US Army Corps of Engineers
Alaska District

Northeast Cape HTRW
Remedial Actions
Northeast Cape, St. Lawrence Island, Alaska
Site 28 Phase I Sediment
Removal Report
FUDS No. F10AK096903
Contract No. W911KB-12-C-0003

Revision 2

May 2013

F10AK096903_07.08_0504_a
200-1e

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ACRONYMS AND ABBREVIATIONS

′	minutes
°	degrees
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
AAC	Alaska Administrative Code
AC&WS	Aircraft Control and Warning Station
ADEC	Alaska Department of Environmental Conservation
bcy	bank cubic yards
Bristol	Bristol Environmental Remediation Services, LLC
BTEX	benzene, toluene, ethylbenzene, and xylenes
CDQR	Chemical Data Quality Report
COC	contaminant of concern
DRO	diesel range organics
DU	decision unit
FUDS	Formerly Used Defense Site
GRO	gasoline range organics
HDPE	high-density polyethylene
mg/kg	milligrams per kilogram
MI	*MULTI INCREMENT®*
MOC	Main Operations Complex
MS/MSD	matrix spike/matrix spike duplicate
NE Cape	Northeast Cape
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PDT	Project Delivery Team
POL	petroleum, oil or lubricants
QAR	Quality Assurance Representative
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
RRO	residual range organics

ACRONYMS AND ABBREVIATIONS (continued)

Suqi	Suqitughneq
TAH	total aromatic hydrocarbons
TAqH	total aqueous hydrocarbons
TCLP	Toxicity Characteristic Leaching Procedure
TestAmerica	TestAmerica Laboratories, Inc.
TOC	total organic carbon
USACE	US Army Corps of Engineers
USAF	U.S. Air Force
WACS	White Alice Communications System

1.0 INTRODUCTION

This Site 28 Phase I Sediment Removal Report presents the methods used for and results of removal activities performed in September 2012 at Site 28 of Northeast Cape (NE Cape), on Saint Lawrence Island, Alaska. Bristol Environmental Remediation Services, LLC (Bristol), performed the work for the US Army Corps of Engineers (USACE), Alaska District, under Contract No. W911KB-12-C-0003.

1.1 SITE HISTORY

Saint Lawrence Island is located in the Bering Sea, near the territorial waters of Russia, approximately 135 air miles southwest of Nome, Alaska, at 63 degrees (°) 20 minutes (′) north latitude and 168° 59′ west longitude (Figure 1). The project site, which originally encompassed 4,800 acres located near NE Cape, is between Kitnagak Bay to the northeast, Kangighsak Point to the northwest, and the Kinipaghulghat Mountains to the south (Figure 2). A U.S. Air Force (USAF) Aircraft Control and Warning Station (AC&WS) was constructed at the site during 1950 and 1951 and was activated in 1952. In 1954, the USAF constructed a White Alice Communications System (WACS) station, composed of four large parabolic antennas and a building housing the electronic equipment. The facility functioned as a surveillance station, providing radar coverage for the Alaskan Air Command and, later, for the North American Air Defense Command. It was part of an Alaska-wide early warning system constructed to reduce potential vulnerability to bomber attacks across the polar region.

The AC&WS and WACS operations ended in 1969 and 1972, respectively. The majority of the military personnel supporting those operations were reassigned from the NE Cape site by the end of 1969. The NE Cape buildings and the majority of furnishings and equipment were abandoned in place because of the high cost of off-island transport. In 2000, the White Alice Station was reclassified as a formerly used defense sites- (FUDS-)

eligible property, and the USACE included the area in the ongoing cleanup program for NE Cape.

1.2 PREVIOUS STUDIES AND ACTIONS AT NE CAPE

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. Remedial investigations (RIs) were initiated at NE Cape during the summer of 1994. Additional sampling was performed during subsequent investigations: Phase II RI (Montgomery Watson, 1996 and 1999); Phase III RI (Montgomery Watson Harza, 2003); and Phase IV RI (Shannon & Wilson, Inc., 2005). 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. Bristol Environmental & Engineering Services Corporation performed removal actions in both 2003 and 2005. In 2009, Bristol returned to the island to construct a landfill cap, remove petroleum, oil, and lubricants- (POL-) containing drums, and perform a chemical oxidation study. Bristol again returned to NE Cape during the summer of 2010 to excavate POL-contaminated soils from sites 1, 3, 6, and 32; to excavate polychlorinated biphenyl- (PCB-) contaminated soils from sites 13, 16, 21, and 31; to excavate arsenic-contaminated soils from Site 21; to cap the Site 9 landfill; and to continue monitoring Site 8 for natural attenuation. In 2011, Bristol excavated 8,091 tons of diesel range organics- (DRO-) contaminated soil from two areas within the Main Operations Complex (MOC), excavated 3,838 tons of PCB-contaminated soil from sites 13 and 31, and excavated 14.8 tons of arsenic-contaminated soil from Site 21. Extensive soil and sediment sampling was conducted in the Site 28 wetland, and additional samples were collected from Site 8 and from groundwater monitoring wells within the MOC. Thirty-four tons of metal and miscellaneous debris were also removed and disposed of during field activities in 2011.

2.0 SITE 28 DESCRIPTION AND BACKGROUND

The Site 28 drainage basin is located north of the MOC and drains north into the Suqitughneq (Suqi) River, as shown in Figure 3. This site contains variable surface features consisting of wetlands, rolling tundra, ponds, and flowing streams. The most significant sources of surface water are overland flow (runoff) from the MOC and from the ground in the form of seeps immediately north of the MOC gravel pad and periodically throughout the drainage basin. Two distinct sub-drainages containing feeder streams originating as seeps drain into the main stream approximately one-quarter of the way down the drainage. Surface water runoff, usually during and immediately following occasional rainfall events, can contribute significant amounts of water to the basin. The general area contains subsurface, discontinuous permafrost, which significantly impacts the appearance of surface topography.

Three distinct drainages originate from the upgradient MOC gravel pad and contribute flow to Site 28 (Figure 4). The eastern drainage flows from the area adjacent to sites 10 and 11, a vegetated area north of the former fuel tanks; the middle drainage originates from an area where a culvert that previously directed flow from Site 27 was removed during 2010 remedial actions and the western drainage is located downgradient of Site 13 (Figure 3). The western drainage originated from a manhole and a small, concrete supporting structure just north of the perimeter access road, which emptied into an artificially created swale. The manhole likely served as the drain leading from Building 110 (Heat and Electrical Power Building) at the MOC. In 2010, the concrete manhole structure was cleaned and removed. A 12-inch corrugated metal pipe, which attached to the manhole and continued upgradient toward the MOC, was cut and 63 feet of the pipe was removed. The open end of the pipe was then filled with bentonite and welded shut. In the middle drainage, another 12-inch corrugated metal pipe, measuring 32 feet in length, was completely removed.

Less than 55 gallons of sludge was contained inside the manhole. Using scoops and shovels, Bristol personnel donned appropriate personal protective equipment, including Tyvek coveralls and nitrile gloves, and transferred this material from the concrete manhole to an open-top 55-gallon drum for disposal. Sludge and concrete samples were collected from the manhole and sent to TestAmerica Laboratories, Inc. (TestAmerica), for analysis. Two field duplicate samples, 10NC28BW01 and 10NC28BW02, were collected from the drummed sludge that was removed from the Site 28 manhole. Samples 10NC28BW01 and 10NC28BW02 contained concentrations of lead at 5,000 milligrams per kilogram (mg/kg) and 1,900 mg/kg, respectively; and mercury at 15 mg/kg and 6.4 mg/kg, respectively. Applying the "Rule of 20", these lead concentrations exceed the limit at which the waste is considered hazardous. As a result of these high lead concentrations, the drum containing the sludge from Site 28 was manifested and disposed of as hazardous waste. Arsenic was detected in the sludge at 41 mg/kg and 40 mg/kg; barium at 820 mg/kg and 410 mg/kg; cadmium at 18 mg/kg in both samples; silver at 16 mg/kg and 9.6 mg/kg; Aroclor 1254 at 20 mg/kg and 23 mg/kg; and DRO at 100,000 mg/kg and 68,000 mg/kg, respectively. The PCB Aroclor that exceeded cleanup levels was Aroclor 1254, not Aroclor 1260, which is prevalent at Sites 13 and 31. The source of Aroclor 1254 is not known, but PCB samples from Site 16 also had Aroclor 1254 present in analytical samples.

Concrete samples were chipped out of the bottom of the Site 28 manhole and submitted to TestAmerica for metals and PCB analyses using a Toxicity Characteristic (TCLP) Procedure extraction method. Results for all analytes were below hazardous waste criteria.

Site 28 has been impacted by historical MOC bulk fuel releases, in addition to releases from other sources such as drainage from the heat and power plant's drain and manhole.

Soil staining has been observed near the head of the eastern drainage and at the former aboveground storage tank locations at Site 11. Sediments in the upper portion of the

Site 28 Drainage Basin have been described as stained, and they produce sheen when disturbed. Sampling activities occurred at the drainage basin between 1994 and 2001. Based on data available before 2011, the primary contaminants of concern (COCs) in soil and sediments are chromium, lead, zinc, PCBs, polynuclear aromatic hydrocarbons (PAHs), DRO, and residual range organics (RRO). The highest concentrations of contaminants are located proximal to the edge of the MOC gravel pad.

Surface water samples were collected from the drainage basin in 1994, 1996, and 2001. According to the Decision Document (USACE, 2009), concentrations of DRO, total recoverable petroleum hydrocarbons, PCBs, and lead exceeded cleanup levels in 1994. Surface water samples collected in 2001 were analyzed for DRO, RRO, and PCBs. The samples were not analyzed for lead. DRO was detected at concentrations ranging from 0.39 to 2.3 milligrams per liter. PCBs and RRO were not detected. Analytical results indicated that the most heavily contaminated surface waters of the drainage basin were found at the head of the western and middle drainages, located at the terminus of the former culverts.

Sediment and soil sampling was conducted by Bristol in 2011 along 11 transects placed between the upper end of Site 28 (near the MOC) and its confluence with the Suqi River to delineate the extent and magnitude of contamination at Site 28. Transect lines were placed to include areas of historical contamination and were analyzed to gain a general understanding of the potential contaminants throughout the drainage. This sampling event did not result in a full characterization of the drainage system. Results from the 2011 sampling event found contaminants that exceeded the Alaska Department of Environmental Conservation (ADEC) Method Two and site-specific cleanup levels presented in the 2009 Decision Document, including DRO, RRO, toluene, ethylbenzene, total xylenes, PAHs, PCBs, arsenic, cadmium, chromium, lead, and selenium. The Site 28

Technical Memorandum (Bristol Engineering Services Corporation, 2012) presents detailed information from the 2011 Site 28 investigation.

3.0 2012 SITE 28 MAPPING AND SAMPLING

Bristol performed a sediment mapping and sampling effort within the Site 28 Drainage Basin in July 2012. Sediment was defined as all loose material (mineral and organic) except for that which is actively growing vegetation or is part of the vegetative mat. The sediment mapping was conducted in two phases: during the first phase, streams and ponds in the drainage basin were visually and manually inspected to define the horizontal boundaries of the sediment areas; during the second phase, probing was conducted to determine the thickness of sediment and the composition of the underlying material in each sediment area. Approximately 400 cubic yards of sediment was mapped within the Site 28 drainage basin in 2012. After the mapping effort, 51 primary sediment samples and six duplicate samples were collected from the mapped sediment areas to delineate the extent and magnitude of contamination at the site. Analytical results from the sampling effort indicated that fuel, PCBs, and metal contamination was present within the drainage basin, and the highest contaminant concentrations were generally found adjacent to the MOC pad. Complete mapping and sampling procedures and results are presented in the Final Technical Memorandum Addendum prepared by Bristol (2012a).

The results of the mapping and sampling effort and comments to the Site 28 Technical Memorandum Addendum were discussed in a conference call between the ADEC, the USACE Project Delivery Team (PDT) and Bristol on September 7, 2012. The meeting minutes are presented in Appendix A of this report. The following items were discussed in the teleconference: the proposed field efforts for the Phase I Sediment removal; sediment migration mitigation; surface water sampling frequency and visual observation during removal actions; sediment removal depths; and post removal sediment sampling. The participants also discussed the two proposed removal methods, including excavation where sediments are reasonably accessible. Pre-removal sampling was also finalized for areas where sumps or impoundments were to be constructed, as well as post-removal

sampling at the same locations. The removal plan was tentatively approved via email by the ADEC to the USACE PDT on September 7, 2012. A copy of the approval is located in Appendix A.

4.0 2012 SITE 28 PHASE I SEDIMENT REMOVAL ACTIVITIES

Bristol was tasked to perform a Phase I sediment removal action based upon the results of the mapping and sampling effort. The sediment removal areas are described in Section 4.2. The volume of sediment scoped for removal during the 2012 Phase I removal effort was a maximum of 140 bank cubic yards (bcy). The purpose of the 2012 Phase I sediment removal activities was to remove contaminated sediments in accordance with the USACE Decision Document (2009) and to evaluate the efficacy of two proposed methods of sediment removal, specifically:

- The method that results in the most effective sediment dewatering (i.e., lowest moisture content following dewatering)
- The method that results in the lowest volume of water requiring treatment prior to on-site discharge
- The method that causes the least amount of suspended sediment during removal activities

Two sediment removal procedures were employed during the 2012 field season: the first was removal by an excavator; the second was a venturi dredge and geotextile dewatering tube combination, which is described in further detail in the following sections. Photographs of the 2012 Phase I sediment removal effort are presented in Appendix B. Field notes are presented in Appendix C.

4.1 SITE PREPARATION AND BASELINE SAMPLING

Work/staging areas and water containment areas, shown on Figure 5, were constructed prior to the Site 28 Phase I contaminated sediment removal.

MULTI INCREMENT® [1] (MI) soil samples were collected from all work and staging areas to establish baseline conditions before site disturbance. MI soil samples were collected in accordance with the Alaska Department of Environmental Conservation's Draft Guidance

[1] *MULTI INCREMENT®* is a registered trademark of EnviroStat, Inc.

on MI Soil Sampling, March 2009 (ADEC, 2009). Rectangular decision units (DUs) were constructed in the field using fiberglass measuring tapes. Each DU was subdivided into equally sized "increments" from which samples were collected. A dice roll determined the location within each increment where the sample was collected.

Each work area constituted a DU; since there were four work areas during the Phase I removal effort, a total of four DUs were created (Figure 6):

- The water processing area/work staging area DU was 150 feet by 60 feet, and 40 increments measuring 15 feet by 15 feet were sampled.
- The lower intermediate sump DU (Sump No. 1) was 50 feet by 60 feet, and 30 increments measuring 10 feet by 10 feet were sampled.
- The upper intermediate sump DU (Sump No. 2) was 50 feet by 60 feet, and 30 increments measuring 10 feet by 10 feet were sampled.
- The fourth DU was intended to be representative of the planned location of the third water containment area northeast of the main water processing area. The fourth DU was 105 feet by 105 feet, and 49 increments measuring 15 feet by 15 feet were sampled. Based on field conditions, the actual location of the third water containment area was placed less than 30 feet south of the DU.

MI soil samples were submitted to TestAmerica Laboratories, Inc., Tacoma, Washington, and analyzed for DRO/RRO, DRO/RRO with silica gel cleanup, total organic carbon (TOC), PAHs, PCBs, and Resource Conservation and Recovery Act (RCRA) 8 metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), plus nickel, vanadium, and zinc. Analytical results are discussed in Section 5.1 and presented in Table 1.

4.1.1 Water Processing Area

An existing gravel pad located on a topographically high section of ground to the west of the Site 28 drainage basin was prepared for use as a water processing area for the sediment dredging operations, as shown in Figure 5. This pad was also used as a construction/work area and equipment staging area for dredging supplies.

The water processing area consisted of two lined containment areas adjacent to each other, each measuring approximately 60 feet by 30 feet by 1.5 feet deep and with an approximate capacity of 20,000 gallons; Containment Area No. 1 was the primary containment area (untreated) and Containment Area No. 2 served as the secondary (treated) containment area. The primary containment area contained a geotextile dewatering tube for sediment dewatering. Geotextile dewatering tubes are woven geotextile sediment collection tubes designed to effectively separate water and sediment by containing the sediment while allowing water to pass through the pore spaces. The pore size on the sediment tubes ranges from 59 microns to 350 microns. Water in the primary containment area was treated by pumping the water through a scrubber into a secondary water impoundment area. Water-scrubbing material, consisting of a natural cellulose fiber that selectively absorbed hydrocarbons while repelling water, was loaded into high-density polyethylene (HDPE) containers with an inlet located at the top. Water from the primary containment was pumped through the inlet, allowed to percolate through the fibers, and drained through an outlet at the bottom of the container. Piping attached to the outlet of the water-scrubber directed the flow of water into the secondary water containment area. Water samples were collected from the primary and secondary containment areas. Sample 12NC28TWA01 was collected directly from the water treatment outlet pipe following treatment on September 19, 2012. Sample 12NC28TWA04 was taken directly from the treated water impoundment on September 20, 2012. Samples 12NC28TWA02 and 12NC28TWA03 (field duplicates) were collected from containment 1 (untreated) on the morning of September 19, 2012. The results for the treated and untreated water are presented in Table 2 of the report. Water was left in the secondary and tertiary containments over winter pending analytical results confirming that contaminant concentrations are in accordance with the State of Alaska Wastewater General Permit 2009DB0004 under discharge authorization 2009DB0004-

0216 (permits are included in Appendix D). Containment water sampling is further discussed in Section 4.1.4.

For future work in 2013, Bristol will add an inner, non-woven liner, with a pore size of approximately 130 microns to the inside of the geotextile dewatering tube. The water treatment and filtration system will consist of two sock filters with pore sizes as small as 5 microns.

During active dredging activities, a third lined containment area measuring approximately 25 feet by 25 feet was constructed near the main water-processing area. This containment area was built to hold additional treated water generated during dredging. The water that is being held in Containment Area No. 3 received the same level of treatment as the water held in Containment Area 2; the water was pumped first from Containment Area No. 1 through a scrubber and into Containment Area No. 2, and then ultimately into Containment Area No. 3 with no additional treatment. This allowed dredging to continue while waiting for analytical results from water samples collected from the primary and secondary water containment areas.

Water collected into the secondary and tertiary containments remains in the containments (containments 1 and 2) and will be assessed during the 2013 season. No water remains in the primary containment area to overwinter.

4.1.2 Intermediate Sumps

The elevation difference between the dredging operations at Removal Area 4 and the water processing area near the MOC is approximately 30 vertical feet. Because the pumps on site were not powerful enough to push the sediment/water mix from the dredging operations in Removal Area 4 to the containment area, two intermediate, lined sumps, Sump No. 1 and Sump No. 2 were constructed to serve as lift stations (Figure 5). The lower sump (Sump No. 1) dimensions were approximately 15 feet by 19 feet by 3 feet

deep, and the upper sump (Sump No. 2) dimensions were approximately 15 feet by 19 feet by 2.5 feet deep. Both of the two intermediate sumps had diaphragm pumps with a 3-inch intake and discharge on the uphill side of the sump. The dredged material was pumped from the sediment removal area to Sump No. 1, then pumped into Sump No. 2, and then pumped the rest of the way up the hill into a geotextile tube placed in the primary containment area. The intermediate sumps were left in place over the winter with a small amount of water inside the containment to hold the liner in place.

4.1.3 Controlling Migration of Sediment

Two methods were evaluated for controlling and minimizing downstream sediment migration in the Site 28 drainage during removal activities. These methods included an in-stream sediment trap and silt fencing. The sediment trap was chosen as an in-stream filtration method to deal with the constant flow that occurs in the drainage, and the silt fence was installed directly north of Removal Area 2 as a means of controlling sediment migration in intermittent sheet flow from this area.

The silt fencing was used north of Removal Area 2, in a location where there is no direct flow to the main channel of the Suqitughneq River. The silt fence was placed on the downstream (north) side of the ponded area. The fencing was placed to prevent migration of disturbed soil/sediment away from the area. No water migrated from the site during sediment removal; however, during high-water/storm conditions in this area, the silt fence directed the migration of suspended sediments away from the area.

The sediment trap was placed downstream of Removal Area 4. Initially the trap was put in place and filled with rolls of jute matting to act as a medium for sediment collection. The rolled jute mats were too tightly wrapped and water began to pool and flow around the trap. The jute rolls were removed and unrolled and then loosely placed inside of the sediment trap and placed upstream and downstream of the trap. The jute matting inside

and outside of the trap slowed down the water and allowed suspended particles to fall out of suspension in the trap.

The turbidity readings collected before, during, and after removal activities showed an increase in turbidity during dredging activities (Table 3). This increase could be due to many factors, including the short window between the time the sediment trap was installed and the dredging activity; the dredging activity; the weather conditions; or the disturbance of the water/sediment by the sampler during turbidity sample collection. Turbidity readings in all three post-dredging sample locations were lower than those collected before and during dredging activities, which indicates that the turbidity was affected by a variety of factors in addition to direct sediment removal activities. The nature of the surface waters in Removal Area 4 and the surface water downstream from Area 4 consist of a very low-energy environment. The wetland itself acts as a series of "check dams," which direct water in a stepwise fashion through a series of ponds that lead to the Suqitughneq River.

4.1.3.1 Sediment Trap

A sediment trap was placed downstream of the sediment removal areas (Figure 5) in consultation with the on-site USACE Quality Assurance Representative (QAR). The trap was manufactured on site and consisted of a welded steel box approximately 8 feet wide by 4 feet deep, with the rear height extending approximately 6 feet high and tapering down to a front section that was approximately 4 feet high. Rectangular slots, approximately 2 inches high by 10 inches wide, were cut in the lower half of the box to allow water to flow down and through the box.

The sediment trap was transported by excavator from the work pad to the section of creek immediately north of Area 4. At the chosen location, an excavation was made to place the trap, the trap was lowered in place, and backfill was placed around it. Once in place, the trap was filled with unrolled erosion-control mats. Earthen dams were made at a 45°

angle on the upstream face of the trap to funnel the water flow into the trap. Rolled and unrolled erosion-control mats were placed upstream and downstream of the sediment trap location for additional filtration. Photographs of the sediment trap placement are located in Appendix B. In 2013, a permeable geotextile fabric will be added to the sediment trap to provide an additional layer of filtration in conjunction with the jute matting.

4.1.4 Accessing Sediment

There were two methods used to access contaminated sediment. These methods included a floating Venturi dredge and an excavator.

The excavator method was employed in Removal areas 1 and 2, both areas located just off the edge of the pad of the MOC. The excavator worked best for this area because of its easy access to the removal areas. The benefit of this method included the ability to dewater removed sediment in place, which eliminated the collection of water and the subsequent treatment and sampling that would have occurred. The detriment of this method is that it can only be used in areas of firm ground which reduces its effectiveness in a large percentage of the drainage where soft ground and floating vegetative mat make up a large percentage of the site.

The Venturi dredge removal method was employed in removal Area 4, located in the main channel of the Site 28 drainage. The area is a relatively wide section of the creek where there is ponded water. The edge of the removal area consisted of shallow water with a dense floating vegetative mat. The benefit of this method is that the floating dredge can be used in areas where heavy equipment cannot, and the hose system can pump sediment and water removed from the drainage to higher ground. The main detriment encountered with the dredge is its utilization of large volumes of water to remove sediment. The dredge relies on water to remove and transport sediment. An area with a narrow and/or shallow stream channel may not have the capability of supplying an

adequate amount of water for dredge operations. In these cases, Bristol will have to create a temporary water containment from which the dredge can draw water for operations.

The two methods of sediment access both have their benefits. In 2013, both methods will be utilized in the removal action where applicable. The excavator will only be used in areas where heavy equipment can safely travel without the high likelihood of becoming inundated with water or causing significant damage to the tundra. The dredge will be used in all other removal areas. In areas where large volumes of water are not available, collapsible mobile water containments will be used.

4.1.5 Containment Water Sampling

Water samples were collected from the containments at the Site 28 work pad/water-processing area. One primary water sample was collected from the untreated water in the primary containment that contained the geotextile dewatering tubes, and two primary samples were collected from the treated water within Water Containment 2. Water Containment 3 was an overflow containment and it was not sampled because this was previously sampled water from containment areas 1 and 2.

Samples were collected directly into pre-cleaned containers provided by the laboratory. Water samples for the primary containment were collected by dipping bottles directly into standing containment water at a location approximately 15 feet away from the geotextile tube. Water samples from the secondary containment were collected from two hose outlets that discharged treated water from the primary containment into the secondary containment. Samples were submitted to SGS Environmental Services, Inc., in Anchorage, Alaska, and analyzed for gasoline range organics (GRO); benzene, toluene, ethylbenzene, and xylenes (BTEX); DRO; RRO; PAHs; PCBs; and total and dissolved metals (RCRA 8 Metals [arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver], plus nickel, vanadium, and zinc). Duplicate samples were collected at a rate of one per 10 samples, or 10 percent, and matrix spike/matrix spike duplicate (MS/MSD)

analyses samples were collected at a rate of one for every 20 primary samples, or 5 percent. Analytical results are discussed in Section 5.4.

4.2 SEDIMENT REMOVAL AREAS

Based on the results of the mapping and sampling effort conducted in July 2012, Bristol proposed four locations, Areas 1 through 4, for the removal of contaminated sediment during the Phase I Removal activities. Complete mapping and sampling results are presented in the Technical Memorandum Addendum (Bristol, 2012a). The proposed removal areas are shown in Figure 4.

Areas 1 and 2 were located immediately north of the MOC pad and consisted mainly of standing water surrounded by thick grasses (Figure 5). Sediment Removal Area 1 was located in the Western Drainage just off the MOC pad. Sediment Removal Area 2 was located in the Middle Drainage north of the MOC pad. During the 2012 season, an excavation to remove POL-contaminated soils at the MOC pad was opened to the immediate south of Removal Area 2. The POL excavation had been backfilled and excavation had ceased for the season during the sediment removal activities. The sediment removal method chosen for evaluation at Areas 1 and 2 was heavy equipment, specifically an excavator. Sediment removal in these two areas is described in Section 4.3.

The remaining two areas, Areas 3 and 4, were located in the Site 28 drainage basin north of the MOC (Figure 5). Area 3 consisted of a narrow, flowing stream channel approximately 500 feet north of the MOC pad. Area 4 was a ponded area north of Removal Area 3 in the Site 28 drainage basin. Area 4 was approximately 800 feet north of the MOC pad. The sediment removal method chosen for evaluation in Areas 3 and 4 was a venturi dredge.

Sediment removal in Area 4 is described in Section 4.4. Sediment removal did not occur in Area 3 during the 2012 field season due to time and weather constraints. Sediment removal activities in Area 3 will occur during the 2013 field season.

4.3 SEDIMENT REMOVAL WITH EXCAVATOR – AREA 1 AND AREA 2

Sediment Removal Area 1 and Sediment Removal Area 2 were excavated using a John Deere 450C excavator with a toothed bucket. The boundaries of the removal areas were marked with lath by surveyors from ECO-LAND, LLC, before sediment removal to guide the excavation.

In Area 1, approximately 5 cubic yards of contaminated sediment was excavated, placed into a rock truck, and temporarily placed on a lined area at Site 11 to dewater. In Area 2, approximately 16 cubic yards of contaminated sediment was removed and placed on the same lined area as the sediment removed from Area 1. Sediment volumes were approximated using both the number of excavator buckets removed and the space filled in the rock truck. The final limits of sediment removal in Areas 1 and 2 were surveyed by ECO-LAND, LLC, personnel and are depicted in Figure 5.

4.3.1 Sediment Confirmation Samples – Area 1 and Area 2

Sediment confirmation samples were collected from areas 1 and 2 after sediment removal. Two primary confirmation samples were collected from the excavation floor in Area 1, and two primary confirmation samples were collected from the excavation floor in Area 2 (Figure 6). Sample material was removed from the excavator bucket and placed into a stainless steel bowl and then placed into appropriate containers provided by the laboratory. Samples for volatile analyses were collected first by transferring approximately 20–25 grams of material into a tared 4-ounce container. Methanol preservative (provided by the laboratory) was immediately poured over the soil sample, and the container was sealed tightly. The remaining analyses were collected after the

volatile samples. Personnel wore new, disposable nitrile gloves for handling each sample. Confirmation sample locations were surveyed by ECO-LAND, LLC, personnel.

Samples were submitted to TestAmerica-Tacoma and analyzed for GRO, BTEX, DRO, RRO, PAHs, PCBs, and the RCRA 8 metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), plus nickel, vanadium, and zinc. A field duplicate sample was collected along with the four primary samples at a rate greater than one per 10 samples, or 25 percent. An MS/MSD sample was collected as part of the project QC, also at a rate of 25 percent. Analytical results are described in Section 5.2.

4.3.2 Waste Characterization Samples

After dewatering, approximately 21 cubic yards of excavated material from Areas 1 and 2 was placed into three bulk bag shipping containers. One composite sample (12NC28BW01) was collected for waste characterization and disposal purposes and submitted to TestAmerica-Tacoma. The waste characterization sample was analyzed for GRO, BTEX, DRO, RRO, TOC, PAHs, PCBs, and RCRA 8 metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), plus nickel, vanadium, and zinc. Analytical results from the waste characterization sample are discussed in Section 5.5. The bulk bag shipping containers currently remain staged at NE Cape and will be transported for disposal in 2013.

4.4 SEDIMENT REMOVAL WITH DREDGE – AREA 4

Sediment removal in Area 4 was performed with a dredge. Sediment removal advanced upstream from 2012 sediment sample location 12NC28SS017. Removal occurred in a sweeping motion in 2- to 3-foot-wide sections marked with lath by Bristol. It was possible to tell areas that had been dredged visually and by the distinct change in feel from the soft sediment areas to the relatively firm peat or native silt/clay layer beneath. Surveyors from ECO-LAND, LLC, surveyed the completed areas as dredging progressed.

Suction would cease once the dredge operator encountered the firm layer under the sediment layer; this depth varied from approximately 0.75 foot to 1.25 feet below the surface of the sediment. Vegetated areas were not disturbed. Once sediment was removed from a designated area, a new segment was staked out by Bristol personnel, and sediment removal continued in the same manner.

Sediment removal in Area 4 was not completed by the end of the 2012 field season due to time and weather constraints. Approximately 18 cubic yards of sediment was removed from Area 4 in 2012, leaving approximately 135.3 cubic yards to be removed in 2013. The limits of the sediment removed in Area 4 in 2012 were surveyed by ECO-LAND, LLC, personnel (Figure 6). Confirmation samples were not collected in Area 4 because additional sediment removal is planned for 2013. Removal area four was part of the Phase I removal, and as such was a means of testing and refining sediment access and removal. In 2013, removal activities will begin in the most upstream sediment area in the drainage and progress downstream. Removal Area 4 will be re-dredged during the 2013 removal activities to remove sediment that has accumulated since the 2012 removal.

The dredging operation was a multi-part system consisting of the dredge used for sediment removal; two intermediate sumps, each with one pump to lift the water and sediment uphill; and the geotextile tube and associated water containments used to dewater the dredged sediment. Sediment was removed using a Keene Engineering, Inc., Venturi dredge with a 2½-inch intake and a 2-inch discharge capable of pushing 200 feet of head. The inlet consisted of a foot valve with a one-way diaphragm connected to a 2½-inch inlet hose. The suction nozzle was connected to the 2-inch discharge of the pump by a 2-inch hose; the nozzle itself had a 2¾-inch-diameter end. The suction nozzle from the dredge discharged through a 3-inch hose that ran to the intermediate sumps and then into a geotextile tube in the water-processing area near the MOC. Sections 4.1.1 and 4.1.2 describe the water-processing area and intermediate sumps area.

In Figure 5, where the sediment removed from Removal Area 4 is outlined, it appears that an area that was mapped as sediment was left in place; however, this is not the case. The area around the removal area contained actively growing vegetation in September 2012 where none had been present during the sediment mapping in July 2012. The "ring" around the sediment Removal Area 4 consists of areas where grass grew in the stream during the two months between mapping and removal. The areas were not disturbed because of actively growing vegetation.

4.4.1 Surface Water Sampling

Surface water samples were collected at three locations downstream of the sediment trap to evaluate whether or not the removal operations were adversely affecting water quality downstream of the trap. Surface water samples were collected for every 1 to 2 hours of dredging activity at the direction of the ADEC. The surface water sample locations were chosen in consultation with the on-site QAR at the following areas shown in Figure 5:

- Immediately downstream of the sediment trap
- The confluence of the Site 28 drainage basin and the Suqi River
- A point in between the two other surface water sample locations

Three sampling events were conducted for the three surface water sample areas: one event prior to removal activities, one event during removal activities, and one event after removal activities. Additional water samples immediately downstream of the sediment trap were collected periodically during dredging operations. A total of 11 primary surface water samples were collected during the Phase I removal actions. It should be noted that total metals were inadvertently omitted from the analyses of the pre-removal water sampling analytical suite; however, these metals were included in the analyses for the mid- and post-removal sampling.

Samples were collected by dipping non-preserved, 1-liter amber bottles directly into the stream. Preserved bottles were filled with water from the non-preserved bottles.

Water samples were submitted to TestAmerica-Tacoma and analyzed for BTEX, DRO, RRO, PAHs, PCBs, and total and dissolved metals (RCRA 8 Metals [arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver], plus nickel, vanadium, and zinc). Field turbidity readings were also measured during sampling events. Duplicate samples were collected at a rate of one per 10 samples, or 10 percent, and MS/MSD analyses samples were collected at a rate of one for every 20 primary samples, or 5 percent. Analytical results are discussed in Section 5.3.

5.0 ANALYTICAL RESULTS

Analytical results were compared to site-specific cleanup levels specified in the decision document (USACE, 2009). Soil analytical results were also compared to values specified in Title 18 Alaska Administrative Code, Chapter 75 (18 AAC 75), Tables B1 and B2 *Migration to Groundwater* (ADEC, 2008) if a cleanup level was not specified in the decision document for a particular analyte. Sediment results were compared to the criteria specified in the 2009 Decision Document when applicable. If sediment criteria were not listed in the Decision Document for a particular analyte, and then the evaluation criteria were based on the National Oceanic and Atmospheric Administration's Screening Quick Reference Tables (SQuiRTs) for freshwater sediment at the probable effects level.

5.1 *MULTI INCREMENT®* SOIL SAMPLES

MI soil samples were collected prior to the construction of the work/water containment gravel pad and the two intermediate sumps (Figure 6). Samples were collected to document baseline conditions for the areas before disturbance. Each of the areas was sampled prior to the initiation of sediment removal operations.

TestAmerica-Tacoma initially processed the MI samples as grab samples due to a communication error. The samples were reprocessed as MI samples after the holding times were exceeded for PAHs, mercury, DRO/RRO, DRO/RRO with silica gel, and one sample for TOC. The results for those analyses were flagged QL to indicate a QC issue with a potentially low bias due to holding time expiration and were also H flagged. Sample 12NC28MI001 was specified as the MS/MSD sample on the Chain-of-Custody form and the sample results for mercury and five PAHs were flagged ML due to the low recoveries in the MS/MSD samples. DRO and RRO results were flagged MH for the same sample because the MS/MSD recoveries exceeded the upper control limits. DRO and DRO with silica gel sample results for 12NCMI002, 12NCMI003, and 12NCMI004 were B

flagged due to method blank contamination reported at a concentration less than 10 times the concentration in the samples.

Compounds detected in the MI samples included DRO, RRO, several PAHs, PCB-1260, and metals. The MI samples were also analyzed for DRO/RRO with silica gel treatment and TOC. The silica gel DRO and RRO results showed approximately a 55 percent average reduction in concentration compared to non-treated results. The highest DRO and RRO concentrations, both silica-gel treated and untreated correlated to the highest TOC concentrations. A chromatographic review and interpretation did not reveal any petroleum patterns consistent with diesel or motor oil. However, all analytical results were below the site-specific cleanup levels and the cleanup levels from 18 AAC 75. MI analytical results are presented in Table 1. Additional data quality issues are discussed in the Chemical Data Quality Report (CDQR) in Appendix E.

5.2 SEDIMENT CONFIRMATION SAMPLES

Confirmation samples were collected in removal areas 1 and 2 after excavation. Confirmation samples were not collected from Removal Area 3 because no removal occurred in this area in 2012, and confirmation samples were not collected from Removal Area 4 since sediment removal was not considered complete in this area.

In Area 1, DRO, naphthalene, acenaphthylene and 2-methylnaphthalene exceeded cleanup criteria in both confirmation samples. DRO, RRO, naphthalene, 2-methylnaphthalene, acenaphthene, acenaphthylene, fluorene, and phenanthrene exceeded cleanup criteria in both confirmation samples from Area 2. In addition, all of the sediment confirmation samples exceeded the total low molecular weight PAH (LPAH) cleanup criterion of 7.8 mg/kg. However, the calculated values for Total high molecular weight PAHs (HPAHs) in each of the samples were below the cleanup criterion of 9.6 mg/kg. Analytical results for sediment confirmation samples are presented in Table 4.

Silica gel and TOC were accidentally omitted from the Site 28 confirmation samples. Samples will be re-collected in 2013 for DRO/RRO, DRO/RRO with silica gel, and TOC from areas 1 and 2.

5.3 SURFACE WATER

Surface water sampling was conducted to evaluate whether or not the removal operations were adversely affecting water quality downstream of the sediment trap. Bristol collected surface water samples at three locations before, during, and after sediment removal and at one location immediately downstream of the sediment trap at regular intervals during sediment removal operations. The samples were collected below the sediment trap at a rate of 1 sample for every two hours of dredging. Dredge removal was limited to 1 to 2 hours per day of each dredging day, which resulted in roughly 1 sample per day plus QC.

The site-specific and ADEC discharge permit criterion for surface water is 15 micrograms per liter (µg/L) total aqueous hydrocarbons (TAqH), which is the sum of BTEX and PAH compounds (USACE, 2009). All surface water results were below the TAqH criterion specified by the discharge permit and by the drinking water reference criteria specified in 18AAC 70 (ADEC, 2008). Surface water samples were analyzed for BTEX, PAHs, PCBs, 11 target analyte metals, GRO, DRO and RRO. Surface water analytical results are presented in Table 3; GRO analysis was originally requested in the Scope of Work and through consultation with the USACE PDT and the ADEC it was determined not to be necessary for the mid- and post-removal sampling events. A copy of the email regarding this matter is included in Appendix A). Contaminant concentrations, mainly those associated with TAqH, increased slightly during sediment removal, but remained below cleanup levels. In addition, significant amounts of increased turbidity or other evidence of potential contaminant migration downstream of the sediment trap was not observed during removal activities.

5.4 CONTAINMENT WATER

Water samples were collected from the containment areas to determine whether contaminant concentrations were in accordance with the State of Alaska Wastewater General Permit 2009DB0004 under discharge authorization 2009DB0004-0216, located in Appendix D. The discharge criteria for containment water are 10 µg/L for total aromatic hydrocarbons (TAH) (the sum of BTEX), and 15 µg/L for TAqH (the sum of BTEX and PAHs). Analytes not identified as COCs for surface water in the Decision Document were compared against surface water criteria specified in 18 AAC 70. One primary sample (and one duplicate sample) of untreated water was collected, and two primary samples were collected from the treated water.

The primary untreated water sample and its duplicate had TAH concentrations of 8.65 µg/L and 6.96 µg/L respectively; neither of which exceeds the TAH discharge concentration of 10 µg/L. There were two treated water samples, one of which exhibited a TAH concentration of 8.77 µg/L (below the TAH discharge criteria) and one with a concentration of 19.6 µg/L (above the TAH criteria).

All four of the water samples—untreated primary/duplicate as well as both primary treated samples—exceeded discharge criteria for TAqH. The primary untreated water sample exceeded the criterion for TAqH, with a concentration of 18.15 µg/L; the duplicate sample had a concentration of 15 µg/L. Both of the treated water samples exceeded the TAqH criterion, with concentrations of 17.4 µg/L and 22.6 µg/L, respectively. The analytical results for the containment water are presented in Table 4.

Since analytical results for the containment water exceed surface water discharge criteria, the water has not been discharged to the ground. Currently, the water remains in the containment areas and will be resampled and/or retreated early in the 2013 field season. The water will remain in the impoundment area until discharge criteria are met.

5.5 GEOTEXTILE DEWATERING TUBE SAMPLING

The getextile tube that was used during the 2012 season remains in place and is only minimally filled. The tube was left to dewater over winter and will be sampled in 2013.

In 2013, once dewatered, two representative sediment samples will be collected and submitted to a geotechnical laboratory for moisture content and density; one of these samples will also be submitted for sieve analysis (gradation). Four additional representative samples will be submitted to an analytical laboratory for analysis of petroleum hydrocarbons (BTEX, GRO, DRO/RRO, and PAHs), PCBs, and the 8 RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) plus nickel, vanadium, and zinc. Analyses will also include silica gel cleanup and TOC as described in ADEC Technical Memorandum 06-001 (ADEC 2006). Data will be presented in table form in the 2013 Removal Action Report.

5.6 WASTE CHARACTERIZATION

One composite sample representative of the three bulk containers of contaminated sediment from Areas 1 and 2 was collected for waste characterization and disposal purposes. Analytical results for the sample were compared to relevant regulatory criteria (RCRA, Toxic Substances Control Act [TSCA]) in accordance with the Waste Management Plan (Appendix A of the Work Plan; Bristol, 2012b). The bulk containers of sediment were classified as POL-Contaminated Sediment, non-RCRA after comparison of the results with hazardous concentration levels specified in Table 1 of 40 CFR 261.24. Results are summarized in Table 5. TCLP extraction was not performed on the bulk bag sample; instead, the Rule of 20 was applied to sample results, i.e., the regulatory limits were multiplied by 20 and compared against the sample results. As discussed in Section 4.3.2, the bulk bag shipping containers currently remain staged at NE Cape and will be transported for disposal in 2013.

5.7 CHEMICAL DATA VERIFICATION

The analytical results for the samples collected during the Site 28 Phase I sediment removal were reviewed by AECOM for completeness and accuracy. AECOM has performed third-party data verification of all samples submitted for certified laboratory analysis, as described in the NE Cape 2012 Quality Assurance Project Plan (QAPP) (Appendix D of the Work Plan; Bristol, 2012b), and has presented their findings in a CDQR. The CDQR and ADEC checklists are provided in Appendix E.

This Report evaluates the analytical data generated during the NE Cape Remedial Actions conducted at Site 28 during September 2012. This assessment evaluated whether program objectives and data quality goals were met. The assessment reviewed sample receipt conditions, extraction and analytical procedures, sampling procedures, and correspondence to method criteria and project DQOs. The following conclusions were drawn based on this assessment of the analytical data:

- Sample receipt conditions were acceptable based on temperatures upon receipt and COC correspondence to submitted sample set. There were instances when the information on the container labels did not match the COC. For these instances, the laboratory made a determination as to which information to use and provided documentation in the laboratory narrative. One 1-liter amber jar was received broken, sufficient volume was available to perform all requested analyses.
- Extraction and analytical procedures were acceptable based on holding times, MBs, LCSs/LCSDs, MS/MSDs, and surrogates except as noted below:
- MI soil samples were initially analyzed as bulk samples. These samples were re-analyzed outside holding time requirements using the incremental sample preparation procedures. All MI results for PAHs, DRO/RRO, DRO/RRO with silica gel cleanup, and mercury and one MI results for TOC were H qualified to indicate the analysis occurred outside holding time requirements.
  - Detected results were qualified as estimated with a high bias (QH) due to high surrogate recoveries as follows:
    - Detected RRO in two samples, and
    - Detected RRO after silica gel cleanup in one sample

- Detected RRO results for one soil sample were qualified as estimated with a high bias (QH) due to a high CCV recovery.
- Results were qualified as estimated with a low bias (ML for GRO results, QL for PAH results) due to low surrogate recoveries as follows:
  - GRO results for 2 samples,
  - PAH results for 1 sample
- One naphthalene result had a high RPD between the LCS and LCSD. The result had been qualified due to a low surrogate recovery (QL) and further qualification was not required.
- The following results were B qualified due to associated method blank contamination at a concentration <10x the sample concentration:
  - GRO results in two trip blanks
  - Benzo[g,h,i]perylene, fluoranthene, and pyrene results in three water samples
  - Benzo[a]anthracene, benzo[a]pyrene, and chrysene results in one water sample
  - DRO and DRO following silica gel cleanup in three soil samples
  - Total and dissolved mercury in ten water samples.
- Samples were qualified due to either high (MH) or low (ML) MS/MSD recoveries to indicate potential bias due to a matrix effect. Qualification was limited to the spiked sample since no trends were observed. An MN qualifier was used to indicate a matrix effect with an unknown bias when both a high and low MS/MSD recovery were observed or for a high MS/MSD RPD, unassociated with bias. Qualified organic samples were:
  - Ethylbenzene and o-xylene results for one sample were MH qualified,
  - Benzo[a]pyrene, indeno[1,2,3-cd]pyrene, dibenz[a,h]anthracene, and benzo[g,h,i]perylene results for one sample were ML qualified,
  - Acenaphthene , acenaphthylene, and phenanthrene results for one sample were MH qualified,
  - DRO and DRO with silica gel cleanup for one soil sample were MH qualified,
  - RRO results for one water sample were MH qualified,
  - Barium, lead, nickel, vanadium, and zinc were MH qualified in one soil sample
  - Mercury was ML qualified in one soil sample.

- Multiple sample results were reported when sample concentrations exceeded the calibration range of the instrument. The result associated with the higher dilution

and within the instrument calibration range was reported. Results for the lower dilution should not be reported for the following:

  - m&p-Xylene and o-xylene results for sample 12NC28SS055,
  - 1-Methylnaphthalene, 2-methylnaphthalene and naphthalene results for samples 12NC28SS052 through 12NC28SS056, and
  - 1-Methylnaphthalene and 2-methylnaphthalene results for sample 12NC28BW01.

- Field QC results met QAPP criteria with the following exceptions:
  - Imprecision was observed in field duplicate samples for:
    - 2-methylnaphthalene in one water field duplicate pair
    - Fluoranthene, phenanthrene, and pyrene in one MI triplicate set
    - p & m-Xylene and Aroclor-1260 in one water field duplicate pair.
- In all cases, the majority of duplicate sample results met the control criteria and qualification as estimated with an unknown bias (QN) was limited to the field duplicate pair or triplicate set, as applicable.

Based on this review, the analytical data generated during the NE Cape Remedial Action at Site 28 are complete, correct, consistent, and compliant with method procedures and QC requirements, and are usable as qualified.

6.0 CONCLUSIONS

Two sediment removal procedures were employed during the 2012 field season. The first method was removal by an excavator followed by transport of the sediments via truck to a temporary lined stockpile area. The second method was a Venturi dredge and geotextile dewatering tube combination. Due to time and weather constraints, sediment removal could not be completed at Area 4 or initiated at Area 3. An evaluation of the two methods is presented in this section.

6.1 SEDIMENT REMOVAL WITH EXCAVATOR

During the 2012 Phase I removal action, a total of approximately 21 bcy of contaminated sediment was removed at two locations (Areas 1 and 2) near the MOC pad. The excavator was able to remove the sediment that was in standing to slow moving water. Sediments were initially dewatered in place by suspending the bucket over the removal site. Excavated sediment was then transported via a rock truck to a lined area within the MOC. No visible liquid drained from the material to the liner.

For the excavator removal option to be feasible within the lower reaches of the Site 28 drainage area, a road would have to be constructed in order for heavy equipment to safely and reliably access the remaining contaminated sediment. In addition, construction of a road would reduce the impact of heavy equipment on the surrounding tundra environment; however, this option would also require removal of the road and significant wetland restoration, as well as landowner approval.

6.2 SEDIMENT REMOVAL WITH VENTURI DREDGE

During the 2012 Phase I removal action, an estimated 18 bcy of contaminated sediment were removed from the downstream portion of Area 4. The removal area will be surveyed in 2013 after sediment removal to determine the final volume of sediment removed. Excavated sediment and water currently remains within the lined

containments described in Section 4.1.1. Water that remains in the containment areas will be resampled and/or retreated early in the 2013 field season and will not be discharged until surface water criteria are met.

Future sediment removal at Site 28 using the venturi dredge will require handling and treating large volumes of water. In 2012, over the course of 2 to 3 hours of active dredging, approximately 30,000 gallons of water were generated. The remaining areas recommended for removal at the site include Area 3, which consists of a narrow, flowing streambed channel; the remainder of Area 4; and multiple ponded areas in the northern portion of the drainage leading up to the confluence of the Suqitughneq River. Based on the locations of the remaining contaminated sediments, effective water treatment and dewatering will be critical. The construction of additional lined containments for holding untreated water and sediment will allow dredging operations to progress more efficiently.

The sediment removed from the Site 28 drainage is very fine grained and has a high organic content. The sediment also appears to be very mobile in water and tends to have a high affinity for petroleum hydrocarbons. Possible solutions to this include the use of polymers, settling ponds/tanks, non-woven inner linings for the geotextile dewatering tubes, and a more aggressive water treatment program that includes fine-particle filtration. Effective filter media would ideally be equipped with both the ability to trap small-diameter sediment and preferentially absorb petroleum hydrocarbons from the water. All proposed water treatment options, such as polymer use, will have to be reviewed and approved by ADEC before commencement of removal activities.

6.3 RECOMMENDATIONS

Contaminated sediment removal with an excavator was the method that was easiest to implement at the site, and it was also effective at dewatering the sediments prior to containerization. Depending on site conditions, some of the recommended sediment removal areas – particularly at the southern end of the Site 28 drainage – may be

accessible by an excavator and other heavy equipment without the construction of an access road. The majority of the remaining contaminated sediment areas will likely require removal using the Venturi dredge. Modifications to the geotextile dewatering tube system, including pre-treatment with polymers and additional filtration measures, are recommended for the 2013 season. Bristol has collected a representative sample of the material being dredged from Area 4 and has requested bench scale tests to determine appropriate polymers and their efficacy. A vendor is performing the bench scale tests to select the best polymer and application rates. Once suitable polymers are identified, the information will be provided to the USACE PDT and ADEC for acceptance.

Figure 7 depicts the recommended future removal areas and estimated volumes. It is estimated that approximately 373 bcy remain for removal in 2013.

