 6898
JBER, Alaska 99506-0898
FAX 907-753-1836

NO. DACA85-8-12-00046

SAINT LAWRENCE ISLAND, ALASKA

3

Kukulget Inc.
P.O. Box 160
Savoonga, AK.
99769

Phone/Fax (907)-984-6184

April 23, 2013

Mr. Thomas M. Kretzschmar
Chief, Real Estate Division
US Army Engineer District, AK
P. O. B0x 6898
JBER, Alaska 99506-0898

Dear Mr. Kretzschmar:

The Board of Director's held a meeting April 5, 2013 and these items shall be considered for the upcoming project at Northeast Cape starting June 1, 2013:

1. Fishing only at the mouth of Tapisak River

2. There shall not be any beachcombing by project employees

3. There shall not be any 4 wheeler riding or any type of land mode transportation on Lands other than stated in the Project's use.

Thank you and please consider these issues as we did not revise the Right of Entry Contract with these additions.

Sincerely yours,

Morris Toolie, Jr.
President

APPENDIX B

Monthly Status Reports

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

2011, 2013 and 2014 Northeast Cape HTRW Remedial Actions
Contracts: W911KB-06-D-0007 TO 0007, W911KB-13-C-0004, and W911KB-14-D-0006 TO 0002
Monthly Status Report
December 9, 2014 through January 11, 2015

Submitted on 1/12/2015

Summary of Work Tasks December 9 through January 11, 2014

- Bristol is completing in-town demobilization activities.
  - The last pieces of rental equipment have been returned.
  - Repairs and maintenance are being performed on heavy equipment and vehicles that were used at NE Cape.
- Bristol finalized the 2014 Work Plan and submitted the document to the USACE on 12/18/2014.
- Bristol finalized the 2013 HTRW RA Report and the Site 28 Tech Memo Addendum. The reports are currently with Bristol's technical editing/formatting team and will be submitted on 1/13/2015.
- Bristol has received the very first disposal documents for Site 28 sediment and miscellaneous debris.
- Bristol is working on the 2014 HTRW RA Report and the CDQR. Anticipated delivery date is 1/30/2015.

Subcontractors

- Eco-Land surveyors submitted the final data delivery package on 12/10/2014.
- Bristol is in the process of closing subcontracts with Fairweather, TestAmerica and Global Services

USACE and ADEC Correspondence

- 12/22/2014 – J. Craner emailed R. James with some minor corrections that needed to be made to the 2014 work plan regarding the FRMD number of the document. Bristol made the changes and delivered the edited sheets and CDs to the USACE on 12/30/2014.
- 12/29/2014 – J. Craner emailed copies of signed manifests to R. James. The manifests were related to miscellaneous debris shipped from NE Cape.
- 1/8/2015 – R. James emailed V. Palmer and J. Craner with questions regarding final report deliverables. The FRMD request sheet was submitted to the USACE for the final 2013 reports. The USACE returned the FRMD document sheet to Bristol.

Project Schedule

- Waste disposal is ongoing
- 1/12/2015 thru 1/23/2015 – Maintenance and repair to heavy equipment used at NE Cape.
- 1/13/2015 – Submittal of final 2013 HTRW RA Report and Site 28 Tech Memo Addendum
- 1/30/2015 – Submittal of draft 2014 RA Report
- March, 2015 – Submittal of draft-final 2014 RA Report
- Late April/Early May, 2015 – Submittal of final 2014 RA Report and contract closeout

Payments and Invoices

- Bristol paid approximately $76,677 to subcontractors and vendors during the period 12/9/2014 thru 1/11/2015 for Contract W911KB-14-D-0006 TO 0002.
- Bristol paid approximately $34,854 to vendors during the period 12/9/2014 thru 1/11/2015 for Contract W911KB-13-C-0004.
- Bristol paid $6,250 to subcontractors and vendors during the period 12/9/2014 thru 1/11/2015 for Contract W911KB-06-D-0007 TO 0007.

Work Underway

- Bristol is printing and binding the 2013 HTRW RA Report and will submit on Tuesday, 1/13/2015.
- The 2014 HTRW RA Report and CDQR are currently being written.
- Bristol is organizing equipment and supplies that have returned from NE Cape and performing maintenance and repairs on heavy equipment.
- Bulk bags are in transit to the disposal facility.

Work Planned for the Upcoming Month

- Submit 2013 RA Report, Site 28 Tech Memo and the Draft 2014 HTRW RA Report
- Closeout subcontracts.
- Complete waste disposal and receive disposal paperwork from Waste Management.

Accident/Exposure Hours

- During the period 12/9/2014 thru 1/11/2015, Bristol has worked 181.00 hours for contract W911KB-06-D-0007 TO 007
- During the period 12/9/2014 thru 1/11/2015, Bristol has worked 210.75 hours for contract W911KB-13-C-0004
- During the period 12/9/2014 thru 1/11/2015, Bristol has worked 352.50 hours for contract W911KB-14-D-0006 TO 0002

Bristol
ENVIRONMENTAL
REMEDIATION SERVICES, LLC

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

2011, 2013 and 2014 Northeast Cape HTRW Remedial Actions
Contracts: W911KB-06-D-0007 TO 0007, W911KB-13-C-0004, and W911KB-14-D-0006 TO 0002
Monthly Status Report
January 12, 2015 through February 11, 2015

Submitted on 2/11/2015

Summary of Work Tasks January 12 through February 11, 2015

- Bristol is completing in-town demobilization activities.
  - Repairs and maintenance are being performed on heavy equipment and vehicles that were used at NE Cape.
  - Conex containers are being organized in the Bristol storage yard.
- Bristol finalized the 2013 HTRW RA Report and the Site 28 Tech Memo Addendum. The reports are currently with Bristol's technical editing/formatting team and will be submitted on 1/13/2015.
- Bristol has received the very first disposal documents for Site 28 sediment and miscellaneous debris.
- Bristol is working on the 2014 HTRW RA Report and the CDQR. Anticipated delivery date is 1/30/2015.

Subcontractors

- Eco-Land surveyors submitted the final data delivery package on 12/10/2014.
- Bristol is in the process of closing subcontracts with Fairweather, TestAmerica and Global Services

USACE and ADEC Correspondence

- 12/22/2014 – J. Craner emailed R. James with some minor corrections that needed to be made to the 2014 work plan regarding the FRMD number of the document. Bristol made the changes and delivered the edited sheets and CDs to the USACE on 12/30/2014.
- 12/29/2014 – J. Craner emailed copies of signed manifests to R. James. The manifests were related to miscellaneous debris shipped from NE Cape.
- 1/8/2015 – R. James emailed V. Palmer and J. Craner with questions regarding final report deliverables. The FRMD request sheet was submitted to the USACE for the final 2013 reports. The USACE returned the FRMD document sheet to Bristol.

Project Schedule

- Waste disposal is ongoing
- 1/12/2015 thru 1/23/2015 – Maintenance and repair to heavy equipment used at NE Cape.
- 1/13/2015 – Submittal of final 2013 HTRW RA Report and Site 28 Tech Memo Addendum
- 1/30/2015 – Submittal of draft 2014 RA Report
- March, 2015 – Submittal of draft-final 2014 RA Report
- Late April/Early May, 2015 – Submittal of final 2014 RA Report and contract closeout

Payments and Invoices

- Bristol paid approximately $76,677 to subcontractors and vendors during the period 12/9/2014 thru 1/11/2015 for Contract W911KB-14-D-0006 TO 0002.
- Bristol paid approximately $34,854 to vendors during the period 12/9/2014 thru 1/11/2015 for Contract W911KB-13-C-0004.
- Bristol paid $6,250 to subcontractors and vendors during the period 12/9/2014 thru 1/11/2015 for Contract W911KB-06-D-0007 TO 0007.

Work Underway

- Bristol is printing and binding the 2013 HTRW RA Report and will submit on Tuesday, 1/13/2015.
- The 2014 HTRW RA Report and CDQR are currently being written.
- Bristol is organizing equipment and supplies that have returned from NE Cape and performing maintenance and repairs on heavy equipment.
- Bulk bags are in transit to the disposal facility.

Work Planned for the Upcoming Month

- Submit 2013 RA Report, Site 28 Tech Memo and the Draft 2014 HTRW RA Report
- Closeout subcontracts.
- Complete waste disposal and receive disposal paperwork from Waste Management.

Accident/Exposure Hours

- During the period 12/9/2014 thru 1/11/2015, Bristol has worked 181.00 hours for contract W911KB-06-D-0007 TO 007
- During the period 12/9/2014 thru 1/11/2015, Bristol has worked 210.75 hours for contract W911KB-13-C-0004
- During the period 12/9/2014 thru 1/11/2015, Bristol has worked 352.50 hours for contract W911KB-14-D-0006 TO 0002

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

2013 and2014 Northeast Cape HTRW Remedial Actions
Contracts: W911KB-13-C-0004, and W911KB-14-D-0006 TO 0002
Monthly Status Report
February 12, 2015 through April 15, 2015

Submitted on 4/16/2015

Summary of Work Tasks February 12 through April 15, 2015

- Primary work tasks during this period focused on the 2014 RA Report.
- Bristol submitted the draft 2014 HTRW RA Report and the CDQR on 1/30/2015. Comments have been received and addressed. A comment resolution meeting was held with the USACE on 4/1/2015. Bristol initiated work on the draft-final 2014 RA Report. Anticipated submittal of the draft-final 2014 RA Report is 4/24/2015.

Subcontractors

- Bristol is self-performing remaining tasks for the Northeast Cape project.

USACE and ADEC Correspondence

- 02/12/2015 – J. Craner emailed G. Jarrell, R. Broyles and V. Palmer with a portion of the USACE's comments on the draft 2014 RA Report.
- 02/25/2015 – Bristol received final payment for the 2013 NE Cape contract in the amount of $10,114.31.
- 03/6/2015 – J. Craner emailed the remaining comments from A. Shewman and S. Benjamin on the 2014 RA Report.
- 3/16/2015 – Bristol returned responses to the USACE comments on the 2014 RA Report.
- 3/17/2015 – J. Craner acknowledges receipt of Bristol's responses to USACE comments.
- 3/23/2015 – R. Broyles emailed Bristol to request a comment resolution meeting. Bristol provided available times to the USACE and a meeting was set for 4/1/2015 at 1:30 PM at the USACE offices.
- 3/31/2015 – Bristol submitted pay estimate 08 for the 2014 NE Cape project in the amount of $52,915.87 to R. Broyles. R. Broyles signed the pay estimate and returned to Bristol on 4/1/2015. Bristol sent the R. Broyles invoice 34140087-08 on 4/3/2015.
- 4/1/2015 – G. Jarrell, R. James and M. Hannah attended a comment resolution meeting at the USACE offices at 1:30 PM. In attendance: V. Palmer, A. Shewman, J. Craner, R. Broyles, L. Geist and S. Benjamin.
- 4/2/2015 – J. Craner emailed to Bristol the USACE's acceptance of Bristol's responses to comments on the draft 2014 RA Report. The comment sheets contained notes from the comment resolution meeting conducted on 4/1/2015.

- 4/7/2015 – Bristol emailed A. Shewman a revised write-up of the MNA section for the 2014 RA Report for review.

Project Schedule

- 4/15/2015 thru 4/24/2015 – The draft-final 2014 NE Cape RA Report is being edited and formatted and will be submitted to the USACE by 4/24/2015.
- 5/1/2015 – Work is anticipated to begin on the 2015 Work Plan Addendum for monitoring well sampling in August, 2015. Anticipated submittal date for Work Plan Addendum is mid- to late-may, 2015.
- May, 2015 – Receipt of draft-final 2014 RA Report comments.
- Early June, 2015 – Submittal of final 2014 NE Cape RA Report.

Payments and Invoices

- Bristol paid approximately $1,193.05 to vendors during the period 02/12/2015 thru 4/15/2015 for Contract W911KB-14-D-0006 TO 0002.
- Bristol received payment for invoice 34130068-09 on 2/25/2015 in the amount of $10,114.31
- Bristol sent invoice 34140087-08 on 4/3/2015 in the amount of $52.915.87.

Work Underway

- Bristol is in the process of editing and formatting the draft-final 2014 HTRW RA Report and will submit by Friday, 4/24/2015.
- Bristol is performing maintenance and repairs on heavy equipment.

Work Planned for the Upcoming Month

- Submit 2014 draft-final RA Report, Site 28 Tech Memo and the Draft 2014 HTRW RA Report

Accident/Exposure Hours

- During the period 2/12/2015 thru 4/15/2015, Bristol has worked 1,289.75 hours for contract W911KB-13-C-0004
- During the period 2/12/2015 thru 4/15/2015, Bristol has worked 335.50 hours for contract W911KB-14-D-0006 TO 0002

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

2014 Northeast Cape HTRW Remedial Actions
Contract W911KB-14-D-0006, Task Order 0002
Monthly Status Report
April 16, 2015 through June 23, 2015

Submitted on 6/24/2015

Summary of Work Tasks April 16 through June 23, 2015

- Primary work tasks during this period focused on the 2014 RA Report and the Work Plan Addendum for work to be completed in August, 2015.
- Bristol submitted the draft-final 2014 HTRW RA Report on 4/24/2015. Some additional comments have been received from the USACE and will be addressed prior to submission of the final report.
- The draft Work Plan Addendum was submitted to the USACE on 6/23/2015.

Subcontractors

- Bristol is self-performing remaining tasks for the Northeast Cape project.

USACE and ADEC Correspondence

- 04/17/2015 – The monthly status report for time period February 12 thru April 15 was submitted to Palmer, Broyles and Suprenant via email.
- 4/17/2015 – Bristol received Shewman's comments on the MOC monitoring well natural attenuation write-up for the 2014 RA Report. Bristol's James acknowledged receipt via email.
- 4/24/2015 – Bristol submitted the draft-final RA Report. A transmittal letter was emailed to the USACE's Broyles, Craner and Palmer.
- 4/28/2015 – Bristol's Hannah emailed USACE's Utley and Benjamin regarding SEDD. Utley responded via email on 4/28/2015.
- 4/30/2015 – Craner emailed James and Jarrell (Bristol), Palmer (USACE), and Broyles (USACE) acknowledging receipt of the draft-final RA Report. Craner provided one additional correction that needed to be made to Figure 14 and said that the rest of the USACE's comments had been adequately addressed, pending review from a select few. Bristol's James responded and noted that the change would be made to Figure 14.
- 5/4/2015 – Bristol's Hannah emailed Utley regarding SEDD files.
- 5/4/2015 – Bristol submitted pay estimate 09 for the 2014 NE Cape project in the amount of $15,950.51 to R. Broyles. R. Broyles signed the pay estimate and returned to Bristol on 5/4/2015.

- 5/4/2015 – Bristol submitted the monthly record of work-related injuries/illnesses & exposure forms for April, 2015.
- 5/5/2015 – Bristol submitted invoice 34140087-09 to Broyles in the amount of $15,950.51.
- 5/6/2015 – O. Northern emailed B. Burked contract modification 03 in the amount of $221,235.00.
- 5/11/2015 – USACE's Craner emailed Bristol USACE comments on the draft-final RA report. Craner noted that S. Benjamin had some outstanding chemistry comments that needed to be addressed. Craner provided suggestions on how to restructure Appendix I.
- 6/1/2015 – Bristol emailed A. Shewman an updated NE Cape Schedule.
- 6/18/2015 – Bristol emailed the USACE to inform them that the Work Plan Addendum for 2015 sampling would be delivered later than expected.
- 6/23/2015 – The Work Plan Addendum for 2015 monitoring well sampling and landfill cap inspections was delivered to J. Craner.
- 6/23/2015 – Bristol submitted the monthly record of work-related injuries/illnesses & exposure forms for May, 2015

Project Schedule

- 6/24/2015 thru 8/9/2015 – Bristol will prepare equipment/supplies for the monitoring well sampling and landfill cap inspections currently scheduled to begin August 10, 2015.
- Bristol awaits comments from the ADEC on the 2014 draft-final RA report. Comments will be addressed and a final report will be submitted once comments are received.
- Bristol awaits comments on the Work Plan Addendum submitted 6/23/2015. Bristol will address comments and submit the final work plan following receipt of comments and prior to mobilizing for the field effort in August, 2015.

Payments and Invoices

- Bristol paid approximately $4,412.80 to vendors during the period 4/16/2015 thru 6/23/2015.
- Bristol received payment for invoice 34140087-09 on 5/12/2015 in the amount of $15,950.51

Work Underway

- Bristol is in the process of addressing comments on the draft-final report.
- Bristol is planning for the upcoming monitoring well sampling and landfill cap inspections slated for August, 2015.

Work Planned for the Upcoming Month

- Bristol will submit the final Work Plan Addendum that addresses USACE and ADEC comments.

- Bristol will ship some supplies/equipment to Nome in preparation for August sampling and landfill cap inspections.

Accident/Exposure Hours

- During the period 4/16/2015 thru 6/15/2015, Bristol has worked 567 hours for contract W911KB-14-D-0006, Task Order 0002.

Bristol
ENVIRONMENTAL
REMEDIATION SERVICES, LLC

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

2014 Northeast Cape HTRW Remedial Actions
Contract W911KB-14-D-0006, Task Order 0002
Monthly Status Report
24 June 2015 through 9 August 2015

Submitted on 9 August 2015

Summary of Work Tasks 24 June 2015 through 7 August 2015

- Primary work tasks during this period focused on the responding to stakeholder comments on the 2014 Draft-Final RA Report (Revision 1) and the Work Plan Addendum for work to be completed in August 2015.
- The final Work Plan Addendum was submitted to the USACE on 7 August 2015 (Serialized Letter H-0018).
- Conducted mobilization activities for scoped 2015 groundwater sampling and landfill inspection event.

Subcontractors

- Bristol is self-performing remaining tasks for the Northeast Cape project.

USACE and ADEC Correspondence

- 14 July 2015 - Informed USACE of tentative schedule of week of August 10th to perform scheduled fieldwork at NE Cape. Informed by Ron Broyles that ADEC has until 24 July 2015 to submit comments on the Work Plan Addendum.
- 15 July 2015 - Submitted copies of SWPPP NOTs to Jeremy Craner as per request.
- 21 July 2015 - Submitted Bristol RTCs for Work Plan Addendum to USACE for final approval.
- 22 July 2015 - Notified by Valerie Palmer that ADEC and ACAT have confirmed that they will have comments on the Draft-Final RA Report by the end of the day (22 July 2015).
- 23 July 2015 - Received ADEC and ACAT comments on the Draft-Final RA Report from Valerie Palmer.
- 23 July 2015 - Received one more set of comments on Draft-Final RA Report (Revision 1) from TAPP advisor. Comments forwarded to Bristol from Valerie Palmer.
- 27 July 2015 - Bristol received information from Valerie Palmer outlining the yet to be resolved USACE comments from the Draft-Final 2014 RA Report.

- 27 July 2015 - Bristol received clarification from Valerie Palmer about which USACE comments were yet to be resolved for the Draft-Final 2014 RA report, and a reminder that USACE comments are not to be included in the final report; only stakeholders.
- 28 July 2015 - Bristol emailed figure changes to USACE Environmental Engineer for acceptance of changes prior to his departure.
- 28 July 2015 - Bristol received acceptance of the proposed figure changes with one caveat.
- 28 July 2015 - Bristol's Hannah emailed Valerie Palmer to ask for a digital copy of the Jacobs 5 year review.
- 28 July 2015 - Valerie Palmer sent an email stating that the 5 year review document would be available on AMRDEC.
- 30 July 2015 - Bristol's Tyler Ellingboe sent an email asking if Bristol's response to the 2014 Work Plan Addendum were acceptable.
- 30 July 2015 - Bristol received all comment forms for the 2014 Work Plan Addendum from Valerie Palmer with all comments accepted and one comment needing clarification. In addition Palmer instructed Bristol to finalize the Work Plan despite not having received work plan comments from USACE.
- 3 August 2015 - Bristol submitted an inquiry to USACE Project Manager Valerie Palmer as to whether or not the Work Plan Addendum needed FRMD & ARIMS numbers
- 3 August 2015 - Valerie Palmer sent a copy of the FRMD document request form to Bristol.
- 3 August 2015 - Bristol submitted an FRMD document request form to USACE Project Manager Valerie Palmer. Bristol Received FRMD numbers from USACE Project Manager Valerie Palmer.

Project Schedule

- 10 August 2015 thru 17 August 2015 – Bristol will conduct field work for the 2015 the monitoring well sampling and landfill cap inspections.

- Bristol will answer comments from the ADEC on the 2014 draft-final RA report. Comments will be addressed and a final report will be submitted once comments are received.

Payments and Invoices

- No invoices submitted to USACE during current period.

Work Underway

- Bristol is in the process of addressing comments on the draft-final report.
- Bristol is planning for the upcoming monitoring well sampling and landfill cap inspections slated for 10-17 August 2015.

Work Planned for the Upcoming Month

- Bristol will continue to address stakeholder comments on the draft-final RA Report.
- Bristol will initiate and finish scheduled fieldwork including the NE Cape monitoring well sampling and landfill cap inspections.

Accident/Exposure Hours

- Project accident/exposure hours worked during the period of 16 June 2015 through 31 July 2015 by Bristol and key subcontractors was 191.0. The 2015 project total of hours worked is 2,380.50. The July 2015 Monthly Record of Work–Related Injuries/Illnesses & Exposure Forms were submitted to cepoaso@usace.army.mil on 9 August 2015.

Bristol
ENVIRONMENTAL
REMEDIATION SERVICES, LLC

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

2014 Northeast Cape HTRW Remedial Actions
Contract W911KB-14-D-0006, Task Order 0002
Monthly Status Report
10 August 2015 through 11 September 2015

Submitted on 11 September 2015

Summary of Work Tasks 10 August 2015 through 11 September 2015

- Primary work tasks during this period focused on the responding to stakeholder comments on the 2014 Draft-Final RA Report (Revision 1).
- Conducted mobilization activities for scoped 2015 groundwater sampling and landfill inspection event.
- Conducted 2015 field effort at NE Cape including MNA groundwater sampling and landfill cap inspection. All scoped project wells were sampled successfully.

Subcontractors

- Bristol is self-performing remaining tasks for the Northeast Cape project. No subcontractors used for 2015 field effort.

USACE and ADEC Correspondence

- 10 August 2015 – Notified by USACE (J. Craner) that 2014 Work Plan Addendum CDs did not contain the final complete .pdf. Re-issued new CDs and delivered to USACE.
- 17 August 2015 – Bristol (E. Barnhill) submittal of DQCR reports to USACE (V. Palmer) for 2015 field effort that occurred 11 August 2015 to 15 August 2015.
- 18 August 2015 – Notified by USACE (V. Palmer) that additional ADEC comments were received by USACE on 17 August 2015. USACE will review comments and forward the ones which Bristol will need to help address.
- 21 August 2015 – USACE (V. Palmer) forwarded remaining ADEC comments that need addressed for the Final HTRW Report.
- 9 September 2015 – Bristol submittal of August 2015 exposure hour report to USACE CEPOASO.
- 9 September 2015 – Bristol submittal of POA 15 (pay estimate 34140087-11) to USACE COR for pre-approval. Received signed POA 15 from USACE COR.

- 11 September 2015 – Submittal of pay estimate 34140087-11 to USACE COR under serial letter H-0019. Also submitted August/September Monthly Status Report and updated schedule.

Project Schedule

- 2015 groundwater sampling and landfill cap inspection field effort is complete. 2015 field effort performed from 10 August to 17 August 2015.
- Bristol will continue to address ADEC comments on the Draft Final HTRW Report. Bristol will prepare and submit Final HTRW Report once responses to comments are accepted.
- Following results of analytical data packages, Bristol will perform chemical data quality review and 2015 reporting.

Payments and Invoices

- Pay Estimate 34140087-11 submitted on 11 September under serial letter H-0019. Pay estimate covers period from 24 June 2015 to 11 September 2015.

Work Underway

- Bristol is in the process of addressing comments on the draft-final report.
- 2015 MNA groundwater sampling and landfill cap inspection field effort is complete. 2015 field effort performed 10 August to 17 August 2015.

Work Planned for the Upcoming Month

- Bristol will continue to address stakeholder comments on the draft-final RA Report.
- Bristol awaiting final data packages from project laboratory for the 2015 field effort. Once data packages are received Bristol will perform chemical data quality review and prepare report.

Accident/Exposure Hours

- Project accident/exposure hours worked during the month of August 2015 by Bristol and key subcontractors was 394.25. The 2015 project total of hours through 31 August 2015 worked is 2,774.75. The August 2015 Monthly Record of Work–Related Injuries/Illnesses & Exposure Forms were submitted to cepoaso@usace.army.mil on 8 September 2015.

Bristol
ENVIRONMENTAL
REMEDIATION SERVICES, LLC

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

2014 Northeast Cape HTRW Remedial Actions
Contract W911KB-14-D-0006, Task Order 0002
Monthly Status Report
12 September 2015 through 8 October 2015

Submitted on 8 October 2015

Summary of Work Tasks 12 September 2015 through 8 October 2015

- Primary work tasks during this period focused on the responding to stakeholder comments on the 2014 Draft-Final RA Report (Revision 1).
- Conducted demobilization activities for scoped 2015 groundwater sampling and landfill inspection event.

Subcontractors

- Bristol is self-performing remaining tasks for the Northeast Cape project. No subcontractors used for 2015 field effort.

USACE and ADEC Correspondence

- 2 October 2015 – Bristol PM (T. Ellingboe) sent e-mail to USACE COR regarding recommended contract de-obligation amount. CLIN 0040 (-$21,030) and CLIN 0041 (-$2,731).
- 6 October 2015 – Bristol PM sent September 2015 exposure hour report to USACE CEPOASO. Report was corrected and resubmitted on 8 October 2015.
- 6 October 2015 – Bristol Chemist (M. Hannah) e-mailed USACE PM (V. Palmer) regarding 2014 Draft Final RTC #21 and 22. Bristol asking for additional feedback in order to properly address comments.
- 7 October 2015 – Bristol received response back from USACE (L. Geist) regarding ADEC comments 20 and 21 on the Draft Final HTRW Report.

Project Schedule

- Bristol will continue to address ADEC comments on the Draft Final HTRW Report.
- Bristol will soon schedule a comment resolution meeting with the ADEC and USACE for the Draft Final HTRW Report. Bristol will prepare and submit Final HTRW Report once responses to comments are accepted.

- Following results of analytical data packages, Bristol will perform chemical data quality review and 2015 reporting.

Payments and Invoices

- No pay estimate submitted this period.

Work Underway

- Bristol is in the process of addressing comments on the Draft-Final HTRW Report.
- Bristol awaiting final data package for 2015 field effort. Bristol has started preparation of reporting document for the 2015 field effort.

Work Planned for the Upcoming Month

- Bristol will continue to address stakeholder comments on the draft-final RA Report.
- Bristol awaiting final data packages from project laboratory for the 2015 field effort. Once data packages are received Bristol will perform chemical data quality review and prepare report.

Accident/Exposure Hours

- Project accident/exposure hours worked during the month of September 2015 by Bristol and key subcontractors was 64.5. The 2015 project total of personnel hours worked through 30 September 2015 is 2,839.25. The September 2015 Monthly Record of Work–Related Injuries/Illnesses & Exposure Forms were submitted to cepoaso@usace.army.mil on 8 October 2015.

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

2014 Northeast Cape HTRW Remedial Actions
Contract W911KB-14-D-0006, Task Order 0002
Monthly Status Report
9 October 2015 through 6 November 2015

Submitted on 6 November 2015

Summary of Work Tasks 9 October 2015 through 6 November 2015

- Primary work tasks during this period focused on the responding to stakeholder comments on the 2014 Draft-Final RA Report (Revision 1).
- Complete demobilization activities for scoped 2015 groundwater sampling and landfill inspection event.
- Begin preparation of 2015 MNA and landfill cap inspection report.

Subcontractors

- Bristol is self-performing remaining tasks for the Northeast Cape project. No subcontractors used for 2015 field effort.

USACE and ADEC Correspondence

- 12 October 2015 – Bristol submitted responses to USACE regarding additional ADEC comments on Draft-Final HTRW Report.
- 16 October 2015 – Bristol received e-mail from USACE PM (Palmer) requesting comment resolution meeting between Bristol/USACE to address ADEC comments. Meeting scheduled for 20 October 2015. USACE also asked about status of Bristol responses to ACAT and TAPP comments.
- 19 October 2015 – Bristol submitted responses to ACAT/TAPP comments on the Draft-Final HTRW Report to the USACE.
- 20 October 2015 – Received previous e-mail backup from USACE (Craner) regarding key 2014 conversations between ADEC (Dunkin) and USACE PM (Palmer).
- 20 October 2015 – Bristol provided USACE with Bristol responses to ACAT comments in table format.
- 27 October 2015 – Bristol submitted revised responses to ADEC comments on the Draft-Final HTRW Report to the USACE for review and forwarding to the ADEC.

- 5 November 2015 – Bristol notified by USACE (Craner) that USACE had forwarded Bristol responses to ADEC comments on the Draft-Final HTRW Report to ADEC for review and acceptance.
- 6 November 2015 – Bristol submittal of October 2015 exposure hours to USACE CEPOASO.

Project Schedule

- Bristol currently awaiting ADEC review of Bristol/USACE comments on the Draft-Final HTRW Report. Bristol will schedule a comment resolution meeting with the ADEC and USACE, if requested.
- Following results of analytical data package from August 2015 NE Cape sampling event, Bristol will perform chemical data quality review and 2015 reporting.
- Schedule update will be provided with next pay estimate.

Payments and Invoices

- No pay estimate submitted this period.

Work Underway

- Bristol awaiting ADEC acceptance/rejection of Bristol/USACE responses to comments on Draft-Final HTRW Report.
- Bristol awaiting final data package for 2015 field effort. Bristol has started preparation of reporting document for the 2015 field effort.

Work Planned for the Upcoming Month

- Bristol will incorporate accepted responses to stakeholder comments on Draft-Final HTRW Report once received and following a potential comment resolution meeting.
- Bristol awaiting final data packages from project laboratory for the 2015 field effort. Once data packages are received Bristol will perform chemical data quality review and prepare report.

Accident/Exposure Hours

- Project accident/exposure hours worked during the month of October 2015 by Bristol and key subcontractors was 136.0. The 2015 project total of personnel hours worked through 31 October 2015 is 2,975.25. The October 2015 Monthly Record of Work–Related Injuries/Illnesses & Exposure Forms were submitted to cepoaso@usace.army.mil on 6 November 2015.

Bristol
ENVIRONMENTAL
REMEDIATION SERVICES, LLC

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

2014 Northeast Cape HTRW Remedial Actions
Contract W911KB-14-D-0006, Task Order 0002
Monthly Status Report
7 November 2015 through 8 December 2015

Submitted on 8 December 2015

Summary of Work Tasks 9 October 2015 through 6 November 2015

- Bristol awaiting review of responses to stakeholder (ADEC, ACAT, TAPP Advisor) comments on 2014 Draft-Final RA Report (Revision 1).
- Continue preparation of 2015 MNA and landfill cap inspection report.

Subcontractors

- Bristol is self-performing remaining tasks for the Northeast Cape project. No subcontractors used for 2015 field effort.

USACE and ADEC Correspondence

- 10 November 2015 – Notified by USACE (Craner) that Bristol/USACE responses to ACAT comments on the Draft-Final HTRW Report have been submitted to ACAT for review and approval.
- 13 November 2015 – Notified by USACE (Craner) that Bristol/USACE responses to TAPP Advisor (Scrudato) comments on the Draft-Final HTRW Report have been submitted to TAPP Advisor for review and approval.
- 13 November 2015 - Notified by USACE (Craner) that USACE followed up with ADEC (Dunkin) regarding status of review of Bristol/USACE comments on the Draft-Final HTRW Report. ADEC hopeful to respond during week of 23 November 2015.
- 7 December 2015 – Bristol submittal of November 2015 exposure hours to USACE CEPOASO.

Project Schedule

- Bristol currently awaiting ADEC review of Bristol/USACE comments on the Draft-Final HTRW Report. Bristol will schedule a comment resolution meeting with the ADEC and USACE, if requested.
- Following results of analytical data package from August 2015 NE Cape sampling event, Bristol will perform chemical data quality review and 2015 reporting.

- Schedule update will be provided with next pay estimate.

Payments and Invoices

- No pay estimate submitted this period.

Work Underway

- Bristol awaiting ADEC acceptance/rejection of Bristol/USACE responses to comments on Draft-Final HTRW Report.
- Bristol has started preparation of reporting document for the 2015 groundwater monitoring and landfill cap inspection field effort.

Work Planned for the Upcoming Month

- Bristol will incorporate accepted responses to stakeholder comments on Draft-Final HTRW Report once received and following a potential comment resolution meeting.
- Bristol will continue to prepare 2015 groundwater monitoring and landfill cap inspection reports.

Accident/Exposure Hours

- Project accident/exposure hours worked during the month of November 2015 by Bristol and key subcontractors was 57.0. The 2015 project total of personnel hours worked through 30 November 2015 is 3,032.25. The November 2015 Monthly Record of Work–Related Injuries/Illnesses & Exposure Forms were submitted to cepoaso@usace.army.mil on 7 December 2015.

Bristol
ENVIRONMENTAL
REMEDIATION SERVICES, LLC

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

2014 Northeast Cape HTRW Remedial Actions
Contract W911KB-14-D-0006, Task Order 0002
Monthly Status Report
9 December 2015 through 8 January 2016

Submitted on 8 January 2016

Summary of Work Tasks 9 December 2015 through 8 January 2016

- Bristol awaiting review of responses to stakeholder (ADEC, ACAT, TAPP Advisor) comments on 2014 Draft-Final RA Report (Revision 1).
- Continued preparation of 2015 MNA and landfill cap inspection report.

Subcontractors

- Bristol is self-performing remaining tasks for the Northeast Cape project. No subcontractors used for 2015 field effort.

USACE and ADEC Correspondence

- 18 December 2015 – Provided brief update to USACE PM (Palmer) that Bristol currently preparing 2015 Annual Groundwater Monitoring and Landfill Inspection Reports. Final data package was delayed and not received from the project laboratory until 16 November 2015 which will delay delivery of the draft deliverables. Draft deliverables should be completed and submitted by early to mid-January.
- 6 January 2016 – Bristol submittal of December exposure hours to USACE CEPOASO.

Project Schedule

- Bristol currently awaiting ADEC review of Bristol/USACE responses to comments on the 2014 Draft-Final HTRW Report. Bristol will schedule a comment resolution meeting with the ADEC and USACE, if requested.
- Bristol currently preparing 2015 Draft Annual Groundwater Sampling and Landfill Inspection Reports.
- Schedule update will be provided with next pay estimate.

Payments and Invoices

- No pay estimate submitted this period.

Work Underway

- Bristol awaiting ADEC acceptance/rejection of Bristol/USACE responses to comments on Draft-Final HTRW Report.
- Bristol in process of completing Draft 2015 Annual Groundwater Monitoring and Landfill Cap Inspection reports.

Work Planned for the Upcoming Month

- Bristol will incorporate accepted responses to stakeholder comments on Draft-Final HTRW Report once received and following a potential comment resolution meeting.
- Bristol will finalize and submit Draft Annual Groundwater Monitoring and Landfill Cap Inspection reports.

Accident/Exposure Hours

- A total of 201 project accident/exposure hours were worked during the month of December 2015 by Bristol and key subcontractors. The 2015 project total of personnel hours worked through 31 December 2015 was 3,233.25. The December 2015 Monthly Record of Work–Related Injuries/Illnesses & Exposure Forms were submitted to cepoaso@usace.army.mil on 5 January 2016.

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

2014 Northeast Cape HTRW Remedial Actions
Contract W911KB-14-D-0006, Task Order 0002
Monthly Status Report
9 January 2016 through 8 February 2016

Submitted on 8 February 2016

Summary of Work Tasks 9 January 2016 through 8 February 2016

- Bristol awaiting review of responses to stakeholder (ADEC, ACAT, TAPP Advisor) comments on 2014 Draft-Final RA Report (Revision 1).
- Bristol submitted Draft 2015 Annual Groundwater Monitoring Report and Draft 2015 Landfill Cap Inspection Reports to USACE for review and approval.
- Bristol awaiting ADEC/USACE responses to Draft 2015 Annual Groundwater Monitoring Report and Draft 2015 Landfill Cap Inspection Reports.

Subcontractors

- Bristol is self-performing remaining tasks for the Northeast Cape project. No subcontractors used for 2015 field effort.

USACE and ADEC Correspondence

- 12 January 2016 – Submitted serial letter H-0020 for the submittal of the Draft 2015 Landfill Periodic Visual Inspection Report.
- 12 January 2016 – Notified by USACE PM (Palmer) that ADEC review of the 2014 RA Report should be completed by first week of January. ADEC has not yet completed their review.
- 12 January 2016 – Notified USACE PM that Bristol would be submitting the draft 2015 Groundwater Monitoring Report the week of 18 – 22 of January.
- 19 January 2016 – Submitted serial letter H-0021 for the submittal of the Draft 2015 Annual Groundwater Monitoring Report.
- 8 February 2016 – Bristol submittal of January 2016 exposure hours to USACE CEPOASO.

Project Schedule

- Bristol currently awaiting ADEC review of Bristol/USACE responses to comments on the 2014 Draft-Final HTRW Report. Bristol will schedule a comment resolution meeting with the ADEC and USACE, if requested.
- Bristol currently awaiting ADEC/USACE comments on the Draft 2015 Annual Groundwater Monitoring Report and 2015 Landfill Cap Inspection reports
- Schedule update will be provided with next pay estimate.

Payments and Invoices

- No pay estimate submitted this period.

Work Underway

- Bristol awaiting ADEC acceptance/rejection of Bristol/USACE responses to comments on Draft-Final HTRW Report.
- Bristol awaiting ADEC/USACE comments on the Draft 2015 Annual Groundwater Monitoring Report and 2015 Landfill Cap Inspection reports.

Work Planned for the Upcoming Month

- Bristol will incorporate accepted responses to stakeholder comments on Draft-Final HTRW Report once received and following a potential comment resolution meeting.
- Bristol will incorporate accepted responses to stakeholder comments on Draft Annual Groundwater Monitoring and Landfill Cap Inspection reports.

Accident/Exposure Hours

- A total of 160.25 project accident/exposure hours were worked during the month of January 2016 by Bristol and key subcontractors. The 2016 project total of personnel hours worked through 31 January 2016 was 160.25. The January 2016 Monthly Record of Work–Related Injuries/Illnesses & Exposure Forms were submitted to cepoaso@usace.army.mil on 8 February 2016.

Bristol
ENVIRONMENTAL
REMEDIATION SERVICES, LLC

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

2014 Northeast Cape HTRW Remedial Actions
Contract W911KB-14-D-0006, Task Order 0002
Monthly Status Report
9 February 2016 through 7 March 2016

Submitted on 7 March 2016

Summary of Work Tasks 9 February 2016 through 7 March 2016

- Bristol awaiting review of responses to stakeholder (ADEC, ACAT, TAPP Advisor) comments on 2014 Draft-Final RA Report (Revision 1).
- Bristol received USACE comments on the Draft 2015 Annual Groundwater Monitoring Report and Draft 2015 Landfill Cap Visual Inspection Reports. Bristol has started to address USACE comments.
- Bristol awaiting ADEC responses to Draft 2015 Annual Groundwater Monitoring Report and Draft 2015 Landfill Cap Visual Inspection Reports.

Subcontractors

- Bristol is self-performing remaining tasks for the Northeast Cape project. No subcontractors used for 2015 field effort.

USACE and ADEC Correspondence

- 29 February 2016 – Received USACE comments on 2015 Draft Groundwater Sampling Report
- 29 February 2016 – Received USACE comments on 2015 Landfill Periodic Visual Inspection Report
- 1 March 2016 – Submitted e-mail to USACE COR (Broyles) indicating that contract period of performance needs to be extended and questioning if it would be a good time to issue contract modification for remaining contract de-obligation amount.
- 7 March 2016 – Submitted project accident/exposure hours worked during the month of February 2016 to USACE CEPOASO.

Project Schedule

- Bristol currently awaiting ADEC review of Bristol/USACE responses to comments on the 2014 Draft-Final HTRW Report. Bristol will schedule a comment resolution meeting with the ADEC and USACE, if requested.

- Bristol recently received USACE comments on the Draft 2015 Annual Groundwater Monitoring Report and 2015 Landfill Cap Visual Inspection reports. Bristol has started addressing USACE comments and is awaiting receipt of ADEC comments on both draft reports.
- Schedule update will be provided with next pay estimate.

Payments and Invoices

- No pay estimate submitted this period.

Work Underway

- Bristol awaiting ADEC acceptance/rejection of Bristol/USACE responses to comments on Draft-Final HTRW Report.
- Bristol is currently addressing USACE comments on the Draft 2015 Annual Groundwater Monitoring Report and 2015 Landfill Cap Inspection reports. Bristol awaiting ADEC comments on both Draft 2015 Annual Groundwater Monitoring Report and 2015 Landfill Cap Inspection reports.

Work Planned for the Upcoming Month

- Bristol will incorporate accepted responses to stakeholder comments on Draft-Final HTRW Report once received and following a potential comment resolution meeting.
- Bristol will prepare and incorporate accepted responses to stakeholder comments on Draft Annual Groundwater Monitoring and Landfill Cap Inspection reports.

Accident/Exposure Hours

- A total of 19.75 project accident/exposure hours were worked during the month of February 2016 by Bristol and key subcontractors. The 2016 project total of personnel hours worked through 29 February 2016 was 180.0. The February 2016 Monthly Record of Work–Related Injuries/Illnesses & Exposure Forms were submitted to cepoaso@usace.army.mil on 7 March 2016.

Bristol
ENVIRONMENTAL
REMEDIATION SERVICES, LLC

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

2014 Northeast Cape HTRW Remedial Actions
Contract W911KB-14-D-0006, Task Order 0002
Monthly Status Report
8 March 2016 through 5 April 2016

Submitted on 5 April 2016

Summary of Work Tasks 8 March 2016 through 5 April 2016

- Bristol awaiting ADEC acceptance/rejection of Bristol responses to ADEC comments on 2014 Draft-Final RA Report (Revision 1).
- Bristol awaiting ADEC comments on Draft 2015 Annual Groundwater Monitoring Report and Draft 2015 Landfill Cap Visual Inspection Report.
- Bristol submitted responses to initial USACE comments on the Draft 2014 Landfill Visual Inspection Report.
- Bristol currently in the process of addressing USACE comments on the Draft 2014 Groundwater Monitoring Report.

Subcontractors

- Bristol is self-performing remaining tasks for the Northeast Cape project. No subcontractors used for 2015 field effort.

USACE and ADEC Correspondence

- 9 March 2016 – Bristol PM (Ellingboe) notifying USACE PM (Palmer) that Bristol currently responding to received USACE comments on 2015 Landfill Periodic Visual Inspection Report. Bristol requested and received proper reference for *First Periodic Review Report, Site 7 Cargo Beach Road Landfill (USACE, 2015)*.
- 10 March 2016 – Bristol PM (Ellingboe) e-mail to USACE PM (Palmer) addressing incompletion of field forms and Bristol proposed action to remedy deficiency. Received response from USACE PM (Palmer) agreeing to proposed remedy of completing forms where information is known. Changes to field forms will be initialed and dated accordingly.
- 11 March 2016 – Bristol Chemist (Hannah) e-mail to USACE Chemist (Benjamin) regarding Benjamin Review Comment #1 on 2015 Landfill Visual Inspection Report. Bristol Chemist (Hannah) notified USACE Chemist (Benjamin) that dissolved metals not showing up in SEDD checker although the results are showing up in the xml file. May need input from USACE Chemist (Utley).

- 17 March 2016 – Bristol Chemist (Hannah) e-mail to USACE Chemist (Benjamin) regarding chromatogram interpretations of NE Cape groundwater samples for DRO. Interpretation leads one to believe that low-level DRO contamination appears due to instrument use at the project laboratory and not from pumps used in the field during sample collection.
- 21 March 2016 – Bristol PM (Ellingboe) e-mail to USACE PM (Palmer) regarding status of Bristol RTCs. Bristol awaiting input from USACE Chemist (Benjamin) on Bristol's chromatogram interpretation. Bristol PM (Ellingboe) submitted responses to USACE comments on the 2015 Landfill Visual Inspection Report.
- 21 March 2016 – Bristol PM (Ellingboe) and USACE PM (Palmer) e-mail correspondence regarding status of Bristol responses to ACAT and TAPP comments on 2014 NE Cape HTRW Report. Notified by USACE PM (Palmer) to proceed with incorporating Bristol responses to ACAT/TAPP comments into the report and that ACAT/TAPP acceptance/rejection of Bristol responses will not be forthcoming.
- 25 March 2016 – E-mail correspondence from USACE Chemist (Benjamin) to Bristol Chemist (Hannah) regarding recommended flagging of data.
- 28 March 2016 – Multiple e-mail correspondence between Bristol Chemist (Hannah) and USACE Chemist (Benjamin) regarding interpretation of laboratory data, chromatograms, and proper flagging.
- 5 April 2016 – Submitted project accident/exposure hours worked during the month of March 2016 to USACE CEPOASO.

Project Schedule

- Bristol currently awaiting ADEC review of Bristol/USACE responses to comments on the 2014 Draft-Final HTRW Report. Bristol will schedule a comment resolution meeting with the ADEC and USACE, if requested.
- Bristol received USACE comments on the Draft 2015 Annual Groundwater Monitoring Report and Draft 2015 Landfill Cap Visual Inspection reports. Bristol has started addressing USACE comments and is awaiting receipt of ADEC comments on both draft reports.
- Schedule update will be provided with next pay estimate.

Payments and Invoices

- No pay estimate submitted this period.

Work Underway

- Bristol awaiting ADEC acceptance/rejection of Bristol/USACE responses to comments on Draft-Final HTRW Report.

- Bristol is currently addressing USACE comments on the Draft 2015 Annual Groundwater Monitoring Report and 2015 Landfill Cap Inspection reports. Bristol awaiting ADEC comments on both Draft 2015 Annual Groundwater Monitoring Report and 2015 Landfill Cap Inspection reports.

Work Planned for the Upcoming Month

- Issue contract modification to extend contract period of performance. Also need contract modification to de-obligate unused remaining contract line items.
- Bristol will incorporate accepted responses to stakeholder comments on 2014 Draft-Final HTRW Report once received and following a potential comment resolution meeting. Bristol still waiting for ADEC comments on the report.
- Bristol will prepare and submit responses to ADEC and USACE comment on the 2015 Groundwater Monitoring Report. Bristol has not yet received ADEC comments on the report.
- Bristol will prepare and submit responses to ADEC comments on the 2015 Landfill Cap Inspection Report once initial comments are received from the ADEC.

Accident/Exposure Hours

- A total of 106.0 project accident/exposure hours were worked during the month of March 2016 by Bristol and key subcontractors. The 2016 project total of personnel hours worked through 31 March 2016 was 286.0. The March 2016 Monthly Record of Work–Related Injuries/Illnesses & Exposure Forms were submitted to cepoaso@usace.army.mil on 5 April 2016.

APPENDIX C

Field Documentation

Eric Barnhill
NE Cape Groundwater monitoring

34140087

Rite in the Rain
ALL-WEATHER
FIELD
№ 351

August 10 → August 17

INCH

Rite in the Rain®
ALL-WEATHER WRITING PAPER

Name Eric Barnhill

Address 111 W 16th Ave
Anchorage AK 99501

Phone 907 563 0013

Project NE Cape
34140087

Clear Vinyl Protective Slipcovers (Item No. 30) are available for this style of notebook.
Helps protect your notebook from wear & tear. Contact your dealer or the J. L. Darling Corporation

CONTENTS

PAGE	REFERENCE	DATE

Monday August 10, 2015

0730 – Picking up Lyndsey Kleppin, heading to TTT Environmental to pick up Hach supplies for MNA. Supplies were ordered in time, but had not shown up as of Friday

0800 – @TTT – Fedex had not yet delivered the Hach/MNA supplies to TTT. It is, we're told, in Anchorage. TTT will call upon receiving the supplies and I will instruct them further.

0820 Airport

1015 – Take off to Nome

In Nome,

August 11, 2015

- Bering Air @ 0800
  - Fly to NE Cape

- Walking up to MOC / Landfills for Landfill monitoring inspection and well water / depth measurements and Site 9 landfill surface water sampling

- See L. Kleppin's notes for well water levels

End 2030

[signature]

8/12/14

- Side by Side rental not yet available. Had teleconference with Greg Jarrell and Tyler Ellingboe. The decision was made to stay in Nome and create sampling packages
  - Labels
  - bottles

15NC MOC GW 01	26MW1	MS/MSD
15NC MOC GW 02	22MW2	
15NC MOC GW 03	20MW-1	
15NC MOC GW 04	17MW1	
15NC MOC GW 05	14MW1	
15NC MOC GW 06	14MW07	
15NC MOC GW 07	MW88-10	
15NC MOC GW 08	14MW03	
15NC MOC GW 09	14MW02	
15NC MOC GW 10	MW88-1	
15NC MOC GW 11	MW88-3	
15NC MOC GW 12	MW 10-1 (ms/msd voc + 8hcol)	
15NC MOC GW 13	14MW04	
15NC MOC GW 14	14MW05	
15NC MOC GW 15	14MW06	
15NC MOC GW 16/17	duplicates	

8-13-15

0800 Bering air - Flight to NE Cape

22MW2 @ 1400
- PCB
- PAH
- BTEX — 15NCMOC GW02 @ 1400
- GRO
- DRO/RRO

20MW1 @ 1710

Depth to water - 24.95

Total depth - 28.75

- PCB
- PAH
- BTEX
- GRO — 15NCMOC GW03 @ 1710
- DRO/RRO
- MNA

8-14-15

0800 - Bering Air

14MW07 @ 1140

- 15NCMOC GW06 @ 1140

14MW02 @ 1640

- 15NCMOC GW09 @ 1640

8-15-15

0800 Bering Air
- NE Cape

~~14MW07 @ 1110~~

14MW05 @ 1230 / 1240 (duplicates)
- 15NCMOC GW 14 @ 1230
- 15NCMOC GW 17 @ ~~1300~~ 1240

MW 88-3 @ 1300
- 15NCMOC GW 11

8/16/15
Packaging Samples For Shipment
via air.

8/17/15

Travel to Anchorage from Nome

L. Kleppin

Rite in the Rain®
ALL-WEATHER
JOURNAL
№ 391

NE Cape Groundwater Sampling

8/2015

3414-0087

INCH

Rite in the Rain®
ALL-WEATHER WRITING PAPER

Name Lyndsey Kleppin

Address 111 W 16th Ave
Anchorage, AK 99501

Phone

Project NE Cape # 34140087

Clear Vinyl Protective Slipcovers (Item No. 30) are available for this style of notebook.
Helps protect your notebook from wear & tear. Contact your dealer or JL Darling LLC.

CONTENTS

PAGE	REFERENCE	DATE

08/11/15 Travel Day
0730 TTT for Hach kit (colorimeter)
0815 Check In AK Air 1200 Arrive Nome
Check on side-by-side @ Morgans, Buy supplies
Rent car, check in to hotel. End 1600
8.5 hours

08/11/15 # 34140087

0800 Arrive Bering Air w/ Noyuk Peacock + Eric Barnhill

0820 Depart Nome

Arrive Northeast Cape Airstrip, sort supplies, walk to MOC

1050	20MW1	38.41' DTW BTOC	MOC groundwater well water level survey
1108	22MW2	29.92'	
1118	17MW1	13.06'	
1125	14MW01	16.44'	
1136	20MW1	24.82'	
1142	MW88-10	22.82'	
1150	14MW07	27.91'	
1221	MW88-1	18.97	water level meter decontaminated after each reading w/ Alconox spray + DI rinse
1228	MW88-3	14.22	
1236	14MW03	13.41	
1242	14MW02	11.42	
1252	14MW04	4.66'	
1259	14MW05	4.12	
1306	14MW06	4.50	no ice present in any wells
1311	MW10-1	6.85	

Surface water sampling at site 9 Landfill

1400 15NC09SW001 MS/MSD 25.6 NTU

GRO, BTEX, DRO/RRO, PCB, PAH,

total metals, dissolved metals (8RCRA + Zn)

No sheen, orangish water

1430 15NC09SW02 no sheen, clear 1.19 NTU

1435 15NC09SW04 DUPLICATE

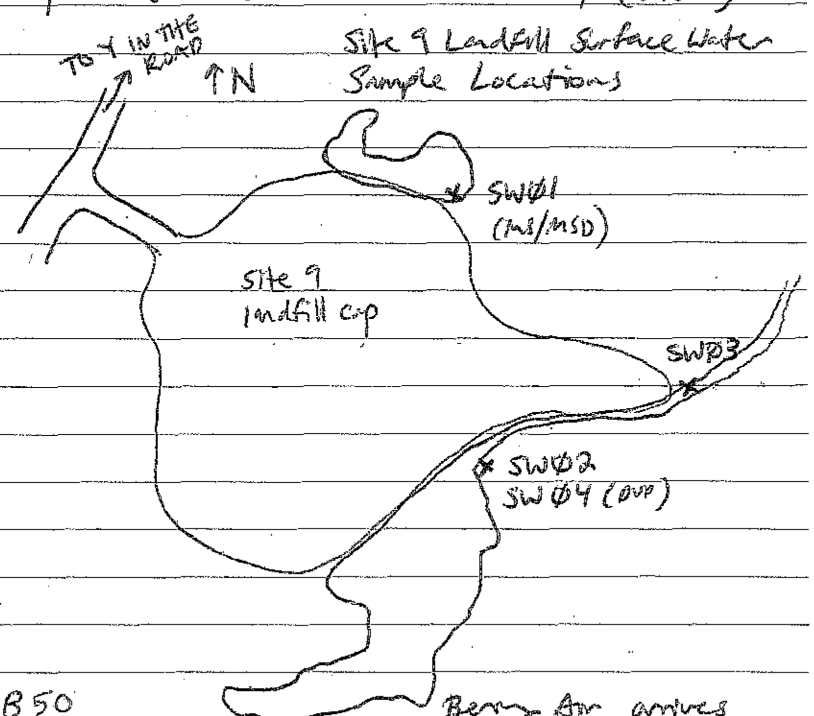
1450 15NC09SW03 biogenic sheen 1.14 NTU

clear

Collected dissolved metals samples in unpreserved polys to be filtered using peristaltic pump during transfer into HNO_3 preserved polys

Noyuk + Eric conduct landfill survey (Site 7)

Site 9 Landfill Surface Water Sample Locations



1850 Bering Air arrives

2000 Arrive Nome

Purchase 4 gas cans, fill with gas

End 2030 12.5 hours

Rite in the Rain

08/12/15

0800 Arrive Bering Air w/ Noyde and Eric
Adam @ Bering Air let us know Morgan's called to say our side by side will not be ready today.
Return to hotel to write up groundwater sample labels:

	15NCMOCGWØ1	26MW1	MS/MSD
explore ~~equipment transport~~	Ø2	22MW2	
options, call	Ø3	20MW-1	
Greg Jarrell +	Ø4	17MW1	
Tyler Ellingboe	Ø5	14MW1	
about ATV use	Ø6	14MWØ7	
options/weather	Ø7	MWBB-10	
delay time	Ø8	14MWØ3	
	Ø9	14MWØ2	
	1Ø	MWBB-1	
	11	MWBB-3	
	12	MW10-1	(MS/MSD VOC cal glwl)
	13	14MW04	
	14	14MW05	
	15	14MW06	
	16	DUP	
	17	DUP	

1400 Finish Labels

6 hours

8/13/15 34140087

0800 Arrive at Bering Air King Air + Casa w/ Arctic Cat depart Nome
0900 Arrive NE Cape. Unload King Air + Casa
Organize equipment + mobilize to site
Set up on 26MW1 for MS/MSD
35.51' DTW (see gw purge sheet)
39.69 pump set clear, good recharge, no odor
1200 Collect 15NCMOCGWØ1 (MS/MSD)
Move to 17MW1
Eric + Noyde at 22MW2 → move to 20MW1
Set up on 17MWØ1, begin purge
17MWØ1 (see gw purge sheet)
~~17.55' BT~~ water
~~19.69 BT~~ pump
clear, good recharge, no odor
1430 15NCMOCGWØ4
Move to 14MWØ1
Purge - cloudy, brown, slight fuel odor, no sheen
16.55' depth BTOC to water, 19.65 depth BTOC to pump

1610 15NCMOCGWØ5

Bering air arrive 1900
2000 Arrive Nome, sample management
2030 End
13.5 hours

 8/14/15

0800 Arrive Bering Air / Depart Nome 0900 Arrive NE Cape
Calibrate YSI, mobilize to site
MW88-10 23.89' to pump
23.20' to water small water column
clear, no odor, good recharge,
1120 15NCMOCGWØ7 @ MW 88-10
see gw sample form.
1300 15NCMOCGW1Ø @ MW 88-1
very turbid initially, cleaned up well
see groundwater sample form

8/15/15

0800 Arrive Bering Air / Depart Nome
0900 Arrive NE Cape - calibrate YSI
Mob to site

1230 15NCMOCGW13 14MW04

1300 15NCMOCGW16 DUPLICATE

8/16/15

1100 Package samples/sample management
at Bering Air. Noyuk Peacock → ANC
surface water and ground water samples
2 coolers with VOA vials – trip blank
set added to each cooler (7 total)
Goldstreak to TA Tacoma
organize pallets of equipment for
shipment to NAE (2)
batteries and generator separate

standby for evening flight – full
[signature] 8 hours

8/17/15 standby for morning flight to ANC
Barnhill → ANC
Depart nome → ANC 8:30pm
8 hours

[signature]

	Fe^{2+}	Alkalinity
15NCMOCGWØ1	0.05	0
Ø2	0.06	0
Ø3	0.32	0
Ø4	0.06	0
Ø5*	0.09	0
Ø6	0.07	0
Ø7	0.05	0
Ø8*	2.17	40 40
Ø9*	3.30 (limit. Dilute/2 2.05 → 4.10 mg/kg)	
1Ø	0.00	0
11	0.06	0
12	0.09	0
13*	0.51	~~120~~ ~~80~~ 40
14*	2.80	~~240~~ ~~120~~ 40
15	0.09	~~720~~ ~~120~~ 80

* some Fe^{3+} precipitate present

8/19/15 Hach kit analysis

	Mn	Nitrate	Sulfate
ISNCMOC6WP1	0.2	0.06	9
02	0.6	0.06	13
03	0.3	0.22	14
04	0.2	0.08	10
05	0.2	0.02	8
06	0.4	0.09	4
07	0.4	0.05	6
08	0.4	0.00	6
09	1.1	0.01	7
10	0.0	0.16	9
11	0.5	0.17	8
12	0.5	0.16	5
13	0.4	0.02	27
14	2.2	0.03	10
15	0.5	0.02	6

Mn - acid digestion? Sodium Periodate packets

Nitraver 3 and Nitraver 6 vs Nitraver 5

ok No

NOYUK PEACOCK
NE CAPE GROUNDWATER
MONITORING 34140087

AUGUST 2015

Rite in the Rain.
ALL-WEATHER
JOURNAL
№ 391

INCH

1 2 3 4 5 6

Rite in the Rain®
ALL-WEATHER WRITING PAPER

Name ______________________

____

Address ______________________

____

Phone ______________________

Project ______________________

____

____

____

Clear Vinyl Protective Slipcovers (Item No. 30) are available for this style of notebook.
Helps protect your notebook from wear & tear. Contact your dealer or JL Darling LLC.

CONTENTS

PAGE	REFERENCE	DATE

Nome 8/10/2015

Arrived in Nome at approximately
12:00 pm.

Gathered Materials and food
to bring over to Northeast Cape.

Northeast Cape 8/11/2015

Flew to Northeast Cape at approximately
8:00 am

Measured groundwater depth at
15 wells proposed to be sampled.

Took 3 Surface water samples
at Site 9 and collected
three GPS features using historic
locations.

Flew back to Nome at approximately
7:00 pm.

Nome 8/12/2015

Spent the day in Nome writing labels for the proposed Ground Water sample locations while waiting for the side by side to be fixed.

Northeast Cape 8/13/2015
MOC

22MW2
start: 12:15 pm
End: 2:05 pm

20M1
Start: 2:50 pm
End: 5:20 pm

7:00 pm (approximately) Flew back to Nome

Northeast Cape 8/14/2015

8:05 am Take off from Nome
9:00 am Arrived Northeast Cape

MOC
14 MW07
Start: 10:40 am
End: 12:00 pm

MW89-3
Start: 12:30 pm
End: 1:30 pm

14 MW02
Start: 2:00 pm
End: 5:00 pm

7:00 pm Take off from Northeast Cape
8:00 pm Arrived Nome

Northeast Cape 8/15/2015

~8:15 am Take off from Nome
~9:00 am Arrived Northeast Cape

MOC
14MW05
~Start: 10:45
~End: 1:~~10~~15

14 MW06
~Start: 1:45
~End: 3:00

~~Northeast Cape~~ N.P. Nome 8/16/2015

Flew back to Anchorage

Bristol
ENVIRONMENTAL REMEDIATION SERVICES, LLC

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

TOOLBOX SAFETY MEETING RECORD

DATE: 8-11-15

SUBJECTS:

1. Slips/trips/falls
2. Airplane Safety
3.
4.
5.
6.
7.
8.

	PRINTED NAME	SIGNATURE	COMPANY
1.	Lyndsey Klepp[illegible]	[illegible]	BERS
2.	Eric Barnhill	EB[illegible]	BERS
3.	Noyuk Peacock	[illegible]	BERS
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			
26.			
27.			
28.			
29.			
30.			

Bristol

ENVIRONMENTAL
REMEDIATION SERVICES, LLC

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

TOOLBOX SAFETY MEETING RECORD

DATE: 8-13-15

SUBJECTS:

1. slips trips falls
2. proper UTV usage
3. dress appropriately - layers
4.
5.
6.
7.
8.

	PRINTED NAME	SIGNATURE	COMPANY
1.	Lyndsey Klypin	[signature]	BERS
2.	Eric Barnhill	[signature]	BERS
3.	Nuyuk Peacock	[signature]	BERS
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			
26.			
27.			
28.			
29.			
30.			

Bristol

ENVIRONMENTAL REMEDIATION SERVICES, LLC

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

TOOLBOX SAFETY MEETING RECORD

DATE: 8-14-15

SUBJECTS:

1. Weather - dress right
2. protect hands - Sampling acids
3. UTV - slower is better
4.
5.
6.
7.
8.

	PRINTED NAME	SIGNATURE	COMPANY
1.	Eric Barnhill	[signature]	BERS
2.	Lyndsey Kleppin	[signature]	BERS
3.	Noyuk Peacock	[signature]	BERS
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			
26.			
27.			
28.			
29.			
30.			

Bristol

ENVIRONMENTAL
REMEDIATION SERVICES, LLC

111 W. 16th Avenue, Third Floor
Anchorage, AK 99501
phone (907) 563-0013
fax (907) 563-6713
www.bristol-companies.com

TOOLBOX SAFETY MEETING RECORD

DATE: 8-15-15

SUBJECTS:

1. Slips - trips - falls
2. team carry heavy things
3.
4.
5.
6.
7.
8.

	PRINTED NAME	SIGNATURE	COMPANY
1.	Lyndsey Klopper	[illegible]	BEES
2.	Eric Barnhill	[illegible]	BEES
3.	Noyak Peacock	[illegible]	BEES
4.	~~Lyn~~		
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			
26.			
27.			
28.			
29.			
30.			

APPENDIX D

2015 Visual Inspection Forms

Visual Inspection Checklist (Post-Closure)
Site 7 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Name of Inspector: Eric Barnhill Date: August 11, 2015

Weather conditions: Mostly cloudy; occasional sun breaks Precipitation ☐ Yes ☒ No

Temperature: 40-45 °**F** Prevailing Wind Direction: East Speed: 15-20 mph

Photographs Taken: Yes

Landfill Post-Closure Monitoring Items	**Y**	**N**	**COMMENTS**
Evidence of settlement or frost jacking within or on surface of landfill?		X	
Ponded water within, against, or on surface of landfill?	X		Ponds present at toe of slope on North and West side of landfill. No sheen present in ponds.
Evidence of surface erosion on disposal area walls or on exterior berms?		X	
Erosion of access roads?		X	
Discoloring of vegetation downslope?		X	
Any evidence of leakage or escape of waste from cells?		X	
Airborne ash or dust particles?		X	
Evidence of wildlife or birds present? Include number and type of birds on site.	X		Small sparrow like birds passing through
Windblown litter in cells or along access roads or adjacent ponds?		X	
Landfill odors?		X	
Fire or combustion in the waste?		X	
Damage to the structural integrity of a dike wall, culvert, or erosion control feature, if present?		X	
Is revegetation occurring?	X		Landfill remains sparsely covered by grass, moss small plants
Estimated Percent Vegetative Cover: On Cap Surface 60 On Sideslopes: 60			
Comments: Vegetation has taken hold in a large percentage of available area. Much of the landfill is covered by rocks, cobbles, boulders, etc.			

General Comments: Vegetation on the landfill cap ranges from moss to grass to small plants and shrubs. Grass ranges from brown to green and other plant life seems healthy and green. The surrounding tundra appears much drier than in prior years. Fill added to the top of the landfill in 2014 appears to be stable, there is no ponding water present, and vegetation has started to grow. Access to the Landfill, via Cargo Beach Road, remains in good shape.

Corrective Actions Taken: None necessary at this time.

Visual Inspection Checklist (Post-Closure)
Site 7 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Photo 1: Site 7 Landfill - View of western slope

Photo 2: Site 7 Landfill – View of landfill cap vegetation

Visual Inspection Checklist (Post-Closure)
Site 7 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Photo 3: Site 7 Landfill – View of landfill cap vegetation

Photo 4: Site 7 Landfill – View looking north, various landfill cap vegetation

Visual Inspection Checklist (Post-Closure)
Site 7 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Photo 5: Site 7 Landfill - View looking north Across Cargo Beach Road which separates the northern and southern slopes of the cap

Photo 6: Site 7 Landfill - View looking south across landfill to mountains; rocky surface shown with uneven vegetation

Visual Inspection Checklist (Post-Closure)
Site 7 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Photo 7: Site 7 Landfill - View looking down northwestern slope of landfill toward tundra pond

Photo 8: Site 7 Landfill - View looking down northeastern slope of landfill toward depleting tundra pond

Visual Inspection Checklist (Post-Closure)
Site 9 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Name of Inspector: Eric Barnhill Date: August 11, 2015

Weather conditions: Mostly cloudy, partial sunny breaks Precipitation ☐ Yes ☒ No

Temperature: 40-45 °**F** Prevailing Wind Direction: East Speed: 15-20

Photographs Taken: Yes

Landfill Post-Closure Monitoring Items	**Y**	**N**	**COMMENTS**
Evidence of settlement or frost jacking within or on surface of landfill?		X	
Ponded water within, against, or on surface of landfill?	X		Ponds present at the toe of landfill on east and north sides. No sheen observed. No ponding on top of landfill, good drainage is present.
Evidence of surface erosion on disposal area walls or on exterior berms?		X	
Erosion of access roads?		X	
Discoloring of vegetation downslope?		X	
Any evidence of leakage or escape of waste from cells?		X	
Airborne ash or dust particles?		X	
Evidence of wildlife or birds present? Include number and type of birds on site.		X	
Windblown litter in cells or along access roads or adjacent ponds?		X	
Landfill odors?		X	
Fire or combustion in the waste?		X	
Damage to the structural integrity of a dike wall, culvert, or erosion control feature, if present?		X	
Is revegetation occurring?	X		
Estimated Percent Vegetative Cover: On Cap Surface 60-70 On Sideslopes: 70-80			
Comments: Much of the side slope area encounters the ponds at the edge of the landfill. These areas are well vegetated.			

General Comments: The entire landfill has sparse grass cover with a good amount of coverage by moss and other small plants. Landfill seems stable from year to year. Access via the approximately 60 foot access road parallel to Cargo Beach Road was in good shape and seems stable. Cargo Beach road is also in good shape.

Corrective Actions Taken: None necessary at this time.

Visual Inspection Checklist (Post-Closure)
Site 9 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Photo 1: Site 7 Landfill – View of south/southeast slope of landfill with large armor rock and partial vegetation

Photo 2: Site 7 Landfill – View of south/southeast slope of landfill with large armor rock and partial vegetation, looking down slope toward tundra

Visual Inspection Checklist (Post-Closure)
Site 9 Landfill

This form is to be filled out annually for 5 years after landfill closure.


Photo 3: Site 9 Landfill – View looking east across entrance


Photo 4: Site 9 Landfill - View of northern slope with pond at toe of slope

Visual Inspection Checklist (Post-Closure)
Site 9 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Photo 5: Site 9 Landfill - Close-up view of vegetation

Photo 6: Site 9 Landfill - Overview looking southwest

Visual Inspection Checklist (Post-Closure)
Site 9 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Photo 7: Site 9 Landfill – View of eastern half of landfill, eastern slope sloping down to a pond

Photo 8: Site 9 Landfill – View of pond present along eastern slope of landfill

Visual Inspection Checklist (Post-Closure)
Site 9 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Photo 9: Site 9 Landfill – View of creek fed by draining of pond along eastern slope of landfill

APPENDIX E

Previous Visual Inspection Forms

Visual Inspection Checklist (Post-Closure)
Site 7 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Name of Inspector: ___Lisa Geist________________________ Date: ____August 7, 2013______

Weather conditions: ___Partly sunny, overcast skies______ Precipitation ☐ Yes ☒ No

Temperature: _54_°**F** Prevailing Wind Direction: ___E____ Speed: __10-15 mph__

Photographs Taken: ___Yes____

Landfill Post-Closure Monitoring Items	Y	N	COMMENTS
Evidence of settlement or frost jacking within or on surface of landfill?		X	
Ponded water within, against, or on surface of landfill?	X		Tundra ponds close to toe of landfill on west and north sides.
Evidence of surface erosion on disposal area walls or on exterior berms?		X	
Erosion of access roads?		X	
Discoloring of vegetation downslope?		X	
Any evidence of leakage or escape of waste from cells?		X	
Airborne ash or dust particles?		X	
Evidence of wildlife or birds present? Include number and type of birds on site.	X		One fox sighted on west side of landfill, animal droppings scattered around landfill. Three cranes in nearby tundra. Two Tundra voles on landfill cap.
Windblown litter in cells or along access roads or adjacent ponds?		X	
Landfill odors?		X	
Fire or combustion in the waste?		X	
Damage to the structural integrity of a dike wall, culvert, or erosion control feature, if present?		X	Culvert by gravel access road is clear.
Is revegetation occurring?	X		Grass growing well, areas of moss beginning to appear, but landfill surface still very cobbly with rocks.
Estimated Percent Vegetative Cover: On Cap Surface ___70_______ On Sideslopes: ___70___ Comments: Grasses growing well, but only moss is establishing itself on very rocky surfaces.			

General Comments: __ Landfill cover appears very stable and unchanged. Vegetation on landfill surface appears brownish/yellow/green with surrounding tundra very green, lush, and moist____

Corrective Actions Taken: __None_______________________________________

____

____

(Use additional pages if necessary)

F10AK096903_07.11_0503_p
F10AK096905_07.11_0502_p
200-1f

Visual Inspection Checklist (Post-Closure)
Site 9 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Name of Inspector: ______Lisa Geist_________________________Date: ___August 7, 2013___

Weather conditions: ___Partly sunny, overcast skies_____ Precipitation ☐ Yes ☒ No

Temperature: _54_°**F** Prevailing Wind Direction: ____E_____ Speed: _10-15 mph__

Photographs Taken: ____Yes____

Landfill Post-Closure Monitoring Items	Y	N	COMMENTS
Evidence of settlement or frost jacking within or on surface of landfill?		X	
Ponded water within, against, or on surface of landfill?	X		Tundra ponds close to toe of landfill on east and north sides
Evidence of surface erosion on disposal area walls or on exterior berms?		X	
Erosion of access roads?		X	
Discoloring of vegetation downslope?		X	
Any evidence of leakage or escape of waste from cells?		X	
Airborne ash or dust particles?		X	
Evidence of wildlife or birds present? Include number and type of birds on site.	X		2 cranes in nearby tundra.
Windblown litter in cells or along access roads or adjacent ponds?		X	
Landfill odors?		X	
Fire or combustion in the waste?		X	
Damage to the structural integrity of a dike wall, culvert, or erosion control feature, if present?		X	
Is revegetation occurring?	X		
Estimated Percent Vegetative Cover: On Cap Surface ___80_____ On Sideslopes: __70_____ Comments: Grasses growing well with moss establishing on more rocky areas.			

General Comments: _Landfill cover appears very stable and unchanged. Vegetation on landfill surface appears brown/yellow/green with surrounding tundra green, lush, and moist

Corrective Actions Taken: ___None____

(Use additional pages if necessary)

Photo 1: Site 7 Landfill - Overview of landfill area, facing SW.

Photo 2: Site 7 Landfill - View of south side of landfill from Cargo Beach Road, facing SW.


Photo 3: Site 7 Landfill - View of west side of landfill area, facing south.

Photo 4: Site 7 Landfill – Southeast side of landfill from Cargo Beach Road, facing NW.


Photo 5: Site 7 Landfill – Surface of landfill, note both newer (green) and older (brown) grass tufts, facing east.


Photo 6: Site 7 Landfill – North slope of landfill, note tall grass tufts with seed, facing NW.

Photo 7: Site 9 Landfill – Overview of entire landfill area from site access road, facing south.

Photo 8: Site 9 Landfill – View of landfill facing west, MOC in background.

Photo 9: Site 9 Landfill – North end of landfill, facing NE.

Photo 10: Site 9 Landfill – Close-up view of landfill vegetation.

Photo 11: Site 9 Landfill – Pond along SE side of landfill, facing SW.

Photo 12: Site 9 Landfill – Diversion ditch that drain pond shown in Photo 11, operating sufficiently, facing NE.

Visual Inspection Checklist (Post-Closure)
Site 7 Landfill

furthest from MOC

This form is to be filled out annually for 5 years after landfill closure.

Name of Inspector: Jeremy Craner Date: 9-17-11

Weather conditions: foggy/cloudy Precipitation ☒ Yes ☐ No

Temperature: 45 °F Prevailing Wind Direction: north Speed: 10-20 mph

Photographs Taken: ~~None today, taken previously on sunny day.~~

Landfill Post-Closure Monitoring Items	Y	N	COMMENTS
Evidence of settlement or frost jacking within or on surface of landfill?		X	Stable, level surface.
Ponded water within/against/or on surface of landfill?	X		Natural tundra ponds adjacent to landfill on S, W, N sides.
Evidence of surface erosion on disposal area walls or on exterior berms?		X	
Erosion of access roads?		X	
Discoloring of vegetation downslope?		X	
Any evidence of leakage or escape of waste from cells?		X	
Airborne ash or dust particles?		X	
Evidence of wildlife or birds present? Include number and type of birds on site.	X		Small white/black birds in covey of 15-20 eating bird seed.
Windblown litter in cells or along access roads or adjacent ponds?		X	No visible debris
Landfill odors?		X	
Fire or combustion in the waste?		X	
Damage to the structural integrity of a dike wall, culvert, or erosion control feature, if present?		X	N/A
Is revegetation occurring?	X		Grass is up to 3 ft tall and healthy in areas

Estimated Percent Vegetative Cover: On Cap Surface 70% On Sideslopes: 60%
Comments: South + ~~East~~ WEST sideslopes less vegetated. Very rocky and wind likely blew off seed when initially applied last year.

General Comments: No visible erosion, Leakage, debris. Appears very structurally sound + stable. Grass not growing well in rocky areas, however, these areas VERY stable.

Corrective Actions Taken: ~~None.~~ JC Seed was spread by Bristol Environmental on 9-13-11 at bare areas. Hope to promote vegetation in these areas even though rocky.

(Use additional pages if necessary)

F10AK096903_07.11_0500_p
F10AK096905_07.11_0500_p
200-1f

Visual Inspection Checklist (Post-Closure)
Site 9 Landfill
close to MOC

This form is to be filled out annually for 5 years after landfill closure.

Name of Inspector: Jeremy Craner Date: 9-17-11

Weather conditions: Cloudy/foggy Precipitation ☒ Yes ☐ No

Temperature: 45 °F Prevailing Wind Direction: NORTH Speed: 10-20 mph

Photographs Taken: No, taken previously on a nice clear sunny day.

Landfill Post-Closure Monitoring Items	Y	N	COMMENTS
Evidence of settlement or frost jacking within or on surface of landfill?		X	Very stable in appearance
Ponded water within, against, or on surface of landfill?	X		Natural tundra ponds to north + east. Ditch drains to NE.
Evidence of surface erosion on disposal area walls or on exterior berms?		X	
Erosion of access roads?		X	
Discoloring of vegetation downslope?		X	
Any evidence of leakage or escape of waste from cells?		X	
Airborne ash or dust particles?		X	
Evidence of wildlife or birds present? Include number and type of birds on site.		X	
Windblown litter in cells or along access roads or adjacent ponds?		X	No visible debris.
Landfill odors?		X	
Fire or combustion in the waste?		X	
Damage to the structural integrity of a dike wall, culvert, or erosion control feature, if present?		X	Manmade ditch in excellent condition + functioning properly.
Is revegetation occurring?	X		Grass is short, however, appears to be revegging.
Estimated Percent Vegetative Cover: On Cap Surface 70% On Sideslopes: 70% Comments: Grass/vegetation not growing well in rocky areas.			

General Comments: Landfill appears structurally sound + stable. No visible erosion, Grass is short but coverage is good. Overall in great shape. No evidence of Leachate.

Corrective Actions Taken: ~~None~~ JC Spread seed on bare areas on 9-13-11, conducted by Bristol Environmental. Hope to promote veg. in rocky areas.

(Use additional pages if necessary)

Photo 1: Site 7 Landfill – North slope of landfill, facing east.

Photo 2: Site 7 Landfill – East slope of landfill, facing northeast.

Photographs taken on 20 August 2011

Photo 3: Site 7 Landfill – View from approximate center of landfill, facing northeast.

Photo 4: Site 7 Landfill – South slope of landfill, facing west.

Photographs taken on 20 August 2011

Photo 5: Site 7 Landfill – View of top of landfill from south end, facing north.

Photo 6: Site 7 Landfill – South slope of landfill, facing west.

Photographs taken on 20 August 2011

Photo 7: Site 7 Landfill - West slope of landfill, facing south.

Photo 8: Site 7 Landfill - View of top of landfill from northeast corner, facing southwest.

Photo 9: Site 7 Landfill – View of top of landfill from east side (from road), facing west.

Photo 10: Site 7 Landfill – South slope of landfill, facing northwest with camp in background.

Photographs taken on 20 August 2011

Photo 11: Site 7 Landfill – Surface water pond on northwest side of landfill, facing northwest with camp in background.

Photo 12: Site 9 Landfill – Drainage ditch operating well and in good condition, facing northeast.

Photographs taken on 20 August 2011


Photo 13: Site 9 Landfill – East side of landfill, facing north.


Photo 14: Site 9 Landfill – North side of landfill, facing east.

Photographs taken on 20 August 2011

Photo 15: Site 9 Landfill – North side of landfill, facing northwest.

Photo 16: Site 9 Landfill – Southeast side of landfill, facing northwest.

Photographs taken on 20 August 2011

Photo 17: Site 9 Landfill –West side of landfill, facing southwest.

Photo 18: Site 9 Landfill – East side of landfill, facing southwest.

Photographs taken on 20 August 2011

Photo 19: Site 9 Landfill – View of landfill from east side, facing west.

Visual Inspection Checklist (Post-Closure)
Site 7 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Name of Inspector: ____Aaron Shewman______________________Date: ___26 July 2012__________

Weather conditions: __Cloudy, Windy, Rainy_______________ Precipitation X Yes ☐ No

Temperature: _50_°**F** Prevailing Wind Direction: __West__ Speed: _15-20 mph_____

Photographs Taken: __Yes____

Landfill Post-Closure Monitoring Items	Y	N	COMMENTS
Evidence of settlement or frost jacking within or on surface of landfill?		X	Stable, level surface
Ponded water within, against, or on surface of landfill?	X		Yes, tundra ponds are against the N, W, and S sides of the landfill cap
Evidence of surface erosion on disposal area walls or on exterior berms?		X	
Erosion of access roads?		X	
Discoloring of vegetation downslope?		X	
Any evidence of leakage or escape of waste from cells?		X	
Airborne ash or dust particles?		X	
Evidence of wildlife or birds present? Include number and type of birds on site.		X	
Windblown litter in cells or along access roads or adjacent ponds?		X	
Landfill odors?		X	
Fire or combustion in the waste?		X	
Damage to the structural integrity of a dike wall, culvert, or erosion control feature, if present?		X	
Is revegetation occurring?	X		
Estimated Percent Vegetative Cover: On Cap Surface _70______ On Sideslopes: ___60____ Comments: S and W sideslopes have less vegetation. These slopes are rocky and subject to high winds.			

General Comments: The landfill cap appears structurally sound and stable, Vegetation is not growing in rocky areas, but these areas remain stable due to the rocky nature of the slope(s).

____

Corrective Actions Taken: __None____

____

____

(Use additional pages if necessary)

F10AK096903_07.11_0501_p
F10AK096905_07.11_0501_p
200-1f

Visual Inspection Checklist (Post-Closure)
Site 9 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Name of Inspector: ____Aaron Shewman________________________Date: ___26 July 2012___________

Weather conditions: __Cloudy, Windy, Rainy________________ Precipitation X Yes ☐ No

Temperature: _50_°**F** Prevailing Wind Direction: __West__ Speed: _15-20 mph_____

Photographs Taken: __Yes____

Landfill Post-Closure Monitoring Items	Y	N	COMMENTS
Evidence of settlement or frost jacking within or on surface of landfill?		X	Stable, level surface
Ponded water within, against, or on surface of landfill?	X		Yes, tundra ponds are against the N and E sides of the landfill cap
Evidence of surface erosion on disposal area walls or on exterior berms?		X	
Erosion of access roads?		X	
Discoloring of vegetation downslope?		X	
Any evidence of leakage or escape of waste from cells?		X	
Airborne ash or dust particles?		X	
Evidence of wildlife or birds present? Include number and type of birds on site.		X	
Windblown litter in cells or along access roads or adjacent ponds?		X	None
Landfill odors?		X	
Fire or combustion in the waste?		X	
Damage to the structural integrity of a dike wall, culvert, or erosion control feature, if present?		X	Ditch from tundra pond in excellent condition and functioning very well
Is revegetation occurring?	X		
Estimated Percent Vegetative Cover: On Cap Surface _70______ On Sideslopes: ___70____ Comments: Vegetation is sparse in rocky areas.			

General Comments: The cap appears structurally sound and stable. Vegetation is either sparse or not growing in very rocky areas, but these areas remain stable due to the rocky nature of the slope(s).

Corrective Actions Taken: __None____

____

____

(Use additional pages if necessary)

Photo 1: Site 7 Landfill – Pond on west side of landfill, facing north.

Photo 2: Site 7 Landfill – View of landfill cap from north side, facing southwest.

Photo 3: Site 7 Landfill – Panorama view from south side of landfill, facing north, road on right.

Photo 4: Site 7 Landfill – View of landfill cap, facing east.

Photo 5: Site 7 Landfill – East side of landfill, facing northeast.

Photo 6: Site 7 Landfill – East side of landfill, facing south.

Photo 7: Site 7 Landfill – East side of landfill, facing southwest.

Photo 8: Site 7 Landfill – East side of landfill, facing west.

Photo 9: Site 9 Landfill – View of landfill cap surface, facing west with MOC in background.

Photo 10: Site 9 Landfill – Pond outlet ditch in good condition and operating efficiently, facing northeast.

Photo 11: Site 9 Landfill – Diversion ditch in good condition, facing northeast.

Photo 12: Site 9 Landfill – Northeast side of landfill and adjacent pond, facing northwest.

Photo 13: Site 9 Landfill – Diversion ditch outfall area into wetland, facing north.

Photo 14: Site 9 Landfill – East side of landfill and adjacent pond, facing southwest.

Photo 15: Site 9 Landfill – Drive point well on east corner of landfill (removed in 2012) facing southwest.

Photo 16: Site 9 Landfill – Drive point well (removed in 2012) and PVC monitoring well on east side of landfill, facing west.

Visual Inspection Checklist (Post-Closure)
Site 7 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Name of Inspector: ___Lisa Geist________________________ Date: ____August 7, 2013______

Weather conditions: ___Partly sunny, overcast skies______ Precipitation ☐ Yes ☒ No

Temperature: _54_°**F** Prevailing Wind Direction: ___E____ Speed: __10-15 mph__

Photographs Taken: ___Yes____

Landfill Post-Closure Monitoring Items	**Y**	**N**	**COMMENTS**
Evidence of settlement or frost jacking within or on surface of landfill?		X	
Ponded water within, against, or on surface of landfill?	X		Tundra ponds close to toe of landfill on west and north sides.
Evidence of surface erosion on disposal area walls or on exterior berms?		X	
Erosion of access roads?		X	
Discoloring of vegetation downslope?		X	
Any evidence of leakage or escape of waste from cells?		X	
Airborne ash or dust particles?		X	
Evidence of wildlife or birds present? Include number and type of birds on site.	X		One fox sighted on west side of landfill, animal droppings scattered around landfill. Three cranes in nearby tundra. Two Tundra voles on landfill cap.
Windblown litter in cells or along access roads or adjacent ponds?		X	
Landfill odors?		X	
Fire or combustion in the waste?		X	
Damage to the structural integrity of a dike wall, culvert, or erosion control feature, if present?		X	Culvert by gravel access road is clear.
Is revegetation occurring?	X		Grass growing well, areas of moss beginning to appear, but landfill surface still very cobbly with rocks.
Estimated Percent Vegetative Cover: On Cap Surface ___70_______ On Sideslopes: ___70___ Comments: Grasses growing well, but only moss is establishing itself on very rocky surfaces.			

General Comments: __ Landfill cover appears very stable and unchanged. Vegetation on landfill surface appears brownish/yellow/green with surrounding tundra very green, lush, and moist____

Corrective Actions Taken: __None____

____

____

(Use additional pages if necessary)

F10AK096903_07.11_0503_p
F10AK096905_07.11_0502_p
200-1f

Visual Inspection Checklist (Post-Closure)
Site 9 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Name of Inspector: ______Lisa Geist_________________________Date: ___August 7, 2013___

Weather conditions: ___Partly sunny, overcast skies_____ Precipitation ☐ Yes ☒ No

Temperature: _54_°**F** Prevailing Wind Direction: ____E_____ Speed: _10-15 mph__

Photographs Taken: ____Yes____

Landfill Post-Closure Monitoring Items	Y	N	COMMENTS
Evidence of settlement or frost jacking within or on surface of landfill?		X	
Ponded water within, against, or on surface of landfill?	X		Tundra ponds close to toe of landfill on east and north sides
Evidence of surface erosion on disposal area walls or on exterior berms?		X	
Erosion of access roads?		X	
Discoloring of vegetation downslope?		X	
Any evidence of leakage or escape of waste from cells?		X	
Airborne ash or dust particles?		X	
Evidence of wildlife or birds present? Include number and type of birds on site.	X		2 cranes in nearby tundra.
Windblown litter in cells or along access roads or adjacent ponds?		X	
Landfill odors?		X	
Fire or combustion in the waste?		X	
Damage to the structural integrity of a dike wall, culvert, or erosion control feature, if present?		X	
Is revegetation occurring?	X		
Estimated Percent Vegetative Cover: On Cap Surface ___80_____ On Sideslopes: __70_____ Comments: Grasses growing well with moss establishing on more rocky areas.			

General Comments: _Landfill cover appears very stable and unchanged. Vegetation on landfill surface appears brown/yellow/green with surrounding tundra green, lush, and moist

Corrective Actions Taken: ___None____

(Use additional pages if necessary)

Photo 1: Site 7 Landfill - Overview of landfill area, facing SW.

Photo 2: Site 7 Landfill - View of south side of landfill from Cargo Beach Road, facing SW.


Photo 3: Site 7 Landfill - View of west side of landfill area, facing south.


Photo 4: Site 7 Landfill – Southeast side of landfill from Cargo Beach Road, facing NW.

Photo 5: Site 7 Landfill – Surface of landfill, note both newer (green) and older (brown) grass tufts, facing east.

Photo 6: Site 7 Landfill – North slope of landfill, note tall grass tufts with seed, facing NW.

Photo 7: Site 9 Landfill – Overview of entire landfill area from site access road, facing south.

Photo 8: Site 9 Landfill – View of landfill facing west, MOC in background.


Photo 9: Site 9 Landfill – North end of landfill, facing NE.


Photo 10: Site 9 Landfill – Close-up view of landfill vegetation.

Photo 11: Site 9 Landfill – Pond along SE side of landfill, facing SW.

Photo 12: Site 9 Landfill – Diversion ditch that drain pond shown in Photo 11, operating sufficiently, facing NE.

U.S. Army Corps of Engineers
Alaska District

2013 SAMPLING CONDUCTED IN CONJUNCTION WITH THE 2013 FIVE-YEAR REVIEW AT NORTHEAST CAPE

NORTHEAST CAPE
ST. LAWRENCE ISLAND, ALASKA

FUDS No. F10AK0969-05

Final
February 2014

F10AK096905_07.11_0503_p
200-1f

U.S. Army Corps of Engineers Alaska District

2013 SAMPLING CONDUCTED IN CONJUNCTION WITH THE 2013 FIVE-YEAR REVIEW AT NORTHEAST CAPE

NORTHEAST CAPE
ST. LAWRENCE ISLAND, ALASKA

FUDS No. F10AK0969-05

Final
February 2014

F10AK096905_07.11_0503_p
200-1f

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

SECTION | **PAGE**

TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

ADEC	Alaska Department of Environmental Conservation
BERS	Bristol Environmental Remediation Services, LLC.
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
COC	contaminant of concern
DRO	diesel-range organics
EPA	U.S. Environmental Protection Agency
FUDS	Formerly Used Defense Site
GRO	gasoline-range organics
HTRW	hazardous, toxic, or radioactive waste
Jacobs	Jacobs Engineering Group
KMS	Kangukhsam Mountain Spring
mL	milliliter
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
QAPP	Quality Assurance Project Plan
QC	quality control
RCRA	Resource Conservation and Recovery Act
RRO	residual-range organics
USACE	U.S. Army Corps of Engineers
µm	micron

(intentionally blank)

EXECUTIVE SUMMARY

This Report describes sample collection activities conducted at three Northeast Cape sites on St. Lawrence Island, Alaska, which were performed in order to facilitate the first five-year review. Although the five-year review site inspections coincided with the September sample collection, those activities will be described in a separate report.

Sampling activities occurred on 11 and 12 September 2013 at approved locations, as identified in the *Supplement to the Northeast Cape HTRW Remedial Actions Quality Assurance Project Plan* (U. S. Army Corps of Engineers [USACE] 2013b). A summary of the collection activities are listed below:

- At Cargo Beach Road Landfill (Site 7), surface water was collected from three locations and submitted to an offsite analytical laboratory for analysis. Groundwater grab sampling was attempted at four locations downgradient of the landfill. Drive point refusal was encountered at depths ranging from 6 to 30 inches below ground surface, due to large rocks. Groundwater was not encountered during the attempts and sampling was discontinued following consultation with USACE.
- At Housing and Operations Landfill (Site 9), surface water was collected from three locations and submitted to an offsite analytical laboratory for analysis. A single groundwater grab sample was collected from Site 9. Limited water production of 2.5 milliliters (mL) per minute from the drive point screened interval was less than the work plan-specified rate of 250 mL per minute. Sufficient volume was obtained for gasoline-range organics (GRO); benzene, toluene, ethylbenzene, and xylenes (BTEX); and dissolved (field filtered) Resource Conservation and Recovery Act (RCRA) metals with zinc analysis. Groundwater collection was halted following consultation with USACE.
- At Kangukhsam Mountain Spring, surface water was collected from one location and submitted to an offsite analytical laboratory for analysis.

All sample results were compared to the project cleanup level and no exceedances were identified.

(intentionally blank)

1.0 INTRODUCTION

The Northeast Cape site is located on St. Lawrence Island, Alaska approximately 135 air miles southwest of Nome (Figure A-1). The Village of Savoonga is the closest community, and is located 60 miles northwest of the site (Figure A-2). The Northeast Cape site was constructed as an Aircraft Control and Warning Station during 1950 and 1951, and provided radar coverage and surveillance as part of the Alaska Early Warning System until 1972. The site encompasses approximately 4,800 acres (7.5 square miles) and is bounded by Kitnagak Bay to the northeast, Kangighsak Point to the northwest, and the Kinipaghulghat Mountains to the south. The Northeast Cape site, classified as a Formerly Used Defense Site (FUDS), is comprised of 34 individual sites. These individual sites have previously been subject to several phased remedial investigations and/or removal actions.

Site-specific sampling was requested by community members at the two landfill sites and the seasonal drinking water source, Kangukhsam Mountain Spring (Figure A-3). Sampling activities coincided with five-year review site inspections.

1.1 OBJECTIVES

The purpose of this sampling effort is to determine if site-specific contaminants of concern (COC) are present in groundwater and/or surface water at the Cargo Beach Road Landfill (Site 7), the Housing and Operations Landfill (Site 9), or Kangukhsam Mountain Spring.

1.2 SCOPE OF WORK

The definable features of work include the following:

- Collection of one surface water sample from Kangukhsam Mountain Spring
- Collection of one surface water sample from three locations within Cargo Beach Road Landfill (Site 7)
- Attempt collection of one groundwater grab sample from Cargo Beach Road Landfill (Site 7)
- Collection of one surface water sample from three locations within Housing and Operations Landfill (Site 9)

- Collection of one groundwater grab sample from Housing and Operations Landfill (Site 9)
- Management of investigation-derived waste

1.3 FIELD CHANGE FORMS

Work described in this report was conducted in accordance with the *Supplement to the Northeast Cape HTRW Remedial Actions Quality Assurance Project Plan* (USACE 2013b). Deviations from the Work Plan and/or approved field changes were not generated from this sampling effort.

2.0 FIELD INVESTIGATION ACTIVITIES

Surface water and/or groundwater samples were collected from three Northeast Cape sites between 11 September 2013 and 12 September 2013. Jacobs personnel travelled from Anchorage to Nome via commercial airline, and from Nome to the Northeast Cape site via charter aircraft. While onsite, personnel were housed within a temporary camp maintained by Bristol Environmental Remediation Services, LLC (BERS). Throughout the duration of the sampling activities, BERS was onsite completing work described in the *Northeast Cape HTRW Remedial Actions Work Plan, Revision 1* (USACE 2013a). Ambient temperatures ranged from 35 to 40 degrees Fahrenheit (°F) during the sampling effort.

2.1 SAMPLING AND ANALYTICAL APPROACH

Individual sites within the Northeast Cape site were accessed via existing site roads. Sampling locations were identified using existing landmarks and verified with the onsite USACE Quality Assurance Representative prior to sampling.

Sampling at the Northeast Cape site included the collection of both unfiltered and filtered water samples. Unfiltered water samples were used for analysis of gasoline-range organics (GRO) by Alaska Method 101 (AK101), diesel-range organics (DRO) by AK102, residual-range organics (RRO) by AK103, benzene, toluene, ethylbenzene, and xylenes (BTEX) by U.S. Environmental Protection Agency (EPA) Method SW8260C, polycyclic aromatic hydrocarbons (PAH) by EPA Method SW8270-SIM, polychlorinated biphenyls (PCB) by EPA Method SW8082, eight Resources Conservation and Recovery Act (RCRA) metals, and zinc by EPA Method SW6020A/SW7471. Filtered water samples were collected for analysis of dissolved metals, which was performed using a disposable 0.45-micron (µm) in-line water filter attached to a peristaltic pump. Filtered water was transferred to sample containers provided by the laboratory and used for analysis of eight RCRA metals and zinc by EPA Method SW6020A/SW7471. In addition, filtered and unfiltered water samples collected from Cargo Beach Road Landfill (Site 7) were also analyzed for nickel using EPA Method SW6020A.

A pin flag or lathe was placed at the sampling location to allow for later identification during surveying. Observations, sampling information, and field parameter readings were recorded in the field logbook and/or field sampling forms provided in Appendix C. Photographs relevant to this sampling effort are included in the photograph log (Appendix D). The logbook (Appendix C) was shared between two field teams during this field effort and includes additional photographs and field activities not related to site-specific sampling efforts.

2.2 SURFACE WATER SAMPLING

Surface water samples were collected from Cargo Beach Road Landfill (Site 7), Housing and Operations Landfill (Site 9), and Kangukhsam Mountain Spring. Samples were collected near the shoreline, slightly below the surface of the water. A disposable Teflon® dipper was used to retrieve the surface water at each location in accordance with the procedures detailed in the *Supplement to the Northeast Cape HTRW Remedial Actions Quality Assurance Project Plan* (USACE 2013b). Sampling locations are shown in Figures A-4, A-5, and A-6.

2.3 GROUNDWATER GRAB SAMPLING

Groundwater grab sampling was attempted downgradient of Cargo Beach Road Landfill (Site 7) and Housing and Operations Landfill (Site 9). A 30-inch screened drive point was attached to a 36-inch drive rod (totaling 66 inches in length) and advanced into the subsurface using hand tools until groundwater was encountered or refusal was met.

At Cargo Beach Road Landfill (Site 7), large rocks were visible at the surface near the proposed groundwater grab sample location north of the landfill cap. The first attempt to advance the drive point resulted in a ground penetration of 6 inches before refusal was met. The onsite USACE Quality Assurance Representative was consulted along with the USACE Project Manager and a decision was made to step out from the planned groundwater grab sampling location. The drive point was advanced at three additional locations and met with refusal each time. The greatest depth reached during these attempts was 30 inches below ground surface (bgs) and recoverable water was not observed; therefore, groundwater grab sampling was halted. Figure A-4 displays the attempted groundwater grab sample locations at Cargo Beach Road Landfill (Site 7).

At Housing and Operations Landfill (Site 9), the terrain near the groundwater grab sample location appeared to be tundra with little exposed rock. The drive point was advanced and achieved a ground penetration of 48 inches before resistance – possibly due to permafrost – was noticed. Water was found in the drive point and eventually stabilized at 33 inches bgs as measured by a water level probe.

An unused ¼-inch inside diameter polyethylene tube was inserted through the drive rod (until it was below the water surface) and attached to a peristaltic pump. The pump was set to the lowest speed and water was removed from the drive point into a graduated beaker to determine the flow. The flow rate was found to be 2.5 mL per minute, which is far below the minimum acceptable flow rate of 250 mL per minute, as established in the work plan. Although groundwater production from the well point was low, sufficient volume was collected over a two-hour period for field parameter measurements and to fill sample containers for BTEX, GRO, and dissolved (field filtered) RCRA metals with zinc analysis. The onsite USACE Quality Assurance Representative was consulted along with the USACE Project Manager regarding the limited water production, and groundwater sampling was discontinued. Figure A-5 displays the Housing and Operations Landfill (Site 9) groundwater grab sample location.

2.4 LAND SURVEYING

An optical survey was performed in order to record the sampling and attempted sampling locations. Surveying was conducted by Eco-Land, LLC, a professional land surveyor, subcontracted by BERS. Horizontal data are presented in feet, using the Alaska State Plane Zone 9 projection and the North American Datum of 1983. Survey data tables relevant to sampling locations, and compliant with the *Manual for Electronic Deliverables* (USACE 2011), will be included with the Remedial Actions Report prepared by BERS. An abbreviated survey data table is included in Appendix F.

2.5 WASTE MANAGEMENT

Waste was transported and disposed of in accordance with all applicable local, state, and federal regulations. Investigation-derived waste included used personal protective equipment, disposable filters and bailers, calibration and decontamination water, and general refuse. Solid waste was stored in a contractor bag, co-mingled with BERS waste onsite, and disposed of by BERS in accordance with the *Northeast Cape HTRW Remedial Actions Work Plan, Revision 1* (USACE 2013a). Liquid waste was stored in a 5-gallon bucket and transported to Anchorage, Alaska by Jacobs personnel, then transferred to Emerald Waste Services in Palmer, Alaska for disposal. Liquid waste quantities are summarized in Table 2-1; the liquid waste manifest and certificate of disposal are included in Appendix E.

Table 2-1
Liquid Waste Quantities

Waste Type	Number of Containers	Disposal Quantity
Non-hazardous Wastewater	1	5-gallon bucket

3.0 INVESTIGATION RESULTS

This section summarizes the field and analytical results for the 2013 sampling activities, which were conducted at the Northeast Cape site by Jacobs. The sample summary table, complete analytical results, and assessment of data quality are included in Appendix B.

3.1 SURFACE WATER SAMPLING RESULTS

Prior to sampling, field parameters were recorded directly from the water source using a YSI water quality meter and a Micro turbidimeter. Surface water parameters measured prior to sampling are provided in Table 3-1.

Table 3-1
Surface Water Parameters Prior to Sampling

Site ID	Sampling Location	Temperature (°C)	Conductivity (µS/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (NTU)
KMS	KMS-WS01	4.26	32	17.713	6.31	186.2	0.56
Site 7	7LF-WS01	11.42	42	10.767	6.06	179.9	166.2
Site 7	7LF-WS02	12.77	45	10.251	6.1	160.0	33.44
Site 7	7LF-WS03	11.59	35	11.99	6.64	127.3	2.67
Site 9	9LF-WS01 9LF-WS02[1]	6.09	36	11.19	5.4	203.8	19.27
Site 9	9LF-WS03	6.07	38	20.022	6.02	172.2	0.54
Site 9	9LF-WS04	7.96	66	10.286	6.34	150.9	210.2

Notes:
[1]Sampling locations 9LF-WS01 and 9LF-WS02 are a duplicate pair
°C = Degrees Celsius
DO = dissolved oxygen
KMS = Kangukhsam Mountain Spring
µS/cm = microSiemens per centimeter
mg/L = milligrams per liter
mV = millivolts
NTU = nephelometric turbidity units
ORP = oxidation reduction potential

Turbidity readings for sampling locations 7LF-WS01 and 9LF-WS04 were found to be much greater than other nearby sampling locations. Sampling locations 7LF-WS01 and 9LF-WS04 are located immediately adjacent to the landfill caps for each site and were noted as being turbid with no apparent odor or sheen. Field observations by Jacobs personnel did not identify any recent disturbances or possible landfill cap erosion that could have contributed to the high turbidity readings.

Seven primary surface water samples and one duplicate sample were collected and sent to ALS Environmental, Inc. (ALS) for analysis. Analytical results were compared to project cleanup levels obtained from Table 15-3 of the *Northeast Cape HTRW Remedial Actions Work Plan, Revision 1* (USACE 2013a), using the cleanup levels from the "Cleanup levels from 2009 Decision Document" column (USACE 2009). Surface water analytical results are presented in the following subsections.

Cargo Beach Road Landfill (Site 7)

Three primary surface water samples were collected for analysis of GRO, DRO, RRO, BTEX, PAHs, PCBs, eight RCRA metals, nickel, and zinc. Sampling locations are shown in Figure A-4.

Analytes did not exceed project cleanup levels in surface water samples collected from this site. The complete analytical results table is provided in Appendix B.

Housing and Operations Landfill (Site 9)

Three primary surface water samples and one duplicate sample were collected for analysis of GRO, DRO, RRO, BTEX, PAHs, PCBs, eight RCRA metals and zinc. Sampling locations are shown in Figure A-5.

Analytes did not exceed project cleanup levels in surface water samples collected from this site. The complete analytical results table is provided in Appendix B.

Kangukhsam Mountain Spring

One surface water sample was collected and analyzed for GRO, DRO, RRO, BTEX, PAHs, PCBs, eight RCRA metals, and zinc. This sampling location is shown in Figure A-6.

Analytes did not exceed project cleanup levels in surface water samples collected from this site. The complete analytical results table is provided in Appendix B.

3.2 GROUNDWATER GRAB SAMPLING RESULTS

Groundwater grab sampling was attempted at locations downgradient from Cargo Beach Road Landfill (Site 7) and Housing and Operations Landfill (Site 9). Due to the limitations described in Section 2.3, only one primary groundwater grab sample was collected from Housing and Operations Landfill (Site 9); it was sent to ALS for analysis. Analytical results were compared to the project cleanup levels obtained from Table 15-3 of the *Northeast Cape HTRW Remedial Actions Work Plan, Revision 1* (USACE 2013a), using the cleanup levels from the "Cleanup levels from 2009 Decision Document" column (USACE 2009).

Prior to sampling, field parameters including: temperature, pH, dissolved oxygen, conductivity, oxidation-reduction potential, and turbidity, were recorded using a YSI water quality meter and a Micro turbidimeter. Groundwater parameters measured at the time of sampling are provided in Table 3-2.

Table 3-2
Groundwater Parameters Prior to Sampling

Site ID	Sampling Location	Temperature (°C)	Conductivity (µS/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (NTU)
Site 9	9LF-WG01-2	6.22	132	0.73	5.44	177	9999[1]

Notes:
[1] A reading of "9999" indicates an over range error code.
°C = Degrees Celsius
DO = dissolved oxygen
µS/cm = microSiemens per centimeter
mg/L = milligrams per liter
mV = millivolts
NTU = nephelometric turbidity units
ORP = oxidation reduction potential

Cargo Beach Road Landfill (Site 7)

Groundwater grab samples were not collected from Cargo Beach Road Landfill (Site 7).

Housing and Operations Landfill (Site 9)

One primary groundwater grab sample was collected from this site. Sediment and organics in the groundwater continually blocked the flow of groundwater through the screen, resulting in a groundwater production rate of approximately 2.5 milliliters per minute (mL/min). The groundwater production rate resulted in a limited quantity of groundwater available for analysis. A sufficient volume of groundwater was collected for the analysis of GRO by AK101, BTEX by SW8260C, and dissolved (field filtered) RCRA metals with zinc by SW6020A/SW7471.

Although the analysis of DRO by AK102, RRO by AK103, PAHs by SW8270-SIM, and PCBs by SW8082 were planned, insufficient water production from the well point and the volume of water required to fill the sample containers (six liters) made collection impractical. An unfiltered sample volume for RCRA metals with zinc by SW6020A/SW7471 analysis was not collected due to high turbidity.

GRO, BTEX, and dissolved metals (RCRA metals with zinc) did not exceed project cleanup levels in groundwater obtained from Site 9. The complete analytical results table is provided in Appendix B.

3.3 DATA EVALUATION

Data quality was assessed through the review of the laboratory case narrative, laboratory data deliverables, and completion of ADEC checklists. A review of the analytical results and associated QC samples was performed by the Jacobs Project Chemist, as per the *Work Plan* (USAF 2013b).

Data quality was evaluated against the following requirements: U.S. Department of Defense *Quality Systems Manual for Environmental Laboratories*, version 4.2 (U.S. Department of Defense 2010); ADEC and EPA analytical methods (ADEC 2008; EPA 2007); and laboratory limits. Qualifiers were applied to sample results that did not meet the project data quality objectives. Qualified results are considered estimated and, whenever possible, indicated as biased high or low.

The data assessment found the overall quality of the project data to be acceptable and no results were rejected. The complete dataset, in addition to details of the data validation, is provided in the Data Quality Assessment (Appendix B).

4.0 CONCLUSIONS

Surface water and groundwater results collected during the 2013 sampling effort did not detect analytes greater than the project cleanup levels.

4.1 CARGO BEACH ROAD LANDFILL (SITE 7)

This site has been subject to several remedial efforts, including: investigation of metallic anomalies, removal of approximately 50 drums and 50 cubic yards of severely stained soils, placement of a minimum 2-foot thick, gravel landfill cap in 2009, and revegetation.

Previously identified COCs in surface water include DRO, which was detected in one surface water sample at a concentration of 8.9 mg/L in 1994 (USACE 2007). Groundwater grab samples collected in 2001, approximately 200 feet downgradient of the surface water exceedance, did not contain DRO greater than cleanup levels. Alternatively, lead and RRO were detected at concentrations exceeding cleanup levels (USACE 2007).

The 1994 surface water sampling location was not available for resampling in 2013 because the area had previously been covered by the landfill cap in 2009. As an alternative, site surface water was collected from three ponds located near the base of the landfill cap. The locations were selected as a representative subset of site surface water. Surface water sampling locations are shown in Figure A-4. Surface water samples were analyzed for DRO, RRO, GRO, BTEX, PAHs, PCBs, RCRA metals, nickel, and zinc. Analytical results did not exceed project cleanup levels in surface water samples from this site.

The 2013 groundwater grab sampling was attempted near the 2001 groundwater grab sampling locations; however, as described previously in Section 2.3, groundwater grab samples could not be collected because refusal was met at 30 inches bgs and groundwater was not present. Historically, sampling groundwater at this site has been quite difficult. Previous efforts to install temporary well points were successful at location WP 7-1 in 2001, yet required approximately three days before sampling could take place due to a low groundwater production rate. In some cases, the sampling points purged dry after 48 hours, without producing the required sampling volume (USACE 2007). Two groundwater grab samples

(WP7-2 and WP7-3) collected in 2001 were obtained by digging ‘pits’ to 36 to 40 inches bgs and allowing them to fill with water prior to sampling.

Significant effort will be required to install and maintain permanent monitoring wells at Cargo Beach Road Landfill (Site 7). The use of a tracked drill rig in addition to air rotary or sonic drilling methods would likely be needed for the successful installation of a monitoring well at this location. Walking the needed the drill rig to boring locations would subject the fragile tundra and surface vegetation to disturbance. Additionally, any monitoring wells would likely be subject to frost jacking due the extreme variability of seasonal conditions.

4.2 HOUSING AND OPERATIONS LANDFILL (SITE 9)

This site has been subject to several remedial actions, including placement of a minimum 2-foot thick, gravel landfill cap in 2010, removal of debris from nearby streams, construction of a diversion trench, and revegetation.