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TABLES

Table 1 Site 28 *MULTI INCREMENT®* Soil Sample Results

			Sample ID	12NC28MI001	12NC28MI002	12NC28MI003[D]	12NC28MI004[D]	12NC28MI005	12NC28MI006
			Laboratory ID	580-35084-1	580-35084-2	580-35084-3	580-35084-4	580-35084-5	580-35084-6
			Location ID	28-MI-01	28-MI-02	28-MI-03	28-MI-04	28-MI-05	28-MI-06
			Collection Date	9/10/2012	09/11/12	09/11/12	09/11/12	9/16/2012	9/16/2012
Analysis Method	**Analyte**	**Unit**	**Cleanup Level**						
6020	Arsenic	mg/kg	11[1]	5.1	6.3	5.4	5.8	3.9	5
6020	Barium	mg/kg	1,100[2]	140 MH	47	46	48	140	160
6020	Cadmium	mg/kg	5.0[2]	0.19 J	0.19 J	0.17 J	0.18 J	0.2	0.23
6020	Chromium	mg/kg	25[2]	20	8	8.6	8.4	17	23
6020	Lead	mg/kg	400 [3]	11 MH	22	21	22	8.7	10
6020	Nickel	mg/kg	86[2]	12 MH	8.1	8.2	8.5	14	15
6020	Selenium	mg/kg	3.4[2]	0.87	0.89	0.86	0.87	0.88	0.87
6020	Silver	mg/kg	11.2[2]	0.074 J	0.078 J	0.077 J	0.077 J	0.071 J	0.084 J
6020	Vanadium	mg/kg	3,400[2]	31 MH	17	18	18	28	34
6020	Zinc	mg/kg	4,100[2]	37 MH	41	41	41	41	45
7471A	Mercury	mg/kg	1.4[2]	0.059 QL ML	0.017 J QL	ND (0.0098) QL	0.012 J QL	0.055 QL	0.056 QL
8082	PCB-1016	mg/kg	1[1]	ND (0.0017)	ND (0.0016)	ND (0.0016)	ND (0.0016)	ND (0.0016)	ND (0.0016)
8082	PCB-1221	mg/kg	1[1]	ND (0.0033)	ND (0.0032)	ND (0.0033)	ND (0.0032)	ND (0.0033)	ND (0.0032)
8082	PCB-1232	mg/kg	1[1]	ND (0.0033)	ND (0.0032)	ND (0.0033)	ND (0.0032)	ND (0.0033)	ND (0.0032)
8082	PCB-1242	mg/kg	1[1]	ND (0.0017)	ND (0.0016)	ND (0.0016)	ND (0.0016)	ND (0.0016)	ND (0.0016)
8082	PCB-1248	mg/kg	1[1]	ND (0.0017)	ND (0.0016)	ND (0.0016)	ND (0.0016)	ND (0.0016)	ND (0.0016)
8082	PCB-1254	mg/kg	1[1]	ND (0.0017)	ND (0.0016)	ND (0.0016)	ND (0.0016)	ND (0.0016)	ND (0.0016)
8082	PCB-1260	mg/kg	1[1]	ND (0.0017)	0.011	0.0071	0.0098	0.0024 J	ND (0.0016)
8270C SIM	1-Methylnaphthalene	mg/kg	6.2[2]	0.0085 QL	0.0022 QL	0.0033 QL	0.0021 QL	0.011 QL	0.0074 QL
8270C SIM	2-Methylnaphthalene	mg/kg	6.1[2]	0.011 QL	0.0033 QL	0.0044 QL	0.0035 QL	0.015 QL	0.010 QL
8270C SIM	Acenaphthene	mg/kg	18[2]	0.0024 QL	0.00064 J QL	0.0014 J QL	0.00098 J QL	0.0015 J QL	0.0014 J QL
8270C SIM	Acenaphthylene	mg/kg	180[2]	ND (0.00082) QL	ND (0.00081) QL	ND (0.00081) QL	ND (0.0008) QL	ND (0.00079) QL	ND (0.00081) QL
8270C SIM	Anthracene	mg/kg	3,000[2]	ND (0.00082) QL	ND (0.00081) QL	0.00077 J QL	0.00052 J QL	0.0015 J QL	0.0024 QL
8270C SIM	Benzo(a)anthracene	mg/kg	3.6[2]	ND (0.00082) QL	0.0007 J QL	0.00085 J QL	0.0008 J QL	ND (0.00079) QL	0.00093 J QL
8270C SIM	Benzo(a)pyrene	mg/kg	2.1[2]	ND (0.00082) QL ML	ND (0.00081) QL	ND (0.00081) QL	ND (0.0008) QL	ND (0.00079) QL	ND (0.00081) QL
8270C SIM	Benzo(b)fluoranthene	mg/kg	12[2]	2.1 QL	0.00082 J QL	0.00093 J QL	0.0011 J QL	0.0019 QL	0.0027 QL
8270C SIM	Benzo(g,h,i)perylene	mg/kg	38,700[2]	ND (0.00082) QL ML	0.00061 J QL	ND (0.00081) QL	0.0009 J QL	ND (0.00079) QL	ND (0.00081) QL
8270C SIM	Benzo(k)fluoranthene	mg/kg	120[2]	0.00055 J QL	ND (0.00081) QL	ND (0.00081) QL	ND (0.0008) QL	ND (0.00079) QL	ND (0.00081) QL
8270C SIM	Chrysene	mg/kg	360[2]	ND (0.00082) QL	0.0017 QL	0.0020 QL	0.0019 QL	0.0031 QL	0.0039 QL
8270C SIM	Dibenz(a,h)anthracene	mg/kg	4[2]	ND (0.00082) QL ML	ND (0.00081) QL	ND (0.00081) QL	ND (0.0008) QL	ND (0.00079) QL	ND (0.00081) QL
8270C SIM	Fluoranthene	mg/kg	1,400[2]	ND (0.00082) QL	0.0015 J QL QN	0.004 QL, QN	0.0022 QL QN	0.0011 J QL	0.0062 QL
8270C SIM	Fluorene	mg/kg	220[2]	ND (0.00082) QL	ND (0.00081) QL	0.0014 J QL	0.00058 J QL	0.0055 QL	0.0062 QL

Table 1 Site 28 *MULTI INCREMENT®* Soil Sample Results (continued)

			Sample ID	12NC28MI001	12NC28MI002	12NC28MI003[D]	12NC28MI004[D]	12NC28MI005	12NC28MI006
			Laboratory ID	580-35084-1	580-35084-2	580-35084-3	580-35084-4	580-35084-5	580-35084-6
			Location ID	28-MI-01	28-MI-02	28-MI-03	28-MI-04	28-MI-05	28-MI-06
			Collection Date	9/10/2012	09/11/12	09/11/12	09/11/12	9/16/2012	9/16/2012
Analysis Method	**Analyte**	**Unit**	**Cleanup Level**						
8270C SIM	Indeno(1,2,3-cd)pyrene	mg/kg	41[2]	ND (0.00082) QL ML	0.001 J QL	0.0005 J QL	0.0012 J QL	ND (0.00079) QL	ND (0.00081) QL
8270C SIM	Naphthalene	mg/kg	120[1]	0.0061 QL	0.0021 QL	0.0028 QL	0.0030 QL	0.0083 QL	0.0058 QL
8270C SIM	Phenanthrene	mg/kg	3,000[2]	0.013 QL	0.0022 QL QN	0.0044 QL QN	0.0026 QL QN	0.011 QL	0.013 QL
8270C SIM	Pyrene	mg/kg	1,000[2]	ND (0.00082) QL	0.0013 J QL QN	0.0030 QL QN	0.0020 QL QN	0.0012 J QL	0.013 QL
AK102	DRO (nC10–<nC25)	mg/kg	9,200[1]	350 QL MH	11 QL B	12 QL B	12 QL B	280 QL	340 QL
AK102	DRO with SG	mg/kg	9,200[1]	130 QL MH	6.6 QL B	7.2 QL B	7.1 QL B	120 QL	190 QL
AK103	RRO (nC25–nC36)	mg/kg	9,200[1]	2,100 QL QH	79 QL	83 QL	81 QL	2,000 QL QH	1,900 QL
AK103	RRO with SG	mg/kg	9,200[1]	860 QL QH	41 QL	43 QL	42 QL	800 QL	1,000 QL
SW 9060	Total Organic Carbon	mg/kg	NS	53,000 QL	5100	5,500	5300	63,000	40,000

Notes:

[1] Site-specific cleanup values established in 2009 Decision Document (US Army Corps of Engineers, Alaska District. *2009 Decision Document Hazardous, Toxic, and Radioactive Waste [HTRW] Project #F10AK096903 Northeast Cape Formerly Used Defense Site [FUDS] St. Lawrence Island, Alaska.* January.)

[2] Cleanup levels from 18AAC75 Section 341, Tables B1 and B2, migration to groundwater

[3] Cleanup level from 18AAC75 Section 341, Table B1 direct contact

[D]Sample is a duplicate/replicate of previous sample

AAC = Alaska Administrative Code

AK = Alaska test method

B = Analyte considered a high estimated value due to presence in method blank.

DRO = diesel range organics

J = Result is an estimate.

mg/kg = milligrams per kilogram

MH = Analyte result is considered an estimated biased high due to matrix effects.

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

ND = Sample result is non-detect; limit of detection is in parentheses.

NS = not stated

PCB = polychlorinated biphenyl

QH = Analyte result is considered an estimte with a high bias due to a quality control failure.

QL = Analyte result is considered an estimte with a low bias due to a quality control failure.

QN = Analyte result is considered an estimte with an uncertain bias due to a quality control failure.

SG = silica gel

SIM = selective ion monitoring

µg/kg = micrograms per kilogram

Table 2 Site 28 Post Sediment Removal Sediment Confirmation Sample Results

			Sample ID	12NC28SS052	12NC28SS053	12NC28SS056[D]	12NC28SS054	12NC28SS055
			Laboratory ID	580-35140-1	580-35140-2	580-35140-5	580-35140-3	580-35140-4
			Location ID	12NC28S52	12NC28S53	12NC28S53	12NC28S54	12NC28S55
			Collection Date	9/18/2012	9/18/2012	9/18/2012	9/18/2012	9/18/2012
Analysis Method	**Analyte**	**Unit**	**Evaluation Criteria**	Area 1	Area 1	Area 1	Area 2	Area 2
6020	Arsenic	mg/kg	93[a]	4.3	3.3	4.5	2.6	4.1
6020	Barium	mg/kg	NS	72	58	65	83	74
6020	Cadmium	mg/kg	3.53[b]	0.26	0.19 J	0.27	0.22 J	0.30 J
6020	Chromium	mg/kg	270[a]	19	16	16	11	8.2
6020	Lead	mg/kg	530[a]	15	13	17	8.7	8.4
6020	Nickel	mg/kg	36.0[b]	14	10	11	6.5	5.6
6020	Selenium	mg/kg	NS	0.76 J	0.67 J	0.79 J	1.7	1.9
6020	Silver	mg/kg	NS	0.067 J	0.056 J	0.060 J	0.087 J	0.12 J
6020	Vanadium	mg/kg	NS	28	23	26	28	22
6020	Zinc	mg/kg	960[a]	56	39	47	16	7.5
7471A	Mercury	mg/kg	0.486[b]	0.031	0.017	0.028	0.066	0.080
8082/DOD	PCB-1016	mg/kg		ND (0.0061)	ND (0.0063)	ND (0.0070)	ND (0.011)	ND (0.010)
8082/DOD	PCB-1221	mg/kg		ND (0.012)	ND (0.013)	ND (0.014)	ND (0.021)	ND (0.021)
8082/DOD	PCB-1232	mg/kg		ND (0.012)	ND (0.013)	ND (0.014)	ND (0.021)	ND (0.021)
8082/DOD	PCB-1242	mg/kg	0.7[a]	ND (0.0061)	ND (0.0063)	ND (0.0070)	ND (0.011)	ND (0.010)
8082/DOD	PCB-1248	mg/kg		ND (0.0061)	ND (0.0063)	ND (0.0070)	ND (0.011)	ND (0.010)
8082/DOD	PCB-1254	mg/kg		ND (0.0061)	ND (0.0063)	ND (0.0070)	ND (0.011)	ND (0.010)
8082/DOD	PCB-1260	mg/kg		0.064	0.082	0.084	ND (0.011)	0.039
8260B/DOD	Benzene	mg/kg	NS	0.0064 J	ND (0.0053)	ND (0.0065)	0.32	0.47
8260B/DOD	Ethylbenzene	mg/kg	NS	0.81	0.83	1.0	1.7 MH	2.7
8260B/DOD	m,p-Xylene	mg/kg	NS	2.5	2.6	3.2	5.6	8.0
8260B/DOD	o-Xylene	mg/kg	NS	0.092	0.970	1.2	3.3 MH	3.8
8260B/DOD	Toluene	mg/kg	NS	ND (0.017)	0.0053 J	ND (.019)	0.046	0.190
8270C SIM/DOD	1-Methylnaphthalene	mg/kg	NS	13	22	30	320	540
8270C SIM/DOD	2-Methylnaphthalene	mg/kg	0.6[a]	**19**	**32**	**44**	**560**	**890**
8270C SIM/DOD	Acenaphthene	mg/kg	0.5[a]	.320	.490	.360	**7.9 MH**	**10**
8270C SIM/DOD	Acenaphthylene	mg/kg	0.128[b]	**0.140**	**0.200**	**0.170**	**3.6 MH**	**4.4**
8270C SIM/DOD	Anthracene	mg/kg	0.245[b]	0.026	ND (0.0031)	ND (0.0035)	ND (0.110)	ND (0.110)
8270C SIM/DOD	Benzo[a]anthracene	mg/kg	0.385[b]	0.015	0.016	0.017	ND (0.110)	ND (0.110)
8270C SIM/DOD	Benzo[a]pyrene	mg/kg	0.782[b]	0.0088	0.0066	0.0075	ND (0.110)	ND (0.110)
8270C SIM/DOD	Benzo[b]fluoranthene	mg/kg	NS	0.010	0.010	0.011	ND (0.110)	ND (0.110)

Table 2 Site 28 Sediment Removal Sediment Confirmation Sample Results (continued)

		Sample ID		12NC28SS052	12NC28SS053	12NC28SS056[D]	12NC28SS054	12NC28SS055
		Laboratory ID		580-35140-1	580-35140-2	580-35140-5	580-35140-3	580-35140-4
		Location ID		12NC28S52	12NC28S53	12NC28S53	12NC28S54	12NC28S55
		Collection Date		9/18/2012	9/18/2012	9/18/2012	9/18/2012	9/18/2012
Analysis Method	**Analyte**	**Unit**	**Evaluation Criteria**	Area 1	Area 1	Area 1	Area 2	Area 2
8270C SIM/DOD	Benzo[g,h,i]perylene	mg/kg	1.7[a]	0.0066	0.0049 J	0.0060 J	ND (0.110)	ND (0.110)
8270C SIM/DOD	Benzo[k]fluoranthene	mg/kg	NS	0.0050 J	0.0031 J	0.0051 J	ND (0.110)	ND (0.110)
8270C SIM/DOD	Chrysene	mg/kg	0.862[b]	0.020	0.019	0.022	ND (0.110)	0.110 J
8270C SIM/DOD	Dibenz(a,h)anthracene	mg/kg	0.135[b]	ND (0.0032)	ND (0.0031)	0.0034 J	ND (0.110)	ND (0.110)
8270C SIM/DOD	Fluoranthene	mg/kg	2.0[a]	0.040	0.034	0.042	0.130 J	0.230
8270C SIM/DOD	Fluorene	mg/kg	0.8[a]	0.44	0.51	0.49	**11**	**15**
8270C SIM/DOD	Indeno[1,2,3-cd]pyren	mg/kg	3.2[a]	0.0047 J	0.0048 J	0.0055 J	ND (0.110)	ND (0.110)
8270C SIM/DOD	Naphthalene	mg/kg	1.7[a]	**6.6**	**12**	**16**	**260**	**450**
8270C SIM/DOD	Phenanthrene	mg/kg	4.8[a]	0.31	0.44	0.51	**8 MH**	**14**
8270C SIM/DOD	Pyrene	mg/kg	0.875[b]	0.036	0.031	0.036	0.110 J	0.210 J
8270	LPAH	mg/kg	7.8[a]	**7.84**	**13.6**	**17.5**	**291**	**493**
8270	HPAH	mg/kg	9.6[a]	0.146	0.129	0.156	0.24	0.55
AK101	GRO (nC6-nC10)	mg/kg	NS	110	78	110	95 ML	120
AK102 & 103	DRO (nC10-<nC25)	mg/kg	3,500[a]	**4,700**	**6,500**	**8,600**	**60,000**	**94,000**
AK102 & 103	RRO (nC25-nC36)	mg/kg	3,500[a]	870	1,100	1,400	**5,600 QH**	**9,100**

Notes:

[a]cleanup level from NE Cape 2009 Decision Document (US Army Corps of Engineers, Alaska District. *2009 Decision Document Hazardous, Toxic, and Radioactive Waste [HTRW] Project #F10AK096903 Northeast Cape Formerly Used Defense Site [FUDS] St. Lawrence Island, Alaska.* January.)

[b] Evaluation criteria based on NOAA Screening Quick Reference Tables (SQuiRTs), Freshwater Sediment, PEL (Probable Effects Level)

Bold = Result exceeds cleanup level.

[D] = Sample is a duplicate of previous sample.

AK = Alaska test method

DOD = Department Of Defense

GRO = gasoline range organics

HPAH = high molecular weight polynuclear aromatic hydrocarbons

J = Result is an estimate.

LPAH = low molecular weight polynuclear aromatic hydrocarbons

mg/kg = milligrams per kilogram

MH = Analyte result is considered an estimated value biased high due to matirx interference.

ND = non-detect, limit of detection in parentheses

NS = not stated

PCB = polychlorinated biphenyl

QL = Analyte result is considered an estimated value with a low bias due to a quality control failure.

RRO = residual range organics

SIM = selective ion monitoring

µg/kg = micrograms per kilogram

Table 3 Site 28 Downstream Surface Water Monitoring Results

		Sample ID	12NC28WA01	12NC28WA02	12NC28WA03	12NC28WA04*	12NC28WA05*	12NC28WA06[D*]	12NC28WA07*	12NC28WA08	12NC28WA09	12NC28WA10	12NC28WA13[D]	12NC28WA11	12NC28WA12
		Laboratory ID	280-33360-8	280-33360-9	280-33360-10	580-35085-1	580-35085-2	580-35085-3	580-35092-1	580-35092-2	580-35092-3	580-35092-4	580-35092-7	580-35092-5	580-35092-6
		Location ID	28-W-01	28-W-02[†]	28-W-03[†]	28-W-01	28-W-01	28-W-01	28-W-01	28-W-02[†]	28-W-03[†]	28-W-01	28-W-01	28-W-03[†]	28-W-02[†]
		Collection Date	9/13/2012	9/13/2012	9/14/2012	9/17/2012	9/18/2012	9/18/2012	9/19/2012	9/19/2012	9/19/2012	9/20/2012	9/20/2012	9/20/2012	9/20/2012
		Collection Time	1600	1630	0900	1550	1500	1530	1500	1515	1530	1505	1515	1430	1445
		Turbidity (NTU)	17.4	16.7	10.2	14.1	33	33	27.4	15.8	9.4	7.04	7.2	7.92	7.92
Analytical Method	**Analyte**	**Unit**	**Evaluation Criteria**	**Pre-Removal Sampling**			**Mid-Removal Sampling**						**Post-Removal Sampling**			
8260B/DoD	Benzene	µg/L	5[b]	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.45)	ND (0.45)	ND (0.45)	ND (0.45)	ND (0.45)	ND (0.45)	ND (0.45)	ND (0.45)	ND (0.45)	ND (0.45)
8260B/DoD	Ethylbenzene	µg/L	700[b]	0.29 J	ND (0.2)	ND (0.2)	0.35 J	0.38 J	0.38 J	1.0	ND (0.45)	ND (0.45)	0.34 J	0.34 J	ND (0.45)	ND (0.45)
8260B/DoD	m-Xylene & p-Xylene	µg/L		ND (0.8)	ND (0.8)	ND (0.8)	0.47 J	0.75 J	0.80 J	1.3 J	ND (0.90)	ND (0.90)	0.45 J	0.44 J	ND (0.90)	ND (0.90)
8260B/DoD	o-Xylene	µg/L		ND (0.4)	ND (0.4)	ND (0.4)	0.15 J	0.42 J	0.47 J	0.69 J	ND (0.45)	ND (0.45)	ND (0.45)	ND (0.45)	ND (0.45)	ND (0.45)
8260	Xylenes (total)	µg/L	10000[b]	ND (1.2)	ND (1.2)	ND (1.2)	0.62 J	1.17 J	1.27 J	1.99 J	ND (1.35)	ND (1.35)	0.9 J	0.89 J	ND (1.35)	ND (1.35)
8260B/DoD	Toluene	µg/L	1000[b]	ND (0.4)	ND (0.4)	ND (0.4)	0.20 J	ND (0.45)	ND (0.45)	ND (0.45)	ND (0.45)	ND (0.45)	ND (0.45)	ND (0.45)	ND (0.45)	ND (0.45)
8270C SIM/DoD	1-Methylnaphthalene	µg/L	15[c]	ND (0.0097)	ND (0.0096)	ND (0.0096)	0.40	0.81	0.87	1.2	0.032 J	ND (0.072)	0.61	0.45	ND (0.072)	0.085 J
8270C SIM/DoD	2-Methylnaphthalene	µg/L	15[c]	ND (0.0097)	ND (0.0096)	ND (0.0096)	0.070 J	0.13 QN	0.27 QN	0.25	ND (0.072)	ND (0.072)	0.13	0.088 J	ND (0.072)	ND (0.072)
8270C SIM/DoD	Acenaphthene	µg/L	2,200[c]	0.018 J	ND (0.019)	ND (0.019)	0.068 J	0.084 J	0.093 J	0.14	ND (0.072)	ND (0.072)	0.090 J	0.074 J	ND (0.072)	ND (0.072)
8270C SIM/DoD	Acenaphthylene	µg/L	2,200[c]	ND (0.0097)	ND (0.0096)	ND (0.0096)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)
8270C SIM/DoD	Anthracene	µg/L	11,000[c]	ND (0.019)	ND (0.019)	ND (0.019)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)
8270C SIM/DoD	Benzo[a]anthracene	µg/L	1.2[c]	ND (0.0097)	0.076 J B	ND (0.0096)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)
8270C SIM/DoD	Benzo[a]pyrene	µg/L	0.2[b]	ND (0.0097)	0.0069 J B	ND (0.0096)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)
8270C SIM/DoD	Benzo[b]fluoranthene	µg/L	1.2[c]	ND (0.0097)	ND (0.0096)	ND (0.0096)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)
8270C SIM/DoD	Benzo[g,h,i]perylene	µg/L	1,100[c]	0.022 J B	0.028 J B	0.017 J B	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)
8270C SIM/DoD	Benzo[k]fluoranthene	µg/L	12[c]	ND (0.0097)	ND (0.0096)	ND (0.0096)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)
8270C SIM/DoD	Chrysene	µg/L	120[c]	ND (0.0097)	0.08 J B	ND (0.0096)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)
8270C SIM/DoD	Dibenz(a,h)anthracene	µg/L	0.12[c]	0.0097 J	ND (0.0096)	ND (0.0096)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)
8270C SIM/DoD	Fluoranthene	µg/L	1,500[c]	0.021 J B	0.039 J B	0.0081 J B	ND (0.072)	ND (0.072)	ND (0.072)	0.033 J	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)
8270C SIM/DoD	Fluorene	µg/L	1,500[c]	0.029 J	ND (0.019)	ND (0.019)	0.15	0.17	0.18	0.21	ND (0.072)	ND (0.072)	0.19	0.16	ND (0.072)	0.038 J
8270C SIM/DoD	Indeno[1,2,3-cd]pyrene	µg/L	1.2[c]	0.027 J	ND (0.019)	0.021 J	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)
8270C SIM/DoD	Naphthalene	µg/L	730[c]	ND (0.0097)	0.0094 J	0.0065 J	0.27	0.30	0.36	0.34	ND (0.072)	ND (0.072)	0.39	0.33	ND (0.072)	0.13
8270C SIM/DoD	Phenanthrene	µg/L	11,000[c]	ND (0.0097)	ND (0.0096)	ND (0.0096)	ND (0.072)	0.034 J	0.036 J	0.053 J	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)
8270C SIM/DoD	Pyrene	µg/L	1,100[c]	0.027 J B	0.053 J B	0.011 J B	ND (0.072)	ND (0.072)	ND (0.072)	0.029 J	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)	ND (0.072)
8260 + 8270	Sum TAqH (BTEX + PAHs)	µg/L	15[a]	2.36	2.44	2.22	3.51	4.84	5.22	6.87	3.96	4.00	4.49	4.17	4.00	4.03
6020	Arsenic (Dissolved)	µg/L	10[b]	0.67 J	0.39 J	ND (1)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
6020	Barium (Dissolved)	µg/L	2000[b]	9.3	7.9	6.7	1.1	1.1	1.1	14	8.9	8.1	9.8	9.6	7.1	10
6020	Cadmium (Dissolved)	µg/L	5[b]	ND (0.12)	ND (0.12)	ND (0.12)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)
6020	Chromium (Dissolved)	µg/L	100[b]	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)
6020	Lead (Dissolved)	µg/L	15[c]	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)
6020	Nickel (Dissolved)	µg/L	100[c]	0.58 J	ND (0.9)	ND (0.9)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)
6020	Selenium (Dissolved)	µg/L	50[b]	ND (2)	ND (2)	ND (2)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
6020	Silver (Dissolved)	µg/L	100[c]	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)
6020	Vanadium (Dissolved)	µg/L	260[c]	ND (1)	ND (1)	ND (1)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
6020	Zinc (Dissolved)	µg/L	5000[c]	3.8 J	ND (6)	ND (6)	ND (5)	ND (5)	ND (5)	4.4 J	ND (5)	6.9 J	ND (5)	ND (5)	ND (5)	4.6 J
7470A	Mercury (Dissolved)	µg/L	2[b]	ND (0.08)	ND (0.08)	ND (0.08)	0.055 J B	0.058 J B	0.063 J B	0.055 J B	0.062 J B	0.063 J B	0.056 J B	0.065 J B	0.066 J B	0.057 J B
6020	Arsenic (Total)	µg/L	10[b]	NR	NR	NR	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
6020	Barium (Total)	µg/L	2000[b]	NR	NR	NR	1.2	1.7	1.7	15	10	8.3	11	13	7.8	8.6
6020	Cadmium (Total)	µg/L	5[b]	NR	NR	NR	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)
6020	Chromium (Total)	µg/L	100[b]	NR	NR	NR	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)	ND (1.5)
6020	Lead (Total)	µg/L	15[c]	NR	NR	NR	0.2 J	0.49 J	0.51 J	0.44 J	0.18 J	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)
6020	Nickel (Total)	µg/L	100[c]	NR	NR	NR	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)	ND (2.5)
6020	Selenium (Total)	µg/L	50[b]	NR	NR	NR	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)	ND (4)
6020	Silver (Total)	µg/L	100[c]	NR	NR	NR	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)

Table 3 Site 28 Surface Water Monitoring Results (continued)

		Sample ID	12NC28WA01	12NC28WA02	12NC28WA03	12NC28WA04*	12NC28WA05*	12NC28WA06[D*]	12NC28WA07*	12NC28WA08	12NC28WA09	12NC28WA10	12NC28WA13[D]	12NC28WA11	12NC28WA12
		Laboratory ID	280-33360-8	280-33360-9	280-33360-10	580-35085-1	580-35085-2	580-35085-3	580-35092-1	580-35092-2	580-35092-3	580-35092-4	580-35092-7	580-35092-5	580-35092-6
		Location ID	28-W-01	28-W-02[†]	28-W-03[†]	28-W-01	28-W-01	28-W-01	28-W-01	28-W-02[†]	28-W-03[†]	28-W-01	28-W-01	28-W-03[†]	28-W-02[†]
		Collection Date	9/13/2012	9/13/2012	9/14/2012	9/17/2012	9/18/2012	9/18/2012	9/19/2012	9/19/2012	9/19/2012	9/20/2012	9/20/2012	9/20/2012	9/20/2012
		Collection Time	1600	1630	0900	1550	1500	1530	1500	1515	1530	1505	1515	1430	1445
		Turbidity (NTU)	17.4	16.7	10.2	14.1	33	33	27.4	15.8	9.4	7.04	7.2	7.92	7.92
Analytical Method	**Analyte**	**Unit**	**Evaluation Criteria**	**Pre-Removal Sampling**			**Mid-Removal Sampling**						**Post-Removal Sampling**			
6020	Vanadium (Total)	µg/L	260[c]	NR	NR	NR	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
6020	Zinc (Total)	µg/L	5000[c]	NR	NR	NR	ND (5)	ND (5)	4.4 J	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)	ND (5)
7470A	Mercury (Total)	µg/L	2[b]	NR	NR	NR	0.059 J B	0.053 J B	0.061 J B	0.054 J B	0.054 J B	0.060 J B	0.054 J B	0.063 J B	0.058 J B	0.0061 J B
8082	PCB-1016	µg/L		ND (0.3)	ND (0.29)	ND (0.29)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.096)	ND (0.096)	ND (0.10)	ND (0.095)	ND (0.10)	ND (0.095)
8082	PCB-1221	µg/L		ND (0.3)	ND (0.29)	ND (0.29)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.12)	ND (0.13)	ND (0.12)
8082	PCB-1232	µg/L		ND (0.39)	ND (0.39)	ND (0.38)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.096)	ND (0.096)	ND (0.10)	ND (0.095)	ND (0.10)	ND (0.095)
8082	PCB-1242	µg/L		ND (0.3)	ND (0.29)	ND (0.29)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.096)	ND (0.096)	ND (0.10)	ND (0.095)	ND (0.10)	ND (0.095)
8082	PCB-1248	µg/L		ND (0.2)	ND (0.19)	ND (0.19)	ND (0.080)	ND (0.080)	ND (0.080)	ND (0.080)	ND (0.077)	ND (0.077)	ND (0.080)	ND (0.076)	ND (0.080)	ND (0.076)
8082	PCB-1254	µg/L		ND (0.3)	ND (0.29)	ND (0.29)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.12)	ND (0.13)	ND (0.12)
8082	PCB-1260	µg/L		ND (0.3)	ND (0.29)	ND (0.29)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.096)	ND (0.096)	ND (0.10)	ND (0.095)	ND (0.10)	ND (0.095)
8082	Total PCBs	ug/L	0.5[b]	ND (0.39)	ND (0.39)	ND (0.38)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.13)	ND (0.12)	ND (0.13)	ND (0.12)
AK102	DRO (nC10–<nC25)	mg/L	1.5[c]	0.5	0.38	0.28	0.62	0.82	0.85	0.99	0.61	0.53	0.77	0.66	0.45	0.52
AK103	RRO (nC25–nC36)	mg/L	1.1[c]	0.079 J	0.12 J	ND (0.097)	0.14	0.24	0.3	0.35 MH	0.22	0.18	0.20	0.22	0.14	0.15
AK101	GRO	mg/L	2.2[c]	0.0074 J	0.009 J	ND (0.01)	NR*	NR*	NR*	NR*	NR*	NR*	NR*	NR*	NR*	NR*
Visual	Petrogenic Sheen		Presence/ Absence	No Sheen	No Sheen	No Sheen	No Sheen	No Sheen	No Sheen	No Sheen	No Sheen	No Sheen	No Sheen	No Sheen	No Sheen	No Sheen

Notes:

* Samples collected at intervals during dredging

[†] Sample locations 28-W-02 and 28-W-03 were sampled only at three intervals; pre-removal, mid-removal and post-removal

[a]Cleanup level from NE Cape 2009 Decision Document (US Army Corps of Engineers, Alaska District. 2009 Decision Document Hazardous, Toxic, and Radioactive Waste [HTRW] Project #F10AK096903 Northeast Cape Formerly Used Defense Site [FUDS] St. Lawrence Island, Alaska. January.)

[b]Cleanup level from Alaska Water Quality Criteria Manual for toxic and Other Deleterious Organic and Inorganic substances, Drinking water standards

[c] Cleanup level from 18AAC75 section 345, Table C

[D] Sample is a duplicate of previous sample

AK = Alaska test method

B = Analyte considered a high estimated value due to presence in method blank.

BTEX = benzyne, toluene, ethylbenzene and xylenes

DoD = U.S. Department of Defense

DRO = diesel range organics

GRO = gasoline range organics

J = Result is an estimate.

mg/L = milligrams per liter

MH = Analyte result is considered an estimated value biased high due to matrix effects.

ND = Sample result is non-detect; limit of detection is in parentheses.

NR = analysis not requested

NR* = It was determined, through consultation with USACE and ADEC, that GRO analysis was not necessary in the pre- and post- removal samples

NS = not stated

PAH = polynuclear aromatic hydrocarbon

PCB = polychlorinated biphenyls

QN = Analyte result is considered an estimated value with an uncertain bias due to a quality control failure.

RRO = residual range organics

TAH = total aromatic hydrocarbons

TAqH = total aqueous hydrocarbons

µg/L = micrograms per liter

Table 4 Site 28 Containment Water Pre- and Post-Treatment Results

			Client Sample Id:	12NC28TWA02	12NC28TWA03[D]	12NC28TWA01	12NC28TWA04
			Lab Sample Id:	1124556004	1124556005	1124556001	1124556006
			Location ID:	12NC28TW02	12NC28TW03	12NC28TW01	12NC28TW04
			Date Sampled:	9/19/2012	9/19/2012	9/19/2012	9/20/2012
Analysis Method	**Analyte**	**Units**	**Evaluation Criteria**	**Untreated Water**		**Treated Water**	
AK101	Gasoline Range Organics	mg/L	2.2[c]	0.0624 J	0.052 J	0.0486 J	0.0896 J
AK102	Diesel Range Organics	mg/L	1.5[c]	0.702	0.336 J	0.549 J	0.985
AK102	Residual Range Organics	mg/L	1.1[c]	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)
Visual	Presence of Sheen	NA	No sheen[a]	No sheen observed	No sheen observed	No sheen observed	No sheen observed
SW6020	Arsenic-Total	µg/L	10[b]	**16.4**	**14.9**	**15.5**	**10.7**
SW6020	Barium-Total	µg/L	2000[b]	50.7	46.3	42.2	54.7
SW6020	Cadmium-Total	µg/L	5[b]	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)
SW6020	Chromium-Total	µg/L	100[b]	2.53 J	2.23 J	ND (2.4)	3.11 J
SW6020	Lead-Total	µg/L	15[c]	3.5	3.08	2.54	4.81
SW6020	Nickel-Total	µg/L	100[c]	1.62 J	1.39 J	ND (1.24)	2.42
SW6020	Selenium-Total	µg/L	50[b]	ND (3)	ND (3)	ND (3)	ND (3)
SW6020	Silver-Total	µg/L	100[c]	ND (1.24)	ND (1.24)	ND (1.24)	ND (1.24)
SW6020	Vanadium-Total	µg/L	260[c]	6.89 J	ND (12.4)	ND (12.4)	7.11 J
SW6020	Zinc-Total	µg/L	5,000[c]	20.6 J	16.2 J	16.2 J	25.8
SW7470A	Mercury-Total	µg/L	2[b]	0.703	0.701	1.17	0.438
SW6020	Arsenic-Dissolved	µg/L	10[b]	**11.4**	**13.4**	ND (3)	ND (3)
SW6020	Barium-Dissolved	µg/L	2000[b]	36.6	37.8	10.7	11.7
SW6020	Cadmium-Dissolved	µg/L	5[b]	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.2)
SW6020	Chromium-Dissolved	µg/L	100[b]	1.57 J	1.85 J	ND (2.4)	ND (2.4)
SW6020	Lead-Dissolved	µg/L	15[c]	2.21	2.34	ND (0.62)	ND (0.62)
SW6020	Nickel-Dissolved	µg/L	100[c]	1.28 J	0.988 J	ND (1.24)	0.774 J
SW6020	Selenium-Dissolved	µg/L	50[b]	ND (3)	ND (3)	ND (3)	ND (3)
SW6020	Silver-Dissolved	µg/L	100[c]	ND (1.24)	ND (1.24)	ND (1.24)	ND (1.24)
SW6020	Vanadium-Dissolved	µg/L	260[c]	ND (12.4)	ND (12.4)	ND (12.4)	ND (12.4)
SW6020	Zinc-Dissolved	µg/L	5,000[c]	13.7 J	12.4 J	ND (15.6)	ND (15.6)
SW7470A	Mercury-Dissolved	µg/L	2[b]	0.377	0.45	0.0964 J	ND (0.124)
SW8082A	Aroclor-1016	µg/L	NS	ND (0.062)	ND (0.062)	ND (0.062)	ND (0.062)
SW8082A	Aroclor-1221	µg/L	NS	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)
SW8082A	Aroclor-1232	µg/L	NS	ND (0.062)	ND (0.062)	ND (0.062)	ND (0.062)
SW8082A	Aroclor-1242	µg/L	NS	ND (0.062)	ND (0.062)	ND (0.062)	ND (0.062)
SW8082A	Aroclor-1248	µg/L	NS	ND (0.062)	ND (0.062)	ND (0.062)	ND (0.062)
SW8082A	Aroclor-1254	µg/L	NS	ND (0.062)	ND (0.062)	ND (0.062)	ND (0.062)
SW8082A	Aroclor-1260	µg/L	NS	ND (0.062) QN	0.19 QN	ND (0.062)	ND (0.062)
8082	Total PCBs	ug/L	0.5[b]	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)
SW8260B	Benzene	µg/L	5[b]	ND (0.24)	ND (0.24)	0. 47	0. 21 J
SW8260B	Ethylbenzene	µg/L	700[b]	0.97 J	0.67 J	0.66 J	2.31
SW8260B	o-Xylene	µg/L	NS	2.78	2.11	1.92	6.79
SW8260B	m-Xylene & p-Xylene	µg/L	NS	3.86 QN	2.83 QN	3.05	9.42
8260	Xylenes (total)	µg/L	10000[b]	6.64	4.94	4.97	16.21
SW8260B	Toluene	µg/L	1000[b]	1.04	1.11	0.00267	.00083 J
8260	TAH total	µg/L	10[a]	8.65	6.96	8.77	**19.6**

Table 4 Site 28 Containment Water Pre- and Post-Treatment Results (continued)

			Client Sample Id:	12NC28TWA02	12NC28TWA03[D]	12NC28TWA01	12NC28TWA04
			Lab Sample Id:	1124556004	1124556005	1124556001	1124556006
			Location ID:	12NC28TW02	12NC28TW03	12NC28TW01	12NC28TW04
			Date Sampled:	9/19/2012	9/19/2012	9/19/2012	9/20/2012
Analysis Method	**Analyte**	**Units**	**Evaluation Criteria**	**Untreated Water**		**Treated Water**	
8270D SIMs (PAH)	1-Methylnaphthalene	µg/L	15[c]	3.17	2.35	2.07	1.44 QL
8270D SIMs (PAH)	2-Methylnaphthalene	µg/L	15[c]	2.21	1.99	2.13	0.25 QL
8270D SIMs (PAH)	Acenaphthene	µg/L	2,200[c]	ND (0.15)	0.173 J	ND (0.15)	0.13 QL
8270D SIMs (PAH)	Acenaphthylene	µg/L	2,200[c]	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.03) QL
8270D SIMs (PAH)	Anthracene	µg/L	11,000[c]	ND (0.15)	ND (0.15)	ND (0.15)	0.0184 J,QL
8270D SIMs (PAH)	Benzo(a)anthracene	µg/L	1.2[c]	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.03) QL
8270D SIMs (PAH)	Benzo(a)pyrene	µg/L	0.2[b]	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.03) QL
8270D SIMs (PAH)	Benzo(b)fluoranthene	µg/L	1.2[c]	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.03) QL
8270D SIMs (PAH)	Benzo(g,h,i)perylene	µg/L	1,100[c]	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.03) QL
8270D SIMs (PAH)	Benzo(k)fluoranthene	µg/L	12[c]	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.03) QL
8270D SIMs (PAH)	Chrysene	µg/L	120[c]	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.03) QL
8270D SIMs (PAH)	Dibenzo(a,h)anthracene	µg/L	0.12[c]	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.03) QL
8270D SIMs (PAH)	Fluoranthene	µg/L	1,500[c]	0.169 J	0.11 J	0.0934 J	0.091 QL
8270D SIMs (PAH)	Fluorene	µg/L	1,500[c]	0.455	0.344	0.24 J	0.271 QL
8270D SIMs (PAH)	Indeno(1,2,3-c,d) pyrene	µg/L	1.2[c]	ND (0.15)	ND (0.15)	ND (0.15)	ND (0.03) QL
8270D SIMs (PAH)	Naphthalene	µg/L	730[c]	1.16	1.2	2.13	0.394 QL
8270D SIMs (PAH)	Phenanthrene	µg/L	11,000[c]	0.291	0.234 J	0.177 J	0.134 QL
8270D SIMs (PAH)	Pyrene	µg/L	1,100[c]	ND (0.15)	ND (0.15)	ND (0.15)	0.0738 QL
8260 + 8270	Sum TAqH (BTEX + PAHs)	µg/L	15[a]	**18.1**	**15**	**17.4**	**22.6 QL**

Notes:
1-TAqH limit per ADEC discharge permit No. 2009DB0004-0216

[a]Cleanup level from NE Cape 2009 Decision Document (US Army Corps of Engineers, Alaska District. 2009 Decision Document Hazardous, Toxic, and Radioactive Waste [HTRW] Project #F10AK096903 Northeast Cape Formerly Used Defense Site [FUDS] St. Lawrence Island, Alaska. January.)
[b]Cleanup level from Alaska Water Quality Criteria Manual for toxic and Other Deleterious Organic and Inorganic substances, Drinking water standards
[c] Cleanup level from 18AAC75 section 345, Table C
Bold = Result exceeds cleanup level
[D] = Sample is a duplicate of previous sample
AK = Alaska test method
BTEX = benzene, toluene, ethylbenzene, and xylenes
EPA = U.S. Environmental Protection Agency
J = Result is an estimate
mg/L = milligrams per liter
ND = Result is non-detect, limit of detection in parentheses
NS = not stated
PAH = polynuclear aromatic hydrocarbon
QL = Analyte result is considered an estimated value with a low bias due to a quality control failure.
QN = Analyte result is considered an estimated value with an uncertain bias due to a quality control failure.
SIM = selective ion monitoring
SW = EPA Solid Waste Test Method
TAH = total aromatic hydrocarbons (BTEX)
TAqH = total aqueous hydrocarbons (BTEX + PAHs)
µg/L = micrograms per liter

Table 5 Site 28 Bulk Waste Characterization Analytical Results

			Sample ID	12NC28BW01
			Laboratory ID	580-35168-10
			Location ID	12NC28BW01
			Collection Date	9/17/2012
Analytical Method	**Analyte**	**Unit**	**Regulatory Level***	
AK101	GRO	mg/kg	NS	180 ML
AK102	DRO	mg/kg	NS	67000
AK103	RRO	mg/kg	NS	8300
6020	Arsenic	mg/kg	100	7.1
6020	Barium	mg/kg	2,000	110
6020	Cadmium	mg/kg	20	0.72
6020	Chromium	mg/kg	100	27
6020	Lead	mg/kg	100	71
6020	Nickel	mg/kg	NS	16
6020	Selenium	mg/kg	20	1.2
6020	Silver	mg/kg	100	0.14 J
6020	Vanadium	mg/kg	NS	36
6020	Zinc	mg/kg	NS	140
7471A	Mercury	mg/kg	4	0.17
8082/DoD	PCB-1016	mg/kg	50	ND (0.0088)
8082/DoD	PCB-1221	mg/kg	50	ND (0.018)
8082/DoD	PCB-1232	mg/kg	50	ND (0.018)
8082/DoD	PCB-1242	mg/kg	50	ND (0.0088)
8082/DoD	PCB-1248	mg/kg	50	ND (0.0088)
8082/DoD	PCB-1254	mg/kg	50	ND (0.0088)
8082/DoD	PCB-1260	mg/kg	50	0.21
8260B/DoD	Benzene	µg/kg	10,000	240
8260B/DoD	Ethylbenzene	µg/kg	NS	3700
8260B/DoD	m,p-Xylene	µg/kg	NS	15,000
8260B/DoD	o-Xylene	µg/kg	NS	8,300
8260B/DoD	Toluene	µg/kg	NS	290
8270C SIM/DoD	1-Methylnaphthalene	µg/kg	NS	210,000
8270C SIM/DoD	2-Methylnaphthalene	µg/kg	NS	220,000

Table 5 Bulk Waste Characterization Samples (continued)

			Sample ID	12NC28BW01
			Laboratory ID	580-35168-10
			Location ID	12NC28BW01
			Collection Date	9/17/2012
Analytical Method	**Analyte**	**Unit**	**Regulatory Level***	
8270C SIM/DoD	Acenaphthene	µg/kg	NS	4,300
8270C SIM/DoD	Acenaphthylene	µg/kg	NS	1,700
8270C SIM/DoD	Anthracene	µg/kg	NS	ND (44)
8270C SIM/DoD	Benzo(a)anthracene	µg/kg	NS	79 J
8270C SIM/DoD	Benzo(a)pyrene	µg/kg	NS	ND (44)
8270C SIM/DoD	Benzo(b)fluoranthene	µg/kg	NS	ND (44)
8270C SIM/DoD	Benzo(g,h,i)perylene	µg/kg	NS	43 J
8270C SIM/DoD	Benzo(k)fluoranthene	µg/kg	NS	ND (44)
8270C SIM/DoD	Chrysene	µg/kg	NS	200
8270C SIM/DoD	Dibenz(a,h)anthracene	µg/kg	NS	ND (44)
8270C SIM/DoD	Fluoranthene	µg/kg	NS	340
8270C SIM/DoD	Fluorene	µg/kg	NS	6300
8270C SIM/DoD	Indeno(1,2,3-cd)pyrene	µg/kg	NS	ND (44)
8270C SIM/DoD	Naphthalene	µg/kg	NS	42,000
8270C SIM/DoD	Phenanthrene	µg/kg	NS	5,900
8270C SIM/DoD	Pyrene	µg/kg	NS	320
9060	Total Organic Carbon – Quad	µg/kg	NS	78,000

Notes:

Results compared to RCRA/TSCA levels from title 40 CFR for disposal

AK = Alaska test method

DoD = Department of Defense

DRO = diesel range organics

GRO = gasoline range organics

J = Result is an estimate.

mg/kg = milligrams per killigram

ML = Analyte result is considered estimated with a low bias due to matrix effects.

ND = non-detect; limit of detection in parentheses

RCRA = Resource Conservation and Recovery Act

RRO = residual range organics

SIM = selective ion monitoring

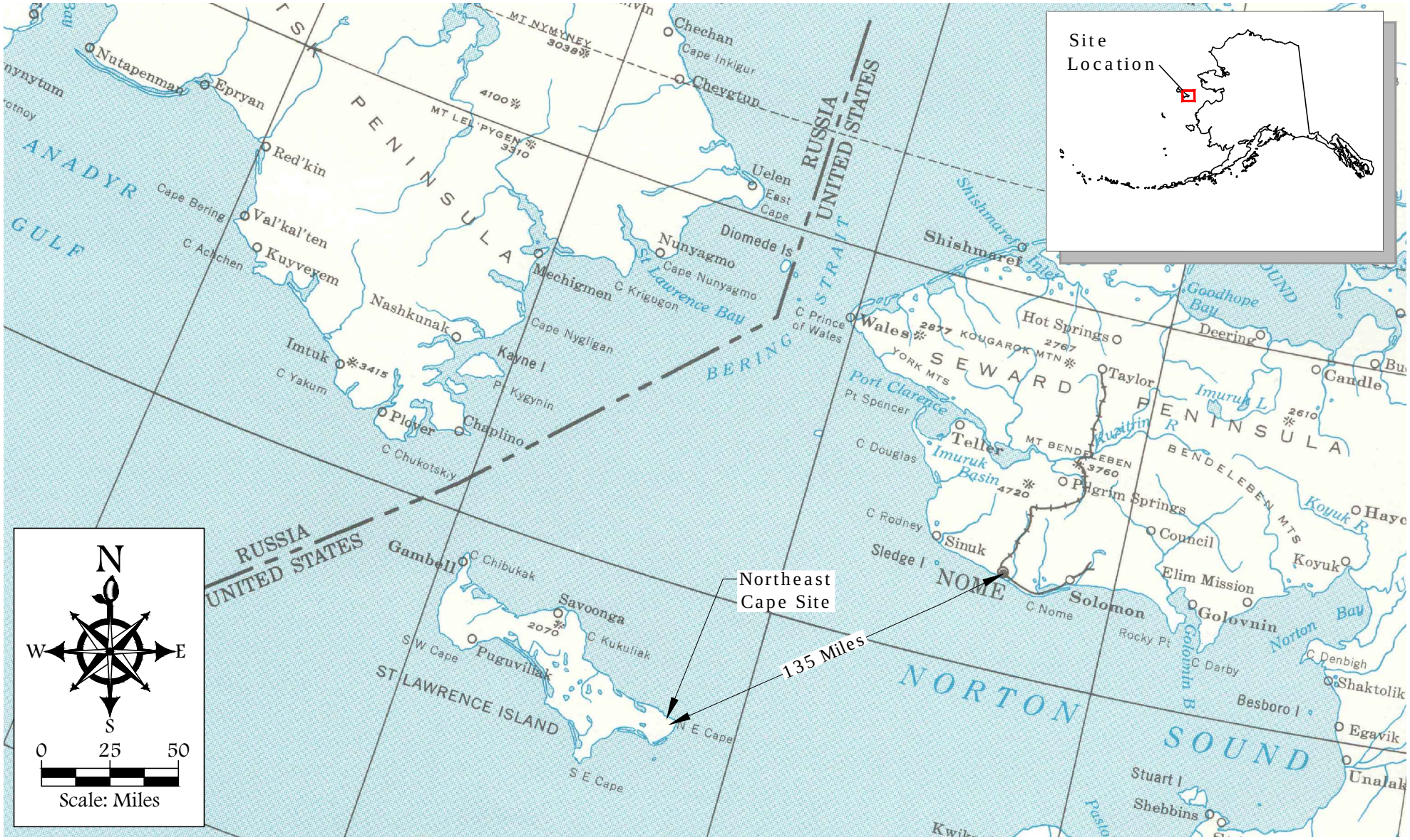
TSCA = Toxic Substances Control Act

µg/kg = micrograms per kilogram

*A total waste analysis can be used in lieu of the TCLP to determine that a waste does not exhibit the toxicity characteristic. For solids, this is accomplished by dividing the total concentration of a constituent in the waste by 20 (reflecting the weight ratio of solid sample to acetic acid in the TCLP) If this maximum theoretical leachate concentration is lower than the characteristic level for the constituent, the waste cannot exhibit the toxicity characteristic for that constituent, and the TCLP need not be run.

FIGURES

Drawing: O:\JOBS\34120057 2012 NE CAPE\ACAD-ENVIRO\FIGURES-SITE28-NOV2012\FIG1-SITE28.DWG - Layout: 34120057-FIG1-NOV2012
User: NPEACOCK Dec 13, 2012 - 1:16pm Xrefs: - Images: NECAPE.JPG



Source: USGS National Atlas Sheet Number 42-43

Legend

HTRW Hazardous, Toxic, and Radioactive Waste

FIGURE 1
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA
NORTHEAST CAPE HTRW REMEDIAL ACTIONS
PHASE I SEDIMENT REMOVAL
VICINITY MAP

Bristol
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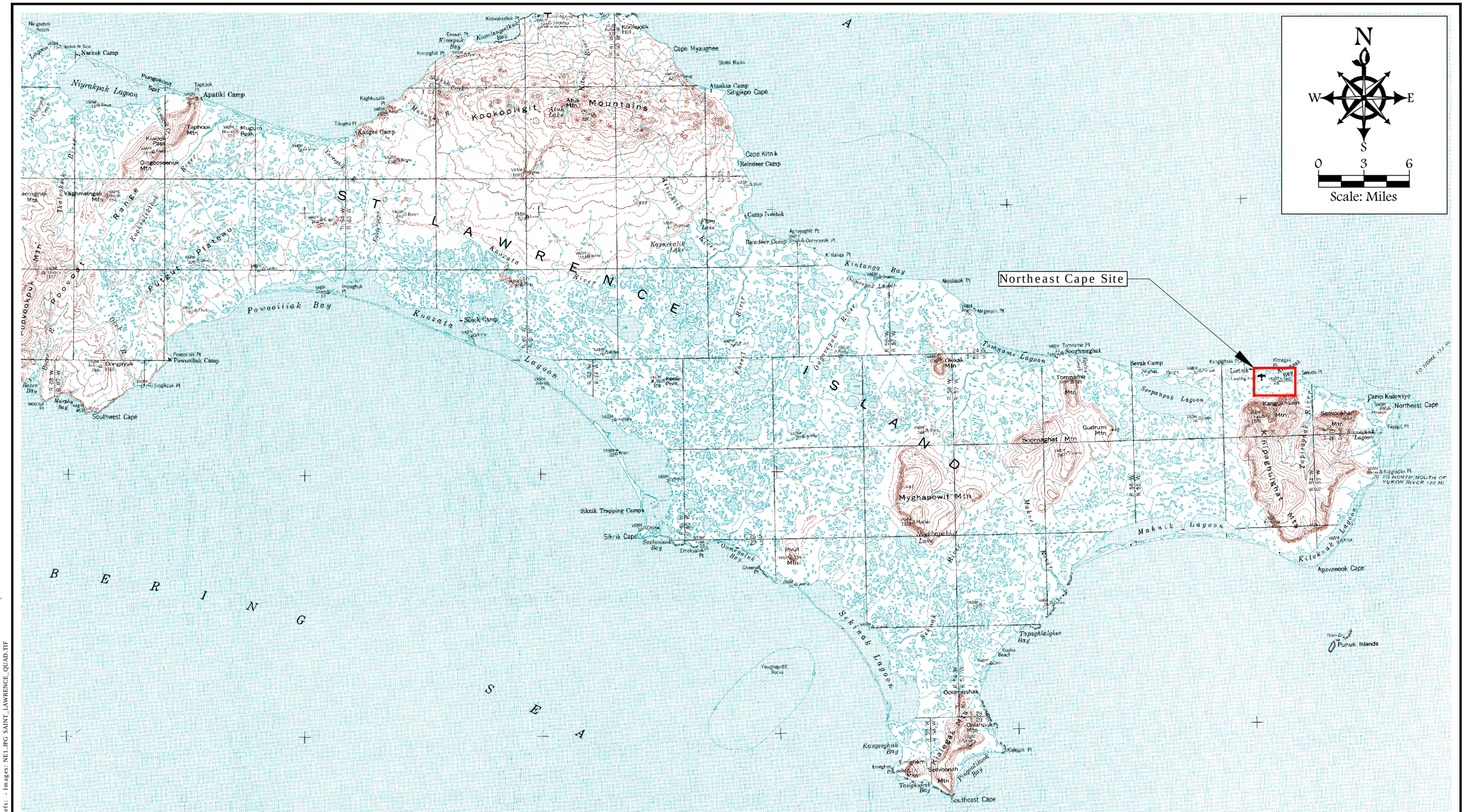
Phone (907) 563-0013 Fax (907) 563-6713

DATUM:	NAD 83
PROJECTION:	STATE PLANE AK 9
Project No.	34120057
DATE	11/27/12
DWN.	MTG
SCALE	SHOWN
APPRVD.	JRC



Legend

HTRW Hazardous, Toxic, and Radioactive Waste

FIGURE 2
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA
NORTHEAST CAPE HTRW REMEDIAL ACTIONS
PHASE I SEDIMENT REMOVAL
LOCATION MAP

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DATUM:	DATE	11/27/12
NAD 83	DWN.	MTG
PROJECTION:	SCALE	SHOWN
STATE PLANE AK 9	APPRVD.	JRC
Project No.		
34120057		

Drawing: O:\JOBS\34120057 2012 NE CAPE\ACAD-ENVIRO\FIGURES-SITE28-NOV2012\FIG2-SITE28.DWG - Layout: 34120057-FIG2-NOV12
User: NPEACOCK Dec 13, 2012 - 1:20pm Xrefs: - Images: NE1.JPG SAINT_LAWRENCE_QUAD.TIF

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Scale: Feet

Medical Facility
Temporary Construction Camp
Barge Landing Area
Cargo Beach Staging Area
Over Winter Equipment Staging Area
Bulk Bag Staging Area at Site 6
Sugitughneg River
Site 28-Drainage Basin
Site 7 Cargo Beach Landfill
Site 8-POL Spill
Water Withdrawal Area
Hazardous Waste Accumulation Point
Site 13-Power and Heat Building
Site 9 Housing and Operations Landfill
Site 21-Wastewater Treatment Tank
Fuel Storage/Containment Area
Former Building 98 Foundation
MOC
Bulk Bag Staging Area
Mechanic Shop/Container Storage Area
Site 31-White Alice Site
Over Winter Equipment Staging Area
Roofing Tar Area
Borrow Source

LEGEND

HTRW	Hazardous, Toxic, and Radioactive Waste
MOC	Main Operations Complex
POL	Petroleum, Oil, and Lubricants

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

FIGURE 3
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA
NORTHEAST CAPE HTRW REMEDIAL ACTIONS
PHASE I SEDIMENT REMOVAL
PROJECT WORK SITES

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Phone (907) 563-0013 Fax (907) 563-6713

DATUM: NAD 83
PROJECTION: STATE PLANE AK 9
Project No. 34120057

DATE 11/27/12
DWN. MTG
SCALE SHOWN
APPRVD. GJ

User: MGARCIA Apr 18, 2013 - 9:15am
Drawing: \\BEESC-JOBS\BERS\JOBS\34120057 2012 NE CAPE\ACAD-ENVIRO\FIGURES-SITE28-NOV2012\FIG4-SITE28.DWG - Layout: FIG4-SITE28-NOV12
Xrefs: None - Images: EASTCAPE-STLAWRENCE_ORTHO_MOSAIC_AK83-9F.TIF

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Scale: Feet

SUQITUGHNEQ RIVER
Island
Island
Island
Location of Sediment Trap
Sediment Removal Area 4
Island
Sediment Removal Area 3
Sediment Removal Area 2
Sediment Removal Area 1
MOC Surface Water Sampling Site
Western Drainage
Former Culvert
Former Culvert
Middle Drainage
Eastern Drainage
Former AST
Former AST
Main Operations Complex (MOC)

Legend
- Sediment Boundary
- Vegetative Mat Boundary
- Ponded Water
- Secondary Contours
- Primary Contours
- Island

Notes:
AST Aboveground Storage Tank
HTRW Hazardous, Toxic, and Radioactive Waste
-Sediment is defined as all loose mineral or organic material except for that which is actively growing vegetation or is part of the vegetative mat.

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Project No. 34120057

FIGURE 4
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA
NE CAPE HTRW REMEDIAL ACTIONS
PHASE I SEDIMENT REMOVAL
2012 SITE 28 SEDIMENT REMOVAL AREAS

SCALE: 1" = 60'	DESIGNED:	CHECKED: JRC	DRAWN: MTG	DATE: 11/27/12

User: MGARCIA May 02, 2013 - 12:08pm
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Xrefs: None - Images: EASTCAPE-STLAWRENCE_ORTHO_MOSAIC_AK83-9F.TIF

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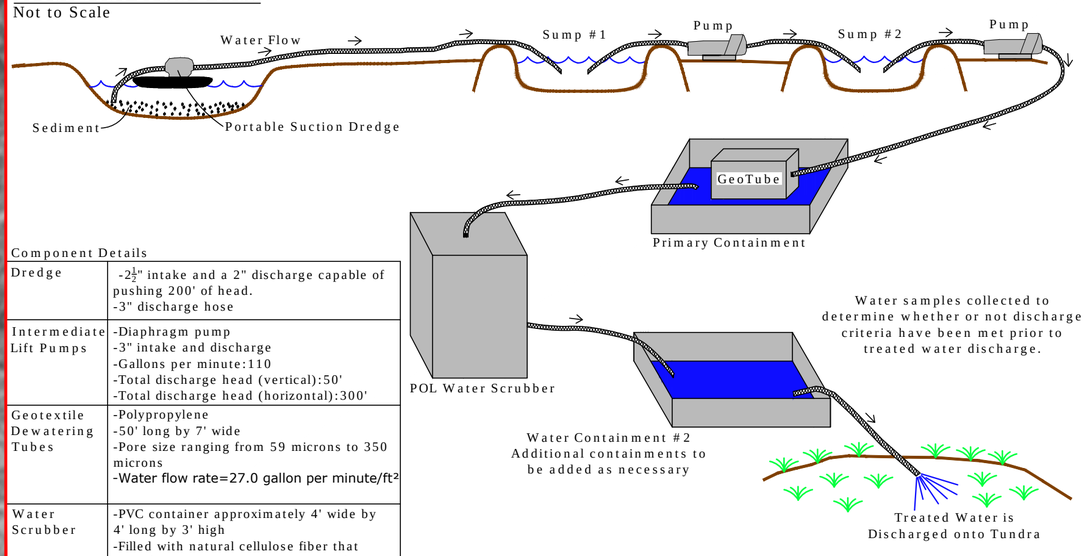
0 30 60
Scale: Feet

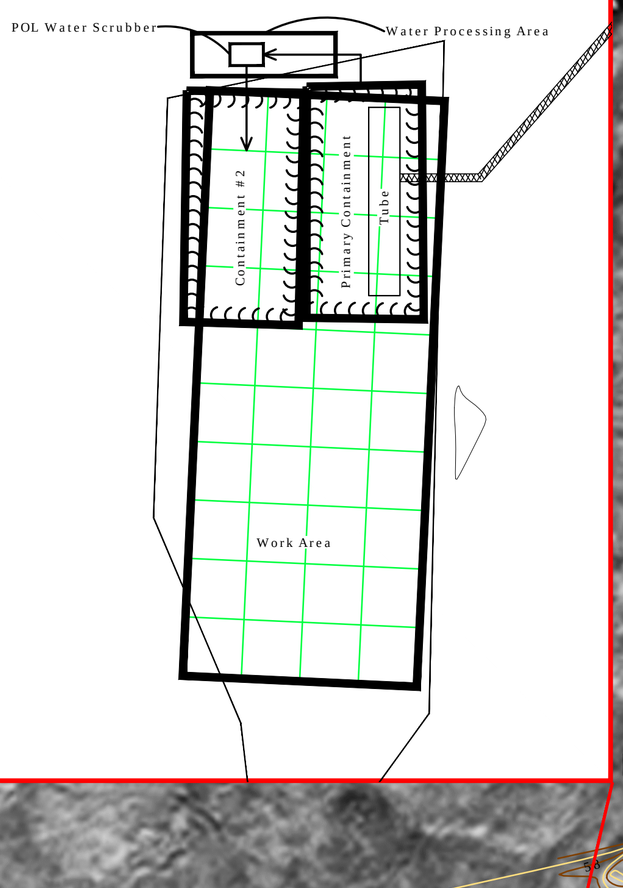
Treatment Train Detail

Not to Scale



Component Details

Dredge	-2½" intake and a 2" discharge capable of pushing 200' of head. -3" discharge hose
Intermediate Lift Pumps	-Diaphragm pump -3" intake and discharge -Gallons per minute:110 -Total discharge head (vertical):50' -Total discharge head (horizontal):300'
Geotextile Dewatering Tubes	-Polypropylene -50' long by 7' wide -Pore size ranging from 59 microns to 350 microns -Water flow rate=27.0 gallon per minute/ft²
Water Scrubber	-PVC container approximately 4' wide by 4' long by 3' high -Filled with natural cellulose fiber that selectively absorb hydrocarbons while repelling water -Passive drain to 1" outlet



SUQITUGHNEQ RIVER
12NC28SS001
12NC28WA03
12NC28SS002
Island
12NC28SS003
Island
12NC28SS004
12NC28SS005
12NC28SS006
12NC28SS008
12NC28SS007
12NC28SS009
12NC28SS010
12NC28SS011
12NC28SS012
12NC28WA02
Island
12NC28SS013
12NC28SS014
12NC28SS015
12NC28SS038
Location of Sediment Trap
12NC28SS016
12NC28WA01
These areas were actively growing vegetation during removal operations.
2012 Sediment Removal Area 4
12NC28SS017
These areas were actively growing vegetation during removal operations.
12NC28SS018
Sump Hose Line
Dredge
12NC28SS021
12NC28SS019
Sump #1
12NC28SS020
Island
12NC28MI005
12NC28SS022
12NC28SS023
12NC28SS024
12NC28SS025
12NC28SS026
12NC28SS027
Sump Hose Line
12NC28SS028
12NC28SS029
12NC28SS030
2012 Sediment Removal Area 3
12NC28SS031
12NC28SS032
12NC28SS033
12NC28MI001
12NC28MI006
Sump #2
Water Containment Number 3
Water Containment Number 2
Water Treatment System
Work Pad
Primary Containment Number 1
12NC28SS039
12NC28SS040
12NC28SS034
12NC28SS036
12NC28SS035
12NC28SS041
12NC28SS042
12NC28SS043
12NC28MI002
12NC28MI003
12NC28MI004
12NC28SS037
2012 Sediment Removal Area 2
12NC28SS050
12NC28SS046
12NC28SS045
12NC28SS047
12NC28SS048
2012 Sediment Removal Area 1
12NC28SS049
12NC28SS044
MOC Surface Water Sampling Site
12NC28SS051
Western Drainage
Eastern Drainage
Former Culvert
Middle Drainage
Former Culvert
Former AST
Former AST
Main Operations Complex (MOC)

Legend

- 2013 Proposed Removal Areas
- 2012 Removed Sediment Boundary
- Vegetative Mat Boundary
- Ponded Water
- MI Decision Unit
- 2012 Sediment Sample Location
- 2012 Water Sample Location
- Island
- Secondary Contours
- Primary Contours
- 12NC28SS051 Sample Identification

Notes:

AST Aboveground Storage Tank
HTRW Hazardous, Toxic, and Radioactive Waste
MI *MULTI INCREMENT®*

-Sediment is defined as all loose mineral or organic material except for that which is actively growing vegetation or is part of the vegetative mat.

The area around the removal area contained actively growing vegetation in September 2012, where none was present during the sediment mapping in July 2012. The "ring" around the sediment removal area 4 consists of areas that grass grew in the stream during the two months between mapping and removal. The areas were not disturbed because of actively growing vegetation. Removal area 4 will be re-dredged in 2013, sediment accumulated since the 2012 removal.

These areas were actively growing vegetation during removal operations.

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Project No. 34120057

FIGURE 5
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA
NE CAPE HTRW REMEDIAL ACTIONS
PHASE I SEDIMENT REMOVAL
2012 SITE 28 SEDIMENT REMOVAL AREAS AND PROPOSED SEDIMENT REMOVAL AREAS

SCALE: 1" = 60'	DESIGNED:	CHECKED: JRC	DRAWN: MTG	DATE: 11/27/12

User: MGARCIA May 02, 2013 - 11:38am
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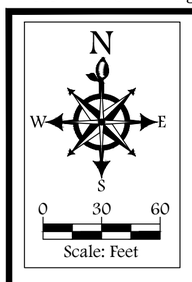
Xrefs: None - Images: None



SUQITUGHNEQ RIVER
12NC28WA03
Island
12NC28WA02
Island
12NC28WA01
2012 Sediment Removal Area 4
Location of Sediment Trap
These areas were actively growing vegetation during removal operations.
These areas were actively growing vegetation during removal operations.
Sump Hose Line
Dredge
Sump #1
12NC28MI005
Island
Sump Hose Line
2012 Sediment Removal Area 3
Sump #2
12NC28MI001
12NC28MI006
Water Containment Number 3
Sump Hose Line
Water Treatment/Filter System
Work Pad
Water Containment Number 2
Water Containment Number 1
12NC28MI002
12NC28MI003
12NC28MI004
2012 Sediment Removal Area 2
2012 Sediment Removal Area 1
12NC28SS054
12NC28SS055
MOC Surface Water Sampling Site
12NC28SS052
12NC28SS053/056
Western Drainage
Eastern Drainage
Former Culvert
Former Culvert
Middle Drainage
Former AST
Former AST
Main Operations Complex (MOC)

Legend

- 2013 Proposed Removal Areas
- 2012 Removed Sediment Boundary
- Vegetative Mat Boundary
- Ponded Water
- 2012 Water Sample Location
- 2012 Sediment Confirmation Sample Location
- Island
- Secondary Contours
- Primary Contours
- 12NC28SS051 Sample Identification
- These areas were actively growing vegetation during removal operations.

Notes:

AST Aboveground Storage Tank
HTRW Hazardous, Toxic, and Radioactive waste
-Sediment is defined as all loose mineral or organic material except for that which is actively growing vegetation or is part of the vegetative mat.

Bristol

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Project No. 34120057

FIGURE 6
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA
NE CAPE HTRW REMEDIAL ACTIONS
PHASE I SEDIMENT REMOVAL
SITE 28 ***MULTI INCREMENT®*** SAMPLE DECISION UNITS AND CONFIRMATION SEDIMENT SAMPLE LOCATIONS

SCALE: 1" = 60'	DESIGNED:	CHECKED: JRC	DRAWN: MTG	DATE: 11/27/12

User: MGARCIA Apr 18, 2013 - 12:11pm
Drawing: \\BEESC-JOBS\BERS\JOBS\34120057 2012 NE CAPE\ACAD-ENVIRO\FIGURES-SITE28-NOV2012\FIG7-SITE28.DWG - Layout: FIG7-NOV12
Xrefs: None - Images: None

N
W E
S
0 30 60
Scale: Feet

SUQITUGHNEQ RIVER
6.8 Cu. Yds.
Island
2.7 Cu. Yds.
Island
0.3 Cu. Yds.
8.2 Cu. Yds.
16.9 Cu. Yds.
7.2 Cu. Yds.
1.3 Cu. Yds.
4.2 Cu. Yds.
Island
0.7 Cu. Yds.
62.9 Cu. Yds.
Location of Sediment Trap
Island
135.3 Cu. Yds.
69.8 Cu. Yds.
0.3 Cu. Yds.
0.5 Cu. Yds.
3.3 Cu. Yds.
9.3 Cu. Yds.
2.4 Cu. Yds.
29.3 Cu. Yds.
3.8 Cu. Yds.
0.5 Cu. Yds.
0.5 Cu. Yds.
6.9 Cu. Yds.
MOC Surface Water Sampling Site
Western Drainage
Former Culvert
Former Culvert
Middle Drainage
Eastern Drainage
Former AST
Former AST
Main Operations Complex (MOC)

Legend
- Sediment Boundary
- Vegetative Mat Boundary
- Ponded Water
- 2012 Probing Location
- Island
- Secondary Contours
- Primary Contours
- 12NC28SS051 Sample Identification

Notes:
AST Aboveground Storage Tank
HTRW Hazardous, Toxic, and Radioactive
-Sediment is defined as all loose mineral or organic material except for that which is actively growing vegetation or is part of the vegetative mat.

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Project No. 34120057

FIGURE 7
NORTHEAST CAPE, ST. LAWRENCE ISLAND, ALASKA
NE CAPE HTRW REMEDIAL ACTIONS
PHASE I SEDIMENT REMOVAL
SITE 28 ESTIMATED SEDIMENT VOLUMES

SCALE: 1" = 60'	DESIGNED:	CHECKED: JRC	DRAWN: MTG	DATE: 11/19/12

APPENDIX A

Correspondence, Meeting Minutes, and
Response to Comments

CORRESPONDENCE AND MEETING MINUTES

Clark, Julie

From: Dunkin, Curtis S (DEC) [curtis.dunkin@alaska.gov]
Sent: Friday, September 07, 2012 3:35 PM
To: 'Cossaboom, Carey C POA'; Jarrell, Greg; Clark, Julie; Johnson, Steve
Cc: 'Broyles, Ronald S POA'; 'Shewman, Aaron F POA'
Subject: ADEC's comments on the draft August 2012 Northeast Cape Site 28 Tech Memo and Site 28 Phase I Sediment Removal Work Plan

Carey, and project team, thank you for today's teleconference to discuss the draft 2012 Site 28 TM and Phase I Sediment RA. ADEC submitted the comments in the email below earlier today after reviewing both documents. Please note that the comments below were focused on identifying ADEC's concerns with regards to finalizing the sediment removal action effort. ADEC does have other minor comments on the Site 28 TM which I'll forward as additional comments to the team early next week along with the comments below in a formal template for the Corps' records. Per the teleconference today, the project team discussed oral responses to ADEC's comments below which according to Bristol will be documented early next week. ADEC concurred with all of the oral responses provided during the teleconference and also concurred with the project team's numerous agreements on the best paths forward to implement the 2012 Site 28 Phase I Sediment Removal Action. ADEC looks forward to receiving the formal responses and revisions to the Site 28 TM as discussed today.
This email serves as ADEC's tentative approval to implement the 2012 NEC Site 28 Phase I RA Work Plan in field. ADEC will submit a formal approval letter to the Corps and project team once the work plan is finalized. Please keep ADEC apprised of any changes or unforeseen complications with implementing the removal action at this site as well as the DQCR's being currently provided; which are appreciated by ADEC.
Please contact me if you have any questions.
Thanks and best regards

Curtis Dunkin
Environmental Program Specialist
ADEC Contaminated Sites Program
555 Cordova Street
Anchorage, AK 99501
Phone: 907-269-3053

-----Original Message-----
From: Dunkin, Curtis S (DEC)
Sent: Friday, September 07, 2012 1:02 PM
To: 'Cossaboom, Carey C POA'
Cc: Broyles, Ronald S POA; Shewman, Aaron F POA
Subject: RE: Site 28 (UNCLASSIFIED)

Carey, ADEC still has a few general comments on the draft 2012 NEC site 28 tech memo that are not included in the comments below that I'll submit later since they are not critical for review and approval of the sediment removal action. Below are comments and questions which are still unclear from the draft May 2012 RA work plan and the Aug. Site 28 TM. Please contact me if you have any questions. I will be in the office until 5pm and am available anytime the rest of today for a teleconf.
thanks

1. The sediment mitigation control(s) referenced in section 5.0 (stated in the May 2012 NEC SWPPP as being a silt fence, is not adequate for the Phase I removal. Due to the large amounts of potential contaminated sediment migration, a more extensive sediment control/settling system should be proposed (incl. absorbent booms). Because it may not be

feasible/practical to obtain in situ sampling results, the sediment and contaminant migration monitoring and mitigation measures need to be adequate. While the proposed three surface water samples (pre/during/and post removal activities) are necessary, they provide no mitigation. More water samples should be collected at intervals during removal to determine what concentrations of contaminants (if any) may have migrated off site.
2. Section 4.3.1.2 re: the discussion about the use of the Silica Gel cleanup method to determine whether cleanup goals are met will require revision; ADEC did not approve the SG method to be utilized for confirmation sampling for this removal action.
3. Re: the proposal in section 5.0 that states that depth of sediment removal will not exceed 2 ft. in any removal area, based on documentation provided in the draft 2012 TM, there were no areas where mapped sediment depth exceeded 2ft; therefore this should not be a concern. However, ADEC requests that all contaminated material that is defined for the purposes of this project as sediment, be removed from the areas where the project team agrees to remove sediment; i.e. if 2.5 ft. of sediment is encountered then removal should not stop at 2 ft.
4. What are the general components of the two methods being proposed to evaluate for the sediment removal discussed in section 5.0? Are excavation w/ equipment and suction dredging considered the two different proposed methods?
5. Section 5.0 states possible use of flocculants - confirm whether or not these will be used since they can cause problems with sample analyses. Previous communication w/ Bristol confirmed to ADEC that no flocculants or other chemicals or additives would be applied to the sediment and water throughout the process; except for treatment of water in the impoundments prior to discharge per the water quality requirements outlined in the permit.
6. What will be the estimated volumes of the impoundments and how often will sampling occur; i.e. once per day regardless or frequency/gallons? What is the actual treatment process proposed and which location is proposed to discharge the treated water? Will the water impoundment areas be deconstructed or overwintered? Will soil samples be collected preconstruction and post deconstruction of the water processing area?
7. Re: the proposed overwintering of the geo tube, will the impoundment area be sufficient in the event of tube failure; re: the proposal to overwinter?
8. ADEC concurs w/ the four areas proposed for the Phase I sediment removal which are stated in section 5.0.

Curtis Dunkin
Environmental Program Specialist
ADEC Contaminated Sites Program
555 Cordova Street
Anchorage, AK 99501
Phone: 907-269-3053

-----Original Message-----
From: Cossaboom, Carey C POA [mailto:Carey.C.Cossaboom@usace.army.mil]
Sent: Friday, September 07, 2012 11:27 AM
To: Dunkin, Curtis S (DEC)
Cc: Broyles, Ronald S POA; Shewman, Aaron F POA
Subject: RE: Site 28 (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Curtis,

Sounds good. Can we squeeze in a teleconference with Bristol today to talk about your comments/concerns?

Carey

-----Original Message-----
From: Dunkin, Curtis S (DEC) [mailto:curtis.dunkin@alaska.gov]
Sent: Friday, September 07, 2012 10:39 AM
To: Cossaboom, Carey C POA
Subject: RE: Site 28 (UNCLASSIFIED)

Carey I've completed my review of the TM and have a few questions which I'll email you w/in the hour. Re: your email below, did ADEC-DOW issue anything to the Corps/Bristol re: the water discharge approval under the general permit (i.e. a letter, stipulations)? That was my understanding that they were going to allow the discharge(s) under the general permit but w/ stipulations and were going to generate a letter re: the NOI.
I do have questions and concerns re: the sediment controls (for which the SWPP states a silt fence) - and nothing more. Others include what volume(s) of impounded water will be a decision unit prior to sampling and discharging; I will email these asap. Given we can concur on these today, I don't see any reason why we can't finalize ADEC's approval to implement the project asap. I'll get back w/ you w/in the hour/prior to noon.
thanks

Curtis Dunkin
Environmental Program Specialist
ADEC Contaminated Sites Program
555 Cordova Street
Anchorage, AK 99501
Phone: 907-269-3053

-----Original Message-----
From: Cossaboom, Carey C POA [mailto:Carey.C.Cossaboom@usace.army.mil]
Sent: Thursday, September 06, 2012 4:51 PM
To: Dunkin, Curtis S (DEC)
Subject: Site 28 (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Curtis,

According to Greg Jarrell at Bristol, they've been given authorization to perform the Site 28 sediment-removal dewatering within the guidelines of their General Permit. That is a major hurdle overcome. With that out of the way, the major obstacle now is the field season time limit. USACE has reviewed the Site 28 Tech Memo Addendum and doesn't have any major issues with their proposal. Can you imagine any issues now that would prevent us from authorizing them to begin? We can always make adjustments on the fly to accommodate concerns. I envisioned this as a mid-summer conference to provide guidance to Bristol, not a full-blown report-review comment process. We can have a teleconference tomorrow if that would help.

Carey Cossaboom
Project Manager
U.S. Army Corps of Engineers
907-753-2689 (ph.)
907-753-2829 (fax)
carey.c.cossaboom@usace.army.mil

Classification: UNCLASSIFIED
Caveats: NONE

From:	Barnhill, Eric
To:	Hannah, Marty
Subject:	FW: Site 28 water samples (UNCLASSIFIED)
Date:	Tuesday, March 19, 2013 10:06:57 AM

Eric Barnhill
Environmental Scientist
Bristol Environmental Remediation Services, LLC
Phone : (907) 563-0013

From: James, Russell
Sent: Saturday, September 15, 2012 7:19 AM
To: Kleppin, Lyndsey; Barnhill, Eric
Subject: FW: Site 28 water samples (UNCLASSIFIED)

Dear Team,
I hope this email finds you well. Please see Mr. Craner's email below. We don't have to sample for GRO with the Site 28 surface water samples, but keep in mind we still have to collect BTEX samples.
May you live happy and content,
Russell

Russell James
Environmental Scientist
Bristol Environmental Remediation Services, LLC
Phone : (907) 563-0013

From: Craner, Jeremy POA [mailto:Jeremy.D.Craner@usace.army.mil]
Sent: Friday, September 14, 2012 6:53 PM
To: James, Russell
Subject: Site 28 water samples (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Russell,

I just heard from Carey that we don't have to have the lab analyze for the following: GRO, vanadium, and nickel. Curtis has agreed to only this parameters. This should at least get rid of the VOAs….

Jeremy

Classification: UNCLASSIFIED
Caveats: NONE

From:	Benjamin, Sean P POA
To:	Hannah, Marty
Cc:	James, Russell; Palmer, Valerie Y POA
Subject:	RE: Comment #11 (Lee) Site 28 Phase 1 Sediment (UNCLASSIFIED)
Date:	Tuesday, April 30, 2013 10:52:12 AM

Classification: UNCLASSIFIED
Caveats: NONE

As long as the RL is used as the generic for any one of the DOD defined reporting limits in the labs case narrative, then I am okay with that.

Sean Benjamin
907-753-5514

-----Original Message-----
From: Hannah, Marty [mailto:mhannah@bristol-companies.com]
Sent: Tuesday, April 30, 2013 10:00 AM
To: Benjamin, Sean P POA
Cc: James, Russell
Subject: Comment #11 (Lee) Site 28 Phase 1 Sediment

Hi Sean, this is the follow up email to our phone conversation. Comment # 11 and the responses are pasted below. To clarify, the case narrative is referring to the hard copy lab report and the lab is discussing method blank contamination for several PAHs at concentrations less than half the reporting limit (LOQ). The 4th paragraph of the case narrative states:

Please note, all references to reporting limit and method detection limit in the case narrative are equivalent to LOQ and DL. They put that statement in for DoD work to address the DL, LOD, LOQ terminology.

All references in the Site 28 Phase I removal report and CDQR use the correct terminology. Can we have the comment accepted now that things have been clarified?

1.

Lab reports

580-33360-1

In the case narrative, why are there references to RL's? In accordance with DOD QSM, the lab should be referencing DLs, LODs, and LOQs.

Collectively, the DL, LOD and LOQ are still referred to as reporting limits. When one parameter is elevated due to matrix etc, all limits are affected.

D - RL is not defined in the DOD-QSM. Remove it. Also, if the LOD is elevated, it does not necessarily mean that the LOQ is affected too.

Marty Hannah
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Classification: UNCLASSIFIED
Caveats: NONE

From:	Craner, Jeremy POA
To:	Hannah, Marty; Benjamin, Sean P POA
Cc:	James, Russell; Palmer, Valerie Y POA
Subject:	RE: Craner comment #11 (UNCLASSIFIED)
Date:	Wednesday, May 01, 2013 8:45:00 AM

Classification: UNCLASSIFIED
Caveats: NONE

Looks and sounds good to me. Thanks Marty.

-----Original Message-----
From: Hannah, Marty [mailto:mhannah@bristol-companies.com]
Sent: Wednesday, May 01, 2013 8:42 AM
To: Craner, Jeremy POA; Benjamin, Sean P POA
Cc: James, Russell; Palmer, Valerie Y POA
Subject: RE: Craner comment #11 (UNCLASSIFIED)

Here is the updated table with the H replaced by QL per Teresa Lee comments. We followed the flagging per the SOW and there is no H in the flags, thus QL. I prefer the H as everyone knows what it means and QL is a bit general. The flags are further defined in the CDQR as far as why the results are flagged QL.
So we're good to go? We're submitting the report to tech editing today for final edits.

Marty Hannah
Project Chemist/Environmental Scientist
Bristol Environmental Remediation Services, LLC
Phone : (907) 563-0013
-----Original Message-----
From: Craner, Jeremy POA [mailto:Jeremy.D.Craner@usace.army.mil]
Sent: Wednesday, May 01, 2013 6:58 AM
To: Hannah, Marty; Benjamin, Sean P POA
Cc: James, Russell; Palmer, Valerie Y POA
Subject: RE: Craner comment #11 (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Marty,

Now that wasn't so hard, was it? This is what I had originally requested to be inserted into the text. Looks good to me although I had a couple of questions/comments. Please clarify these (see attached doc with markups) and this should be good to go.

Thank you,
Jeremy

-----Original Message-----
From: Hannah, Marty [mailto:mhannah@bristol-companies.com]
Sent: Tuesday, April 30, 2013 4:07 PM
To: Craner, Jeremy POA; Benjamin, Sean P POA
Cc: James, Russell
Subject: RE: Craner comment #11 (UNCLASSIFIED)

I've prepared a new paragraph to be inserted as the second paragraph of Section 5.1 of the Phase I sediment removal. It addresses the mis-communication that the MI samples were initially processed as grab samples and discusses the major data flags as well as referring the reader to the CDQR for further

discussion. The second proposed paragraph discusses the DRO/RRO results with and without silica gel.

Marty Hannah
Project Chemist/Environmental Scientist
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-----Original Message-----
From: Craner, Jeremy POA [mailto:Jeremy.D.Craner@usace.army.mil]
Sent: Tuesday, April 30, 2013 1:27 PM
To: Hannah, Marty; Benjamin, Sean P POA
Cc: James, Russell
Subject: RE: Craner comment #11 (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Wow, no thanks. Please proceed as requested below.

Jeremy

-----Original Message-----
From: Hannah, Marty [mailto:mhannah@bristol-companies.com]
Sent: Tuesday, April 30, 2013 1:02 PM
To: Craner, Jeremy POA; Benjamin, Sean P POA
Cc: James, Russell
Subject: RE: Craner comment #11 (UNCLASSIFIED)

How about if I just leave the reference to the CDQR in Section 5.1?

Marty Hannah
Project Chemist/Environmental Scientist
Bristol Environmental Remediation Services, LLC Phone : (907) 563-0013

From: Craner, Jeremy POA [mailto:Jeremy.D.Craner@usace.army.mil]
Sent: Tuesday, April 30, 2013 11:58 AM
To: Hannah, Marty; Benjamin, Sean P POA
Cc: James, Russell
Subject: RE: Craner comment #11 (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Please don't cut and paste. This is not helpful in explain to the general reader what these flags are and how they may affect the final data values. I suggest that instead of cutting and pasting the exact wording from the CDQR into the report text that you summarize in a couple of sentences (in non-chemist lingo) what these flags are and how they came about. Your response to my original comment is similar to what I envisioned going into the report with a simple reference to where the CDQR is located in case the reader wants more info.

Thanks,

Jeremy

From: Hannah, Marty [mailto:mhannah@bristol-companies.com]
Sent: Tuesday, April 30, 2013 10:55 AM
To: Benjamin, Sean P POA
Cc: James, Russell; Craner, Jeremy POA
Subject: Craner comment #11

Hi Sean, Jeremy's comment #11 (pasted below) is asking for text to be inserted into Section 5.1 regarding the MI samples from underneath the dredge sumps being initially processed by the lab as grab samples and the holding times expired for DRO/RRO (with SG), mercury and 8270SIM (PAHs).

We directed the reader to the CDQR in Section 5.1 and also discussed the holding times being missed on the MI samples in Section 5.7 (Chemical Data Review). The flags are discussed in Section 5.7. I've pasted the MI sample discussion from Section 5.7 below, it starts with the bullet.

Can we get your and Jeremy's acceptance that the comment has been addressed?

Page 19, Section 5.1 and Table 1

MI Samples:

"B" Flag in Table 1 indicates detection in method blank, and several samples contained this flag type. Please explain in text.

"A" Flag in Table 1 indicates samples analyzed past hold times. Methods 7471A, 8270C SIM, AK102, AK103, and SW 9060 were all run past hold times for all samples. Why did this happen? What are the implications? Please explain in text. What does Bristol plan to do to mitigate this issue in the future? Major delays are far too common with TestAmerica. Need to address for next years' work.

In text, briefly compare and discuss the silica gel vs. non-silica gel sample results in Table 1.

B flags and any other data related issues are contained and clearly described in the chemical data quality review (CDQR).

The MI samples in Table 1 were accidentally logged in as grab samples and not MI samples. Once the error was realized the samples were prepared as MI samples and extracted and analyzed past holding time. This is also described in the CDQR.

Discussion of untreated and silica gel treated POL results will be added to text in Section 5.1.

D - I know this info is in the CDQR. No reference to the CDQR is made in this section of the report and no explanation of flagging is discussed in the report. Please insert your response to my comments in adjacent cell into the report or reference the CDQR so that the reader knows where to find this valuable information.

· MI soil samples were initially analyzed as bulk samples. These samples were re-analyzed outside holding time requirements using the incremental sample preparation procedures. All MI results for PAHs, DRO/RRO, DRO/RRO with silica gel cleanup, and mercury and one MI results for total organic carbon were H[KM1] qualified to indicate the analysis occurred outside holding time requirements.

- Detected results were qualified as estimated with a high bias (QH) due to high surrogate recoveries as follows:

§ Detected RRO in two samples, and

§ Detected RRO after silica gel cleanup in one sample

- Detected RRO results for one soil sample were qualified as estimated with a high bias (QH) due to a high CCV recovery.

- Results were qualified as estimated with a low bias (ML for GRO results, QL for PAH results) due to low surrogate recoveries as follows:

§ GRO results for 2 samples,

§ PAH results for 1 sample

- One naphthalene result had a high RPD between the LCS and LCSD. The result had been qualified due to a low surrogate recovery (QL) and further qualification was not required.

- The following results were B qualified due to associated method blank contamination at a concentration <10x the sample concentration:

§ GRO results in two trip blanks

§ Benzo[g,h,i]perylene, fluoranthene, and pyrene results in three water samples

§ Benzo[a]anthracene, benzo[a]pyrene, and chrysene results in one water sample

§ DRO and DRO following silica gel cleanup in three soil samples

§ Total and dissolved mercury in ten water samples.

- Samples were qualified due to either high (MH) or low (ML) MS/MSD recoveries to indicate potential bias due to a matrix effect. Qualification was limited to the spiked sample since no trends were observed. An MN qualifier was used to indicate a matrix effect with an unknown bias when both a high and low MS/MSD recovery were observed or for a high MS/MSD RPD, unassociated with bias. Qualified organic samples were:

§ Ethylbenzene and o-xylene results for one sample were MH qualified,

§ Benzo[a]pyrene, indeno[1,2,3-cd]pyrene, dibenz[a,h]anthracene, and benzo[g,h,i]perylene results for one sample were ML qualified,

§ Acenaphthene , acenaphthylene, and phenanthrene results for one sample were MH qualified,

§ DRO and DRO with silica gel cleanup for one soil sample were MH qualified,

§ RRO results for one water sample were MH qualified,

§ Barium, lead, nickel, vanadium, and zinc were MH qualified in one soil sample

§ Mercury was ML qualified in one soil sample.

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Classification: UNCLASSIFIED
Caveats: NONE

H flags were replaced with a QL flag per Lee comment.

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Caveats: NONE

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NE Cape Site 28 Phase I Sediment Removal Action
Minutes of Teleconference
September 7, 2012 – 2:30 p.m.

Participants:
USACE: Carey Cossaboom, Aaron Shewman
ADEC: Curtis Dunkin
Bristol: Greg Jarrell, Steve Johnson, Julie Clark

- Purpose of teleconference is to address some of ADEC's comments on the Site 28 Technical Memorandum (Tech Memo) Addendum and the Phase I sediment removal action. The comments need to be resolved before proceeding with the sediment removal action.
- **ADEC Comment 1:** The sediment mitigation control(s) referenced in section 5.0 (stated in the May 2012 NEC SWPPP as being a silt fence, is not adequate for the Phase I removal. Due to the large amounts of potential contaminated sediment migration, a more extensive sediment control/settling system should be proposed (incl. absorbent booms). Because it may not be feasible/practical to obtain in situ sampling results, the sediment and contaminant migration monitoring and mitigation measures need to be adequate. While the proposed three surface water samples (pre/during/and post removal activities) are necessary, they provide no mitigation. More water samples should be collected at intervals during removal to determine what concentrations of contaminants (if any) may have migrated off site.

  Discussion:
  - Bristol describes the construction of the sediment trap for sediment mitigation. The trap is an in-stream device consisting of a metal box that sits on the bottom of the creek. The box will be filled with straw wattles and connect with other filtration such as booms, to prevent downstream migration of sediment during active removal operations.
  - The following text will be added to Section 5 of the Tech Memo Addendum: "The sediment trap will consist of a metal box placed across the stream channel that contains straw wattles and other filtration material such as sorbent boom."
  - Regarding surface water samples to be collected during the removal effort, Curtis would like to have more samples collected during active sediment removal.
  - Carey says USACE is amenable to adding more samples and would work on a contract modification for the additional samples.
  - Greg says that everyone agrees on the pre- and post-removal surface water samples (pre-removal samples collected once at three different locations downstream of the sediment trap, and post-removal samples collected once at the same three locations), but we need to determine at what frequency surface water samples will be collected during active removal. Greg proposes two per day.
  - Curtis thinks more samples may be needed, depending on the duration of disturbance.
  - Steve suggests a goal of one surface water sample collected per every 1-2 hours of disturbance.
  - Curtis would like to see one sample collected every hour, though if visual observations suggested that contaminants were not migrating off-site, the frequency could be reduced.
  - Carey thinks a sample frequency of one per hour is overkill, and would like to limit the samples to a maximum of three per day.
  - Project team agrees. The following text will be added to Section 5 of the Tech Memo Addendum: "During active sediment removal operations, surface water samples will be

collected at one location immediately downstream of the sediment trap to confirm that the operations are not adversely affecting water quality downstream of the sediment trap. The field team will visually observe and document water conditions (such as turbidity) downstream of the sediment trap during active sediment removal. One surface water sample will be collected per every 1-2 hours of disturbance based on the visual observations, with samples collected at a higher frequency if disturbances downstream of the sediment trap are observed. A maximum of 3 surface water samples will be collected per day."

- **ADEC Comment 2:** Section 4.3.1.2 re: the discussion about the use of the Silica Gel cleanup method to determine whether cleanup goals are met will require revision; ADEC did not approve the SG method to be utilized for confirmation sampling for this removal action.

  Discussion:
  - The text will be revised to make it clear that the silica gel-treated results will not be used unless the ADEC agrees that it is appropriate.
- **ADEC Comment 3:** Re: the proposal in section 5.0 that states that depth of sediment removal will not exceed 2 ft. in any removal area, based on documentation provided in the draft 2012 TM, there were no areas where mapped sediment depth exceeded 2ft; therefore this should not be a concern. However, ADEC requests that all contaminated material that is defined for the purposes of this project as sediment, be removed from the areas where the project team agrees to remove sediment; i.e. if 2.5 ft. of sediment is encountered then removal should not stop at 2 ft.

  Discussion:
  - Bristol does not have a problem with removal deeper than 2 feet, but there is the potential issue of headcutting. Carey added that contamination typically does not exceed 2 feet in historical sediment sampling so going deeper is not warranted. We would prefer to have sediment to use for confirmation samples. Bristol will add text to the Tech Memo Addendum text stating that we don't want to create more damage to the site by headcutting and that sediment removal shouldn't extend beyond 2 feet.
  - Aaron is still concerned about headcutting, particularly in the stream bed area. Discretion will need to be used in the field to avoid headcutting.
  - If any problems such as headcutting are observed during the sediment removal, the field crew will stop operations and discuss the problem with the project team.
  - Discussion about confirmation sampling following sediment removal. Confirmation sampling is an option that has not yet been awarded.
  - Curtis says that if all sediment has been removed from an area, there is no need for any confirmation samples to be collected since the matrix has been removed. Confirmation samples will only be collected sediment remains in an area after the sediment removal operations.
  - Carey will exercise the confirmation sampling option in case confirmation samples need to be collected this year.
- **ADEC Comment 4:** What are the general components of the two methods being proposed to evaluate for the sediment removal discussed in section 5.0? Are excavation w/ equipment and suction dredging considered the two different proposed methods?

  Discussion:
  - Excavation and dredging are considered the two different methods.
  - Carey mentions his comment regarding dewatering sediments removed by excavator, how will that be done?
  - Sediments removed by excavator will be dewatered as much as possible at the time of removal by allowing water to naturally flow out of the excavator bucket via gravity. If further dewatering is needed, the sediment will be placed in a lined area separate from the Geotubes.

  - Curtis asks where this dewatering area would be located.
  - Due to the dynamic nature of activities at the MOC, it is uncertain where this dewatering area would be located at this time. Text will be added to the Tech Memo Addendum stating that if a lined dewatering area for the sediment removed by excavator is necessary, the location of the dewatering area will be discussed and agreed upon by the project team.

- **ADEC Comment 5:** Section 5.0 states possible use of flocculants - confirm whether or not these will be used since they can cause problems with sample analyses. Previous communication w/ Bristol confirmed to ADEC that no flocculants or other chemicals or additives would be applied to the sediment and water throughout the process; except for treatment of water in the impoundments prior to discharge per the water quality requirements outlined in the permit.

  Discussion:
  - Bristol emphasizes that flocculants will not be used during the Phase I sediment removal.
- **ADEC Comment 6:** What will be the estimated volumes of the impoundments and how often will sampling occur; i.e. once per day regardless or frequency/gallons? What is the actual treatment process proposed and which location is proposed to discharge the treated water? Will the water impoundment areas be deconstructed or overwintered? Will soil samples be collected preconstruction and post deconstruction of the water processing area?

  Discussion:
  - Since the impoundments have not been built, it is unknown at this time the estimated volumes of water the impoundments will hold. The size of the impoundments can be adjusted based on conditions observed in the field.
  - Curtis asks if each impoundment was a decision unit, as far as collecting analytical samples from the impoundment water.
  - Bristol says that each impoundment will be a decision unit.
  - Curtis requests that a volume estimate of the impoundment areas be added to the text. Once determined, Bristol will add this information.
  - Curtis asks what analytes the impoundment water will be sampled for. TAH and TAqH only? Bristol responds that the impoundment water will be analyzed for all Site 28 COCs.
  - Bristol will collect one pre-construction MI sample at the water processing area, as well as one post-construction MI sample after the water processing area is removed.
- **ADEC Comment 7:** Re: the proposed overwintering of the geo tube, will the impoundment area be sufficient in the event of tube failure; re: the proposal to overwinter?

  Discussion:
  - The impoundment area will be constructed such that all material can be contained in the impoundment in the event of tube failure.
- **ADEC Comment 7:** ADEC concurs w/ the four areas proposed for the Phase I sediment removal which are stated in section 5.0.

  Discussion:
  - Aaron recommends that "Sediment Removal Area 3" be slightly enlarged to include sediment sample location 12NC28SS028. Bristol will include 12NC28SS028 in Sediment Removal Area 3.
- Curtis will have formal comments back to the project team sometime next week. However, sediment removal field activities can proceed based on the discussion from this teleconference.

Site 28 Phase I Sediment Removal Teleconference adjourned at 3:15 p.m.
Bristol submitted minutes to Carey Cossaboom on 9/19/12

RESPONSE TO COMMENTS

REVIEW COMMENTS

PROJECT: NE Cape HTRW Remedial Actions (Contract No. W911KB-13-C-0003)
DOCUMENT: Site 28 Phase I Sediment Removal Report – Dec 2012 Location: St. Lawrence Island, Alaska

U.S. ARMY CORPS OF ENGINEERS	DATE: 01-02-12 REVIEWER: J. Craner PHONE: 753-2628	Action taken on comment by:

Item No.	Drawing Sheet No., Spec. Para.	COMMENTS HIGHLIGHTED = Modifications made to original comments.	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
1.	General	Overall this report is of good technical quality, generally easy to read and makes sense, and is presented in a logical manner. The figures are nice. Some minor to major technical items need to be clarified and addressed. These are discussed in the comments below.		Agreed.	A
2.	Page i and ii	*MULTI INCREMENT®*, *MULTI INCREMENT*, and MULTI INCREMENT type labels are used on these two pages and vary throughout the report. Please be consistent and don't mix and match.		The form "MULTI INCREMENT®" has been applied throughout the document.	A
3.	Page 11, 1st paragraph	3rd sentence states: "Geotextile dewatering tubes are woven geotextile sediment collection tubes designed to effectively separate water and sediment by containing the sediment while allowing water to pass through the pore spaces." Please specify what diameter of sediment particles the woven geotextile tubes were designed to filter. This is important to consider when determining the effectiveness of the tubes.		The pore size on the sediment tubes ranges from 59 microns to 350 microns. For future work, Bristol will add an inner, non-woven liner, with a pore size of approximately 130 microns. The water treatment system will consist of sock filters as small as 5 microns. This information will be added to the text.	A
4.	Pages 12 & 13, Section 4.1.3	Please briefly describe why this type of sediment trap was built and installed in order to minimize downstream suspended sediment migration during sediment removal. Were any other methods assessed? Section 4.6.18 in SOW, 1st paragraph, states at least two methods shall be assessed.		Text has been added that briefly describes why the sediment trap used was used and installed Text has been added describing the two methods of sediment control assessed.	A
5.	Page 13, Section 4.1.4	1st paragraph: Samples were collected from Water Containment 1 & 2. Were samples collected from Water Containment 3? I assume not since it was used as an overflow containment, but please clarify if or if not samples were collected.		Verbiage clarifying that water containment 3was not sampled because it was a holding area for previously sampled water from the first and second containments has been added.	A
6.	Page 14	2nd paragraph: Discusses removal of sediment at Areas 1 & 2 using an excavator. Briefly describe why an excavator was selected for sediment removal/dewatering for these two areas, as opposed to other removal/dewatering methods.		A section (4.1.5) has been added that describes sediment removal/access.	A

U.S. ARMY CORPS OF ENGINEERS	DATE: 01-02-12 REVIEWER: J. Craner PHONE: 753-2628	Action taken on comment by:

Item No.	Drawing Sheet No., Spec. Para.	COMMENTS HIGHLIGHTED = Modifications made to original comments.	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
7.	Page 14	3rd paragraph: Discusses that a venturi dredge was selected for sediment removal at Areas 3 & 4. Briefly describe the advantages/disadvantages of the venturi dredge, and why it was selected for sediment removal at these areas over other technologies.		A section (4.1.5) has been added that describes sediment removal/access.	A
8.	Page 15, Section 4.3.1	The section is titled "Sediment Confirmation Samples." Sediment was mapped both vertically and horizontally in Areas 1 & 2 then the sediment was removed. Samples were collected from the excavation floor. These samples should then be considered "soil" samples, and, sample results should be screened against associated soil criteria.		The section name has been changed from "Sediment confirmation samples" to "Soil confirmation samples" The cleanup levels will be changed to soil levels per the decision document first and ADEC 18AAC75 Table B1 in no CULs are specified in the decision document.	4/3/2013: USACE PDT met following responses from ADEC. Please continue to call the confirmation samples "Sediment Confirmation Samples" and compare to criteria as directed by Valerie Palmer, PM.
9.	Page 17, Section 4.4.1	2nd paragraph, 2nd sentence: States: "Additional water samples immediately downstream of the sediment trap were collected periodically during dredging operations." Please state the sample collection frequency (approximate OK) and also state that this sampling was conducted at the request of ADEC.		A sentence stating the frequency of sampling and that it was at the request of the ADEC has been added.	A
10.	Tables	The following are global changes/issues that need addressed to Tables 1 – 5 that display analytical results. - Need to make sure soil cleanup levels are used for screening when soil results are presented and sediment cleanup/screening levels are used when sediment results are presented. I see some mix and matching of screening values. Decision Document values take precedence over all others. Please check and address accordingly.		All tables have had cleanup levels modified to match the true matrix and surface water cleanup levels have been added to all water tables.	4/3/2013: USACE PDT met following responses from ADEC. Compare sediment and water data to criteria as directed by Valerie Palmer, PM.