Sampling of groundwater in 2001 identified lead, RRO, beryllium, and antimony above cleanup levels at locations downgradient, to the north, east, and west of the landfill (USACE 2007). Figure A-5 shows historical sampling locations from 2001 that exceed cleanup levels. Groundwater sampling in 2013 was located at a downgradient location east of the landfill cap, and did not detect GRO, BTEX, filtered RCRA metals, or zinc above project cleanup levels. Future sampling efforts at this site may benefit from sampling near the 2001 locations that produced sufficient quantities of groundwater and contained contaminants at levels greater than cleanup levels.

Historical analysis of surface water samples did not detect contaminants greater than cleanup levels (USACE 2009). In 2013, surface water samples were collected from a pond located immediately north of the landfill cap and at the northern and southern extents of the constructed diversion trench, located downgradient and immediately adjacent to the landfill cap. Sampling locations are shown in Figure A-5. Analytical results indicate that contaminants did not exceed project cleanup levels.

4.3 KANGUKHSAM MOUNTAIN SPRING

This site was added as a sampling location at the Northeast Cape site after a request from a local community member. The spring is located to the south of the Northeast Cape site, near the Lower Tramway (Site 32), and is used as a seasonal drinking water source. Surface water samples were collected from an area likely to be used for drinking water, upgradient from many of the Northeast Cape sites. Analysis of these samples did not detect contaminants exceeding project cleanup levels.

(intentionally blank)

5.0 REFERENCES

Alaska Department of Environmental Conservation (ADEC). 2008

USACE (U.S. Army Corps of Engineers). 2013a (June). *Northeast Cape HTRW Remedial Actions Work Plan. Revision 1*. Prepared by Bristol Environmental Remediation Services, LLC.

USACE. 2013b (September). *Supplement to the Northeast Cape HTRW Remedial Actions Quality Assurance Project Plan.* Prepared by Jacobs Engineering Group, Inc.

USACE. 2011 (October). *Manual for Electronic Deliverables*. Prepared by USACE-Alaska District.

USACE. 2009a (January). *Decision Document: Hazardous, Toxic, and Radioactive Waste (HTRW) Project #F10AK096903, Northeast Cape Formerly Used Defense Site (FUDS) St. Lawrence Island, Alaska.* Prepared by USACE-Alaska District.

USACE. 2009b (June). *Decision Document: Site 7 Cargo Beach Road Landfill Containerized Hazardous, Toxic, and Radioactive Waste (CON-HTRW) Project #F10AK096905, Northeast Cape Formerly Used Defense Site (FUDS) St. Lawrence Island, Alaska.* Prepared by USACE-Alaska District.

USACE. 2007 (March). *Feasibility Study: Hazardous, Toxic, and Radioactive Waste (HTRW) Project #F10AK096903, Northeast Cape Formerly Used Defense Site (FUDS) St. Lawrence Island, Alaska*. Prepared by USACE-Alaska District.

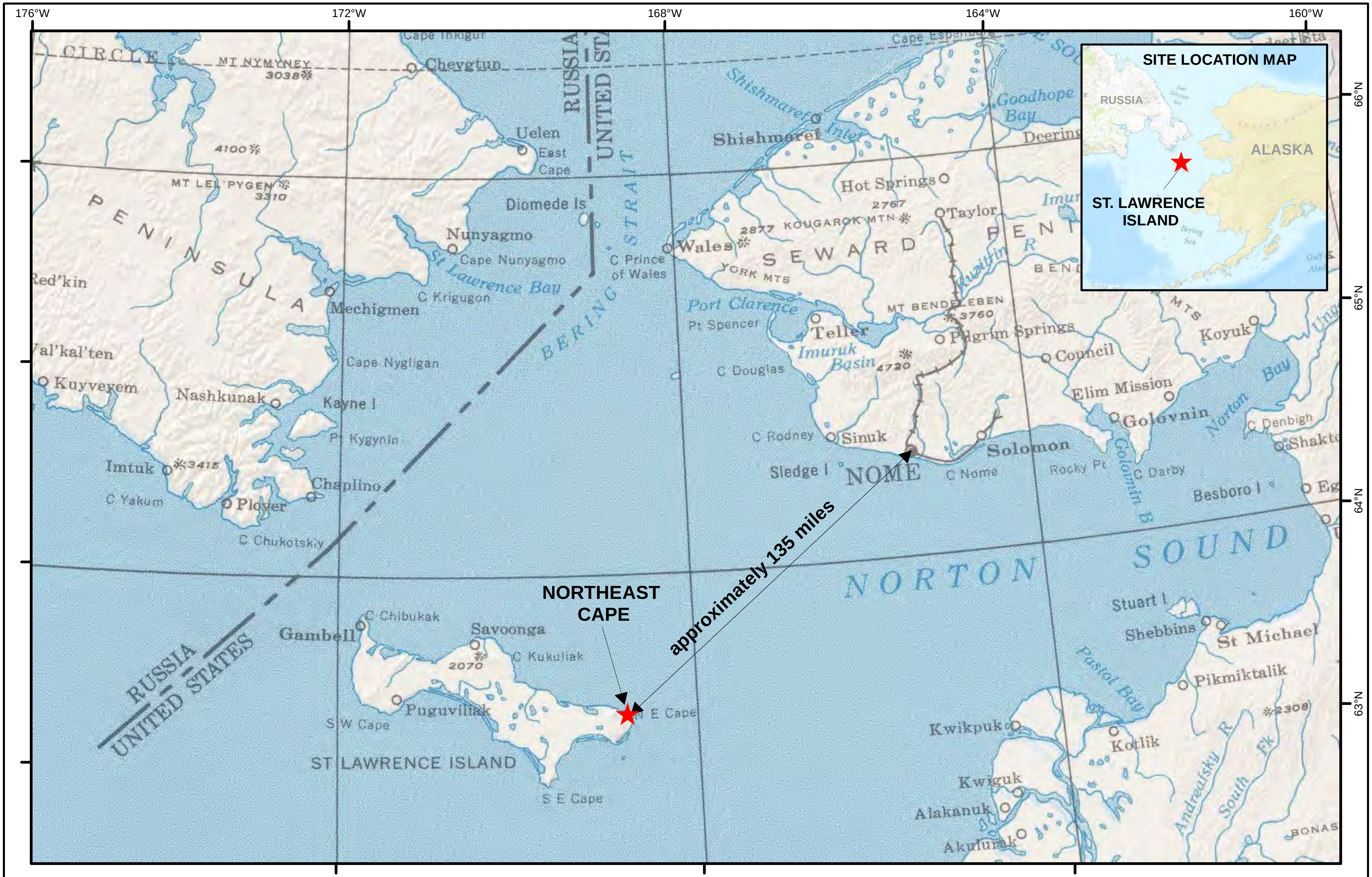
U.S. Department of Defense. 2010.

U.S. Environmental Protection Agency (EPA). 2007.

(intentionally blank)

APPENDIX A

Figures



★ Northeast Cape (Site Location)

N

All Locations Are Approximate

0 20 40 60 80

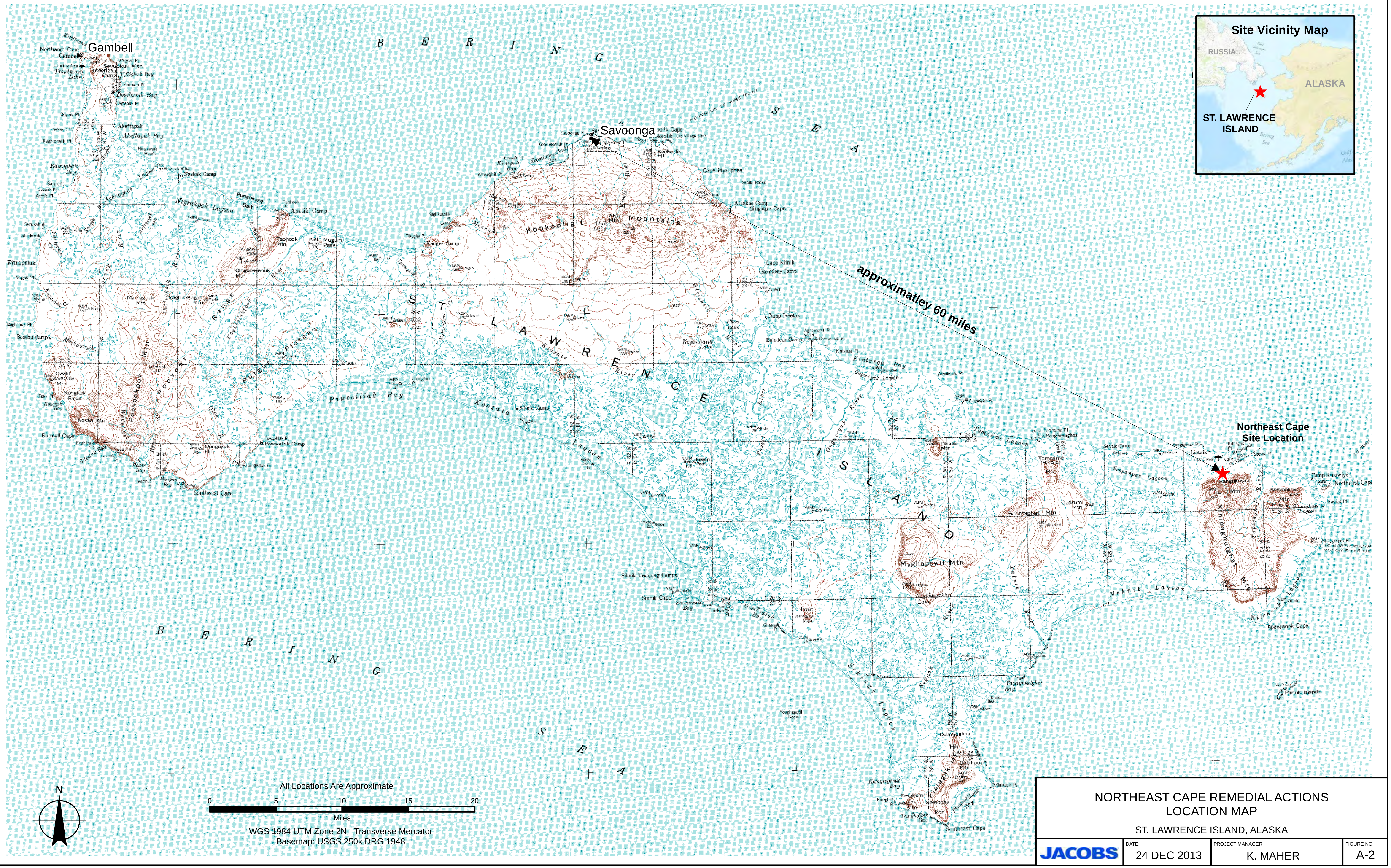
Miles

WGS 1984 UTM Zone 2N

NORTHEAST CAPE REMEDIAL ACTIONS
VICINITY MAP

ST. LAWRENCE ISLAND, ALASKA

JACOBS	DATE: 12 NOV 2013	PROJECT MANAGER: K. MAHER	FIGURE NO: A-1

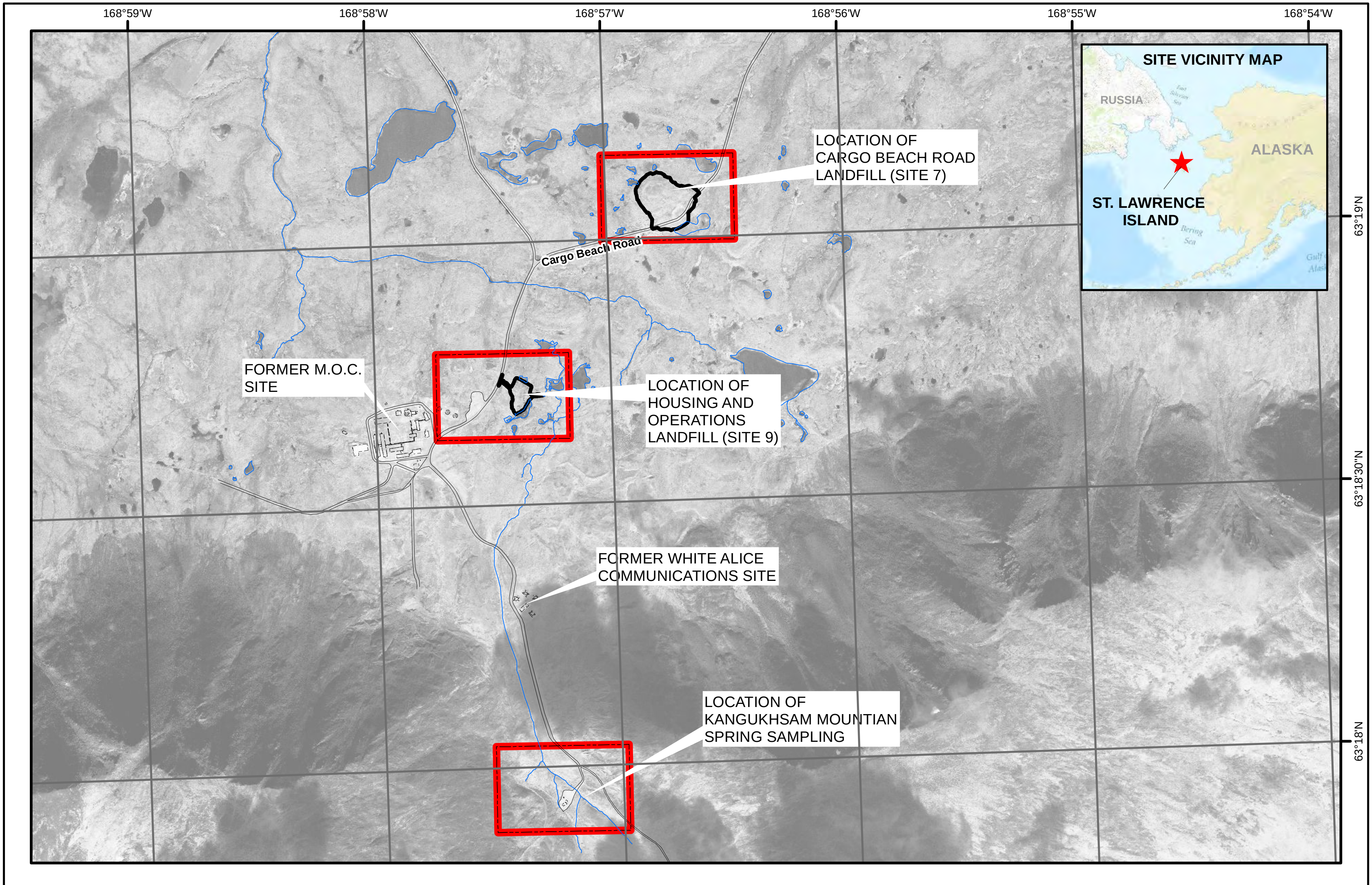


NORTHEAST CAPE REMEDIAL ACTIONS
LOCATION MAP

ST. LAWRENCE ISLAND, ALASKA

JACOBS	DATE: 24 DEC 2013	PROJECT MANAGER: K. MAHER	FIGURE NO: A-2

P:\StLawrenceIsland\MXD\TO09_NorthEastCape\StLawrenceLoc_DRG.mxd beatycj



Site Vicinity
Landfill Cap Boundary
Hydrologic Feature
Road
Former Structure

N

All Locations Are Approximate

0 500 1,000 1,500 2,000
Feet

WGS 1984 UTM Zone 2N

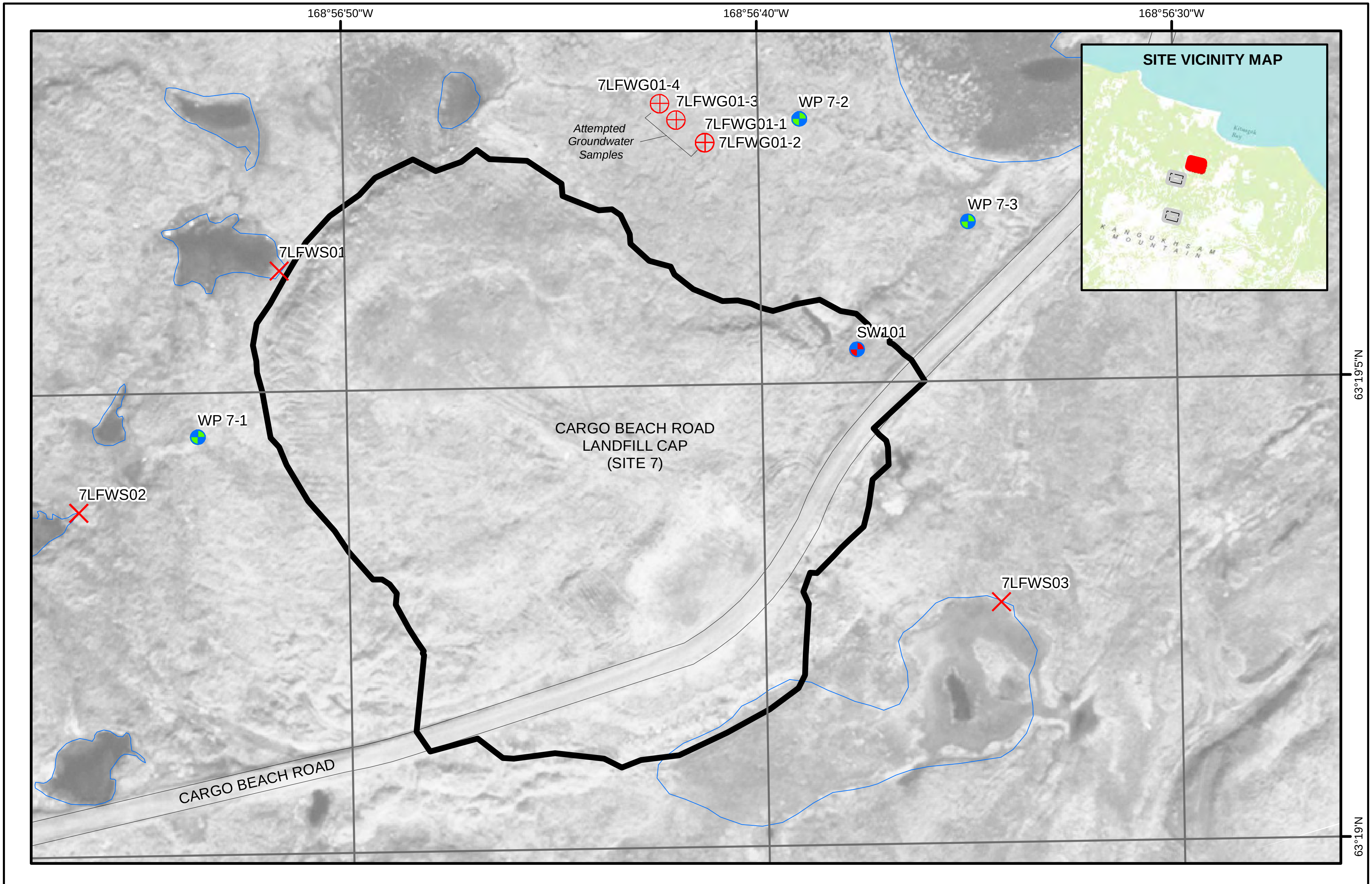
NORTHEAST CAPE REMEDIAL ACTIONS
VICINITY MAP

ST. LAWRENCE ISLAND, ALASKA

JACOBS

DATE:	PROJECT MANAGER:	FIGURE NO:
31 DEC 2013	K. MAHER	A-3

P:\StLawrenceIsland\MXD\TO09_NorthEastCape\StLawrenceSiteMap.mxd beatycj



1994 Historic Monitoring Well (Approx. Location)

2001 Historic Monitoring Well (Approx. Location)

Attempted Groundwater Sample

Surface Water Sample

Area 7 Landfill Cap Boundary

N

All Locations Are Approximate

0 50 100 150 200

Feet

NAD 1983 StatePlane Alaska 9 FIPS 5009 Feet

NORTHEAST CAPE REMEDIAL ACTIONS
SITE 7 - CARGO BEACH LANDFILL

ST. LAWRENCE ISLAND, ALASKA

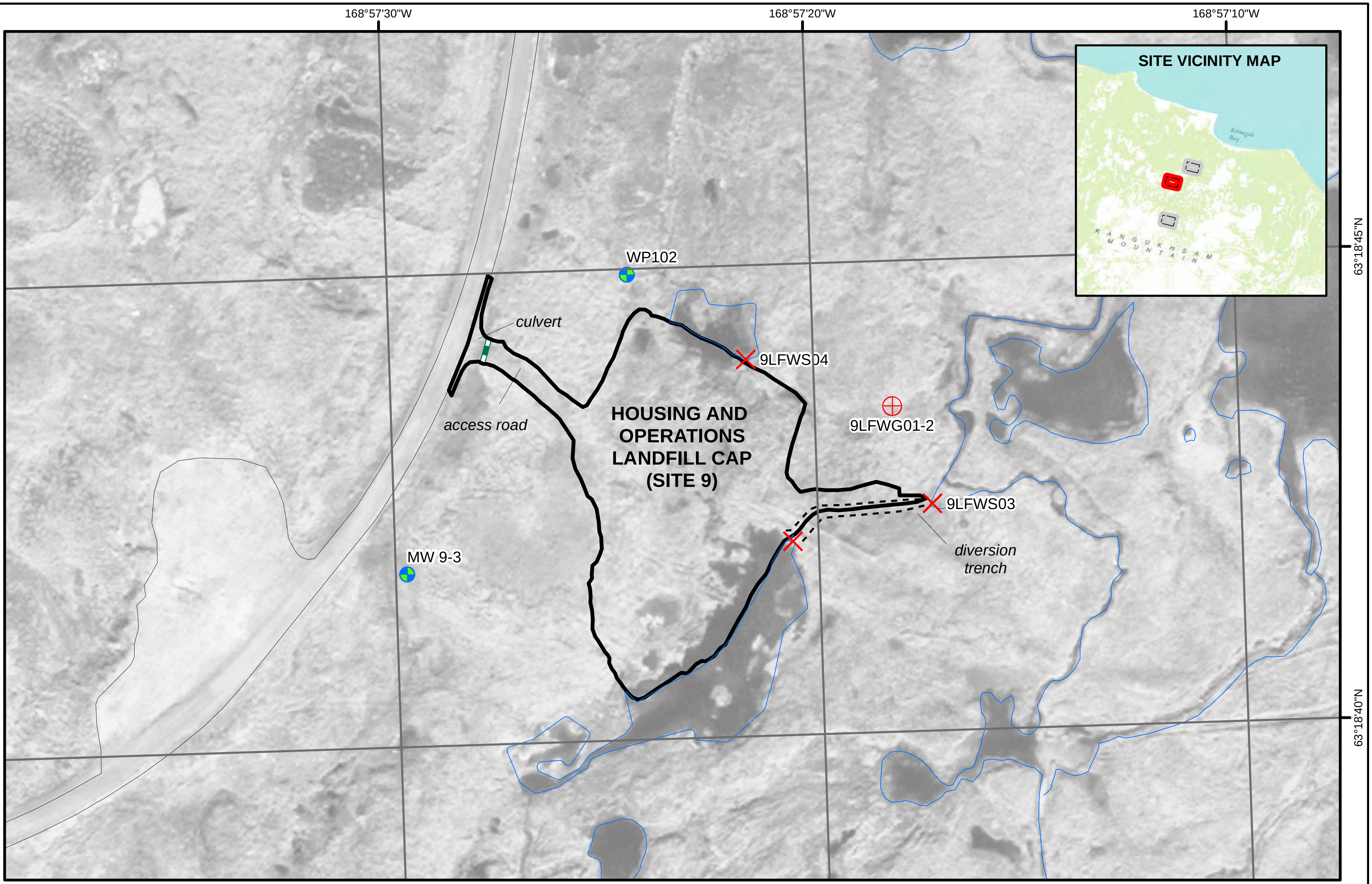
JACOBS

DATE: 31 DEC 2013

PROJECT MANAGER: K. MAHER

FIGURE NO: A-4

P:\StLawrenceIsland\MXD\TO09_NorthEastCape\StLawrenceSite7.mxd beatycj



2001 Historic Monitoring Well (Approx. Location)
Surface Water Sample
Groundwater Sample
Culvert
Trench Edge
Landfill Cap Boundary

N

All Locations Are Approximate

0 50 100 150 200
Feet

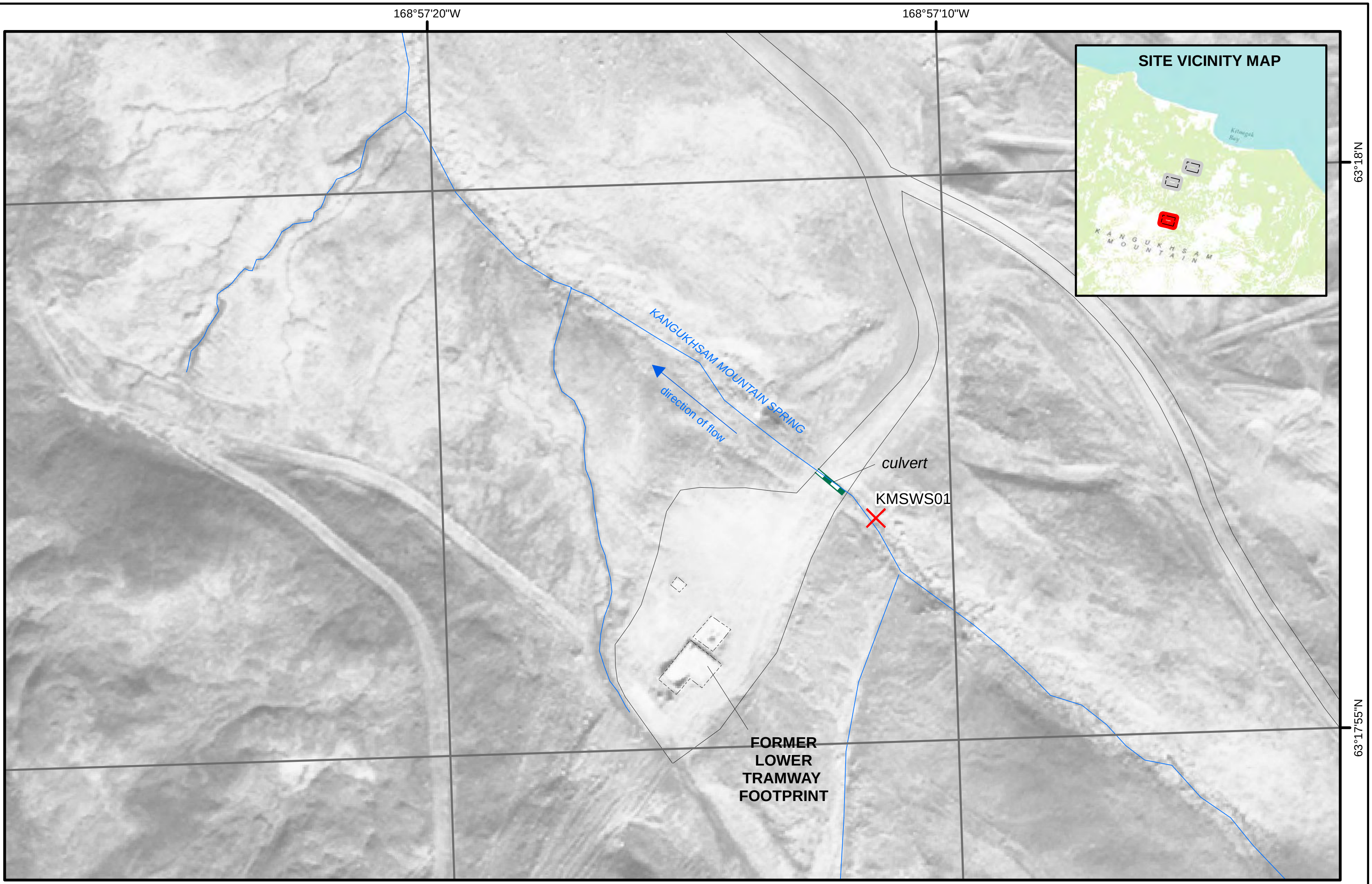
WGS 1984 UTM Zone 2N

NORTHEAST CAPE REMEDIAL ACTIONS
SITE 9 - HOUSING AND OPERATIONS LANDFILL

ST. LAWRENCE ISLAND, ALASKA

JACOBS	DATE: 31 DEC 2013	PROJECT MANAGER: K. MAHER	FIGURE NO: A-5

P:\StLawrenceIsland\MXD\TO09_NorthEastCape\StLawrenceSite9.mxd beatycj



Surface Water Sample
Culvert
Hydrologic Feature
Road
Former Structure

N

All Locations Are Approximate

0 50 100 150 200
Feet

WGS 1984 UTM Zone 2N

NORTHEAST CAPE REMEDIAL ACTIONS
KANGUKHSAM MOUNTAIN SPRING
SAMPLE LOCATIONS

ST. LAWRENCE ISLAND, ALASKA

JACOBS

DATE:	PROJECT MANAGER:	FIGURE NO:
31 DEC 2013	K. MAHER	A-6

P:\StLawrenceIsland\MXD\TO09_NorthEastCape\StLawrenceSite_KANGUKAM.mxd beatycj

APPENDIX B

Data Quality Assessment, ADEC Checklists, and Supporting Documentation

1.0 INTRODUCTION

A Data Quality Assessment and ADEC laboratory data review checklists were completed to assess the overall quality and usability of data from the 2013 NE Cape surface water and groundwater activities. The Jacobs Project Chemist performed a data quality review using the 2013 Supplement to the Northeast Cape HTRW Remedial Actions Work Plan (QAPP 2013).

This DQA, which appears as an appendix to the 2013 Sampling Report, contains analytical data tables, sample summary tables, and Alaska Department of Environmental Conservation (ADEC) Laboratory Data Review Checklists, organized into the following attachments:

- **Attachment B-1** contains the sample summary and analytical data tables.
- **Attachment B-2** presents tables of sample results that did not meet the project data quality objectives (DQO).
- **Attachment B-3** includes the ADEC Laboratory Data Review Checklists for each sample delivery group.
- **Attachment B-4** provides laboratory data in electronic format.

Seven primary water samples and one duplicate sample were submitted for gasoline-range organics (GRO); diesel-range organics (DRO); residual-range organics (RRO); polychlorinated biphenyls (PCBs); benzene, toluene, ethylbenzene, and xylene (BTEX); polycyclic aromatic hydrocarbons (PAH); dissolved metals; and total metals analysis. One primary sample was submitted for GRO, BTEX, and dissolved metals; there was insufficient sample volume for further analysis. One trip blank was submitted for GRO and BTEX. ALS Laboratories of Kelso, Washington, provided primary analytical support for these water samples.

2.0 DATA QUALITY SUMMARY

This evaluation consisted of a review of chain-of-custody (CoC) and sample receipt records; laboratory case narratives; and laboratory data, which includes analytical methodology, sample holding times, laboratory blanks, detection limit (DL), limit of detection (LOD), limit of quantitation (LOQ), surrogate recoveries, laboratory control sample (LCS) recoveries, matrix spike (MS) recoveries, and precision. Analytical data quality objectives (DQOs) were considered met when the quality of the sample data met precision, accuracy, representativeness, completeness, comparability, and sensitivity requirements, as specified in the project Work Plan (QAPP 2013). Results were categorized as acceptable, estimated, or rejected (flagged R). Data was qualified according to the definitions at the bottom of the analytical data table (Attachment B-1). A completeness check of the laboratory data was performed to verify that the data packages and electronic files included all information requested.

The overall quality of the data was acceptable, as qualified with the anomalies below and described in the ADEC laboratory data review checklist.

- AK103 method blank (QC batch KWG1310602) had RRO concentrations above the detection limit. Associated samples that have a concentration within a factor of 10 of the method blank contamination are qualified B and are presented in Table B-2-1 (Attachment B-2). There is no impact on the data since results are biased high and less than the Project Action Limit of 1.1 mg/L.
- AK102/AK103 method blank (QC batch KWG1311318) extract was lost during the initial extraction. Samples were re-extracted within the holding time. During the re-extraction the extraction vial for sample 13-9LF-WS03-0 broke. There was insufficient sample for a third re-extraction. The results from the initial extraction were reported and qualified QN; they are presented in Table B-2-2 (Attachment B-2). The impact is minimal since results were less than the Project Action Limits and there is no bias.
- AK102 MS and MSD recoveries for DRO were less than AK series method criteria at 72% and 74%, respectively. Parent sample 13-9LF-WS01-0 was qualified ML, indicating a low bias due to matrix effects. Impacts are minimal since the DRO result was significantly less than the Project Action Limit. Qualified results are presented in Table B-2-3 (Attachment B-2).
- Field duplicate precision was evaluated by calculating the RPD between the primary sample 13-9LF-WS01-0 and duplicate sample 13-9LF-WS02-0. Multiple analytes had RPDs greater than 30% and were qualified QN. These results are presented in Table B-2-4 (Attachment B-2). The impact is minimal since in all cases the primary and duplicate were less than Project Action Limit.

ATTACHMENT B-1

Sample Summary and Analytical Data Tables

2013 Northeast Cape
Sample Summary

Sample ID	Location ID	Collection Date	Collection Time	Sampler	Quantity	ContainerType	ContainerVolume	Preservative	Matrix	Analytical Method Requested	QC Type	TAT	Notes	COC Number	Cooler Name	Laboratory	SDG Number	Start Sample Depth (feet)	End Sample Depth (feet)
13-9LF-WS01-0	9LF-WS01	12-Sep-13	1000	CF/KM/JO	12	VOA	40 mL	HCl, 4 ± 2 °C	WS	AK101 (GRO) BTEX (SW8260)	MS/MSD	14		13NECAPE-01	Kilo	ALS	K1309641	0.00	0.50
13-9LF-WS02-0	9LF-WS02	12-Sep-13	1000	CF/KM/JO	4	VOA	40 mL	HCl, 4 ± 2 °C	WS	AK101 (GRO) BTEX (SW8260)	Dup	14		13NECAPE-01	Kilo	ALS	K1309641	0.00	0.50
13-9LF-WS03-0	9LF-WS03	12-Sep-13	1155	CF/KM/JO	4	VOA	40 mL	HCl, 4 ± 2 °C	WS	AK101 (GRO) BTEX (SW8260)		14		13NECAPE-01	Kilo	ALS	K1309641	0.00	0.50
13-9LF-WS04-0	9LF-WS04	12-Sep-13	1350	CF/KM/JO	4	VOA	40 mL	HCl, 4 ± 2 °C	WS	AK101 (GRO) BTEX (SW8260)		14		13NECAPE-01	Kilo	ALS	K1309641	0.00	0.50
13-9LF-WG01-2	9LF-WG01	12-Sep-13	1351	CF/KM/JO	4	VOA	40 mL	HCl, 4 ± 2 °C	WS	AK101 (GRO) BTEX (SW8260)		14		13NECAPE-01	Kilo	ALS	K1309641	2.00	2.50
13-KMS-WS01-0	KMS-WS01	12-Sep-13	1521	CF/KM/JO	4	VOA	40 mL	HCl, 4 ± 2 °C	WS	AK101 (GRO) BTEX (SW8260)		14		13NECAPE-01	Kilo	ALS	K1309641	0.00	0.50
13-7LF-WS01-0	7LF-WS01	12-Sep-13	1630	CF/KM/JO	4	VOA	40 mL	HCl, 4 ± 2 °C	WS	AK101 (GRO) BTEX (SW8260)		14		13NECAPE-01	Kilo	ALS	K1309641	0.00	0.50
13-7LF-WS02-0	7LF-WS02	12-Sep-13	1644	CF/KM/JO	4	VOA	40 mL	HCl, 4 ± 2 °C	WS	AK101 (GRO) BTEX (SW8260)		14		13NECAPE-01	Kilo	ALS	K1309641	0.00	0.50
13-7LF-WS03-0	7LF-WS03	12-Sep-13	1654	CF/KM/JO	4	VOA	40 mL	HCl, 4 ± 2 °C	WS	AK101 (GRO) BTEX (SW8260)		14		13NECAPE-01	Kilo	ALS	K1309641	0.00	0.50
13-TB01		12-Sep-13	0800		4	VOA	40 mL	HCl, 4 ± 2 °C	WS	AK101 (GRO) BTEX (SW8260)	Trip Blank			13NECAPE-01	Kilo	ALS	K1309641		
13-7LF-WS03-0	7LF-WS03	12-Sep-13	1654	CF/KM/JO	2	Amber	1 L	HCl, 4 ± 2 °C	WS	AK102 (DRO) AK103 (RRO)		14		13NECAPE-02	Juliett	ALS	K1309641	0.00	0.50
13-9LF-WS01-0	9LF-WS01	12-Sep-13	1000	CF/KM/JO	3	Poly	250 mL	HNO3, 4 ± 2 °C	WS	SW6020 (RCRA Metals, Zn) SW7471 (Mercury)	MS/MSD	14	Filtered (0.45 µm)	13NECAPE-02	Juliett	ALS	K1309641	0.00	0.50
13-9LF-WS01-0	9LF-WS01	12-Sep-13	1000	CF/KM/JO	3	Poly	250 mL	HNO3, 4 ± 2 °C	WS	SW6020 (RCRA Metals, Zn) SW7471 (Mercury)	MS/MSD	14	Unfiltered	13NECAPE-02	Juliett	ALS	K1309641	0.00	0.50
13-9LF-WS02-0	9LF-WS02	12-Sep-13	1000	CF/KM/JO	1	Poly	250 mL	HNO3, 4 ± 2 °C	WS	SW6020 (RCRA Metals, Zn) SW7471 (Mercury)	Dup	14	Filtered (0.45 µm)	13NECAPE-02	Juliett	ALS	K1309641	0.00	0.50
13-9LF-WS02-0	9LF-WS02	12-Sep-13	1000	CF/KM/JO	1	Poly	250 mL	HNO3, 4 ± 2 °C	WS	SW6020 (RCRA Metals, Zn) SW7471 (Mercury)	Dup	14	Unfiltered	13NECAPE-02	Juliett	ALS	K1309641	0.00	0.50
13-9LF-WS03-0	9LF-WS03	12-Sep-13	1155	CF/KM/JO	1	Poly	250 mL	HNO3, 4 ± 2 °C	WS	SW6020 (RCRA Metals, Zn) SW7471 (Mercury)		14	Filtered (0.45 µm)	13NECAPE-02	Juliett	ALS	K1309641	0.00	0.50
13-9LF-WS03-0	9LF-WS03	12-Sep-13	1155	CF/KM/JO	1	Poly	250 mL	HNO3, 4 ± 2 °C	WS	SW6020 (RCRA Metals, Zn) SW7471 (Mercury)		14	Unfiltered	13NECAPE-02	Juliett	ALS	K1309641	0.00	0.50
13-9LF-WS04-0	9LF-WS04	12-Sep-13	1350	CF/KM/JO	1	Poly	250 mL	HNO3, 4 ± 2 °C	WS	SW6020 (RCRA Metals, Zn) SW7471 (Mercury)		14	Filtered (0.45 µm)	13NECAPE-02	Juliett	ALS	K1309641	0.00	0.50
13-9LF-WS04-0	9LF-WS04	12-Sep-13	1350	CF/KM/JO	1	Poly	250 mL	HNO3, 4 ± 2 °C	WS	SW6020 (RCRA Metals, Zn) SW7471 (Mercury)		14	Unfiltered	13NECAPE-02	Juliett	ALS	K1309641	0.00	0.50
13-9LF-WG01-2	9LF-WG01	12-Sep-13	1351	CF/KM/JO	1	Poly	250 mL	HNO3, 4 ± 2 °C	WS	SW6020 (RCRA Metals, Zn) SW7471 (Mercury)		14	Low Volume Filtered (0.45 µm)	13NECAPE-02	Juliett	ALS	K1309641	2.00	2.50
13-KMS-WS01-0	KMS-WS01	12-Sep-13	1521	CF/KM/JO	1	Poly	250 mL	HNO3, 4 ± 2 °C	WS	SW6020 (RCRA Metals, Zn) SW7471 (Mercury)		14	Filtered (0.45 µm)	13NECAPE-02	Juliett	ALS	K1309641	0.00	0.50
13-KMS-WS01-0	KMS-WS01	12-Sep-13	1521	CF/KM/JO	1	Poly	250 mL	HNO3, 4 ± 2 °C	WS	SW6020 (RCRA Metals, Zn) SW7471 (Mercury)		14	Unfiltered	13NECAPE-02	Juliett	ALS	K1309641	0.00	0.50
13-7LF-WS01-0	7LF-WS01	12-Sep-13	1630	CF/KM/JO	1	Poly	250 mL	HNO3, 4 ± 2 °C	WS	SW6020 (RCRA Metals, Zn, Ni) SW7471 (Mercury)		14	Filtered (0.45 µm)	13NECAPE-02	Juliett	ALS	K1309641	0.00	0.50
13-7LF-WS01-0	7LF-WS01	12-Sep-13	1630	CF/KM/JO	1	Poly	250 mL	HNO3, 4 ± 2 °C	WS	SW6020 (RCRA Metals, Zn, Ni) SW7471 (Mercury)		14	Unfiltered	13NECAPE-02	Juliett	ALS	K1309641	0.00	0.50
13-7LF-WS02-0	7LF-WS02	12-Sep-13	1644	CF/KM/JO	1	Poly	250 mL	HNO3, 4 ± 2 °C	WS	SW6020 (RCRA Metals, Zn, Ni) SW7471 (Mercury)		14	Filtered (0.45 µm)	13NECAPE-02	Juliett	ALS	K1309641	0.00	0.50
13-7LF-WS02-0	7LF-WS02	12-Sep-13	1644	CF/KM/JO	1	Poly	250 mL	HNO3, 4 ± 2 °C	WS	SW6020 (RCRA Metals, Zn, Ni) SW7471 (Mercury)		14	Unfiltered	13NECAPE-02	Juliett	ALS	K1309641	0.00	0.50
13-7LF-WS03-0	7LF-WS03	12-Sep-13	1654	CF/KM/JO	1	Poly	250 mL	HNO3, 4 ± 2 °C	WS	SW6020 (RCRA Metals, Zn, Ni) SW7471 (Mercury)		14	Filtered (0.45 µm)	13NECAPE-02	Juliett	ALS	K1309641	0.00	0.50
13-7LF-WS03-0	7LF-WS03	12-Sep-13	1654	CF/KM/JO	1	Poly	250 mL	HNO3, 4 ± 2 °C	WS	SW6020 (RCRA Metals, Zn, Ni) SW7471 (Mercury)		14	Unfiltered	13NECAPE-02	Juliett	ALS	K1309641	0.00	0.50
13-9LF-WS01-0	9LF- WS01	12-Sep-13	1000	CF/KM/JO	8	Amber	1 L	4 ± 2 °C	WS	SW8270 SIM (PAH) SW8082 (PCBs)	MS/MSD	14	1 additional container in 13NECAPE-04	13NECAPE-03	Charlie	ALS	K1309641	0.00	0.50
13-9LF-WS01-0	9LF-WS01	12-Sep-13	1000	CF/KM/JO	1	Amber	1 L	4 ± 2 °C	WS	SW8270 SIM (PAH) SW8082 (PCBs)	MS/MSD	14	8 additional container in 13NECAPE-03	13NECAPE-04	Mike	ALS	K1309641	0.00	0.50
13-9LF-WS01-0	9LF-WS01	12-Sep-13	1000	CF/KM/JO	6	Amber	1 L	HCl, 4 ± 2 °C	WS	AK102 (DRO) AK103 (RRO)	MS/MSD	14		13NECAPE-04	Mike	ALS	K1309641	0.00	0.50
13-9LF-WS02-0	9LF-WS02	12-Sep-13	1000	CF/KM/JO	1	Amber	1 L	HCl, 4 ± 2 °C	WS	AK102 (DRO) AK103 (RRO)	Dup	14		13NECAPE-04	Mike	ALS	K1309641	0.00	0.50
13-9LF-WS02-0	9LF-WS02	12-Sep-13	1000	CF/KM/JO	1	Amber	1 L	HCl, 4 ± 2 °C	WS	AK102 (DRO) AK103 (RRO)	Dup	14		13NECAPE-05	Alfa	ALS	K1309641	0.00	0.50
13-9LF-WS02-0	9LF-WS02	12-Sep-13	1000	CF/KM/JO	3	Amber	1 L	4 ± 2 °C	WS	SW8270 SIM (PAH) SW8082 (PCBs)	Dup	14		13NECAPE-05	Alfa	ALS	K1309641	0.00	0.50
13-9LF-WS03-0	9LF-WS03	12-Sep-13	1155	CF/KM/JO	3	Amber	1 L	4 ± 2 °C	WS	SW8270 SIM (PAH) SW8082 (PCBs)		14		13NECAPE-05	Alfa	ALS	K1309641	0.00	0.50
13-9LF-WS03-0	9LF-WS03	12-Sep-13	1155	CF/KM/JO	1	Amber	1 L	HCl, 4 ± 2 °C	WS	AK102 (DRO) AK103 (RRO)		14		13NECAPE-05	Alfa	ALS	K1309641	0.00	0.50
13-9LF-WS03-0	9LF-WS03	12-Sep-13	1155	CF/KM/JO	1	Amber	1 L	HCl, 4 ± 2 °C	WS	AK102 (DRO) AK103 (RRO)		14		13NECAPE-06	Hotel	ALS	K1309641	0.00	0.50
13-9LF-WS04-0	9LF-WS04	12-Sep-13	1350	CF/KM/JO	3	Amber	1 L	4 ± 2 °C	WS	SW8270 SIM (PAH) SW8082 (PCBs)		14		13NECAPE-06	Hotel	ALS	K1309641	0.00	0.50
13-9LF-WS04-0	9LF-WS04	12-Sep-13	1350	CF/KM/JO	2	Amber	1 L	HCl, 4 ± 2 °C	WS	AK102 (DRO) AK103 (RRO)		14		13NECAPE-06	Hotel	ALS	K1309641	0.00	0.50
13-KMS-WS01-0	KMS-WS01	12-Sep-13	1521	CF/KM/JO	2	Amber	1 L	HCl, 4 ± 2 °C	WS	AK102 (DRO) AK103 (RRO)		14		13NECAPE-06	Hotel	ALS	K1309641	0.00	0.50
13-KMS-WS01-0	KMS-WS01	12-Sep-13	1521	CF/KM/JO	3	Amber	1 L	4 ± 2 °C	WS	SW8270 SIM (PAH) SW8082 (PCBs)		14		13NECAPE-07	Echo	ALS	K1309641	0.00	0.50
13-7LF-WS01-0	7LF-WS01	12-Sep-13	1630	CF/KM/JO	2	Amber	1 L	HCl, 4 ± 2 °C	WS	AK102 (DRO) AK103 (RRO)		14		13NECAPE-07	Echo	ALS	K1309641	0.00	0.50
13-7LF-WS01-0	7LF-WS01	12-Sep-13	1630	CF/KM/JO	3	Amber	1 L	4 ± 2 °C	WS	SW8270 SIM (PAH) SW8082 (PCBs)		14		13NECAPE-07	Echo	ALS	K1309641	0.00	0.50
13-7LF-WS02-0	7LF-WS02	12-Sep-13	1644	CF/KM/JO	3	Amber	1 L	4 ± 2 °C	WS	SW8270 SIM (PAH) SW8082 (PCBs)		14		13NECAPE-08	Romeo	ALS	K1309641	0.00	0.50
13-7LF-WS02-0	7LF-WS02	12-Sep-13	1644	CF/KM/JO	2	Amber	1 L	HCl, 4 ± 2 °C	WS	AK102 (DRO) AK103 (RRO)		14		13NECAPE-08	Romeo	ALS	K1309641	0.00	0.50
13-7LF-WS03-0	7LF-WS03	12-Sep-13	1654	CF/KM/JO	3	Amber	1 L	4 ± 2 °C	WS	SW8270 SIM (PAH) SW8082 (PCBs)		14		13NECAPE-08	Romeo	ALS	K1309641	0.00	0.50

2013 Northeast Cape
Groundwater Analytical Data Table

			Location ID Sample ID Lab Sample ID SDG Sample Date Matrix Laboratory	9LF-WG01 13-9LF-WG01-2 130964106F K1309641 9/12/2013 WS CASK	9LF-WG01 13-9LF-WG01-2 K130964106 K1309641 9/12/2013 WS CASK
Method	**Analyte**	**Units**	**Project Action Limit[1]**		
AK101	Gasoline Range Organics (C6-C10)	mg/L	1.3	–	ND [0.025]
SW6020A	Arsenic	mg/L	0.01	0.00037 [0.00013] J	–
SW6020A	Barium	mg/L	2	0.00936 [0.00003]	–
SW6020A	Cadmium	mg/L	0.005	0.000032 [0.00001]	–
SW6020A	Chromium	mg/L	0.1	0.00109 [0.00005]	–
SW6020A	Lead	mg/L	0.015	0.000501 [0.00001]	–
SW6020A	Nickel	mg/L	0.1	–	–
SW6020A	Selenium	mg/L	0.05	ND [0.0005]	–
SW6020A	Silver	mg/L	0.1	0.00001 [0.00001] J	–
SW6020A	Zinc	mg/L	5	0.00906 [0.00025]	–
SW7470A	Mercury	mg/L	0.002	ND [0.00005]	–
SW8260C	Benzene	mg/L	0.005	–	0.00016 [0.0001] J
SW8260C	Ethylbenzene	mg/L	0.7	–	ND [0.0001]
SW8260C	o-Xylene	mg/L	10	–	ND [0.0002]
SW8260C	Toluene	mg/L	1	–	0.00032 [0.0001] J
SW8260C	Xylene, Isomers m & p	mg/L	10	–	ND [0.0002]

[1] Project action limit from 2013 QAPP (USACE 2013) and 18 AAC 75, Table C Groundwater Cleanup Levels (ADEC 2012)

– = No criteria/ Not analyzed

ND [LOD] = The analyte result is less than the limit of detection [value in brackets].

mg/L = milligram per liter

J = The analyte result is considered an estimated value because the reported result is below the limit of quantitation but above the detection limit (formerly the method detection limit.

SDG = sample delivery group

CASK = ALS Laboratories formerly known as Columbia Analytical Services of Kelso, WA

2013 Northeast Cape
Surface Water Analytical Data Table

			Location ID	7LF-WS01	7LF-WS01	7LF-WS02	7LF-WS02	7LF-WS03	7LF-WS03	9LF-WS01
			Sample ID	13-7LF-WS01-0	13-7LF-WS01-0	13-7LF-WS02-0	13-7LF-WS02-0	13-7LF-WS03-0	13-7LF-WS03-0	13-9LF-WS01-0
			Lab Sample ID	130964108F	K130964108	130964109F	K130964109	130964101F	K130964101	130964102F
			SDG	K1309641	K1309641	K1309641	K1309641	K1309641	K1309641	K1309641
			Sample Date	9/12/2013	9/12/2013	9/12/2013	9/12/2013	9/12/2013	9/12/2013	9/12/2013
			Matrix	WS	WS	WS	WS	WS	WS	WS
			Laboratory	CASK	CASK	CASK	CASK	CASK	CASK	CASK
Method	**Analyte**	**Units**	**Project Action Limit[1]**							
8270SIM	1-Methylnaphthalene	mg/L	–	–	0.0000041 [0.000005]	–	0.0000044 [0.000005]	–	0.0000066 [0.000005]	–
8270SIM	2-Methylnaphthalene	mg/L	–	–	ND [0.000005]	–	ND [0.000005]	–	0.0000025 [0.000005] J	–
8270SIM	Acenaphthene	mg/L	–	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Acenaphthylene	mg/L	–	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Anthracene	mg/L	–	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Benzo(a)anthracene	mg/L	–	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Benzo(a)pyrene	mg/L	0.0002	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Benzo(b)fluoranthene	mg/L	–	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Benzo(g,h,i)perylene	mg/L	–	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Benzo(k)fluoranthene	mg/L	–	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Chrysene	mg/L	–	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Dibenzo(a,h)anthracene	mg/L	–	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Fluoranthene	mg/L	–	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Fluorene	mg/L	–	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Indeno(1,2,3-cd)pyrene	mg/L	–	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Naphthalene	mg/L	–	–	0.000016 [0.000005] J	–	0.000047 [0.000005]	–	0.000022 [0.000005]	–
8270SIM	Phenanthrene	mg/L	–	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Pyrene	mg/L	–	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Total Aqueous Hydrocarbons (Sum of PAHs)	mg/L	0.015	–	0.0001001	–	0.0001314	–	0.0001061	–
AK101	Gasoline Range Organics (C6-C10)	mg/L	1.3	–	ND [0.025]	–	ND [0.025]	–	ND [0.025]	–
AK102	Diesel Range Organics (C10-C25)	mg/L	1.5	–	0.058 [0.02] J	–	0.07 [0.02] J	–	0.063 [0.02] J	–
AK103	Residual Range Organics (C25-C36)	mg/L	1.1	–	0.12 [0.05] J, B	–	0.21 [0.05] J, B	–	0.12 [0.05] J, B	–
SW6020A	Arsenic	mg/L	0.01	0.0003 [0.00013] J	0.00031 [0.00013] J	0.00039 [0.00013] J	0.00059 [0.00013]	0.00034 [0.00013] J	0.00046 [0.00013] J	ND [0.00013]
SW6020A	Barium	mg/L	2	0.00962 [0.00003]	0.00927 [0.00003]	0.0079 [0.00003]	0.0088 [0.00003]	0.00378 [0.00003]	0.0045 [0.00003]	0.0065 [0.00003]
SW6020A	Cadmium	mg/L	0.005	0.000013 [0.00001] J	0.00002 [0.00001] J	ND [0.00001]	0.000005 [0.00001] J	0.000015 [0.00001] J	0.000012 [0.00001] J	0.000012 [0.00001] J, QN
SW6020A	Chromium	mg/L	0.1	0.00032 [0.00005]	0.00039 [0.00005]	0.00033 [0.00005]	0.00037 [0.00005]	0.0004 [0.00005]	0.00049 [0.00005]	0.00019 [0.00005] J
SW6020A	Lead	mg/L	–	0.000949 [0.00001]	0.00149 [0.00001]	0.000037 [0.00001]	0.000175 [0.00001]	0.000321 [0.00001]	0.00089 [0.00001]	0.000013 [0.00001] J, QN
SW6020A	Nickel	mg/L	–	0.00121 [0.0001]	0.00095 [0.0001]	0.00069 [0.0001]	0.00062 [0.0001]	0.00075 [0.0001]	0.00082 [0.0001]	–
SW6020A	Selenium	mg/L	0.05	ND [0.0005]	ND [0.0005]	ND [0.0005]	ND [0.0005]	ND [0.0005]	ND [0.0005]	ND [0.0005]
SW6020A	Silver	mg/L	0.1	0.000005 [0.00001] J	0.000007 [0.00001] J	ND [0.00001]	ND [0.00001]	ND [0.00001]	0.000016 [0.00001] J	ND [0.00001]
SW6020A	Zinc	mg/L	–	0.0125 [0.00025]	0.01148 [0.00025]	0.00328 [0.00025]	0.00376 [0.00025]	0.00649 [0.00025]	0.0062 [0.00025]	0.00183 [0.00025]
SW7470A	Mercury	mg/L	0.002	ND [0.00005]	ND [0.00005]	ND [0.00005]	ND [0.00005]	ND [0.00005]	ND [0.00005]	ND [0.00005]
SW8082A	PCB-1016 (Aroclor 1016)	mg/L	0.0005	–	ND [0.000002]	–	ND [0.000002]	–	ND [0.0000021]	–
SW8082A	PCB-1221 (Aroclor 1221)	mg/L	0.0005	–	ND [0.000008]	–	ND [0.000008]	–	ND [0.000008]	–
SW8082A	PCB-1232 (Aroclor 1232)	mg/L	0.0005	–	ND [0.000002]	–	ND [0.000002]	–	ND [0.0000022]	–

2013 Northeast Cape
Surface Water Analytical Data Table

			Location ID	7LF-WS01	7LF-WS01	7LF-WS02	7LF-WS02	7LF-WS03	7LF-WS03	9LF-WS01
			Sample ID	13-7LF-WS01-0	13-7LF-WS01-0	13-7LF-WS02-0	13-7LF-WS02-0	13-7LF-WS03-0	13-7LF-WS03-0	13-9LF-WS01-0
			Lab Sample ID	130964108F	K130964108	130964109F	K130964109	130964101F	K130964101	130964102F
			SDG	K1309641	K1309641	K1309641	K1309641	K1309641	K1309641	K1309641
			Sample Date	9/12/2013	9/12/2013	9/12/2013	9/12/2013	9/12/2013	9/12/2013	9/12/2013
			Matrix	WS	WS	WS	WS	WS	WS	WS
			Laboratory	CASK	CASK	CASK	CASK	CASK	CASK	CASK
Method	**Analyte**	**Units**	**Project Action Limit**[1]							
SW8082A	PCB-1242 (Aroclor 1242)	mg/L	0.0005	–	ND [0.000002]	–	ND [0.000002]	–	ND [0.000002]	–
SW8082A	PCB-1248 (Aroclor 1248)	mg/L	0.0005	–	ND [0.000002]	–	ND [0.000002]	–	ND [0.000002]	–
SW8082A	PCB-1254 (Aroclor 1254)	mg/L	0.0005	–	0.0000013 [0.000002] J	–	ND [0.000002]	–	0.0000017 [0.000002] J	–
SW8082A	PCB-1260 (Aroclor 1260)	mg/L	0.0005	–	0.0000023 [0.000002] J	–	ND [0.000002]	–	0.0000018 [0.000002] J	–
SW8082A	PCB-1262 (Aroclor 1262)	mg/L	0.0005	–	ND [0.000002]	–	ND [0.000002]	–	ND [0.000002]	–
SW8082A	PCB-1268 (Aroclor 1268)	mg/L	0.0005	–	ND [0.000002]	–	ND [0.000002]	–	ND [0.000002]	–
SW8260C	Benzene	mg/L	0.005	–	ND [0.0001]	–	ND [0.0001]	–	ND [0.0001]	–
SW8260C	Ethylbenzene	mg/L	0.7	–	ND [0.0001]	–	ND [0.0001]	–	ND [0.0001]	–
SW8260C	o-Xylene	mg/L	10	–	ND [0.0002]	–	ND [0.0002]	–	ND [0.0002]	–
SW8260C	Toluene	mg/L	1	–	0.00032 [0.0001] J	–	0.00023 [0.0001] J	–	0.0002 [0.0001] J	–
SW8260C	Xylene, Isomers m & p	mg/L	10	–	ND [0.0002]	–	ND [0.0002]	–	ND [0.0002]	–

[1] Project action limit from 2013 QAPP (USACE 2013) and 18 AAC 75, Table C Groundwater Cleanup Levels (ADEC 2012)

– = No criteria/ Not analyzed

ND [LOD] = The analyte result is less than the limit of detection [value in brackets].

mg/L = milligram per liter

J = The analyte result is considered an estimated value because the reported result is below the limit of quantitation but above the detection limit (formerly the method detection limit.

B = Analyte result is considered a high biased estimated value due to contamination present in the method blank. Results less than 10 times the reported method blank concentration will be B flagged to indicate bias.

QN = Analyte result is considered estimated value biased uncertain due to due to a laboratory quality control failure.

ML = Analyte result is considered an estimated value biased low due to matrix effects.

SDG = sample delivery group

CASK = ALS Laboratories formerly known as Columbia Analytical Services of Kelso, WA

2013 Northeast Cape
Surface Water Analytical Data Table

			Location ID Sample ID Lab Sample ID SDG Sample Date Matrix Laboratory	9LF-WS01 13-9LF-WS01-0 K130964102 K1309641 9/12/2013 WS CASK	9LF-WS02 13-9LF-WS02-0 130964103F K1309641 9/12/2013 WS CASK	9LF-WS02 13-9LF-WS02-0 K130964103 K1309641 9/12/2013 WS CASK	9LF-WS03 13-9LF-WS03-0 130964104F K1309641 9/12/2013 WS CASK	9LF-WS03 13-9LF-WS03-0 K130964104 K1309641 9/12/2013 WS CASK	9LF-WS04 13-9LF-WS04-0 130964105F K1309641 9/12/2013 WS CASK
Method	**Analyte**	**Units**	**Project Action Limit[1]**						
8270SIM	1-Methylnaphthalene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	2-Methylnaphthalene	mg/L	–	0.0000026 [0.000005] J, QN	–	ND [0.000005] QN	–	ND [0.000005]	–
8270SIM	Acenaphthene	mg/L	–	0.0000053 [0.000005] J	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Acenaphthylene	mg/L	–	0.0000059 [0.000005] J	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Anthracene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Benzo(a)anthracene	mg/L	–	0.0000038 [0.000005] J	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Benzo(a)pyrene	mg/L	0.0002	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Benzo(b)fluoranthene	mg/L	–	0.0000026 [0.000005] J, QN	–	ND [0.000005] QN	–	ND [0.000005]	–
8270SIM	Benzo(g,h,i)perylene	mg/L	–	0.0000059 [0.000005] J	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Benzo(k)fluoranthene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Chrysene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Dibenzo(a,h)anthracene	mg/L	–	0.0000027 [0.000005] J, QN	–	ND [0.000005] QN	–	ND [0.000005]	–
8270SIM	Fluoranthene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Fluorene	mg/L	–	0.0000087 [0.000005] J, QN	–	ND [0.000005] QN	–	ND [0.000005]	–
8270SIM	Indeno(1,2,3-cd)pyrene	mg/L	–	0.0000052 [0.000005] J	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Naphthalene	mg/L	–	0.000031 [0.000005] QN	–	0.000094 [0.000005] QN	–	0.000027 [0.000005]	–
8270SIM	Phenanthrene	mg/L	–	0.0000087 [0.000005] J, QN	–	ND [0.000005] QN	–	ND [0.000005]	–
8270SIM	Pyrene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Total Aqueous Hydrocarbons (Sum of PAHs)	mg/L	0.015	0.0001174	–	0.000179	–	0.000112	–
AK101	Gasoline Range Organics (C6-C10)	mg/L	1.3	ND [0.025]	–	ND [0.025]	–	ND [0.025]	–
AK102	Diesel Range Organics (C10-C25)	mg/L	1.5	0.016 [0.02] J, ML	–	0.014 [0.02] J	–	0.014 [0.02] J, QN	–
AK103	Residual Range Organics (C25-C36)	mg/L	1.1	0.036 [0.05] J, B, QN	–	0.024 [0.05] J, B, QN	–	0.03 [0.05] J, QN	–
SW6020A	Arsenic	mg/L	0.01	0.00011 [0.00013] J	0.0001 [0.00013] J	0.00009 [0.00013] J	0.00011 [0.00013] J	0.00009 [0.00013] J	0.00018 [0.00013] J
SW6020A	Barium	mg/L	2	0.00662 [0.00003]	0.00645 [0.00003]	0.00651 [0.00003]	0.00652 [0.00003]	0.0066 [0.00003]	0.0132 [0.00003]
SW6020A	Cadmium	mg/L	0.005	0.000005 [0.00001] J, QN	0.00004 [0.00001] QN	0.00001 [0.00001] J, QN	0.000014 [0.00001] J	0.000009 [0.00001] J	0.000101 [0.00001]
SW6020A	Chromium	mg/L	0.1	0.00015 [0.00005] J	0.00017 [0.00005] J	0.00019 [0.00005] J	0.00013 [0.00005] J	0.00015 [0.00005] J	0.0002 [0.00005]
SW6020A	Lead	mg/L	–	0.000031 [0.00001]	0.000051 [0.00001] QN	0.000027 [0.00001] J	0.000031 [0.00001]	0.000026 [0.00001] J	0.000027 [0.00001] J
SW6020A	Nickel	mg/L	–	–	–	–	–	–	–
SW6020A	Selenium	mg/L	0.05	ND [0.0005]	ND [0.0005]	ND [0.0005]	ND [0.0005]	ND [0.0005]	ND [0.0005]
SW6020A	Silver	mg/L	0.1	0.000009 [0.00001] J	0.00001 [0.00001] J	ND [0.00001]	ND [0.00001]	ND [0.00001]	ND [0.00001]
SW6020A	Zinc	mg/L	–	0.00178 [0.00025] QN	0.00219 [0.00025]	0.00131 [0.00025] QN	0.00157 [0.00025]	0.0013 [0.00025]	0.02157 [0.00025]
SW7470A	Mercury	mg/L	0.002	ND [0.00005]	ND [0.00005]	ND [0.00005]	ND [0.00005]	ND [0.00005]	ND [0.00005]
SW8082A	PCB-1016 (Aroclor 1016)	mg/L	0.0005	ND [0.000002]	–	ND [0.000002]	–	ND [0.000002]	–
SW8082A	PCB-1221 (Aroclor 1221)	mg/L	0.0005	ND [0.000008]	–	ND [0.000008]	–	ND [0.000008]	–
SW8082A	PCB-1232 (Aroclor 1232)	mg/L	0.0005	ND [0.0000023]	–	ND [0.0000021]	–	ND [0.000002]	–

2013 Northeast Cape
Surface Water Analytical Data Table

			Location ID	9LF-WS01	9LF-WS02	9LF-WS02	9LF-WS03	9LF-WS03	9LF-WS04
			Sample ID	13-9LF-WS01-0	13-9LF-WS02-0	13-9LF-WS02-0	13-9LF-WS03-0	13-9LF-WS03-0	13-9LF-WS04-0
			Lab Sample ID	K130964102	130964103F	K130964103	130964104F	K130964104	130964105F
			SDG	K1309641	K1309641	K1309641	K1309641	K1309641	K1309641
			Sample Date	9/12/2013	9/12/2013	9/12/2013	9/12/2013	9/12/2013	9/12/2013
			Matrix	WS	WS	WS	WS	WS	WS
			Laboratory	CASK	CASK	CASK	CASK	CASK	CASK
Method	**Analyte**	**Units**	**Project Action Limit[1]**						
SW8082A	PCB-1242 (Aroclor 1242)	mg/L	0.0005	ND [0.000002]	–	ND [0.000002]	–	ND [0.000002]	–
SW8082A	PCB-1248 (Aroclor 1248)	mg/L	0.0005	ND [0.0000022]	–	ND [0.000002]	–	ND [0.000002]	–
SW8082A	PCB-1254 (Aroclor 1254)	mg/L	0.0005	ND [0.000002]	–	ND [0.000002]	–	ND [0.000002]	–
SW8082A	PCB-1260 (Aroclor 1260)	mg/L	0.0005	0.0000015 [0.000002] J	–	ND [0.000002]	–	ND [0.000002]	–
SW8082A	PCB-1262 (Aroclor 1262)	mg/L	0.0005	ND [0.000002]	–	ND [0.000002]	–	ND [0.000002]	–
SW8082A	PCB-1268 (Aroclor 1268)	mg/L	0.0005	ND [0.000002]	–	ND [0.000002]	–	ND [0.000002]	–
SW8260C	Benzene	mg/L	0.005	ND [0.0001]	–	ND [0.0001]	–	ND [0.0001]	–
SW8260C	Ethylbenzene	mg/L	0.7	ND [0.0001]	–	ND [0.0001]	–	ND [0.0001]	–
SW8260C	o-Xylene	mg/L	10	ND [0.0002]	–	ND [0.0002]	–	ND [0.0002]	–
SW8260C	Toluene	mg/L	1	ND [0.0001]	–	0.00008 [0.0001] J	–	0.00007 [0.0001] J	–
SW8260C	Xylene, Isomers m & p	mg/L	10	ND [0.0002]	–	ND [0.0002]	–	ND [0.0002]	–

[1] Project action limit from 2013 QAPP (USACE 2013) and 18 AAC 75, Table C Groundwater Cleanup Levels (AD
– = No criteria/ Not analyzed
ND [LOD] = The analyte result is less than the limit of detection [value in brackets].
mg/L = milligram per liter
J = The analyte result is considered an estimated value because the reported result is below the limit of quantitat
B = Analyte result is considered a high biased estimated value due to contamination present in the method blank
QN = Analyte result is considered estimated value biased uncertain due to due to a laboratory quality control failu
ML = Analyte result is considered an estimated value biased low due to matrix effects.
SDG = sample delivery group
CASK = ALS Laboratories formerly known as Columbia Analytical Services of Kelso, WA

2013 Northeast Cape
Surface Water Analytical Data Table

			Location ID	9LF-WS04	KMS-WS01	KMS-WS01	QCTB
			Sample ID	13-9LF-WS04-0	13-KMS-WS01-0	13-KMS-WS01-0	13-TB01
			Lab Sample ID	K130964105	130964107F	K130964107	K130964110
			SDG	K1309641	K1309641	K1309641	K1309641
			Sample Date	9/12/2013	9/12/2013	9/12/2013	9/12/2013
			Matrix	WS	WS	WS	WS
			Laboratory	CASK	CASK	CASK	CASK
Method	**Analyte**	**Units**	**Project Action Limit[1]**				
8270SIM	1-Methylnaphthalene	mg/L	–	0.0000048 [0.000005] J	–	ND [0.000005]	–
8270SIM	2-Methylnaphthalene	mg/L	–	0.0000026 [0.000005] J	–	ND [0.000005]	–
8270SIM	Acenaphthene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Acenaphthylene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Anthracene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Benzo(a)anthracene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Benzo(a)pyrene	mg/L	0.0002	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Benzo(b)fluoranthene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Benzo(g,h,i)perylene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Benzo(k)fluoranthene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Chrysene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Dibenzo(a,h)anthracene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Fluoranthene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Fluorene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Indeno(1,2,3-cd)pyrene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Naphthalene	mg/L	–	0.000058 [0.000005]	–	0.00002 [0.000005]	–
8270SIM	Phenanthrene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Pyrene	mg/L	–	ND [0.000005]	–	ND [0.000005]	–
8270SIM	Total Aqueous Hydrocarbons (Sum of PAHs)	mg/L	0.015	0.0001404	–	0.000105	–
AK101	Gasoline Range Organics (C6-C10)	mg/L	1.3	ND [0.025]	–	ND [0.025]	ND [0.025]
AK102	Diesel Range Organics (C10-C25)	mg/L	1.5	0.031 [0.02] J	–	0.015 [0.02] J	–
AK103	Residual Range Organics (C25-C36)	mg/L	1.1	0.057 [0.05] J, B	–	0.027 [0.05] J, B	–
SW6020A	Arsenic	mg/L	0.01	0.00032 [0.00013] J	ND [0.00013]	0.00008 [0.00013] J	–
SW6020A	Barium	mg/L	2	0.0127 [0.00003]	0.0041 [0.00003]	0.0042 [0.00003]	–
SW6020A	Cadmium	mg/L	0.005	0.000042 [0.00001]	0.000012 [0.00001] J	0.000006 [0.00001] J	–
SW6020A	Chromium	mg/L	0.1	0.00022 [0.00005]	0.00015 [0.00005] J	0.00016 [0.00005] J	–
SW6020A	Lead	mg/L	–	0.000211 [0.00001]	0.000026 [0.00001] J	0.000101 [0.00001]	–
SW6020A	Nickel	mg/L	–	–	–	–	–
SW6020A	Selenium	mg/L	0.05	ND [0.0005]	ND [0.0005]	ND [0.0005]	–
SW6020A	Silver	mg/L	0.1	0.000008 [0.00001] J	ND [0.00001]	ND [0.00001]	–
SW6020A	Zinc	mg/L	–	0.01967 [0.00025]	0.00095 [0.00025]	0.00105 [0.00025]	–
SW7470A	Mercury	mg/L	0.002	ND [0.00005]	ND [0.00005]	ND [0.00005]	–
SW8082A	PCB-1016 (Aroclor 1016)	mg/L	0.0005	ND [0.000002]	–	ND [0.000002]	–
SW8082A	PCB-1221 (Aroclor 1221)	mg/L	0.0005	ND [0.000008]	–	ND [0.000008]	–
SW8082A	PCB-1232 (Aroclor 1232)	mg/L	0.0005	ND [0.0000024]	–	ND [0.000002]	–

2013 Northeast Cape
Surface Water Analytical Data Table

Method	Analyte	Units	Location ID / Sample ID / Lab Sample ID / SDG / Sample Date / Matrix / Laboratory / Project Action Limit[1]	9LF-WS04 / 13-9LF-WS04-0 / K130964105 / K1309641 / 9/12/2013 / WS / CASK	KMS-WS01 / 13-KMS-WS01-0 / 130964107F / K1309641 / 9/12/2013 / WS / CASK	KMS-WS01 / 13-KMS-WS01-0 / K130964107 / K1309641 / 9/12/2013 / WS / CASK	QCTB / 13-TB01 / K130964110 / K1309641 / 9/12/2013 / WS / CASK
SW8082A	PCB-1242 (Aroclor 1242)	mg/L	0.0005	ND [0.000002]	–	ND [0.000002]	–
SW8082A	PCB-1248 (Aroclor 1248)	mg/L	0.0005	ND [0.000002]	–	ND [0.000002]	–
SW8082A	PCB-1254 (Aroclor 1254)	mg/L	0.0005	ND [0.000002]	–	ND [0.000002]	–
SW8082A	PCB-1260 (Aroclor 1260)	mg/L	0.0005	ND [0.000002]	–	ND [0.000002]	–
SW8082A	PCB-1262 (Aroclor 1262)	mg/L	0.0005	ND [0.000002]	–	ND [0.000002]	–
SW8082A	PCB-1268 (Aroclor 1268)	mg/L	0.0005	ND [0.000002]	–	ND [0.000002]	–
SW8260C	Benzene	mg/L	0.005	ND [0.0001]	–	ND [0.0001]	ND [0.0001]
SW8260C	Ethylbenzene	mg/L	0.7	ND [0.0001]	–	ND [0.0001]	ND [0.0001]
SW8260C	o-Xylene	mg/L	10	ND [0.0002]	–	ND [0.0002]	ND [0.0002]
SW8260C	Toluene	mg/L	1	0.00018 [0.0001] J	–	0.00017 [0.0001] J	ND [0.0001]
SW8260C	Xylene, Isomers m & p	mg/L	10	ND [0.0002]	–	ND [0.0002]	ND [0.0002]

[1] Project action limit from 2013 QAPP (USACE 2013) and 18 AAC 75, Table C Groundwater Cleanup Levels (AD

– = No criteria/ Not analyzed

ND [LOD] = The analyte result is less than the limit of detection [value in brackets].

mg/L = milligram per liter

J = The analyte result is considered an estimated value because the reported result is below the limit of quantitat

B = Analyte result is considered a high biased estimated value due to contamination present in the method blank

QN = Analyte result is considered estimated value biased uncertain due to due to a laboratory quality control failu

ML = Analyte result is considered an estimated value biased low due to matrix effects.

SDG = sample delivery group

CASK = ALS Laboratories formerly known as Columbia Analytical Services of Kelso, WA

ATTACHMENT B-2

Sample Results Below Project Data Quality Objectives (DQO)

Table B-2-1
Sample Results Qualified B due to Method Blank Exceedance

Sample ID	QC Batch	SDG	Lab Sample ID	Method	Analyte	Result (mg/L)	Qualifier
Method Blank	KWG1310602	QCK1309641	KWG13106025	AK103	Residual Range Organics (C25-C36)	0.02	
13-KMS-WS01-0	KWG1310602	K1309641	K130964107	AK103	Residual Range Organics (C25-C36)	0.027	J, B
13-9LF-WS02-0	KWG1310602	K1309641	K130964103	AK103	Residual Range Organics (C25-C36)	0.024	J, B
13-9LF-WS04-0	KWG1310602	K1309641	K130964105	AK103	Residual Range Organics (C25-C36)	0.057	J, B
13-9LF-WS01-0	KWG1310602	K1309641	K130964102	AK103	Residual Range Organics (C25-C36)	0.036	J, B
13-7LF-WS03-0	KWG1310602	K1309641	K130964101	AK103	Residual Range Organics (C25-C36)	0.12	J, B
13-7LF-WS02-0	KWG1310602	K1309641	K130964109	AK103	Residual Range Organics (C25-C36)	0.21	J, B
13-7LF-WS01-0	KWG1310602	K1309641	K130964108	AK103	Residual Range Organics (C25-C36)	0.12	J, B

Table B-2-2
Sample Results Qualified QN due to Missing Method Blank

Sample ID	QC Batch	SDG	Lab Sample ID	Method	Analyte	Result (mg/L)	Qualifier
13-9LF-WS03-0	KWG1311316	K1309641	K130964104	AK102	Diesel Range Organics (C10-C25)	0.014	J, QN
13-9LF-WS03-0	KWG1311318	K1309641	K130964104	AK103	Residual Range Organics (C25-C36)	0.03	J, QN

Table B-2-3
Sample Results Qualified QL due to Matrix Spike Exceedance

Sample ID	QC Batch	SDG	Lab Sample ID	Method	Analyte	Result (mg/L)	Percent Recovery	Qualifier
13-9LF-WS01-0	KWG1310603	K1309641	K130964102	AK102	Diesel Range Organics (C10-C25)	0.016	-	QL
Matrix Spike	KWG1310603	QCK1309641	KWG13106031	AK102	Diesel Range Organics (C10-C25)	1.13	74	
Matrix Spike Dup	KWG1310603	QCK1309641	KWG13106032	AK102	Diesel Range Organics (C10-C25)	1.12	72	

Table B-2-4
Sample Results Qualified QN due to Duplicate RPD Exceeding 30%

Sample ID	Lab Sample ID	Dup Sample ID	Dup Lab Sample ID	Method	Analyte	Result (mg/L)	Duplicate Result (mg/L)	RPD (%)
13-9LF-WS01-0	130964102F	13-9LF-WS02-0	130964103F	SW6020A	Cadmium	0.000012	0.00004	108
13-9LF-WS01-0	130964102F	13-9LF-WS02-0	130964103F	SW6020A	Lead	0.000013	0.000051	119
13-9LF-WS01-0	K130964102	13-9LF-WS02-0	K130964103	8270SIM	2-Methylnaphthalene	0.0000026	0.000005	63
13-9LF-WS01-0	K130964102	13-9LF-WS02-0	K130964103	8270SIM	Benzo(b)fluoranthene	0.0000026	0.000005	63
13-9LF-WS01-0	K130964102	13-9LF-WS02-0	K130964103	SW6020A	Cadmium	0.000005	0.00001	67
13-9LF-WS01-0	K130964102	13-9LF-WS02-0	K130964103	8270SIM	Dibenzo(a,h)anthracene	0.0000027	0.000005	60
13-9LF-WS01-0	K130964102	13-9LF-WS02-0	K130964103	8270SIM	Fluorene	0.0000087	0.000005	54
13-9LF-WS01-0	K130964102	13-9LF-WS02-0	K130964103	8270SIM	Naphthalene	0.000031	0.000094	101
13-9LF-WS01-0	K130964102	13-9LF-WS02-0	K130964103	8270SIM	Phenanthrene	0.0000087	0.000005	54
13-9LF-WS01-0	K130964102	13-9LF-WS02-0	K130964103	AK103	Residual Range Organics (C25-C36)	0.036	0.024	40
13-9LF-WS01-0	K130964102	13-9LF-WS02-0	K130964103	SW6020A	Zinc	0.00178	0.00131	30

ATTACHMENT B-3

ADEC Laboratory Data Review Checklists

Laboratory Data Review Checklist

Completed by:	Angela DiBerardino		
Title:	Project Chemist	**Date:**	October 22, 2013
CS Report Name:	North East Cape	**Report Date:**	November 2013
Consultant Firm:	Jacobs Engineering Group Inc.		
Laboratory Name:	ALS Environmental	**Laboratory Report Number:**	K1309641
ADEC File Number:		**ADEC RecKey Number:**	

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

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

   ALS of Kelso, WA performed all analysis.

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

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

2. **Chain of Custody (CoC)**
   a. CoC information completed, signed, and dated (including released/received by)?

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

   b. Correct Analyses requested?

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

3. **Laboratory Sample Receipt Documentation**
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

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

   Cooler Alpha - Temperature Blank 1.8°C, Cooler Temperature 4.2°C
   Cooler Mike - Temperature Blank 1.2°C, Cooler Temperature 0.8°C
   Cooler Kilo - Temperature Blank NA, Cooler Temperature 0.8°C
   Cooler Juliet - Temperature Blank 1.7°C, Cooler Temperature 2.7°C
   Cooler Echo - Temperature Blank 2.8°C, Cooler Temperature 4.6°C
   Cooler Romeo - Temperature Blank 3.2°C, Cooler Temperature 3.7°C
   Cooler Charlie - Temperature Blank 1.2°C, Cooler Temperature 4.6°C
   Cooler Hotel - Temperature Blank 2.4°C, Cooler Temperature 5.7°C

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

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

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

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

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

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

There were no discrepancies according to the cooler receipt form besides the temperature.

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

Comments:

Data quality and usability was not affected by the low temperature since no samples were frozen upon receipt at the laboratory.

4. <u>Case Narrative</u>

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:

Manual integrations performed by the laboratory are presented in the case narrative for method AK101, AK102, AK103, SW8082 SW8260, and SW8270.
QC failures are discussed in the relevant sections of this checklist.

c. Were all corrective actions documented?

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

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

Comments:

Effects on data quality and usability are discussed in the relevant sections of this checklist.

5. <u>Samples Results</u>

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:

Water samples were submitted with this SDG.

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:

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:

AK102/103 - Sample 13-9LF-WS03-0 was reported without a method blank. During the initial preparation batch KWG1311318, the method blank extract was lost. The samples were re-extracted except for sample 13-9LF-WS03-0 had insufficient sample for re-extraction.

ii. All method blank results less than PQL?

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

AK103 – Method blank (QC batch KWG1310602) had a detection for RRO above the DL at 0.02 mg/L.

iii. If above PQL, what samples are affected?

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

Associated samples were 13-KMS-WS01-0, 13-9LF-WS02-0, 13-9LF-WS04-0, 13-9LF-WS01-0, 13-7LF-WS03-0, 13-7LF-WS02-0, and 13-7LF-WS01-0.

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

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

Associated samples were qualified B. Sample 13-9LF-WS03-0 was qualified QN for AK102/AK103.

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

Comments:

Data quality is minimally affected for sample results qualified B since they have a high bias and were less than the Project Action Limit. Sample 13-9LF-WS03-0 was qualified without a bias. The data quality is minimally affected; if there were to be a bias based on the method blank it would be high and the sample result is significantly less than ADEC Cleanup criteria.

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

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

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

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

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

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

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

All LCS percent recoveries were within DoD QSM and AK series criteria.

AK102 – MS and MSD recovery for DRO was less than ADEC method criteria at 72% and 74%.
SW8270 – MS recovery for Benzo(a)pyrene was greater than DoD QSM criteria at 113%.

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

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

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

Comments:

AK102 – Parent sample 13-9LF-WS01-0 was affected
SW8270 – Parent sample 13-9LF-WS01-0 was not affected since the bias was high and the parent sample result was nondetect.

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

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

AK102 – Parent sample 13-9LF-WS01-0 was qualified ML
SW8270 – Parent sample 13-9LF-WS01-0 was not qualified since the bias was high and the parent sample result was nondetect.

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

Comments:

Data quality was minimally affected even though the bias was low; the AK102 sample result 13-9LF-WS01-0 was significantly below the Project Action Limit.

c. Surrogates – Organics Only

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

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

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

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

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

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

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

Comments:

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:

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:

NA

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

Comments:

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:

ii. Submitted blind to lab?

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

Primary 13-9LF-WS01-0 / Duplicate 13-9LF-WS02-0

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

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

RPDs were greater than 30% for the following analytes and results were qualified QN:
SW6020 Dissolved – cadmium, lead
SW6020 – cadmium, zinc
SW8270 - 2-Methylnaphthalene, Benzo(b)fluoranthene, Dibenzo(a,h)anthracene, Fluorene, Naphthalene, and Phenanthrene
AK103 - Residual Range Organics (C25-C36)
In cases where the result is nondetect, the LOD was used for calculation purposes.

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

Comments:

Data quality was minimally affected, all results qualified QN were less than the Project Action Limit. The largest value between the primary and duplicate value will be used.

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

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

Disposable sampling equipment was used.

i. All results less than PQL?

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

ii. If above PQL, what samples are affected?

Comments:

NA

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

Comments:

Data quality and usability were not affected.

7. <u>Other Data Flags/Qualifiers (ACOE, AFCEE, Lab-Specific, etc.)</u>

a. Defined and appropriate?

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

Qualifiers are defined in the Data Quality section of the report.

ATTACHMENT B-4

Laboratory Data

(Available electronically)

APPENDIX C

Field Documentation

Field Logbooks
Groundwater Sampling Forms

INCH

Outdoor writing products for Outdoor writing people

This cover contains post-consumer recycled material

Rite in the Rain

A patented, environmentally responsible, all-weather writing paper that sheds water and enables you to write anywhere, in any weather.

Using a pencil or all-weather pen, *Rite in the Rain* ensures that your notes survive the rigors of the field, regardless of the conditions.

J. L. DARLING CORPORATION
Tacoma, WA 98424-1017 USA
www.RiteintheRain.com

Item No. 373
ISBN: 978-1-932149-87-6

6 32281 37311 7

NE CAPE 5-YR REVIEW
LOGBOOK #1 SITE NOTES

9/11/13 TO 9/16/13

Rite in the Rain
ALL-WEATHER
UNIVERSAL
№ 373

C. FELL
J. ORCZEWSKA
K. MAHER

HTRW-J07-0SF45902-H04-0001
0SF45902

Did you remember ... ???

Daily Logbook Checklist

- ☐ Project name / Site ID / Client
- ☐ Date
- ☐ Weather, site conditions, and other salient observations
- ☐ Level of PPE used
- ☐ Full names of onsite personnel and affiliations (including all visitors)
- ☐ Daily objectives
- ☐ Field measurements and calibrations
- ☐ Time and location of activity
- ☐ Field observations and comments
- ☐ Deviations from the Work Plan
- ☐ Site photographs
- ☐ Site sketches (with reference i.e. "N" arrow)
- ☐ Survey and location i.e. samples or debris (GPS coordinates when possible)
- ☐ For each sample record:
  - – Date, time, sampler(s)
  - – Sample ID
  - – Media, container(s), preservatives
  - – QC (dup/MS/MSD)
  - – Analysis
  - – MeOH lot #
  - – Tare weight

- ☐ Sample shipments (when, what, destination)
- ☐ Waste tracking (when, how much, destination)
- ☐ Daily summary of activities (i.e. # of samples collected)

LOGBOOK #1 SITE NOTES

DCN
HTRW-J07-05F45902-H04-0001

Name JACOBS ENGINEERING

Address 4300 B STREET SUITE 600
ANCHORAGE AK 99503

Phone 907 563 3322

Project NE CAPE 5-YR REVIEW
05F45902

C. FELL CF
J. ORCZEWSKA
K. MAHER

CONTENTS

NE CAPE, 5-YR REVIEW, USACE 9/11/13

~1240 LEFT NOME FOR NE CAPE ON BERING AIR

~1400 ARRIVED AT BRISTOL ENG. CAMP ON NE CAPE

SITE ORIENTATION W/ CHUCK CROLEY

PERSONNEL (LEVEL D PPE)

JACOBS	K. MAHER	P.M.
JACOBS	J. ORCZEWSKA	BIOLOGIST
JACOBS	C. FELL	GEOLOGIST
BRISTOL	C. CROLEY	SITE SUPER
USACE	J. CRANER	QAR

1430 GOT SITUATED IN LODGING AND PREPPED SOME OF THE FIELD GEAR
↳ GEL ICE IN FREEZER
↳ ONLY 12 COOLERS → SPACE ISSUE?

NOTE PLAN TO SPEND REMAINDER OF DAY SCOUTING SITES AND FLAGGING SAMPLING LOCATIONS

WX: MOSTLY CLOUDY TO OVERCAST
South wind 5 to 10 mph temp mid 40s

Scale: 1 square = ______

Rite in the Rain

1521 SITE DRIVE W/ THE CRAR (USACE)
↳ SITE 8 IS THE LOW LYING AREA ALONG THE RIGHT SIDE OF THE ROAD (CAMP)

LEFT FROM CAMP ROAD
↳ SITE 7 IS THE THINLY VEGETATED HILL LEFT FROM SITE 8
↳ SITE 6 IS WHERE ~~INTERMODAL~~ INTERMODAL CONTAINERS ARE STAGED
↳ SITE 3 IS ON THE RIGHT JUST BEFORE BEACH
↳ SITE 4 IS ON THE LEFT JUST BEFORE BEACH
↳ SITE 5 IS ON THE BEACH

NOTE MARK BOUNDARIES OF SITES WHERE OBSERVED OR MAKE SKETCHES

1612 ↳ SITE 9 IS THE BARE AREA ON LEFT SIDE OF ROAD JUST BEFORE INTERMODAL CONTAINER STAGING AREA ON THE RIGHT
↳ SITE 10 IS THE NEWLY GRADED AREA JUST PAST CONTAINER STAGING AREA.
↳ SITE 11 IS THE NEWLY DISTURBED AREA JUST DOWNHILL OF ~~THE~~ CF 9/11/13 SITE 10
↳ SITE 28 IS THE LOW AREA BELOW SITE 10
↳ SITE 31 & 32 ARE UP THE ROAD TOWARD QUARRIES
→ 32 IS FOUNDATION AT BASE OF HILL

Scale: 1 square = ______

1711 ↳ SITE 16 IS ESSENTIALLY AT THE GAC STATION JUST BEFORE THE GAC STATION
* DIRECTIONS ARE BASED ON COMING FROM CAMP

1742 END OF SITE WALK

1745 to 1815 DINNER

1820 GEAR ORGANIZATION & COOLER PREP

Bottle Count

		From WP	WC19
Coolers = 12			
250 HNO_3 Polys = 33	3	30	Filtered Unfiltered
1L HCL = 35	5	30	>10
1L No pres = ~~120~~	50	45	
40mL HCL VOA = ~~68~~		60	

Per cooler Sample location
- Ground water + SW
  - 6 x 40mL VOA
  - 2 x 1L HCL amber
  - 3 x 1L No pres AMBER
  - 2 x 250mL HNO_3 [Filtered, Unfiltered]

2005 END OF DAY

Scale: 1 square = ______

NE CAPE USACE
5-YEAR REVIEW 9/12/13

0655 HEALTH AND SAFETY MEETING (BRISTOL)

0715 DAILY TAILGATE (JACOBS)

↳ PERSONNEL (LEVEL D PPE)

JACOBS	K. MAHER	SITE LEAD
JACOBS	C. FELL	SSHO/TECH
JACOBS	J. ORCZEWSKA	TECH

WX: PARTLY TO MOSTLY CLOUDY
35°F TO 40°F
CALM TO LIGHT BREEZE

0752 DAILY OBJECTIVES:
- COMPLETE GW/SURFACEWATER SAMPLING
- SITE WALKS FOR SITE 7 & 9 (LANDFILL)

Christopher D. Fell 9/12/13

Scale: 1 square =

NE CAPE USACE
5 YEAR REVIEW 9/12/13

0754 TURBIDIMETER (S/N 6192)
↳ CALIBRATED ON 9/6/13 BY TTT ENVIRO

0905 YSI (S/N 1000449) CALIBRATION VERIFICATION
↳ CALIBRATED ON 9/6/13 BY TTT ENVIRO
↳ BAROMETER CAL: 29.72 in Hg
↳ CAL VERIFICATION
→ ORP: 240mV exp. 12/17 = 256.8mV OK
→ COND: 1413 um/cm (25°C) / 1020 um/cm (11°C) = 929 OK
→ pH 7.0: 6.95 OK
→ pH 10.01: 10.01 OK
→ pH 4.01: 3.95 OK

0940 LOADED SUPPLIES IN PICKED AND TRAVELLED TO SITE 9

0945 ARRIVED AT SITE 9 LANDFILL
↳ BEGAN SAMPLING PROCEDURE AT LOCATIONS 9LF-WS01 & 9LF-WS02

0950 ADVANCED DRIVE POINT

Scale: 1 square =

Rite in the Rain

NE CAPE
5 YEAR REVIEW

USACE
9/12/13

1000 *SAMPLE: 13-9LF-WS01-0
PRIMARY & MS/MSD ↳COLLECTED WITH DEDICATED DIPPER
↳4 40ml VOAs (HCl) AK101/BTEX SW8260
unfiltered ↳1 250poly (HNO3) SW6020 RCRA METALS SW7471 MERCURY
filtered ↳1 250poly (HNO3) SW6020 RCRA METALS SW7471 MERCURY
CF/KM/JO ↳2 1L AMBER (HCl) AK102/AK103
↳3 1L AMBER (none) SW8270SIM/SW8082
→ SURFACE WATER
X3 FOR MS/MSD
— FILTERED METALS COLLECTED W/PERISTALTIC

1000 *SAMPLE: 13-9LF-WS02-0
↳COLLECTED WITH DEDICATED DIPPER
DUPLICATE ↳4 40ml VOAs (HCl) AK101/BTEX SW8260
unfiltered ↳1 250poly (HNO3) SW6020 RCRA METALS SW7471 MERCURY
filtered ↳1 250poly (HNO3) SW6020 RCRA METALS SW7471 MERCURY
CF/KM/JO ↳2 1L AMBER (HCl) AK102/AK103
↳3 1L AMBER (none) SW8270SIM/SW8082
→ SURFACE WATER
— FILTERED METALS COLLECTED W/PERISTALTIC

1135 FINISHED SAMPLING 9LF-WS01
9LF-WS02

* SAMPLES MAINTAINED AT 4±2°C AFTER COLLECTION

NE CAPE
5 YEAR REVIEW

USACE
9/12/13

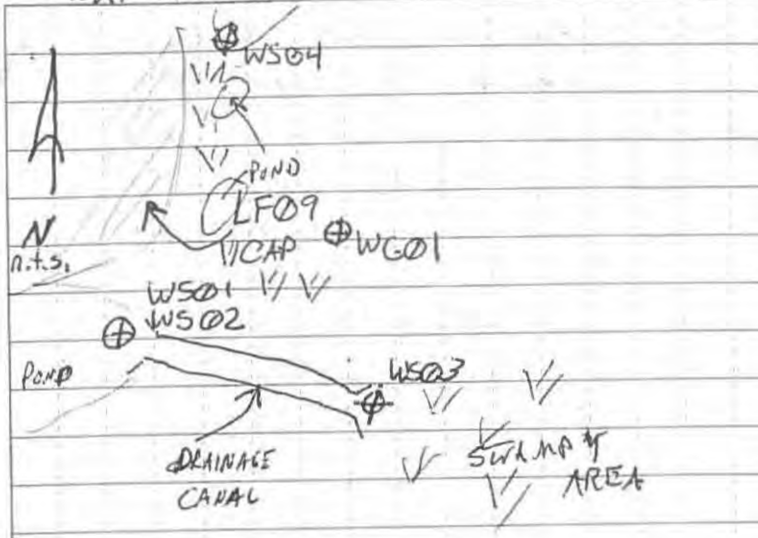
1149 BEGAN SAMPLING PROCEDURE AT LOCATION 9LF-SW03

1155 *SAMPLE: 13-9LF-WS03-0
CF/KM/JO PRIMARY ↳COLLECTED WITH DEDICATED DIPPER
↳4 40ml VOAs (HCl) AK101/SW8260
unfiltered ↳1 250poly (HNO3) SW6020 RCRA METALS SW7471 MERCURY
filtered ↳1 250poly (HNO3) SW6020 RCRA METALS SW7471 MERCURY
↳2 1L AMBER (HCl) AK102/AK103
↳3 1L AMBER (none) SW8270 SIM/SW8082
→ SURFACE WATER
→ FILTERED METALS COLLECTED W/PERISTALTIC

1211 FINISHED SAMPLING AT LOCATION 9LF-WS03

1212 SAMPLING LOCATIONS ARE RECORDED ON APPENDIX A FIGURES IN THE WORKPLAN (FIELD COPY) AND ON PAGE 8

1215 LEFT FOR LUNCH



1305 HEADED BACK TO SITE

1310 ADVANCED DRIVE POINT AT SITE 7 LANDFILL
↳ REFUSAL AT APPROX 4-6 INCHES BGS
↳ STEPPED OUT APPROX. 1FT → REFUSAL AT 6IN
↳ STEPPED OUT APPROX 10FT NORTH → REFUSAL AT 6IN
↳ STEPPED OUT APPROX 20FT NORTH → REFUSAL AT 30in

1340 BEGAN SAMPLING AT 9LF-WG01

1348 BEGAN SAMPLING PROCEDURE AT LOCATION 9LF-WS04

1350 * SAMPLE: 13-9LF-WS04-0
PRIMARY ↳ COLLECTED W/ DEDICATED DIPPER, FILTERED METALS COLLECTED W/ PERISTALTIC
↳ 4 40ml VOAs (HCL) AK101/SW8260(BTEX)
↳ 2 1L AMBER (HCL) AK102/AK103
FILTERED ↳ 1 250ml POLY (HNO_3) SW6020 RCRA METALS SW7471 MERCURY
UNFILTERED ↳ 1 250ml POLY (HNO_3) SW6020 RCRA METALS SW7471 MERCURY
↳ 3 1L AMBER (none) SW8270 SIM/SW8082
→ SURFACE WATER

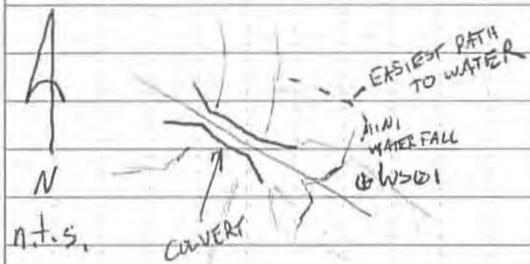
1351 * SAMPLE: ~~13-9LF-WS0~~ CF 9/12
PRIMARY 13-9LF-WG01-2
↳ COLLECTED W/ PERISTALTIC PUMP
1416 ↳ 4 40ml VOAs (HCl) AK101/SW8260(BTEX)
1550 FILTERED ↳ 1 250ml POLY (HNO_3) SW6020 RCRA METALS SW7471 MERCURY
~~↳ 250ml POLY (HNO_3)~~ CF 9/12

Christopher D Fell
9/12/13

1437 GROUNDWATER GRAB SAMPLING AT LOCATION 9LF-WG01
- WATER EXTREMELY TURBID W/ SILT/FINE SAND & ORGANICS.
- SCREEN CONTINUALLY PLUGS WITH FINE ORGANICS & SEDIMENT
- PRODUCTION RATE MUCH LOWER THAN 250ml/min
- 4 40ml VOAs IN ONE HOUR

1450 FINISHED SAMPLING 9LF-WS04

1504 ARRIVED AT KANGUKSHAM MOUNTAIN SPRING SAMPLING LOCATION (KMS



1516 STARTED SAMPLING PROCEDURE AT THE KANGUKSHAM MOUNTAIN SPRING

1521 *SAMPLE: 13-KMS-WS01-0
PRIMARY CF/JO
↳ COLLECTED WITH DEDICATED DIPPER, FILTERED ~~w/~~ CF 9/12 METALS COLLECTED WITH PERISTALTIC PUMP
↳ 4 40ml VOAs (HCl) AK101/SW8260(BTEX)
↳ 1 250ml POLY (HNO3) SW6020 RCRA METALS SW 7471 MERCURY
↳ 1 250ml POLY (HNO3) SW6020 RCRA METALS SW 7471 MERCURY
↳ 2 1L AMBER (HCl) AK102/AK103
↳ 3 1L AMBER (none) SW8270SIM/SW8082
→ SURFACE WATER

1539 FINISHED SAMPLING AT KANGUKSHAM MOUNTAIN SPRING

1550 FINISHED SAMPLING AT ~~9LF-WS0~~ CF 9/12 9LF-WG01-2 DUE TO EXTREMELY LOW WATER PRODUCTION FROM THE WELL POINT

1600 ARRIVED AT SITE 7 LANDFILL
↳ LAID OUT LOCATIONS

1625 STARTED SAMPLING PROCEDURE AT
7LF-WS01

1630 *SAMPLE: 13-7LF-WS01-0
PRIMARY ↳ COLLECTED w/ DEDICATED DIPPER,
CF/JO/KM FILTERED METALS COLLECTED w/
PERISTALTIC PUMP
↳ 4 40ml VOAs (HCl) AK101/SW8260 (BTEX)
FILTERED ↳ 1 250ml POLY (HNO3) SW6020 RCRA METALS SW7471 MERCURY
UNFILTERED ↳ 1 250ml POLY (HNO3) SW6020 RCRA METALS SW7471 MERCURY
↳ 2 1L AMBER (HCl) AK102/AK103
↳ 3 1L AMBER (none) SW8270SIM/SW8082
– SURFACE WATER

1650 FINISHED SAMPLING AT 7LF-WS01

1640 STARTED SAMPLING PROCEDURE AT
7LF-WS02

1644 *SAMPLE: 13-7LF-WS02-0
PRIMARY ↳ COLLECTED w/ DEDICATED DIPPER,
JO/CF/KM FILTERED METALS COLLECTED WITH
PERISTALTIC PUMP
↳ 4 40ml VOAs (HCl) AK101/SW8260 (BTEX)
FILTERED ↳ 1 250ml POLY (HNO3) SW6020 RCRA METALS SW7471 MERCURY
UNFILTERED ↳ 1 250ml POLY (HNO3) SW6020 RCRA METALS SW7471 MERCURY
↳ 2 1L AMBER (HCl) AK102/AK103
↳ 3 1L AMBER (none) SW8270SIM/SW8082
→ SURFACE WATER

1653 STARTED SAMPLING PROCEDURE AT
7LF-WS03-0
~~PRIM~~
CF 9/12

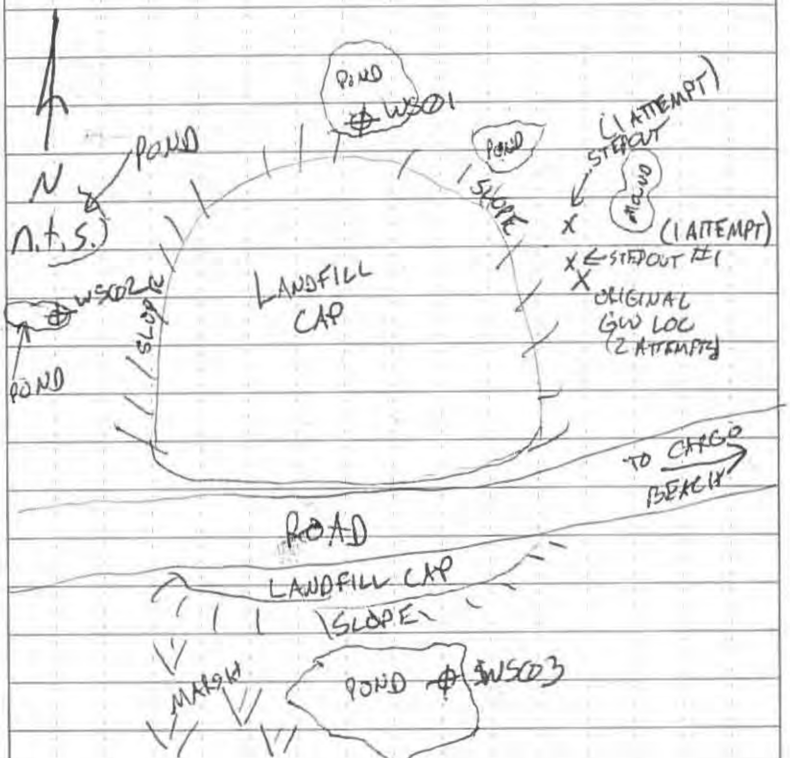
1654 *SAMPLE: 13-7LF-WS03-0
PRIMARY ↳ COLLECTED w/ DEDICATED DIPPER, FILTERED METALS
JO/CF/KM WITH PERISTALTIC PUMP
↳ 4 40ml VOAs (HCl) AK101/SW8260 (BTEX)
FILTERED ↳ 1 250ml POLY (HNO3) SW6020 RCRA METALS SW7471 MERCURY
UNFILTERED ↳ 1 250ml POLY (HNO3) SW6020 RCRA METALS SW7471 MERCURY
↳ 2 1L AMBER (HCl) AK102/AK103
↳ 3 1L AMBER (none) SW8270SIM/SW8082
→ SURFACE WATER

1720 FINISHED SAMPLING AT 7LF-WS02

1738 FINISHED SAMPLING AT 7LF-WS03

~~LEFT SITE FOR THE DAY~~ CP 9/12

1736 7LF GW SAMPLING LOCATION



1749 LEFT SITE FOR THE DAY
↳ TRANSFERRED SAMPLES BACK TO CAMP
↳ SAMPLING WASTE/IDW TRANSFERRED BACK TO CAMP IN 5 GALLON BUCKETS (PAGE 62)

Christopher D. Fell
9/12/13

0700 JACOBS TAILGATE

PERSONNEL

JACOBS	K. MAHER	SHE LEAD
JACOBS	C. FELL	SSHO/TECH
JACOBS	J. ORCZEWSKA	TECH

→ K. MAHER DEPARTED AT APPROX 1440

WX: WINDY 10-20mph GUSTS
30s F TO 40s F
OVERCAST

0720 DAILY OBJECTIVES
- COOLER PACKING
- RENTAL DEMOBE
- 5 YR REVIEW TRAINING
- BEGIN 5YR REVIEWS

0800 BRISTOL TAILGATE

0830 TO 1140 PREPARED CHAINS OF CUSTODY FOR 8 COOLERS WITH SAMPLES COLLECTED ON 9/12/13

COOLERS
- KILO
- JULIETT
- CHARLIE
- MIKE
- ALFA
- HOTEL
- ECHO
- ROMEO

1140 5 YEAR REVIEW CHECKLIST TRAINING

1200 LUNCH

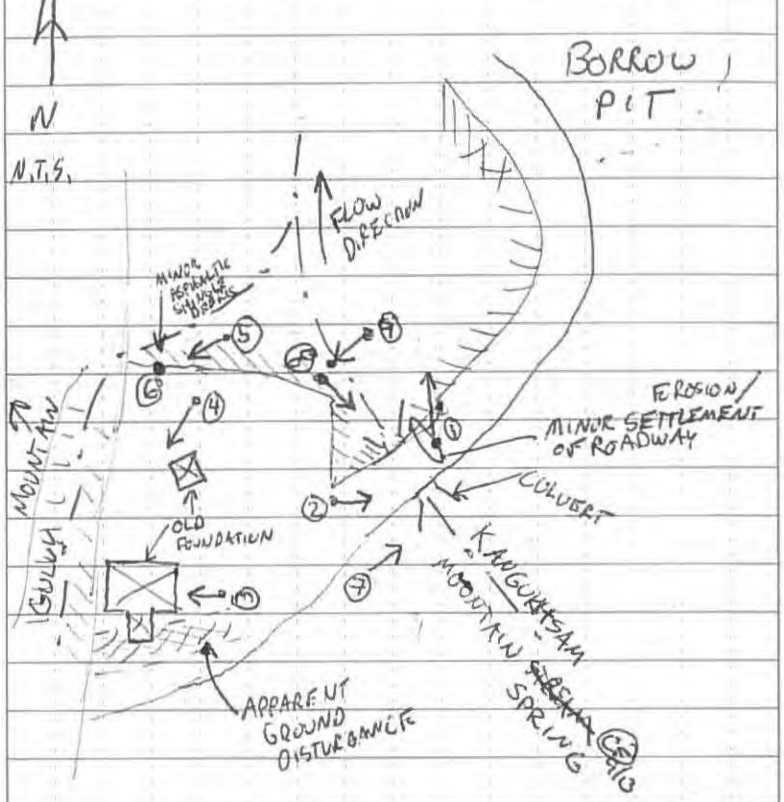
1230 BACK FROM LUNCH - GOING TO START SITE WALKS
→ K. MAHER WAITING W CAMP FOR AIRPLANE TO NOME

NE CAPE
5 YEAR REVIEW

USACE
9/13/13

1240 SITE WALK OF SITE 32 - LOWER TRAMWAY
↳ SEE CHECKLIST FOR FURTHER INFORMATION

SITE 32: LOWER TRAMWAY



① PICTURE LOCATION

NE CAPE
5 YEAR REVIEW

USACE
9/13/13

1313 OBSERVED MINOR WOOD AND METAL DEBRIS ON SITE

1321 OBSERVED MINOR ASPHALTIC SHINGLE DEBRIS 1x2 FT TO 2x2 FT (APPROX) DIMENSIONS ON THE GROUND WEST OF THE OLD FOUNDATION

1325 OBSERVED APPARENT GROUN DISTURBANCE (RECENT) TO THE EAST OF THE OLD FOUNDATION. THIN VEGETATION IS GROWING ON THE EXTREMELY ROCKY SOIL

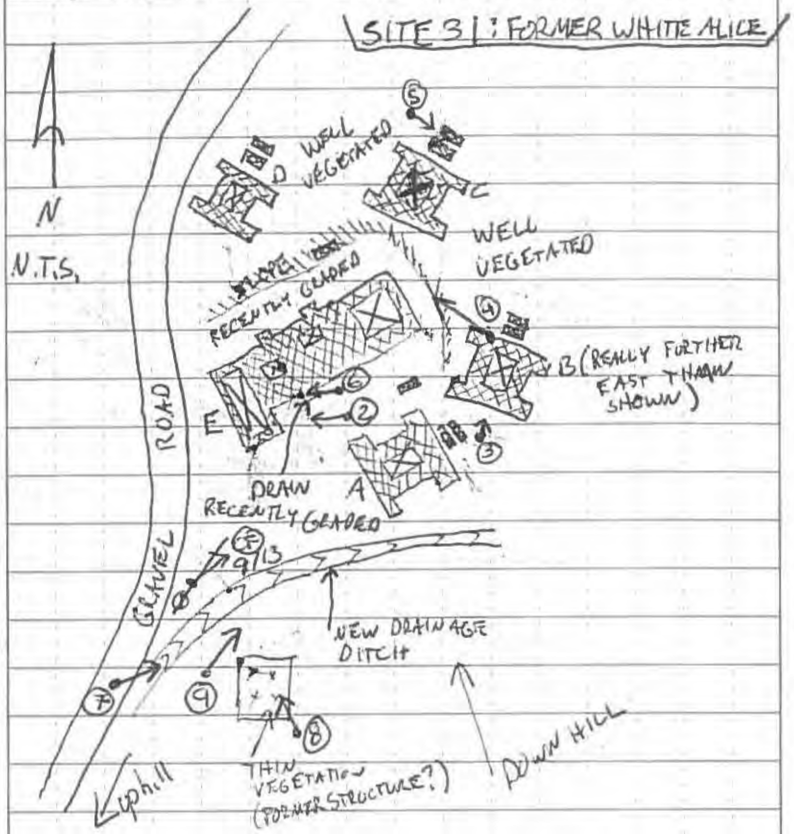
1327 NO GROUNDWATER MONITORING WELLS WERE OBSERVED

1330 CULVERT UNDER ROAD AT THE SITE IS APPROX 5 TO 6 FT IN DIAMETER

1332 ONGOING REMEDIAL ACTIVITY IS MINING BORROW FOR BACK FILL ADJACENT TO THE SITE ON THE OPPOSITE SIDE OF KANGUKHSAM MOUNTAIN SPRING

1343 LEFT SITE 32: LOWER TRAMWAY

1347 ARRIVED AT SITE 31: FORMER WHITE ALICE



FOUNDATION (CONCRETE)

① → PHOTO + DIRECTION

HOLES IN FOUNDATIONS (FILLED W/ SOIL)

1404 OBSERVED MINOR WOOD/METAL/WIRING DEBRIS NEAR ANTENNA FOUNDATION "C"

1405 OBSERVED A DRAIN COVER (RUSTED) ON THE SOUTH SIDE OF FOUNDATION "E" WITH AN UNFILLED VOID UNDERNEATH (APPROX 6 FT DEEP, 5 WIDE, 9 FT LENGTH) DRAIN IS APPROX 4 FT LONG & 6 INCHES WIDE.