U.S. ARMY CORPS OF ENGINEERS	DATE: 01-02-12 REVIEWER: J. Craner PHONE: 753-2628	Action taken on comment by:

Item No.	Drawing Sheet No., Spec. Para.	COMMENTS HIGHLIGHTED = Modifications made to original comments.	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
		- Some elevated values are not shaded as exceedances as they should be in several of the tables. Please correct. - Why are both µg/kg and mg/kg units used for presenting results and associated cleanup values for soil and sediment? The ADEC and DD specifically use mg/kg. This is unnecessarily confusing to any reader/reviewer, and especially so to the general public since they don't do this every day. This should never be done and if possible avoided as all costs. Please address. For surface water, I guess it is OK to use both units of µg/L and mg/L since the ADEC reg.'s (18 AAC 70) have the unit µg/L as discharge limits. However, one should avoid using two different unit types in the same table if at all possible.		All sample results will be reviewed for exceedances and bolded if the result exceeds cleanup levels for the appropriate analyte. Units will be changed to mg/Kg for soil and sediment. Noted.	A
11.	Page 19, Section 5.1 and Table 1	MI Samples: "B" Flag in Table 1 indicates detection in method blank, and several samples contained this flag type. Please explain in text. "A" Flag in Table 1 indicates samples analyzed past hold times. Methods 7471A, 8270C SIM, AK102, AK103, and SW 9060 were all run past hold times for all samples. Why did this happen? What are the implications? Please explain in text. What does Bristol plan to do to mitigate this issue in the future? Major delays are far too common with TestAmerica. Need to address for next years' work. In text, briefly compare and discuss the silica gel vs. non-silica gel sample results in Table 1.		B flags and any other data related issues are contained and clearly described in the chemical data quality review (CDQR). The MI samples in Table 1 were accidentally logged in as grab samples and not MI samples. Once the error was realized the samples were prepared as MI samples and extracted and analyzed past holding time. This is also described in the CDQR. Discussion of untreated and silica gel treated POL results will be added to text in Section 5.1.	D - I know this info is in the CDQR. No reference to the CDQR is made in this section of the report and no explanation of flagging is discussed in the report. Please insert your response to my comments in adjacent cell into the report or reference the CDQR so that the reader knows where to find this

U.S. ARMY CORPS OF ENGINEERS	DATE: 01-02-12 REVIEWER: J. Craner PHONE: 753-2628	Action taken on comment by:

Item No.	Drawing Sheet No., Spec. Para.	COMMENTS HIGHLIGHTED = Modifications made to original comments.	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
					valuable information.
12.	Page 19-20, Section 5.2 and Table 2	~~Sediment~~ Soil Samples: As previously mentioned, these samples should be considered soil samples and screened against appropriate associated cleanup levels. Cleanup levels need to be adjusted accordingly. Several DRO and RRO values should be in bold. Section 4.6.7 of the SOW within the contract states that silica gel cleanup and total organic carbon shall be analyzed. I don't see these results. Were they run for these analyses? If so, please add data to table and discuss results in text. If not, why? Explain in text.		Soil samples marked sediment samples will be corrected within the report universally. Exceedances will be bolded. Silica gel and TOC discussion will be added to Section 5.1 of the report. Only the MI soil samples received SG and TOC analyses. SG and TOC were accidentally omitted from Site 28 confirmation samples. Samples will be recollected in 2013 for DRO/RRO DRO/RRO with SG and TOC from areas 1 and 2.	A - Please be sure to explain that the SG and TOC were accidentally omitted and that the samples will be recollected in 2013.
13.	Page 20, Section 5.3 and Table 3	Surface Water: 1st paragraph, 2nd sentence states: "Bristol collected surface water samples at three locations before, during, and after sediment removal and at one location immediately downstream of the sediment trap at regular interval during sediment removal operations." Please clarify at what "regular intervals" the samples were collected immediately downgradient from the sediment trap. Table 3 does not indicate what sample results are associated with the 3 locations downgradient of the sediment trap. Pre-mid-, and post-removal sample categories are clearly marked, but samples with different names are associated with each category and these names don't correlate to those locations in Figures 5 and 6. Three locations (WA01, WA02, and WA03) are labeled on the figures. WA01 should have pre-, mid-, and post-removal samples PLUS those taken at regular intervals.		The intervals that were used were 1 sample every 1-2 hours of removal activity. Removal activity was limited to a couple of hours each of the days that dredging occurred. Due to the limited time dredging, samples were limited to one sample plus QC on the days of dredging. All of the sample sites had samples collected pre-, post- and mid. Some samples at sample site 28-W-01, 12NC28WA04, 05/06, are strictly interval samples for the days of dredging. 12NC28WA07 doubles as the interval sample and the mid removal sample. Sites 28-W-02 and 03 received only pre-, post- and mid removal sampling. Table 3 will be revised to make this clear.	A

U.S. ARMY CORPS OF ENGINEERS	DATE: 01-02-12 REVIEWER: J. Craner PHONE: 753-2628	Action taken on comment by:

Item No.	Drawing Sheet No., Spec. Para.	COMMENTS HIGHLIGHTED = Modifications made to original comments.	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
		Regular interval samples are not indicated. WA02 and WA03 should have only pre-, mid-, and post- removal sample results. Please add times to each sample. Please revise Table 3 and clarify. The Discharge Authorization Permit (Appendix C) and the SOW require field turbidity to be collected, and also requires pH to be monitored, flow measurements to be recorded, and visual checks for sheen recorded. I can't locate field parameters in the field notes (Appendix B), or any other field observations. Please either: 1) add all field parameters/recorded observations to each sample in Table 3 or 2) add a new table that contains all field parameters/recorded observations recorded for each sample. Table 3 contains "NR" flags (analysis not requested) flags for all pre-removal samples analyzed for metals. Why? Please explain this data gap in text. GRO was determined to not be required for analysis following the per-removal sampling, hence why there are NR's for GRO after this sampling event.		The permit is for discharge of water to the ground. At this time all water that was removed from the stream is contained in manmade containments. In addition, The permit has waved monitoring for pH, turbidity, settleable solids and total chlorine (Authorization 2009DB0004-0216, page 2) Turbidity was monitored in the stream during dredge activity and those observations have been added to table 3. Prior to discharge the proper observations/samples will be collected and the required metrics will be met. A statement has been added to say that GRO was requested for the pre-removal sample, and then through consultation with the Corps and ADEC it was determined to not be necessary for the mid- and post- samples.	Thanks for the clarification. In addition to the turbidity results column, please also add a column labeled "SHEEN" and answer "Yes" or "No" for each sample (Pg. 1, Items 2 and 3 of permit). An estimate of flow rate also needs to be determined and discussed in the text (Pg. 1, Item 3 of permit). Bristol response: Following comment resolution meeting on 4/12/13: Discharge flow/volumes will be measured using the containment areas as proxies (each containment holds approximately 20,000 gallons). Flow rates will not

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					be measure in the Site 28 drainage during dredging activities. A
14.	Page 20-21, Section 5.4 and Table 4	Containment Water: 2nd and 3rd paragraphs that discuss sample results are confusing – please rework and clearly state the results that correlate to what is shown on Table 4. Treated results vs. untreated results. Sum TAqH results should all be in bold, except for last sample.		Section 5.4 will be modified for clarity and more detail will be added to treated and untreated results. TaQH results will be reviewed and all exceedences will be bolded.	A 4/3/2013: USACE PDT met following responses from ADEC. Compare water data to criteria as directed by Valerie Palmer, PM.
15.		Section 4.6.18 of the SOW, 6th paragraph, specifically requests the collection of x2 geotechnical samples and x4 analytical samples from the dewatered sediment from within the geotubes. When do you plan on collecting these samples? When will the data be presented and results discussed? Please add a separate section to this report that states when these samples will be collected and how the data will be presented. These samples are a key component to analyzing the effectiveness of the venturi dredge coupled with geotube method.		The samples from the geotubes will be collected during the 2013 season. The sample results will be presented in the 2013 report. A section (5.5) titled Geotextile Dewatering Tube Sampling has been added detailing the anticipated sampling.	A, please be sure to explain that the samples will be collected in 2013 and presented in the 2013 report.
16.	Page 23, Section 6.1	Please add a sentence to the end of the first paragraph that states: "No visible liquid drained from the material to the liner."		The sentence has been added.	A
17.	Figures 4 -	Legend titles contain letters that start with both capitalized and		Figure legends will be reviewed for	A

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	7	non-capitalized letters (i.e., Sediment Boundary, ponded water, etc.). Please make all labels similar – capitalize each word. Legend symbol labels should be the same for all figures. Currently, they are not. Please edit. Add the definition of sediment as it pertains to Site 28 to each figure somewhere near the legend.		consistency and correctness. The definition of sediment will be added to the figures as a note.	
18.	Figure 5	Text for sample 12NC28SS034 printed out weird. Please correct. The dark black lines that depict the sumps, pumps, pipelines, containments, etc. look very sloppy and unprofessional compared to the rest of the figures. Some lines do not match up with one another, can't tell what is what, etc. Need to label everything and/or add to legend and clean it up. These lines are also on Figures 6 and 7. Please make necessary adjustments to these figures as well.		The figure will be updated as requested.	A
		----- End of Comments ----			

REVIEW COMMENTS **PROJECT: NE Cape HTRW Remedial Actions**
DOCUMENT: Site 28 Phase I Sediment Removal Report – Dec 2012 Location: St. Lawrence Island, Alaska

U.S. ARMY CORPS OF ENGINEERS	DATE: 3 January 2013 REVIEWER: Aaron Shewman PHONE: 753-5558	Action taken on comment by:

Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
1.	Section 4.1 Page 9	Please add "soil" after "(MI).		"soil" has been added.	A
2.	Section 4.1 Page 10	Add a space between "INCREMENT" and "Soil"		A space has been added.	A
3.	Section 4.1.1 Page 11 2nd Paragraph	Indicate Containment Area #1 was the "primary containment", and Containment Area #2 was the "secondary containment". Delete "system" in the last sentence of the paragraph.		Wording has been added to indicate the containment areas. The word "system" has been removed from that paragraph.	Accepted if this is also done on the applicable figures.
4.	Section 4.1.1 Page 11 2nd Paragraph	Please clarify which containments contained water at the end of the 2012 construction season and were overwintered with and without water.		A sentence has been added to the end of section 4.1.1 clarifying where water was left for overwintering.	A
5.	Section 4.1.1 Page 11 3rd Paragraph	It is stated the third containment, "Containment #3" held additional treated water. How was this water treated? Did it first pass through Water Containments #1 and #2? Please clarify.		Clarifying language has been added.	A
6.	Section 4.2.1 Page 12 1st Paragraph	1st Sentence: Replace "geotextile dewatering tube staging area and water containment" with "water processing" 2nd Sentence: Insert "Sump #1 and Sump #2" after "sumps". Be consistent with the use of either "No." or "#" within the text and between the text and figures; recommend using one or the other, but not both. After this section, recommend adding a section describing assessment of two methods for controlling and minimizing downstream suspended sediment migration during sediment removal as required by the contract.		The suggested wording changes have been made. A section has been added describing the assessment of the two methods.	A
7.	Section 4.1.3	1st Sentence: Replace "gravel" with "work" for clarity.		"Gravel" has been replaced with "work".	A

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	Page 12 2nd Paragraph				
8.	Section 4.1.4 Page 13 1st Paragraph	1st Sentence: Replace "impoundment areas" with "containments" for clarity. 2nd Sentence: Replace "impoundment" with "containment" for clarity, and delete "(Water Containment 1)".		The suggested wording changes have been made.	A
9.	Section 4.1.4 Page 13 2nd Paragraph	2nd Sentence: replace "spot located" with "location". 3rd Sentence: Replace "area" with "into the secondary containment". After this section, recommend adding a section describing assessment of two methods of accessing contaminated sediment as required by the contract.		The suggested wording changes have been made. A section has been added with an assessment of the two methods of accessing sediment that were used.	A
10.	Section 4.2 Page 14 1st complete Paragraph on page	5th Sentence: Does "The POL excavation was no longer active" mean the excavation had been backfilled? Please clarify.		Language has been added to clarify that the excavation had been backfilled and that excavation had ceased for the season.	A
11.	Section 4.3	1st Paragraph, 1st Sentence: Capitalize "Removal" and "Areas". 2nd Paragraph: Replace "corners" with "boundaries" to be more correct. How was the "approximately 5 cubic yards" measured? By survey of the removal area multiplied by an arbitrary 1-foot? By surveyed area and actual depth? Depth of the pile in the rock truck? Depth of the pile on the dewatering area liner? Please describe since volumes are discussed several places within this report and the selected approach will be used in 2013.		The suggested wording changes have been made. Language describing the method used to estimate the amount of sediment removed in Removal Areas 1 and 2 has been added.	A
12.	Section	Section title should be "Soil Confirmation Samples" unless		The suggested wording changes have been	D - Please refer to

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	4.3.1	sediment was not completely removed and residual sediment was indeed sampled for purposes of confirmation of incomplete sediment removal. 1st Paragraph, 1st Sentence: Recommend inserting "Soil" before "confirmation". Where are the results of silica gel cleanup and TOC as required by the contract?		made. Silica gel and TOC discussion will be added to Section 5.1 of the report. Only the MI soil samples received SG and TOC analyses. SG and TOC were accidentally omitted from Site 28 confirmation samples. Samples will be recollected in 2013 for DRO/RRO DRO/RRO with SG and TOC from areas 1 and 2.	confirmation samples as "sediment" instead of "soil" in accordance with ADEC input. Bristol response: Confirmation samples will be referred to as "sediment".
13.	Section 4.3.2	Where are the results of silica gel cleanup and TOC as required by the contract?		Silica gel and TOC discussion will be added to Section 5.1 of the report. Only the MI soil samples received SG and TOC analyses. SG and TOC were accidentally omitted from Site 28 confirmation samples. Samples will be recollected in 2013 for DRO/RRO DRO/RRO with SG and TOC from areas 1 and 2.	A
14.	Section 4.4	Why were some sediments not removed from Area 4, specifically the sediments shown in a "ring" around the fringe of the removal area indicated on Figure 5?		The area around the removal area contained actively growing vegetation in September 2012, where none was present during the sediment mapping in July2012. The "ring" around the sediment removal area 4 consists of areas that grass grew in the stream during the two months between mapping and removal. The areas were not disturbed because of actively growing vegetation.	D – At a minimum, the texture/color of the "ring" of residual sediments shown on Figure 10 should be changed and a note added to explain the reason why the sediment was left in place. This scenario will repeat itself in 2013, so we should

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					discuss and agree on a suitable approach now. Please note sediment will have accumulated in Sediment Removal Area 4 subsequent to the Phase 1 removal effort. The re-accumulated sediment will require removal during 2013. Bristol response: following comment resolution meeting on 4/12/2013, the decision was made to highlight the areas of sediment that are outside of the removal area and add a note stating that these areas were actively growing vegetation during the 2012 removal operations. This will be done on all applicable

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					figures. Area 4 will be redredged during 2013 operations.
15.	Section 5.1	"Soil" should be inserted between "INCREMENT" and "Samples" in the section title. 1st Paragraph, 1st Sentence: Insert "soil" between "MI" and "samples".		The suggested wording changes have been made.	A
16.	Section 5.2	Section title should be "SOIL", not "SEDIMENT" unless residual sediment was indeed sampled for purposes of confirmation of incomplete sediment removal. It appears "sediment" should be replaced with "soil" throughout this section. Last Sentence in Section: Sentence should read, "Post-sediment removal soil confirmation sample analytical results are presented in Table 2.		Noted Sediment has been replaced with soil in this section. The last sentence has been changed to reflect the suggested wording.	D – Please see RTC 12. Bristol response: Confirmation samples will be referred to as "sediment", not "soil".
17.	Section 5.3	2nd Paragraph, 4th Sentence: Recommend striking "Analytical" since this word makes the sentence awkward. I disagree with the statement that contaminant concentrations did not significantly increase during the sediment removal action. According to data in Table 3, it appears contaminant concentrations, mainly those associated with TAqH, increased slightly during sediment removal, but remained below cleanup levels. Where are turbidity data tabulated?		"Analytical" has been removed from the sentence. The statement reading "Analytical contaminant concentrations did not significantly increase during the sediment removal action" has been changed to "Contaminant concentrations, mainly those associated with TAqH, increased slightly during sediment removal, but remained below cleanup levels." Turbidity data have been added to table 3.	A

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18.	Section 6.0	Last Sentence: Why is this only a preliminary evaluation? When will the final evaluation be made?		The word "preliminary" has been removed. The evaluation presented is the final evaluation of Site 28 removal methods.	A
19.	Section 6.2 2nd Paragraph	4th Sentence: Recommend inserting "water treatment and" between "effective" and "dewatering".		The suggested wording changes have been made.	A
20.	Section 6.3	A proposed treatment-train diagram would be appropriate to indicate improvements/modifications made as a result of the Phase 1 Sediment Removal. Check and correct spelling of dredge in last sentence of 1st Paragraph. Last sentence: Add the total estimated volume of sediment to be removed during 2013.		A treatment train diagram is being produced and will be added to the report as a standalone figure or as an inset on an existing figure. "Drudged" has been changed to "dredged". A sentence stating the estimated remaining sediment to be removed in 2013 has been added	Accepted, but please provide a copy of the draft figure for review prior to finalizing.
21.	Table 2	Title should be changed to read, "Site 28 Post-Sediment Removal Soil Confirmation Sample Results"		The title change has been made.	
22.	Table 3	Why was GRO analysis not requested? This should be discussed in the text associated with this table.		A statement has been added to say that GRO was requested for the pre-removal sample, and then through consultation with the Corps and ADEC it was determined to not be necessary for the mid- and post- samples	A
23.	Table 4	It seems logical to list untreated water data first, treated water second as read from left to right. Please bold data that exceed cleanup levels, such as Sum TAqH.		The suggested change to table order has been made. Data that exceeds cleanup levels are now bolded	A
24.	Table 5	Please include cleanup levels and bold data that exceed cleanup levels.		Theoretical regulatory levels for waste were added as well as text explaining the reasoning: "A total waste analysis can be used in lieu of the TCLP to determine that a waste does not exhibit the toxicity characteristic. For solids, this is accomplished by dividing the total concentration of a constituent in the waste by	A

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				20 (reflecting the weight ratio of solid sample to acetic acid in the TCLP) If this maximum theoretical leachate concentration is lower than the characteristic level for the constituent, the waste cannot exhibit the toxicity characteristic for that constituent, and the TCLP need not be run."	
25.	FIGURE 5	In the title, bold "SITE 28 MULTI INCREMENT" AND replace "SEDIMENT" with "CONFIRMATION SOIL" unless samples of residual sediment instead of soil were truly collected as confirmation samples following sediment removal. Why does the yellow highlight of Sediment Removal Area 4 have a "ring" of orange indicating residual sediment? Bear in mind following full-scale sediment removal in 2013, the objective is to completely remove sediment leaving only soil behind, so aspects like the "ring" indicated on this figure are important and could be perceived as incomplete sediment removal. Label all decision units. Label the "Water Processing Area". Show a symbol indicating the dredge in Sediment Removal Area 4 as well as dredge hose leading from Area 4 to Sump #1. Show a symbol indicating a geotextile dewatering tube in Water Containment #1. Show a symbol for a water scrubber between Water Containment #1 and #2 as appropriate. Show all hoses that were part of the system. A treatment-train diagram indicating the 2012 approach would be beneficial, perhaps in the empty space available in		"References to "Sediment" confirmation samples will be changed to "Soil" confirmation samples on all applicable figures. The area around the removal area contained actively growing vegetation in September 2012, where none was present during the sediment mapping in July2012. The "ring" around the sediment removal area 4 consists of areas that grass grew in the stream during the two months between mapping and removal. The areas were not disturbed because of actively growing vegetation. Decision units will be labeled. The water processing area will be labeled and more detail will be added to show the sediment collection tube, water containments, and treatment system. Arrows will be added to indicate the direction of water flow. A symbol will be added to the figure to represent the dredge and associated hoses.	D – Please see RTCs 12 and 14. Bristol response: confirmation samples will be referred to as "sediment", not "soil".

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		the upper left corner of this figure.			
26.	Appendix A	Photograph 17: Indicate sump number. Photograph 18: Delete "er" from "Photograph. Indicate sump number. Photograph 19: Indicate sump number. Photographs 20, 21, 22, 23, 24: Indicate containment number as appropriate. Insert photograph of water scrubber after current Photograph 21.		The suggested changes have been made.	A
		----- End of Comments ----			

REVIEW COMMENTS

PROJECT: NE Cape HTRW Remedial Actions

DOCUMENT: Site 28 Phase I Sediment Removal Report – Dec 2012 Location: St. Lawrence Island, Alaska

U.S. ARMY CORPS OF ENGINEERS	DATE: 14-FEB-2013 REVIEWER: Lee PHONE: 753-2788	Action taken on comment by:

Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
1.	general	I see no reference to silica gel or TOC chromatogram review and interpretation nor do I see any c chromatograms supplied for ADEC review. Please include in the text of the document and representative chromatograms as an appendix to the report.		Silica gel and TOC discussion will be added to Section 5.1 of the report. Only the MI soil samples received SG and TOC analyses. SG and TOC were accidentally omitted from Site 28 confirmation samples. Samples will be recollected in 2013 for DRO/RRO DRO/RRO with SG and TOC from areas 1 and 2.	A
2.	Section 5.3	Only TAqH cleanup criteria is mentioned. Please reference other analytical suites analyzed.		Reference to metals, PCBs and POL will be added to section 5.3 as well as cleanup criteria will be added to section 5.3	A
3.	Data Tables	Please remove the alternating highlighted columns. Only those qualifiers as defined in the SOW/QAPP should be presented. Definitions should match the SOW/QAPP.		Alternate column highlighting will be removed. Qualifiers will be revised to match SOW/QAPP.	A
4.	Data tables, ADEC Check sheet CDQR	H is utilized as a qualifier. The assigned qualifiers must conform to those listed in the SOW. Please remove all references to H qualification and re-qualify, for instance, utilizing the SOW assigned qualifiers, a volatile sample run slightly outside of hold time should be qualified QL instead of H.		H will be removed and QL will be substituted for samples analyzed outside of hold time.	A
5.	Data tables Table 5	Remove ML from the footnotes. Define J and QL in the footnotes.		J will be defined on Table 5. QL not on table. Per email on January 10, 2013 from Teresa Lee regarding flagging GRO with low surrogate recovery.	? Please forward e-mail to sean.p.benjamin@usace.ary.mil for further evaluation.
6.	Sample Summary Sheet	Are the trip blanks included on the sample summary sheet?		Trip blanks will be included in the sample summary sheet.	A

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7.	EDD	NPDLNARR not complete for 280-33360.		A revised EDF with a complete NPDLNARR File has been requested and will be verified for completeness and submitted with the final report.	A
8.	ADEC Check sheet 580-33360-1 6.b.1 CDQR	It states that Batch precision for 8260 analyses will be from MS/MSD. However, there was no project specific MS/MSD run with batch 138812 (a DOD requirement). This deviation is noted in the CDQR. However, there is no discussion of how the multiple MS/MSD lab QC failures has on the data. Please add to the narrative in of the CDQR that matrix interference and/or precision/accuracy ca not be determined for all the affected lab batches and discuss the impact to the data. The case narrative indicates that due to lack of sample volume that the MS/MSD could not be run for batch 138074. This MS/MSD is shown as batched in the EDD. Strange. This should be investigated further.		Agree that the laboratory did not follow QSM nor project notes regarding LCS/LCSD and project MS/MSDs due to lab error. A revised report was received on 1/23/13 with more batch information that will be included in the ADEC checklist and CDQR and will address the possible impact on the data. The revised report also contains the MS/MSD information for batch 138074.	A
9.	ADEC Check Sheet 580-33360-1 6.a.ii	Flouranthene also had method blank failure in lab batch 138074 with a blank result of 97.6. Benzopyrene also had blank failure in this batch with a blank result of 43.3. benzo(g,h,i)perylene also had blank failure in this batch with a blank result of 43.9. Chrysene also had blank failure in this batch with a blank result of 141. These analytes are noted in the CDQR. Please add and		The PAHs detected in batch 280-138074 will be added to the ADEC checklist and results will be reviewed for accuracy and proper flagging using the 10 X rule.	A

REVIEW COMMENTS **PROJECT: NE Cape HTRW Remedial Actions**
DOCUMENT: Site 28 Phase I Sediment Removal Report – Dec 2012 Location: St. Lawrence Island, Alaska

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Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
		review all adec checksheets for congruence with the CDQR.			
10.	ADEC Check sheets	For all samples where the question is asked, "What samples are affected?, the samples affected should be listed. Or at a minimum, reference the section in the CDQR where they are listed.		Affected samples will be referenced to the appropriate CDQR sections.	A
11.	Lab reports 580-33360-1	In the case narrative, why are there references to RL's? In accordance with DOD QSM, the lab should be referencing DLs, LODs, and LOQs.		Collectively, the DL, LOD and LOQ are still referred to as reporting limits. When one parameter is elevated due to matrix etc, all limits are affected.	D – RL is not defined in the DOD-QSM. Remove it. Also, if the LOD is elevated, it does not necessarily mean that the LOQ is affected too.
12.	CDQR	Table 2-12 needs formatting.		Table 2-12 will be reformatted.	A

Alaska Department of Environmental Conservation (ADEC)
Contaminated Sites Program
Document Reviewed: Draft January 2013 Northeast Cape Site 28 Phase I Sediment Removal Report Revision 1
Commenter: Curtis Dunkin-ADEC **Date Submitted:** March 06, 2013; ADEC Review of RTCs on April 10, 2013

#	Page #	Section	ADEC Comment	Response
1.	2	1.2	Revise the title of this section to clarify that it is summarizing the site wide remedial history for Northeast Cape since the Site 28-specific information is included in the next section.	Title will be revised as "Previous Studies and Actions at NE Cape". ADEC-Accepted April 10, 2013-
2.	3	2.0	Summarize the sampling and analytical results associated with the manhole removal discussion in the second paragraph of this section.	Sampling and analytical results will be summarized and added to second paragraph of Section 2.0 ADEC-Accepted April 10, 2013
3.	4	2.0	First sentence on this page, briefly state/summarize what is meant by '…in addition to releases from other sources'. Revise the last sentence on this page to state: '…that exceeded ADEC Method Two Cleanup Levels as well as ADEC-approved site-specific (alternative) cleanup levels…'.	Language will be added to clarify the meaning of the referenced statement. Last sentence on Page 4 to be modified and include. ADEC Method Two Cleanup Levels and ADEC approved site specific cleanup levels presented in the 2009 Decision Document. ADEC-Accepted April 10, 2013
4.	7	3.0	State the number of all samples (primary and duplicate) collected for each matrix in this and other sections throughout the document. Revise the last sentence on this page to state: '…the Final Technical Memorandum Addendum prepared by Bristol (2012a)'. A subsection should be included in section 3.0 that references the Sept. 07, 2012 project delivery team meeting and final meeting minutes (which should be included in this document and listed in the references). This new section should summarize the deliberations and agreements made by the project team members re: the paths forward for implementing the Site 28 Phase I Sediment Removal.	Sample quantities and types will be added to appropriate Sections. Final will be added to last sentence on page 7. ADEC-Accepted April 10, 2013 Done Reference to Sept 7 meeting will be added to Section 3 as sub-section (3.1) and meeting minutes will be included as an appendix as well as a copy of the ADEC email. ADEC-Accepted April 10, 2013

			It should also state that this plan was tentatively approved by ADEC via email to the PDT on Sept. 07, 2012. Include a copy of this email along with the meeting minutes in this report. This section should reference the figures 4-7 which were generated as a result of the 2012 sediment mapping and sampling.	The subsection will include reference to Figures 4-7 and reference they were generated as part of the sediment mapping and sampling. ADEC-Accepted April 10, 2013
5.	9	4.0	Revise the third sentence of the first paragraph. 140 cu yards was not estimated to be removed, rather that volume was scoped as the maximum amount to be removed as part of the Phase I removal effort.	The sentence will be restated per comment. ADEC-Accepted April 10, 2013
6.	11	4.1.1	In this and other applicable sections, whenever discussing water samples which were collected from components/locations of the water processing system, state the estimated volume of water the sample represented at the time collected and also state at what stage of the removal action(s) the sample was collected. Also, as previously commented above, state the number of primary and duplicate samples in the narrative sections when referring to samples. This section states that samples were collected from the primary and secondary containment areas however, Table 4 lists 2 samples each in the treated and untreated column. One of the untreated samples is stated as a duplicate. Does this mean that two primary treated and one primary untreated samples were collected? This should be reconciled and explained clearly in the narrative and identify which samples came from the primary and secondary containments.	Estimated water volumes in sumps will be added to section 4.1.1 included more detailed descriptions of where the samples came from. ADEC-Accepted April 10, 2013 Sample counts will be added to text. ADEC-Accepted April 10, 2013 The collection of 2 treated water samples and one untreated water sample will be clarified in the text as to which containments they were collected from. ADEC-Accepted April 10, 2013
7.	12	4.1.2	Section should clarify whether MI sampling was conducted at both intermediate sump locations prior to installation and whether or not the sump locations were left in place/overwintered or deconstructed prior to demobilization; in the latter case of which post-construction MI sampling should have been conducted. Make sure this is clarified in each of the sections re: components of the removal system.	Section 4.1.2 will be revised to state where MI sampling was conducted and Tabled results will indicate which sump area it was collected from. ADEC-Accepted April 10, 2013
8.	13	4.1.4	See comment #6 above.	Section 4.1.4 (now Section 4.1.5) will include sample counts and sample locations. ADEC-Accepted April 10, 2013
9.	14	4.3	Revise the titles to reflect the specific removal areas discussed in that	Titles will be revised to identify specific

			section; for this and other sections (i.e. Sediment Removal in Areas 1 and 2 with Excavator. Revise section 4.4 title to specify Area 4 and others where applicable.	removal areas. ADEC-Accepted April 10, 2013 Section 4.4 will be revised. ADEC-Accepted April 10, 2013
10.	19 and 20	5.0 and 5.3	The statement that 'Some analytes did not have cleanup levels…' is incorrect. These sections and others (incl. associated tables and references) should state and/or make reference that the 2009 ROD states that 'all surface water cleanup levels will be based on State of Alaska 18 AAC 70'. All of the analytes listed in Tables 1-5 of this report have promulgated cleanup levels under 18AAC70 and 18AAC75 with the exception of total organic carbon. ADEC requests that this be reconciled where applicable in all narrative sections and tables throughout the document.	Statements will be modified to address cleanup levels and comparison values will be added to all results tables with proper citations. ADEC-Accepted April 10, 2013 Text will be modified to state that: Analytes not identified as contaminants of concern for a particular media in the 2009 Decision Document will be compared to values specified in 18 AAC 75, Tables B1, B2, or C, or water quality evaluation criteria (drinking water levels) from 18 AAC 70 with sources referenced in the analytical table footnotes. ADEC-Accepted April 10, 2013
11.	20	5.4	Revise typo on last page of this section; change 'collected of the' to 'collected from the'.	Wording change to "collected from the". ADEC-Accepted April 10, 2013
12.	21	5.4	The wastewater discharge permit issued by ADEC's Division of Water (DOW) for this project states in section 1.2.5 that 'the discharge shall be free of …(c) toxic substances; …or (f) other contaminants. The Corps should ensure whether or not TAH and TAqH and visible sheen are the only parameters the permit requires to be met prior to discharge. The ADEC DOW references specific water quality criteria in the 2008 Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances. Tables 3 and 4 should also be amended per comment #10 above.	Statements will be modified to address discharge evaluation criteria and comparison values will be added to all results tables with proper citations. ADEC-Accepted April 10, 2013 Please see attached letter from ADEC specifying what parameters must be met prior to discharge. ADEC-Accepted April 10, 2013

13.	21	5.5	State the source area(s) of this waste for clarification in both the title and the narrative. ADEC assumes that this is the sediment generated from the removals conducted at Areas 1 and 2 since Area 4 sediments were stated as being overwintered in place inside the Geotube. Briefly state why the waste was determined to be non-RCRA (i.e. concentrations observed in analytical sample results confirmed…).	Section 5.5 will be modified to identify the source of the bulk waste. ADEC-Accepted April 10, 2013 A statement will be added regarding the non-RCRA determination based on analytical results. ADEC-Accepted April 10, 2013
14.	25	6.1	See comment #9 above. Last paragraph of this section, state whether or not the road construction is being considered for future work. Also state that this option would require landowner approval.	The removal areas with an excavator will be identified in section 6.1. ADEC-Accepted April 10, 2013 The possibility of future road construction and that road construction will require landowner approval will be addressed. ADEC-Accepted April 10, 2013
15.	26	6.2	This section should include a detailed/robust evaluation of the challenges, limitations and capacity of the dredge-removal system. For example, is it feasible and achievable to remove all of the estimated volume of contaminated sediment identified within Site 28 with the limitations observed in 2012 with the ratio of waste water generated to sediment actually removed in the Geotube? Re: the 18bcy of contaminated sediment stated to have been removed from Area, how was this approximation determined and is it based on what was removed from Area 4 or from the sediment observed to have been collected/trapped in the Geotube? State in last paragraph of this section that any sediment treatment options (i.e. flocculant use) would have to be reviewed and approved by ADEC. Also state this in section 6.3.	Additional text will be added to this section regarding the various removal methods and water treatment. ADEC-Accepted April 10, 2013 BCY estimates are at this point, only estimates based primarily on the weight of bulk bags filled with material from Areas 1 and 2. Final survey will be conducted in 2013 at all sediment removal areas. ADEC-Accepted April 10, 2013; please include the response in the narrative Statement will be added regarding ADEC approval of any treatment/filtration methods. ADEC-Accepted April 10, 2013
16.	27	6.3	What is meant by Bristol having requested bench scale tests re: flocculants and their efficacy. If tests are conducted in association with NEC then ADEC should previously be informed so that methods and	The tests mentioned are <u>bench scale</u> tests that are being performed by a vendor to determine whether or not a flocculent is

			objectives can be reviewed and approved for application.	available that will help separate solids from the water and potential application rates within the treatment train process. In the event that a flocculent is available and Bristol believes that it will be helpful in the Site 28 sediment removal process, the information will be provided to the USACE and ADEC for acceptance. ADEC-Accepted April 10, 2013; please state the response in the narrative
17.		Table 1	Insert a column that states the LOQ for each analyte.	Per Curtis Dunkin in a phone conversation on 3-19-13, as long as non-detect results have the LOD in parentheses the tables are acceptable as is. ADEC-Accepted April 10, 2013
18.		Table 2	Insert a column that states the LOQ for each analyte. There a several cleanup level exceedances for several analytes across numerous sample rows which are not emboldened to depict an exceedance of the cleanup level(s). Revise this table to accurately depict the exceedances.	Per Curtis Dunkin in a phone conversation on 3-19-13, as long as non-detect results have the LOD in parentheses the tables are acceptable as is. ADEC-Accepted April 10, 2013 Tables will be reviewed for exceedences of water evaluation criteria and any positive results will be bolded, non-detect exceedences will be highlighted. ADEC-Accepted April 10, 2013
19.		Table 3	Insert a column that states the LOQ for each analyte. Why were metals not requested for the pre-removal sampling? Per comment #10 above, ADEC requests that the 'NS' which is currently entered for cleanup levels in surface water be replaced with '18 AAC 70'; with the exception of TAH and TAqH. Also insert a row for the criteria 'sheen' in order to enter a yes or no whether or not a sheen was observed.	Per Curtis Dunkin in a phone conversation on 3-19-13, as long as non-detect results have the LOD in parentheses the tables are acceptable as is. ADEC-Accepted April 10, 2013 Metals were inadvertently omitted from the

				pre-removal sampling and will be noted as a deviation in the tech memo. NS has been replaced with evaluation criteria from 18AAC70 drinking water criteria. ADEC-Accepted April 10, 2013 A row denoting if sheen was present will be added to Table 3. ADEC-Accepted April 10, 2013
20.		Table 4	Apply the same requests and revisions stated in comment #19 above be applied to Table 4. The	Noted, water evaluation criteria from 18AAC70 will replace NS on Table 4. ADEC-Accepted April 10, 2013
21.		Table 5	Insert a column that states the LOQ for each analyte and another column that states the RCRA/TSCA threshold for waste characterization.	Per Curtis Dunkin in a phone conversation on 3-19-13, as long as non-detect results have the LOD in parentheses the tables are acceptable as is. RCRA/TSCA thresholds will be added to table 5. ADEC-Accepted April 10, 2013
22.		Figures 4-7	Depict the sediment trap on Figures 4 and 7. Have specific IDs been designated for the other areas where sediment was identified as a result of the 2012 mapping (i.e. other than Areas 1-4)? If so these should be depicted on the figures. Include a notation in the legend for the depiction of the islands in the figures.	The sediment trap will be added to figures 4 and 7. ADEC-Accepted April 10, 2013 At the time of this draft report, the additional sediment removal areas had not been defined. They are outlined in the 2013 work plan. An arbitrary numbering system was used. ADEC-Accepted April 10, 2013 A legend notation for islands will be added. ADEC-Accepted April 10, 2013
23.		ADEC Checklists	Numerous entries for the 'data usability affected' sections in several of the checklists simply state 'see above' although most of the referenced 'above' sections don't state whether usability is affected. The checklists should either be revised and/or addressed in the data verification report.	All "see above" statements used in checklists were reviewed for appropriateness and clarity and edits made to checklists.

			The entry of 4c. at the bottom of page 2 of 7 of the checklist with the lab report #580-35168 states that no corrective actions were required for reasons stated that require flagging the data. This should either be explained/justified in the checklist and/or the data verification report or the data should be appropriately flagged. This same checklist also has neither no, yes, or n/a checked and should either be revised or explained in the data verification report. Page 1 of 7 of the checklist with the lab report #1124556 has both yes and no checked for item 2b and should either be revised or explained in the data verification report. A copy of the Sample Summary Sheet (located at the end of the ADEC Checklists Section on the electronic file) is not included in the hard copy of the draft report and should be included in the hard copy of the final report.	ADEC-Accepted April 10, 2013 Checklist 580-35168 will be revised to read as follows for section 4b regarding QC failures identified by the lab in the case narrative - "The GRO surrogate had a low recovery for sample 12NC28BW01, GRO was detected in the MB, the RRO surrogate failed high for samples 12NCMOCBW222 and –BW229. The case narrative states that metals MS/MSD had recovery and/or RPD exceedances and concluded matrix interference. Not stated on the case narrative, but discussed further in the CDQR, the MS/MSD was performed on a non-project sample." Section 4c regarding corrective actions will be revised to state "Corrective actions were not taken by the laboratory for these quality control and matrix related issues. The laboratory indicated a matrix interference for sample 12NC28BW01, as this sample had a 45 % moisture content associated with a GRO surrogate recovery of 45 % which was slightly below the lower limit of 50 %. Moisture is considered interference as per AK Method 101. The GRO detected in the method blank was detected at a level less than ½ the LOQ. The QSM considers the method blank to be contaminated if the amount in the blank is greater than ½ the reporting limit. The laboratory indicate

				matrix interference, due to target analyte presence at fairly high concentrations resulting in surrogate recoveries of 173 and 162 percent for samples 12NCMOCBW222 and –BW229, respectively, which are above the upper acceptance limit of 150 percent. According to TestAmerica's SOP for this method, surrogate recoveries outside limits due to matrix effects will be flagged and discussed in case narrative. Since a metals MS/MSD was not performed on a project sample, precision and accuracy will be evaluated using other QC criteria." Checklist 1124566 will be revised to indicate just a "yes" to indicate the correct analyses were requested. A hardcopy of the sample summary sheet will be provided with the final report. ADEC-Accepted April 10, 2013
24.			**End of ADEC Comments**	

REVIEW COMMENTS

PROJECT: NE Cape HTRW Remedial Actions / Contract No. W911KB-12-C-0003
DOCUMENT: Site 28 Phase I Sediment Removal Rev 0 Location: St. Lawrence Island, Alaska

U.S. ARMY CORPS OF ENGINEERS	DATE: 29 January 2013 REVIEWER: Ronald Scrudato PHONE: 845 598 2413	Action taken on comment by: USACE

Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
1.	Section 1.2	"In 2009, Bristol returned to the island to construct a landfill cap… and perform a chemical oxidation study." Why wasn't it mentioned that the in situ process did not work **because,** they, (Bristol) conducted the process within the peat beds along the north region of the MOC and that the peat consumes the H202 thereby preventing the process from being effective.. In addition, it was strongly recommended that a bench scale in situ assessment be conducted BEFORE the field assessment. The bench scale assessment was not completed prior to conducting the field assessment.		The chemical oxidation study was not mentioned because this is just a synopsis of what happened before. The performance of the study and the reason on the site location are documented in a different report.	
2.	Section 1.2	"…and to continue monitoring Site 8 for natural attenuation." (see comments on the MNA near the end of this document.) The presence of methane in the well field is not a positive matter and does not indicate the POLs were being degradation. Methane is indicative of anaerobic processes--- POLs are far more susceptible to aerobic degradation and methane does not indicate effective biodegradation of POLs. I have mentioned this in earlier comments and have not received any response from Bristol, the COE or EPA/ADEC. The POLs have been in the MOC		The concerns related to MNA and degradation of petroleum at the main complex are outside the scope of this report. The reference to Site 8 is just for background related to previous studies and actions. A summary of the MNA activities which occurred during the 2012 field season will be included in the 2012 Northeast Cape Removal Action Report. This report only focuses on Site 28 sediment removal. The chemical oxidation study that was	

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		and drainage since the military occupancy, more than 60 years ago and MNA has not been effective in reducing the POLs over that time interval. I would appreciate comments from the COE and Bristol including costs of the in situ process failure and costs, specifically on the in situ attempt and MNA. Once it was determined that the selected site for the in situ process was in the peat beds, the pilot should have been moved upgradient, out of the peat bed areas.		performed at the Main Complex focused on the potential to remediate known areas of contamination which exceeded site-specific cleanup levels. Areas upgradient of the peat were not identified as exceeding the site-specific cleanup levels and thus moving the pilot study location would not have achieved the remedial action goals. Regarding Site 8, the MNA results from the past field seasons demonstrate remedial action goals have been achieved.	
3.	Section 2.0	"Site 28 has been impacted by historical MOC bulk fuel releases in addition to releases from other sources." and PCBs, mirex, HCB, DDE		PCBs have been identified as a contaminant of concern in the Site 28 drainage, as mentioned later in the paragraph. However, mirex, HCB and DDE are not considered contaminants of concern at the site. There are no known uses of mirex or HCB by the military at Northeast Cape. Although the use of DDE is possible, concentrations have not exceeded	

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				screening levels.	
4.	Section 2.0	"DRO was detected as concentrations ranging from 0.39 to 2.3 milligrams per liter. PCBs and RRO were not detected." Aroclor, congener?? What were the non-detect PCB concentrations?? I have asked this question before and have not been answered, WHY?? . A range of PCB congeners (12) are dioxin like more toxic than the others congeners and Analytical results indicated that the most heavily contaminated surface waters of the drainage basin were found at the head of the western and middle drainages, located at the terminus of the former culverts.		PCBs in surface water were analyzed by EPA Method 8082, which quantifies concentrations by Aroclors. The limits of detection are shown in parentheses on the Tables in the report. ADEC regulations are based on concentrations of total PCBs. Aroclor 1254 and 1260 are the only two PCB mixtures documented to be used on military installations in the 40's and 50's. The ADEC approved the sampling workplan and laboratory.	
5.	Section 3.0	Soils down gradient of the MOC, north of the MOC contained up to 0.5 mg/kg. See the 2005 paper contained at the end of this report.		According to the 2009 Decision Document, the cleanup level for PCBs in sediment is 0.7 mg/kg. The soil cleanup level for PCBs is 1 mg/kg. Thus the concentration you are referring to is below the established cleanup level for both media.	
6.	Section 4.1	"MI samples were submitted to TestAmerica Laboratories, Inc., Tacoma, Washington, and analyzed for DRO/RRO, DRO/RRO with silica		Mirex, HCB, DDE are not considered contaminants of concern for Site 28, as established in the 2009 Decision	

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		gel cleanup, total organic carbon (TOC), PAHs, PCBs, Why not mirex, HCB, DDE and congener specific PCBs??? Does TestAmerica conduct congener specific PCB analysis??		Document. Therefore, these chemicals were not specified for analysis in the scope of work for the project. Congener-specific PCB analysis is not required by ADEC regulations. Concerns regarding the protectiveness of the selected remedy for Site 28 should be raised during the upcoming 5-year review.	
7.	Section 4.1.4	Samples were submitted to SGS Environmental Services, Inc., in Anchorage, Alaska, and analyzed for gasoline range organics (GRO); benzene, toluene, ethylbenzene, and xylenes (BTEX); DRO; RRO; PAHs; PCBs; and total and dissolved metals (RCRA 8 Metals [arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver], plus nickel, vanadium, and zinc). Why hasn't mirex, HCB and DDE been included in the analysis since the estuary core samples included all three compounds collected in the estuary.		See response to Comment 6.	
8.	Section 4.3.1	Samples were submitted to TestAmerica-Tacoma and analyzed for GRO, BTEX, DRO, RRO, PAHs, PCBs, mirex, HCB, DDE and what was the PCB analytical procedure, aroclor, congener and		See comment #6. The PCB analytical procedure is EPA	

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		what were the detection limits on all of the organics?		method 8082. The detection limits of all compounds are stated in parentheses in the data tables of the report.	
9.	Section 4.3.2	The waste characterization sample was analyzed for GRO, BTEX, DRO, RRO, TOC, PAHs, PCBs aroclor, congener specific, detection limits???		Aroclor detection limits are shown in parentheses on Table 5. Congener-specific analysis for PCBs is not required for determining proper transportation and disposal requirements.	
10.	Section 4.4.1	Water samples were submitted to TestAmerica-Tacoma and analyzed for BTEX, DRO, RRO, PAHs, PCBs, (((analytical procedures, congener, aroclor, detection concentrations???)))		See comment #4, 6, and 11.	
11.	Section 5.1	Detected compounds in the MI samples included DRO, RRO, several PAHs, PCB-1260, and metals. ((clearly, aroclor analytical processes))) for the PCBs. 1260 is a relative insoluble and non-volatile PCB and will be less soluble than the lower chlorinated PCBs. The aroclor process is NOT appropriate for defining total PCBs and requires specific congener analysis which will be		EPA Method 8082 is the ADEC accepted analytical procedure for determining total PCB concentrations. See also response to comment #4.	

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		totally overlooked and therefore not effectively characterized especially in water samples since the 1260 is relatively insoluble.			
12.	Section 5.1	MI analytical results are presented in Table 1. It is not because the lower chlorinated PCBs are more readily dissolved in the water. Without utilizing the congener specific analytical processes and if the aroclor analytical process has been used to define the presence and concentration of PCBs, the overall PCB characterization is useless and does not define the PCB concentrations in water and the very low concentrations in soils/sediments. Again, I have requested the PCB analytical processes used at the NEC and have had no response from Bristol and/or the COE or ADEC. I suggest we review the role the PCB analytical processes utilized by Bristol and sanctioned by the COE and ADEC and the effects on the remedial decisions made during the remediation phases of the soils and waters of the NEC during the past several years Aroclors PCB analyses cannot detect the total amount of PCBs in soils, sediments and especially water. Results are listed as non detect—dependent on the analytical detection		As stated in comment #4, the PCB Aroclor mixtures known to be used by the military, and confirmed by the signature of PCBs detected in soils at the Main Operations Complex (the source area), are Aroclor-1260 and to a lesser extent Aroclor-1254. Thus, we are not focusing on detecting the lower chlorinated PCBs as they were not used by the military during their presence at Northeast Cape. The FUDS program is not authorized to investigate and remediate contaminants of concern from global, non-point sources. EPA Method 8082 is an accepted method for determining total PCB concentrations. See also response to comments #4. A review of the PCB analytical methods used should be brought up at the 5-year	

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		concentration of the procedure used. I have requested this information more than once and have not had a response or explanation.		review (comment #6).	
13.	Section 6.2	In 2012, over the course of 2 to 3 hours of active dredging, approximately 30,000 gallons of water were generated (what was the concentration of trace metal and organics??.		See Sections 4.1.4 and 5.4 of the report. The containment water samples were analyzed for gasoline range organics (GRO); benzene, toluene, ethylbenzene, and xylenes (BTEX); DRO; RRO; PAHs; PCBs; and total and dissolved metals (RCRA 8 Metals [arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver], plus nickel, vanadium, and zinc). Complete analytical results are shown in Table 4.	
14.	Section 6.2	Effective filter media would ideally be equipped with both the ability to trap small-diameter sediment and preferentially absorb petroleum hydrocarbons from the water. (there are available technologies that not only adsorbs trace metals and organics, but simultaneously degrade the		Comment noted. Are the technologies proven or still in trial phase? Are they commercially available from multiple sources?	

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		organics.)			
15.	General	It would be helpful if BRISTOL staff and the COE staff would read the two refereed articles that are journal publications defining research conducted at SLI by a range of persons including SLI residents. First authors: Carpenter, D. O., 2005, on SLI water/sediment characterization and health relations and a paper first authored by: R. J. Scrudato, 1212, et al—either one or both articles are publically available or I can send a copy by email. MNA-- Additionally, it is clear from the groundwater POL monitoring data during the period 2004-2011 at three monitoring wells (SS 4, 10 and 5) that there has not been much of a change in the groundwater Benzene, DRO, RRO concentrations. The relatively elevated methane concentrations in wells SS-4 and 5 are not conducive to the aerobic biodegradation process.		Comment noted. The articles were previously provided to USACE. Monitored natural attenuation cannot effectively be evaluated until AFTER the source removal of POL-contaminated soils is completed. Additional soil at the Main Complex remains to be excavated and disposed during the 2013 field season.	
16.	General	I have reviewed the Bristol report related to the work conducted at SLI, NEC this past work season. I have made my comments directly on the report in red. Many of the comments relate to		Please refer to specific comments responses detailed above. We believe the most appropriate venue to address your concerns regarding additional	

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		similar concerns I have expressed in earlier reviews particularly those dealing with contaminated soil digging and shipping off site, use of MNA, not addressing the impacted groundwater, failure to address the other contaminants of concern and ones we identified and characterized, failure to address the range of contaminants identified in the soils and waters of the NEC including dissolved PCBs, mirex, DDE, HCB and metals. The PCB concentrations in MOC sediments is in excess of 500 ug/kg and the Suqi drainage from up gradient areas of the NEC, including the MOC, are transferring other contaminants into the Suqi River estuary and Bering Sea.		contaminants of concern which could impact protectiveness of the selected remedy is during the upcoming 5 year review. The cleanup level for PCBs in sediment at Northeast Cape, as specified in the 2009 Decision Document, is 0.7 mg/kg. If concentrations lower than 0.7 mg/kg may pose a significant risk to human health and the environment, this concern should be raised during the 5 year review. The question of potential transfer of contaminants from upgradient areas of Northeast Cape to the Suqi River estuary cannot be evaluated until the selected remedy removing the source sediments at Site 28 is fully implemented.	
17.	General	Recognizing that the site will soon be closing down, in one or two years from the upcoming field season, and there will be a range and concentration		The 5 year review will evaluate the protectiveness of the implemented remedy.	