SAFETY ISSUE

1415 AREA AROUND FOUNDATION "E" AND ANTENNA FOUNDATION "A" HAVE BEEN RECENTLY GRADED, COMPACTED, AND SEEDED. NEW VEGETATION IS JUST SPROUTING. AREA APPEARS TO BE GRADED TO PROMOTE POSITIVE DRAINAGE AND MITIGATE EROSION

1416 HOLES IN FOUNDATIONS HAVE BEEN FILLED WITH SOIL
↳ NO STAINING OF CONCRETE OBSERVED

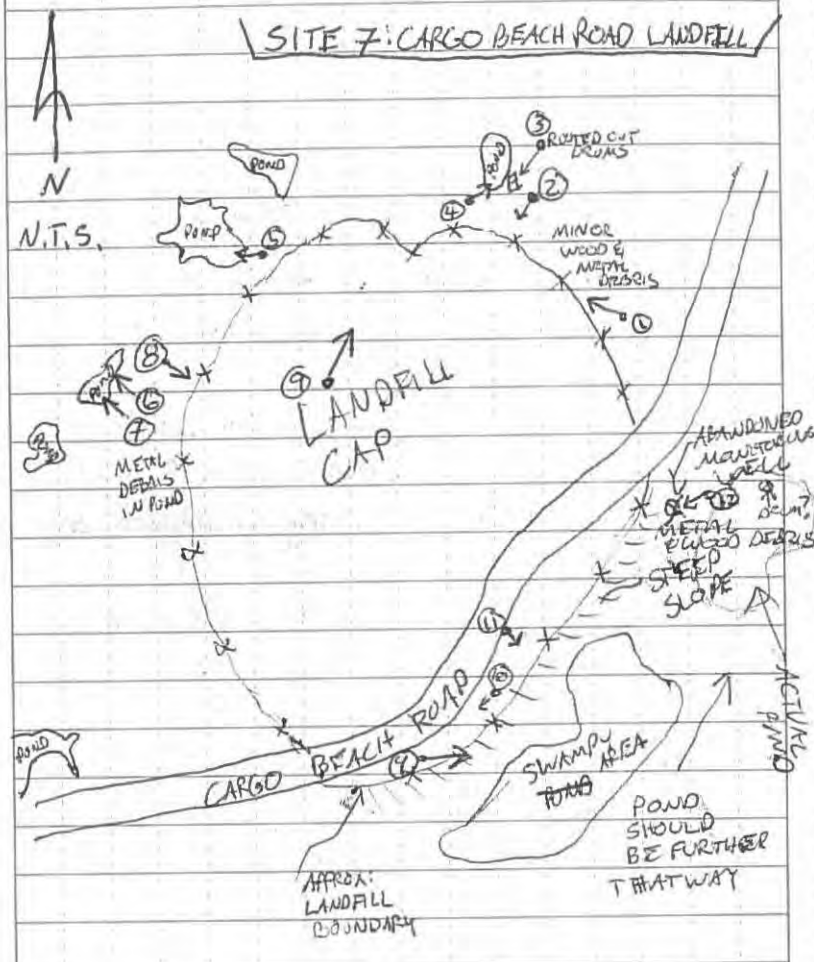
1420 AREA OF STUNTED VEGETATION ~~OF~~ 9/13 UPHILL FROM THE WACS SITE (APPROX 20 FT BY 30 FT RECTANGLE)

1424 NO GROUNDWATER MONITORING WELLS OBSERVED

1440 LEFT SITE 31: WHITE ALICE
↳ CHECKLIST ON SEPERATE FORM

1509 ARRIVED AT SITE 7: CARGO BEACH ROAD LANDFILL

SITE 7: CARGO BEACH ROAD LANDFILL



LANDFILL BOUNDARY (APPROX) STEEP SLOPE

PICTURE LOCATION & DIRECTION

1517 THE LANDFILL COVER APPEARS TO CONSIST OF FINE AND COARSE GRAVEL AT THE SURFACE WITH PATCHY GRASS COVER

1523 CARGO BEACH ROAD CROSSES THE LANDFILL CAP. NO SETTLEMENT OBSERVED GRADING/DRAINAGE APPEARS ADEQUATE

1528 WOOD DEBRIS AT PICTURE 1 LOCATION (MINOR) WITH OTHER WOOD AND METAL DEBRIS NEARBY

1546 OBSERVED 2 RUSTED OUT DRUMS NEAR THE EDGE OF THE POND NEAR THE NE CORNER OF THE LANDFILL (55gal?)

1547 OBSERVED METAL/WOOD/PLASTIC DEBRIS IN THE NORTHEAST POND

1552 OBSERVED METAL DEBRIS IN THE POND AT THE NW CORNER OF THE LANDFILL WHERE PICTURE 5 WAS TAKEN

1553 LANDFILL CAP DOES NOT HAVE OBSERVED SIGNS OF SETTLEMENT/EROSION OR LANDFILL DEBRIS STICKING THROUGH THE CAP

1559 OBSERVED METAL DEBRIS IN THE POND TO THE WEST OF THE LANDFILL (METAL ROOFING?) → PICTURES 6 & 7

1607 RUBBER HOSE STICKING THROUGH LANDFILL CAP ALONG WITH SOME METAL DEBRIS NEAR PICTURES 10 & 11

1615 OBSERVED AN ABANDONED MONITORING WELL NEAR THE SE CORNER OF THE LANDFILL - ABANDONED WITH HYDRATED BENTONITE

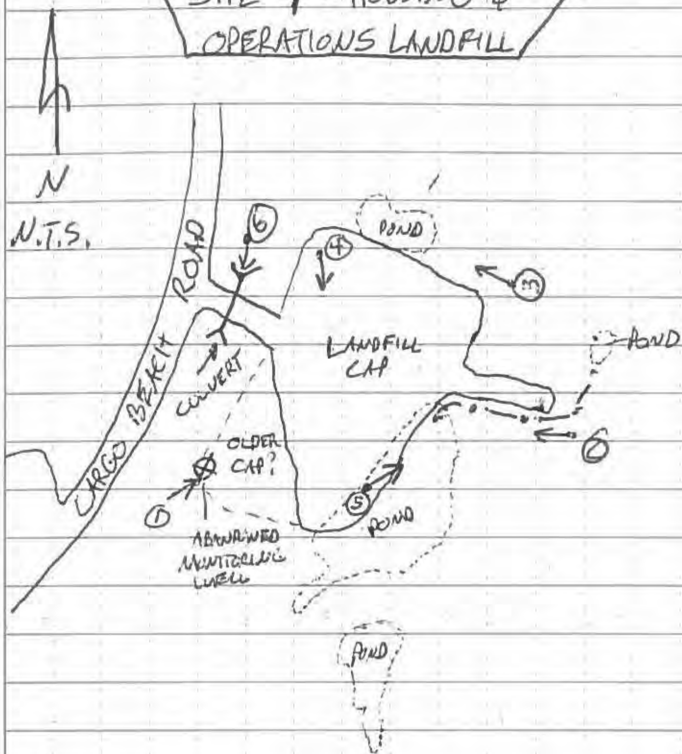
1616 OBSERVED ~~MINOR~~ METAL DEBRIS AND OTHER DEBRIS IN THE POND NEAR THE SE CORNER OF THE LANDFILL
CF 9/13
↳ OBSERVED A SUBMERGED OBJECT W/ A ROUND OPENING (DRUM?)

1633 * ITEMS OF INTEREST *
- DEBRIS PROTRUDING THROUGH CAP ON S SIDE (MINOR)
- SIGNIFICANT METAL & WOOD DEBRIS IN THE SURROUNDING PONDS (INCLUDING A FEW RUSTED OUT DRUMS

1637 LEFT SITE 7 LANDFILL
↳ 5 YR REVIEW CHECKLIST ON SEPERATE FORM

1640 ARRIVED AT SITE 9: HOUSING & OPERATIONS LANDFILL
↳ 5 YR REVIEW CHECKLIST INCLUDED ON A SEPERATE FORM

SITE 9: HOUSING & OPERATIONS LANDFILL



① → PICTURE LOCATION & DIRECTION
POND BOUNDARY
DIVERSION DITCH
CULVERT

1642 DRAINAGE IN EXCELLENT CONDITION ~ NO VEGETATION IN DITCH

1649 LANDFILL CAP APPEARS TO BE IN GOOD CONDITION WITH THIN GRASSY VEGETATION. CAP IS COMPOSED OF COARSE MATERIAL (GRAVEL) THAT MAKES VEGETATIVE GROWTH DIFFICULT.

1651 EROSION & SETTLEMENT WERE NOT OBSERVED. GRADING APPEARS TO ALLOW DRAINAGE

1657 OBSERVED AN ABANDONED MONITORING WELL AT THE SW CORNER OF THE OLD LANDFILL CAP.

→ COULD NOT FIND THE OTHER 2 MONITORING WELLS SHOWN IN THE DECISION DOCUMENT

1734 LEFT SITE 9: HOUSING & OPERATIONS LANDFILL

END OF DAY

Christopher D. Fell 9/13/13

0800 BRISTOL TAILGATE

0830 JACOBS TAILGATE

PERSONNEL

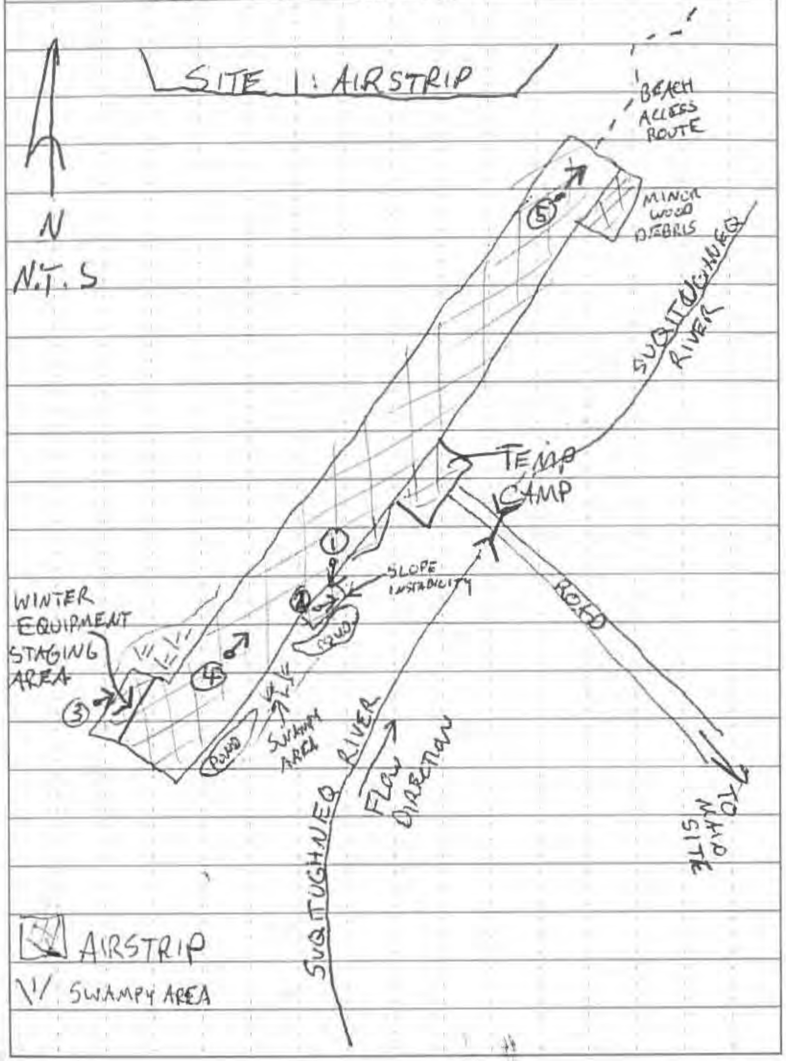
JACOBS	C. FELL	SITE LEAD
JACOBS	J. ORCZEWSKA	SSHO/TECH

WX: CALM
30s TO 40s F
OVERCAST

850 DAILY OBJECTIVES
- 5 YEAR REVIEW SITE WALKS
- PAPERWORK QC
- CONTINUE PREP FOR DEMOBE

850 TO SITE HISTORY REVIEW

0944 LEFT CAMP TO CONDUCT SITE WALK FOR SITE 1 : AIRSTRIP



0955 OBSERVED 1 TO 6 INCH TENSION CRACKS IN THE SLOPE OF A SIDING OFF THE SIDE OF THE RUNWAY. THE NORTHEAST CORNER OF THE PAD HAS APPROXIMATELY 1FT OF SETTLEMENT AT THE TOP OF THE SLOPE.

↳ SLOPE INSTABILITY IS APPROX 30-40FT FROM THE EDGE OF THE RUNWAY AND WILL NOT AFFECT OPERATIONS ON THE RUNWAY

1000 RUNWAY SURFACE WAS OBSERVED TO BE IN GOOD CONDITION AND WAS FREE OF RUTTING, SETTLEMENT, OR EROSION DAMAGE

↳ SLOPES IMMEDIATELY ADJOINING THE RUNWAY SURFACE WERE GENERALLY FREE OF SIGNS OF SLOPE INSTABILITY, HOWEVER ARE SLOPED BETWEEN 1½ TO 1 AND ¾ TO 1 WHICH MAY LEAD TO EROSIVE DAMAGE OVER TIME

↳ SMALL TENSION CRACKS ON ¾ TO 1 SECTIONS

1014 A FEW SHIPPING RACKS ARE STAGED ON THE END OF THE RUNWAY AT THE WINTER STORAGE AREA
↳ NO SOIL STAINING OBSERVED AT STORAGE AREA

1033 MINOR WOOD DEBRIS NOTED ALONG THE EAST SIDE OF THE RUNWAY NEAR THE NORTH END

1038 A TRAIL HAS BEEN FORMED OFF THE NORTH END OF THE RUNWAY LEADING TO THE BEACH.

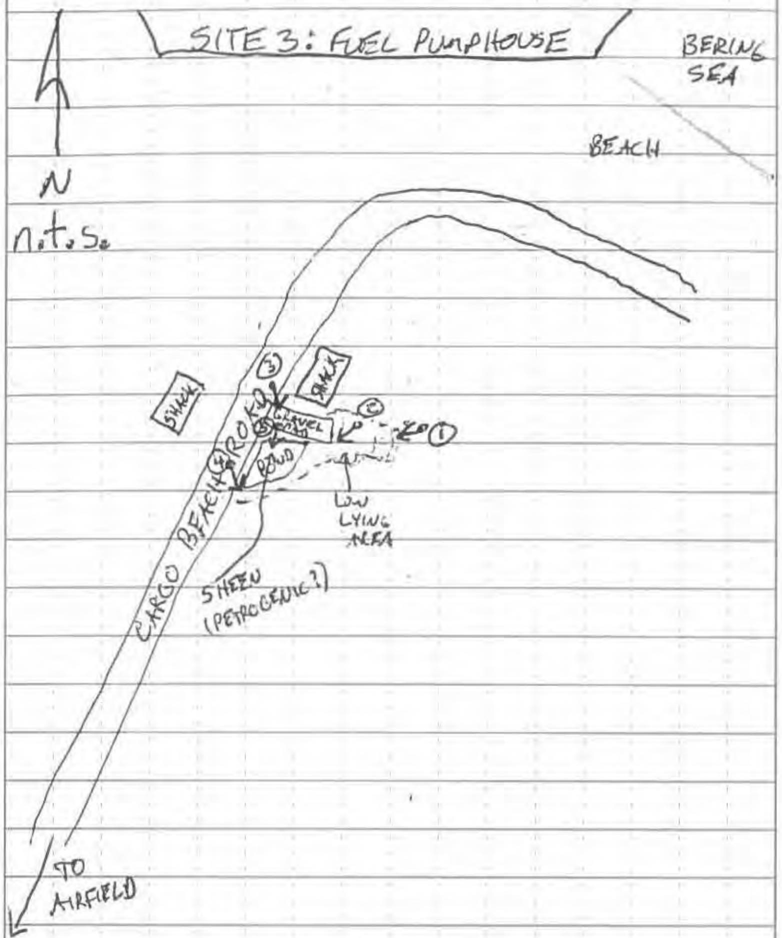
1044 LEFT SITE 1: AIRSTRIP
↳ 5 YEAR REVIEW CHECKLIST ON A SEPERATE FORM 9/14

ITEMS OF INTEREST

- MINOR SLOPE STABILITIES ISSUES ON THE RUNWAY EDGES.

Christopher D. Fell 9/14/13

1055 ARRIVED AT SITE 3: FUEL PUMPHOUSE



1112 OBSERVED A SALVAGED PIECE OF RUSTED OUT EQUIPMENT STAGED FOR REMOVAL

1113 EXCAVATION AREA NOTED IN THE ROD APPEARS TO NOW BE A ROAD

1114 BIOGENIC SHEEN (BRITTLE) NOTED ON SOME WATER W FROM THE ROAD

1116 FORMER PIPELINE WAS NOT OBSERVED (REMOVED?) FORMER PUMPHOUSE STRUCTURE HAS BEEN REMOVED.

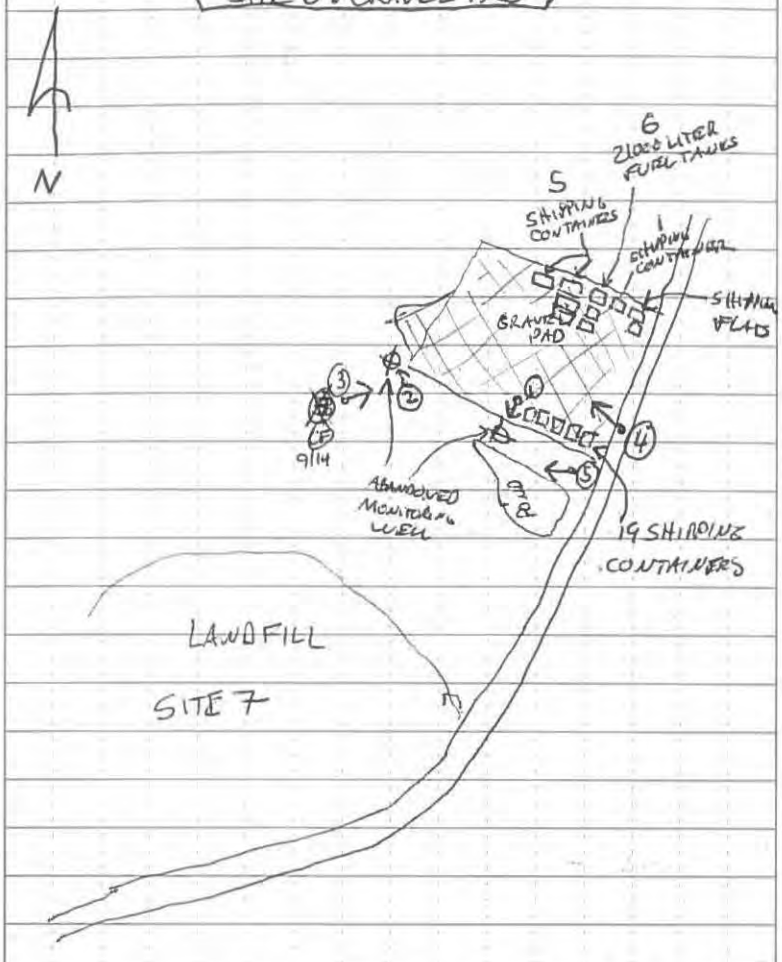
1119 SHEEN NOTED ON PONDED WATER NEAR THE GRAVEL PAD. SHEEN WAS NOT BRITTLE AND FLOWED BACK TOGETHER AFTER BEING DISTURBED (LIGHT SHEEN)

1126 VEGETATION IS GROWING WELL ONSITE EXCEPT ON A NEW GRAVEL PAD

1132 LEFT SITE 3: FUEL PUMPHOUSE

1133 ARRIVED AT SITE 6: GRAVEL PAD
↳ 5 YEAR REVIEW CHECKLIST ON A SEPERATE FORM

SITE 6: GRAVEL PAD



GRAVEL PAD

ABANDONED MONITORING WELL

① → PHOTO LOCATION, DIRECTION

NE CAPE
5 YEAR REVIEW
USACE
9/14/13

1140 OBSERVED AN ABANDONED MONITORING WELL ON THE SW SIDE OF THE SITE. (HYDRATED BENTONITE)

1143 A SECOND ABANDONED MONITORING WELL OBSERVED ON THE WEST CORNER OF THE PAD (HYDRATED BENTONITE)

1148 DID NOT OBSERVE STAINING ON THE NEWLY GRADED GRAVEL PAD THAT IS CURRENTLY BEING USED TO STORE SHIPPING CONTAINERS.

↳ PAD APPEARS TO HAVE BEEN RECENTLY SAMPLED
↳ GRID SAMPLING
↳ PAD GRADED TO PROMOTE DRAINAGE AND MITIGATE EROSION

1153 DID NOT OBSERVE DEBRIS OR A SHEEN IN THE POND TO THE SOUTH OF THE SITE

1155 LEFT SITE 6: GRAVEL PAD

1206 LUNCH

1230 DONE WITH LUNCK

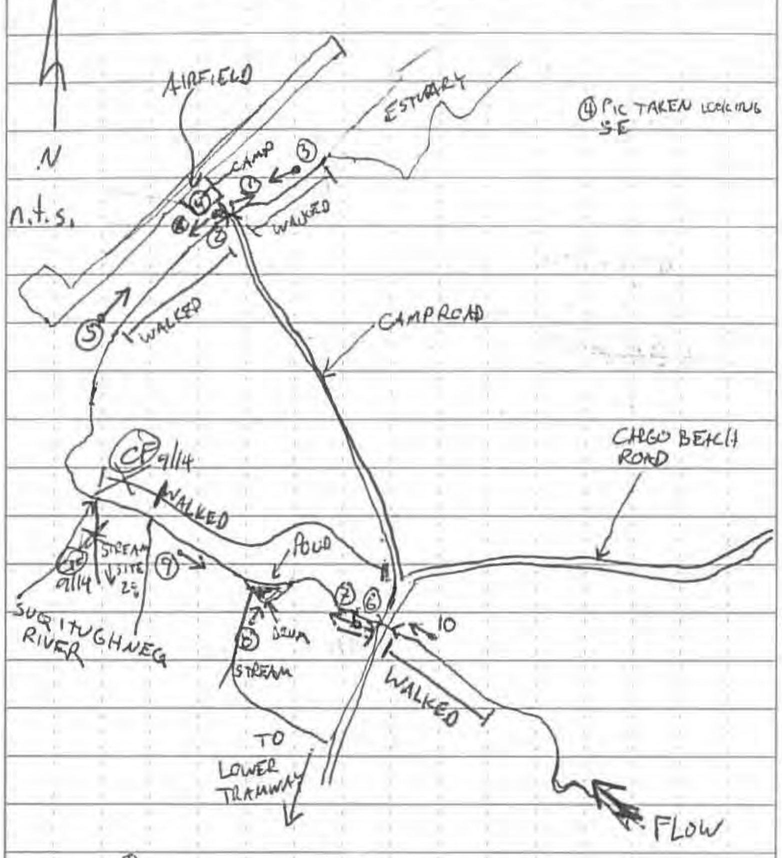
1230 to 1340 VIEWED HISTORICAL PHOTOS WITH JEREMY CRANER (USACE)

Scale: 1 square = ____________

NE CAPE
5 YEAR REVIEW
USACE
9/14/13

1341 SITEWALK FOR SITE 29: SUQITUGHNEQ RIVER
↳ 5 YEAR REVIEW CHECKLIST ON A SEPERATE FORM.

SITE 29: SUQITUGHNEQ RIVER



① OR ① PHOTO, DIRECTION

Scale: 1 square = ____________

NE CAPE USACE
5 YEAR REVIEW 9/14/13

1352 WALKED THE SUQITUGHNEQ RIVER FROM CAMP ROAD TO THE ESTUARY

1357 DID NOT OBSERVE ANY DEBRIS OR (PETROGENIC) SHEEN. LOOKS LIKE A RIVER

1402 CONSTRUCTION CAMP IS PUMPING WATER FROM THE SUQITUGHNEQ RIVER FOR GENERAL USE (SOUTH OF ROAD)

1411 WALKED THE SUQITUGHNEQ RIVER FROM CAMP ROAD TO THE END OF THE RUNWAY

1412 ~~DID NOT~~ CF 9/14 DID NOT OBSERVE ~~OBSERVE~~ CF 9/14 ANY DEBRIS OR SHEEN (PETROGENIC).

TRAVELLED UP RIVER

1426 WALKED THE SUQITUGHNEQ RIVER FROM CARGO BEACH ROAD TOWARDS THE AIRFIELD

1433 OBSERVED A DRUM IN A POND → VERY RUSTED, NO SHEEN OBSERVED

1445 DID NOT SEE DEBRIS/SHEEN (PETROGENIC) TO MOUTH OF SITE 28 DRAINAGE

Scale: 1 square = ______ PAGE 36

NE CAPE USACE
5 YEAR REVIEW 9/14/13

1450 WALKED THE SUQITUGHNEQ RIVER FROM CARGO BEACH ROAD UPSTREAM
↳ WATER HOSE (4inch) IN THE WATER AT THE CULVERT FOR CARGO BEACH ROAD. MAYBE IN USE AS A WATER SOURCE FOR CONSTRUCTION/REMEDIATION ACTIVITIES.

1500 DID NOT SEE DEBRIS/SHEEN (PETROGENIC) ALONG THE SUQITUGHNEQ RIVER

1512 LEFT SITE 29: SUQITUGHNEQ RIVER

1515 SITE WALK FOR SITE 8: POL SPILL
↳ 5 YEAR CHECKLIST ON A SEPERATE FORM

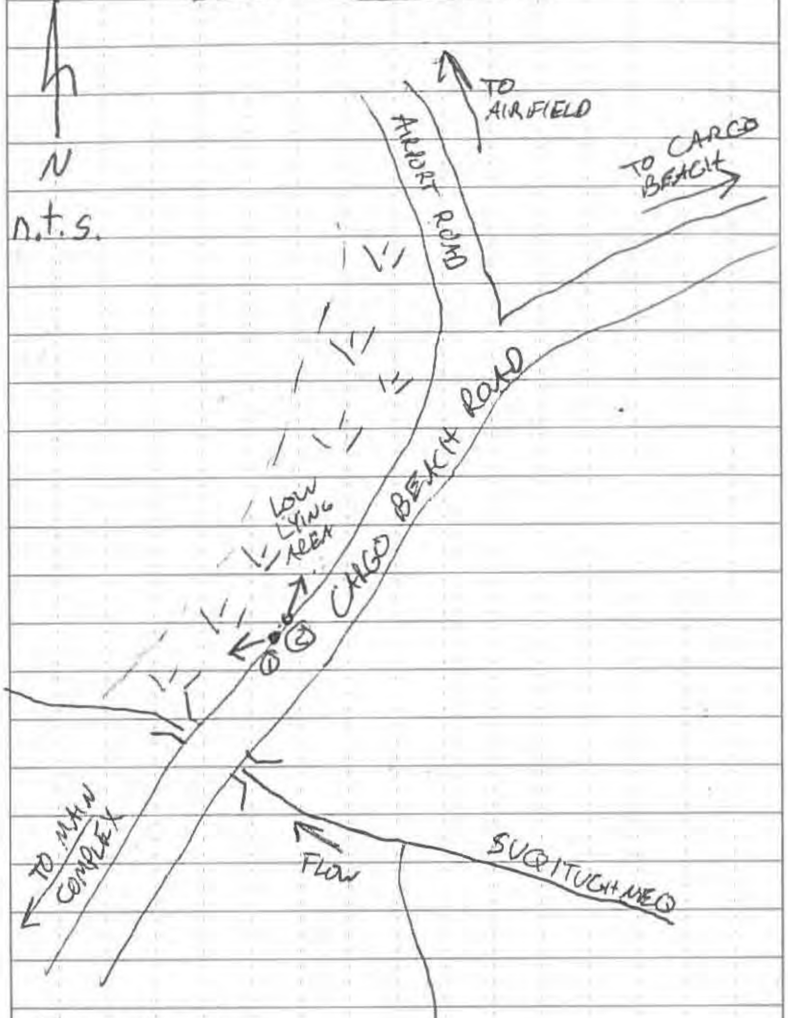
1522 VEGETATION IS THICK AND HEALTHY
NO ODOR OBSERVED
NO SHEEN (PETROGENIC) OBSERVED
NO DEBRIS OBSERVED

1533 LEFT SITE 8: POL SPILL

Scale: 1 square = ______ PAGE 37

Rite in the Rain

SITE 8: POL SPILL



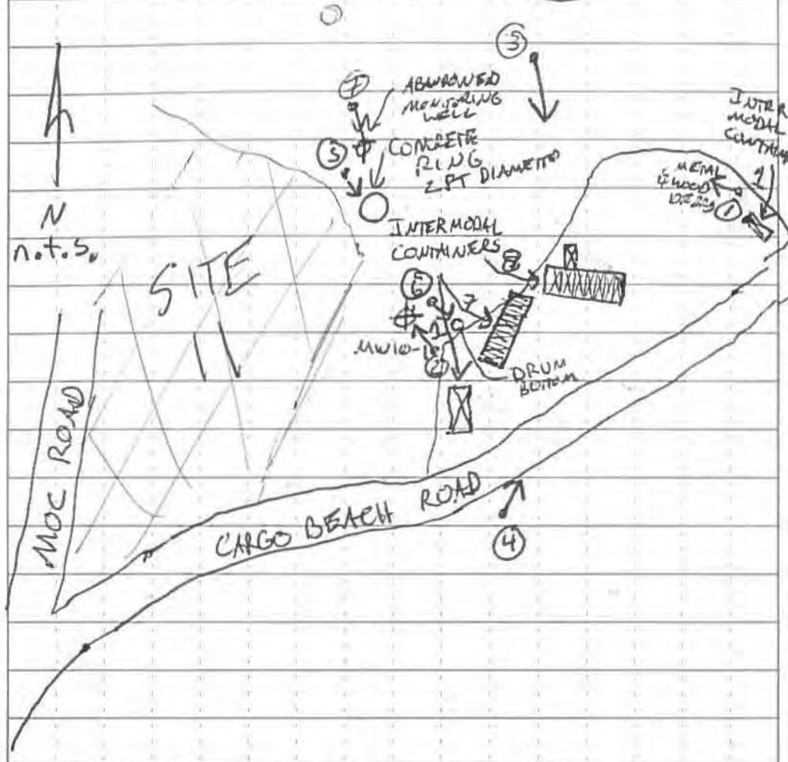
SWAMPY AREA

CULVERT DAYLIGHT ① → PHOTO, DIRECTION FACING

1534 ARRIVED AT SITE 10: BURIED DRUMS

↳ 5 YEAR REVIEW CHECKLIST ON A SEPERATE FORM

SITE 10: BURIED DRUMS



① → PHOTO, DIRECTION FACING

INTERMODAL CONTAINER

1547 OBSERVED WOOD AND METAL DEBRIS (MINOR) AT THE NE CORNER OF THE SITE

1550 OBSERVED MONITORING WELL 10-1. WELL CASING HAS JACKED 1 FOOT ABOVE THE PROTECTIVE STEEL CASING. NO LOCKING CAP OR PROTECTIVE BOLLARDS.

1554 ~~EVIDEN~~ 9/14 OBSERVED EVIDENCE OF RECENT SOIL BORINGS & SAMPLING ACTIVITY

1558 SITE IS CURRENTLY BEING USED AS A LAYDOWN AREA BY THE REMEDIAL CONTRACTOR (BRISTOL). SITE IS GRADED AND COMPACTED TO PROMOTE POSITIVE DRAINAGE AND MITIGATE EROSION

↳ NO VEGETATION PRESENT ON THE GRAVEL PAD, VEGETATION AROUND THE PAD APPEARS HEALTHY

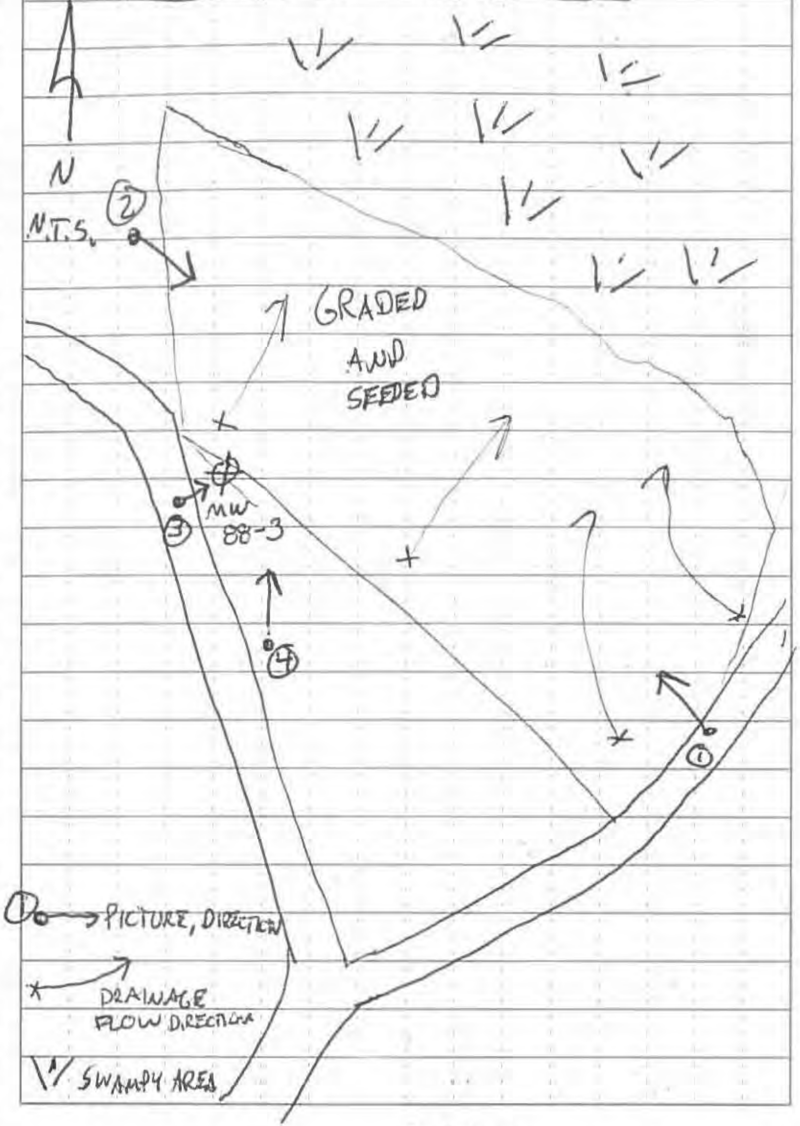
1604 OBSERVED A DRUM BOTTOM AT BASE OF SLOPE

1608 2ND MONITORING WELL SHOWN ON THE FIGURE IN THE ROD WAS NOT FOUND.

↳ JEREMY CRAMER INDICATES IT WAS DECOMMISSIONED (USACE) ↳ OBSERVED THE ABANDONED WELL

1624 LEFT SITE 10: BURIED DRUMS

SITE 11: FUEL TANKS



1625 ARRIVED AT SITE ~~16~~ ~~CP~~ 9/14 11: FUEL TANKS FOR A SITE WALK
↳ 5 YEAR REVIEW CHECKLIST ON A SEPERATE FORM

1635 OBSERVED MONITORING WELL MW88-3.
↳ CASING HAS A LOCKING CAP - WITH NO LOCK
↳ FLUSH MOUNT MONUMENT DOES NOT CLOSE AS THE WELL APPEARS TO HAVE FROST JACKED

1643 SITE HAS BEEN GRADED/COMPACTED/AND SEEDED TO PROMOTE POSITIVE DRAINAGE AND MITIGATE EROSION.
↳ OBSERVED THE REMEDIAL CONTRACTOR (BRISTOL) SPREADING SEED ON THE AREA

1645 LOCATIONS OF THE FORMER ASTS ARE NOT APPARANT

1650 DEBRIS NOT OBSERVED ONSITE OR AROUND THE PERIMETER

1715 LEFT THE SITE Christopher D. Fell 9/14/13

Scale: 1 square = ____

0730 PAPERWORK & SITREP
0745 BREAKFAST
0800 BRISTOL TAILGATE

0830 JACOBS TAILGATE

PERSONNEL

JACOBS	J. ORCZEWSKA	SSHO/TECH
JACOBS	C. FELL	SITE LEAD

WX:
OVERCAST
LIGHT BREEZE
LOW 40s F

PPE: LEVEL D MODIFIED

DAILY OBJECTIVES
- SITEWALK REMAINING 7 SITES
- PREP FOR DEMOBE

Scale: 1 square = ____

Rite in the Rain

0931 ARRIVED AT SITE 28: DRAINAGE BASIN
↳ 5 YEAR REVIEW CHECKLIST ON A SEPERATE FORM

0950 OBSERVED 5 30 FT BY 60 FT SETTLING PONDS FOR COLLECTING WATER & SEDIMENT FROM DREDGE OPERATIONS
↳ 11 SEDIMENT COLLECTION BAGS (25FT × 6FT × 1½FT) PRESENT IN THE PONDS
↳ GAC SYSTEM BY PRO ACT BEING USED TO TREAT WATER PRIOR TO ONSITE DISPOSAL (ONTO TUNDRA)

0956 INTERMEDIATE PONDS ARE BEING USED TO LIFT WATER & SEDIMENT UPHILL WITH PUMPSTATIONS

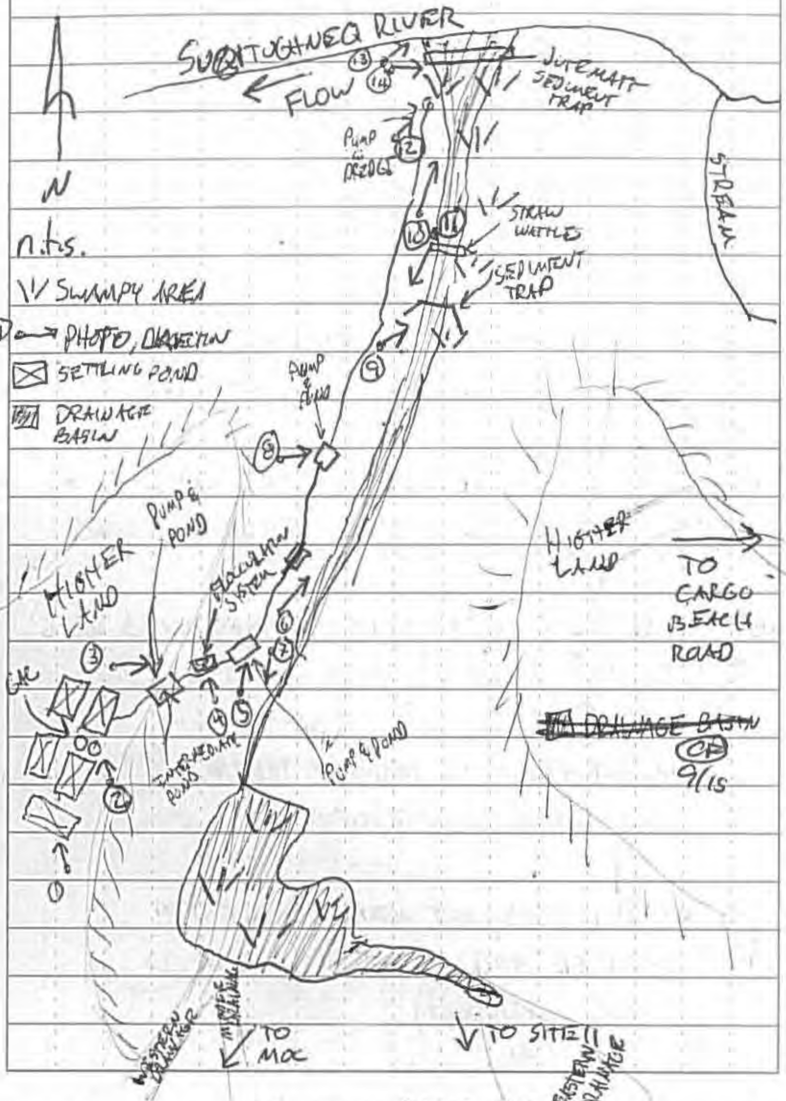
1009 A SEDIMENT TRAP (STEEL WALL, 6FT WITH 3FT WINGS)

1014 A SMALL DREDGE WAS BEING USED TO REMOVE SEDIMENT (ON PONTOONS)

1017 A JUTT MATT SEDIMENT TRAP WAS AT THE MOUTH OF THE DRAINAGE, DID NOT OBSERVE SEDIMENT ESCAPING INTO THE SUQITUGHNEQ RIVER

1018 DID NOT OBSERVE DEBRIS IN THE DRAINAGE

SITE 28: DRAINAGE BASIN



1027 LEFT SITE 28: DRAINAGE BASIN

1030 MET W/ ECO LAND SURVEYING ABOUT SURVEY OF SAMPLING LOCATIONS FROM 9/12/13
↳ NEED TO REMARK SITE 32
↳ WILL VISIT SITE 7 & SITE 9 WITH THE SURVEYOR BEFORE LUNCH

1050 ARRIVED AT SITE 21: WASTEWATER TANK
↳ 5 YEAR REVIEW FORM ON A SEPERATE FORM

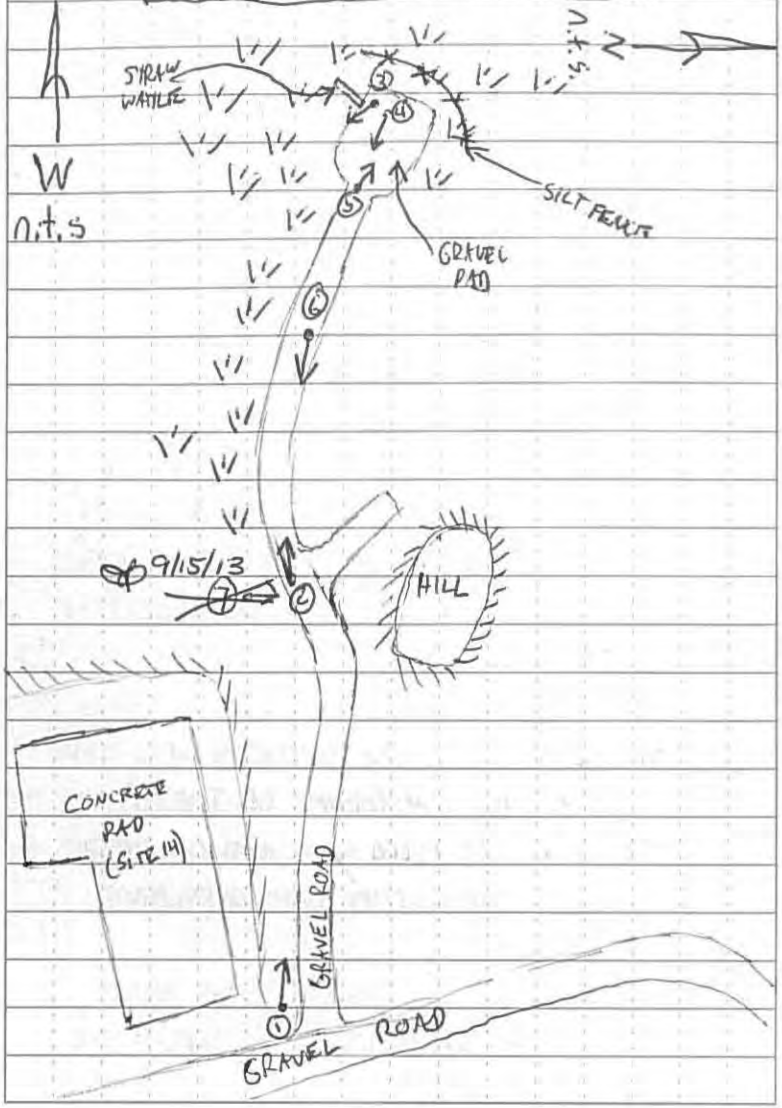
1105 OBSERVED BRISTOL (REMEDIAL CONTRACTOR) SEEDING THE GRAVEL PAD AT THE END OF THE ROAD

1109 GRAVEL PAD HAD BEEN AN OPEN EXCAVATION 3 DAYS AGO. NOW IS BACKFILLED WITH GRAVEL ~~WITH~~ CF 9/15 LITTLE SILT.
↳ A SILT FENCE IS BETWEEN THE PAD AND OPEN WATER DOWN GRADIENT

BACKFILL DOES NOT APPEAR TO HAVE BEEN COMPACTED AND IS TOO WET TO DO SO (PUMPING UNDER FOOT)

Scale: 1 square = ____

SITE 21 : WASTEWATER TANK



Scale: 1 square = ____

1121 LEFT SITE 21: WASTEWATER TANK

1123 ARRIVED AT SITE 16: ~~HEAT & POWER PLANT~~ PAINT & DOPE STORAGE CE 9/15
↳ 5 YEAR REVIEW FORM ON A SEPERATE FORM

1125 TO 1155 MET WITH SURVEYORS TO SHOW WHERE SAMPLING LOCATIONS ARE

1155 LEFT SITE FOR LUNCH
1230 LEFT CAMP FOR SITE

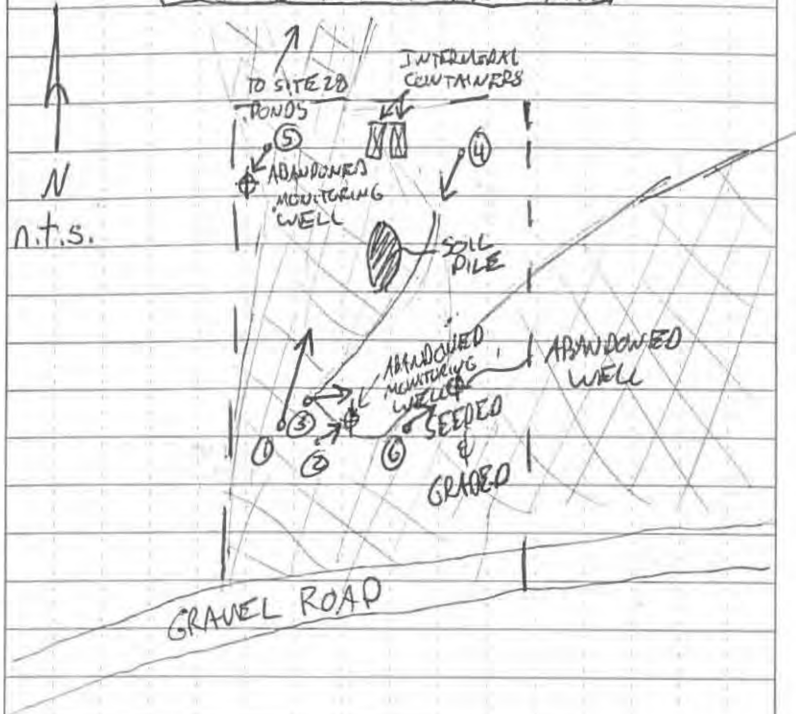
1241 ARRIVED ON SITE 16: ~~HEAT & POWER PLANT~~ PAINT & DOPE STORAGE CE 9/15

1251 OBSERVED AN ABANDONED MONITORING WELL THAT WAS NEAR THE SW CORNER OF THE FORMER BUILDING

1257 OBSERVED AN ABANDONED MONITORING WELL THAT WAS NEAR THE NW CORNER OF THE SITE.
↳ SURFACE WAS FILLED WITH NATIVE MATERIAL SOME OF THE CONCRETE FROM THE SURFACE COMPLETION

1300 SITE HAS BEEN RECENTLY GRADED AND SEEDED ON THE SE PORTION

SITE 16: ~~HEAT & POWER PLANT~~ PAINT & DOPE STORAGE CE 9/15



— — — APPROX SITE BOUNDARY
⊕ ABANDONED MONITORING WELL
DISTURBED GROUND / GRADED AREA

6 TAKEN AFTER PICTURE 11 AT NOC SITE (PG 51)

1301 MUCH OF THE WESTERN PORTION OF THE SITE IS BEING USED TO ACCESS SITE 28 OR AS AN EQUIPMENT STORAGE AREA - AN APPROX 3 YD PILE OF SOIL IS ON SITE

1302 GRADING OF THE SITE APPEARS TO PROMOTE POSITIVE DRAINAGE AND MITIGATE EROSION

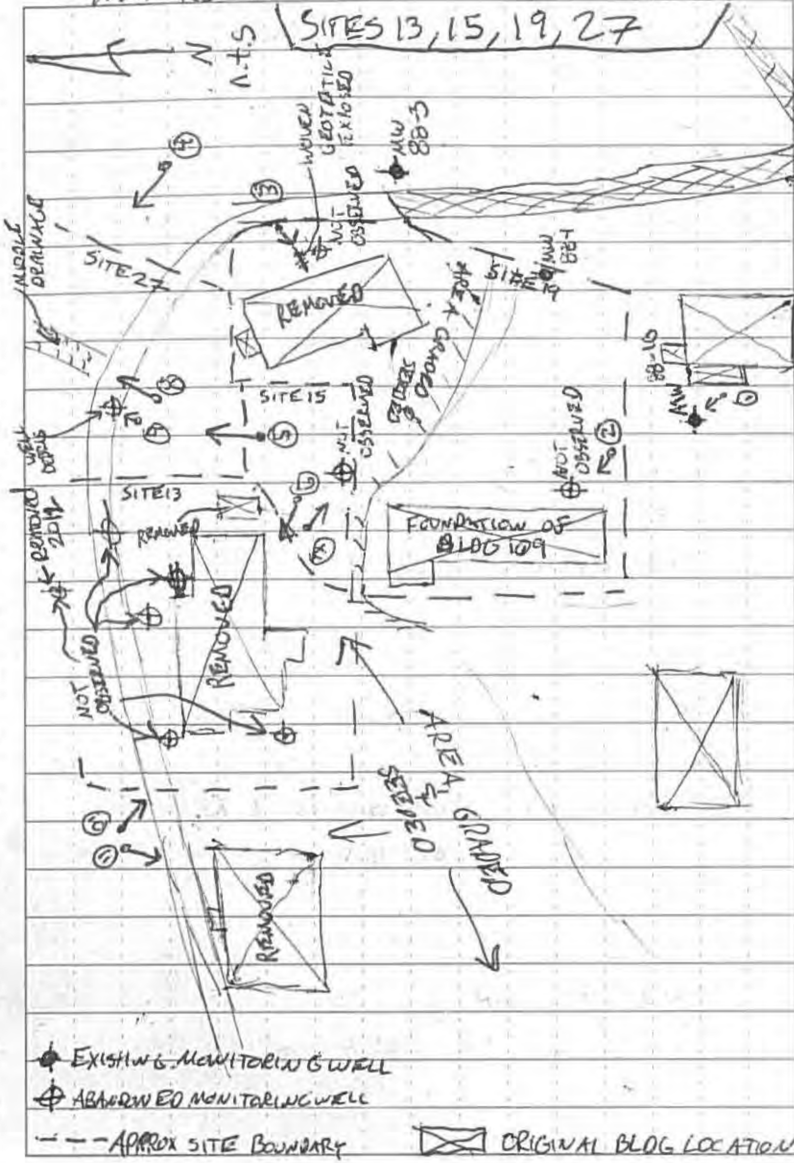
1307 LEFT SITE 16: PAINT & DOPE STORAGE

1313 ONSITE (13, 15, 19, 27) FOR SITE WALKS
↳ 5 YEAR REVIEW CHECKLIST ON SEPERATE FORMS

1325 MONITORING WELL "A" CP 9/15 MW88-10 → OK CONDITION NEEDS REPAIR
- WELL MONUMENT (FLUSH) CLOSES BUT NOT BOLTED
- WELL CASING IS OK AND FITTED WITH LOCKING CAP THAT IS NOT LOCKED

1332 MONITORING WELL MW 88-1 → POOR CONDITION
- WELL MONUMENT (FLUSH) DOES NOT CLOSE
- WELL CASING HAS FROST JACKED AND THE CAP IS NOT LOCKED

1335 MONITORING WELL MW88-3 → POOR CONDITION
- WELL MONUMENT (FLUSH) DOES NOT CLOSE
- WELL CASING HAS FROST JACKED AND THE CAP IS NOT LOCKED



1350 BUILDING AT SITE 13 HAS BEEN REMOVED
ALONG WITH THE FOUNDATION

1353 BUILDING & FOUNDATION ON THE NE PORTION OF
SITE 19 HAS BEEN REMOVED. THE FOUNDATION
FOR THE BUILDING ON THE SW PORTION OF
SITE 19 REMAINS.

1355 SITES 13, 15, & 27 HAVE BEEN RECENTLY
GRADED, AND SEEDED TO PROMOTE POSITIVE
DRAINAGE AND MITIGATE EROSION ALONG WITH
THE NORTHERN HALF OF SITE 19

1356. MONITORING WELLS IN THE CENTRAL PORTION
OF THE MAIN OPERATIONS COMPLEX (MOC) WERE
NOT OBSEVED
↳ LIKELY DECOMMISSIONED OR REMOVED
DURING EXCAVATION

1400 LEFT SITE
1415 BACK AT CAMP

1415 to 1800 5 YEAR REVIEW PAPERWORK and QC

End of Day

9/15/13

Personnel: C. FELL
J. ORCZEWSKA

Weather: Rain, 30-40°F
light wind

PPE: Mod. Level D

Objectives: - Prep site for Demobe
- QC paperwork
- Interview QAR for any remaining questions

CF 9/16/13
~~08~~ 0755: Bristol Tailgate

0800: Jacobs Tailgate

0830: Continue site paperwork and QC.

~~1300~~ CF 9/16/13

1030 - Prep gear for Demob

~~1415 - FLIGHT TO NOME~~ CF 9/16/13

1300 - INTERVIEW W/ J. CRANER (USACE)

↳ SITE 28 SEDIMENTATION POND(S)
- PLAN TO NOT CONSTRUCT AS SEDIMENT LOAD IN THE DRAINAGE IS LOW AND CONSTRUCTION WOULD LIKELY INCREASE RISK OF SPREADING CONTAMINATED SEDIMENT

↳ SITES W/ MNA REMEDIES
- PLAN TO REPAIR WELLS NEXT SEASON
- PLAN TO AUGMENT NETWORK TO PROVIDE SUFFICIENT MONITORING NEXT YEAR

1415 - DEMOBE TO NOME
2000 - DEMOBE TO ANC
2130 - END OF DAY

Christopher D. Fell 9/16/13

NE CAPE 5 YEAR REVIEW
USACE PHOTO LOG
* CONTINUED FROM PG 61 *

Date	Photo#	Dir.	Description
9/14/13	070	N/A	Site 29 Drum in Pond
	071	SE	Site 29 Sugi River
	072	NW	Site 29 Sugi River
	073	SW	Site 8 South overview
	074	NE	Site 8 North Overview
	075	W	Site 10 Debris
	076	N/A	Site 10 Monitoring well
	077	S	Site 10 Bristol Staging
	078	N	Site 10 Bristol Staging
	079	N/A	Site 10 Concrete Ring
	080	N/A	Site 10 drum lid
	081	N/A	Site 10 abandoned well
	082	NW	Site 11 overview
	083	SW	Site 11 overview
	084	N/A	Site 11 monitoring well
9/14/13	085	N	Site 11 seeding
9/15/13	086	N	Site 28 Sedim Pond
	087	W	Site 28 Water filters
	088	NW	Site 28 Sediment Tubes
	089	E	Site 28 Intermed Pond
	090	N	Site 28 Floculate add
	091	N	Site 28 Intermed Pond
9/15/13	092	NE	Site 28 overview.

NE CAPE 5 YEAR REVIEW
USACE PHOTO LOG

Date	Photo#	Dir	Description
9/15/13	093	SW	Site 28 Overview
	094	E	Site 28 Water Pump
	095	E	Site 28 Sediment Trap
	096	N	Site 28 Bristol Demob
	097	S	Site 28 Overview
	098	S	Site 28 Dredge
	099	E	Site 28 Drainage to Sugi
	100	E	Site 28 Wattles before Sugi
	101	W	Site 21 Road
	102	W	Site 21 Road
	103	SE	Site 21 Backfill
	104	E	Site 21 Backfill
	105	W	Site 21 Silt Fence
	106	S	Site 21 Seeding
	107	E	Site 21 Road
	108	N	Site 16 Overview S28 Access
	109	N/A	Site 16 Abandoned well
	110	E	Site 16 Overview
	111	S	Site 16 Overview
	112	N/A	Site 16 abandoned well
	113	N	Site 16 Abandoned well
	114	N	MOC Overview
9/15/13	115	N	MOC Overview

5 year Review
NE CAPE

USACE
PHOTO LOG

Date	Photo #	Dir.	Description
9/15/13	116	N	Site19 Monitoring well
	117	W	Site19 GeoTek
	118	W	MOC Overview
	119	~~W~~ N	Site15 ~~MOC~~ Overview
	120	N	Site13 overview
	121	SE	Site15 Overview
	122	N	Site27 drainage
	123	N	Site27 Well debris
	124	E	MOC Overview
9/15/13	125	S	MOC Overview

Scale: 1 square = PAGE 58

NE CAPE
5-YR REVIEW

USACE
PHOTO LOG

DATE	PHOTO #	DIRECTION FACING	DESCRIPTION
9/12/13	001	S	CALIBRATION YSI
9/12/13	002	S	SITE KMS SAMPLING
9/12/13	003	N	SITE OVERVIEW
9/12/13	004	N	7LF GW SAMPLING LOCATION
9/12/13	005	NE	9LF GW SAMPLING
9/12/13	006	n/a	9LF GW TURBIDITY
9/13/13	007	N	GW attempts 7LF
9/13	008	N	Site32 Road~~way~~ & depression 9/13/13
9/13	009	~~W~~ E 9/13	Site32 ~~lower tramway~~ Roadway
9/13	010	~~S~~ W 9/13	Site32 ~~Old foundation~~ upper tramway
9/13	011	~~W~~ S 1/13	Site32 ~~Debris~~ old foundation
9/13	012	W	Site32 Debris
9/13	013	N/A	Site32 Asphaltic debris
9/13	014	N	Site32 culvert
9/13	015	E	Site32 culvert
9/13	016	S	Site32 metal debris
9/13	017	W	Site31 Recent grading
9/13	018	N	Site31 Antenna foundation
9/13	019	W	Site31 Antenna foundation
9/13	020	E	Site31 Metal debris
9/13	021	N/A	Site31 Drain
9/13	022	N	Site31 Drainage
9/13/13	023	N	Site31 Depression

Scale: 1 square = PAGE 59 Rite in the Rain

NE CAPE
5-YR REVIEW

USACE
PHOTO LOG

DATE	PHOTO #	DIRECTION FACING	DESCRIPTION
9/13/13	024	N	Site31 Foundations N/E
	025	N	Site7 Debris
	026	N/A	Site7 MetalDebris
	027	N/A	Site7 Metal Debris
	028	N	Site7 Rusted Drums
	029	N	Site7 debris in Ponds
	030	W	Site7 Landfill cap
	031	N	Site7 Debris in Pond
	032	NW	Site7 Debris in Pond
	033	W	Site7 Debris in Pond
	034	E	Site7 landfill cap
	035	E	Site7 top of cap
	036	E	Site7 Armored Rock
	037	N/A	Site7 Debris
	038	S	Site7 Debris
	039	N/A	Site7 Abandoned well loc.
	040	S	Site7 Debris in Pond
	041	N/A	Site7 Possible Drum
	042	N/A	Site9 Abandoned well loc
	043	W	Site9 Diversion trench
	044	W	Site9 landfill cap
	045	E	Site9 Vegetation
9/13/13	046	N	Site9 Pond near cap

Scale: 1 square = ______

NE CAPE
5-YR REVIEW

USACE
PHOTO LOG

DATE	PHOTO #	DIRECTION FACING	DESCRIPTION
9/13/13	047	S	Site9 Culvert
9/14/13	048	S	Site1 Pond
	049	E	Site1 cracking on edge
	050	E	Site1 Loading equip
	051	NE	Site1 Runway
	052	NE	Site1 4-wheel trail off runway
	053	W	Site3 Overview
	054	SW	Site3 Pond onsite
	055	S	Site3 Pond onsite
	056	SE	Site3 Recent excavation
	057	N/A	Site3 Sheen in Pond
	058	N/A	Site6 Abandoned well
	059	N/A	Site6 Abandoned well
	060	E	Site6 Bristol Staging
	061	NW	Site6 Bristol Staging
	062	E	Site6 Nearby Pond
	063	E	Site29 Overview from off Road
	064	W	Site29 Overview from Road
	065	E	Site29 Sugi River
	066	SE	Site29 Bristol Water Intake
	067	E	Site29 Sugi River
	068	E	Site29 Culvert
9/14/13	069	W	Site29 Sugi River

CONTINUED ON PAGE 56

Scale: 1 square = ______

NE CAPE
5 YR REVIEW

USACE
WASTE TRACKING

CONTAINER ID	GEN DATE	CONTENTS	CONTAINER TYPE / DESCRIPTION
13NECAPE-B1	9/12/13	DECON/PURGE H_2O / CAL WASTE	5-gallon bucket NON-HAZ ↳ SHIPPED TO NOME 9/13/13
13NECAPE-B2	9/12/13	IDW/PPE WASTE	5-gallon bucket NON-HAZ ↳ ADDED TO BRISTOL'S

Scale: 1 square = ______ PAGE 62

Groundwater Sampling Data Sheet

JACOBS

Site Name	Event	Well ID	Project Number
9LF-WS-01	GRAB SAMPLING	n/a	05F15902
Weather Conditions	**PID Readings of Total VOCs (ppm)** N/A	**Date**	**Sampler Initials**
Overcast, Slight Breeze	Ambient n/a Breathing Zone n/a In Well	9/12/13	KM/JO/CF

Well Information

Well Integrity n/a	TOC Stickup (ft ags)	Well Casing Material	Casing Diameter(in) / Gallons per linear foot(gal/ft)
Good Fair Poor	n/a	PVC SS n/a	n/a 1 / 0.041 2 / 0.163 4 / 0.653 6 / 1.469
Depth to Product (ft)	**Depth to ~~GW~~ (ft btoc)**	**Total Depth of Casing (ft btoc)**	**Product Thickness (ft) and Volume Recovered (mL)**
n/a	APPROX: n/a	n/a (final)	n/a

Max purge volume (3 well casing volumes) = [previous† total depth of casing (ft) – depth to water (ft)] * gallons per linear foot of casing * 3

N/A SURFACE WATER

SHOW WORK Max Purge Volume = (________† ft – ________ ft) • ________ gal/ft • 3 = ________ gal • 3.785 L/gal = ________ L

Well Purging Information

Start Time	Finish Time	Depth of Tubing (ft btoc)		Equipment Used for Purging
1000	1135			DIPPER Bailer Peristaltic Pump Submersible Pump
Color	**Odor**	**Sheen**	**Purged Dry**	**Meter Used During Purging**
Clear Cloudy Brown Other:	None Moderate Faint Strong	Yes No	Yes No	YSI Multi Meter Hach Turbidimeter

Purging reached: ~~Stability Max Vol.~~ | ~~Purge-water was: Treated~~ Stored Other Note: DECON H_2O FOR OFFSITE DISPOSAL

Time (HH:mm)	Volume (Gallons or Liters)		Acceptable Range to Demonstrate Stability						
			± 0.2 °C	± 3%	± 10% or 0.2 mg/L (whichever is greater)	± 0.1	± 10 mV	<10 NTU and ±1 NTU	Drawdown < 0.3 ft
	Change	Total	Temperature (°C)	Conductivity (µS/cm)	DO ~~(mg/L)~~ %	pH (std units)	ORP (mV)	Turbidity (NTU)	Water Level (feet btoc)
10:00	N/A	N/A	6.09	36	90.1	5.4	203.8	19.27	0.0

Christopher D. Fell 9/12/13

Sample Collection Information

Start Time	Finish Time / Date	Depth of Tubing (ft btoc)	Equipment Used for Sampling
1000	1135 / 9/12/13	0.2 N/A	DIPPER Peristaltic Pump Submersible Pump
SAMPLE ID: 13-9LF-WS01-0		QC: Dup MS/MSD	Ferrous Iron (Fe^{2+}) (mg/L) = N/A per work plan
Container/Preservative	**Analysis Requested**		**Notes**
See logbook pg. 6			

"——" = not measured "✓" = stable "+" = rising "-" = falling "*" = all parameters stable ____ Additional observations on back

N/A = Not Applicable

Groundwater Sampling Data Sheet

JACOBS

Site Name	Event	Well ID	Project Number
9LF-WS-Ø3	GRAB SAMPLING	—	05F45902
Weather Conditions	**PID Readings of Total VOCs (ppm)**	**Date**	**Sampler Initials**
Sunny, slight breeze	Ambient — Breathing Zone — In Well —	9/12/13	KM/JO/CF

Well Information

Well Integrity	TOC Stickup (ft ags)	Well Casing Material	Casing Diameter(in) / Gallons per linear foot(gal/ft)
Good Fair Poor	NA	PVC SS	1 / 0.041 2 / 0.163 4 / 0.653 6 / 1.469
Depth to Product (ft)	**Depth to GW (ft btoc)**	**Total Depth of Casing (ft btoc)**	**Product Thickness (ft) and Volume Recovered (mL)**
NA		NA (final)	NA

Max purge volume (3 well casing volumes) = [previous† total depth of casing (ft) – depth to water (ft)] * gallons per linear foot of casing * 3

SHOW WORK Max Purge Volume = (— † ft – — ft) * — gal/ft * 3 = — gal * 3.785 L/gal = — L

Well Purging Information

Start Time	Finish Time	Depth of Tubing (ft btoc)		Equipment Used for Purging
~~###~~ 1149	~~1124~~ 1153	NA		Bailer Peristaltic Pump Submersible Pump
Color	**Odor**	**Sheen**	**Purged Dry**	**Meter Used During Purging**
Clear Cloudy Brown Other:	None Moderate Faint Strong	Yes No	Yes No NA	YSI Multi Meter Hach Turbidimeter

Purging reached: Stability / Max Vol. NA | Purge water was: Treated Stored Other | Note:

Time (HH:mm)	Volume (Gallons or Liters) Change	Total	Temperature (°C) ± 0.2 °C	Conductivity (µS/cm) ± 3%	DO (mg/L) % ± 10% or 0.2 mg/L (whichever is greater)	pH (std units) ± 0.1	ORP (mV) ± 10 mV	Turbidity (NTU) <10 NTU and ±1 NTU	Water Level (feet btoc) Drawdown < 0.3 ft
1149			6.07	38	96.8	6.02	172.2	0.54	0

9/12/13

Sample Collection Information

Start Time	Finish Time / Date	Depth of Tubing (ft btoc)	Equipment Used for Sampling
1155	1211	—	DIPPER Peristaltic Pump Submersible Pump
SAMPLE ID: 13-9LF-WSØ3-Ø		QC: Dup MS/MSD	Ferrous Iron (Fe^{2+}) (mg/L) = ~~N/A per~~ work plan

Container/Preservative	Analysis Requested	Notes
see logbook		

"—" = not measured "✓"= stable "+" = rising "-" = falling "*" = all parameters stable

___ Additional observations on back

Groundwater Sampling Data Sheet

JACOBS

Site Name	Event	Well ID	Project Number
9LF-WS04	GRAB SAMPLING	N/A	05F45902
Weather Conditions	**PID Readings of Total VOCs (ppm)**	**Date**	**Sampler Initials**
Sunny, slight breeze	Ambient — Breathing Zone — In Well —	9/12/13	KM/JD/CF

Well Information

Well Integrity	TOC Stickup (ft ags)	Well Casing Material	Casing Diameter(in) / Gallons per linear foot(gal/ft)
Good Fair Poor	n/a	~~PVC SS~~	~~1 / 0.041 2 / 0.163 4 / 0.653 6 / 1.469~~
Depth to Product (ft)	**Depth to GW (ft btoc)**	**Total Depth of Casing (ft btoc)**	**Product Thickness (ft) and Volume Recovered (mL)**
n/a	n/a	n/a (final)	—

Max purge volume (3 well casing volumes) = [previous† total depth of casing (ft) – depth to water (ft)] * gallons per linear foot of casing * 3

SHOW WORK Max Purge Volume = (NA † ft – ____ ft) * ____ gal/ft * 3 = ____ gal * 3.785 L/gal = ____ L

Well Purging Information

Start Time	Finish Time	Depth of Tubing (ft btoc)		Equipment Used for Purging
1345	1350	—		Bailer Peristaltic Pump ~~Submersible Pump~~
Color	**Odor**	**Sheen**	**Purged Dry**	**Meter Used During Purging**
Clear Cloudy Brown Other:	None Moderate Faint Strong	Yes No	Yes No NA	YSI Multi Meter MICRO ~~Hach~~ Turbidimeter
Purging reached: Stability Max Vol.	Purge water was: Treated Stored Other Note:			

Time (HH:mm)	Volume (Gallons or Liters) Change	Total	Temperature (°C)	Conductivity (µS/cm)	DO ~~(mg/L)~~ %	pH (std units)	ORP (mV)	Turbidity (NTU)	Water Level (feet btoc)
Acceptable Range to Demonstrate Stability			± 0.2 °C	± 3%	± 10% or 0.2 mg/L (whichever is greater)	± 0.1	± 10 mV	<10 NTU and ±1 NTU	Drawdown < 0.3 ft
1345	—		7.96	166	86.8	6.34	150.9	210.2	—

Christopher D Sell 9/12/13

Sample Collection Information

Start Time	Finish Time / Date	Depth of Tubing (ft btoc)	Equipment Used for Sampling
1350	1450	n/a —	DIPPER Peristaltic Pump Submersible Pump
SAMPLE ID: 13-9LF-WS04-0		QC: Dup MS/MSD	Ferrous Iron (Fe^{2+}) (mg/L) = N/A per work plan

Container/Preservative	Analysis Requested	Notes
see logbook		

"—" = not measured "✓" = stable "+" = rising "-" = falling "*" = all parameters stable

____ Additional observations on back

Groundwater Sampling Data Sheet

JACOBS

Site Name	Event	Well ID	Project Number
SITE 9 LANDFILL	GW GRAB SAMPLE	9LF-WG01	05F45902
Weather Conditions	**PID Readings of Total VOCs (ppm)**	**Date**	**Sampler Initials**
P. CLOUDY	Ambient n/a Breathing Zone n/a In Well n/a	9/12/13	KH/CF/JO

Well Information

Well Integrity	TOC Stickup (ft ags)	Well Casing Material	Casing Diameter(in) / Gallons per linear foot(gal/ft)
Good Fair Poor	1.5	~~PVC~~ SS	1 / 0.041 ~~2 / 0.163~~ ~~4 / 0.653~~ ~~6 / 1.469~~
Depth to Product (ft)	**Depth to GW (ft ~~btoc~~ bgs)**	**Total Depth of Casing (ft btoc)**	**Product Thickness (ft) and Volume Recovered (mL)**
n/a	2.8	4' (final) 9/12/13	n/a

Max purge volume (3 well casing volumes) = [previous† total depth of casing (ft) – depth to water (ft)] * gallons per linear foot of casing * 3

SHOW WORK Max Purge Volume = (n/a † ft – n/a ft) • n/a gal/ft • 3 = n/a gal • 3.785 L/gal = n/a L

Well Purging Information

Start Time	Finish Time	Depth of Tubing (ft ~~btoc~~ bgs)		Equipment Used for Purging
1351		3.3 FT		~~Bailer~~ Peristaltic Pump ~~Submersible Pump~~
Color	**Odor**	**Sheen**	**Purged Dry**	**Meter Used During Purging**
Clear Cloudy Brown Other:	None Moderate Faint Strong	Yes No	Yes No	YSI Multi Meter MICRO TPW ~~Hach~~ Turbidimeter

Purging reached: Stability Max Vol. | Purge water was: Treated Stored Other Note:

Time (HH:mm)	Volume (Gallons or Liters) Change	Total	Temperature (°C) ± 0.2 °C	Conductivity (µS/cm) ± 3%	DO (mg/L) ± 10% or 0.2 mg/L (whichever is greater)	pH (std units) ± 0.1	ORP (mV) ± 10 mV	Turbidity (NTU) <10 NTU and ±1 NTU	Water Level (feet btoc) Drawdown < 0.3 ft
1351	N/A	N/A	6.22	132	5.90	5.44	177	overrange	dry

9/12/13 JW

Sample Collection Information

Start Time	Finish Time / Date	Depth of Tubing (ft ~~btoc~~ bgs)	Equipment Used for Sampling
1351	15:50	2.8	DIPPER Peristaltic Pump ~~Submersible Pump~~
SAMPLE ID: 13-9LF-WG01-2		QC: Dup MS/MSD	Ferrous Iron (Fe^{2+}) (mg/L) = N/A per work plan

Container/Preservative	Analysis Requested	Notes
See logbook page for Notes regarding poor water production for temp wellpoint		

"——" = not measured "✓" = stable "+" = rising "-" = falling "*" = all parameters stable ____ Additional observations on back

Groundwater Sampling Data Sheet

JACOBS

Site Name	Event	Well ID	Project Number
KMS ~~KMS~~-WS01-0	GRAB SAMPLING	—	05F45902
Weather Conditions	**PID Readings of Total VOCs (ppm)**	**Date**	**Sampler Initials**
Sunny Slight Breeze	Ambient n/a Breathing Zone n/a In Well n/a	9/12/13	CF/JOF

CF 9/12

Well Information

Well Integrity	TOC Stickup (ft ags)	Well Casing Material	Casing Diameter(in) / Gallons per linear foot(gal/ft)
~~Good Fair Poor~~ n/a	— n/a	~~PVC SS~~	n/a ~~1 / 0.041 2 / 0.163~~ 4 / 0.653 6 / 1.469
Depth to Product (ft)	**Depth to GW (ft btoc)**	**Total Depth of Casing (ft btoc)**	**Product Thickness (ft) and Volume Recovered (mL)**
— n/a	— n/a	— n/a (final)	n/a —

Max purge volume (3 well casing volumes) = [previous† total depth of casing (ft) – depth to water (ft)] * gallons per linear foot of casing * 3

SHOW WORK Max Purge Volume = (n/a † ft – n/a ft) * n/a gal/ft * 3 = n/a gal * 3.785 L/gal = n/a L

Well Purging Information

Start Time	Finish Time	Depth of Tubing (ft btoc)		Equipment Used for Purging
1505	1516	—		~~Bailer~~ Peristaltic Pump ~~Submersible Pump~~
Color	**Odor**	**Sheen**	**Purged Dry**	**Meter Used During Purging**
Clear ~~Cloudy Brown~~ ~~Other:~~	None ~~Moderate~~ ~~Faint Strong~~	Yes No	~~Yes~~ ~~No~~	YSI Multi Meter ~~Hach~~ MICRO Turbidimeter

Purging reached: Stability Max Vol. | Purge water was: Treated Stored Other Note: FOR OFFSITE DISPOSAL

Time (HH:mm)	Volume (Gallons or Liters) Change	Total	Temperature (°C) ± 0.2 °C	Conductivity (µS/cm) ± 3%	DO ~~(mg/L)~~ % ± 10% or 0.2 mg/L (whichever is greater)	pH (std units) ± 0.1	ORP (mV) ± 10 mV	Turbidity (NTU) <10 NTU and ±1 NTU	Water Level (feet btoc) Drawdown < 0.3 ft
1516	n/a	n/a	4.26	32	~~#4~~ 113.0	6.31	186.2	0.56	n/a

Christopher O'Dell 9/12/13

Sample Collection Information

Start Time	Finish Time / Date	Depth of Tubing (ft btoc)	Equipment Used for Sampling
1521	1539	n/a	DIPPER Peristaltic Pump ~~Submersible Pump~~
SAMPLE ID: 13-KMS-WS01-0		QC: ~~Dup MS/MSD~~	Ferrous Iron (Fe^{2+}) (mg/L) = N/A per work plan

Container/Preservative	Analysis Requested	Notes
SEE LOG BOOK		

"——" = not measured "✓"= stable "+" = rising "-" = falling "*" = all parameters stable ____ Additional observations on back

Groundwater Sampling Data Sheet

JACOBS

Site Name	Event	Well ID	Project Number
7LF-WS01	GRAB SAMPLING	n/a	05F45902
Weather Conditions	**PID Readings of Total VOCs (ppm)**	**Date**	**Sampler Initials**
sunny, slight breeze	Ambient n/a Breathing Zone n/a In Well n/a	9/12/13	CF/KM/JO

Well Information

Well Integrity	TOC Stickup (ft ags)	Well Casing Material	Casing Diameter(in) / Gallons per linear foot(gal/ft)
~~Good~~ ~~Fair~~ n/a Poor	n/a	~~PVC~~ ~~SS~~ n/a	1 / 0.041 ~~2 / 0.163~~ 4 / 0.653 6 / 1.469
Depth to Product (ft)	**Depth to GW (ft btoc)**	**Total Depth of Casing (ft btoc)**	**Product Thickness (ft) and Volume Recovered (mL)**
n/a	n/a	n/a (final)	n/a

Max purge volume (3 well casing volumes) = [previous† total depth of casing (ft) – depth to water (ft)] * gallons per linear foot of casing * 3

SHOW WORK Max Purge Volume = (n/a †ft – n/a ft) • n/a gal/ft • 3 = n/a gal • 3.785 L/gal = n/a L

Well Purging Information

Start Time	Finish Time	Depth of Tubing (ft btoc)		Equipment Used for Purging
1625	1626	—		~~Bailer~~ Peristaltic Pump ~~Submersible Pump~~
Color	**Odor**	**Sheen**	**Purged Dry**	**Meter Used During Purging**
~~Clear~~ Cloudy Brown ~~Other:~~	None ~~Moderate~~ ~~Faint~~ ~~Strong~~	Yes No	N/A Yes No	YSI Multi Meter Hach Turbidimeter

Purging reached: Stability Max Vol. | Purge water was: Treated Stored Other Note:

Time (HH:mm)	Volume (Gallons or Liters)		Acceptable Range to Demonstrate Stability						
			± 0.2 °C	± 3%	± 10% or 0.2 mg/L (whichever is greater)	± 0.1	± 10 mV	<10 NTU and ±1 NTU	Drawdown < 0.3 ft
	Change	Total	Temperature (°C)	Conductivity (µS/cm)	DO ~~(mg/L)~~ %	pH (std units)	ORP (mV)	Turbidity (NTU)	Water Level (feet btoc)
1625	—		11.42	42	98.6	6.06	179.9	1166.2	—

JO 9/12/13

Sample Collection Information

Start Time	Finish Time / Date	Depth of Tubing (ft btoc)	Equipment Used for Sampling
1630	1650	n/a	DIPPER Peristaltic Pump Submersible Pump
SAMPLE ID: 13-7LF-WS01-01		QC: ~~Dup~~ ~~MS/MSD~~	Ferrous Iron (Fe^{2+}) (mg/L) = ~~N/A per work plan~~

Container/Preservative	Analysis Requested	Notes
SEE LOG BOOK		

"—" = not measured "✓" = stable "+" = rising "-" = falling "*" = all parameters stable

____ Additional observations on back

Groundwater Sampling Data Sheet

JACOBS

Site Name	Event	Well ID	Project Number
7LF-WS02	GRAB SAMPLING	n/a	35F45902
Weather Conditions 40sF	**PID Readings of Total VOCs (ppm)**	**Date**	**Sampler Initials**
SUNNY/SLIGHT BREEZE	Ambient n/a Breathing Zone n/a In Well n/a	9/12/13	CF/KA/JO

Well Information

Well Integrity	TOC Stickup (ft ags)	Well Casing Material	Casing Diameter(in) / Gallons per linear foot(gal/ft)
~~Good Fair Poor~~ n/a	n/a	n/a ~~PVC SS~~	~~1 / 0.041 2 / 0.163 4 / 0.653 6 / 1.469~~
Depth to Product (ft)	**Depth to GW (ft btoc)**	**Total Depth of Casing (ft btoc)**	**Product Thickness (ft) and Volume Recovered (mL)**
n/a	n/a	n/a (final)	n/a

Max purge volume (3 well casing volumes) = [previous† total depth of casing (ft) – depth to water (ft)] * gallons per linear foot of casing * 3

SHOW WORK Max Purge Volume = (n/a † ft – n/a ft) • n/a gal/ft • 3 = n/a gal • 3.785 L/gal = n/a L

Well Purging Information

Start Time	Finish Time	Depth of Tubing (ft btoc)		Equipment Used for Purging
1710	1712	n/a		Bailer Peristaltic Pump Submersible Pump
Color	**Odor**	**Sheen**	**Purged Dry**	**Meter Used During Purging**
Clear Cloudy Brown Other:	None Moderate Faint Strong	~~Yes~~ No	~~Yes~~ ~~No~~	YSI Multi Meter ~~Hach~~ Turbidimeter

Purging reached: ~~Stability Max Vol.~~ Purge water was: Treated Stored Other Note: FOR OFFSITE DISPOSAL

Time (HH:mm)	Volume (Gallons or Liters)		Acceptable Range to Demonstrate Stability						
			± 0.2 °C	± 3%	± 10% or 0.2 mg/L (whichever is greater)	± 0.1	± 10 mV	<10 NTU and ±1 NTU	Drawdown < 0.3 ft
	Change	Total	Temperature (°C)	Conductivity (µS/cm)	DO ~~(mg/L)~~ %	pH (std units)	ORP (mV)	Turbidity (NTU)	Water Level (feet btoc)
1710	n/a	n/a	12.77	45	96.8	6.10	160.0	33.44	n/a

CF 9/12/13

Sample Collection Information

Start Time	Finish Time / Date	Depth of Tubing (ft btoc)	Equipment Used for Sampling
1644	1720	n/a	DIPPER Peristaltic Pump ~~Submersible Pump~~
SAMPLE ID: 13-7LF-WS02-0		~~QC: Dup MS/MSD~~	Ferrous Iron (Fe^{2+}) (mg/L) = N/A per work plan

Container/Preservative	Analysis Requested	Notes
SEE LOG BOOK		

"—" = not measured "✓" = stable "+" = rising "-" = falling "*" = all parameters stable

____ Additional observations on back

Groundwater Sampling Data Sheet

JACOBS

Site Name	Event	Well ID	Project Number
7LF-WS03	GRAB SAMPLING	n/a	05F45902
Weather Conditions 40 F	**PID Readings of Total VOCs (ppm)**	**Date**	**Sampler Initials**
SUNNY SLIGHT BREEZE	Ambient n/a Breathing Zone n/a In Well n/a	9/12/13	CP WO/KG

Well Information

Well Integrity	TOC Stickup (ft ags)	Well Casing Material	Casing Diameter(in) / Gallons per linear foot(gal/ft)
n/a ~~Good Fair Poor~~	n/a	n/a ~~PVC SS~~	~~1 / 0.041 2 / 0.163 4 / 0.653 6 / 1.469~~
Depth to Product (ft)	**Depth to GW (ft btoc)**	**Total Depth of Casing (ft btoc)**	**Product Thickness (ft) and Volume Recovered (mL)**
n/a	n/a	n/a (final)	n/a

Max purge volume (3 well casing volumes) = [previous† total depth of casing (ft) – depth to water (ft)] * gallons per linear foot of casing * 3

SHOW WORK Max Purge Volume = (n/a † ft – n/a ft) • n/a gal/ft • 3 = n/a gal • 3.785 L/gal = n/a L

Well Purging Information

Start Time	Finish Time	Depth of Tubing (ft btoc)		Equipment Used for Purging
1654	1654	n/a		~~Bailer~~ Peristaltic Pump ~~Submersible Pump~~
Color	**Odor**	**Sheen**	**Purged Dry**	**Meter Used During Purging**
Clear Cloudy Brown Other:	None Moderate Faint Strong	Yes No	~~Yes No~~	YSI Multi Meter ~~Hach~~ Turbidimeter

Purging reached: Stability Max Vol.	Purge water was: Treated Stored Other Note:

Time (HH:mm)	Volume (Gallons or Liters) Change	Volume Total	Temperature (°C) ± 0.2 °C	Conductivity (µS/cm) ± 3%	DO ~~(mg/L)~~ % ± 10% or 0.2 mg/L (whichever is greater)	pH (std units) ± 0.1	ORP (mV) ± 10 mV	Turbidity (NTU) <10 NTU and ±1 NTU	Water Level (feet btoc) Drawdown < 0.3 ft
1654			11.59	35	110.2	6.64	127.3	2.07	—

JIO 9/12/13

Sample Collection Information

Start Time	Finish Time / Date	Depth of Tubing (ft btoc)	Equipment Used for Sampling
1654	1738	n/a	DIPPER Peristaltic Pump ~~Submersible Pump~~
SAMPLE ID: 13-7LF-WS03-0		~~QC: Dup MS/MSD~~	Ferrous Iron (Fe^{2+}) (mg/L) = N/A per work plan

Container/Preservative	Analysis Requested	Notes
SEE LOG BOOK		

"——" = not measured "✓"= stable "+" = rising "-" = falling "*" = all parameters stable ____ Additional observations on back

APPENDIX D

Photograph Log

PHOTOGRAPH LOG
TABLE OF CONTENTS

Photo Number **Page**

(intentionally blank)

Northeast Cape Sampling – St. Lawrence Island, Alaska

Photo No. 1 – 12 September 2013
Calibrating the YSI water quality meter. Facing south.

Photo No. 2 – 12 September 2013
Sampling at Kangukhsam Mountain Spring. Facing south.

Photo No. 3 – 12 September 2013
Overview of Northeast Cape. Photograph taken facing north.

Photo No. 4 – 12 September 2013
Attempted groundwater grab sampling locations at Site 7. Facing north.

Photo No. 5 – 12 September 2013
Measuring surface water quality parameters prior to sampling at Site 9. Facing northeast.

Photo No. 6 – 21 September 2013
Sampling surface water at Site 9. Facing northeast

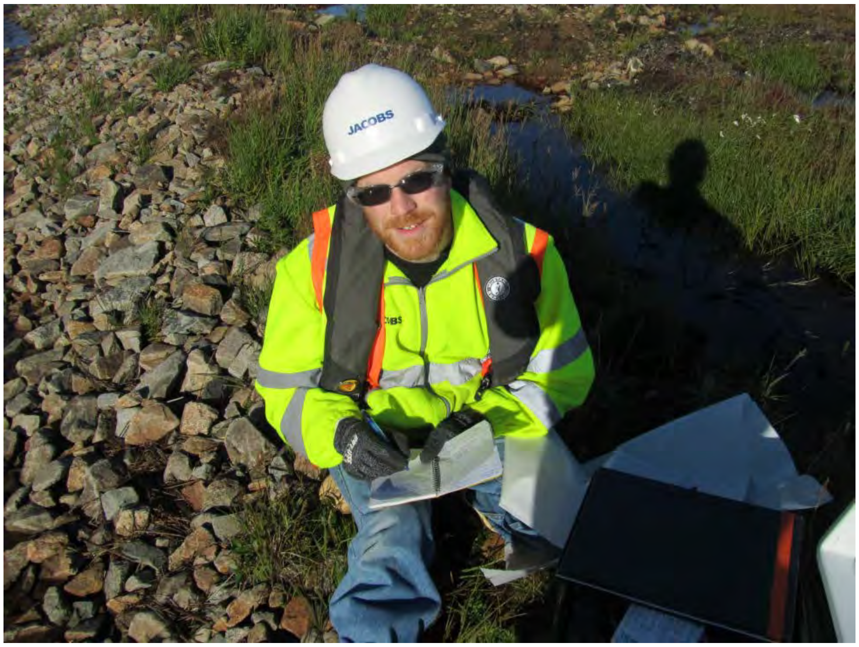


Photo No. 7 – 12 September 2013
Recording sampling efforts in the field logbook. Facing south.

APPENDIX E

Waste Tracking

CERTIFICATE OF DISPOSAL/RECYCLE

GENERATOR: USACE
NE CAPE - ST LAWRENCE ISLAND
SAVOONGA AK 99769

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

EPA ID NUMBER: AKO000228395
MANIFEST/DOCUMENT #: NEC-1
DATE OF DISPOSAL/RECYCLE: 09/27/2013

LINE	WASTE DESCRIPTION	CONTAINERS	TYPE	QUANTITY	UOM
1	DECON WATER	1	DF05	5	P

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

PREPARED BY: JOHN PEREZ

SIGNATURE: ______________________ **DATE:** 9/27/2013

NON-HAZARDOUS WASTE MANIFEST

Ak 20514 (RP)

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

NON-HAZARDOUS WASTE WASTE MANIFEST

1. Generator's US EPA ID No: AK8000228395

Manifest Document No: NEC-1

2. Page 1 of 1

3. Generator's Name and Mailing Address: USACE, Po Box 6898, JBER, AK, 99506 CEPOA-EN-EE

4. Generator's Phone (907) 753-2628

5. Transporter 1 Company Name: Alaska Airlines

6. US EPA ID Number: Exempt

A. State Transporter's ID

B. Transporter 1 Phone (907)-243-3372

7. Transporter 2 Company Name: Jacobs Engineering Group

8. US EPA ID Number: Exempt

C. State Transporter's ID

D. Transporter 2 Phone (907)-563-3322

9. Designated Facility Name and Site Address: Emerald ~~Alaska Services~~ Alaska, 2020 ~~Ship Creek Avenue~~ Viking Drive, ANCH, AK, 99501

10. US EPA ID Number: AKR000004184

E. State Facility's ID

F. Facility's Phone

11. WASTE DESCRIPTION	12. Containers No.	Type	13. Total Quantity	14. Unit Wt./Vol.
a. Material not Regulated By Dot	1	DF	5	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above

Rinse water From equipment Decontamination

AK02908

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

NONE

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
Jeremy Craner	[signature] on behalf DoD	09	13	13

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month	Day	Year
Transporter Refused to sign. JP.				

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date Month	Day	Year
x Kevin Maher Agent For Jacobs	x [signature]	9	29	13

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

GENERATOR / TRANSPORTER / FACILITY

NON-HAZARDOUS WASTE

APPENDIX F

Survey Data

ECO-LAND, LLC
Surveying & Mapping
P.O. Box 1444 Nome, Alaska 99876
(907) 443-6068
www.eco-land-llc.com

Northeast Cape Project 2013
September 17, 2013

Jacob's Engineering
Water Sample Locations
Alaska State Plane Zone 9

Point Number,Northing,Easting,Elevation,Sample ID

39391,3406023.04,1814169.89,51.9,7LFWS03
39392,3406532.21,1813851.12,53.1,7LFWG01-1
39393,3406532.88,1813851.41,52.9,7LFWG01-2
39394,3406557.94,1813820.25,51.9,7LFWG01-3
39395,3406576.07,1813802.30,51.4,7LFWG01-4
39396,3406398.38,1813380.95,48.2,7LFWS01
39397,3406135.59,1813156.81,50.8,7LFWS02
39399,3404131.67,1812013.37,62.6,9LFWS04
39400,3404076.75,1812169.64,66.7,9LFWG01
39401,3403970.29,1812209.87,68.1,9LFWS03
39402,3403934.10,1812058.57,71.9,9LFWS01/WS02
39403,3399356.33,1812480.49,385.6,KMSWS01

ECO-Land, LLC

Jamison L. Allan,
Senior Field Party Chief

Table F-1
Sampling Points

Point number	Northing	Easting	Elevation	Sample ID
39392	3406532.21	1813851.12	53.1	7LFWG01-1
39393	3406532.88	1813851.41	52.9	7LFWG01-2
39394	3406557.94	1813820.25	51.9	7LFWG01-3
39395	3406576.07	1813802.3	51.4	7LFWG01-4
39396	3406398.38	1813380.95	48.2	7LFWS01
39397	3406135.59	1813156.81	50.8	7LFWS02
39391	3406023.04	1814169.89	51.9	7LFWS03
39400	3404076.75	1812169.64	66.7	9LFWG01
39402	3403934.1	1812058.57	71.9	9LFWS01/WS02
39401	3403970.29	1812209.87	68.1	9LFWS03
39399	3404131.67	1812013.37	62.6	9LFWS04
39403	3399356.33	1812480.49	385.6	KMSWS01

APPENDIX G

Response to comments

Alaska Department of Environmental Conservation (ADEC)
Contaminated Sites Program

Document Reviewed: Draft November 2013 Northeast Cape Five-year Review Supplemental Site Investigation Report
Commenter: Curtis Dunkin-ADEC **Date Submitted:** December 18, 2013

#	Page #	Section	ADEC Comment	Response
1.		Document Title	The title of the document should be revised to clarify that this field effort was specifically associated with the first Five-year Review of sites 7 and 9. Note the work plan was titled 'Supplement to the NEC HTRW Remedial Actions Work Plan'.	Accepted The report title will be changed to the following: "2013 SAMPLING CONDUCTED IN CONJUNCTION WITH THE 2013 FIVE YEAR REVIEW AT NORTHEAST CAPE"
2.	ES-1	Executive Summary	Revise the second sentence by omitting the latter half beginning with 'associated' as this part of the sentence doesn't make sense (it is assumed that samples were collected 'where sampling occurred'). Also state here that only one of 5 attempts to collect groundwater samples was successful at sites 7 and 9 due to refusal. Also state wherever applicable throughout the document what the cause of refusal was (i.e. rock, bedrock, permafrost, etc.). Note that the work plan stated that refusal due to permafrost was expected at two feet bgs. Please briefly state in the executive summary and elsewhere in the document where applicable (objectives, etc.) that the field team also conducted site inspections of all sites being evaluated as part of the first Five-year Review. ADEC realizes that the results and observations of these inspections will be provided in the draft Five-year review report and that the subject report is intended to detail the sampling efforts and results. However all efforts conducted as a part of the mobilization associated with this sampling event and/or the Five-year review should be stated in this report.	Accepted The text of the Executive Summary was updated for clarity.

3.	1-2	1.2	Second paragraph of this section (and elsewhere throughout the document) please replace 'Record of Decision' with 'Decision Document'. Revise the third sentence of the second paragraph of this section to clarify that the site-specific sampling conducted at sites 7 and 9 in 2013 was not part of the DD, rather determined in 2013 to be necessary to facilitate the 5-year Review Report.	Accepted All references to "Record of Decision" will be updated to "Decision Document." Noted. The text of the second paragraph of Section 1.0 has been updated as follows: "Site-specific sampling was requested by community members at the two landfill sites and the seasonal drinking water source Kangukhsam Mountain Spring (Figure A-3). Sampling activities coincided with five-year review site inspections."
4.	1-2	1.3	Add a sentence in the beginning of this section to clarify that in respect to groundwater, one of the objectives was to determine if groundwater was present within the targeted sampling zone at the time of the investigation.	The QAPP supplement used to complete the fieldwork does not define establishing the presence or absence of groundwater in the targeted sampling zone an objective.
5.	3-4	3.2	Site 9: Please explain how it was determined as stated in the second sentence of the first paragraph that 'groundwater was encountered at 2.8 feet bgs' when this well only produced 2.5 mL/min. The second paragraph should be revised and should further explain the issue why the analyses were not conducted due to the stated low groundwater production rate. Did this well point experience refusal at 2.8 feet bgs? Please revise the last sentence of this subsection to clarify that only the analytes which were analyzed did not exceed cleanup levels.	The text of section 2.3 will be updated to provide additional details regarding Cargo Beach Road Landfill (Site 7) Text regarding Cargo Beach Road Landfill (Site 7) will be deleted from the results Section 3.2
6.	4-1	4.0	Per the comments in # 5 above, the conclusions section should briefly elaborate on the potential data gaps which potentially exist as a result of 1) all well points except for one hitting refusal given that groundwater was encountered within the targeted sampling depth for the one well; and	Noted. The Five Year Review report will elaborate on any potential data gaps identified from the comprehensive review of site information. The Sampling Data Report only represents a single event and as

			2) the hydrogeological dynamic associated with and specific to each of the site 7 and 9 landfills not being well characterized/understood.	such those conclusions are not appropriate for this report.
7.		Figure A-2	The site location of NEC is incorrectly depicted (too far east/northeast).	Accepted. Figure A-2 has been updated.
8.		Figure A-3	Please state Site 7 and 9 within the respective call out box for each site. Please add 'boundary' to the reference of landfill in the legend.	Accepted. Figure A-3 has been updated.
9.		Figures A-3 and A-4	The previous surface and groundwater sampling locations which have been discussed in both this report and its associated ADEC-approved final work plan should be depicted in these figures. Please apply revision requests stated in comment # 8 above to these figures.	Accepted. Historical sampling locations referenced in this report have been added to the appropriate figures.
10.	B1	1.0	Please explain why the field team didn't or couldn't collect enough sample volume to run all of the planned analysis of analytes.	Accepted. The narrative regarding limited groundwater and why planned samples were not collected is now present in Sections 2.3.
11.	1-6	Analytical Data Table	Surface Water: The narrative of the data quality assessment should explain why so many of the analytes in many of the samples are depicted as 'no criteria/not analyzed'.	Noted. The surface water samples with analytes depicted as 'no criteria/not analyzed' correlate with the column adjacent. The samples were analyzed for dissolved metals and total metals; in order to distinguish between the two an "F" was added to the lab sample ID for dissolved metals analysis. The USACE MED requires lab sample ID to be present in the header information; therefore, the analysis for the sample was split in two columns.
12.	1	Analytical Data Table	Groundwater: Why are man of analytes/COCs not listed in this table?	Noted. See response to comment 11 as it also applies to groundwater.
13.			**End of ADEC Comments**	

Visual Inspection Checklist (Post-Closure)
Site 9 Landfill

This form is to be filled out annually for 5 years after landfill closure.

Name of Inspector: Jeremy Craner   Date: 3 AUG 2014

Weather conditions: Sunny w/ few clouds   Precipitation ☐ Yes ☒ No

Temperature: 65 °F   Prevailing Wind Direction: SW   Speed: 5 mph

Photographs Taken: YES

Landfill Post-Closure Monitoring Items	Y	N	COMMENTS
Evidence of settlement or frost jacking within or on surface of landfill?		X	
Ponded water within, against or on surface of landfill?			Adjacent ponds. No. WATER ON SURFACE CAP
Evidence of surface erosion on disposal area walls or on exterior berms?		X	
Erosion of access roads?		X	
Discoloring of vegetation downslope?		X	
Any evidence of leakage or escape of waste from cells?		X	
Airborne ash or dust particles?		X	
Evidence of wildlife or birds present? Include number and type of birds on site.		X	
Windblown litter in cells or along access roads or adjacent ponds?		X	
Landfill odors?		X	
Fire or combustion in the waste?		X	
Damage to the structural integrity of a dike wall, culvert, or erosion control feature, if present?		X	Diversion ditch functioning well.
Is revegetation occurring?	X		Might be in seed stage.
Estimated Percent Vegetative Cover: On Cap Surface 25% On Sideslopes: 75% Comments:			

General Comments: Structural integrity of landfill cap in great condition. Vegetative cover in seed phase and/or struggling to become establish in coarse surface cap material.

Corrective Actions Taken: NONE.

(Use additional pages if necessary)

F10AK096903_07.11_0505_p
F10AK096905_07.11_0504_p
200-1f

Photo 1: View of landfill cap surface looking toward road, facing NW.
Photo 2: View of landfill cap surface, facing north toward Site 7 landfill (in background).

Photo 3: Surface of landfill cap, facing west.
Photo 4: Surface of landfill cap, facing SW.

Photo 5: View of diversion ditch, functioning very well, facing NE.
Photo 6: East side of landfill cap surface water pond, facing south.

APPENDIX F

Chemical Data Quality Report

TABLE OF CONTENTS

SECTION **PAGE**

TABLES

ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
%	percent
ADEC	Alaska Department of Environmental Conservation
Bristol	Bristol Environmental Remediation Services, LLC
BTEX	benzene, toluene, ethylbenzene, and xylenes
CDQR	Chemical Data Quality Report
CoC	chain-of-custody
DL	detection limit
DoD	Department of Defense
DQO	data quality objective
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
GRO	gasoline range organics
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LOD	limit of detection
LOQ	limit of quantitation
MBs	method blanks
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
ND	non-detect
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyls
QAPP	Quality Assurance Project Plan
QC	quality control
RPD	relative percent difference
RRO	residual range organics
SDG	sample delivery group
SIM	selected ion mode
SW-846	EPA publication *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*

ACRONYMS AND ABBREVIATIONS (continued)

TestAmerica	TestAmerica Laboratories, Inc.
USACE	US Army Corps of Engineers
VOC	volatile organic compound

1.0 DATA VERIFICATION

Bristol Environmental Remediation Services, LLC (Bristol) composed this chemical data quality report (CDQR) in accordance with US Army Corps of Engineers (USACE), Alaska District requirements. All laboratory results relate to the collection of surface water at Northeast Cape, St. Lawrence Island, Alaska. Bristol performed this work under USACE Contract No. W911KB-14-D-0006, Task Order 0002.

Bristol verified sample data collected surface water adjacent to the Site 9 landfill in August 2015. The verification process evaluates data completeness, correctness, consistency, and compliance with method procedures and quality control (QC) requirements; it also identifies anomalous data. The reported project sample values and any method laboratory control samples extracted or prepared with the project samples were reviewed. Data verification considers potentially influential conditions and procedures:

- Sample receipt conditions
  - Sample preservation
  - Cooler temperatures upon receipt
  - Chain-of-custody (CoC) condition/correspondence to submitted sample set
  - Presence/absence of custody seals
- Extraction and analytical procedures
  - Holding times
  - Method blanks (MBs)
  - Laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs)
  - Matrix spike (MS) and matrix spike duplicate (MSD)
  - Duplicate/replicate samples
  - Surrogate recoveries

- Sampling procedures
  - Field duplicates
  - Trip blanks
  - Field duplicate/replicate samples
- Correspondence related to method criteria and project data quality objectives (DQOs)

This report does not include internal standards, calibrations, instrument tunes, chromatograms, quantitation reports, spectra, summaries identifying any analytical irregularities (and the subsequent corrective action taken by the laboratories), or anything not listed above. Laboratory report case narratives were examined and any documented calibration or other QC outliers were included when appropriate.

Control limits are specified in the *2014 Northeast Cape HTRW Remedial Actions Work Plan, Revision 1*, dated December 2014 (Bristol, 2014) and the 2015 field activities are described in the *2015 Northeast Cape Work Plan Addendum* (Bristol, 2015). Unless otherwise stated, data fell within control limits. If control limits were not specified in the Quality Assurance Project Plan (QAPP), in-house laboratory control limits were used for review. In some instances, quality control information beyond QAPP specifications was reported (e.g., additional surrogates). This information was also used for data review unless specifically noted.

Data verification satisfied standards established in the Department of Defense (DoD) *Quality Systems Manual*, Version 5.0 (DoD, 2013) and the Alaska Department of Environmental Conservation (ADEC) Technical Memorandum: Environmental Laboratory and Quality Assurance Requirements (ADEC, 2009).

The data verifier assessed precision and accuracy by comparing surrogate, MS/MSD, and LCS/LCSD recoveries and relative percent differences (RPDs) to the QAPP-specified control limits. Control limits for waste samples were not included in the QAPP. This matrix uses laboratory-specified limits. The frequency of QC samples was compared to the frequency specified in the QAPP. The MS/MSDs performed on non-project samples are not applicable, and were not evaluated.

The reviewed data sets include sample data collected during the August 2015 field effort. TestAmerica Laboratories Inc. (TestAmerica), located in Tacoma, Washington, analyzed the samples and reported the data under SDG 580-52566-1.

TestAmerica used several methods for sample analysis:

- Gasoline range organics (GRO) by ADEC Method AK101
- Diesel range organics (DRO) and residual range organics (RRO) by ADEC Method AK102/AK103
- Volatile Organic Compounds (VOCs) by U.S. Environmental Protection Agency (EPA) publication *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* 846 (SW-846) Method 5030B and 8260C
- Polynuclear aromatic hydrocarbons (PAHs) by SW 3520C/8270D in selected ion mode (SIM)
- Polychlorinated biphenyls (PCBs) by SW8082A
- Total and dissolved Metals by SW3005A/6020A.
- Mercury by SW7470A.

Analytical results tables and data qualifiers are presented in Table 6-1 of 2015 Landfill Inspection Report.

The following data qualifiers may have been used to identify data points when data verification determines that results should be qualified because of a potential bias in the result, or a deviation from method or QAPP QC procedures:

1.1 Data Qualifiers

- B – Analyte result is considered a high estimated value due to contamination present in the method blank, instrument blank, or trip blank. Results less than 10 times the reported method blank concentration will be B flagged to indicate bias.

- J – Positive result is less than the limit of quantitation (LOQ) and is considered an estimate.
- ND (LOD) – Analyte result is less than the detection limit (DL). The non-detected result (ND) has the limit of detection (LOD) in parentheses.
- QH, QL, QN – Analyte result is considered an estimated value biased (high [H], low [L], uncertain [N]) due to a laboratory quality control failure (Q) such as LCS/LCSD, MS/MSD or surrogate recoveries outside of acceptance limits. Field duplicates that do not meet RPD limits but meet other acceptance criteria are also flagged QN.
- H – Sample extracted or analyzed outside of holding time. Results have potential low bias.

Data verification was performed for Site 9 surface water samples collected at Northeast Cape in August 2015. Field sample duplicate pairs are specified in the QAPP at a minimum rate of 10 percent (%) per matrix and analytical suite. Field duplicates were collected at a frequency of greater than 10%.

The sample summary sheet which lists all project samples and their respective analyses is presented as Attachment 1 to this CDQR. The ADEC Laboratory Data Review Checklists are presented in Attachment 2. Bristol-to-USACE Variance-Request correspondence is presented in Attachment 3. Laboratory certifications are included in Attachment 4.

2.0 DATA VERIFICATION RESULTS

2.1 SAMPLE RECEIPT CONDITIONS AND PRESERVATION

Samples were shipped from the Northeast Cape site by field personnel via Alaska Airlines, Goldstreak. Custody seals remained intact until receipt by the laboratory. The majority of the sample delivery groups (SDGs) arrived at the lab at a temperature of 4 (+/-2) degrees Celsius (°C) and in good condition. Exceptions are noted below:

- Seven coolers were shipped that included both MOC groundwater and Site 9 surface water samples. The cooler temperatures were 0.8, 1.0, 1.1, 1.6, 2.0, 4.7 and 4.8 degrees C. None of the samples were frozen and the slightly depressed temperatures had no effect on results.
- The trip blanks were not listed on the CoC for analysis but were noted on the CoC for cooler 081515-01 that it contained surface water volatile samples and a trip blank and the CoC for cooler 081515-02 noted it contained groundwater volatile samples and additional trip blanks. The cooler contents were listed on each CoC submitted with each cooler.
- The cooler receipt form noted that some dates and times on containers did not match the CoC. Samples were logged in per the CoC. The Site 9 surface water samples had holding time issues as samples were received on the day the holding times expired. They were extracted one day after the holding time had expired.
- The sample receipt form for an unspecified cooler noted that a zero headspace (VOC) sample had ¼” or larger bubbles in one or more vials and also noted that one vial had acceptable “zero” headspace. The case narrative did not specify which sample had headspace so it is assumed that analysis was performed on a sample with no headspace.

2.2 VOC ANALYSES (BTEX)

TestAmerica analyzed samples for benzene, toluene, ethylbenzene, and xylenes (BTEX) by SW 8260C. The laboratory report case narrative noted several analytes that were out of control; however; on most instances the samples were only being analyzed for BTEX. QAPP specified QC for an analytical batch of up to 20 samples includes an MB, LCS/LCSD, and MS/MSD pair. An MB, LCS/LCSD and project MS/MSD were analyzed and within control limits with each batch.

2.3 GRO Analyses

TestAmerica analyzed GRO by ADEC Method AK101. Required QC for an analytical batch of up to 20 samples includes an MB, LCS/LCSD, and MS/MSD pair. An MB, LCS/LCSD pair and project MS/MSD pair were performed with each QC batch.