U.S. ARMY CORPS OF ENGINEERS	DATE: 29 January 2013 REVIEWER: Ronald Scrudato PHONE: 845 598 2413	Action taken on comment by: USACE

Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	REVIEW CONFERENCE A - comment accepted W - comment withdrawn (if neither, explain)	CONTRACTOR RESPONSE	USAED/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
		of contaminants left behind in the soils, sediments and surface and groundwater including organics and trace metals.			
18.	General	An issue I have concern over is the use of analytical processes to assess the true concentrations in soils, sediments, and particularly surface and groundwater. In particular, aroclor analysis is not sensitive enough to detect low concentrations of PCBs, mirex, DDE, but especially PCBs. Despite what is said about PCB solubility, the lower chlorinated congeners are fairly soluble and the aroclor analytical process is not sensitive enough to detect the presence of PCBs--declared a non detect even when the concentrations of the total PCBs in water are below the aroclor analytical method.		The PCB Aroclor mixtures known to be used by the military, and confirmed by the signature of PCBs detected in soils at the Main Operations Complex (the source area), are Aroclor-1260 and to a lesser extent Aroclor-1254. Thus, we are not focusing on detecting the lower chlorinated PCBs as they were not used by the military during their presence at Northeast Cape. The FUDS program is not authorized to investigate and remediate contaminants of concern from global, non-point sources. EPA Method 8082 is an accepted method for determining total PCB concentrations.	
19.	General	This has been going on for years--the non detect of the process is higher than the actual concentrations. Dissolved PCBs are contained in		The accepted analytical methods have been approved by ADEC, and detection limits were adequate to meet drinking	

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		the MOC and site 28 as well the northern regions of the NEC and are being sorbed by organic rich soils and sediments and concentrating in the down gradient regions of the site including the estuary and near shore regions of the Bering Sea posing impacts to fish, water fowl and a broad range of animals. The native Alaskans who use the NEC for summer hunting and fishing are going to be continually exposed to not only the PCBs, but the other range of contaminants that are not being adequetly characterized.		water standards. The selected remedy for Northeast Cape includes the excavation and disposal of PCB-contaminated soils and sediment from the Main Complex and Site 28 Drainage. The remedy's protectiveness will be evaluated during the 5 year review process. We believe the removal of the military sources of PCBs will adequately reduce future exposure to PCBs. The FUDS program is not authorized to investigate and remediate global or non point sources of contamination.	
20.	General	I have requested a response to these same questions over the 12 years I have been working as the RAB advisor, but have had no responses from the COE. USEPA, ADEC or Bristol. Hopefully, we can address concerns of the possible continuing exposures to the resident SLI native populations.		We appreciate your concerns and believe we have responded to your questions in the past.	
		----- End of Comments ----			

APPENDIX B

Photograph Log

Site 28 Sediment Removal Photograph Log Table

PHOTO	DATE	LOCATION	DESCRIPTION OF PHOTOGRAPH	VIEW DIRECTION	PHOTOGRAPHER/COMMENTS
image1	September 17, 2012	Site 28	Sediment Removal Area 1 with excavator prior to removal	East	Eric Barnhill
image2	September 17, 2012	Site 28	Sediment Removal Area 1 removal	East	Russell James
image3	September 17, 2012	Site 28	Sediment Removal Area 2, prior to removal	East	Eric Barnhill
image4	September 17, 2012	Site 28	Sediment Removal Area 2, removal in progress	East	Eric Barnhill
image5	September 17, 2012	Site 28	Sediment Removal Area 2 following remova	West	Russell James
image6	September 17, 2012	Site 28	Stockpiled sediment from Removal Areas 1 and 2	Northwest	Russell James
image7	September 16, 2012	Site 28	Site 28 Collecting *MULTI /INCREMENT* Samples	Southwest	Eric Barnhill
image8	September 15, 2012	Site 28	Site 28 Removal Area 4 prior to removal	South	Eric Barnhill
image9	September 15, 2012	Site 28	Site 28 in stream sediment trap	South	Russell James
image10	September 15, 2012	Site 28	North of Removal Area 3, sediment trap placement	West	Russell James
image11	September 15, 2012	Site 28	Sediment trap in place	Northeast	Russell James
image12	September 18, 2012	Site 28	Sediment trap and Removal Area 4 in view	South	Eric Barnhill
image13	September 17, 2012	Site 28	Removal Area 4 dredging and surveying	East	Russell James
image14	September 19, 2012	Site 28	Removal Area 4, last day of dredging	North	Eric Barnhill
image15	September 18, 2012	Site 28	Removal Area 4 dredged area marked by lath	South	Eric Barnhill
image16	September 18, 2012	Site 28	Dredging at Removal Area 4; lath outlines areas	South	Eric Barnhill
image17	September 17, 2012	Site 28	Dredge effluent discharging to first sump	North	Russell James
image18	September 17, 2012	Site 28	Lower intermediate sump filling directly from dredge	North	Eric Barnhill
image19	September 17, 2012	Site 28	Second sump with pump in place; first pump discharge	East	Eric Barnhill
image20	September 17, 2012	Site 28	Primary water containment with geotube in place	North	Russell James
image21	September 18, 2012	Site 28	Primary water containment and filling dewatering geotextile container	South	Russell James
image22	September 18, 2012	Site 28	Primary water containment and filling following treatment with water scrubber	Downward	Russell James
image23	September 18, 2012	Site 28	Overview of primary and secondary water containment with dewatering geotextile container and water-scrubbing system	North	Russell James
image24	September 19, 2012	Site 28	Third water containment area with primary and secondary water containment areas to the southeast	Southeast	Russell James

Photograph 1 Sediment Removal Area 1 with excavator prior to removal
September 17, 2012
Northeast Cape Site 28
Direction: East

Photograph 2 Sediment Removal Area 1 removal
September 17, 2012
Northeast Cape Site 28
Direction: East

Photograph 3 Sediment Removal Area 2, prior to removal
September 17, 2012
Northeast Cape Site 28
Direction: East

Photograph 4 Sediment Removal Area 2, removal in progress
September 17, 2012
Northeast Cape Site 28
Direction: East

Photograph 5 Sediment Removal Area 2 following removal
September 17, 2012 facing west
Northeast Cape Site 28
Direction: West

Photograph 6 Stockpiled sediment from Removal Areas 1 and 2
September 17, 2012
Northeast Cape Site 28
Direction: Northwest

Photograph 7 Site 28 Collecting *MULTI INCREMENT* Samples from lower sump area
September 16, 2012

Northeast Cape Site 28
Direction: Southwest

Photograph 8 Site 28 Removal Area 4 prior to removal
September 15, 2012

Northeast Cape Site 28
Direction: South

Photograph 9 Site 28 in stream sediment trap prior to placement
September 15, 2012

Northeast Cape site 28
Direction: South

Photograph 10 North of Removal Area 3, sediment trap placement

September 15, 2012

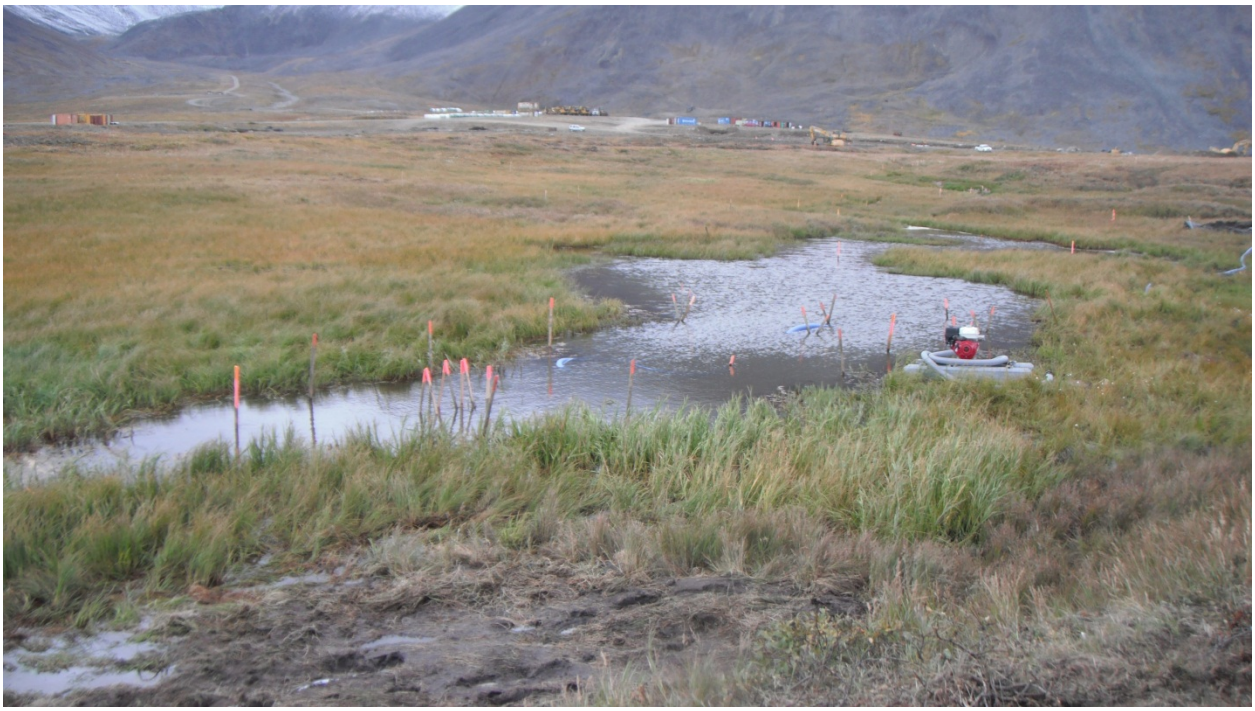
Northeast Cape Site 28
Direction: West

Photograph 11 Sediment trap in place
September 15, 2012
Northeast Cape Site 28
Direction: Northeast

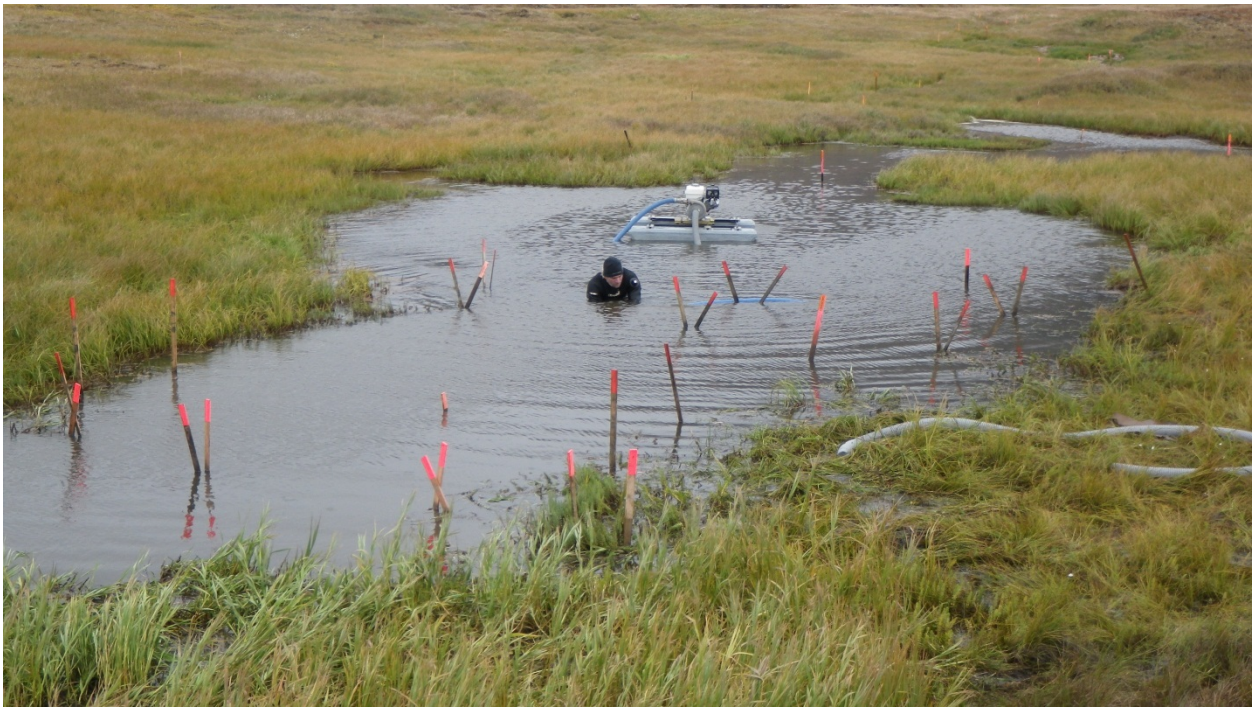
Photograph 12 Sediment trap and Removal Area 4 in view
September 18, 2012
Northeast Cape Site 28
Direction: South

Photograph 13 Removal Area 4 dredging and surveying
September 17, 2012
Northeast Cape Site 28
Direction: East

Photograph 14 Removal Area 4, last day of dredging
September 19, 2012
Northeast Cape Site 28
Direction: North



Photograph 15 Removal Area 4 dredged area marked by lath
September 18, 2012
Northeast Cape Site 28
Direction: South



Photograph 16 Dredging at Removal Area 4; lath outlines areas where dredging has occurred
September 18, 2012
Northeast Cape Site 28
Direction: South

Photograph 17 Dredge effluent discharging to Sump No. 1
September 17, 2012
Northeast Cape Site 28
Direction: North

Photographer 18 Sump No. 1 filling directly from dredge
September 17, 2012
Northeast Cape Site 28
Direction: North

Photograph 19 Sump No. 2 with pump in place; first pump discharge in place
September 17, 2012
Northeast Cape Site 28
Direction: East

Photograph 20 Containment No. 1 with geotube in place
September 17, 2012
Northeast Cape Site 28
Direction: North

Photograph 21 Containment No. 1 and filling dewatering geotextile container
September 18, 2012
Northeast Cape Site 28
Direction: South

Photograph 22 Containment No. 1 (foreground) and water scrubber
Discharging scrubbed water into containment No. 2 (background)
September 18, 2012
Northeast Cape Site 28
Direction: West

Photograph 23 Containment No. 2
following treatment with water scrubber
September 18, 2012
Northeast Cape Site 28
Direction: Downward

Photo 24 Overview of Containment No. 1 (right) and Containment No. 2 (left) with dewatering geotextile container and water-scrubbing system
September 18, 2012
Northeast Cape Site 28
Direction: North

Photograph 25 Containment No. 3 with primary and secondary water containment areas to the southeast
September 19, 2012

Northeast Cape site 28
Direction: Southeast

APPENDIX C

Field Notes

RECYCLABLE

All components of this product are recyclable

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FIELD
№ 351

Eric Barnhill
Northeast Cape HTRW
Bristol Environmental Remediation Services
W911KB-06-D-007 and
W911KB-12-C-0003

Book 1 of 4

Rite in the Rain®
ALL-WEATHER WRITING PAPER

Name Bristol Environmental Remediation Services
Eric Bainhill

Address [redacted] 111 W 16th Ave
Anchorage AK 99501

Phone 907-563-0013

Project NE Cape St. Lawrence Island
HTRW 2012

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

July 3, 2012

FV Anchorage, heading to St. Lawrence Island.
@ airport at ≈ 0900 hours
departed ≈ 1100 hours
arrived at ~~St Lawrence~~ Nome @ 1230

Departed for St Lawrence @ ≈ 1440
arrived at St Lawrence Island @ 1515
- Camp orientation
- room setup

1900 dinner/end of day

10

July 4, 2012

light rain, cool, light breeze

0700 safety meeting
- communication (vehicle 132 fr vs)
- slower is faster
- get help lifting/moving heavy objects
- happy independence day

DQCR -
gathering information for July 3.

- Camp → finish room setup

- Preparing for Meeting of understanding and phase meeting

- Site tour
  - Site 13
  - Site 21
  - Site 31
  - Site 28

July 4, 2012

- Cargo Beach
  - Covered with flats/equipment

1200 lunch → 1230

Prepatory Phase meeting & paperwork
Meeting of understanding
setup.

- Julie Clark and Lyndsey Kleppin measured water levels on MOC wells

- Northland made an attempt to land on Cargo Beach, aborted attempt due to mechanical issue. Nothing was picked up or dropped off.

day end 0545

Total 10.75

July 5, 2012

Clear, mostly sunny, dry

0700
Health and Safety meeting
- be patient; more people coming into camp
- bugs! repellent is available

Vehicles still being worked on
169 - no beach/sand traffic 4wheel drive is out
0900 Camp drinking water sample - SGS
1115 hours -
Security Aviation flight
- Thalia Ibanyen
- Jeb Adkins
- Jeremy Craner
- Carl Calugay
- Mel Bryant

July 5, 2012
Mutual Understanding Meeting
1330 hours

Attending:

Jeremy Craner
Eric Barnhill
Chuck Croley
Julie Clark
Lyndsey Kleppin
Mare Thompson
Morty Hannah

POL, PCB, Arsenic

- Locations of MOC pre/during/after sediment removal will be determined in field.

- POL soil - 4781.5 tons from 2011 and 4000 tons from 2012 TOTAL = 8781.50 TONS

- PCB soils 2700 tons
  31 possible Priority

- Arsenic - 100 tons

July 5, 2012

misc. debris

Poles - 100 poles / tons
misc - 25 tons
drums - 1 ton

Site 8 + MOC wells MNA
-

Radar Dome Sampling
- 6 samples; described in work plan

MI sampling
- same as in WP
  - Cargo beacon
  - Site 6
  - MOC locations

Site 28 sediment mapping
- sed. mapping from the MOC to sugi

Site 28 Sediment Removal + Confirmation Sampling

July 5, 2012

- mapping will be key for determining removal area
- 140 bank cubic yards

Removal of Pol liquids and associated stained soil from site 10

- 1 ton metal
- 50 gallons
- 50 tons of associated contaminated soil.

Field lab correlation study

- Not sure where we are. Touching base (MARTY) with Theresa.

July 5, 2012

Prep Phase Meetings

MOC Surface water sampling

- Initial sample will happen soon the middle and end sample times will need to be discussed

MI Sampling
- Cargo Beach first

1545
at MOC with QAR Jeremy Craner, checking on USACE prescribed MOC surface water sampling points.
- water near removed manhole ✓
- pond to E ✓
- pond to W

Site 28
- walking basin with J. Clark J. Craner, L. Kleppin getting an

July 5, 2012

idea of sediment deposition / site conditions

Arrived on site: Ecoland employees / medic

- Jamie
-
- Abby Page - Medic / Fairweather

10.0

July 6, 2012 Partly cloudy, cool, dry

0700

Safety meeting:

- Communication between workers
- site communication - CB, hand held radio -
- Slower is faster - take time do things right
- use extra time to check vehicles
- keep vehicles clean
- Medic is now on site - Abby Page
- Site orientation for new people after
- Radio channel - Chanel 5
- If equipment ~~boarts~~ eg begins to fail Notify Johnny, Maze (Doug Byers now on Bristol team)

Jeremy Craner - Safety is important take time to do things right, use the right tool for the job; high profile job (lots of onlookers) Political

Filling out DQCR - gave reports for July 4 + 5 to Chad Croley to add his comments

Rite in the Rain

July 6, 2012

1000 - to beach to begin checking areas for MI sampling. The furthest west Unit will be approximately 48 feet wide by 240 feet long

- Crew is moving bags from site 13 to MOC laydown area
- spoke with Surveyor (Ecolands - Jamie Allan) about laying out corners for first decision unit. Surveyors can do it.

1130 - Surveyors arrive at beach, spoke about Unit #1, will lay out corners for unit after lunch
Lyndsey Kleppin finished MOC surface water samples
1200 Lunch

1200 - 1230 Lunch

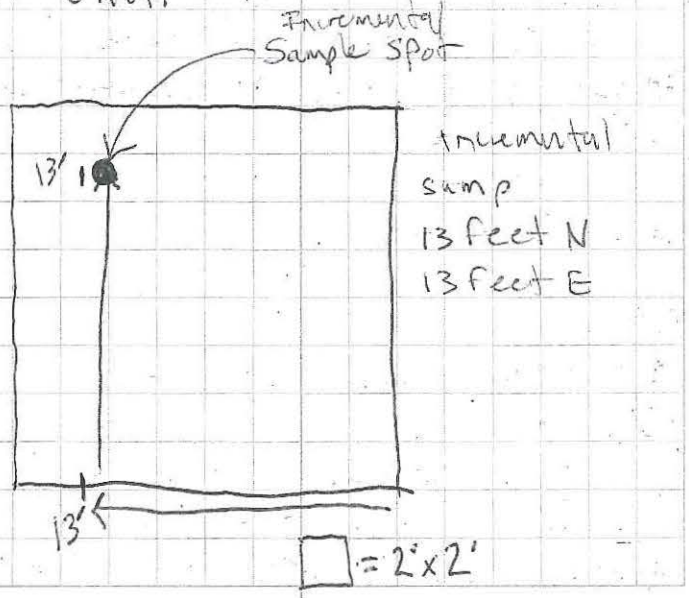
1230 -
Paperwork / drawing out grid.
1300
- getting samples of POL and PCB soil from excavations (JIA & 13) for the lab to train new people

July 6, 2012
1330
@ beach with surveyors laying out grid,

Grid installed
increments or 16' x 16'

Field Unit is 48 feet N to S and 240 feet E to W.

See drawing notebook for sketch of unit.



July 6, 2012

12NCBGSS01
@ 1520
western end / western most unit @
Cargo Beach

L. Kleppin sampled MOL surface waters
in mornings

Flight Arrived @ 1735:
Arrived on Plane:
Russell James
Mylan KingeeKuk
Charles Kava
Albert
Scott
Michael Todie

10.5

July 7, 2012
Foggy, calm, 40° +/-

0700
Health and Safety meeting
- Boat arrived this morning, heavy loads will be moving around - heavy equipment has the right away, use radio alerts especially today with the thick fog.

- Make eye contact with heavy equipment operators; make sure they know you are there.

- lifting + Pulling + Pushing + removing liner, use proper technique.

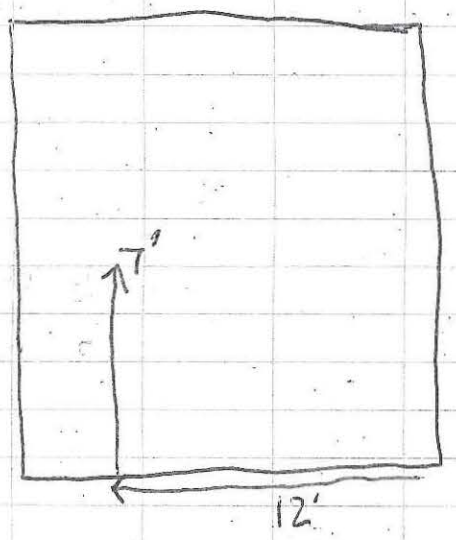
- MEDIC * clinic location. Come any time and interact.
Confidential sheet, fill out medical info even no issues.
There is an Ambulance
- Let her know if you are ill
- injuries get reported; illnesses do not.

July 7, 2012

At Cargo beach:

Surveyors setting up Unit using Surveyors equipment

Setting up Unit and grid with Julie Clark. Unit is 240' x 60'

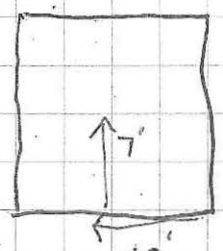


Unit Drawn in large work in rain figure excluding Northern side mylonite due to angle of Beach and Cobbles.

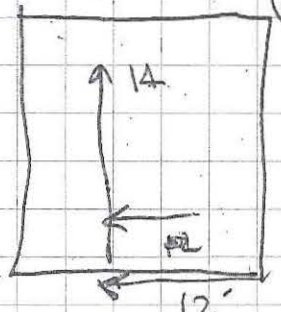
July 7, 2012

12NCBGSS02
@ 1140

(duplicate of 12NCBGSS02)
@ 1400
12NCBGSS03



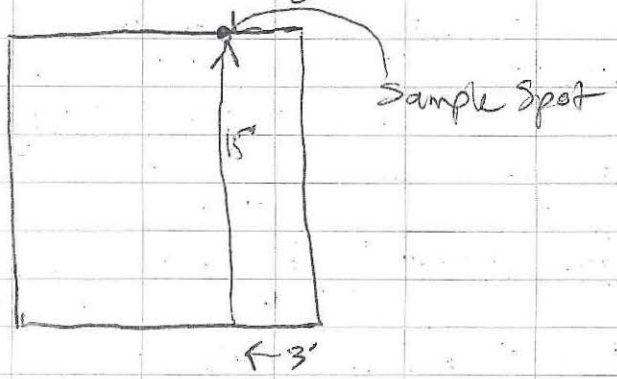
(duplicate of 12NCBGSS02)
@ 1425
12NCBGSS04



July 7th/2012

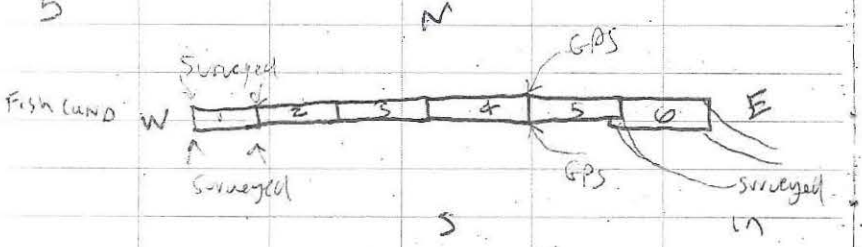
12NCBGSSOS (sketch of unit in large sketch book) @ 1700

Second easternmost quadrant



GPS (ing 5

NW + SW corner of Decision Unit



10.5

July 8, 2012 Tokyo 35-40°F Calm

0700 Safety Meeting

- Be aware of fog; traffic etc.
- Use 3 point mount/restraint on equipment.
- No Jumping from back of trucks/vehicles
- Keep in good contact Spotter-Operator coordinate signals

Boat returning in 2.5 to 3 days

Prep Phase meetings

(Notate!) • MOC wells + 8 MWA - Same as before
• Site 28 mapping

- additional sampling tools to order

Cargo Beach grid setup with Ecoland.

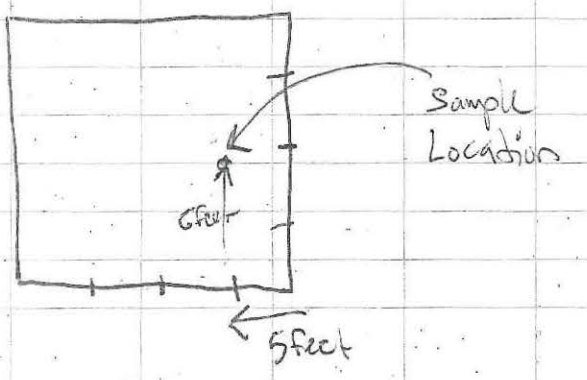
issues with grid, surveyor is going to adjust on computer

July 8, 2012

Lunch:

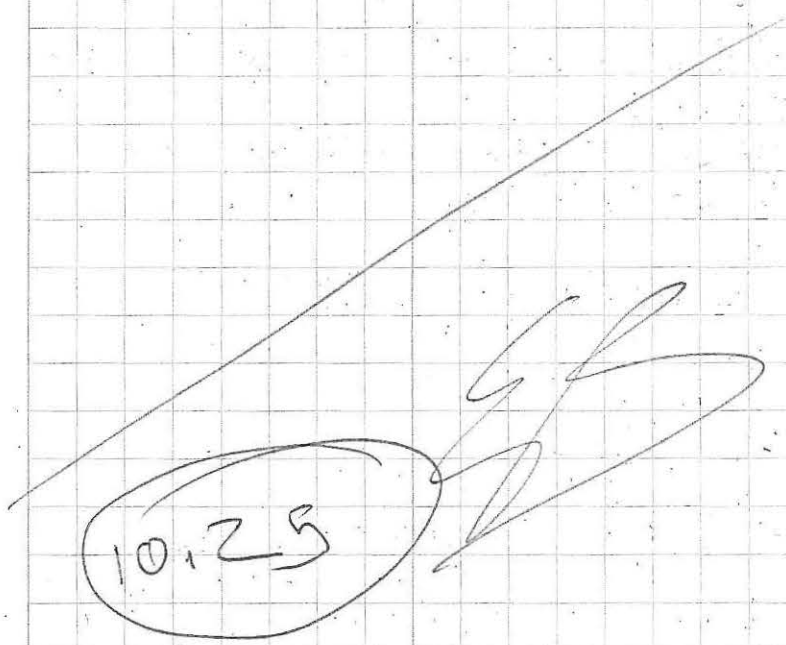
at Cargo beach. Surveyors laying out grid corners.
R. James, J Adkins & I laying out incremental units.

Sample 12NCBG5506
@ 1430



July 8, 2012

third unit laid out
long 210' x 45 wide



July 9, 2012 mostly sunny 40-45°F calm

Safety Meeting:

- Keep in communication with fellow workers
- PPE for wood cutting * hearing Protection hard hat face field, chaps

Environmental Meeting

- 2 units left on Cargo Beach MI sampling
- 2 MOC wells done (LK) 7 to go. Ship on WED/THURS.

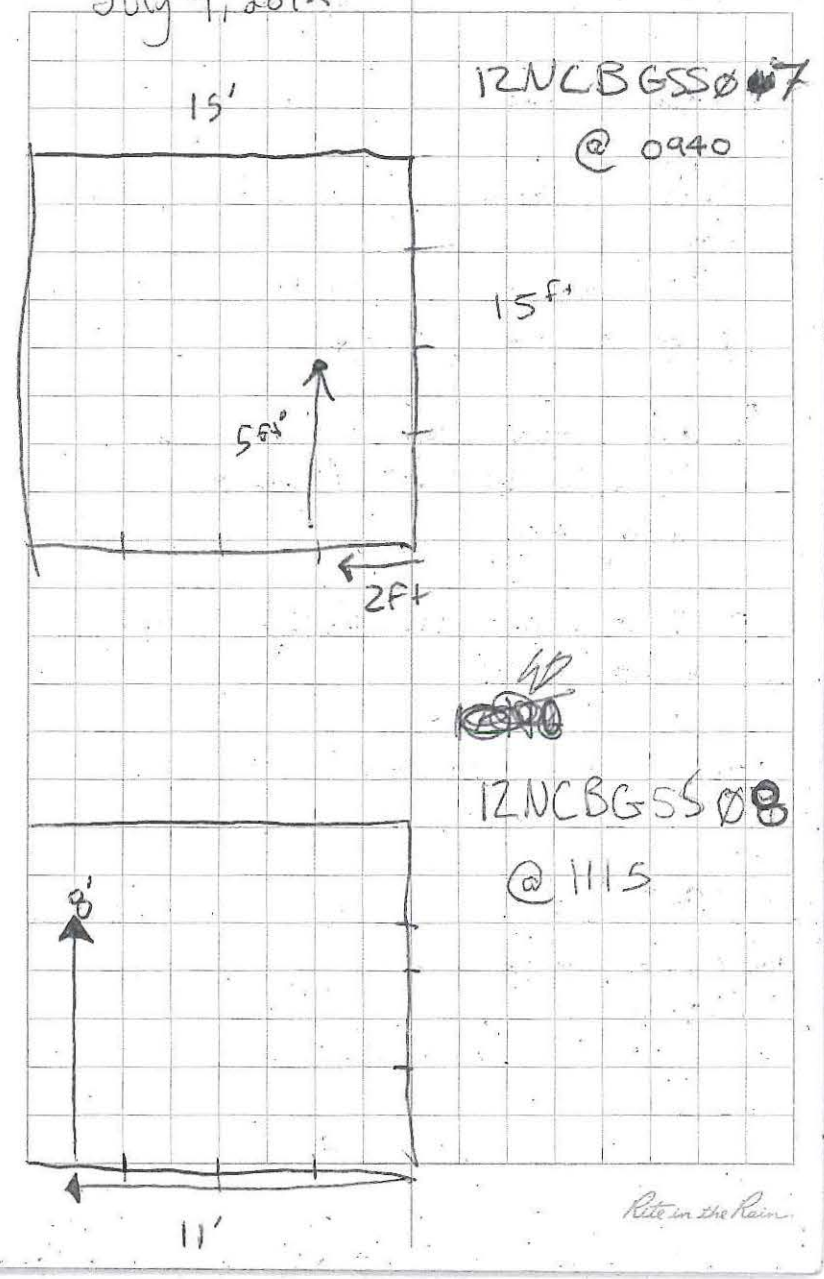
Prep Phase: Excavation

MOC -

PCBs (make sure laborers wear nitrile gloves under other gloves)

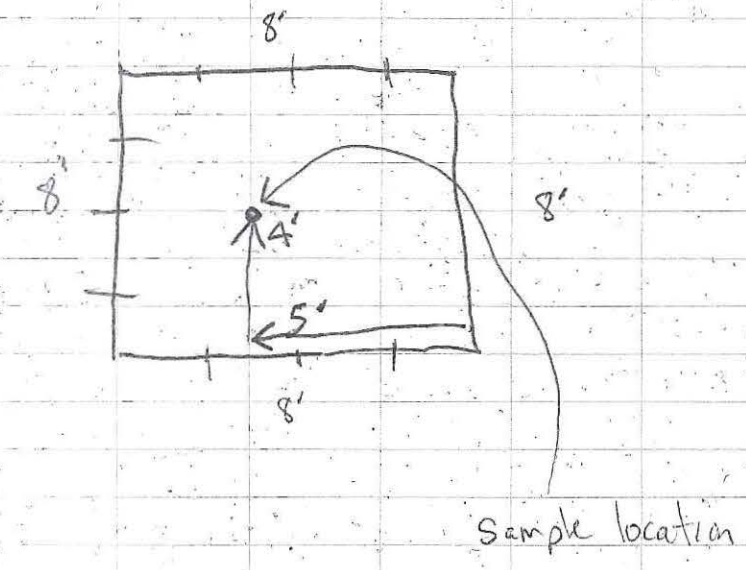
Arsenic - 100 tons
- surface water

July 9, 2013



July 9, 2012
Lunch @ 1200
- 1415
plotting grid for MOC staging area across the street from fueling area.

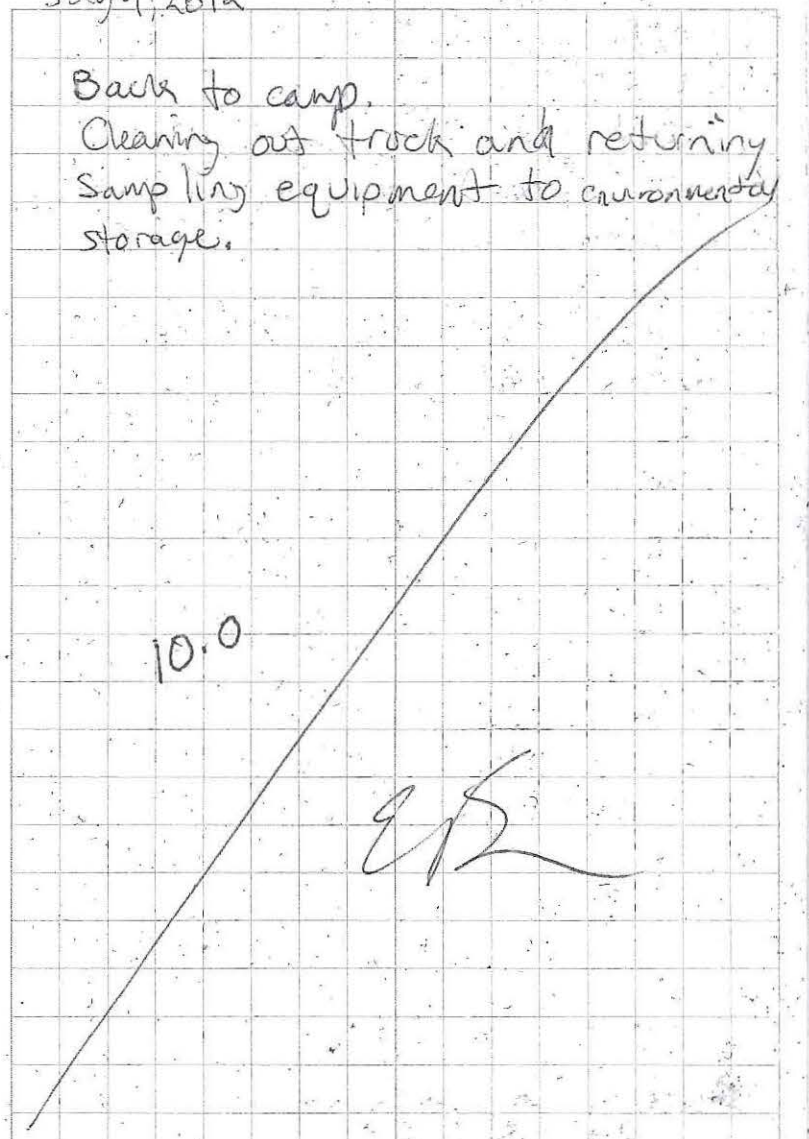
Unit 1 will be 56' by 56' with 8'x 8' grid intervals



starting in SW corner
12NCBG5509
@ 1645

July 9, 2012

Back to camp.
Cleaning out truck and returning sampling equipment to environmental storage.



July 10, 2012 - cloudy; light breeze, 38°-43°F

Safety meeting - (Medical, new are on WED)
- SSHP Covered be C. Cooley
Sampling + labeling moc well samples

(3) (3) (3)
BTEX, GRO, methane — VOA's
(2) DRO - check bottle, make sure it has blue preservation sticker
(2) PCB - Non preserv
(2) PAH - Non preserv
(1) Dissolved - (F = filtered for dissolved) plastic
(1) TOTALS -

Sample 1 = 3 full sets
Sample 2, 3, 4, 5, 6

1200 Lunch

Labeling

STOP 1900

12 hours (11.5)

July 11, 2012 mostly sunny calm 40-45°F

Safety Meeting - AHAs

Cargo Beach
MI Sampling

DV setup

Sampling prep

Rite in the Rain

July 12, 2012 grey, raining ≈40°F, calm

Safety Meeting
PCB excavation starting
- boot wash area
- Tyvek, booties, gloves x 2 nitrile work gloves

Excavator Safety
- Swing radius
- Track movement awareness

Be aware of contaminant tracking

0700 - 0800
Site 31 prep (start 31-21A
(start BW31-21)

0800 - 1200
Site 31 Sampling / Bagging

1230 - 1730
Site 31 BW sampling / Field Samples for lab.

(finish 31-23A)
(finish BW31-21)

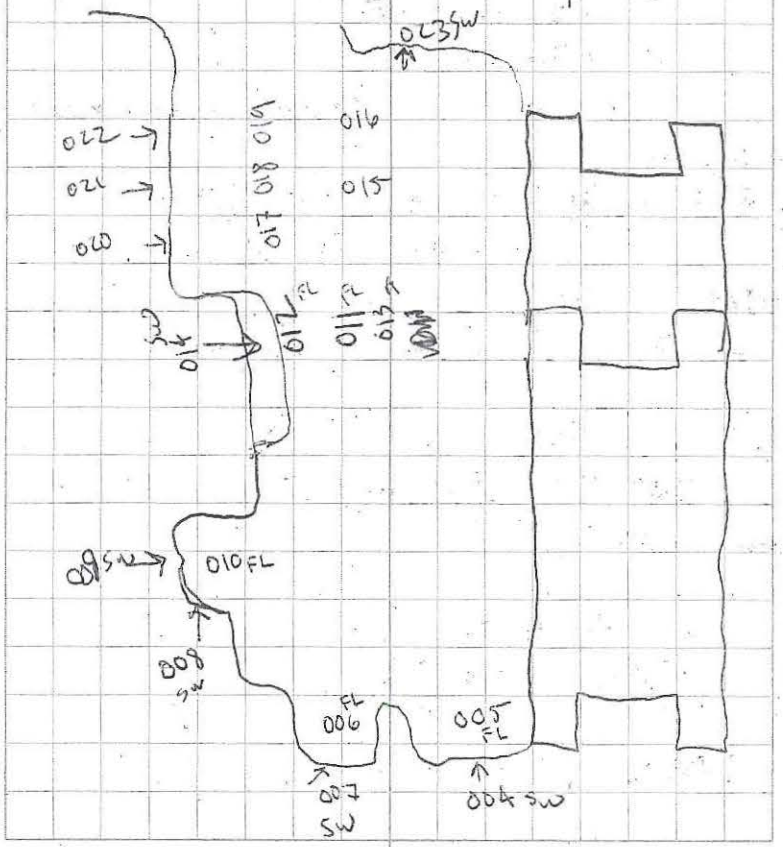
10.0

1730 STOP

July 13, 2012 Partly Cloudy ±40°, calm, dry

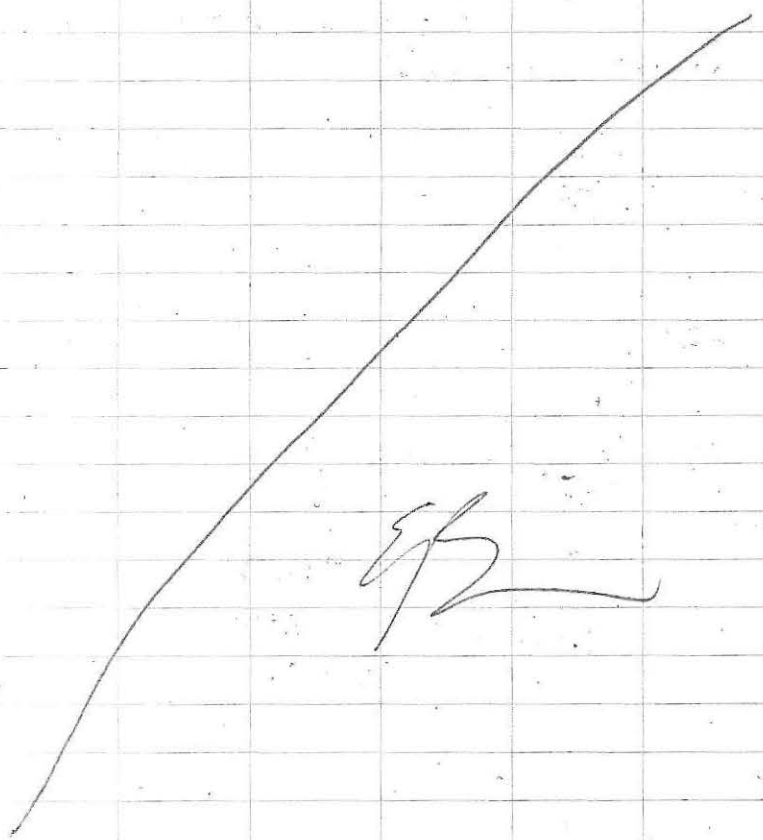
0700 Safety meeting
- slower is faster

Site 31 Bagging and Sampling



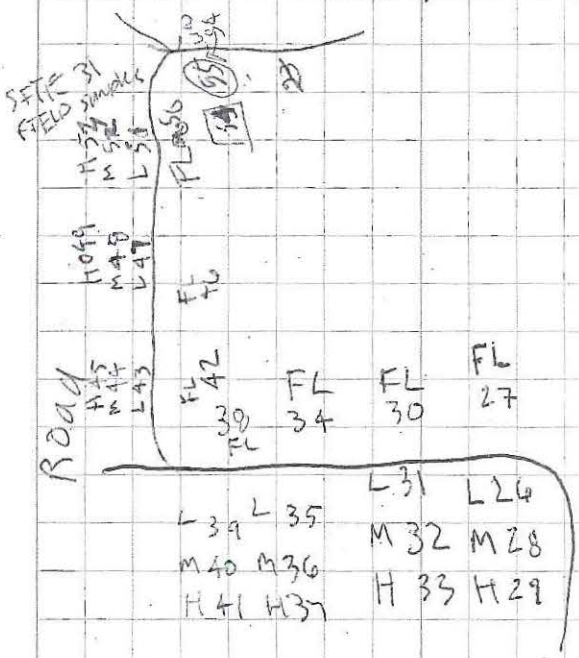
Rite in the Rain

Samples
31-23B → G (6)
BW31-23 (1)
31-24A → G (7)
BW31-24 (1)
B31 25A → G (7)



July 14, 2012
mostly cloudy
≈ 40°, calm

0700
Safety Meeting:
- Fire yesterday
- trash burner
  - Keep caps off of bottles
  - puncture pressurized cans
- shoot extinguisher at base of ignition source
- ~~Steer~~ Don't gather around someone working too much. stand back.



Rite in the Rain

July 15, 2012 rain light breeze 35-40°F

(First sample will be #56.)

Safety Meeting

- Rain - Stay Alive

WEEKLY SAFETY AWARD

- Lyndsey Kleppin

Lyndsey @ site 31

EB @ site six setting up Decision units.

Unit - closest to road
108 feet N→S; 60' E→W

12NLBGSS10 @1545
site six, unit closest to road

12NLBGSS11 @1710
site six, second unit from the road

10:25

10:5

10:5 EB

July 16, 2012 Partly Cloudy ≈ 40°, slight breeze

0700

Safety Meeting + Health

PADS - Physical Agent Data Sheets
- cold
- heat
- noise
- hand arm vib
- lasers
- ionizing radiation
- ultraviolet radiation
-

Keep equipment clean - WINDOWS!

Site Six MI sampling

Setting corners on last two decision units (of four).
Last two are 60' west from ~~E-W~~ E-W
132' from N→S.

July 16, 2012

12NCBGSS12
@ 1120

12NCBGSS13
@ 1410

10.00

July 17, 2012 Cloudy/grey windy ≈ 40°

Safety
- wind
- Liner placement safety in wind

Environmental
Sample at site 31
open up site 13

Sampling @ site 31 with Lyndsey Klepin

Sampling @ site 13

SWPPP inspection report

10.75

EB

July 18

Safety -
- wind
  - Sand → eye protection

Environmental

Field Samples

13-001 – 13-030

BW samples
BW 13-35 – BW 13-37

Hot (over 50 ppm area) samples
BW 13- H01 → H06

~~24~~ 25 bags filled

EB

July 19, 2012

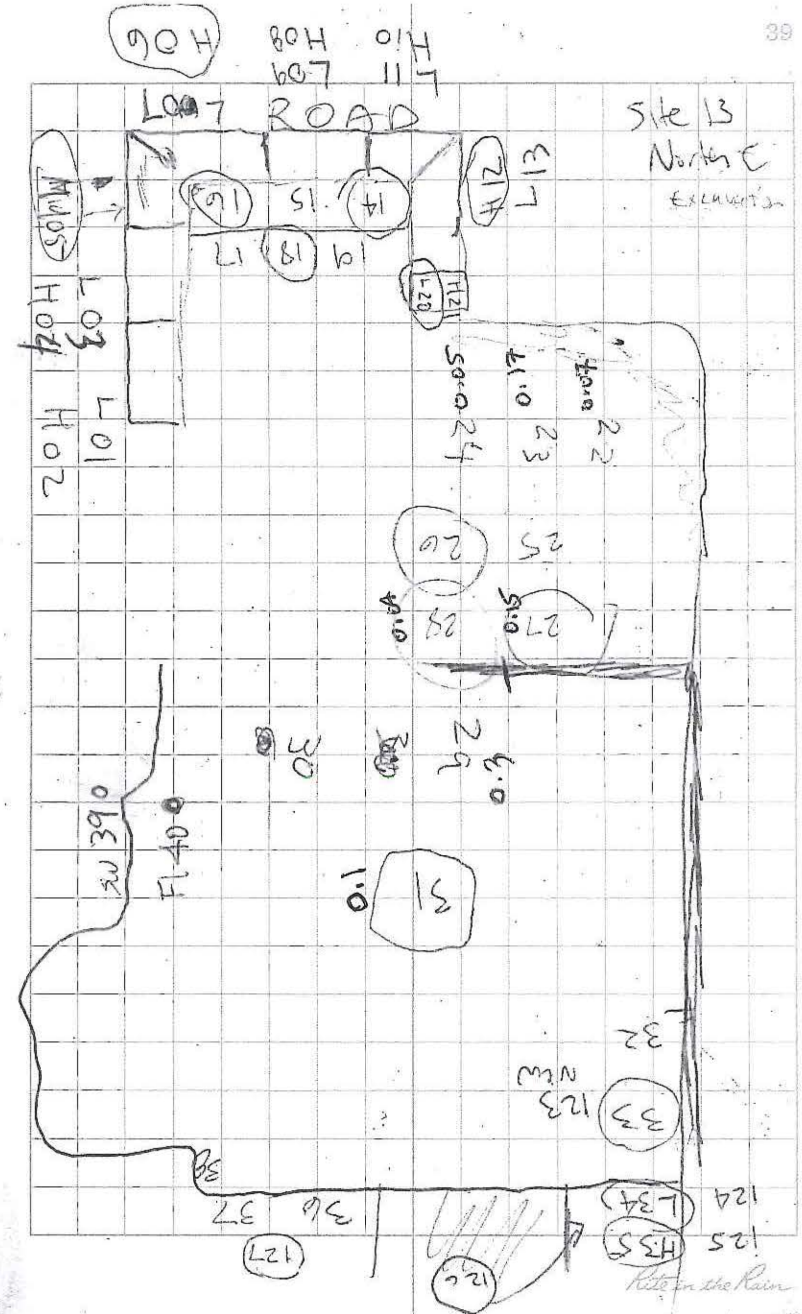
Cloudy, Fair, Misty, ~40 °F

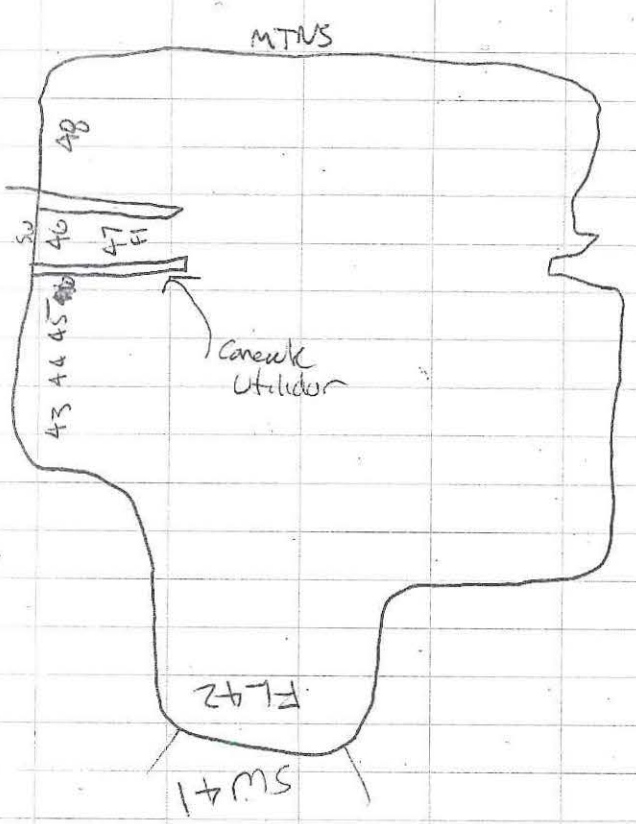
Safety

- stay out of the way of loader
- keep vehicle windows clean

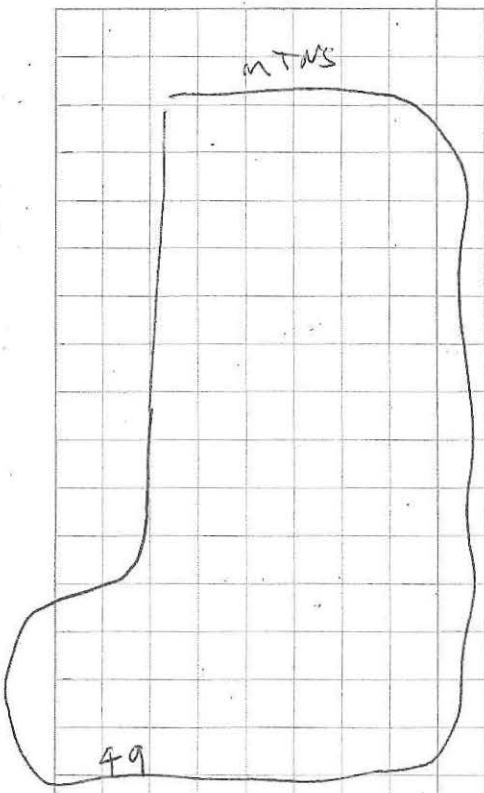
Environmental

Site 13 - continues
Site 20 - continues





Northern
Old stock pile



Southernmost
old stockpile

10:25

Field Sampling on Bulk Wash Sampling
the rest of the day

July 20, 2012

Safety (Eric Bardwell)
- Vehicle / Heavy Equipment Safety
  - walk arounds
  - secure loads
  - Parking Safety
- keep in view of Excavator / equipment operator

Enviro
- Continue Site 28
- Continue Site 31

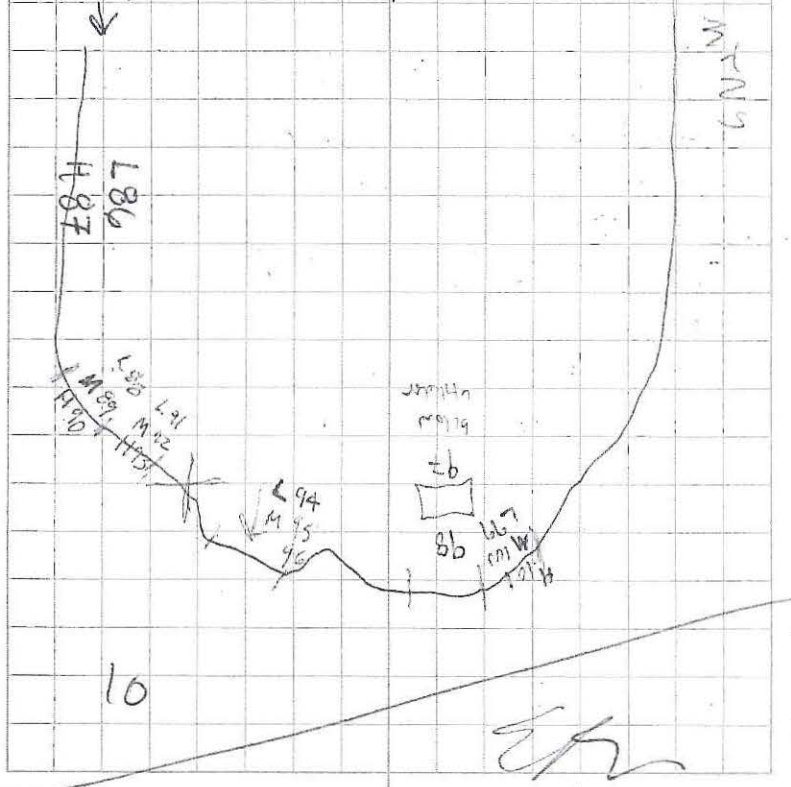
Lunch 1200 - 1230
Sample Management Site 6 Samples
Site 13 -
Excavate field sample
fuel recovery (~20 gallons from Northernmost dig)
Site 6 Samples
- Shipping -- AIC airline

11.0

July 21, 2012

Safety
- Be safe

Environmental
- Site 13
- A-1 - open up find old dirty Confirmation sample
- Site 13 Alcove in SE excavation



10

July 22

Safety-

- safety winner
  MEL!

Environmental Meeting

- G+H plume excavation to continue
- Possibly side 21 today or tomorrow
- Site 13

0900 PCB sample results from site 13 excavation. 8 additional clearout sites

1000 discussing site 13 excavation logistics with Aaron QAR
  - to build ramp?
  - what to do with ramp soil
  - do we dig deeper than 15"?
  - do we dig below water

1100 Digging in site 13, hit a small pocket of water

SW excavation of site 13, Confirmation Sampling.

12NC13SS001 (MS/MSD)
@ 1615

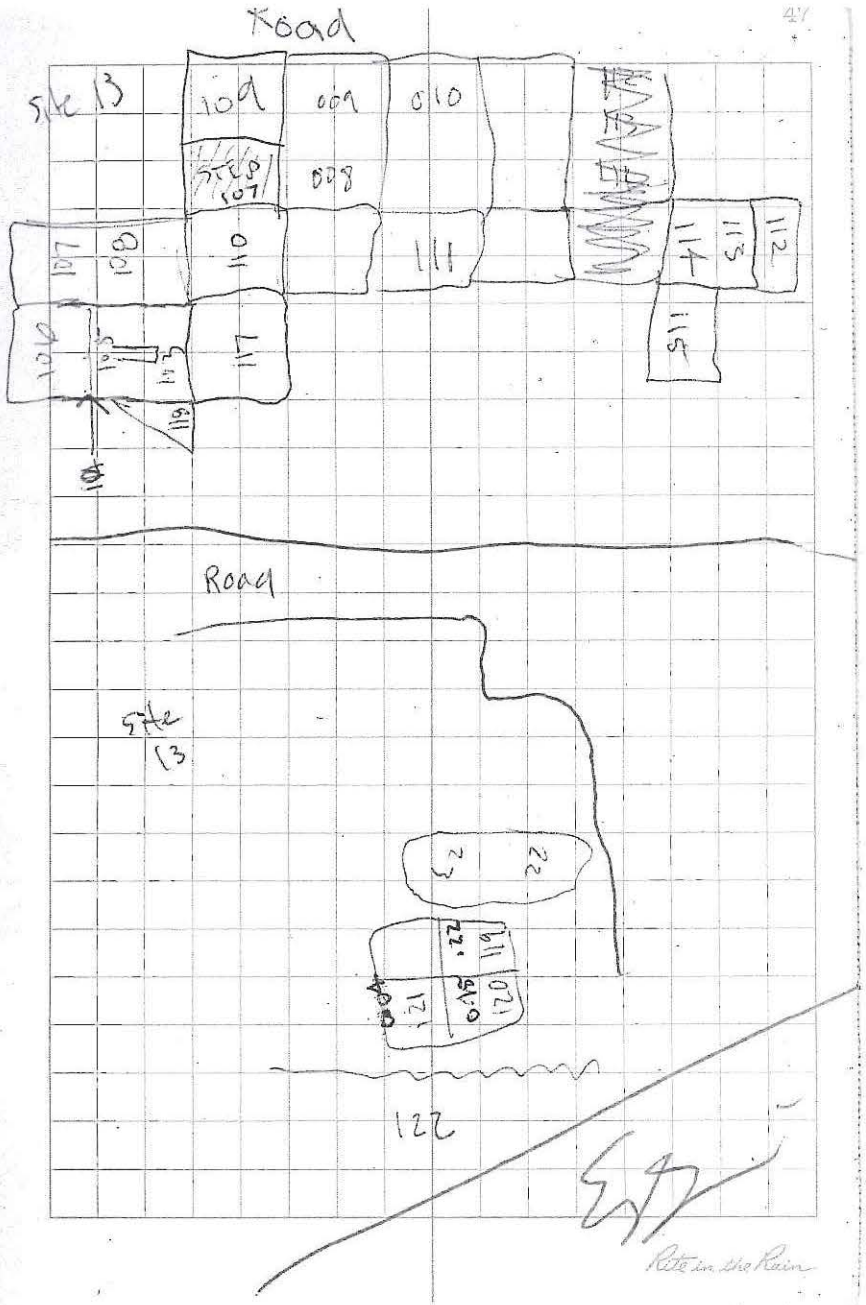
12NC13SS002 (dup of 001)
@ 1620

C

July 23, 2012 [illegible] calm

Environmental / Safety

- Fog + radio communications
- Lots of activity in a small area at Pad 98 (stay safe; communicate)
- Aaron to check up on depth gauges issue at site 13



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HTRW 2012

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CONTENTS

July 24, 2012

Safety

- words

Enviro

running both POL and PCB operations

- EAB

Site 31 after / if finished with 13

- LK

POL bagging / plume diggins

Confirmation Samples

Site 13

Additional Sample results

Bagging / Excavating from all excavations on site

Lunch - 1200 - 1230

- discussed removing Concrete utility Corridor from SE excavation at site 13.

July 24, 2012

Began removing concrete corridor.

Corridor too big to come out in one piece, excavator is Breaking corridor into manageable pieces.

Spoke with QAR about leaving part of Corridor in SW excavation because it was part of an area where soil was clean above and near the corridor This will be done.

Two South excavations are now connected

10.25

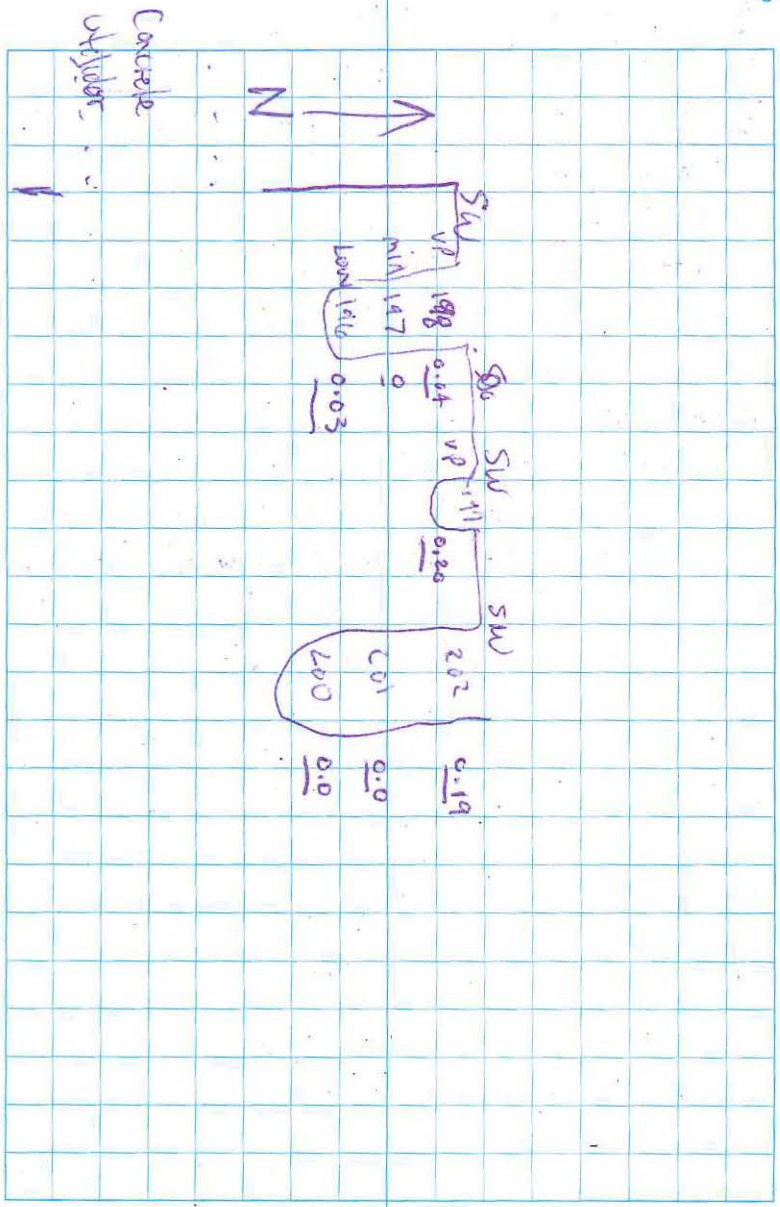
EE

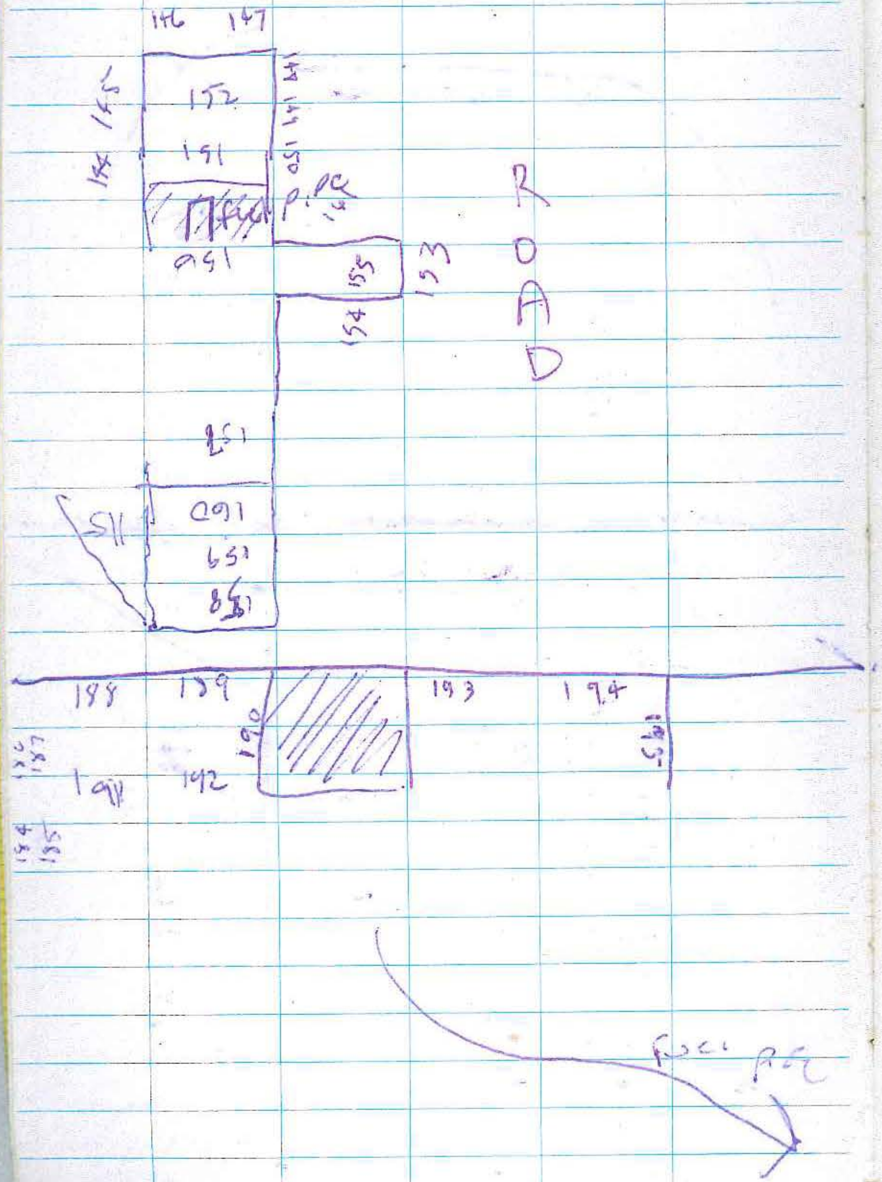
July 25, 202

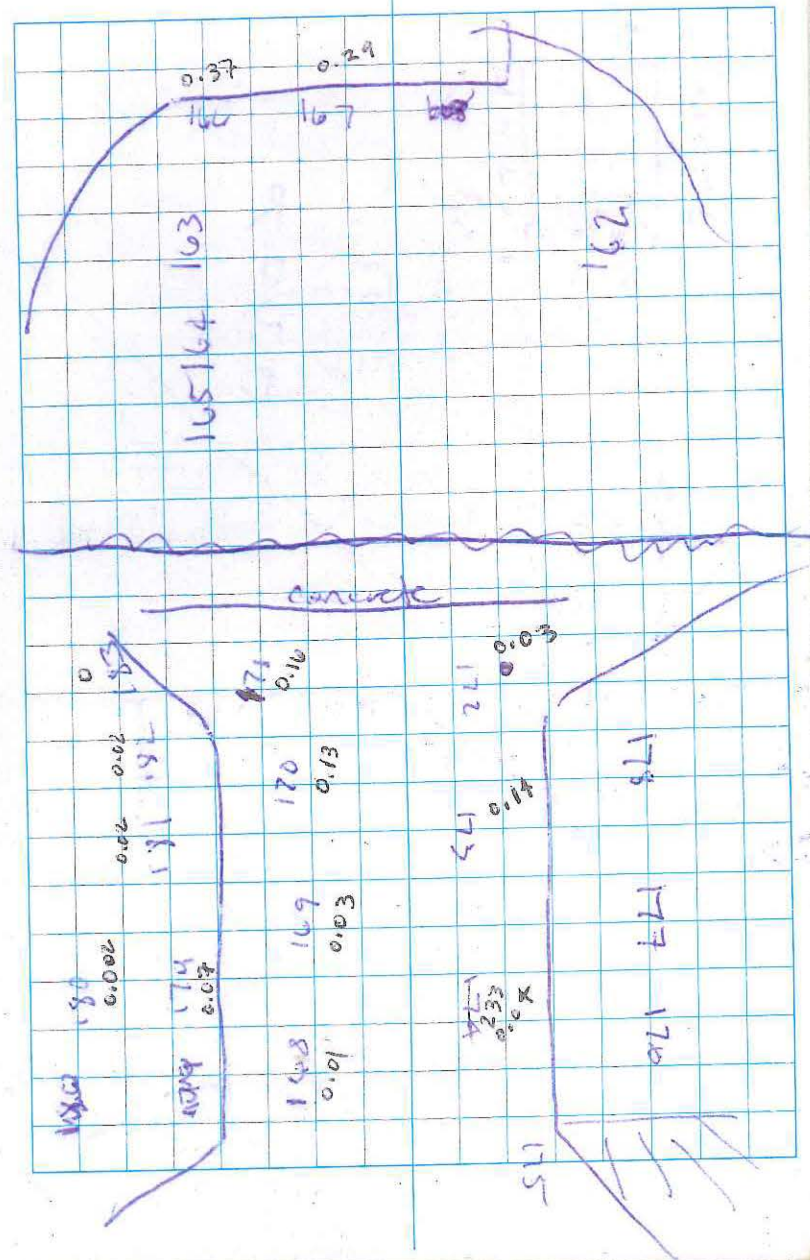
Windy, cool rain.

Safety -
- winds
- wind chill
- rain

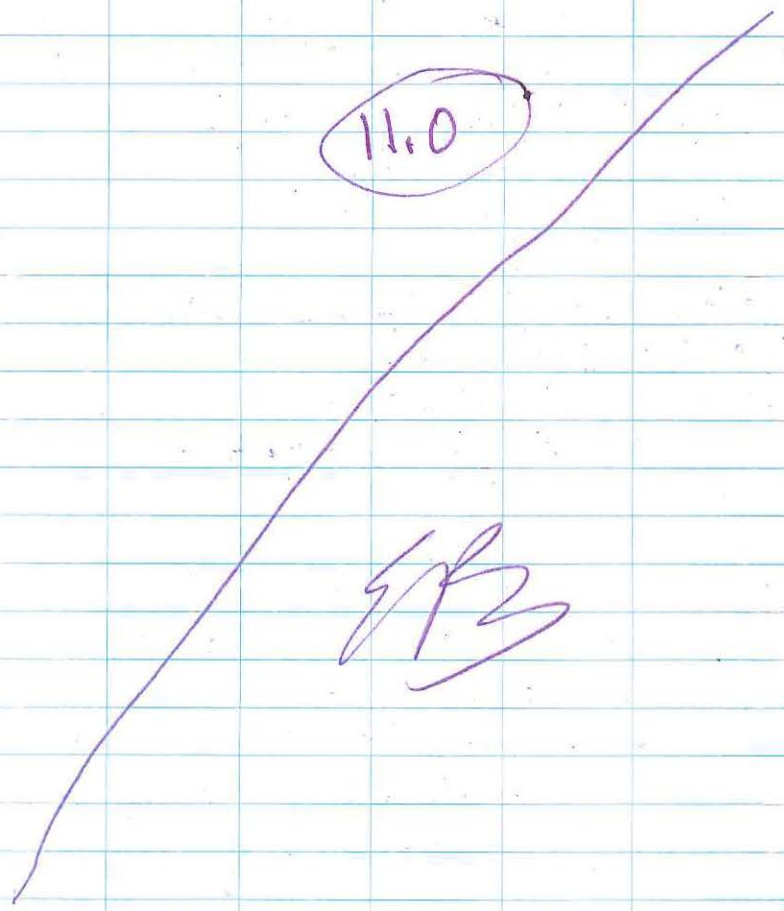
Environmental
- site 13 continuing
- waiting for POL results for A1 and G/H
- Site 31 after 13 gets exhausted




DOOR
PIPE


Concrete

Site 13 field sampling from all of the site 13 excavations.



July 26, 2012

Safety

- Be aware of test pits in areas
- Control of bags easier with 4 people in unit
- Do not throw trash
- Always wear Proper PPE
- Be sure operator knows you are near
- Do things with signals

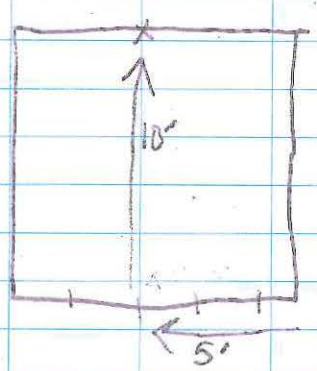
Environmental

- Site 13 waiting on Sample results
- Site 98 - bagging
- MOC = MT sampling
- MOC = plume excavation

1st -
Decision unit uphill from tanks to be laid out.
area to be 60' x 60'
each increment will be 10' x 10'

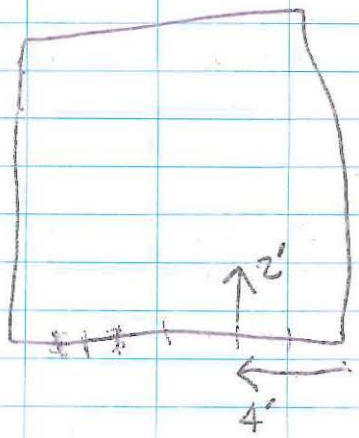
LOC ID - MOC-BS-2

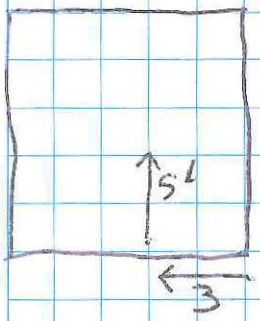
12NCBGSS14
@
1140



12NCBGSS15
@ 1345

(Dup of 14)





12NCBGSS16
@
1420

(Triplicate of 14)

Site 13 Field Sample

10.0

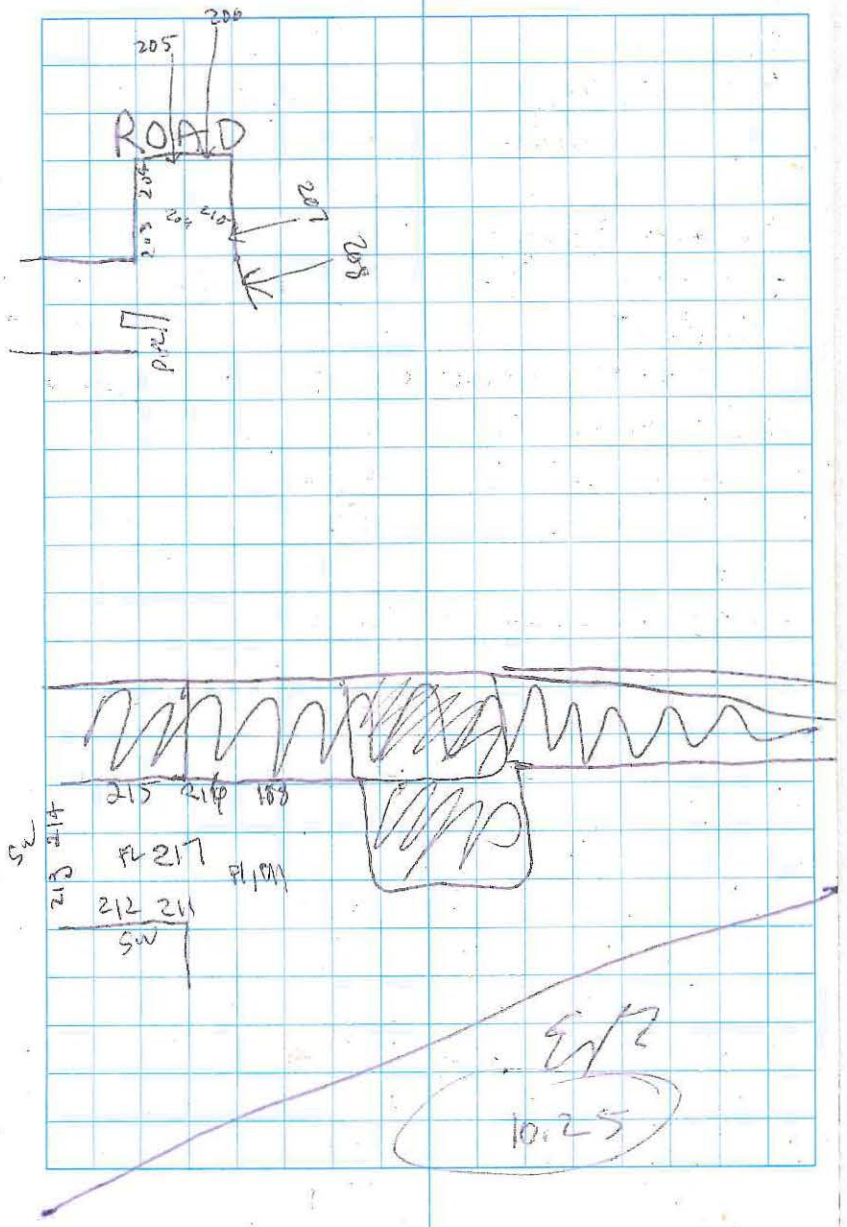
Windy, rain misty

July 27, 2012

safety
Wind + rain - be cautious.
low visibility an issue

Environmental
- Lyndsey sending Confirmation samples
- Site 13 - waiting for lab samples (coming in the morning)
- Site/Pad 98 - bagging

Sampling (bulk waste) at pad 98



partly cloudy, cool

July 28, 2012 day

Safety (ME)
- Foot safety
- eye safety
- be prepared
-
-

Environmental
- MoC to continue removing overburden and dirty soil to stockpile area and pad 99 respectively
- Moving to site #31
- lab would like us to prioritize when necessary

0800
Boat loading crew still at beach
I took a ride down to beach to see progress. Suzanne Lovell, Chuchs Admin. assistant rode with me. Laborers and an operator are moving equipment and an Excavator to site 31.

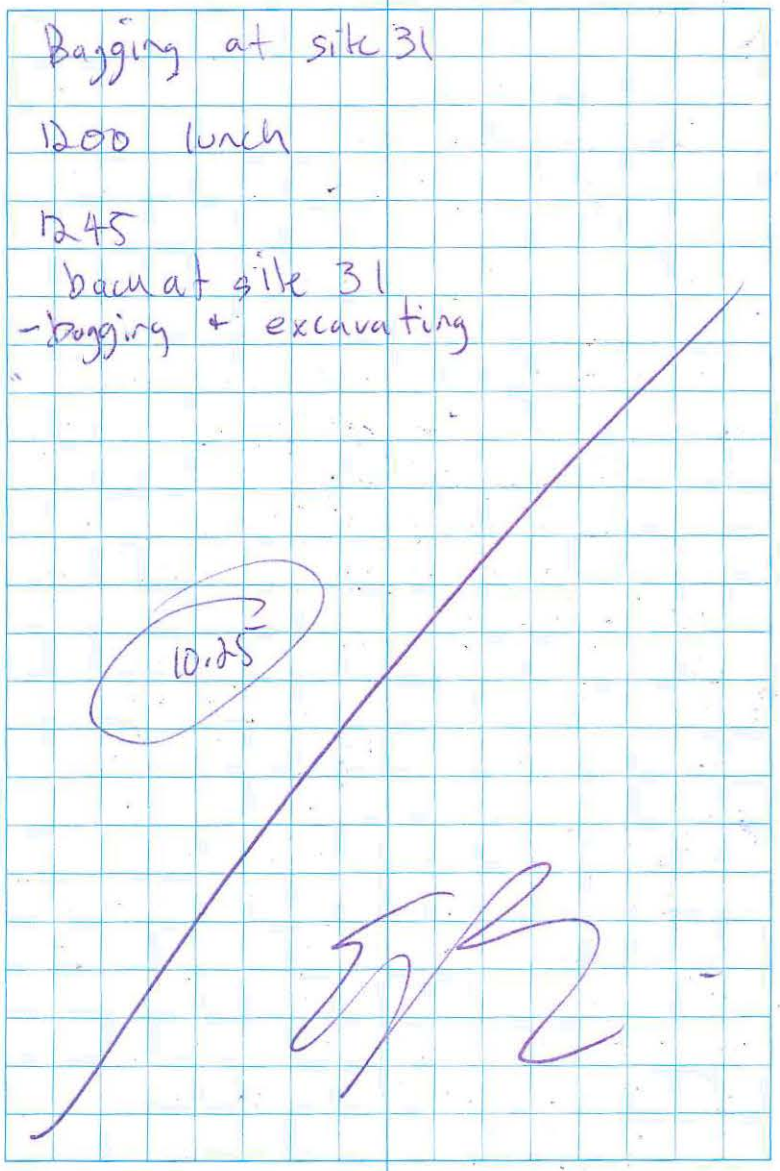
0945
adding a bag frame to site 31

Bagging at site 31

1200 lunch

1245
back at site 31
- bagging + excavating

10.25



July 29, 2012 — Raing, Cloudy windy 35 → 40° F

Rain heavy through the night

Safety

- Be aware of things going on around you

Safety award: Awareness of potential situations

Bruce -

Dayle -

- Chill factor just above freezing
- rain/wind will/may reduce awareness

Environmental

* pad 98 bagged/soupy
* 31 - Bagging
* POL results forthcoming - dry weights

July 30, 2012 — Clear, sunny calm ~40° +/-

Safety -

- proper PPE
  - Level D+ Level D+ Tyvek
  - Rain + warmth gear
  - hard toe boots
- let someone know if u need good equipment / materials

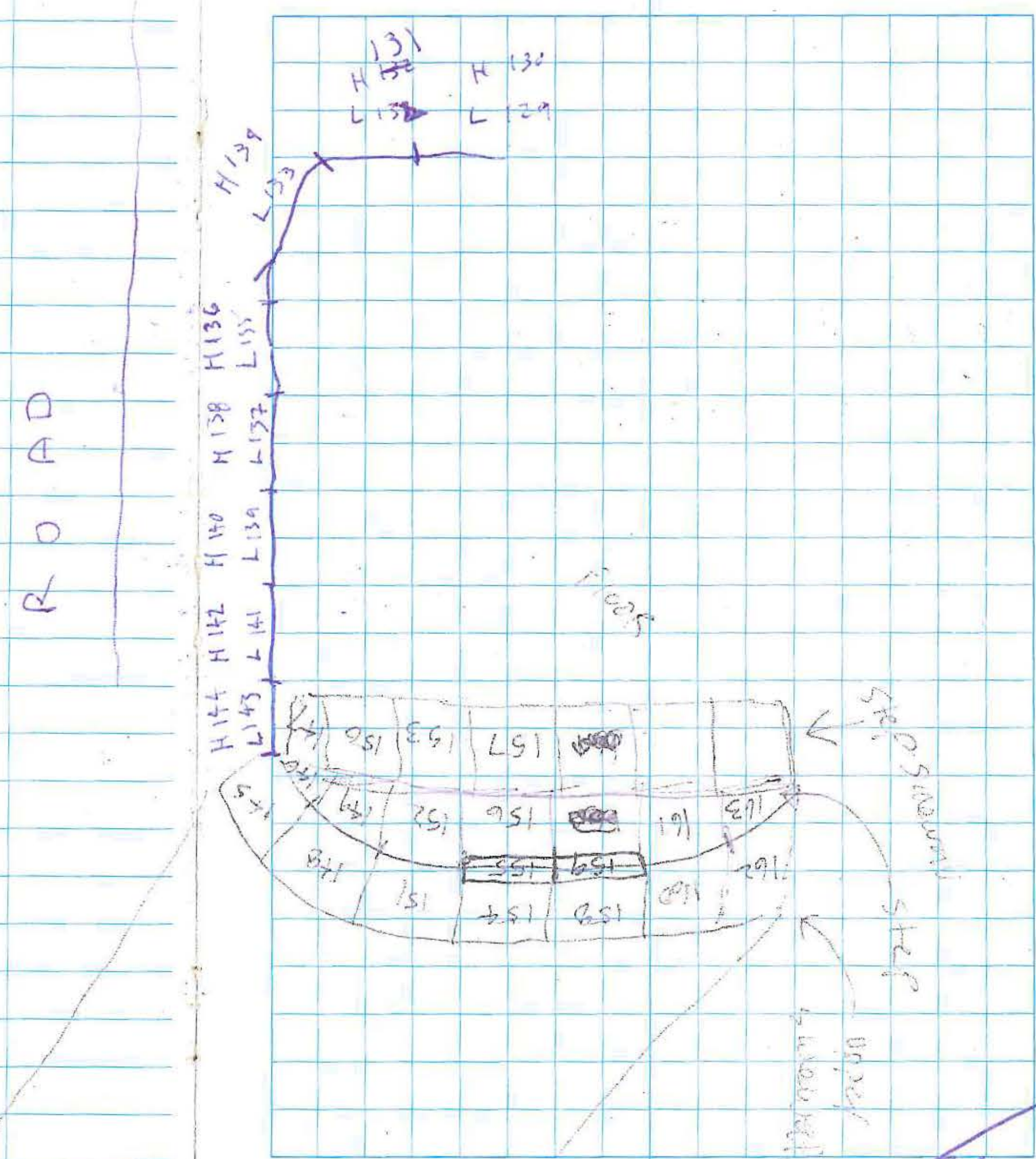
Environmental

continue on

BW31-37 → 40 (4)

31-145 → 163 (19)

EB



EB

July 31, 2012

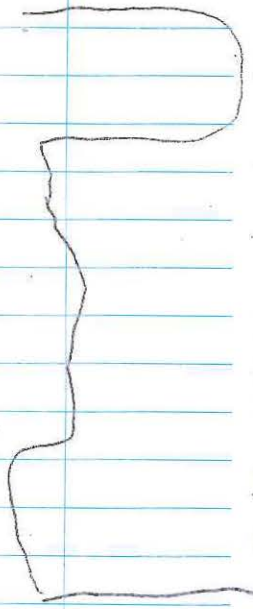
Safety

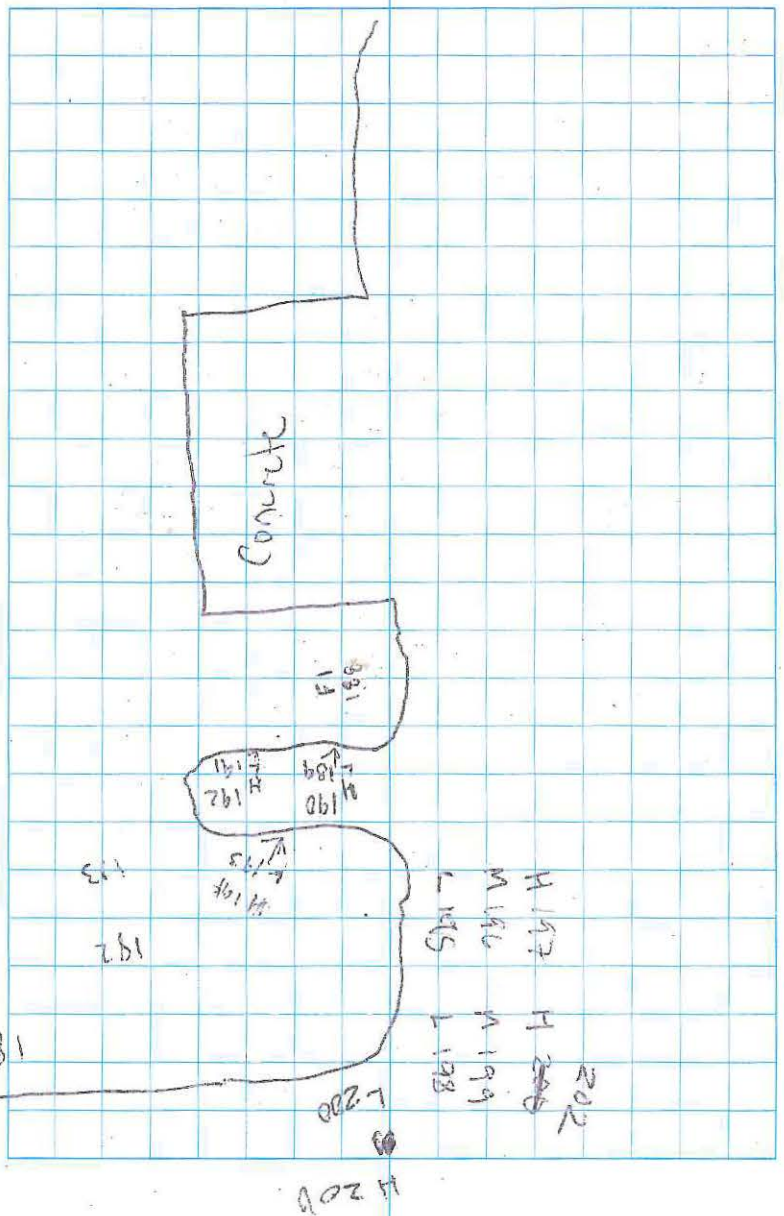
Heat and Cold stress: by Amy Medic

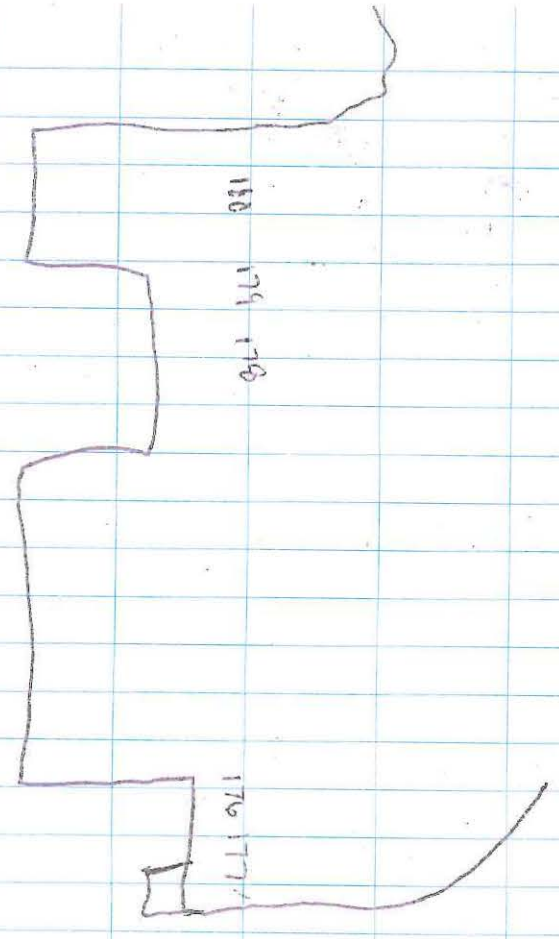
- Keep orange juice available
- Be aware of body changes

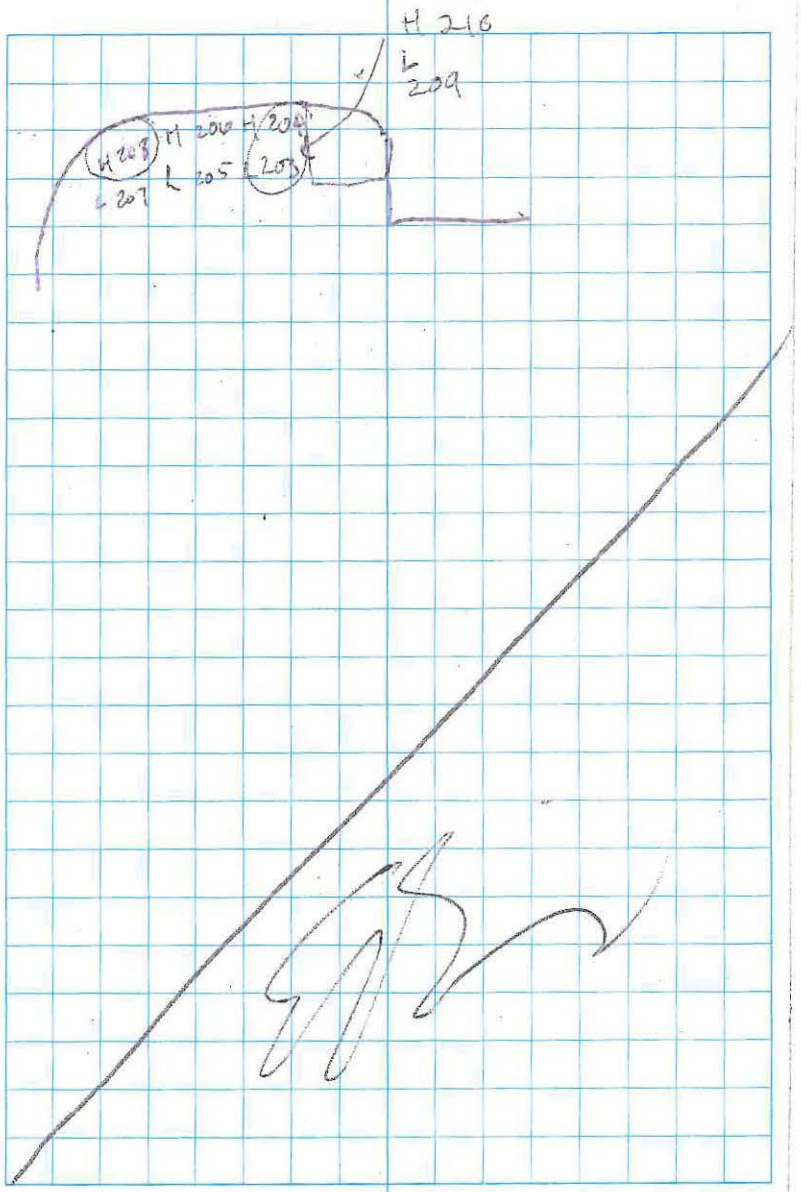
Environmental

- POL bagging today
- PCB sampling
- Lab having POL machine issues, more to be revealed.






176
176
176
176


H 216
L 209
H 208
L 207
H 206
L 205
H 204
L 203

August 1, 2012

Safety

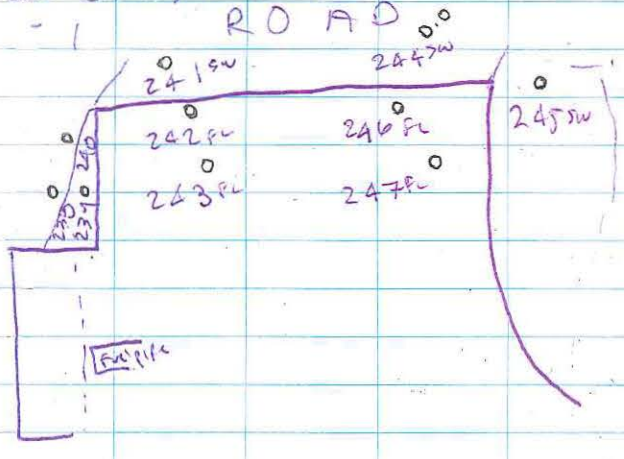
- New visitors

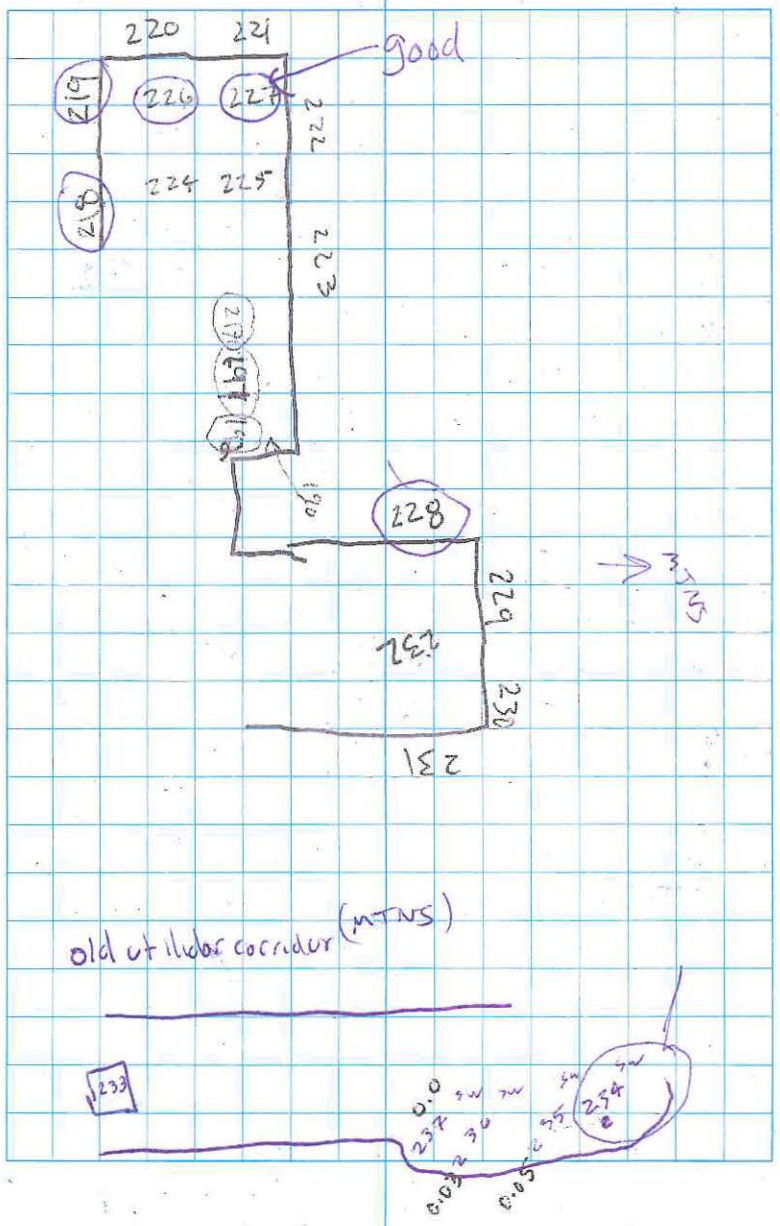
  Large equipment has Right of way

Environmental

Site 13 + 31 paused this morning

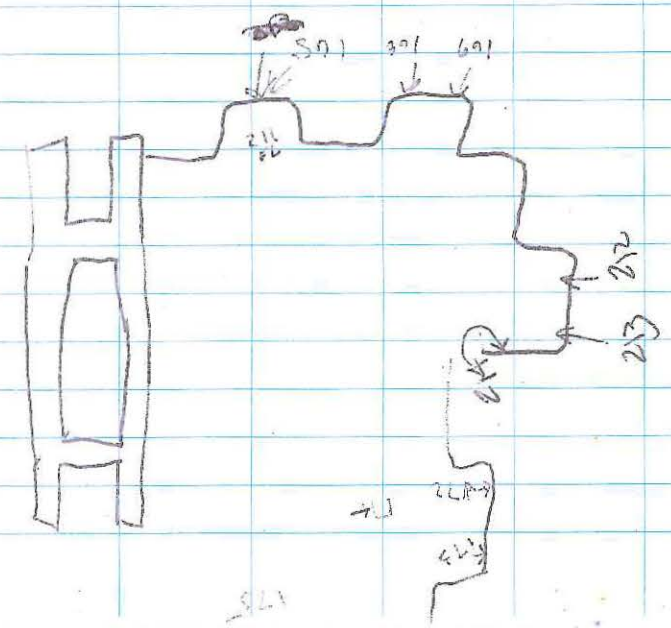
- Pad 98 POL bagging
- visitors checking out site 28, 31 and 13. (Curtis Dunkunk) (Corey Jarrell and Bill Burke) Radar Dome



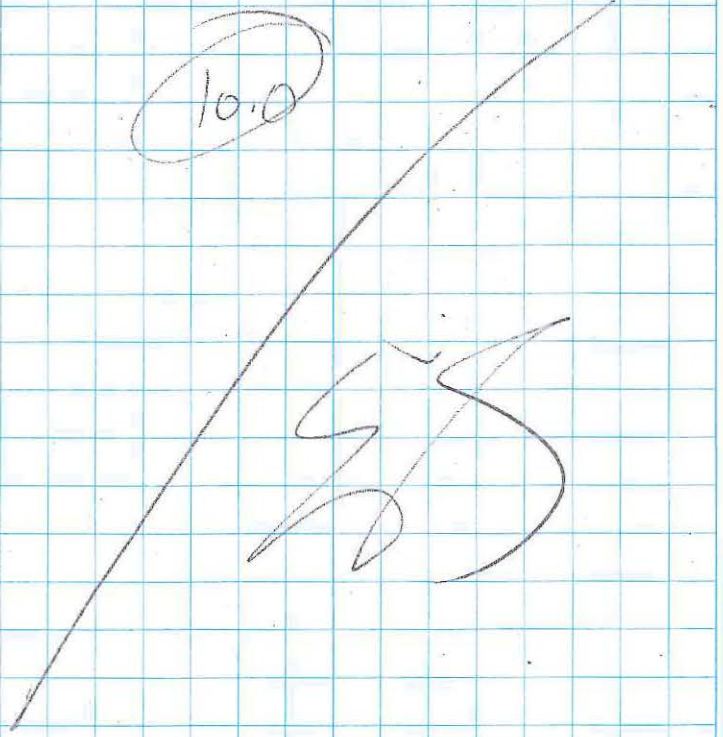


August 2, 202
safety meeting 0700
Environmental:
opening new plume
site 31 sampling / Excavation
0800
site 31
sampling / Excavating
1200 lunch
1230
site 31

site 31 sample



finished at site
31 with a small amount
of soil to dig and samples to
take
1730



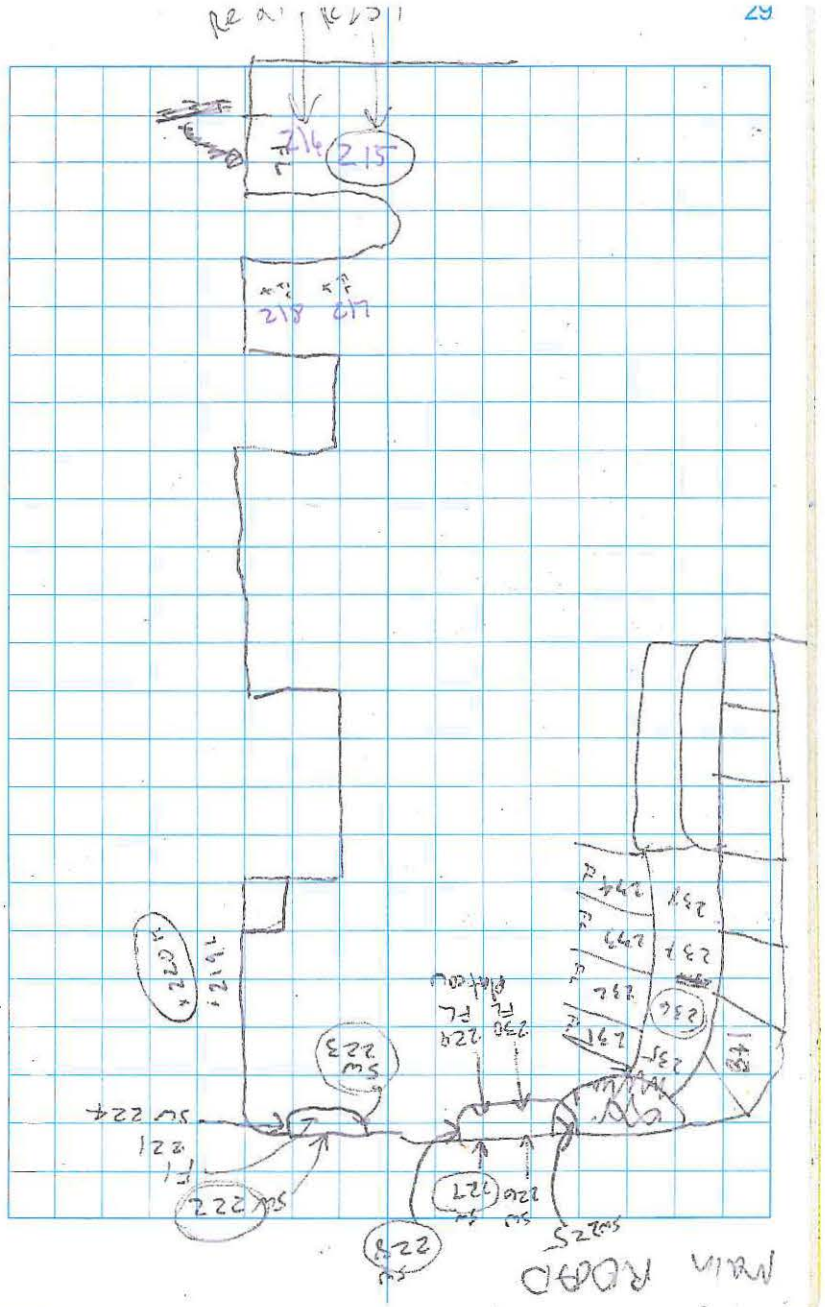
August 3, 2012 ~~Study~~ ☀ 35-40°

Safety
- Choose the right equipment for the right job
  - straps vs chains
  - drum lifters
  - Chaps - proper type