Holding times, MBs, LCS/LCSD recoveries and RPDs, and MS/MSD recoveries and RPDs were reviewed and met all QAPP and method criteria.

2.4 PAH Analysis by SW 8270-SIM

TestAmerica analyzed samples by SW 8270C selected ion mode (SIM) for PAHs. Required QC for an analytical batch of up to 20 samples includes an MB, LCS/LCSD, and MS/MSD pair. A MB, LCS/LCSD, and project MS/MSD pair were performed with each QC batch and met criteria with some exceptions:

- The following samples collected from Site 9 surface waters were analyzed outside of holding time for PAHs due to being received on the day the holding time expired: 15NC09SW001(580-52566-18), 15NC09SW002 (580-52566-19), 15NC09SW003 (580-52566-20), 15NC09SW004 (580-52566-21).
- Anthracene and benzo[a]pyrene failed the recovery criteria low for the LCS and LCSD in batch 580-198441/2-A and also exceeded the RPD limit. These analytes were outside the marginal exceedance limits and were indicative of a systematic problem; therefore, re-extraction and/or re-analysis was performed. However, since the re-analysis yielded no improvement, the in-hold data was qualified and reported.
- Anthracene and Benzo[a]pyrene failed the recovery criteria low for the MS/MSD of sample 15NC09SW001 (580-52566-18), also in batch 580-199581. The analytical results have already been flagged QL due to recoveries in the LCS/LCSD that were below the lower acceptance limit.
- Anthracene and benzo[a]pyrene failed the recovery criteria low in the LCS/LCSD in batch 580-198677. Anthracene and benzo[a]pyrene also exceeded the RPD limit. Sample results associated with batch 580-198677 have been qualified QL for quality issue with potential low bias.

2.5 DRO / RRO ANALYSES

TestAmerica analyzed samples for DRO/RRO following ADEC methods AK102/AK103. Required QC for a batch of up to 20 samples includes an MB, LCS /LCSD, and MS/MSD pair. A MB, LCS/LCSD, and project MS/MSD pair were performed with each QC batch and met acceptance criteria.

2.6 PCBS BY METHOD 8082A

PCB-1016 failed the recovery criteria high for the MS of sample 15NC09SW001MS (580-52566-18) in batch 580-199221. PCB-1016 andPCB-1260 exceeded the RPD limit for the MS/MSD of sample 15NC09SW001MSD (580-52566-18) in batch 580-199221. The associated lab control sample met the acceptance criteria. The non-detect PCB results for sample 15NC09SW001 were flagged QN for the RPD quality issue with no directional bias.

2.7 METALS BY EPA METHOD 6020A

2.7.1 Dissolved Metals

Cadmium was detected in the dissolved method blank MB 580-199196/9-B at 0.000286 milligrams per liter (mg/L), which was above the detection limit but below ½ the LOQ. Dissolved cadmium was detected in all surface water samples, so dissolved cadmium surface water results were B flagged for method blank contamination.

2.7.2 Total Metals

Total silver failed the recovery criteria low for the MS of sample 15NC09SW001MS (580-52566-18) in batch 580-199268. The associated lab control sample met the acceptance criteria. The total silver result for 15NC09SW001 was flagged QL for quality issue with potential low bias. The result was non-detect.

2.8 MERCURY BY EPA METHOD 7470A

Total mercury failed the recovery criteria low for the MSD of sample 15NC09SW001 (580-52566-18) in batch 580-198638. The associated lab control sample met the acceptance criteria. The mercury result for 15NC09SW001 was flagged QL for quality issue with potential low bias. The result was non-detect.

2.9 FIELD QA/QC

Field QC samples included field duplicate pairs, MS/MSD pairs, and trip blanks. Field QC samples were analyzed in the same manner and in the same extraction and analytical batches as primary field samples. Field duplicate samples were submitted "blind" to the lab with similar sample IDs as primary field samples, so the lab could not identify which samples were duplicates.

2.9.1 Field Sample Duplicates

The comparison of field sample duplicate results provides for the evaluation of precision as measured by RPD for the overall sample collection and analytical process. The precision between the field duplicate samples may be influenced by the unequal distribution of target analyte concentrations within a matrix. The RPD assessment criteria of 30% RPD for water (as specified in the QAPP) were used to evaluate the field duplicates. This variability is assessed by evaluating the calculated RPDs between the field duplicate sample results. If target analytes were detected in one sample greater than the LOQ and not detected in the duplicate, both detected and non-detected results were flagged QN to indicate imprecision. Data which was J flagged and detected between the LOQ and the DL had the RPD calculated, but analytical results were not flagged for out of control RPDs.

Field Duplicate Frequencies

Field sample duplicate pairs are specified the QAPP at a minimum rate of 10% per matrix and analytical suite. Two sets of field duplicates were collected at the MOC along with fifteen primary samples. One set of field duplicates was collected at Site 9 along with three primary water samples at greater than the minimum 10% frequency for the project. The field duplicate pairs are noted below: 15NC09SW002 and 15NC09SW004 (Site 9 Surface Waters)

Field Duplicate RPDs

Table 2-1 lists the calculated RPDs between the field duplicate and parent sample results for target analytes that were outside of the 30% RPD for water samples. RPDs out of precision control and detected above the LOQ in both the parent and field duplicate sample were flagged QN. Analytes with one or both results below the LOQ had the RPDs calculated but neither result was flagged due to the inherent imprecision of the multiple methods below the LOQ.

Table 2-1 Field Sample Duplicate Pair Results

Parent Sample ID/ Laboratory Sample ID	Field duplicate Sample ID/ Laboratory Sample ID	Compound	Units	Parent Field Sample Result	Field Duplicate Result	RPD (%)
15NC09SW002 (580-52566-19)	15NC09SW004 (580-52566-21)	All Analytes Met RPD Criteria	mg/L	NA	NA	**NA**

Notes:
BOLD = Exceeds RPD acceptance criteria.
mg/L = milligrams per Liter
RPD (%) = relative percent difference

The field duplicate RPDs were within control limits with the exceptions shown in bold on Table 2-1. A total of 7 out of 167 duplicate results (4.2%) did not meet RPD criteria. The out of control results for the parent and duplicate sample results were QN qualified to indicate estimated results with an unknown bias. In addition, if one of the pair had a detection above the LOQ and the duplicate result was less than the LOQ, the RPD was calculated but not flagged for results outside of RPD acceptance limits, as there is a lower degree of analytical accuracy at concentrations less than the LOQ. No results were flagged if one or both results were reported at less than the LOQ. All other results were also usable for project decisions to demonstrate that none of the precision biased sample results were greater than or anywhere near site-specific cleanup levels. The overall field duplicate imprecision was 4.2%, well below the 10% data quality objective for usable results.

2.9.2 Trip Blanks

Water trip blanks were included in the two coolers containing samples which were submitted to the laboratory for VOC and GRO analyses. Trip blanks were included with shipments containing samples for VOC and GRO analyses and were non-detect for target analytes.

3.0 SENSITIVITY AND QUANTITATION LIMITS

Sensitivity is the capability of a test method or instrument to discriminate between measurement responses that represent different levels (e.g., concentrations) of a variable or analyte of interest. Examples of QC measures for determining sensitivity include laboratory-fortified blanks at the LOQ/ LOD studies, and the lowest calibration standards at or below the LOQ. In order to meet the needs of the data users, the project data must meet the measurement performance criteria for sensitivity and project LOQs. Analytical factors, such as dilutions or high percent soil moisture, may elevate the reporting limits for all target constituents. Overall sensitivity and reporting for the project met quantitation reporting.

3.1 SENSITIVITY SUMMARY

Overall project sensitivity was met.

(Intentionally blank)

4.0 REFERENCES

Alaska Department of Environmental Conservation (ADEC). (2009). Technical Memorandum: Environmental Laboratory Data and Quality Assurance Requirements. March.

Bristol Environmental Remediation Services, LLC (Bristol). (2014). *Northeast Cape HTRW Remedial Action Work Plan* (Revision 1). Northeast Cape, Saint Lawrence Island, Alaska: USACE.

Bristol. (2015). *2014 Northeast Cape HTRW Remedial Actions Work Plan Addendum* (Revision 1). Northeast Cape, Saint Lawrence Island, Alaska: USACE. Department of Defense, United States (DoD). (2013). DoD/DOE Quality Systems Manual for Environmental Laboratories. Version 5.0. Prepared by DoD Environmental Data Quality Workgroup and the Department of Energy Consolidated Audit Program Operations Team. October.

U.S. Army Corps of Engineers (USACE). (2009). *Decision Document: Hazardous, Toxic, and Radioactive Waste (HTRW).* Project #F10AK096903, Northeast Cape Formerly Used Defense Site (FUDS) St. Lawrence Island, Alaska. Prepared by U.S. Army Corps of Engineers-Alaska District. January.

U.S. Department of Defense (DoD). (2013). *DoD Quality Systems Manual for Environmental Laboratories*. Version 5.0. June.

(Intentionally blank)

ATTACHMENT 1

Sample Summary Table

Attachment 1 2015 Site 9 Surface Water Sample Summary Table

Lab Reporting Batch	Location ID	Client Sample ID	Lab Sample ID	Collection Date/Time	Matrix ID	Sample Depth	Result Basis	Quality Control	Lab Name	SW 6020A	SW 7470A	SW 8082A	SW 8260 C	SW 8270D SIM	AK 101	AK 102/ AK 103	Sampler Initials	Preservative	Sample Container	Turnaround Time	Cooler ID
580-52566-1	SW001	15NC09SW001	580-52566-18	08/11/2015 14:00:00	Water	Surface	Dissolved	Matrix Spike/ Matrix Spike Duplicate	TestAmerica Tacoma	X	X						EB	1	A	21 days	Large blue/white
580-52566-1	SW001	15NC09SW001	580-52566-18	08/11/2015 14:00:00	Water	Surface	Total	Matrix Spike/ Matrix Spike Duplicate	TestAmerica Tacoma	X	X	X	X	X	X	X	EB	2,3	B,C	21 days	Large blue/white
580-52566-1	SW002	15NC09SW002	580-52566-19	08/11/2015 14:30:00	Water	Surface	Dissolved		TestAmerica Tacoma	X	X						EB	1	A	21 days	Large blue/white
580-52566-1	SW002	15NC09SW002	580-52566-19	08/11/2015 14:30:00	Water	Surface	Total		TestAmerica Tacoma	X	X	X	X	X	X	X	EB	2,3	B,C	21 days	Large blue/white
580-52566-1	SW003	15NC09SW003	580-52566-20	08/11/2015 14:50:00	Water	Surface	Dissolved		TestAmerica Tacoma	X	X						EB	1	A	21 days	Large blue/white
580-52566-1	SW003	15NC09SW003	580-52566-20	08/11/2015 14:50:00	Water	Surface	Total		TestAmerica Tacoma	X	X	X	X	X	X	X	EB	2,3	B,C	21 days	Large blue/white
580-52566-1	SW004	15NC09SW004	580-52566-21	08/11/2015 14:35:00	Water	Surface	Dissolved	Field Duplicate of SW002	TestAmerica Tacoma	X	X						EB	1	A	21 days	Large blue/white
580-52566-1	SW004	15NC09SW004	580-52566-21	08/11/2015 14:35:00	Water	Surface	Total	Field Duplicate of SW002	TestAmerica Tacoma	X	X	X	X	X	X	X	EB	2,3	B,C	21 days	Large blue/white

Notes:

ID = identification

Preservative Key:
1 = nitric acid
2 = hydrochloric acid
3 = cool

Container Key:
A = 250 mL poly
B = 40 mL VOA Vial
C = 250 mL amber glass

ATTACHMENT 2

ADEC Laboratory Data Review Checklists

Laboratory Data Review Checklist

Completed by: Marty Hannah

Title: Project Chemist

Date: 11/18/15

CS Report Name: 2015 NE Cape Site 9 Surface Water Report

Report Date: 10/30/15

Consultant Firm: Bristol Environmental Remediation Services, LLC

Laboratory Name: TestAmerica-Tacoma

Laboratory Report Number: 580-52566-1

ADEC File Number:

ADEC RecKey Number:

1. Laboratory
   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
      x□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 x□NA (Please explain.) Comments:

      Samples were shipped directly to TA-Tacoma via Alaska Airlines Goldstreak for analysis..

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

   b. Correct analyses requested?
      x□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 □x No □NA (Please explain.) Comments:

      Seven coolers were shipped that included both MOC groundwater and Site 9 surface water samples. The cooler temperatures were 0.8, 1.0, 1.1, 1.6, 2.0, 4.7 and 4.8 degrees. None of the samples were frozen and the slightly depressed temperatures had no effect on results.

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

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

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

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

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

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

No discrepancies were noted with the surface waters.

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

Comments:

Sample results were usable without qualification with respect to sample receipt conditions and preservation.

4. Case Narrative

a. Present and understandable?

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

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

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

Anthracene and Benzo[a]pyrene failed the recovery criteria low in the LCS/LCSD in prep batch 198441 for the MS/MSD of sample 15NC09SW001 (580-52566-18) in analytical batch 580-199581.

c. Were all corrective actions documented?

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

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

Comments:

Samples were re-extracted and reanalyzed without improvement in results.

5. Samples Results

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

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

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

Surface water samples collected at Site 9 had PAH holding times expire as the samples were received at the lab on the same day the 7 day holding times expired. Results were flagged H

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

All samples were water samples.

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

e. Data quality or usability affected?
   Comments:

While the holding time exceedences have potential affect on data quality, all potentially affected PAH results were non-detect. The results were usable for project purposes to demonstrate that the former Site 9 landfill was not leaching contents into nearby surface waters.

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

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

Cadmium was detected in the dissolved method blank MB 580-199196/9-B at 0.000286 mg/L

      iii. If above PQL, what samples are affected?

Dissolved cadmium was detected in all surface water samples but not in Total Cadmium was not detected in any samples so laboratory contamination is suspected. B flags were applied to all 4 surface water dissolved cadmium results for method blank contamination.

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

The dissolved cadmium results for samples 15NC09SW001 thru –SW004 were B flagged for blank contamination.

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

The only potentially impacted data results were the dissolved cadmium results.

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

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

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

Mercury failed the recovery criteria low for the MSD of sample 15NC09SW001MSD (580-52566-18) in batch 580-198638. The associated lab control sample met the acceptance criteria. Silver failed the recovery criteria low for the MS of sample 15NC09SW001MS (580-52566-18) in batch 580-199268. The associated lab control sample met the acceptance criteria. PCB-1016 failed the recovery criteria high for the MS of sample 15NC09SW001MS (580-52566-18) in batch 580-199221.

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 ☐x No ☐NA (Please explain.) Comments:

Anthracene and benzo[a]pyrene failed to meet RPD limits. PCB-1016 andPCB-1260 exceeded the RPD limit for the MSD of sample 15NC09SW001MSD (580-52566-18) in batch 580-199221. The associated lab control sample met the acceptance criteria

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

All anthracene and benzo[a]pyrene results were flagged QL for low LCS/LCSD recoveries. The results were not flagged for RPD failures as the QL flag has more impact on results.

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

Results wre flagged QL for the low benzo[a]pyrne and anthracene results and the PCB results for sample 15NC09SW0001 were flagged QN for quality issue with no directions bias for the MS/MSD RPD failures.

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

Comments:

While there were multiple QC failures and flags which could potentially impact data quality. All results were usable for project purposes of monitoring surface water at Site 9.

c. Surrogates – Organics Only

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

x☐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 x☐ No ☐NA (Please explain.) Comments:

The PCB surrogate decachlorobiphenyl had its recovery exceed the upper control limit in sample 15NC09SW001 and the MSD on the same sample had the decachlorobiphenyl recover below the lower acceptance limit.

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

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

The PCB results for sample 15NC09SW001 were already flagged QN for out of control RPD in the MS/MSD. No additional flags were added.

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

Comments:

While there were several laboratory issues related to QC spike and surrogate recoveries, the results were still usable to demonstrate that no analytes were leaching out of the Site 9 landfill cap into surface waters above cleanup levels.

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.)

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

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

Noted on bottom of respective CoCs.

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

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

Not applicable, all results were ND.

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

Sample results were usable for project purposes without qualification with respect to trip blank inclusion and reporting.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
x☐Yes ☐ No ☐NA (Please explain.) Comments:

Duplicate pair was samples 15NC09SW002 and 15NC09SW004.

ii. Submitted blind to lab?
x☐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 ☐x No ☐NA (Please explain.) Comments:

All surface water duplicate results met RPD criteria. The vast majority of results were non-detect.

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

Comments:

The overall 90% precision criteria was met for field duplicates.

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

□Yes □ No x□NA (Please explain.) Comments:

Samples were collected with pre-cleaned unpreserved containers and carefully transferred into the properly preserved containers.

i. All results less than PQL?

□Yes □ No x□NA (Please explain.) Comments:

ii. If above PQL, what samples are affected?

Comments:

Not applicable

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

Comments:

Not applicable

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

a. Defined and appropriate?

x□Yes □ No □NA (Please explain.) Comments:

.

ATTACHMENT 3

USACE Approved Variance Requests

From:	Utley, Michael D POA
To:	Hannah, Marty; Benjamin, Sean P POA
Subject:	RE: NE Cape Variance Requests (UNCLASSIFIED)
Date:	Thursday, September 24, 2015 3:53:25 PM

Classification: UNCLASSIFIED
Caveats: NONE

Variance granted.

-----Original Message-----
From: Hannah, Marty [mailto:mhannah@bristol-companies.com]
Sent: Thursday, September 24, 2015 2:11 PM
To: Utley, Michael D POA; Benjamin, Sean P POA
Subject: [EXTERNAL] FW: NE Cape Variance Requests

OK, I looked at the actual sample result for the full VOC sample and its ND. Sample 52566-12 (15NCMOCGW12). It's a groundwater sample from Site 10, the only NE Cape GW sample to get full VOCs, all the rest are just BTEX and are fine. There are only xylene and ethybenzene detections in the project samples but QC is ND including the trip blank so I'm just ignoring the detections below the RL. It's a fuel site.

Can we get a variance?

Marty Hannah
Project Chemist/Environmental Scientist
Bristol Environmental Remediation Services, LLC Phone : (907) 743-9369

From: Greer, Robert A. [mailto:Robert.Greer@testamericainc.com]
Sent: Thursday, September 24, 2015 12:12 PM
To: Hannah, Marty; Ellingboe, Tyler
Subject: RE: NE Cape Variance Requests

ROBERT GREER

Project Manager II

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

5755 8th Street East

Tacoma, WA 98424

Tel 253.248-4971 I Fax 253.922.5047

Blockedwww.testamericainc.com <Blockedhttp://www.testamericainc.com/>

From: Hannah, Marty [mailto:mhannah@bristol-companies.com]
Sent: Thursday, September 24, 2015 9:33 AM
To: Greer, Robert A.; Ellingboe, Tyler
Subject: RE: NE Cape Variance Requests

Rob can I get preliminary results? Utley will not grant a variance without them. CCVs, MB, LCS/LCSD and sample results please.

Marty Hannah
Project Chemist/Environmental Scientist
Bristol Environmental Remediation Services, LLC Phone : (907) 743-9369

From: Greer, Robert A. [mailto:Robert.Greer@testamericainc.com]
Sent: Wednesday, September 23, 2015 2:18 PM
To: Ellingboe, Tyler; Hannah, Marty
Subject: NE Cape Variance Requests

Hi Tyler,

I have some variance requests for SDG 580-52566 listed below. Can we narrate and report?

* The continuing calibration verification (CCV) recovered above the upper control limit for Vinyl chloride (37.2), Trichlorofluoromethane (20.7), Chloromethane (26.8%) and Dichlorodifluoromethane (85.8%). These analytes were all detected in the CCVL, and the sample associated with this CCV were detected below half of the RL for the affected analytes.
* The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) recovered outside control limits for the following analytes: multi analyte. These analytes were biased high in the LCS and were not detected in the associated samples.

LCS

Analyte	%	%R Lmt
1,1,2,2-Tetrachloroethane	125	71-121
1,2,3-Trichloropropane	129	73-122
1,2-Dibromo-3-Chloropropane	142	62-128
1,2-Dichlorobenzene	122	80-119

1,3-Dichlorobenzene	121	80-119
Naphthalene	130	61-128
tert-Butylbenzene	129	78-124

LCSD

Analyte	%R	Lmt
1,3,5-Trimethylbenzene	125	75-124
Benzene	121	79-120
Chlorobromomethane	125	78-123
Chloroform	127	79-124
Methylene Chloride	126	74-124
tert-Butylbenzene	130	78-124
trans-1,2-Dichloroethene	125	75-124

* The continuing calibration verification (CCV) recovered above the upper control limit for Vinyl chloride and Dichlorodifluoromethane . The samples associated with this CCV were non-detects for the affected analytes

ROBERT GREER

Project Manager II

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

5755 8th Street East

Tacoma, WA 98424

Tel 253.248-4971 l Fax 253.922.5047

Blockedwww.testamericainc.com <Blockedhttp://www.testamericainc.com/>

ATTACHMENT 4

Laboratory Certifications

THE STATE
of ALASKA
GOVERNOR BILL WALKER

Department of Environmental Conservation

DIVISION OF ENVIRONMENTAL HEALTH
Environmental Health Laboratory

5251 Dr. Martin Luther King Jr. Ave.
Anchorage, Alaska 99507-1293
Main: 907.375.8200
Fax: 907.929.7335
www.dec.alaska.gov

March 2, 2015

Terri Torres
TestAmerica-Seattle, WA
5755 8th Street East
Tacoma, WA 98424

Reference: FY2015 Contaminated Sites Approval, #UST-022

Terri Torres:

Thank you for submitting an application on January 23, 2015 to the Alaska Department of Environmental Conservation's (DEC) Laboratory Certification Program (LCP), for renewal of your Alaska Contaminated Sites (CS) Laboratory Approval.

Based on the materials reviewed to date, TestAmerica-Seattle, WA, located at 5755 8th Street East, Tacoma, WA, is granted ***Full approval*** to perform the analyses listed in the attached *State of Alaska Scope of Accreditation*, for Alaska CS projects, including UST/LUST, under the January 30, 2003 revision of 18 AAC 78. Approval Status may be upgraded or downgraded upon full review of the renewal application, supporting materials, and any additionally requested documentation.

Be aware that method detection limit (MDL) data must be retained on file for each method and instrument for which you are maintaining or seeking approval under the AK CS Program. The data may be subject to inspection at any time.

Please remember your expiration date is 3/2/2016. The required documentation must be submitted for renewal no earlier than 90 days and no later than 30 days before your date of expiration. The application, fees, and the latest revision of the quality assurance manual must be received during this window. Proficiency test (PT) results must be performed less than 90 days before expiration, and must be submitted from the vendor to the LCP before the expiration date. Please remember to include the laboratory's ID number, listed above, on ALL correspondence concerning the laboratory, and on all data transmittals.

A copy of the application may be downloaded from the following site:
http://www.state.ak.us/dec/eh/lab/cs/csapproval.htm

If you have any questions, please contact the LCP at (907)375-8200, or at the following email address: declabcert@alaska.gov.

Respectfully,

Shera Hickman
Alaska CS Lab Approval Officer

Attachments: Certificate, Scope of Approval

THE STATE OF ALASKA

Department of Environmental Conservation

Laboratory Approval Program

Scope of Approval

Expiration: 03/02/2016

TestAmerica-Seattle, WA **UST-022**
5755 8th Street East
Tacoma, WA 98424

is approved by the State of Alaska Department of Environmental Conservation, pursuant to 18 AAC 78, to perform analysis for the parameters listed below using the analytical methods indicated. Approval for all parameters is final. Approval is for the latest version of a method unless specified otherwise in a note. EPA refers to the U.S. Environmental Protection Agency. AK refers to Alaska Methods 101, 102 and 103 for the determination of gasoline, diesel and residual range organics in soil and water. ASTM refers to the American Society for Testing and Materials.

Contaminated Sites

Method/Test Name	Reference	Analyte	Matrix	Status
6010C	EPA	Total Arsenic	Soil	Approved
6010C	EPA	Total Barium	Soil	Approved
6010C	EPA	Total Cadmium	Soil	Approved
6010C	EPA	Total Chromium	Soil	Approved
6010C	EPA	Total Lead	Soil	Approved
6010C	EPA	Total Nickel	Soil	Approved
6010C	EPA	Total Vanadium	Soil	Approved
6010C	EPA	Total Arsenic	Water	Approved
6010C	EPA	Total Barium	Water	Approved
6010C	EPA	Total Cadmium	Water	Approved
6010C	EPA	Total Chromium	Water	Approved
6010C	EPA	Total Lead	Water	Approved
6010C	EPA	Total Nickel	Water	Approved
6010C	EPA	Total Vanadium	Water	Approved
6020A	EPA	Total Arsenic	Soil	Approved
6020A	EPA	Total Barium	Soil	Approved
6020A	EPA	Total Cadmium	Soil	Approved
6020A	EPA	Total Chromium	Soil	Approved
6020A	EPA	Total Lead	Soil	Approved

Contaminated Sites

Method/Test Name	Reference	Analyte	Matrix	Status
6020A	EPA	Total Nickel	Soil	Approved
6020A	EPA	Total Vanadium	Soil	Approved
6020A	EPA	Total Arsenic	Water	Approved
6020A	EPA	Total Barium	Water	Approved
6020A	EPA	Total Cadmium	Water	Approved
6020A	EPA	Total Chromium	Water	Approved
6020A	EPA	Total Lead	Water	Approved
6020A	EPA	Total Nickel	Water	Approved
6020A	EPA	Total Vanadium	Water	Approved
8082A	EPA	Polychlorinated Biphenyls-PCB	Soil	Approved
8082A	EPA	Polychlorinated Biphenyls-PCB	Water	Approved
8082A-SV	EPA	Polychlorinated Biphenyls-PCB	Water	Approved
8260B	EPA	BTEX	Soil	Approved
8260B	EPA	Total Volatile Chlorinated Solvents	Soil	Approved
8260B	EPA	BTEX	Water	Approved
8260B	EPA	Total Volatile Chlorinated Solvents	Water	Approved
8260C	EPA	BTEX	Soil	Approved
8260C	EPA	Total Volatile Chlorinated Solvents	Soil	Approved
8260C	EPA	BTEX	Water	Approved
8260C	EPA	Total Volatile Chlorinated Solvents	Water	Approved
8270D	EPA	PAH	Soil	Approved
8270D	EPA	PAH	Water	Approved
8270D-SV	EPA	PAH-small volume by 3510C	Water	Approved
AK101	AK	Gasoline Range Organics	Soil	Approved
AK101	AK	Gasoline Range Organics	Water	Approved
AK101-MS	AK	Gasoline Range Organics	Soil	Approved
AK101-MS	AK	Gasoline Range Organics	Water	Approved
AK102	AK	Diesel Range Organics	Soil	Approved
AK102	AK	Diesel Range Organics	Water	Approved
AK102-SV	AK	Diesel Range Organics-small volume	Water	Approved
AK103	AK	Residual Range Organics	Soil	Approved

THE STATE OF ALASKA

Department of Environmental Conservation
Laboratory Certification Program

Certificate of Approval for Contaminated Sites Analysis

TestAmerica-Seattle, WA

5755 8th Street East
Tacoma, WA 98424

UST-022

has complied with the provisions set forth in 18 AAC 78 and is hereby recognized by The Department of Environmental Conservation as **Fully Approved** for the analytical parameters listed on the accompanying Scope of Accreditation. This certificate is effective **3/2/2015**, and expires **3/2/2016**.

Patryce D. McKinney
State of Alaska Certification Authority

Shera Hickman
Laboratory Approval Officer

American Association for Laboratory Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

TESTAMERICA DENVER
4955 Yarrow Street
Arvada, CO 80002
Margaret S. Sleevi Phone: 303-736-0100
www.testamericainc.com

ENVIRONMENTAL

Valid To: October 31, 2015 Certificate Number: 2907.01

In recognition of the successful completion of the A2LA evaluation process, (including an assessment of the laboratory's compliance with ISO IEC 17025:2005, the 2003 NELAC Chapter 5 Standard, the requirements of the DoD Environmental Laboratory Accreditation Program (DoD ELAP) as detailed in version 4.2 of the DoD Quality Systems Manual for Environmental Laboratories), and for the test methods applicable to the Wyoming Storage Tank Remediation Laboratory Accreditation Program, accreditation is granted to this laboratory to perform recognized EPA methods using the following testing technologies and in the analyte categories identified below:

Testing Technologies

Atomic Absorption/ICP-AES Spectrometry, ICP/MS, Gas Chromatography, Gas Chromatography/Mass Spectrometry, Gravimetry, High Performance Liquid Chromatography, Ion Chromatography, Misc.- Electronic Probes (pH, O_2), Oxygen Demand, Hazardous Waste Characteristics Tests, Spectrophotometry (Visible), Spectrophotometry (Automated), Titrimetry, Total Organic Carbon, Total Organic Halide

Parameter/Analyte	WY Storage Tank Program	Non-Potable Water	Solid Hazardous Waste (Water)	Solid Hazardous Waste (Solid)
Metals				
Aluminum	----------------------	----------------------	EPA 6010B / 6010C	EPA 6010B / 6010C
Antimony	----------------------	----------------------	EPA 6010B / 6010C / 6020 / 6020A	EPA 6010B / 6010C / 6020 / 6020A
Arsenic	----------------------	----------------------	EPA 6010B / 6010C / 6020 / 6020A	EPA 6010B / 6010C / 6020 / 6020A
Barium	----------------------	----------------------	EPA 6010B / 6010C / 6020 / 6020A	EPA 6010B / 6010C / 6020 / 6020A
Beryllium	----------------------	----------------------	EPA 6010B / 6010C / 6020 / 6020A	EPA 6010B / 6010C / 6020 / 6020A
Boron	----------------------	----------------------	EPA 6010B / 6010C	EPA 6010B / 6010C
Cadmium	EPA 6010C	----------------------	EPA 6010B / 6010C / 6020 / 6020A	EPA 6010B / 6010C / 6020 / 6020A

Peter Mlnyer

5301 Buckeystown Pike, Suite 350 | Frederick, Maryland 21704-8373 | Phone: 301 644 3248 | Fax: 301 662 2974 | www.A2LA.org

Parameter/Analyte	WY Storage Tank Program	Non-Potable Water	Solid Hazardous Waste (Water)	Solid Hazardous Waste (Solid)
Calcium	----------------------	----------------------	EPA 6010B / 6010C	EPA 6010B / 6010C
Chromium	EPA 6010C	----------------------	EPA 6010B / 6010C / 6020 / 6020A	EPA 6010B / 6010C / 6020 / 6020A
Cobalt	----------------------	----------------------	EPA 6010B / 6010C / 6020 / 6020A	EPA 6010B / 6010C / 6020 / 6020A
Copper	----------------------	----------------------	EPA 6010B / 6010C / 6020 / 6020A	EPA 6010B / 6010C / 6020 / 6020A
Iron	----------------------	----------------------	EPA 6010B / 6010C	EPA 6010B / 6010C
Lead	EPA 6010C	----------------------	EPA 6010B / 6010C / 6020 / 6020A	EPA 6010B / 6010C / 6020 / 6020A
Lithium	----------------------	----------------------	EPA 6010B / 6010C	EPA 6010B / 6010C
Magnesium	----------------------	----------------------	EPA 6010B / 6010C	EPA 6010B / 6010C
Manganese	----------------------	----------------------	EPA 6010B / 6010C / 6020 / 6020A	EPA 6010B / 6010C / 6020 / 6020A
Mercury	----------------------	----------------------	EPA 7470A	EPA 7471A / 7471B
Molybdenum	----------------------	----------------------	EPA 6010B / 6010C / 6020 / 6020A	EPA 6010B / 6010C / 6020 / 6020A
Nickel	----------------------	----------------------	EPA 6010B / 6010C / 6020 / 6020A	EPA 6010B / 6010C / 6020 / 6020A
Potassium	----------------------	----------------------	EPA 6010B / 6010C	EPA 6010B / 6010C
Selenium	----------------------	----------------------	EPA 6010B / 6010C / 6020 / 6020A	EPA 6010B / 6010C / 6020 / 6020A
Silica	----------------------	----------------------	EPA 6010B / 6010C	EPA 6010B / 6010C
Silicon	----------------------	----------------------	EPA 6010B / 6010C	EPA 6010B / 6010C
Silver	----------------------	----------------------	EPA 6010B / 6010C / 6020 / 6020A	EPA 6010B / 6010C / 6020 / 6020A
Sodium	----------------------	----------------------	EPA 6010B / 6010C	EPA 6010B / 6010C
Strontium	----------------------	----------------------	EPA 6010B / 6010C	EPA 6010B / 6010C
Thallium	----------------------	----------------------	EPA 6010B / 6010C / 6020 / 6020A	EPA 6010B / 6010C / 6020 / 6020A
Tin	----------------------	----------------------	EPA 6010B / 6010C	EPA 6010B / 6010C

Parameter/Analyte	WY Storage Tank Program	Non-Potable Water	Solid Hazardous Waste (Water)	Solid Hazardous Waste (Solid)
Titanium	----------------------	----------------------	EPA 6010B / 6010C	EPA 6010B / 6010C
Vanadium	----------------------	----------------------	EPA 6010B / 6010C / 6020 / 6020A	EPA 6010B / 6010C / 6020 / 6020A
Zinc	----------------------	----------------------	EPA 6010B / 6010C / 6020 / 6020A	EPA 6010B / 6010C / 6020 / 6020A
Nutrients				
Nitrate (as N)	----------------------	By calculation	By calculation / EPA 9056 / 9056A	By calculation / EPA 9056 / 9056A
Nitrate-nitrite (as N)	----------------------	EPA 353.2	EPA 353.2 / 9056 / 9056A	EPA 9056 / 9056A
Nitrite (as N)	----------------------	SM 4500-NO2 B	SM 4500-NO2 B; EPA 9056 / 9056A	EPA 9056 / 9056A
Orthophosphate (as P)	----------------------	----------------------	EPA 9056 / 9056A	EPA 9056 / 9056A
Total phosphorus	----------------------	----------------------	EPA 6010B / 6010C	EPA 6010B / 6010C
Demands				
Total Organic Carbon	----------------------	----------------------	EPA 9060 / 9060A	EPA 9060 / 9060A
Total Organic Halides	----------------------	----------------------	EPA 9020B	----------------------
Wet Chemistry				----------------------
Alkalinity (Total Bicarbonate, Carbonate, and Hydroxide Alkalinty)	----------------------	SM 2320 B_1997	SM 2320 B	SM 2320 B
Ammonia	----------------------	EPA 350.1	EPA 350.1	----------------------
Biological Oxygen Demand	----------------------	SM 5210B	SM 5210B	----------------------
Bromide	----------------------	----------------------	EPA 9056 / 9056A	EPA 9056 / 9056A
Chloride	----------------------	----------------------	EPA 9056 / 9056A	EPA 9056 / 9056A
Chemical Oxygen Demand	----------------------	EPA 410.4	EPA 410.4	
Conductivity	----------------------	----------------------	EPA 9050 / 9050A	EPA 9050 / 9050A
Cyanide	----------------------	----------------------	9012A / 9012B	9012A / 9012B
Ferrous Iron	----------------------	SM 3500 Fe B, D	SM 3500 Fe B, D	----------------------
Fluoride	----------------------	----------------------	EPA 9056 / 9056A	EPA 9056 / 9056A
Hexavalent Chromium	EPA 7196A	----------------------	EPA 7196A	----------------------
pH	----------------------	----------------------	EPA 9040B / 9045C	EPA 9040B / 9045C
Oil and Grease (HEM and SGT-HEM)	----------------------	----------------------	EPA 1664A/ 1664B	9071B
Percent Moisture	----------------------	----------------------	----------------------	ASTM D2216
Perchlorate	----------------------	----------------------	EPA 6860	EPA 6860
Phenols	----------------------	----------------------	EPA 9066	EPA 9066
Solids, Total	----------------------	SM 2540 B	SM 2540 B	SM 2540 B
Solids, Total Suspended	----------------------	SM 2540 D	SM 2540 D	SM 2540 D
Solids, Total Dissolved	----------------------	SM 2540 C	SM 2540 C	SM 2540 C
Sulfate	----------------------	----------------------	EPA 9056 / 9056A	EPA 9056 / 9056A
Sulfide, Total	----------------------	----------------------	EPA 9034	EPA 9034
Sulfide	----------------------	----------------------	EPA 9030B	EPA 9030B
Total Kjeldahl Nitrogen	----------------------	----------------------	EPA 351.2	----------------------

Parameter/Analyte	WY Storage Tank Program	Non-Potable Water	Solid Hazardous Waste (Water)	Solid Hazardous Waste (Solid)
Purgeable Organics (volatiles)				----------------------
Acetone	----------------------	----------------------	EPA 8260B	EPA 8260B
Acetonitrile	----------------------	----------------------	EPA 8260B	EPA 8260B
Acrolein	----------------------	----------------------	EPA 8260B	EPA 8260B
Acrylonitrile	----------------------	----------------------	EPA 8260B	EPA 8260B
Allyl Chloride	----------------------	----------------------	EPA 8260B	EPA 8260B
tert-Amyl Methyl Ether	EPA 8260B			
Benzene	EPA 8260B / 8021B	----------------------	EPA 8260B / 8021B / AK101/ OK DEQ GRO	EPA 8260B / 8021B / AK101/ OK DEQ GRO
Bromobenzene	----------------------	----------------------	EPA 8260B	EPA 8260B
Bromochloromethane	----------------------	----------------------	EPA 8260B	EPA 8260B
Bromodichloromethane	----------------------	----------------------	EPA 8260B	EPA 8260B
Bromoform	----------------------	----------------------	EPA 8260B	EPA 8260B
Bromomethane	----------------------	----------------------	EPA 8260B	EPA 8260B
2-Butanone	----------------------	----------------------	EPA 8260B	EPA 8260B
n-Butyl alcohol	----------------------	----------------------	EPA 8260B / 8015B / 8015C	EPA 8260B / 8015B / 8015C
tert-Butyl alcohol	EPA 8260B			
n-Butylbenzene	----------------------	----------------------	EPA 8260B	EPA 8260B
sec-Butylbenzene	----------------------	----------------------	EPA 8260B	EPA 8260B
tert-Butylbenzene	----------------------	----------------------	EPA 8260B	EPA 8260B
Carbon disulfide	----------------------	----------------------	EPA 8260B	EPA 8260B
Carbon tetrachloride	----------------------	----------------------	EPA 8260B	EPA 8260B
Chlorobenzene	----------------------	----------------------	EPA 8260B / 8021B	EPA 8260B / 8021B
2-Chloro-1,3-butadiene	----------------------	----------------------	EPA 8260B	EPA 8260B
Chloroethane	----------------------	----------------------	EPA 8260B	EPA 8260B
2-Chloroethyl vinyl ether	----------------------	----------------------	EPA 8260B	EPA 8260B
Chloroform	----------------------	----------------------	EPA 8260B	EPA 8260B
1-Chlorohexane	----------------------	----------------------	EPA 8260B	EPA 8260B
Chloromethane	----------------------	----------------------	EPA 8260B	EPA 8260B
Chloroprene	----------------------	----------------------	EPA 8260B	EPA 8260B
4-Chlorotoluene	----------------------	----------------------	EPA 8260B	EPA 8260B
2-Chlorotoluene	----------------------	----------------------	EPA 8260B	EPA 8260B
Cyclohexane	----------------------	----------------------	EPA 8260B	EPA 8260B
Cyclohexanone	----------------------	----------------------	EPA 8260B	EPA 8260B
Dibromochloromethane	----------------------	----------------------	EPA 8260B	EPA 8260B
1,2-Dibromo-3-chloropropane (DBCP)	----------------------	EPA 504	EPA 504 / 8260B / 8011	EPA 8260B / 8011
Dibromochloromethane	----------------------	----------------------	EPA 8260B	EPA 8260B
Dichlorodifluoromethane	----------------------	----------------------	EPA 8260B	EPA 8260B
Dibromomethane	----------------------	----------------------	EPA 8260B	EPA 8260B
1,2 Dibromoethane (EDB)	EPA 8011	EPA 504	EPA 504 / 8260B / 8011	EPA 8260B / 8011
1,2-Dichlorobenzene	----------------------	----------------------	EPA 8260B / 8021B	EPA 8260B / 8021B
1,3-Dichlorobenzene	----------------------	----------------------	EPA 8260B / 8021B	EPA 8260B / 8021B

Parameter/Analyte	WY Storage Tank Program	Non-Potable Water	Solid Hazardous Waste (Water)	Solid Hazardous Waste (Solid)
1,4-Dichlorobenzene	----------------------	----------------------	EPA 8260B / 8021B	EPA 8260B / 8021B
cis-1,4-Dichloro-2-butene	----------------------	----------------------	EPA 8260B	EPA 8260B
trans-1,4-Dichloro-2-butene	----------------------	----------------------	EPA 8260B	EPA 8260B
1,1-Dichloroethane	----------------------	----------------------	EPA 8260B	EPA 8260B
1,2-Dichloroethane	EPA 8260B	----------------------	EPA 8260B	EPA 8260B
1,1-Dichloroethene	----------------------	----------------------	EPA 8260B	EPA 8260B
1,2-Dichloroethene	----------------------	----------------------	EPA 8260B	EPA 8260B
cis-1,2-Dichloroethene	----------------------	----------------------	EPA 8260B	EPA 8260B
trans-1,2-Dichloroethene	----------------------	----------------------	EPA 8260B	EPA 8260B
Dichlorofluoromethane	----------------------	----------------------	EPA 8260B	EPA 8260B
1,2-Dichloropropane	----------------------	----------------------	EPA 8260B	EPA 8260B
1,3-Dichloropropane	----------------------	----------------------	EPA 8260B	EPA 8260B
2,2-Dichloropropane	----------------------	----------------------	EPA 8260B	EPA 8260B
1,1-Dichloropropene	----------------------	----------------------	EPA 8260B	EPA 8260B
1,3-Dichloropropene	----------------------	----------------------	EPA 8260B	EPA 8260B
cis-1,3-Dichloropropene	----------------------	----------------------	EPA 8260B	EPA 8260B
trans-1,3-Dichloropropene	----------------------	----------------------	EPA 8260B	EPA 8260B
Diethyl ether	----------------------	----------------------	EPA 8260B	EPA 8260B
Di-isopropylether	EPA 8260B	----------------------	EPA 8260B	EPA 8260B
1,4-Dioxane	----------------------	----------------------	EPA 8260B / 8260B SIM	EPA 8260B / 8260B SIM
Ethanol	----------------------	----------------------	EPA 8260B / 8015B / 8015C	EPA 8260B / 8015B / 8015C
Ethyl Acetate	----------------------	----------------------	EPA 8260B	EPA 8260B
Ethyl Benzene	EPA 8260B/8021B	----------------------	EPA 8260B / 8021B / AK101/ OK DEQ GRO	EPA 8260B / 8021B/ AK101/ OK DEQ GRO
Ethyl Methacrylate	----------------------	----------------------	EPA 8260B	EPA 8260B
Ethyl tert-Butyl Ether	EPA 8260B			
Ethylene Glycol	----------------------	----------------------	EPA 8015C	EPA 8015C
Gas Range Organics (GRO)	EPA 8015C	----------------------	EPA 8015B / 8015C / AK101 / 8015D	EPA 8015B / 8015C / AK101 / 8015D
Hexane	----------------------	----------------------	EPA 8260B	EPA 8260B
2-Hexanone	----------------------	----------------------	EPA 8260B	EPA 8260B
Hexachlorobutadiene	----------------------	----------------------	EPA 8260B	EPA 8260B
Isobutyl Alcohol (2-Methyl-1-propanol)	----------------------	----------------------	EPA 8260B / 8015B / 8015C	EPA 8260B / 8015B / 8015C
Isopropyl Alcohol	----------------------	----------------------	EPA 8260B	EPA 8260B
Isopropylbenzene	----------------------	----------------------	EPA 8260B	EPA 8260B
1,4-Isopropyltoluene	----------------------	----------------------	EPA 8260B	EPA 8260B
Iodomethane	----------------------	----------------------	EPA 8260B	EPA 8260B
Methacrylonitrile	----------------------	----------------------	EPA 8260B	EPA 8260B
Methanol	----------------------	----------------------	EPA 8015B / 8015C	EPA 8015B / 8015C
Methyl Acetate	----------------------	----------------------	EPA 8260B	EPA 8260B
Methyl Cyclohexane	----------------------	----------------------	EPA 8260B	EPA 8260B
Methylene Chloride	----------------------	----------------------	EPA 8260B	EPA 8260B
Methyl Ethyl Ketone (MEK)	----------------------	----------------------	EPA 8260B	EPA 8260B
Methyl Isobutyl Ketone	----------------------	----------------------	EPA 8260B	EPA 8260B
Methyl Methacrylate	----------------------	----------------------	EPA 8260B	EPA 8260B

Parameter/Analyte	WY Storage Tank Program	Non-Potable Water	Solid Hazardous Waste (Water)	Solid Hazardous Waste (Solid)
Methyl tert-Butyl Ether (MtBE)	EPA 8260B / 8021B	----------------------	EPA 8260B / 8021B / OK DEQ GRO	EPA 8260B / 8021B/ OK DEQ GRO
4-Methyl-2-Pentanone	----------------------	----------------------	EPA 8260B	EPA 8260B
Naphthalene	EPA 8260B / 8021B	----------------------	EPA 8260B/ OK DEQ GRO	EPA 8260B / OK DEQ GRO
2-Nitropropane	----------------------	----------------------	EPA 8260B	EPA 8260B
2,2' Oxybisethanol	----------------------	----------------------	EPA 8015C	EPA 8015C
2-Pentanone	----------------------	----------------------	EPA 8260B	EPA 8260B
Propionitrile	----------------------	----------------------	EPA 8260B	EPA 8260B
n-Propylbenzene	----------------------	----------------------	EPA 8260B	EPA 8260B
Propylene Glycol	----------------------	----------------------	EPA 8015C	EPA 8015C
Styrene	----------------------	----------------------	EPA 8260B	EPA 8260B
1,1,1,2-Tetrachloroethane	----------------------	----------------------	EPA 8260B	EPA 8260B
1,1,2,2-Tetrachloroethane	----------------------	----------------------	EPA 8260B	EPA 8260B
Tetrachloroethene	----------------------	----------------------	EPA 8260B	EPA 8260B
Tetrahydrofuran	----------------------	----------------------	EPA 8260B	EPA 8260B
Toluene	EPA 8260B / 8021B	----------------------	EPA 8260B / 8021B / AK101 / OK DEQ GRO	EPA 8260B / 8021B / AK101 / OK DEQ GRO
Total Petroleum Hydrocarbons (TPH)	----------------------	EPA 1664A EPA 1664B	EPA 1664A EPA 1664B	----------------------
1,2,3-Trichlorobenzene	----------------------	----------------------	EPA 8260B	EPA 8260B
1,1,1-Trichloroethane	----------------------	----------------------	EPA 8260B	EPA 8260B
1,1,2-Trichloroethane	----------------------	----------------------	EPA 8260B	EPA 8260B
Trichloroethene	----------------------	----------------------	EPA 8260B	EPA 8260B
Trichlorofluoromethane	----------------------	----------------------	EPA 8260B	EPA 8260B
1,2,3-Trichlorobenzene	----------------------	----------------------	EPA 8260B	EPA 8260B
1,2,4-Trichlorobenzene	----------------------	----------------------	EPA 8260B	EPA 8260B
1,2,3-Trichloropropane	----------------------	EPA 504.1	EPA 504.1 / 8260B / 8011	EPA 8260B / 8011
1,1,2-Trichloro-1,2,2-trifluoroethane	----------------------	----------------------	EPA 8260B	EPA 8260B
Triethylene Glycol	----------------------	----------------------	EPA 8015C	EPA 8015C
1,2,3-Trimethylbenzene	----------------------	----------------------	EPA 8260B	EPA 8260B
1,2,4-Trimethylbenzene	----------------------	----------------------	EPA 8260B	EPA 8260B
1,3,5-Trimethylbenzene	----------------------	----------------------	EPA 8260B	EPA 8260B
Vinyl Acetate	----------------------	----------------------	EPA 8260B	EPA 8260B
Vinyl Chloride	----------------------	----------------------	EPA 8260B	EPA 8260B
Xylenes, total	EPA 8260B / 8021B	----------------------	EPA 8260B / 8021B / AK101 / OK DEQ GRO	EPA 8260B / 8021B / AK101 / OK DEQ GRO
1,2-Xylene	EPA 8260B / 8021B	----------------------	EPA 8260B / 8021B / AK101 / OK DEQ GRO	EPA 8260B / 8021B / AK101 / OK DEQ GRO
M+P-Xylene	EPA 8260B / 8021B	----------------------	EPA 8260B / 8021B / AK101 / OK DEQ GRO	EPA 8260B / 8021B / AK101 / OK DEQ GRO
Methane	----------------------	----------------------	RSK-175	----------------------
Ethane	----------------------	----------------------	RSK-175	----------------------
Ethylene (Ethene)	----------------------	----------------------	RSK-175	----------------------
Acetylene	----------------------	----------------------	RSK-175	----------------------

Parameter/Analyte	WY Storage Tank Program	Non-Potable Water	Solid Hazardous Waste (Water)	Solid Hazardous Waste (Solid)
Acetylene Ethane	----------------------	----------------------	RSK-175	----------------------
Extractable Organics (semivolatiles)				
Acenaphthene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
Acenaphthylene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
Acetophenone	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2-Acetylaminofluorene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Alachlor	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
4-Aminobiphenyl	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Aniline	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Anthracene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
Aramite	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Atrazine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Azobenzene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Benzaldehyde	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Benzidine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Benzoic acid	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Benzo (a) Anthracene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
Benzo (b) Fluoranthene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
Benzo (k) Fluoranthene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
Benzo (ghi) Perylene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
Benzo (a) Pyrene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
Benzyl Alcohol	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Bis (2-chloroethoxy) methane	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Bis (2-chloroethyl) Ether	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Bis (2-chloroisopropyl) Ether (2,2'Oxybis(1-chloropropane)	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D

Parameter/Analyte	WY Storage Tank Program	Non-Potable Water	Solid Hazardous Waste (Water)	Solid Hazardous Waste (Solid)
Bis (2-ethylhexyl) Phthalate	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
4-Bromophenyl Phenyl Ether	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Butyl Benzyl Phthalate	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2-sec-Butyl-4,6-Dinitrophenol	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Carbazole	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
4-Chloroanilene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Chlorobenzilate	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
4-Chloro-3-Methylphenol	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
1-Chloronaphthalene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2-Chloronaphthalene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2-Chlorophenol	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
4-Chlorophenyl Phenyl Ether	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Chrysene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
Cresols	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Diallate	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Dibenzo (a,h) Anthracene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
Dibenzofuran	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
1,2-Dichlorobenzene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
1,3-Dichlorobenzene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
1,4-Dichlorobenzene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
3,3'-Dichlorobenzidine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2,4-Dichlorophenol	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2,6-Dichlorophenol	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Diethyl phthalate	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Dimethoate	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
3,3-Dimethylbenzidine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D

Parameter/Analyte	WY Storage Tank Program	Non-Potable Water	Solid Hazardous Waste (Water)	Solid Hazardous Waste (Solid)
p-Dimethylaminoazobenzene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
7,12-Dimethylbenz(a)anthracene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Alpha-,alpha-Dimethylphenethylamine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2,4-Dimethylphenol	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Dimethyl Phthalate	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Di-n-Butyl Phthalate	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Di-n-Octyl Phthalate	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
1,3-Dinitrobenzene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
1,4-Dinitrobenzene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2,4-Dinitrophenol	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2,4-Dinitrotoluene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2,6-Dinitrotoluene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
1,4-Dioxane	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Diphenylamine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
1,2-Diphenylhydrazine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Disulfoton	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Diesel Range Organics (DRO)	EPA 8015C	----------------------	EPA 8015B / 8015C, AK102, TX 1005 / 8015D / OK DEQ DRO	EPA 8015B / 8015C, AK102, TX 1005 / 8015D / OK DEQ DRO
Ethyl Methanesulfonate	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Famphur	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Fluoroanthene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
Fluorene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
Gasoline Range Organics	----------------------	----------------------	TX 1005 / OK DEQ GRO	TX 1005 / OK DEQ GRO
Hexachlorobenzene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Hexachlorobutadiene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Hexachlorocyclopentadiene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D

Parameter/Analyte	WY Storage Tank Program	Non-Potable Water	Solid Hazardous Waste (Water)	Solid Hazardous Waste (Solid)
Hexachloroethane	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Hexachloropropene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Indeno (1,2,3-cd) Pyrene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
Isodrin	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Isophorone	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Isosafrole	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Methapyrilene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
3-Methylcholanthrene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2-Methyl-4,6-Dinitrophenol	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Methyl Methane Sulfonate	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2-Methylcholanthrene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
1-Methylnaphthalene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
2-Methylnaphthalene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
2-Methylphenol	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
3+4-Methylphenol	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Naphthalene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
1,4-Naphthoquinone	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
1-Naphthylamine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2-Naphthylamine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2-Nitroaniline	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
3-Nitroaniline	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
4-Nitroaniline	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Nitrobenzene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2-Nitrophenol	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
4-Nitrophenol	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Nitroquinoline-1-Oxide	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D

Parameter/Analyte	WY Storage Tank Program	Non-Potable Water	Solid Hazardous Waste (Water)	Solid Hazardous Waste (Solid)
N-Nitrosodiethylamine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
N-Nitrosodimethylamine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
N-Nitrosodi-n-Butylamine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
N-Nitrosodi-n-Propylamine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
N-Nitrosodiphenylamine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
N-Nitrosomethylethylamine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
N-Nitrosomorpholine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
N-Nitrosopiperidine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
N-Nitrosopyrrolidine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
5-Nitro-o-Toluidine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2,2-oxybis(1-chloropropane)	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Parathion, Methyl	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Parathion, Ethyl	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Pentachlorobenzene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Pentachloroethane	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Pentachloronitobenzene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Pentachlorophenol	----------------------	----------------------	EPA 8270C / 8270D / 8321A / 8321B	EPA 8270C / 8270D / 8321A / 8321B
Phenacetin	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Phenanthrene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
Phenol	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Phorate	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2-Picoline	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Pronamide	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Pyrene	----------------------	----------------------	EPA 8270C / 8270D / 8270SIM	EPA 8270C / 8270D / 8270SIM
Pyridine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D