~~Safety~~ Enviro
- E plume continuing
- 3L bag and sample
- Pad 98 bagging

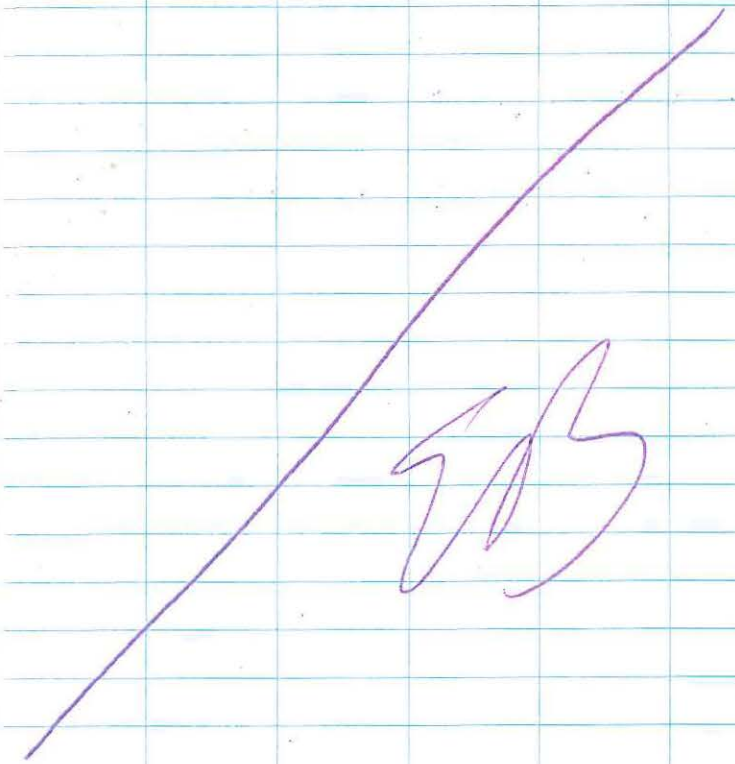
0730
Site 31
- remainder of digging

Field samples 31-215 → 31-238 (24)



August 3, 2012
1000 hours
Padsite 98

MOC 122-G
BWMOC-G
MOC 123A
MOC 123B



August 4

Overcast
≈ 46° F

Safety -
various activities
- wear paper PPE

POL sample frequency
- 2 samples @ 1 per 250²

August 4, 2012

003	1645
004	1646
005	47
006	48
007	1655
008 [dup]	1656
009	1658
010	1707
011	1711 ~~708~~
012	1720
013	1721
014	1722
015	1723
016	1724
017	1725
composite MS/MSD 018	1726
with 028	

August 5 2012

Safety Meeting

Enviro
- Eplume
- 13 Samples

0715
Clearing and preparing Sample Supplies

0800
Site 13

~~NC1213~~ 2

12NC1355	019	0852
	020	0855
	023	0858
	024	0859
	025	0900
(dup of 019)	026	0900
	027	0910
comp MS/MSD	028	0927
with 018		

021	0857
022	0858

August 5, 2012

12NC13 55032 (dup is 042 comp group) @ 1000
(compgroup = 30, 31, 32, ~~42~~, 43, 44

12NC13 55031 (dup = 43 @ 1205) @ 1015
compgroup = 30, 31, 32

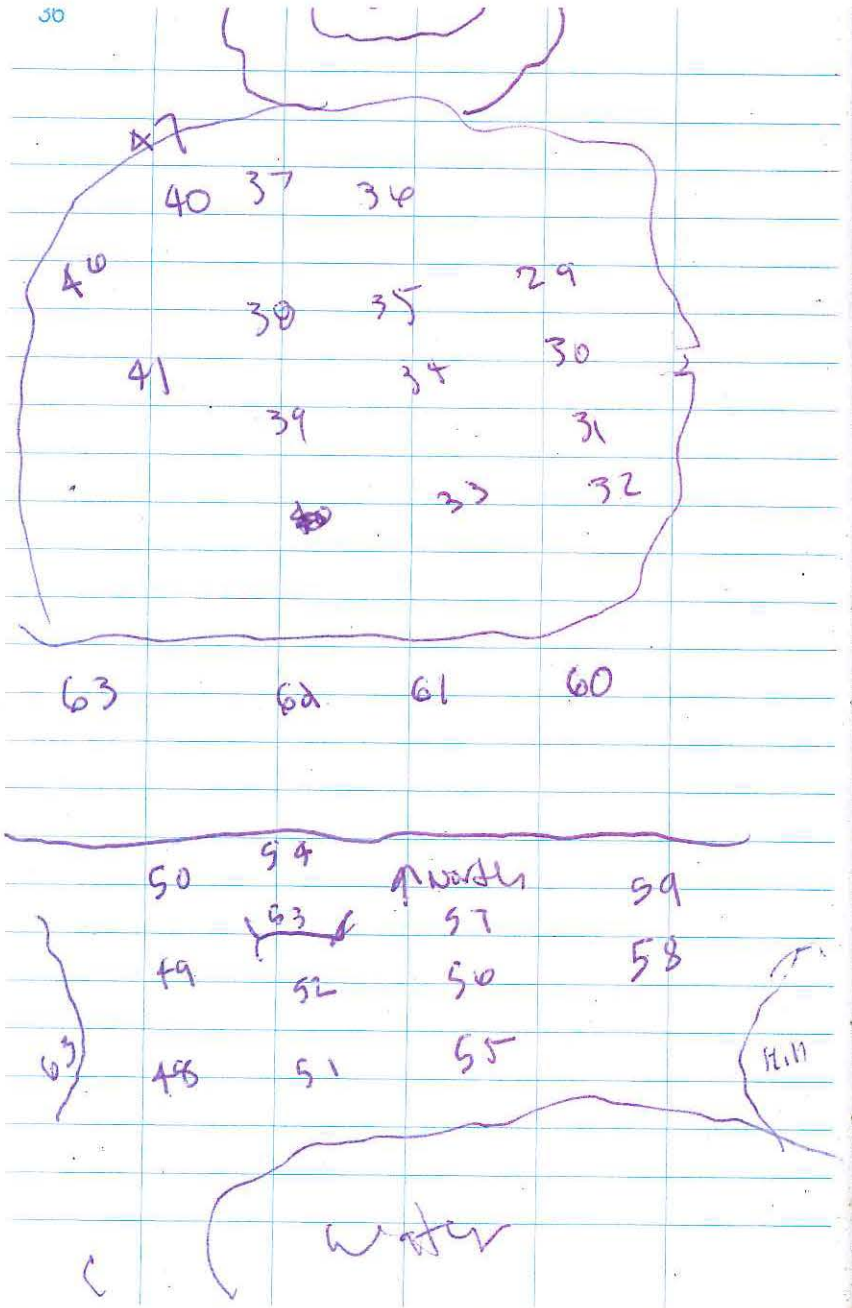
12NC13 55030 (dup 44 @ 1210) @ 1025

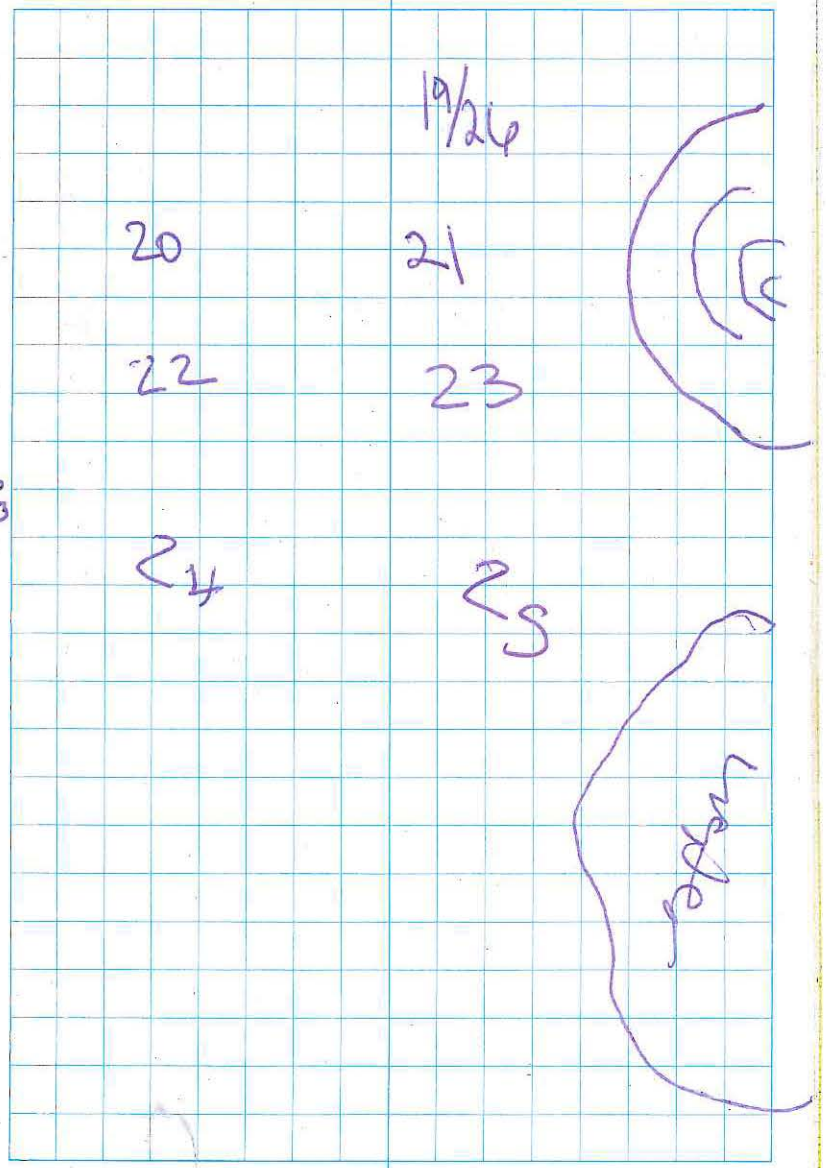
12NC13 55029		1038
033		1047
034		1053
035		1102
dup is 45 * 036		1108]
dup of 36 * 045		1215]
037		1112
038		1117
039		1120
040		1130
041		1132
042	*	1200
043	*	1205
044	*	1210 ~~1205~~
045	*	1215

* duplicates

August 5, 2012

12NC13 55 046		1421
047		1425
(sw) 048		1430
(sw) 049		1441
(sw) 050		1443
051		1456
052		1452
053		1455
054		1457
055		1501
056		1502
057		1504
058		1509
059		1511
060		1516
061		1517
062		1518
063		1520


40 37 34
40
38 35 29
41 37 30
39 31
33 32
63 62 61 60
50 54
North
59
63
49 52 50 58
63
48 51 55
Hill
water


19/26
20 21
22 23
BS
24 25

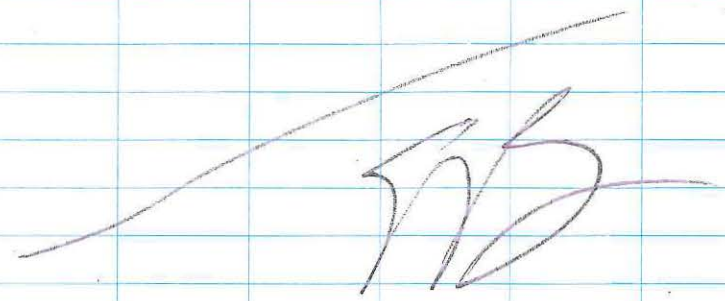
August 6, 2012

Safety:
PPE

Environmental:
- Sample prep

Packing Samples

PUB Samples 1 → 59 in Cooler
080612-1
PUB Samples 60 → 63 in Cooler
080612-2 with MF duplicate
Samples 12NCBG-SS14, 15 + 16



August 7, 2012

Safety -

Enviro -

Site 13 Sampling, Confirmation

064	0903
12NC13SS065	0905
066	0906
067	0907
068	0907
069	0909
070	0910
071	0911
072	0912
073	0913
074	0914
075	0920
076	0921
077	0922
078	0924
079	0926

August 7, 2012

12NC1355080		0931
081	[duplicates]	0933
082		0941
083	[duplicates]	0948
084		1055
085		1057
086		1059
087		1100
088		1101
089		1103
090		1105
091		1106
092		1107
093	[MS/MSD]	1108
094		1109
095		1116
096		1118
097		1119
098		1120
099		1123
100		1124
101		1125
102		1126
103		1128

August 7, 2012

104	1130
105	1133
[dupes] 106	1134
[dupes] 107	1138
108	1142
109	1351
110	1353
111	1354
112	1355
113	1358
114	1358
115	1400
116	1401
117	1404
118	1406
119	1410
120	1412
121	1413
122	1414
123	1415
124	1416
125	1417

August 7, 2012

NV	12NC1355	126	1418
		127	1420
	dupes	128	1437
		129	1438
	dupes	130	1439
		131	1440
	dupes	132	1443
		133	1445
	MS/MSD	134	1452
	dupe	135	1454
		136	1455
	MS/MSD	137	1456
		138	1503
		139	1501
		140	1508
		141	1512
		142	1513

August 7, 2012

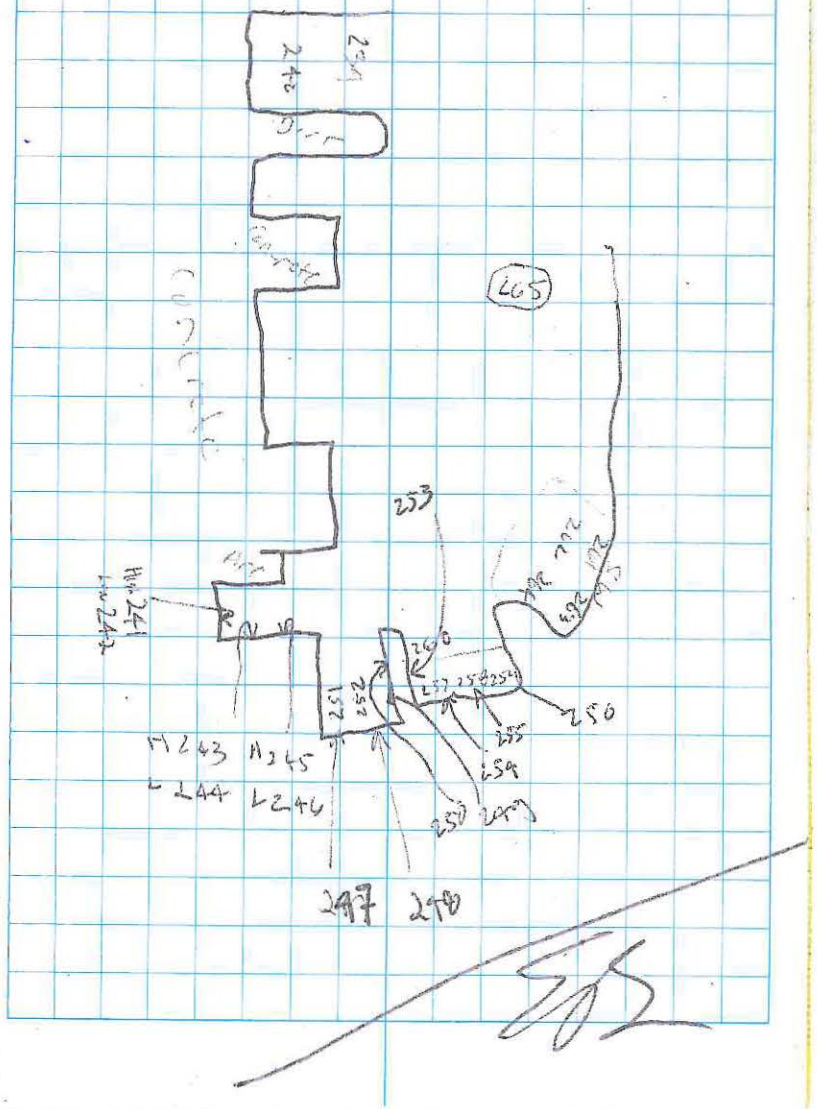
Silt 31 Confirmation Samples

12NC3155		001	1624
		002	1625
		003	1626
		004	1627
		005	1628
		006	1629
		007	1631
		008	1633
		009	1638
		010	1640
		011	1640
		012	1642
	MS/MSD	013	1644
	MS/MSD	014	1648
		015	1650
		016	1653
		017	1654
		018	1656
		019	1658
		020	1659
		021	1700
		022	1702
		023	1703

August 7, 2012
Site 31 Confirmation Samples

12NC31SS	024	1705
	025	1709
	026	1711 ~~1709~~
* dup of 024	027	1715
* dup of 025	028	1716
* dup of 026	029	1717

August 8, 2012
Site 31 Sampling and Excavation



August 9, 2012

Safety

Possible words picking up - proper PPE

Environmental

- Site 31 Continuing
- Pad 98

Site 31 Excavation (See Samples on Page 45)

Field lap samples 239 → 265
WAL 239 → WAL 265

Pad 98 Bulk waste Sampling
SWPP inspection
- inspect and Pictures
SWPP inspection write up

10.5

August 10, 2012

0700 Site Safety meeting
In camp - field prep
Site IS visit with CQCSM
Lunch
1230
Pad 98 Bulk waste
Sampling

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Island HTRW 2012

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CONTENTS

August 11, 2012

Safety Meeting

Environmental Meeting

- Sites 13 + 31
- Pad 98

Lesa Nelson on site assisting, taking over for when I leave

31 - Excavating + Bagging and Sampling for field lab

moves to site 13

Site 13 Bagging, excavating Field lab sampling

1730 stop

10.0

grey, cloudy

August 12, 2012 misty

Safety meeting

Environmental Meeting -

Pad 98
Site 13 - dig / bag / Sample
Site 31 - Field Samples to be taken

Site 13 - excavating + Sampling & bagging
- Field lab samples

Site 31 - Field sampling near road

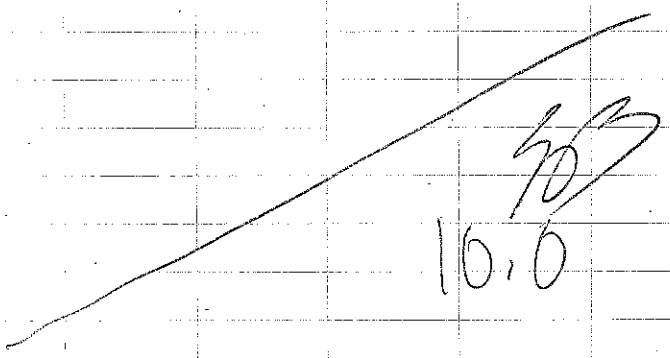
Pad 98 - Lesa Field / bulk waste Sampling
<LUNCH>
MOC water Impoundment Samples
-
- 12NCMOCSWA 009 @ 1415
PAH's
BTEX
MS/MSD + duplicate

August 12, 2012
12NCMOCSWA010 @ 1430
(duplicate of 12NCMOCSWA009)
PAH's
BTEX

Waters Sampled from water impoundment after scrubbing to test for contamination above that which will allow dispersal to ground.

Sample packaging -

Assisted L. Klepin with Stockpile (MOC) Field Sampling



August 13, 2012

Safety meeting
- Pumping out drums

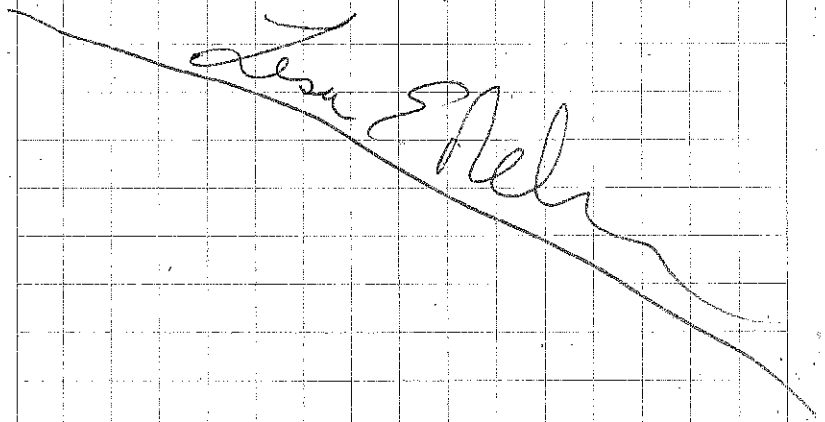
Environmental
- Sample management
- additional soils from Eplume area to Pad 98.

Goes to Anchorage today as weather allows.

End Eric Barnhill entry, begin Lesa Nelson entry

Collect Bulk waste samples from Pad 98

Samples collected BW-MOC166, BW-MOC167, BW-MOC168 to be analyzed for PCBs. - LN



August 14, 2012
- Safety meeting: High winds the next couple of days
- Continue bagging POL soil and bulk waste sampling @ Pad 98.
-> Completed Bulk Waste Samples: BW-MOC169, BW-MOC170, BW-MOC-171, ~~BW-MOC~~ ZN — ZN
- Break for Lunch
* Continue on BW-MOC172 — ZN
-> Completed Bulk Waste POL Samples: BW-MOC172, BW-MOC173, BW-MOC174. — ZN
-> Began BW-MOC175. — ZN
[1730] Done for day. — ZN

[signature] 8/14/12

August 15, 2012
- Safety meeting: high winds
- Excavating 5 supersacks out of Site 21 (arsenic contamination
- Collect confirmation samples. Additional details provided in Lindsey's field notebook
- Due to high winds done for the day

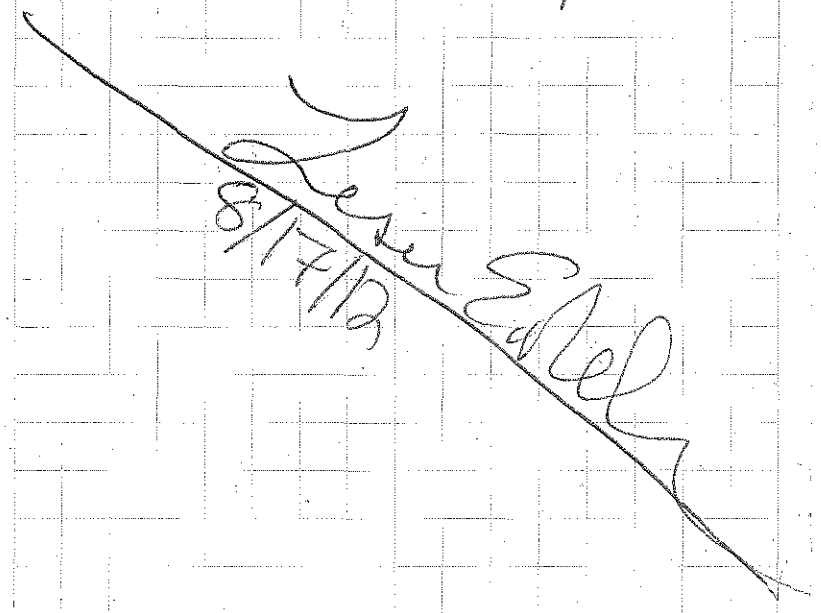
[signature] 8/15/12

August 16, 2012

- Safety meeting: Winds. Dbl check camp, Site, & equipment for any problems due to the high winds on 8/15/12 ——— zn
- Begin excavating Site 13 @ field screening samples 268 & 269. ——— zn
-> Will ~~begin~~ begin on bag 13-57B
-> Completed Bulk Waste Samples: Ø
-> Bags 13-57 B, C, & D Completed
1040 ~~Complete~~ zn Move to Site 31 —zn
Surveyors will mark lab confirmation Sample locations >1 mg/kg & will remove soil @ locations WAL 275 -> 278 and WAL-281 —zn
Begin bags 31-49 ——— zn
Filled bags 31-49 A & B. ——— zn
1200 Break for Lunch ——— zn
1230 Begin on bag 31-49C ——— zn
Completed Samples: BW-WAL-49 ——— zn
Began BW-WAL-50. Completed bag A
1500 Move to Pad 98 ——— zn
Lindsey will stay @ PAD 98. I will begin Collecting confirmation field samples @ Site 31. Field Samples 283 -> 290 on east side of excavations. Sample 291 = fixed lab confirmation Sample Ø19 + 292 = fixed lab confirmation Sample Ø09 former location of 269
At Site 13 Sample 275 @ former location of 269 + 276 @ former location of 268 ——— zn

August 17, 2012 Partly Cloudy, ~50°F

- Safety meeting: Atzn mosquitos —zn
- Begin ~~excavating~~ zn filling bags @ Site 98
- Completed Samples: BW-MOC177 BW-MOC178, BW-MOC179 + zn
Completed Bags MOC-180 A -> E
Break for Lunch ——— zn
Completed Samples: BW-MOC180, BW-MOC181
BW-MOC182, BW-MOC183 ——— zn
Completed bag MOC 184 A + B - zn
+1730 Done for day ——— zn



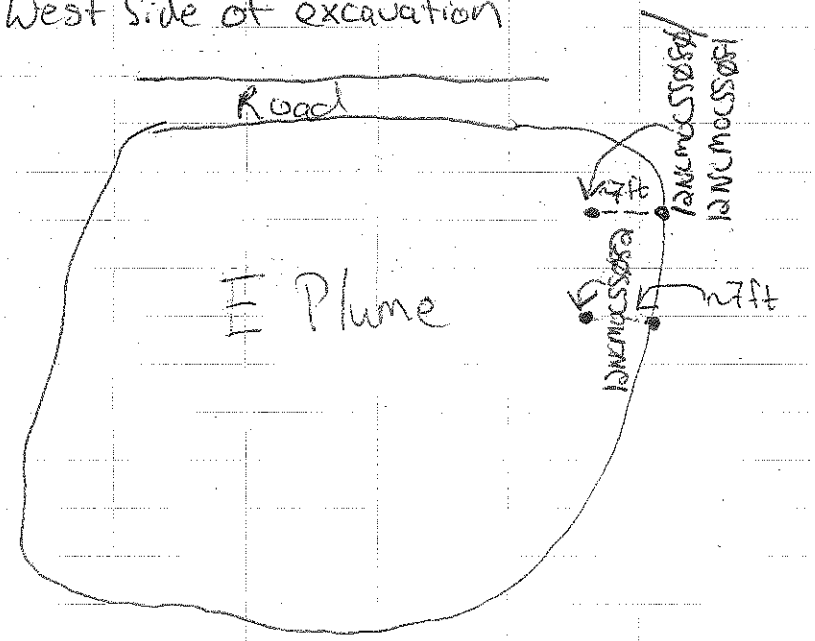
August 18, 2012 Rainy, Slight Wind, ~45°F
- Safety meeting: Rain, + breaks + hydration
-> Begin on bag: MOC-184D ——— dn
Completed Samples: BW-MOC184, BW-MOC185, BW-MOC186, ——— dn
1400 Break for lunch ——— dn
1230 Completed bags before lunch BW-MOC186 A, B, (+D)
Completed Samples: BW-MOC187, BW-MOC188, BW-MOC189, BW-MOC190 ——— dn
Completed Bags: MOC-191A
1730 Done for the day ——— dn

9/18/12

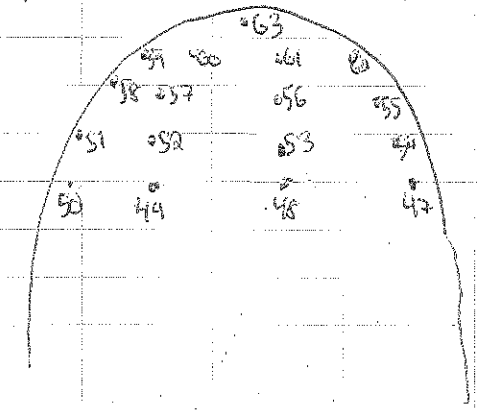
August 19, 2012
-> Safety Meeting: Weather + Communication
-> Head to Site 3, field screen samples WAL-283 + 286 -> cleanup level — dn
Start on BW-WAL50B ——— dn
Completed Bags: BW-WAL50B + C
Confirmation Samples WAL293 + 294
0845 Head to site 13 ——— dn
Begin w/ Bag 13-57E ——— dn
Completed Samples: BW-1357, ——— dn
Confirmation field samples
Collected from Lab Sample Location 008 = 13-277 ——— dn
Completed Samples: BW13-58 ——— dn
Completed bags up to 13-59E — dn
1515 ~~Move to site 98~~ dn Decon
1330 Done for the day ——— dn

8/19/12

August 20, 2012 Partly Cloudy, Slight Wind, ~45°F.
- Health + Safety Meeting: Awareness ——— dn
- Collect 2 Samples from E Plum on West Side of excavation

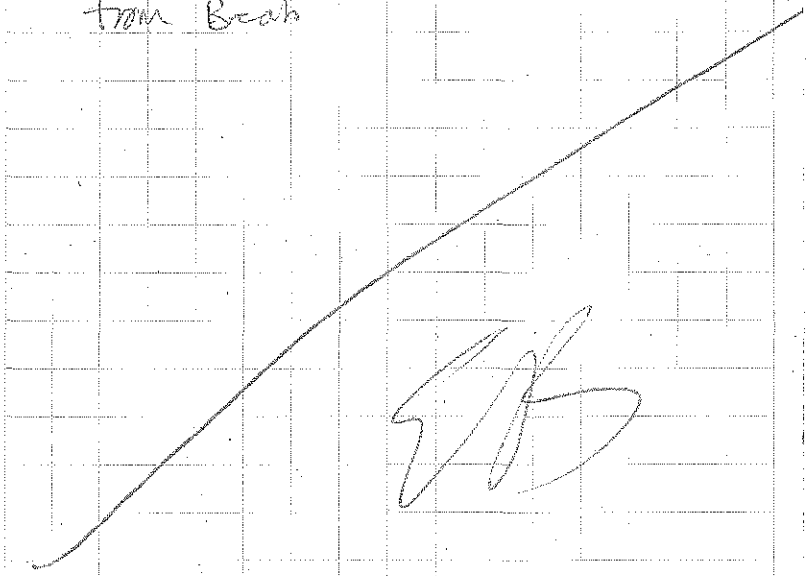


- Place Flags for Stockpile Samples SP47→63



August 20, 2012
1200 Break for lunch ——— dn
1230 Begin collecting field Screening Stockpile Samples SP-47 to SP-63 ——— dn
→ Begin staking out field sample locations @ Site 13. ——— dn
Lab Sample 015 = field Screening Samples 13-278 and 13-279 ——— dn
Lab Sample 061 = field Screening Samples 29 01 → SP 282

E Barnhill returned from Break



August 21, 2012

Safety

Environmental
L. Kleppin Sampling floor of Plume "E" (Confirmation)

E. Barnhill - Site 10; drum sampling

1345 - Sample D-001
mixture of Antifreeze with minor amount of oil. Neon green
2 Jars

1405 Sample D-002
mixed oil and Antifreeze
2 Jars

1416 - Sample D-003
Antifreeze; Bluish green. 2 Jars

1420 - Sample D-004 2 Jars
Clear oil, suspected electrical insulating PCB oil

August 21, 2012

D-005 @ 1435
light blue "Antifreeze"
2 Jars

D-006 @ 1452
Clear oil from drum marked "electrical insulating"
2 Jars

D-007 @ 1603
Motor oil
Brownish/grayish. Clean looking
2 Jars

D-008 @ 1615
Mixed
watery oil mixture
2 Jars

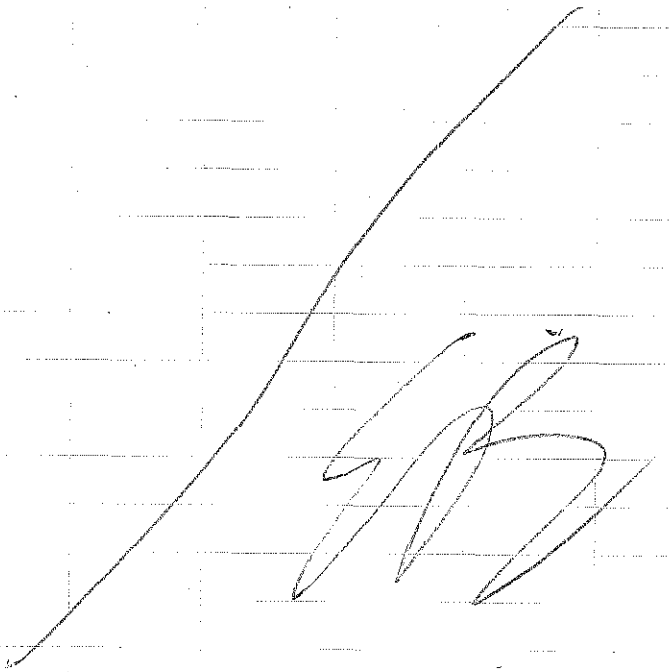
16

August 22, 2012

Safety meeting

Environmental Meeting

Sites 13 + 31
- excavation / sample prep



August 23, 2012

Site 31 confirmation samples

FANC31SS030	0914
31	0916
32	0918
33	0919
34	0922
35	0924
36	0927
37	0931
38	0934
39	0936
40	0937
41	0939
42	0941
43	0944
44	0945

August 23, 2012

12NC3155045		0948
	46	1016
	47	1018
	48	1021
	49	1023
	50	1024
[dup	51	1025
	52	1027
	53	1034
	54	1036
	55	1041
	56	1050
	57	1044
	58	1047
	59	1052
	60	1054
	61	1102
	62	1104
	63	1108
	64	1111
	65 [dup]	1117
	66	1119
	67 [67 dup]	1123

August 27, 2012

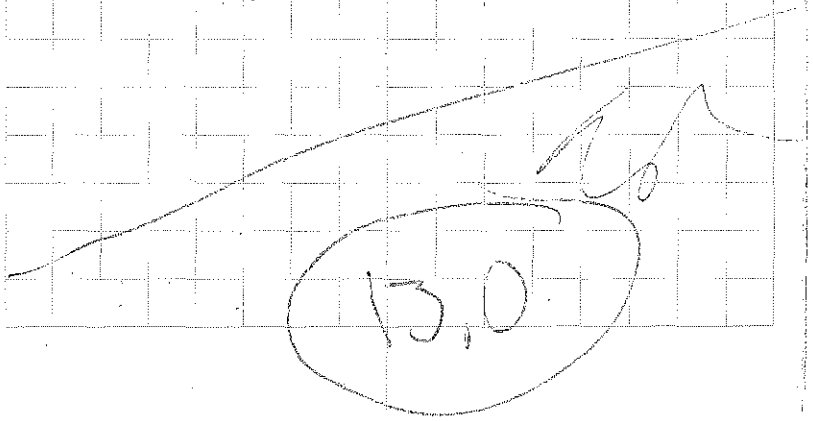
12NC3155068	[67 dup]		1125
	69		1137
	70		1149
	71		1142
	72		1145
	73		1257
	74		1259
	75		1303
	76		1305
	77		1307
	78	MS/MSD	309
	79		1314
	80		1316
	81		1319
	82		1322
	83	MS/MSD	1324
	84		1329
	85		1331
	86		1334
	87		1349
	88		1351
[duplicate	89		1355
	90		1358

August 23, 2012

12NC31550 91	1400
92	1404
93	1405
94	1406
95	1407
96	1411
97	1415
98	1416
99	1421
100	1423
101	1425
102	1427
103	1430
104	1432
105	1434
106	1436
107	1440
108	1442
109	1445
110	1448
111	1559
112	1600
113	1602
114	1604

August 23, 2012

12NC31551 15		1606
116		1606
117		1608
118		1611
119		1612
120		1616
121		1616
122		1617
123		1619
124		1620
125		1621
126	dup of 123	1622
127	dup of 124	1623
128	dup of 125	1624
129		1708
130		1710
131		1713



August 24, 2012

12NC3155	132		0912
	133		0913
	134		0915
	135		0917
	136		0919
	137		0921
	138		0923
ns/nss	139		0926
ns/nss	140		0931
ns/nss	141		0932
ns/nss	142		0933
	143		0938
	144		0939
	145		0940
	146		0945
[dup	147		1015
	148		1019
	149		1023
	150		1024
[dup=52]	151		1040

August 24, 2012

12NC3155	152	[dup=51]	1048
	153		1051
	154	[dup	1035
	155		1036
	156	[dup	1041
	157		1043
	158		1044
	159		1045
	160	[dup	1051
	161		1052
	162	[dup	1055
	163		1054
	164		1105
	165		1106
	166		1107
	167		1108
	168		1109
	169		1110
	170		1111
	171		1112
	172		1113
	173		1137
	174		1139

August 24, 2012

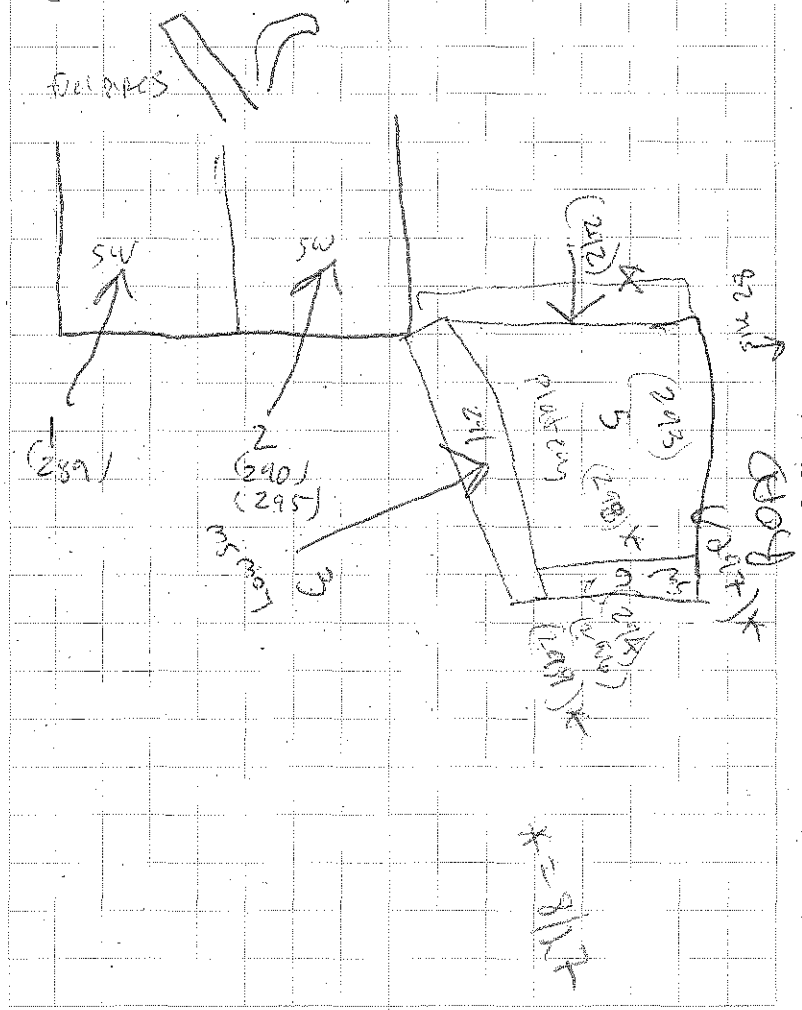
	175		1140
	176		1351
	177	[dup 134]	1400
	178	MS / MSD	1401
	179	[dup 185]	1403
	180	[dup 186]	1404
	181	[dup 187]	1407
	182	[dup 188]	1408
	183	[dup 189]	1410
[177]	184		1411
[179]	185		1412
[180]	186		1416
[181]	187		1418
[182]	188		1420
[183]	189		1424
	190	[dup]	1450
resample of 19	191		1453
resample of 9	192	[dup]	1505
	193		1508

10.25

August 25, 2012

(290 - 0.9
294 - 1.4)

Safety meeting
Environmental Meeting



Aug 25, 2012

12NC1355	143	[dup]
	144	
	145	
	146	
	147	
	148	
	149	
	150	
	151	
	152	
	153	
	154	
	155	
	156	
	157	
	158	
	159	
	160	[dup
	161	]
	162	[dup
	163	]
	164	

1603
1625
1628
1630
1631
1633
1635
1637
1638
1639
1641
1642
1644
1645
1647
1648
1650
1651
1652
1654
1658
1702

Aug 25, 2012

12NC1355	165	1703
	166	1705
	167	1707
	168	1708
	169	1710

August 26, 2012

Safety meeting

Environmental Metrics
Site 13

Site 13 Confirmation Samples

12NC13SS	170	0910
	171	0913
	172	0914
	173	0920
	174	0922
	175	0924
[dup	176	0926
	177	0928
	178	0931
	179	0933
	180	0935
	181	0937
	182	0939
	183	0954
[dup	184	0956
	185	0958

12NC13SS	186	0959
	187	1000
	188	1011
	189	1016
	190	1020
	191	1026
	192	1027
	193	1032
	194	1034
	195	1036
	196	1038
	197	1044
	198	1045
	199	1050
	200	1055
	201	1238
	202	1240
	203	1241
	204	1243
	205	1245
	206	1247
	207	1248
	208	1249
	209	1250

12NC13SS	210 1252
	211 1253
	212 1254
	213 1256

August 27, 2012

Cool ~ 45° F

PCB excavation
and field samples

August 29, 2012

YSI Calibration

① @1030
pH 6.03
DO 6.1% / .68 DO mg/L
Conductivity 0.178 ms/cm / 119 µs/cm
ORP -13.2
Temp 7.85

② @1040
pH 7.12
DO 2.6% DO / 0.39 DO mg/L
Conductivity 0.824 ms/cm / 440 µs/cm
ORP -126.8
Temp 0.59°C

③ @1050
pH 5.89
~~DO~~ Cond 0.109 ms/cm / 75 µs/cm
~~Conductivity~~ / DO 18.1 DO% / 2.12 DO mg/L
ORP 36.3
Temp 8.02

④ @1100
pH 6.20
DO 9.5 DO% / 1.19 DO mg/L
Conductivity 0.121 ms/cm / 83 µs/cm
ORP -2.6
Temp 8.57

⑤ @1110
pH 5.58
DO 8.4 % / .99 DO mg/L
Conductivity 0.091 ms/cm / 62 µs/cm
ORP 105.6
Temp 8.05

⑥ @1120
pH 5.77
DO 10.3 DO% / 1.15 DO mg/L
Conductivity 0.090 ms/cm / 65 µs/cm
ORP 81.1
Temp 8.17°C

⑦ @ 1130
pH 5.65
DO
Conductivity 0.159 ms/cm² / 110 ms/cm
ORP 29.3 DO% / 2.36 DO mg/L
Temp ~~2.56~~ 8.62°C

⑧⑨ @ 1140 / 11~~4~~50
pH 5.49
DO 8.6 DO% / 1.03 DO mg/L
Conductivity 0.072 ms/cm² / 49 ms/cm
ORP 250.6
Temp 8.16°C

⑩ @ 1300
pH 5.27
~~DO~~ Conduct 0.071 ms/cm² / 49 ms/cm
DO ~~Conductivity~~ 93.4 DO% / 4.98 DO mg/L
ORP 260.1
Temp 9.19

① @ 1310
pH 5.24
DO 23.1 DO% / 2.56 DO mg/L
Conductivity 0.067 ms/cm² / 47 ms/cm
ORP 281.1
Temp 9.52

⑫ @ 1320
pH 5.49
DO ~~7.4~~ 21.4 DO% / 2.57 DO mg/L
Conductivity 0.085 ms/cm² / 59 ms/cm
ORP 124.4
Temp 9.59

⑬ @ 1330
pH 5.23
~~DO~~ Cond 0.080 ms/cm² / 55 ms/cm
~~CONDUCTIVITY~~ DO 3.7 DO% / 0.44 DO mg/L
ORP 189.2
Temp 8.67

(14) @ 1340
pH 5.23
DO 41.4 DO% / 4.80 DO mg/L
Conductivity 0.078 ms/cm / 51 ms/cm
ORP ~~255~~ 263
Temp 9.45

(15) @ 1350
pH 5.39
DO 5.6 DO% 0.67 DO mg/L
Conductivity 0.099 ms/cm 68 ms/cm
ORP 82.5
Temp 8.76

(16) @ 1400
pH 5.36
DO 12.3 DO% 1.47 DO mg/L
Conductivity 0.096 ms/cm 68 ms/cm
ORP 85.7
Temp 9.11

(17) (18) @ 1410 / 1420
pH 5.40
DO 35.2 DO% 3.89 DO mg/L
Conductivity 0.69 ms/cm / 48 ms/cm
ORP 214.4
Temp 9.87

(19) @ 1430
pH 5.34
DO 30.0 DO% / 3.42 DO mg/L
Conductivity 0.070 ms/cm / 49 ms/cm
ORP 211.4
Temp 9.51

(20) @ 1610
pH 5.26
DO 19.1 DO% / 2.13 DO mg/L
Conductivity 0.072 ms/cm / 52 ms/cm
ORP 261.3
Temp 10.29

(21) @ 1627
pH 5.48
DO 12.8 DO% 1.46 DO mg/L
Conductivity 0.111 ms/cm² / 77 us/cm
ORP 95.3
Temp 9.37

(22) @ 1634
pH 5.46
DO 10.7 DO% / 1.22 DO mg/L
Conductivity 0.074 ms/cm / 52 us/cm
ORP 139.1
Temp 9.3

(23) (24) @ 1647 @ 1650
pH 6.07
DO 21.7 DO% 2.33 DO mg/L
CONDUCTIVITY 0.082 ms/cm² / 66 us/cm
ORP 27.8
Temp 11.30 °C

(25) @ 1656
pH 4.86
DO 28.9 3.22
Conductivity 0.066 ms/cm² / 46 us/cm
ORP 243
Temp 9.21

~~26~~ (27) * @ 1713
pH 4.90
DO 26.7 DO% 3.14 DO mg/L
Conductivity 0.072 ms/cm² / 49 us/cm
ORP 200.9
Temp 8.24

~~27~~ (26) * @ 1700
pH 4.78
~~DO~~ cond 0.070 ms/cm² / ~~118.2~~ 47 us/cm
DO ~~Conductivity~~ 29.3 DO% / 3.51 DO mg/L
ORP 177.4
Temp 7.56

*out of sequence

August 29, 2012

Site B soil Sampling

12NC08SS003 (MS/MSD)
@ 1000

12NC08SS004

12NC08SS004
@ 1100

site 13

12NC13SS214 @ 1230 [MS/MSD]

12NC13SS215 @ 1235

12NC13SS216 @ 1240

12NC13SS217 @ 1245

12NC13SS218 @ 1250

12NC13SS219 @ 1255

12NC13SS220 @ 1300

12NC13SS221 @ 1305 [dup of 215]

END

10.5

August 30, 2012

Enviro

Bag shortage
Bag enroute
Surveyor back - Site 13 & 31
Confirmation samples need surveying

Sample working at site 31 and Site 13.

10.05

August 31, 2012

Health and Safety - (E. Barnhill)

Lab safety
- team carry heavy gas tanks
- use heavy equipment when able
- stay clear of GC room and extraction room

PAD - Physical Agents Data Sheet
- Cold stress

- PAD 99 BU sampling
- E plume - additional digots digging out

- Lab waste to site six, placed in H bay # H12.