Parameter/Analyte	WY Storage Tank Program	Non-Potable Water	Solid Hazardous Waste (Water)	Solid Hazardous Waste (Solid)
Safrole	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Sulfotepp	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
1,2,4,5-Tetrachlorobenzene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2,3,4,6-Tetrachlorophenol	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Thionazin	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
o-Toluidine	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
1,2,4-Trichlorobenzene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2,4,5-Trichlorophenol	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
2,4,6-Trichlorophenol	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
o,o,o-Triethyl Phosphorothioate	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
1,3,5-Trinitrobenzene	----------------------	----------------------	EPA 8270C / 8270D	EPA 8270C / 8270D
Motor Oil (Residual Range Organics)	----------------------	----------------------	EPA 8015B / 8015C, AK103 / OK DEQ RRO	EPA 8015B / 8015C, AK103 / OK DEQ RRO
Pesticides/Herbicides/PCBs				
Aldrin	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
Atrazine	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Azinophos ethyl	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Azinophos methyl	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
alpha-BHC	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
beta-BHC	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
delta-BHC	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
gamma-BHC	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
Bolstar	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
alpha-Chlordane	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
gamma-Chlordane	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
Chlordane (technical)	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B

Parameter/Analyte	WY Storage Tank Program	Non-Potable Water	Solid Hazardous Waste (Water)	Solid Hazardous Waste (Solid)
Chloropyrifos	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Coumaphos	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
2,4-D	----------------------	----------------------	EPA 8151A / 8321A	EPA 8151A /8321A
Dalapon	----------------------	----------------------	EPA 8151A / 8321A	EPA 8151A / 8321A
2,4-DB	----------------------	----------------------	EPA 8151A / 8321A	EPA 8151A / 8321A
4,4'-DDD	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
4,4'-DDE	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
4,4'-DDT	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
Demeton-O	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Demeton-S	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Demeton, total	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Diazinon	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Dicamba	----------------------	----------------------	EPA 8151A / 8321A	EPA 8151A / 8321A
Dichlorovos	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Dichloroprop	----------------------	----------------------	EPA 8151A / 8321A	EPA 8151A / 8321A
Dieldrin	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
Dimethoate	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Dinoseb	----------------------	----------------------	EPA 8151A / 8321A	EPA 8321A
Disulfoton	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Endosulfan I	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
Endosulfan II	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
Endonsulfan sulfate	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
Endrin	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
Endrin aldehyde	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
Endrin ketone	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
EPN	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B

Parameter/Analyte	WY Storage Tank Program	Non-Potable Water	Solid Hazardous Waste (Water)	Solid Hazardous Waste (Solid)
Ethoprop	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Ethyl Parathion	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Famphur	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Fensulfothion	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Fenthion	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Heptachlor	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
Heptachlor Epoxide	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
Hexachlorobenzene	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
Malathion	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
MCPA	----------------------	----------------------	EPA 8151A / 8321A	EPA 8151A / 8321A
MCPP	----------------------	----------------------	EPA 8151A / 8321A	EPA 8151A / 8321A
Merphos	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Methoxychlor	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
Methyl parathion	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Mevinphos	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Naled	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
PCB-1016 (Arochlor)	----------------------	----------------------	EPA 8082 / 8082A	EPA 8082 / 8082A
PCB-1221	----------------------	----------------------	EPA 8082 / 8082A	EPA 8082 / 8082A
PCB-1232	----------------------	----------------------	EPA 8082 / 8082A	EPA 8082 / 8082A
PCB-1242	----------------------	----------------------	EPA 8082 / 8082A	EPA 8082 / 8082A
PCB-1248	----------------------	----------------------	EPA 8082 / 8082A	EPA 8082 / 8082A
PCB-1254	----------------------	----------------------	EPA 8082 / 8082A	EPA 8082 / 8082A
PCB-1260	----------------------	----------------------	EPA 8082 / 8082A	EPA 8082 / 8082A
PCB-1262	----------------------	----------------------	EPA 8082 / 8082A	EPA 8082 / 8082A
PCB-1268	----------------------	----------------------	EPA 8082 / 8082A	EPA 8082 / 8082A
Phorate	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Phosmet	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Propazine	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Ronnel	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Simazine	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B

Parameter/Analyte	WY Storage Tank Program	Non-Potable Water	Solid Hazardous Waste (Water)	Solid Hazardous Waste (Solid)
Stirophos	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Sulfotepp	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
2,4,5-T	----------------------	----------------------	EPA 8151A / 8321A	EPA 8151A / 8321A
Thionazin	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Tokuthion	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
2,4,5-TP	----------------------	----------------------	EPA 8151A / 8321A	EPA 8151A / 8321A
Toxaphene	----------------------	----------------------	EPA 8081A / 8081B	EPA 8081A / 8081B
Trichloronate	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
o,o,o-Triethylphos Phorothioate	----------------------	----------------------	EPA 8141A / 8141B	EPA 8141A / 8141B
Explosives				
1,3,5-Trinitrobenzene	----------------------	----------------------	EPA 8330A / 8330B / 8321A / 8321B	EPA 8330A / 8330B / 8321A / 8321B
1,3-Dinitrobenzene	----------------------	----------------------	EPA 8330A / 8330B / 8321A / 8321B	EPA 8330A / 8330B / 8321A / 8321B
2,4,6-Trinitrotoluene	----------------------	----------------------	EPA 8330A / 8330B / 8321A / 8321B	EPA 8330A / 8330B / 8321A / 8321B
3,5-Dinitroaniline	----------------------	----------------------	EPA 8330B	EPA 8330B
2,4-Dinitrotoluene	----------------------	----------------------	EPA 8330A / 8330B / 8321A / 8321B	EPA 8330A / 8330B / 8321A / 8321B
2,6-Dinitroltoluene	----------------------	----------------------	EPA 8330A / 8330B / 8321A / 8321B	EPA 8330A / 8330B / 8321A / 8321B
2-Amino-4,6-Dinitrotoluene	----------------------	----------------------	EPA 8330A / 8330B / 8321A / 8321B	EPA 8330A / 8330B / 8321A / 8321B
2-Nitrotoluene	----------------------	----------------------	EPA 8330A / 8330B / 8321A / 8321B	EPA 8330A / 8330B / 8321A / 8321B
3-Nitrotoluene	----------------------	----------------------	EPA 8330A / 8330B / 8321A / 8321B	EPA 8330A / 8330B / 8321A / 8321B
4-Amino-2,6-Dinitrotoluene	----------------------	----------------------	EPA 8330A / 8330B / 8321A / 8321B	EPA 8330A / 8330B / 8321A / 8321B
4-Nitrotoluene	----------------------	----------------------	EPA 8330A / 8330B / 8321A / 8321B	EPA 8330A / 8330B / 8321A / 8321B

Parameter/Analyte	WY Storage Tank Program	Non-Potable Water	Solid Hazardous Waste (Water)	Solid Hazardous Waste (Solid)
Nitrobenzene	----------------------	----------------------	EPA 8330A / 8330B / 8321A / 8321B	EPA 8330A / 8330B / 8321A / 8321B
Nitroglycerin	----------------------	----------------------	EPA 8330A / 8330B / 8321A / 8321B	EPA 8330A / 8330B / 8321A / 8321B
Octahydro-1,3,5,7-Tetrabitro-1,3,5,7-Tetrazocine (HMX)	----------------------	----------------------	EPA 8330A / 8330B / 8321A / 8321B	EPA 8330A / 8330B / 8321A / 8321B
Pentaerythritoltetranitrate (PETN)	----------------------	----------------------	EPA 8330A / 8330B / 8321A / 8321B	EPA 8330A / 8330B / 8321A / 8321B
Picric acid	----------------------	----------------------	EPA 8330A / 8330B / 8321A / 8321B	EPA 8330A / 8330B / 8321A / 8321B
RDX (Hexahydro-1,3,5-Trinitro-1,3,5-Triazine)	----------------------	----------------------	EPA 8330A / 8330B / 8321A / 8321B	EPA 8330A / 8330B / 8321A / 8321B
Tetryl (Methyl 2,4,6-Trinitrophenylnitramine	----------------------	----------------------	EPA 8330A / 8330B / 8321A / 8321B	EPA 8330A / 8330B / 8321A / 8321B
Perfluorinated Hydrocarbons (PFCs) and Perfluorinated Sulfonates (PFSs)				
Perfluorobutanoic Acid	----------------------	SOP DV-LC-0012	SOP DV-LC-0012	SOP DV-LC-0012
Perfluoropentanoic Acid	----------------------	SOP DV-LC-0012	SOP DV-LC-0012	SOP DV-LC-0012
Perfluorohexanoic Acid	----------------------	SOP DV-LC-0012	SOP DV-LC-0012	SOP DV-LC-0012
Perfluoroheptanoic Acid	----------------------	SOP DV-LC-0012	SOP DV-LC-0012	SOP DV-LC-0012
Perfluorooctanoic Acid	----------------------	SOP DV-LC-0012	SOP DV-LC-0012	SOP DV-LC-0012
Perfluorononanoic Acid	----------------------	SOP DV-LC-0012	SOP DV-LC-0012	SOP DV-LC-0012
Perfluorodecanoic Acid	----------------------	SOP DV-LC-0012	SOP DV-LC-0012	SOP DV-LC-0012
Perfluoroundecanoic Acid	----------------------	SOP DV-LC-0012	SOP DV-LC-0012	SOP DV-LC-0012
Perfluorododecanoic Acid	----------------------	SOP DV-LC-0012	SOP DV-LC-0012	SOP DV-LC-0012
Perfluorotridecanoic Acid	----------------------	SOP DV-LC-0012	SOP DV-LC-0012	SOP DV-LC-0012
Perfluorotetradecanoic Acid	----------------------	SOP DV-LC-0012	SOP DV-LC-0012	SOP DV-LC-0012
Perfluorobutane Sulfonate	----------------------	SOP DV-LC-0012	SOP DV-LC-0012	SOP DV-LC-0012
Perfluorohexane Sulfonate	----------------------	SOP DV-LC-0012	SOP DV-LC-0012	SOP DV-LC-0012
Perfluorooctane Sulfonate	----------------------	SOP DV-LC-0012	SOP DV-LC-0012	SOP DV-LC-0012
Perfluorodecane Sulfonate	----------------------	SOP DV-LC-0012	SOP DV-LC-0012	SOP DV-LC-0012
Perfluorooctane Sulfonamide	----------------------	SOP DV-LC-0012	SOP DV-LC-0012	SOP DV-LC-0012
Hazardous Waste Characteristics				
Conductivity	----------------------	----------------------	EPA 9050A	EPA 9050A
Corrosivity	----------------------	----------------------	EPA 9040B	9045C
Ignitibility	----------------------	EPA 1010/EPA 1010A	EPA 1010 / 1010A	EPA 1010 / 1010A
Paint Filter Liquids Test	----------------------	----------------------	EPA 9095A	EPA 9095A
Synthetic Precipitation Leaching Procedure (SPLP)	----------------------	----------------------	EPA 1312	EPA 1312

Parameter/Analyte	WY Storage Tank Program	Non-Potable Water	Solid Hazardous Waste (Water)	Solid Hazardous Waste (Solid)
Toxicity Characteristic Leaching Procedure	----------------------	----------------------	EPA 1311	EPA 1311
Organic Prep Methods				
Separatory Funnel Liquid-Liquid Extraction	----------------------	----------------------	EPA 3510C	-----------------------
Continuous Liquid-Liquid Extraction	----------------------	----------------------	EPA 3520C	-----------------------
Soxhlet Extraction	----------------------	----------------------	-----------------------	EPA 3540C
Microwave Extraction	----------------------	----------------------	-----------------------	EPA 3546
Ultrasonic Extraction	----------------------	----------------------	-----------------------	EPA 3550B
Ultrasonic Extraction	----------------------	----------------------	-----------------------	EPA 3550C
Waste Dilution	----------------------	----------------------	EPA 3580A	EPA 3580A
Solid Phase Extraction Volatiles Purge and trap Volatiles Purge and Trap for Soils	----------------------	----------------------	EPA 3535A EPA 5030B	EPA 5030B EPA 5035
Organic Cleanup Procedures				
Florisil Cleanup	----------------------	----------------------	EPA 3620B	EPA 3620B
Florisil Cleanup	----------------------	----------------------	EPA 3620C	EPA 3620C
Sulfur Cleanup	----------------------	----------------------	EPA 3660B	EPA 3660B
Sulfuric Acid/Permanganate Cleanup	----------------------	----------------------	EPA 3665A	EPA 3665A
Metals Digestion				
Acid Digestion Total Recoverable or Dissolved Metals	----------------------	----------------------	EPA 3005A	----------------------
Acid Digestion for Total Metals	----------------------	----------------------	EPA 3010A	----------------------
Acid Digestion for Total Metals	----------------------	----------------------	EPA 3020A	----------------------
Acid Digestion of Sediments, Sludges and Soils	----------------------	----------------------	----------------------	EPA 3050B

American Association for Laboratory Accreditation

Accredited DoD ELAP Laboratory

A2LA has accredited

TESTAMERICA DENVER

Arvada, CO

for technical competence in the field of

Environmental Testing

In recognition of the successful completion of the A2LA evaluation process that includes an assessment of the laboratory's compliance with ISO/IEC 17025:2005, the 2003 NELAC Chapter 5 Standard, and the requirements of the Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP) as detailed in version 4.2 of the DoD Quality System Manual for Environmental Laboratories (QSM); accreditation is granted to this laboratory to perform recognized EPA methods as defined on the associated A2LA Environmental Scope of Accreditation. This accreditation demonstrates technical competence for this defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

Presented this 5th day of November 2013.

President & CEO
For the Accreditation Council
Certificate Number 2907.01
Valid to October 31, 2015

For the tests to which this accreditation applies, please refer to the laboratory's Environmental Scope of Accreditation.

LABORATORY ACCREDITATION BUREAU®

DoD ELAP®

Certificate of Accreditation

ISO/IEC 17025:2005 Certificate Number L2236

TestAmerica Laboratories, Inc.

5755 8th Street East
Tacoma WA 98424

has met the requirements set forth in L-A-B's policies and procedures, all requirements of ISO/IEC 17025:2005 "General Requirements for the competence of Testing and Calibration Laboratories" and the U.S. Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP).*

The accredited lab has demonstrated technical competence to a defined "Scope of Accreditation" and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

Accreditation valid through: January 19, 2016

R. Douglas Leonard, Jr., President, COO
Laboratory Accreditation Bureau
Presented the 23rd of May 2013

*See the laboratory's Scope of Accreditation for details of accredited parameters
**Laboratory Accreditation Bureau is found to be in compliance with ISO/IEC 17011:2004 and recognized by ILAC (International Laboratory Accreditation Cooperation) and NACLA (National Cooperation for Laboratory Accreditation).

LABORATORY ACCREDITATION BUREAU

Certificate # L2236

Scope of Accreditation
For
TestAmerica Laboratories, Inc.

5755 8th Street East
Tacoma, WA 98424
Terri Torres
253-922-2310

In recognition of a successful assessment to ISO/IEC 17025:2005 and the requirements of the DoD Environmental Laboratory Accreditation Program (DoD ELAP) as detailed in the DoD Quality Systems Manual for Environmental Laboratories (DoD QSM v4.2) based on the National Environmental Laboratory Accreditation Conference Chapter 5 Quality Systems Standard (NELAC Voted Revision June 5, 2003), accreditation is granted to TestAmerica Laboratories, Inc. to perform the following tests:

Accreditation granted through: **January 19, 2016**

Testing - Environmental

Non-Potable Water		
Technology	**Method**	**Analyte**
ICP-AES	EPA 6010B/6010C/200.7	Silver
ICP-AES	EPA 6010B/6010C/200.7	Aluminum
ICP-AES	EPA 6010B/6010C/200.7	Arsenic
ICP-AES	EPA 6010B/6010C/200.7	Boron
ICP-AES	EPA 6010B/6010C/200.7	Barium
ICP-AES	EPA 6010B/6010C/200.7	Beryllium
ICP-AES	EPA 6010B/6010C/200.7	Calcium
ICP-AES	EPA 6010B/6010C/200.7	Cadmium
ICP-AES	EPA 6010B/6010C/200.7	Cobalt
ICP-AES	EPA 6010B/6010C/200.7	Chromium
ICP-AES	EPA 6010B/6010C/200.7	Copper
ICP-AES	EPA 6010B/6010C/200.7	Iron
ICP-AES	EPA 6010B/6010C/200.7	Potassium
ICP-AES	EPA 6010B/6010C/200.7	Magnesium
ICP-AES	EPA 6010B/6010C/200.7	Manganese
ICP-AES	EPA 6010B/6010C/200.7	Molybdenum
ICP-AES	EPA 6010B/6010C/200.7	Sodium
ICP-AES	EPA 6010B/6010C/200.7	Nickel
ICP-AES	EPA 6010B/6010C/200.7	Lead
ICP-AES	EPA 6010B/6010C/200.7	Antimony
ICP-AES	EPA 6010B/6010C/200.7	Selenium
ICP-AES	EPA 6010B/6010C/200.7	Silicon
ICP-AES	EPA 6010B/6010C/200.7	Tin

Non-Potable Water		
Technology	**Method**	**Analyte**
ICP-AES	EPA 6010B/6010C/200.7	Titanium
ICP-AES	EPA 6010B/6010C/200.7	Strontium
ICP-AES	EPA 6010B/6010C/200.7	Thallium
ICP-AES	EPA 6010B/6010C/200.7	Vanadium
ICP-AES	EPA 6010B/6010C/200.7	Zinc
ICP-MS	EPA 6020/6020A/200.8	Silver
ICP-MS	EPA 6020/6020A/200.8	Arsenic
ICP-MS	EPA 6020/6020A/200.8	Barium
ICP-MS	EPA 6020/6020A/200.8	Beryllium
ICP-MS	EPA 6020/6020A/200.8	Cadmium
ICP-MS	EPA 6020/6020A/200.8	Cobalt
ICP-MS	EPA 6020/6020A/200.8	Chromium
ICP-MS	EPA 6020/6020A/200.8	Copper
ICP-MS	EPA 6020/6020A/200.8	Manganese
ICP-MS	EPA 6020/6020A/200.8	Molybdenum
ICP-MS	EPA 6020/6020A/200.8	Nickel
ICP-MS	EPA 6020/6020A/200.8	Lead
ICP-MS	EPA 6020/6020A/200.8	Antimony
ICP-MS	EPA 6020/6020A/200.8	Selenium
ICP-MS	EPA 6020/6020A/200.8	Thallium
ICP-MS	EPA 6020/6020A/200.8	Uranium
ICP-MS	EPA 6020/6020A/200.8	Vanadium
ICP-MS	EPA 6020/6020A/200.8	Zinc
CVAAS	EPA 7470A/245.1	Mercury
ICP-AES	EPA 7195/6010B	Hexavalent Chromium
GC/MS	EPA 8260B/8260C/624	1,1,1,2-Tetrachloroethane
GC/MS	EPA 8260B/8260C/624	1,1,1-Trichloroethane
GC/MS	EPA 8260B/8260C/624	1,1,2,2-Tetrachloroethane
GC/MS	EPA 8260B/8260C/624	1,1,2-Trichloroethane
GC/MS	EPA 8260B/8260C/624	1,1-Dichloroethane
GC/MS	EPA 8260B/8260C/624	1,1-Dichloroethene
GC/MS	EPA 8260B/8260C/624	1,1-Dichloropropene
GC/MS	EPA 8260B/8260C/624	1,2,3-Trichlorobenzene
GC/MS	EPA 8260B/8260C/624	1,2,3-Trichloropropane
GC/MS	EPA 8260B/8260C/624	1,2,4-Trichlorobenzene
GC/MS	EPA 8260B/8260C/624	1,2,4-Trimethylbenzene
GC/MS	EPA 8260B/8260C/624	1,2-Dibromo-3-Chloropropane
GC/MS	EPA 8260B/8260C/624	1,2-Dichlorobenzene
GC/MS	EPA 8260B/8260C/624	1,2-Dichloroethane
GC/MS	EPA 8260B/8260C/624	1,2-Dichloropropane
GC/MS	EPA 8260B/8260C/624	1,3,5-Trimethylbenzene
GC/MS	EPA 8260B/8260C/624	1,3-Dichloropropane

Non-Potable Water

Technology	Method	Analyte
GC/MS	EPA 8260B/8260C/624	1,4-Dichlorobenzene
GC/MS	EPA 8260B/8260C/624	2,2-Dichloropropane
GC/MS	EPA 8260B/8260C/624	2-Chloroethylvinylether
GC/MS	EPA 8260B/8260C/624	2-Chlorotoluene
GC/MS	EPA 8260B/8260C/624	2-Hexanone
GC/MS	EPA 8260B/8260C/624	4-Chlorotoluene
GC/MS	EPA 8260B/8260C/624	4-Isopropyltoluene
GC/MS	EPA 8260B/8260C/624	Acetone
GC/MS	EPA 8260B/8260C/624	Acetonitrile
GC/MS	EPA 8260B/8260C/624	Acrolein
GC/MS	EPA 8260B/8260C/624	Acrylonitrile
GC/MS	EPA 8260B/8260C/624	Benzene
GC/MS	EPA 8260B/8260C/624	Bromobenzene
GC/MS	EPA 8260B/8260C/624	Bromodichloromethane
GC/MS	EPA 8260B/8260C/624	Bromoform
GC/MS	EPA 8260B/8260C/624	Bromomethane
GC/MS	EPA 8260B/8260C/624	Carbon disulfide
GC/MS	EPA 8260B/8260C/624	Carbon tetrachloride
GC/MS	EPA 8260B/8260C/624	Chlorobenzene
GC/MS	EPA 8260B/8260C/624	Chlorobromomethane
GC/MS	EPA 8260B/8260C/624	Chlorodibromomethane
GC/MS	EPA 8260B/8260C/624	Chloroethane
GC/MS	EPA 8260B/8260C/624	Chloroform
GC/MS	EPA 8260B/8260C/624	Chloromethane
GC/MS	EPA 8260B/8260C/624	cis-1,2-Dichloroethene
GC/MS	EPA 8260B/8260C/624	cis-1,3-Dichloropropene
GC/MS	EPA 8260B/8260C/624	Dibromomethane
GC/MS	EPA 8260B/8260C/624	Dichlorodifluoromethane
GC/MS	EPA 8260B/8260C/624	Ethylbenzene
GC/MS	EPA 8260B/8260C/624	Ethylene Dibromide
GC/MS	EPA 8260B/8260C/624	Hexachlorobutadiene
GC/MS	EPA 8260B/8260C/624	Isopropylbenzene
GC/MS	EPA 8260B/8260C/624	Methyl Ethyl Ketone
GC/MS	EPA 8260B/8260C/624	Methyl Isobutyl Ketone
GC/MS	EPA 8260B/8260C/624	Methyl tert-butyl ether
GC/MS	EPA 8260B/8260C/624	Methylene Chloride
GC/MS	EPA 8260B/8260C/624	m-Xylene & p-Xylene
GC/MS	EPA 8260B/8260C/624	Naphthalene
GC/MS	EPA 8260B/8260C/624	n-Butylbenzene
GC/MS	EPA 8260B/8260C/624	N-Propylbenzene
GC/MS	EPA 8260B/8260C/624	o-Xylene
GC/MS	EPA 8260B/8260C/624	sec-Butylbenzene

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/8260C/624	Styrene
GC/MS	EPA 8260B/8260C/624	tert-Butylbenzene
GC/MS	EPA 8260B/8260C/624	Tetrachloroethene
GC/MS	EPA 8260B/8260C/624	Toluene
GC/MS	EPA 8260B/8260C/624	trans-1,2-Dichloroethene
GC/MS	EPA 8260B/8260C/624	trans-1,3-Dichloropropene
GC/MS	EPA 8260B/8260C/624	Trichloroethene
GC/MS	EPA 8260B/8260C/624	Trichlorofluoromethane
GC/MS	EPA 8260B/8260C/624	Vinyl Acetate
GC/MS	EPA 8260B/8260C/624	Vinyl chloride
GC/MS	EPA 8270C/8270D/625	1-Methylnaphthalene
GC/MS	EPA 8270C/8270D/625	1,2,4-Trichlorobenzene
GC/MS	EPA 8270C/8270D/625	1,2-Dichlorobenzene
GC/MS	EPA 8270C/8270D/625	1,3-Dichlorobenzene
GC/MS	EPA 8270C/8270D/625	1,4-Dichlorobenzene
GC/MS	EPA 8270C/8270D/625	bis(2-chloroisopropyl)ether
GC/MS	EPA 8270C/8270D/625	2,3,4,6-Tetrachlorophenol
GC/MS	EPA 8270C/8270D/625	2,4,5-Trichlorophenol
GC/MS	EPA 8270C/8270D/625	2,4,6-Trichlorophenol
GC/MS	EPA 8270C/8270D/625	2,4-Dichlorophenol
GC/MS	EPA 8270C/8270D/625	2,4-Dimethylphenol
GC/MS	EPA 8270C/8270D/625	2,4-Dinitrophenol
GC/MS	EPA 8270C/8270D/625	2,4-Dinitrotoluene
GC/MS	EPA 8270C/8270D/625	2,6-Dinitrotoluene
GC/MS	EPA 8270C/8270D/625	2-Chloronaphthalene
GC/MS	EPA 8270C/8270D/625	2-Chlorophenol
GC/MS	EPA 8270C/8270D/625	2-Methylnaphthalene
GC/MS	EPA 8270C/8270D/625	2-Methylphenol
GC/MS	EPA 8270C/8270D/625	2-Nitroaniline
GC/MS	EPA 8270C/8270D/625	2-Nitrophenol
GC/MS	EPA 8270C/8270D/625	3 & 4 Methylphenol
GC/MS	EPA 8270C/8270D/625	3,3'-Dichlorobenzidine
GC/MS	EPA 8270C/8270D/625	3-Nitroaniline
GC/MS	EPA 8270C/8270D/625	4,6-Dinitro-2-methylphenol
GC/MS	EPA 8270C/8270D/625	4-Bromophenyl phenyl ether
GC/MS	EPA 8270C/8270D/625	4-Chloro-3-methylphenol
GC/MS	EPA 8270C/8270D/625	4-Chloroaniline
GC/MS	EPA 8270C/8270D/625	4-Chlorophenyl phenyl ether
GC/MS	EPA 8270C/8270D/625	4-Nitroaniline
GC/MS	EPA 8270C/8270D/625	4-Nitrophenol
GC/MS	EPA 8270C/8270D/625	Acenaphthene
GC/MS	EPA 8270C/8270D/625	Acenaphthylene

LABORATORY ACCREDITATION BUREAU

Certificate # L2236

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/8270D/625	Aniline
GC/MS	EPA 8270C/8270D/625	Anthracene
GC/MS	EPA 8270C/8270D/625	1,2-Diphenylhydrazine as Azobenzene
GC/MS	EPA 8270C/8270D/625	Benzo[a]anthracene
GC/MS	EPA 8270C/8270D/625	Benzo[a]pyrene
GC/MS	EPA 8270C/8270D/625	Benzo[b]fluoranthene
GC/MS	EPA 8270C/8270D/625	Benzo[g,h,i]perylene
GC/MS	EPA 8270C/8270D/625	Benzo[k]fluoranthene
GC/MS	EPA 8270C/8270D/625	Benzoic acid
GC/MS	EPA 8270C/8270D/625	Benzyl alcohol
GC/MS	EPA 8270C/8270D/625	Bis(2-chloroethoxy)methane
GC/MS	EPA 8270C/8270D/625	Bis(2-chloroethyl)ether
GC/MS	EPA 8270C/8270D/625	Bis(2-ethylhexyl) phthalate
GC/MS	EPA 8270C/8270D/625	Butyl benzyl phthalate
GC/MS	EPA 8270C/8270D/625	Carbazole
GC/MS	EPA 8270C/8270D/625	Chrysene
GC/MS	EPA 8270C/8270D/625	Dibenz(a,h)anthracene
GC/MS	EPA 8270C/8270D/625	Dibenzofuran
GC/MS	EPA 8270C/8270D/625	Diethyl phthalate
GC/MS	EPA 8270C/8270D/625	Dimethyl phthalate
GC/MS	EPA 8270C/8270D/625	Di-n-butyl phthalate
GC/MS	EPA 8270C/8270D/625	Di-n-octyl phthalate
GC/MS	EPA 8270C/8270D/625	Fluoranthene
GC/MS	EPA 8270C/8270D/625	Fluorene
GC/MS	EPA 8270C/8270D/625	Hexachlorobenzene
GC/MS	EPA 8270C/8270D/625	Hexachlorobutadiene
GC/MS	EPA 8270C/8270D/625	Hexachlorocyclopentadiene
GC/MS	EPA 8270C/8270D/625	Hexachloroethane
GC/MS	EPA 8270C/8270D/625	Indeno[1,2,3-cd]pyrene
GC/MS	EPA 8270C/8270D/625	Isophorone
GC/MS	EPA 8270C/8270D/625	Naphthalene
GC/MS	EPA 8270C/8270D/625	Nitrobenzene
GC/MS	EPA 8270C/8270D/625	N-Nitrosodimethylamine
GC/MS	EPA 8270C/8270D/625	N-Nitrosodi-n-propylamine
GC/MS	EPA 8270C/8270D/625	N-Nitrosodiphenylamine
GC/MS	EPA 8270C/8270D/625	Pentachlorophenol
GC/MS	EPA 8270C/8270D/625	Phenanthrene
GC/MS	EPA 8270C/8270D/625	Phenol
GC/MS	EPA 8270C/8270D/625	Pyrene
GC/MS	EPA 8270C/8270D/625	Pyridine

Non-Potable Water		
Technology	**Method**	**Analyte**
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	1-Methylnaphthalene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	2-Methylnaphthalene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Acenaphthene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Acenaphthylene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Anthracene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Benzo[a]anthracene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Benzo[a]pyrene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Benzo[b]fluoranthene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Benzo[g,h,i]perylene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Benzo[k]fluoranthene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Chrysene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Dibenz(a,h)anthracene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Fluoranthene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Fluorene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Indeno[1,2,3-cd]pyrene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Naphthalene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Phenanthrene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Pyrene
GC-ECD	EPA 8011/504.1	1,2-Dibromoethane
GC-ECD	EPA 8011/504.1	1,2-Dibromo-3-Chloropropane
GC-ECD	EPA 8081A/8081B/608	4,4'-DDD
GC-ECD	EPA 8081A/8081B/608	4,4'-DDE
GC-ECD	EPA 8081A/8081B/608	4,4'-DDT
GC-ECD	EPA 8081A/8081B/608	Aldrin
GC-ECD	EPA 8081A/8081B/608	alpha-BHC
GC-ECD	EPA 8081A/8081B/608	alpha-Chlordane
GC-ECD	EPA 8081A/8081B/608	beta-BHC

Non-Potable Water		
Technology	**Method**	**Analyte**
GC-ECD	EPA 8081A/8081B/608	delta-BHC
GC-ECD	EPA 8081A/8081B/608	Dieldrin
GC-ECD	EPA 8081A/8081B/608	Endosulfan I
GC-ECD	EPA 8081A/8081B/608	Endosulfan II
GC-ECD	EPA 8081A/8081B/608	Endosulfan sulfate
GC-ECD	EPA 8081A/8081B/608	Endrin
GC-ECD	EPA 8081A/8081B/608	Endrin aldehyde
GC-ECD	EPA 8081A/8081B/608	Endrin ketone
GC-ECD	EPA 8081A/8081B/608	gamma-BHC (Lindane)
GC-ECD	EPA 8081A/8081B/608	gamma-Chlordane
GC-ECD	EPA 8081A/8081B/608	Heptachlor
GC-ECD	EPA 8081A/8081B/608	Heptachlor epoxide
GC-ECD	EPA 8081A/8081B/608	Methoxychlor
GC-ECD	EPA 8081A/8081B/608	Technical Chlordane
GC-ECD	EPA 8081A/8081B/608	Toxaphene
GC-ECD	EPA 8082/8082A/608	PCB-1016
GC-ECD	EPA 8082/8082A/608	PCB-1221
GC-ECD	EPA 8082/8082A/608	PCB-1232
GC-ECD	EPA 8082/8082A/608	PCB-1242
GC-ECD	EPA 8082/8082A/608	PCB-1248
GC-ECD	EPA 8082/8082A/608	PCB-1254
GC-ECD	EPA 8082/8082A/608	PCB-1260
GC-ECD	EPA 8082/8082A/608	PCB-1262
GC-ECD	EPA 8082/8082A/608	PCB-1268
GC-IT/MS	EPA 8151A MOD	2,4,5-T
GC-IT/MS	EPA 8151A MOD	2,4-D
GC-IT/MS	EPA 8151A MOD	2,4-DB
GC-IT/MS	EPA 8151A MOD	4-Nitrophenol
GC-IT/MS	EPA 8151A MOD	Dalapon
GC-IT/MS	EPA 8151A MOD	Dicamba
GC-IT/MS	EPA 8151A MOD	Dichlorprop
GC-IT/MS	EPA 8151A MOD	Dinoseb
GC-IT/MS	EPA 8151A MOD	MCPA
GC-IT/MS	EPA 8151A MOD	Mecoprop
GC-IT/MS	EPA 8151A MOD	Pentachlorophenol
GC-IT/MS	EPA 8151A MOD	Silvex (2,4,5-TP)
GC-FID	EPA 8015B/AK101/ NWTPH-Gx/NWVPH	Gasoline and Volatile Petroleum Hydrocarbons
GC-FID	EPA 8015B/AK102/ NWTPH-Dx/NWEPH	Diesel and Extractable Petroleum Hydrocarbons
GC-FID	EPA 8015B/AK103/ NWTPH-Dx/NWEPH	Motor Oil and Extractable Petroleum Hydrocarbons

LABORATORY ACCREDITATION BUREAU

Certificate # L2236

Non-Potable Water		
Technology	**Method**	**Analyte**
Titration	EPA 310.1 / SM 2320B	Alkalinity
Colorimetric / RFA	EPA 353.2	Nitrate
Colorimetric / RFA	EPA 353.2	Nitrite
Colorimetric / RFA	EPA 353.2	Nitrate + Nitrite
Probe	EPA 405.1 / SM 5210B	BOD
Titration	EPA 410.1 / 410.2 / SM 5220C	COD
Colorimetric / RFA	SM 5220D 21st Ed	COD
Gravimetric	EPA 1664A	Oil & Grease
Colorimetric/RFA	9012A	Total Cyanides
Colorimetric	7196A	Hexavalent Chromium
Ion Chromatography	EPA 300.0/9056A	Bromide
Ion Chromatography	EPA 300.0/9056A	Chloride
Ion Chromatography	EPA 300.0/9056A	Fluoride
Ion Chromatography	EPA 300.0/9056A	Sulfate
Ion Chromatography	EPA 300.0/9056A	Nitrate
Ion Chromatography	EPA 300.0/9056A	Nitrite
TOC Analyzer (IR)	EPA 415.1/9060	TOC
Probe	EPA 9040/9045/150.1	pH
Conductivity meter	EPA 9050A/120.1 SM 2510B	Specific Conductance
Setaflash	EPA 1020	Flashpoint
Preparation	**Method**	**Type**
Separatory Funnel Liquid-Liquid Extraction	EPA 3510C	Semivolatile and Nonvolatile Organics
Continuous Liquid-Liquid Extraction	EPA 3520C	Semivolatile and Nonvolatile Organics
Purge and Trap	EPA 5030B	Volatile Organic Compounds
Acid Digestion (Aqueous)	EPA 3005A/3010A	Inorganics
TCLP Extraction	EPA 1311	Toxicity Characteristic Leaching Procedure
Florisil Cleanup	EPA 3620B	Cleanup of pesticide residues and other chlorinated hydrocarbons
Silica Gel Cleanup	EPA 3630C	Column Cleanup
Sulfur Cleanup	EPA 3660B	Sulfur Cleanup Reagent
Sulfuric Acid Cleanup	EPA 3665A	Cleanup for Quantization of PCBs

LABORATORY ACCREDITATION BUREAU

Certificate # L2236

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
ICP-AES	EPA 6010B/6010C	Silver
ICP-AES	EPA 6010B/6010C	Aluminum
ICP-AES	EPA 6010B/6010C	Arsenic
ICP-AES	EPA 6010B/6010C	Boron
ICP-AES	EPA 6010B/6010C	Barium
ICP-AES	EPA 6010B/6010C	Beryllium
ICP-AES	EPA 6010B/6010C	Calcium
ICP-AES	EPA 6010B/6010C	Cadmium
ICP-AES	EPA 6010B/6010C	Cobalt
ICP-AES	EPA 6010B/6010C	Chromium
ICP-AES	EPA 6010B/6010C	Copper
ICP-AES	EPA 6010B/6010C	Iron
ICP-AES	EPA 6010B/6010C	Potassium
ICP-AES	EPA 6010B/6010C	Magnesium
ICP-AES	EPA 6010B/6010C	Manganese
ICP-AES	EPA 6010B/6010C	Molybdenum
ICP-AES	EPA 6010B/6010C	Sodium
ICP-AES	EPA 6010B/6010C	Nickel
ICP-AES	EPA 6010B/6010C	Lead
ICP-AES	EPA 6010B/6010C	Antimony
ICP-AES	EPA 6010B/6010C	Selenium
ICP-AES	EPA 6010B/6010C	Silicon
ICP-AES	EPA 6010B/6010C	Tin
ICP-AES	EPA 6010B/6010C	Titanium
ICP-AES	EPA 6010B/6010C	Strontium
ICP-AES	EPA 6010B/6010C	Thallium
ICP-AES	EPA 6010B/6010C	Vanadium
ICP-AES	EPA 6010B/6010C	Zinc
ICP-MS	EPA 6020/6020A	Silver
ICP-MS	EPA 6020/6020A	Arsenic
ICP-MS	EPA 6020/6020A	Barium
ICP-MS	EPA 6020/6020A	Beryllium
ICP-MS	EPA 6020/6020A	Cadmium
ICP-MS	EPA 6020/6020A	Cobalt
ICP-MS	EPA 6020/6020A	Chromium
ICP-MS	EPA 6020/6020A	Copper
ICP-MS	EPA 6020/6020A	Manganese
ICP-MS	EPA 6020/6020A	Molybdenum
ICP-MS	EPA 6020/6020A	Nickel
ICP-MS	EPA 6020/6020A	Lead

LABORATORY ACCREDITATION BUREAU

Certificate # L2236

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
ICP-MS	EPA 6020/6020A	Antimony
ICP-MS	EPA 6020/6020A	Selenium
ICP-MS	EPA 6020/6020A	Thallium
ICP-MS	EPA 6020/6020A	Uranium
ICP-MS	EPA 6020/6020A	Vanadium
ICP-MS	EPA 6020/6020A	Zinc
CVAAS	EPA 7471A	Mercury
GC/MS	EPA 8260B/8260C	1,1,1,2-Tetrachloroethane
GC/MS	EPA 8260B/8260C	1,1,1-Trichloroethane
GC/MS	EPA 8260B/8260C	1,1,2,2-Tetrachloroethane
GC/MS	EPA 8260B/8260C	1,1,2-Trichloroethane
GC/MS	EPA 8260B/8260C	1,1-Dichloroethane
GC/MS	EPA 8260B/8260C	1,1-Dichloroethene
GC/MS	EPA 8260B/8260C	1,1-Dichloropropene
GC/MS	EPA 8260B/8260C	1,2,3-Trichlorobenzene
GC/MS	EPA 8260B/8260C	1,2,3-Trichloropropane
GC/MS	EPA 8260B/8260C	1,2,4-Trichlorobenzene
GC/MS	EPA 8260B/8260C	1,2,4-Trimethylbenzene
GC/MS	EPA 8260B/8260C	1,2-Dibromo-3-Chloropropane
GC/MS	EPA 8260B/8260C	1,2-Dichlorobenzene
GC/MS	EPA 8260B/8260C	1,2-Dichloroethane
GC/MS	EPA 8260B/8260C	1,2-Dichloropropane
GC/MS	EPA 8260B/8260C	1,3,5-Trimethylbenzene
GC/MS	EPA 8260B/8260C	1,3-Dichlorobenzene
GC/MS	EPA 8260B/8260C	1,3-Dichloropropane
GC/MS	EPA 8260B/8260C	1,4-Dichlorobenzene
GC/MS	EPA 8260B/8260C	2,2-Dichloropropane
GC/MS	EPA 8260B/8260C	2-Chlorotoluene
GC/MS	EPA 8260B/8260C	2-Hexanone
GC/MS	EPA 8260B/8260C	4-Chlorotoluene
GC/MS	EPA 8260B/8260C	4-Isopropyltoluene
GC/MS	EPA 8260B/8260C	Acetone
GC/MS	EPA 8260B/8260C	Acetonitrile
GC/MS	EPA 8260B/8260C	Acrolein
GC/MS	EPA 8260B/8260C	Acrylonitrile
GC/MS	EPA 8260B/8260C	Benzene
GC/MS	EPA 8260B/8260C	Bromobenzene
GC/MS	EPA 8260B/8260C	Bromodichloromethane
GC/MS	EPA 8260B/8260C	Bromoform
GC/MS	EPA 8260B/8260C	Bromomethane
GC/MS	EPA 8260B/8260C	Carbon disulfide

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8260B/8260C	Carbon tetrachloride
GC/MS	EPA 8260B/8260C	Chlorobenzene
GC/MS	EPA 8260B/8260C	Chlorobromomethane
GC/MS	EPA 8260B/8260C	Chlorodibromomethane
GC/MS	EPA 8260B/8260C	Chloroethane
GC/MS	EPA 8260B/8260C	Chloroform
GC/MS	EPA 8260B/8260C	Chloromethane
GC/MS	EPA 8260B/8260C	cis-1,2-Dichloroethene
GC/MS	EPA 8260B/8260C	cis-1,3-Dichloropropene
GC/MS	EPA 8260B/8260C	Dibromomethane
GC/MS	EPA 8260B/8260C	Dichlorodifluoromethane
GC/MS	EPA 8260B/8260C	Ethylbenzene
GC/MS	EPA 8260B/8260C	Ethylene Dibromide
GC/MS	EPA 8260B/8260C	Hexachlorobutadiene
GC/MS	EPA 8260B/8260C	Isopropylbenzene
GC/MS	EPA 8260B/8260C	Methyl Ethyl Ketone
GC/MS	EPA 8260B/8260C	Methyl Isobutyl Ketone
GC/MS	EPA 8260B/8260C	Methyl tert-butyl ether
GC/MS	EPA 8260B/8260C	Methylene Chloride
GC/MS	EPA 8260B/8260C	m-Xylene & p-Xylene
GC/MS	EPA 8260B/8260C	Naphthalene
GC/MS	EPA 8260B/8260C	n-Butylbenzene
GC/MS	EPA 8260B/8260C	N-Propylbenzene
GC/MS	EPA 8260B/8260C	o-Xylene
GC/MS	EPA 8260B/8260C	sec-Butylbenzene
GC/MS	EPA 8260B/8260C	Styrene
GC/MS	EPA 8260B/8260C	tert-Butylbenzene
GC/MS	EPA 8260B/8260C	Tetrachloroethene
GC/MS	EPA 8260B/8260C	Toluene
GC/MS	EPA 8260B/8260C	trans-1,2-Dichloroethene
GC/MS	EPA 8260B/8260C	trans-1,3-Dichloropropene
GC/MS	EPA 8260B/8260C	Trichloroethene
GC/MS	EPA 8260B/8260C	Trichlorofluoromethane
GC/MS	EPA 8260B/8260C	Vinyl Acetate
GC/MS	EPA 8260B/8260C	Vinyl chloride
GC/MS	EPA 8270C/8270D	1-Methylnaphthalene
GC/MS	EPA 8270C/8270D	1,2,4-Trichlorobenzene
GC/MS	EPA 8270C/8270D	1,2-Dichlorobenzene
GC/MS	EPA 8270C/8270D	1,3-Dichlorobenzene
GC/MS	EPA 8270C/8270D	1,4-Dichlorobenzene
GC/MS	EPA 8270C/8270D	bis(2-chloroisopropyl)ether
GC/MS	EPA 8270C/8270D	2,3,4,6-Tetrachlorophenol

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/8270D	2,4,5-Trichlorophenol
GC/MS	EPA 8270C/8270D	2,4,6-Trichlorophenol
GC/MS	EPA 8270C/8270D	2,4-Dichlorophenol
GC/MS	EPA 8270C/8270D	2,4-Dimethylphenol
GC/MS	EPA 8270C/8270D	2,4-Dinitrophenol
GC/MS	EPA 8270C/8270D	2,4-Dinitrotoluene
GC/MS	EPA 8270C/8270D	2,6-Dinitrotoluene
GC/MS	EPA 8270C/8270D	2-Chloronaphthalene
GC/MS	EPA 8270C/8270D	2-Chlorophenol
GC/MS	EPA 8270C/8270D	2-Methylnaphthalene
GC/MS	EPA 8270C/8270D	2-Methylphenol
GC/MS	EPA 8270C/8270D	2-Nitroaniline
GC/MS	EPA 8270C/8270D	2-Nitrophenol
GC/MS	EPA 8270C/8270D	3 & 4 Methylphenol
GC/MS	EPA 8270C/8270D	3,3'-Dichlorobenzidine
GC/MS	EPA 8270C/8270D	3-Nitroaniline
GC/MS	EPA 8270C/8270D	4,6-Dinitro-2-methylphenol
GC/MS	EPA 8270C/8270D	4-Bromophenyl phenyl ether
GC/MS	EPA 8270C/8270D	4-Chloro-3-methylphenol
GC/MS	EPA 8270C/8270D	4-Chloroaniline
GC/MS	EPA 8270C/8270D	4-Chlorophenyl phenyl ether
GC/MS	EPA 8270C/8270D	4-Nitroaniline
GC/MS	EPA 8270C/8270D	4-Nitrophenol
GC/MS	EPA 8270C/8270D	Acenaphthene
GC/MS	EPA 8270C/8270D	Acenaphthylene
GC/MS	EPA 8270C/8270D	Aniline
GC/MS	EPA 8270C/8270D	Anthracene
GC/MS	EPA 8270C/8270D	1,2-Diphenylhydrazine as Azobenzene
GC/MS	EPA 8270C/8270D	Benzo[a]anthracene
GC/MS	EPA 8270C/8270D	Benzo[a]pyrene
GC/MS	EPA 8270C/8270D	Benzo[b]fluoranthene
GC/MS	EPA 8270C/8270D	Benzo[g,h,i]perylene
GC/MS	EPA 8270C/8270D	Benzo[k]fluoranthene
GC/MS	EPA 8270C/8270D	Benzoic acid
GC/MS	EPA 8270C/8270D	Benzyl alcohol
GC/MS	EPA 8270C/8270D	Bis(2-chloroethoxy)methane
GC/MS	EPA 8270C/8270D	Bis(2-chloroethyl)ether
GC/MS	EPA 8270C/8270D	Bis(2-ethylhexyl) phthalate
GC/MS	EPA 8270C/8270D	Butyl benzyl phthalate
GC/MS	EPA 8270C/8270D	Carbazole
GC/MS	EPA 8270C/8270D	Chrysene

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS	EPA 8270C/8270D	Dibenz(a,h)anthracene
GC/MS	EPA 8270C/8270D	Dibenzofuran
GC/MS	EPA 8270C/8270D	Diethyl phthalate
GC/MS	EPA 8270C/8270D	Dimethyl phthalate
GC/MS	EPA 8270C/8270D	Di-n-butyl phthalate
GC/MS	EPA 8270C/8270D	Di-n-octyl phthalate
GC/MS	EPA 8270C/8270D	Fluoranthene
GC/MS	EPA 8270C/8270D	Fluorene
GC/MS	EPA 8270C/8270D	Hexachlorobenzene
GC/MS	EPA 8270C/8270D	Hexachlorobutadiene
GC/MS	EPA 8270C/8270D	Hexachlorocyclopentadiene
GC/MS	EPA 8270C/8270D	Hexachloroethane
GC/MS	EPA 8270C/8270D	Indeno[1,2,3-cd]pyrene
GC/MS	EPA 8270C/8270D	Isophorone
GC/MS	EPA 8270C/8270D	Naphthalene
GC/MS	EPA 8270C/8270D	Nitrobenzene
GC/MS	EPA 8270C/8270D	N-Nitrosodimethylamine
GC/MS	EPA 8270C/8270D	N-Nitrosodi-n-propylamine
GC/MS	EPA 8270C/8270D	N-Nitrosodiphenylamine
GC/MS	EPA 8270C/8270D	Pentachlorophenol
GC/MS	EPA 8270C/8270D	Phenanthrene
GC/MS	EPA 8270C/8270D	Phenol
GC/MS	EPA 8270C/8270D	Pyrene
GC/MS	EPA 8270C/8270D	Pyridine
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	2-Methylnaphthalene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Acenaphthene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Acenaphthylene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Anthracene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Benzo[a]anthracene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Benzo[a]pyrene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Benzo[b]fluoranthene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Benzo[g,h,i]perylene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Benzo[k]fluoranthene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Chrysene

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Dibenz(a,h)anthracene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Fluoranthene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Fluorene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Indeno[1,2,3-cd]pyrene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Naphthalene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Phenanthrene
GC/MS SIM	EPA 8270C SIM EPA 8270D SIM	Pyrene
GC-ECD	EPA 8081A/8081B	4,4'-DDD
GC-ECD	EPA 8081A/8081B	4,4'-DDE
GC-ECD	EPA 8081A/8081B	4,4'-DDT
GC-ECD	EPA 8081A/8081B	Aldrin
GC-ECD	EPA 8081A/8081B	alpha-BHC
GC-ECD	EPA 8081A/8081B	alpha-Chlordane
GC-ECD	EPA 8081A/8081B	beta-BHC
GC-ECD	EPA 8081A/8081B	delta-BHC
GC-ECD	EPA 8081A/8081B	Dieldrin
GC-ECD	EPA 8081A/8081B	Endosulfan I
GC-ECD	EPA 8081A/8081B	Endosulfan II
GC-ECD	EPA 8081A/8081B	Endosulfan sulfate
GC-ECD	EPA 8081A/8081B	Endrin
GC-ECD	EPA 8081A/8081B	Endrin aldehyde
GC-ECD	EPA 8081A/8081B	Endrin ketone
GC-ECD	EPA 8081A/8081B	gamma-BHC (Lindane)
GC-ECD	EPA 8081A/8081B	gamma-Chlordane
GC-ECD	EPA 8081A/8081B	Heptachlor
GC-ECD	EPA 8081A/8081B	Heptachlor epoxide
GC-ECD	EPA 8081A/8081B	Methoxychlor
GC-ECD	EPA 8081A/8081B	Technical Chlordane
GC-ECD	EPA 8081A/8081B	Toxaphene
GC-ECD	EPA 8082/8082A	PCB-1016
GC-ECD	EPA 8082/8082A	PCB-1221
GC-ECD	EPA 8082/8082A	PCB-1232
GC-ECD	EPA 8082/8082A	PCB-1242
GC-ECD	EPA 8082/8082A	PCB-1248
GC-ECD	EPA 8082/8082A	PCB-1254

LABORATORY ACCREDITATION BUREAU

Certificate # L2236

Solid and Chemical Materials		
Technology	**Method**	**Analyte**
GC-ECD	EPA 8082/8082A	PCB-1260
GC-ECD	EPA 8082/8082A	PCB-1262
GC-ECD	EPA 8082/8082A	PCB-1268
GC-IT/MS	EPA 8151A MOD	2,4,5-T
GC-IT/MS	EPA 8151A MOD	2,4-D
GC-IT/MS	EPA 8151A MOD	2,4-DB
GC-IT/MS	EPA 8151A MOD	4-Nitrophenol
GC-IT/MS	EPA 8151A MOD	Dalapon
GC-IT/MS	EPA 8151A MOD	Dicamba
GC-IT/MS	EPA 8151A MOD	Dichlorprop
GC-IT/MS	EPA 8151A MOD	Dinoseb
GC-IT/MS	EPA 8151A MOD	MCPA
GC-IT/MS	EPA 8151A MOD	Mecoprop MCPP
GC-IT/MS	EPA 8151A MOD	Pentachlorophenol
GC-IT/MS	EPA 8151A MOD	Silvex (2,4,5-TP)
GC-FID	EPA 8015B/AK101/ NWTPH-Gx/NWVPH	Gasoline and Volatile Petroleum Hydrocarbons
GC-FID	EPA 8015B/AK102/ NWTPH-Dx/NWEPH	Diesel and Extractable Petroleum Hydrocarbons
GC-FID	EPA 8015B/AK103/ NWTPH-Dx/NWEPH	Motor Oil and Extractable Petroleum Hydrocarbons
Colorimetric/RFA	EPA 9012A	Total Cyanides
Ion Chromatography	EPA 300.0/9056A	Bromide
Ion Chromatography	EPA 300.0/9056A	Chloride
Ion Chromatography	EPA 300.0/9056A	Fluoride
Ion Chromatography	EPA 300.0/9056A	Sulfate
Ion Chromatography	EPA 300.0/9056A	Nitrate
Ion Chromatography	EPA 300.0/9056A	Nitrite
TOC Analyzer (IR)	EPA 9060	TOC
Probe	EPA 9040/9045	pH/Corrosivity
Conductivity meter	EPA 9050A	Specific Conductance
Setaflash	EPA 1020	Flashpoint
Preparation	**Method**	**Type**
Separatory Funnel Liquid-Liquid Extraction	EPA 3510C	Semivolatile and Nonvolatile Organics
Continuous Liquid-Liquid Extraction	EPA 3520C	Semivolatile and Nonvolatile Organics

LABORATORY ACCREDITATION BUREAU

Certificate # L2236

Solid and Chemical Materials		
Microwave Extraction	EPA 3546	Semivolatile and Nonvolatile Organics
Ultrasonic Extraction	EPA 3550B	Semivolatile and Nonvolatile Organics
Solvent Dilution	EPA 3580A	Semivolatile and Nonvolatile Organics
Waste Dilution	EPA 3585	Volatile Organic Compounds
Purge and Trap	EPA 5030B	Volatile Organic Compounds
Purge and Trap	EPA 5035	Volatile Organic Compounds
Acid Digestion (Aqueous)	EPA 3005A/3010A	Inorganics
Acid Digestion (Sediments, Sludges, Soils)	EPA 3050B	Inorganics
TCLP Extraction	EPA 1311	Toxicity Characteristic Leaching Procedure
Florisil Cleanup	EPA 3620B	Cleanup of pesticide residues and other chlorinated hydrocarbons
Silica Gel Cleanup	EPA 3630C	Column Cleanup
Sulfur Cleanup	EPA 3660B	Sulfur Cleanup Reagent
Sulfuric Acid Cleanup	EPA 3665A	Cleanup for Quantitation of PCBs

This accreditation covers testing performed at the main laboratory listed above, and a mobile laboratory (VIN# 1GDJP32K0L3500707, License # GLF522) for the tests indicated below.

Solid and Chemical Materials		
Technology	**Method**	**Type**
GC-FID	AK102	Diesel and Extractable Petroleum Hydrocarbons
GC-FID	AK103	Motor Oil and Extractable Petroleum Hydrocarbons
Preparation	**Method**	**Type**
Ultrasonic Extraction	EPA 3550B	Semivolatile and Nonvolatile Organics
Silica Gel Cleanup	EPA 3630C	Column Cleanup

Notes:

1) This laboratory offers commercial testing service.

Approved by: ______________________
R. Douglas Leonard
Chief Technical Officer

Date: May 21, 2014

Re-Issued: 5/23/13 Revised: 5/21/14