10:25

September 1, 2012 I-35

1. Excavator Safety - swing radius eye contact
2. Safety glasses
3. Safety vests
4. radio communication
5. Be prepared
6. Vehicle Check - tires, fluid, windows clean
7. Clear communication of objectives
8. Stay alert
9. Slower is faster
10. $$$$

10.25

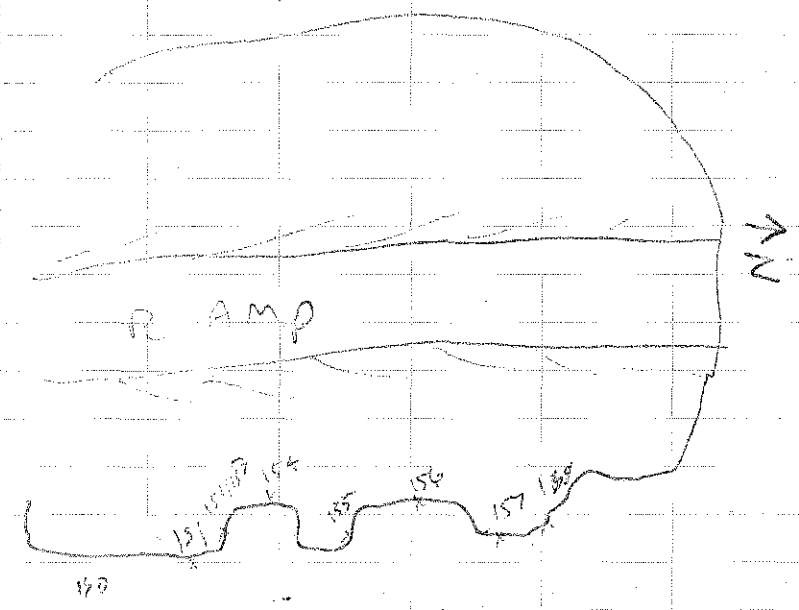
September 2 2012

Safety meeting
1. team left
2. stay warn
Safety Award - Allen Dennis

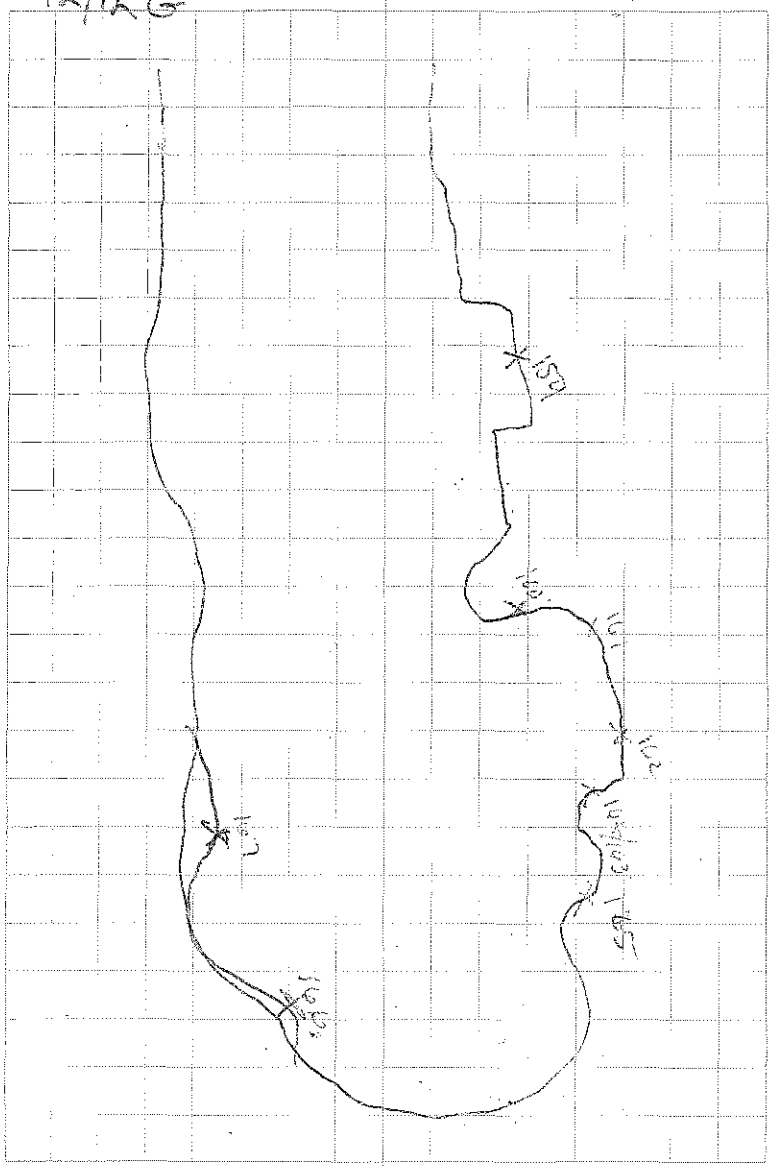
IQUCNOCSSI50			1415
Epure	151		1416
	152	[dupes]	1417
	153		1420
	154		1421
	155		1422
	156		1424
	157		1426
	150	ms/MSD	1427
plume	159		1500
	160		1504
	161		1510,
	162		1514
	163	[dupes]	1516
	164		1518
	165		1524
	166		1529
	167		1531

9/2/12

E Plume

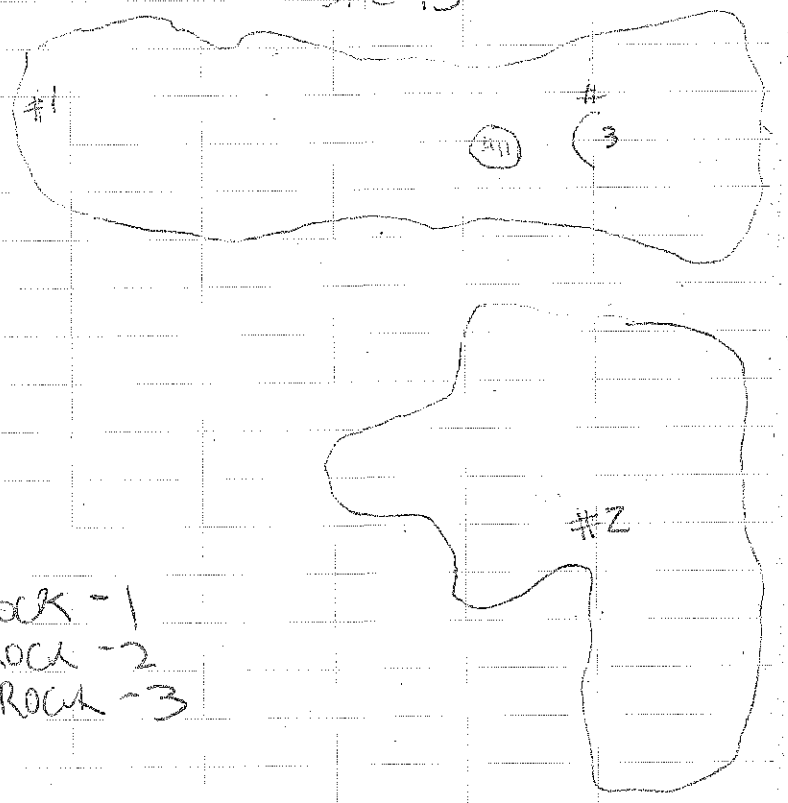


9/2/12 G



9/2/12

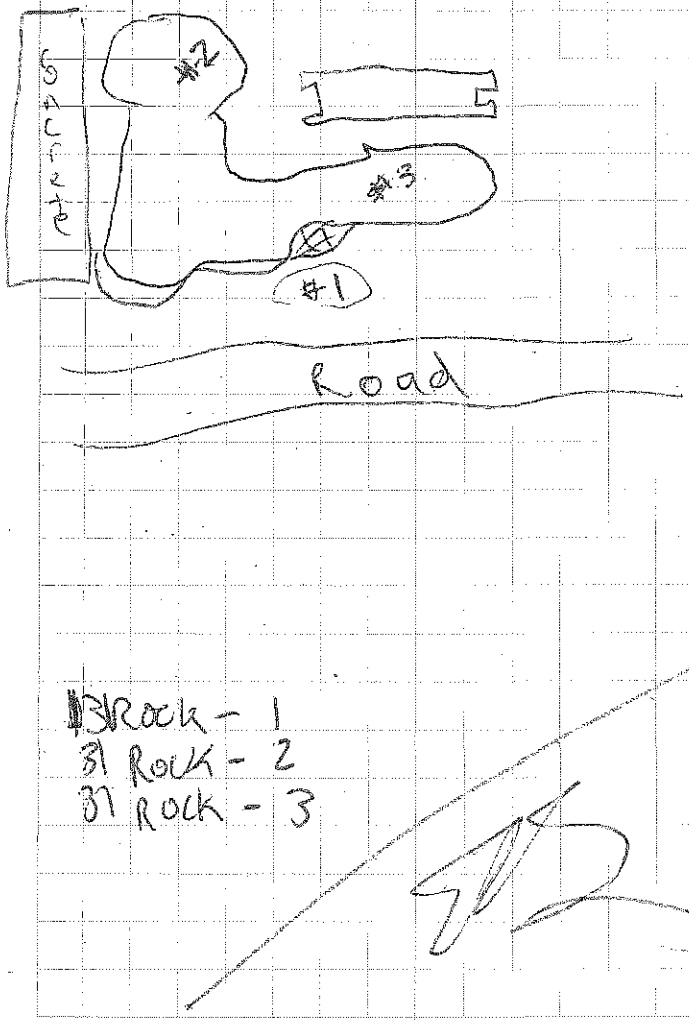
Site 13



13 ROCK - 1
13 ROCK - 2
13 ROCK - 3

9/2/12

Site 31



31 ROCK - 1
31 ROCK - 2
31 ROCK - 3

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"Rite in the Rain®"
ALL-WEATHER WRITING PAPER

Name Bristol Environmental Remediation Services LLC
Erin Barnhill

Address 111 W 16th ave
Anchorage AK 99501

Phone

Project Northeast Cape St. Lawrence Island HTRW
2012

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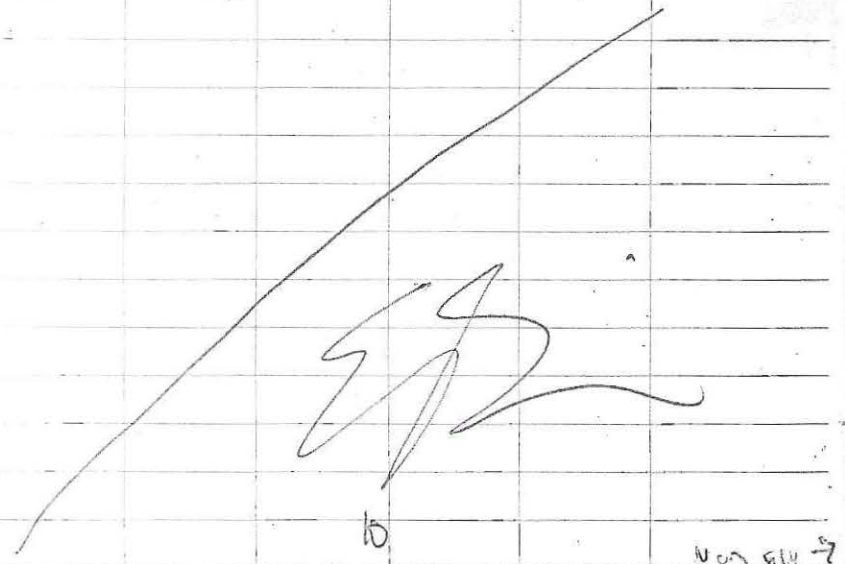
CONTENTS

September 3, 2012

Giving Safety Talk:
PHYSICAL AGENT DATA SHEET
- Hand arm vibration

Pad 98
MOC bagging

In camp:
- Organizing environmental corex



September 4, 2012 cloudy @ 35° F wind chill 39° F

Safety Meeting:
The Zombie apocalypse and a Juxtaposition between it and safety at NE Cape

Environmental Meeting
- Pad 98 bagging
- Arsenic - site 21
- site 10 drum samples

Site 10 drum sample Consolidation/reduction

(2)	drum	1	(2 jars)	One sample per life	
(14)	drum	2	(2 jars)	Fluids will be sent to	
(3)	drum	3	(2 jars)	lab to minimize # of	
(4)	drum	4	(2 jars)	samples shipped, grouped	
(5)	drum	5	(2 jars)	samples are of similar origin	
(6)	drum	6	(2 jars)	based on observations.	
(7)	drum	(7), 9, 15, 18	(3 jars)		
(8)	drum	(14)	(3 jars)		
(9)	drum	(8), 11, 12, 19, 21	(2 jars)		
(10)	drum	16, 20, 22, 24	(3 jars)	1715	
(11)	drum	(10), 17, 13	(3 jars)	1710	
(12)	drum	23	(3 jars)	1515	
(13)	drum	001	@1630	(2 jars)	

September 5, 2012 ISS dark calm

Safety Meetings: Safety Poem

Necessities
slips, trips + falls
PPE / Equipment
Proper clothing
Proper tools for the job

Faster is slower
radio communication
hand washing

Environmental meeting:

- Arsenic dig
- site 10, plume E + G sample management
- PCB spots at site 31

Sample management - 10, E & G

Back to site 31; Excavating confirmation samples return that were above cleanup (18)

First new dig in a while - continuing

Sept 6 2012

Site 31 wipe Samples

WS 31-01 → 1704
WS 31-02 → 1707

Site 13 wipe Samples

		correlating Test America Samples
WS 13-01 →	1725	(01@1723; 02@1724)
WS 13-02 →	1730	
WS 13-03 →	1730	

EPL

10.5

6

September 7, 2012 mostly cloudy cool, dry, little breeze.

Safety Meeting
Comments from the crew regarding safety Right + Wrong.

Site 13 -
Confirmation sample high PCB re-samples/digging
- field lab samples 300 → 311

Shop Pad -
- assisting Johnny Willis Construct site #8 sediment trap

10.850

September 8, 2012

Safety meeting:
Fatigue and NE Cape

- Placarding preparations for Arsenic and PCB bags
- Attaching placards to Arsenic + PCB bags.

Dinner -

evening
- Preparing for safety meeting

10.5

September 9, 2012

Safety meeting -
- Loader Safety
- Stories where proper PPE worked

September 10 Clear, dry, Cool, 35±

- AM Boat load - 0545

- Site 28 MI sampling discussion discussed options with Jeremy Craver, Ak Sending an email to office in Anchorage to go over options for already laid down gravel pad.

- Site 28 - MI Sampling tundra northof Pad. (see large graph paper flipbook)

laid out grd with Albert K., 6"-12" of peet/grass in upper layer. Removed grass/peet layer with shovel. Sample first usable area of Soil/Clay/Sediment

#1 D.U. is 105' x 105'. each increment is 15' x 15". 49 increments.

There will be a second decision unit at pad area.

September 10, 2012

#2 DU (on pad)

Dimensions of unit is 150' long by 60' wide, increment are 15' x 15'. There are 40 increments Unit will be sampled tomorrow. In triplicate.

P.M. Boat load → done at 10:30

12NC28MI001
@1610

14.0

September 11, 2012 partly cloudy 30's °F

Safety Meeting:
Pump Safety - site 28
Water Safety - site 28

A.M. Boat load - loading 28 fuels on the Sam
#2 @ 1100
#3 @ 1120
#4 @ 1140

MI Triplicate site 28 - MI Sampling (see sketch book)

Site 31 -
heading back to site 31 to dig out spots that yielded Confirmation results above cleanup level.

Site 31 - all confirmation results in and available to dig on.

Site 31 - site approximately 60% re-dug as confirm hotspots

Turn in GW and field samples

10.25

September 12, 2012 Cool, dry, partly cloudy

Safety meeting -

Environmental Meeting -
- 1400 hours Site 29 prep phase meeting
- Continue digging site 31 "hot spots"
- Eventual Pad 99 bagging

Site 31 - Excavating hot spots

10.0

Sept 13, 2012

Site 13/31	Confirm Samples
12NC13	222 @ 0900
	223 @ 0901
	224 @ 0902
	225 @ 0903
	226 @ 0904
@ 0905	227 (dup is 234)
	228 @ 0906
@ 0907	229 (dup is 235)
	230 @ 0908
	231 @ 0909
	232 @ 0910
	233 @ 0911
	234 @ 0912
	235 @ 0913
31	
12NC31 SS	194 1236
	195 1231
	196 1232
1233	197 (dup 223)
	198 1234
	199 1235

224 @ 30 225 @ BOL

Collected Sept 14

12NC31 SS	200	1236
	201	1237
1238	202	(dup 224)
	203	1239
	204	1240
	205	1241
	206	1242
	207	1243
	208	1244
1245	209	(dup 125
	210	1246
	211	1248
	212	1249
	213	1250
	214	1251
	215	1252
	216	1253
	217	1254
	218	1255
12.5	219	1256
	220	1257
	221	1258
	222	1259
	223 1300	

Sep 16

Safety meeting
Acknowledgis excellence with the Safety award;

Mylon, Charles, Albert & Michael - headlamps
Eric, Maze and Russell - Leatherman
Enviro meeting - Prep for site 28
Site 28

- MI sampling sumps for uphill run from dredge to Geotube.

Sep 17

Enviro
- Eventually resume Pad 98
- Site 28 - excavating upper ~~esc~~ Sediment areas with excavator

Site 28
-

assisting Johnny Willis with dredging at site 28. Beginning at Northernmost area (downstream) heading South (upstream)

- much of the sediment consists of dead/decayed plant material

- filled lower containment area/sump
- pumped to uphill containment/sump

- refilled lower sump

September 17 2012

pumped higher sump into GeoTube and simultaneously pumped lower sump to higher sump

- Water Sample at area behind/ downstream of sediment trap.

12NC-2804 [MS/MSD taken]
@ 1550
Turbidity reading 14.1

- Continuing pumping until

- Filtering water for dissolved metals in camp with Peri Pump

EB

11.0

September 18, 2012

Safety

Environmental Meeting

Sample taken from downstream of sediment trap. (WA-01)
12NC28WA005 @ 1500
(duplicate) 006 @ 1530
Turbidity: 33

Approximately 3 hours of dredging

September 19, 2012

0800 Safety meeting

Environmental meeting
: 2 to 3 hours of dredging today, then operations at site 28 will cease for the 2012 season.

Sample management
site 28 waters

After Lunch:

Site 28 dredging
- Collected some sediment for possible Analysis in Anchorage.

Water Samples Ø7 = MS/MSD
12NC28WAØ7 @ 1500 (WA-01) Turbidity - 27.4
12NC-28 WA Ø8 @ 1515 (WA-02) Turbidity - 15.8
12NC-28 WA Ø9 @ 1530 (WA-03) Turbidity - 9.4

10.75 ES

September 20, 2012

0700 Safety meeting
- Careful moving
- inventory well while packing

Environmental
- @ Site 28 - last water sample post dredging sample

Sep 21, 2012

Safety:
Environmental

Pad 98
Bulk waste Sampling

Site 28
Bulk waste Sampling

Pad 98
12NC Mix BW 226 @ 0945
227 @ 1036
228 @ 1136
229 @ 1400

Site 28
12NC 28BW01 @ 1521

10

Sept 22, 2012

Safety:

*
Site and Environmental Convex Cleanup

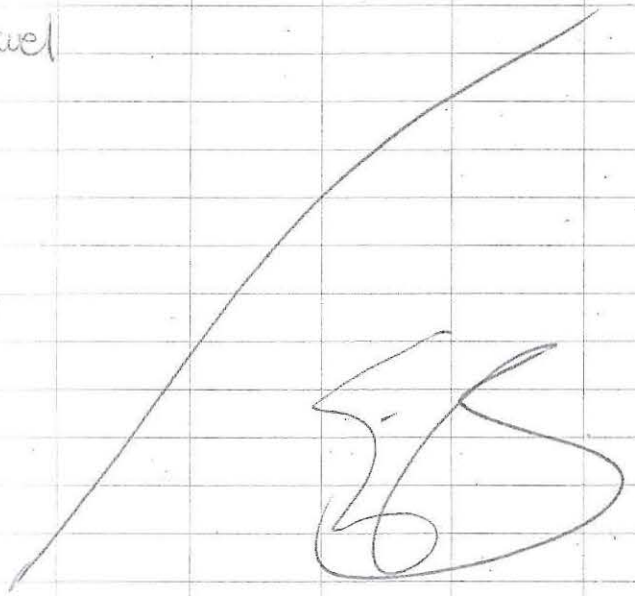
- Convex inventory and organization
- bottle count
- Tent Cleanup
- Vehicle Cleanup

- Bulk waste Sample management

Sept 23, 2012

- Cleanup Activities and Organization activities continued
  - Connex
  - Truck
  - bottles
  - Coolers

Travel



Sept 24, 2012

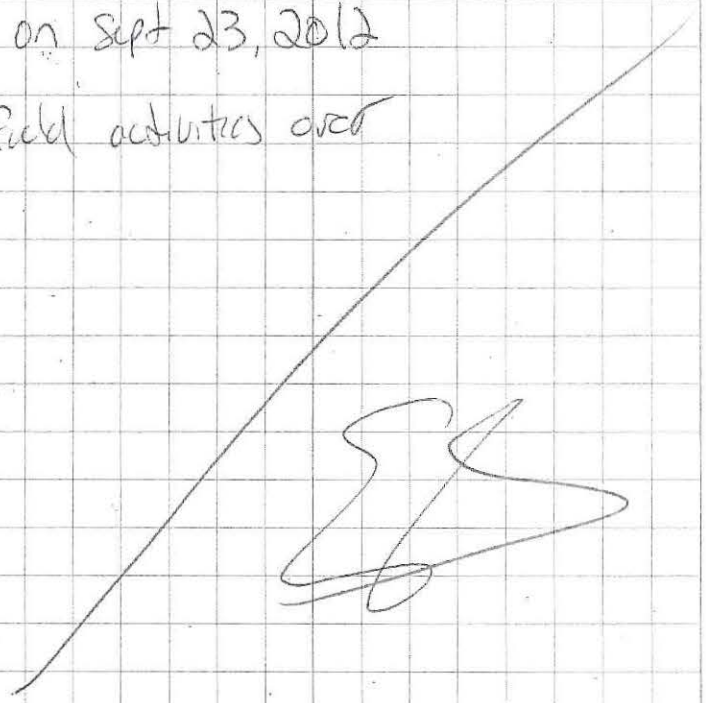
Travel Day After day - in office briefly

Travel from Northwest Cape to Nome

Nome to Anchorage

on Sept 23, 2012

field activities over



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ALL-WEATHER WRITING PAPER

ALL-WEATHER
ENVIRONMENTAL FIELD BOOK

Name Lyndsey Kleppin – Bristol Environmental

Address 111 W 16th Ave
Anchorage, AK

Phone 907 563-0013

Project NE CAPE 2012 HTRW
#34120057

This book is printed on "Rite in the Rain" All-Weather Writing Paper - A unique paper created to shed water and enhance the written image. It is widely used throughout the world for recording critical field data in all kinds of weather. For best results, use a pencil or an all-weather pen.

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Columnar	1/4" Grid	Item No. 550	Item No. 550F

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Reference Page Index

CONTENTS

PAGE	REFERENCE	DATE
	NE CAPE 2012 HTRW	
	31120057	

Location NE Cape HTRW 2012 Date 07/03/12

Project / Client USACE

July 03 Alaska Airlines 11am → Nome
Julie / Randy / Mark / Eric / Jennifer
Jitendra / Rich / Bruce / 1 global staffer

Bering Air → Job Site

Site Orientation
Set up office / printers
Locate equipment / inventory

19:00 Dinner

10 hours

Location NE Cape Date 07/04/12

Project / Client

07/04/12 Morning Safety Meeting
- Environmental group – truck 132
- "Shower is faster"
- communications – work in progress

Received ADEC comments from Molly
- need to consult Jeremy for MoC surface water sample locations, schedule
- Sediment definition (how deep before tundra mat to be considered a sediment?)
- installation of wells down the road?
- clean backfill at 21? "protective" all backfill would need to be bagged again, IMO

Site Visit – snow in Site 31 excavation
- bags at beach staging area
- no snow at MOC

barge arrives (with TA bottle order)

Location NE CAPE Date 7/04/12

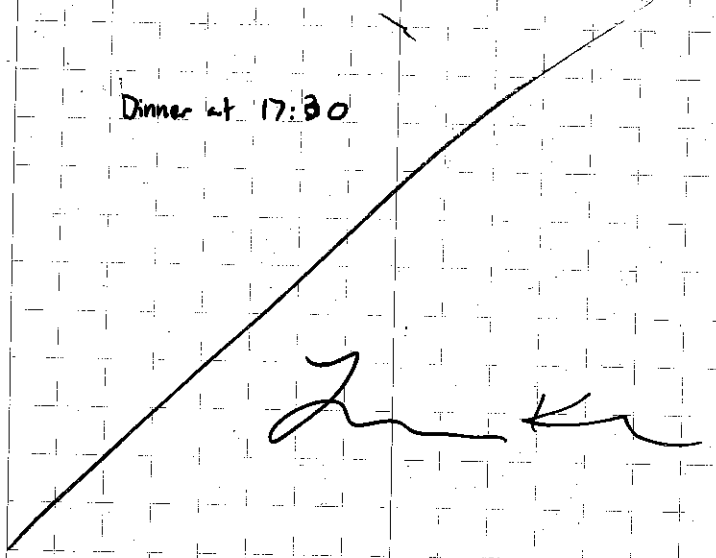
Project / Client 3412/0057

14:10 water levels @ MoC wells
- water level meter probe corroded – did not detect water in wells (sounded in soapy water) cleaned with wire metal brush and re-measured water levels
  88-1 → mud inside

no ice in any wells encountered by probe

need new 2" well caps

Dinner at 17:30



Location NE CAPE Date 7/05/12

Project / Client 341Ø057

7:00 Site Safety + Health Meeting
- barge did not offload yesterday
- slower is faster

2011 → pres. amb. IC 2 boxes + some

SGS potable water sample 900 kitchen tap(e)

Security aviation – 5 arrivals, Talia, Jeb, Jeremy Craner (QAR), Mel, Carl

Meeting of Understanding
- MDC groundwater sampling (9 wells)
- POL PCB Arsenic (100 tons)
  soil removal action
- Site B MNA / surface water
- Site 28 mapping
- MI sampling (beach/site6/MDC)
- MDC surface water

Preparatory Phase
- MDC surface water
- Cargo beach MI sampling
  16x16 interval
  240 x 48

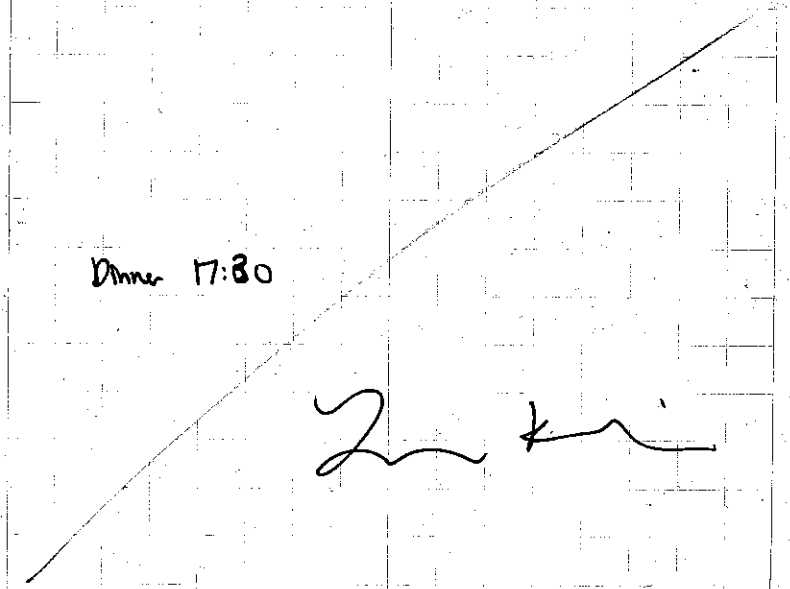
Location NE CAPE Date 7/05/12

Project / Client 341Ø057

Site 28 site walk: Eric Barnhill (CQ/CSM)
Julie Clark, Jeremy Craner (QAR)
Site 28 Basin: soil vs. sediment
iron floc precipitated on active vegetation,
clay, organic (dead, peat) material

MDC surface water sample site selection
low water table (MW B8-4 + B8-5 are ~1 ft lower than mid July 2011)

Dinner 17:30



Location NE CAPE Date 7/06/12

Project / Client 341200857

700 Health and Safety Meeting - site communication
slower is faster
operate on channel 5
medic equipment set-up, moving bags from site 13 excavation

Turbidimeter #1 and YSI #3 calibration
changed batteries in turbidimeter, gelex
standards in 5.10, 48.3, 498
YSI #3 calibration - conductivity out of range, recalibrated all OK

All surface water sample sites marked with lathe. Standing water extent not as wide - lower water table than outlined in planning docs.

12NCMOCSWA001 rocky drainage in gully N of site 13

pH	5.93	
DO	7.54 mg/L	1045
ORP	70.5	
Conductivity	0.272 mS/cm	fuel odor, some sheen
temp.	7.92°C	orange precipitate on
turb.	8.80	vegetation and in water

Location NE CAPE Date 7/06/12

Project / Client 341200857

12NCMOCSWA002		wetland NE of 001
pH	6.01	
DO	6.25 mg/L	1105
ORP	69.2	
Cond.	0.105 mS/cm	odor, sheen, orange mat
temp	7.46	material as in 001
turb	12.8	

12NCMOCSWA003 MS/MSD		E edge of pond to the east of 002
pH	5.87	
DO	~~3.4~~ 3.12	
ORP	19.9	1145
cond	0.128 mS/cm	odor, no sheen, no
temp	8.52	iron floc
turb	5.74	MS/MSD

- take PCB/POL samples for lab extraction training - bulk MOC soil
cargo beach MI sampling - see E. Barnhill notes - Jamie + Ryan surveyed 4 lathe points of ~~eastern~~ western most unit @ cargo beach LK

Location NE CAPE Date 7/07/12

Project / Client 34120057

700 Health and Safety Meeting
- equipment on the road has right of way
- heavy fog, wide loads
- medic capabilities (OTC)
- low 50's sunny <10 mph wind

Barge arrived early this morning
4/ lab supplies, test america bottle order

Organize bottle order in environmental corex
Gel Ice coolers relocated

MI sampling with J Clark, E Barnhill
triplicate sample @ cargo beach
- flats mowed for sampling

2nd unit from far east cargo beach
MI Sample 15x15 interval
60x

→ see E Barnhill notes for MI samples

1730 Dinner

Location NE CAPE Date 7/08/12

Project / Client 34120057

700 Health and Safety Meeting
- heavy fog, lots of equipment traffic. Communicate on the radio

→ Preparatory phase Meeting
4.10/4.11 WP: Site B and MOC groundwater
casing of the ground (stick-up)
eCOC to Marty + Terri
- containerize BB-4/BB-5 purgewater
- filter (GAC after purge)
- review DEC guidance
- note tubing type/conditions

Site B: sediment composite
surface water samples
MNA (bottle instead of peristaltic)

Groundwater DRO/RRO, GRO, PAH
PCB, RCRA 8 metals, MNA, methane
~~VOC~~ BTEX

Site 2B Mapping/Sampling
sediment (mineral + organic)
visual survey — intrusive survey (auger for thickness) each probe — GPS point

Location NE CAPE Date 7/08/12

Project / Client 34/20057

Site 2B preparatory phase

sludge sampler for accurate soil/sed profile? (auger has only 1.5 ft, won't hold loose seds in H_2O)

collect water depth @ each sample point

soil/sed plastic sleeves with cap – suction to hold column in place

clam guns

macro core sleeves + couplers

sludge sampler (with flaps)

sampling protocol/frequency TBA following discussion between Carey + Curtis (APEC) after review of map product)

- veg mat
- H_2O / depth
- sediment + thickness
- underseed material

- iron floc
- black decomposing organic material
- peat/organic silt

C. Crolet, E. Barnhill, J. Craner (QAR)
R. James (CQ/CSM), J. Clark, Jeb Adkins

→ preparatory phase meeting attendees

Location NE CAPE Date 7/08/12

Project / Client 34/20057

YSI #3 → calibrated (see calibration log), confidence solution

Turbidimeter #1 calibrated, gelex standard

– all accepted range

± 2°C / ± 0.1 pH / 3% mS/cm / ± 10mV / 10% DO / 10% NTU

26MW1 → historical non-detect well

WL meter does not sound – sounds in soapy water, not tap water or formation water

– new battery in WL meter, sounds in tap water

WL probe – 34.80' BTOC

monsoon submersible pump caught @ 7' btoc – ice obstruction

allowed pump to run dry 2 min to introduce warm air – 10' steel rod driven down into ice/slush, ice plug just shoved further down. C. Crolet + J. Willis will fabricate 2" dowel to lower into well to melt ice plug

28MW2 – some ice, kept punching at ice plug with pump (~7' BTOC)

set pump 7.99' water column

1.3 gal casing volume

~ 5 gal purge

Location NE CAPE Date 7/08/12

Project / Client 34120057

→ 12NCMOCWA0001 15:00 MS/MSD 22MW2
good recharge, no drawdown @ 470mL/min
no odor, clear
well is flush mount, no damge, TOC level with ground surface
teflon tubing, monsoon sub. pump.

decon pump/WL meter/YSI with Alconox + DI rinse
set up on 26MW1 again - J. Willis + C. Cooley
melted ice plug with 2" steel tube 2' long - attached by rope. Heated the lower 1' section on steel + lowered into hole
purge water discharged to surface per APEC regulations. (No historical detection of COCs, no odor or sheen, no drinking water wells nearby)

→ 12NCMOCWA0002 17:00 26MW1
good recharge, no drawdown @ 450 mL/min
no odor, turbid orange first 10 min of purge then clear. No odor or sheen.

1800

Location NE CAPE Date 7/09/12

Project / Client 34120057

700 Health and Safety
- low 50's, sunny, < 10mph wind

Preparatory phase meeting: POL/PCB/As Soil Removal 4.2/4.3/4.4 WP sections
- have Jamie locate dig-at spots @ PCB/POL
  - 4782 tons POL 2011 contract soil
  - 4000 tons POL 2012 soil
  - 8782 tons POL soil
- liners from PCB excavations to be removed
- stockpile lined areas at the MOC
  - 4.2/4.3/4.4 work plan sections
- site 13 chase PCBs before moving on to DRO plumes (A2/B)
- concrete wipe samples
  - 1 correlation per 10 wipe samples for TA tacoma lab
- As bottom of excavation sampling? To be determined

- 2700 tons PCB Site B+31
- 100 tons As (50, sample, 50)
- site 21 surface water sample

Location NE CAPE MOC Date 7/09/12

Project / Client 341208857

Calibrate YSI #3, Turbidimeter #1 (see calibration log book) all in accepted range for 10°C confidence solution with helper Albert Kulowiyi

1000 Set up on 20MW1, begin purge
clear, no odor
Some drawdown (0.5') @ 480 mL/min - rate decreased to ~430 mL/min stable WL
Purge water discharged to surface per ADEC regs

→ 12NCMOCWA003 20MW1 1040
somewhat variable pump speeds despite constant voltage displayed on voltage regulator
decon. pump/WL meter/YSI w/Alconox + DI rinse

1110 Set up on 88-10, ice @ 3' BTOC
used melting device - galvanized steel - may contribute zinc to gw?
Heated end of melting rod + lowered 3x with J. Willis. Packed up equipment and moved to 17MW1. Set up on 17MW1

1200 Lunch - refridgered 003 samples, gave MW4 sample to field lab. Bering Air flight.

J. Willis continued to use melting tool on 88-10

1320 Began purging 17MW1. Good recovery, clear no odor. Some ice in casing @ ~3ft, used pump to punch through.

Location NE CAPE MOC Date 7/09/12

Project / Client

→ 12NCMOCWA004 17MW1 1320
variable pump speed, stable parameters
<500mL/min
collected sample (LK)
Decontaminated pump, WL meter and YSI probe in Alconox and DI rinse
Purge water discharged to surface per ADEC regs

Returned to 88-10. Ice melted with tool after 5 repetitions (heat/thaw)

1400 Begin purge of 88-10 - turbid initially, cleared up quickly. No odor or sheen. Good recovery.
Variable pump speed - flow controller displays inaccurate voltage (verified with multimeter reading)

1420 Begin sampling

→ 12NCMOCWA005 88-10 1420
variable pump speed. Good recovery.
Decontaminated pump/WL probe/YSI with Alconox, DI rinse

Move to 88-1. Damaged flush mount - mud ran from surface into casing, cleared area and marked well location with large rocks on 7/09/12

Location NE CAPE Date 7/09/12

Project / Client

TD = 23.25 WL = 16.68 BTOC

6.57 x 0.1 x 7 gal/ft = 1.1 gal casing volume

purged 3 gal prior to taking parameters.

Grey, turbid, initially then clear, no odor, no sheen. Good recovery, no ice.

→ 12NCMOCWA0006 88-1 1530

Decontaminated pump, WL meter, YSI probe in Alconox, DI rinse.

Refrigerated analytical samples, took MNA samples to field lab. Return to camp.

o SAMPLE COLLECTION

Flow-through cell removed. Sample containers filled in the following order:

- VOA vials HCl preserved (BTEX/GRO/methane)
- DRO 1L HCl preserved amber
- 1L unpreserved amber (PCB/PAH)
- HDPE HNO_3 (total metals)
- HDPE unpreserved (MNA field lab)
- HDPE HNO_3 (filtered metals) filtered in the field

Location NE CAPE Date 7/09/12

Project / Client

o WATER SAMPLING ADDITIONAL DOCS.

- Groundwater Low Flow Purging Form
- Groundwater Sampling Form
- YSI/turbidimeter calibration log

All groundwater samples taken by L. Kleppin.

o DECONTAMINATION

- Submersible pump + cable submerged in Alconox solution. Pump disassembled to remove sediment + magnetic seals, allowed to run 1 min. Pump then allowed to run several minutes in DI rinse. Cable also wiped with DI soaked paper towel each time it is lowered into a well.
- WL meter and YSI probe washed in Alconox solution, rinsed in DI H_2O

o EQUIPMENT

- SS monsoon pump with car battery voltage regulator attachment.
- teflon lined tubing
  silicone tubing for attachment to flow through cell and metals filter

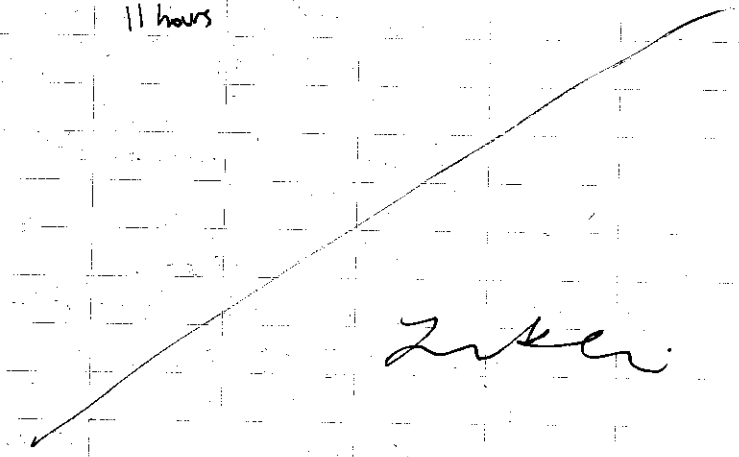
Location NE CAPE Date 7/09/12

Project / Client

1730 Dinner

1900 Sample mngement, sample labeling
anticipated shipment date of 7/11/12
will collect duplicate sample from 88-4

11 hours



Location NE CAPE Date 7/10/12

Project / Client 34120457

700 Health and Safety Meeting
- SSHP review
EM385-1-1
MSDS PADS sheets available - will cover AHAs at another meeting

Environmental Meeting
- need to locate PCB hot spots w/ Jamie
- Jake mapping site 28
- Eric done with cargo beach, MOC MI sampling, will work off GW Sample labels

1030 Set up on 10-1 - began purge
significant drawdown - lower purge rate to as low as sub pump will go ~200 mL/min
@ 6.58' BTOC, WL is stable even @ 450 mL/min. Recharge slow - allowed to recharge 1 hour, WL = 5.83
purging resumed at 200mL/min
WL fell to 6.45 and stabilized.
YSI readings for DO, ORP, pH very different (pH = 3.03, ORP = 307.6, DO = 5.43) but these parameters continually dropped to stabilize again.

Location NE CAPE Date 7/10/12

Project / Client

YSI flow through cell was removed and purge was continued while conductivity solution was used to determine YSI was within acceptable range.
Water level had been sounding for a while during recharge (1hr?)

→ 12NCMOCWA0007 10-1 1400

Decontaminated pump, YSI, WL meter
dissolved metal sample somewhat orange after sitting (?)

1530 Set up on MW 88-4. Purge water turbid initially - dark grey, fuel odor, no sheen. Purged 3+ casing volumes to allow turbidity to decrease, did not drop below 15 NTU.

→ 12NCMOCWA0008 MW88-4 1700
DUPLICATE SAMPLE 0009 1730

Location NE CAPE Date 7/10/12

Project / Client

1730 Set up on MW 88-5, purged 3+ casing volumes due to high turbidity. Flow rate of ~250 mL/min (slowest allowable for sub pump in shallow well). Flow controller highly irregular – continually adjusting voltage. Strong fuel odor, grey and turbid, sheen.

1830

→ 12NCMOCWA0010 MW 88-5 1830

Decontaminated pump/WL meter/YSI

Sample management, labeling

1930 End

12 hours

Location NE CAPE Date 7/11/12

Project / Client 3412ØØ57

700 Health and Safety Meeting - E. Barnhill
→ AHA forms
→ 6am barge arrival

Sample management Trip Blank Ø1 ~~#1772~~ 071112 x4
(BTEX/GRO)

All VOAs in cooler #12 Trip Blank Ø2 071112 x2
(methane)

Russel put in temp blanks

COC# 12NC-003-1 MOC GW
12NC-004-1 MOC surface water
(cooler # ØØ9)

Erie shipped 2 coolers (ØØ1 and ØØ2)
Water samples are in (ØØ3 - Ø12)

Waybell electronically submitted by E. Barnhill

Coolers containing VOA or preserved ambers are marked with an excepted quantity (class 9) label

1730 Dinner

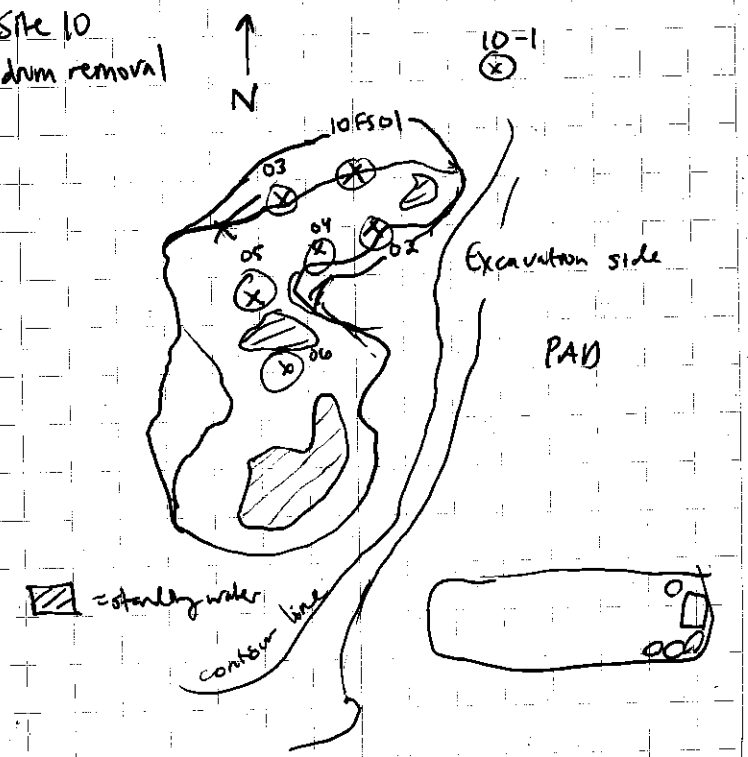
10 hrs

Location NE CAPE Date 7/12/12

Project / Client 3412ØØ57

700 Health and Safety Meeting
Site 13 RCB dig
light rain, partly cloudy

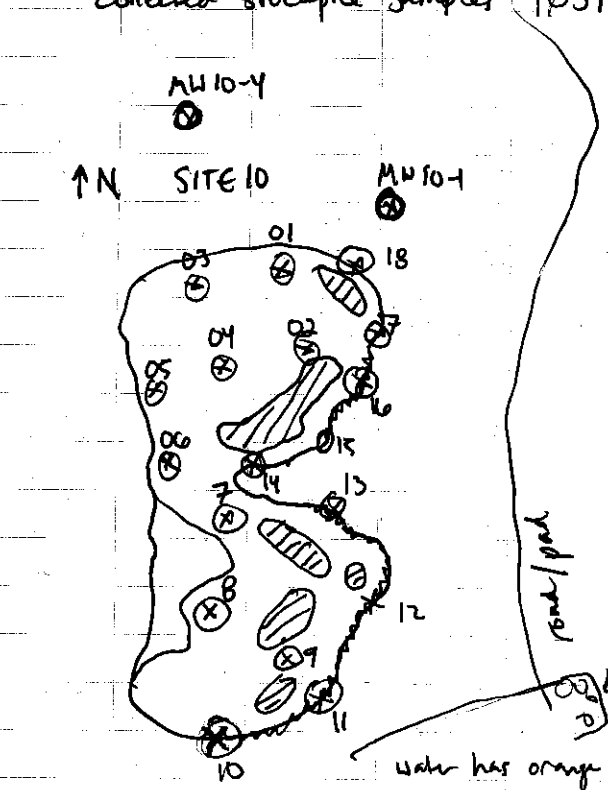
Site 10 drum removal - field screening floor
sample submitted to lab
10FSØ1 - Ø6



Location NE CAPE Date 7/12/12

Project / Client 3412ØØ57

collected stockpile samples 165PØ1 - 165PØ4



= standing water
= 3'+ sidewall

water has orange film, sheen, light grey + black film

stained soil + black oil spots present in mud. Very loose, wet clayey silt with gravel

Location NE CAPE Date 7/12/12

Project / Client 3412ØØ57

Eugene Toolie indicated exact location of drum pile - excavator dug test pits at areas picked up by the metal detector and struck antifreeze drum. Impacted soil was placed on adjacent liner. 5 gal cans of oil were removed and placed in a drum.

soil stuck to tops of open cans seemed to cap the oil inside - oil began to ooze from cans when jostled. Excavation was stopped and cans were manually removed using a shovel. Antifreeze (bright green) hydraulic fluid (orange) and oil (black) were observed to be leaking from rusted drums/cans.

17:30

Location NE CAPE Date 7/13/12

Project / Client

700 Heath and Safety
- slower and faster
- hydraulic line break @ beach

Environmental Meeting - want on site 10 for additional overpack, corps guidance
- Site 5? Last year 8/05/11, too soon to sample this year? Low water.
- GPS points on roadway, beach for hydraulic leak

Look over UVOST logs for depth to fuel at site 13 excavation

17:30 End
10 hours

Location NE CAPE Date 7/14/12

Project / Client

700 Health and Safety Meeting
- site fire @ incinerator
  fire extinguishers on the way

Site 31 sampling with E. Barnhill @ dig at spots Ø24 - Ø53
(see E. Barnhill notes)
Samples submitted to lab.

Received sample results from field lab for dig at spots at Site 31

17:30 End
10 hours

30

Location NE CAPE Date 7/15/12

Project / Client 3412ØØ57

700 Site Safety and Health Meeting
- rain, visibility
Environmental Meeting
- MI Sampling at site 6
- Dig-out spots at site 31

Bulk waste bagging @ site 31
31-28B - 31-39A

BW 31-28 and BW 31-29, 30
submitted to lab

Dig out spots through 31-18
Completed (southern dig)

PCB results in: 31-31, 22, 32, 37
- above clean up level

1730 10 hours

31

Location NE CAPE Date 7/16/12

Project / Client 3412ØØ57

700 Health and Safety Meeting
- PADS sheets
heat/cold exposure
Environmental Meeting
Jaime working on draft site 28 map
Results 31-40 - 31-55 in

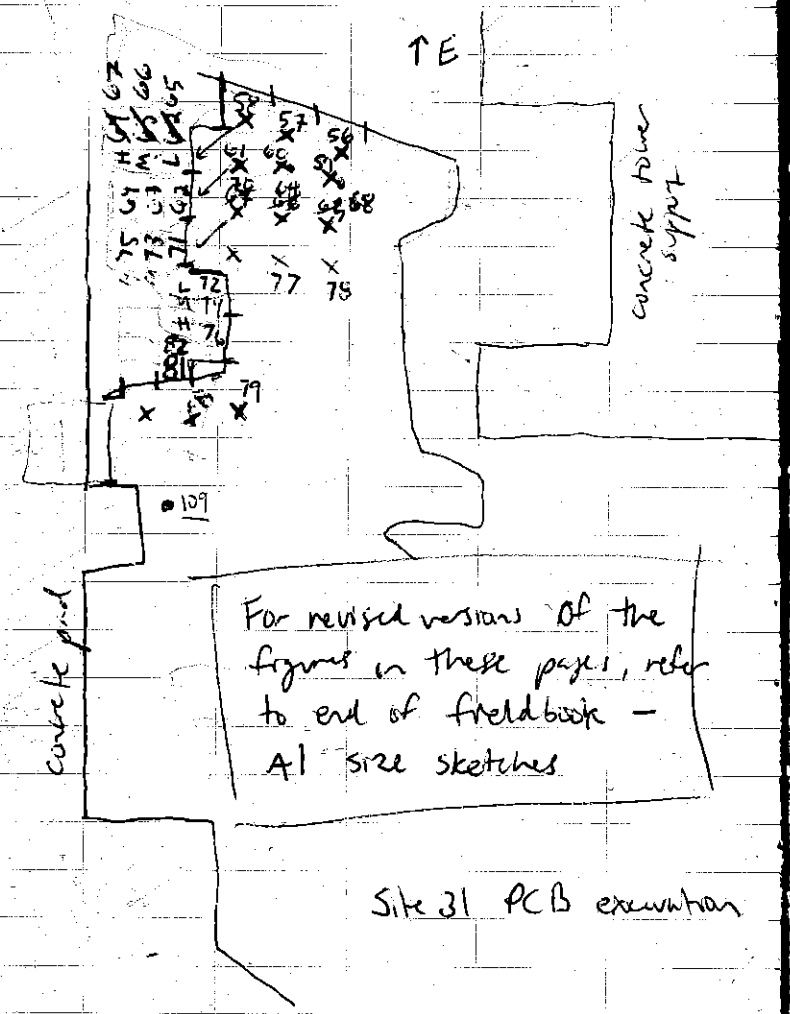
Turn in time sheets

Begin bucket sampling dig-out spots
at Site 31
deep excavation (N) W sidewall:
31-32, 37, 40, 43-45, 47, 48,
52, 53
shallow excavation 04-06, 10-12, 14
18, 21-23

- still need to dig at 23 and 18
(digging + bagging stopped to get
samples to idle lab team)

Location NE CAPE Date 7/16/12

Project / Client

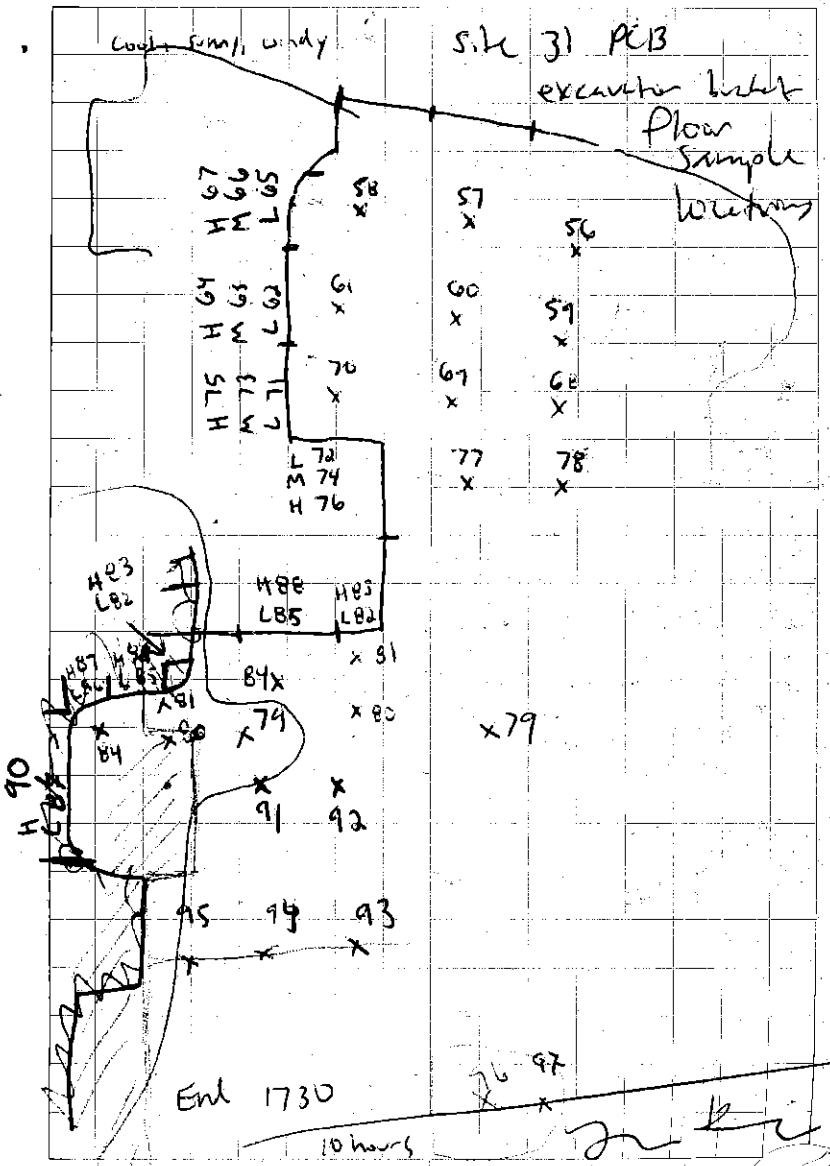


For revised versions of the figures in these pages, refer to end of fieldbook – A1 size sketches

Site 31 PCB excavation

Location NE CAPE Date 7/16/12

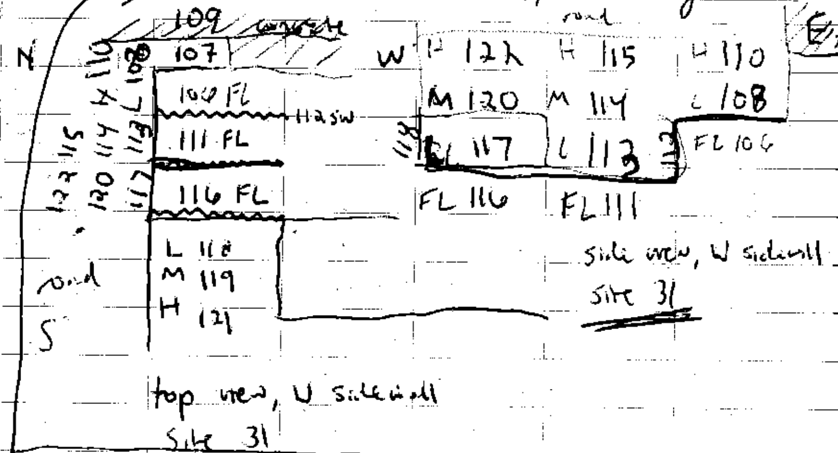
Project / Client



Location NE CAPE Date 7/17/12

Project / Client

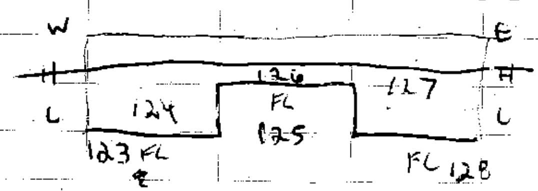
700 Health and Safety Meeting



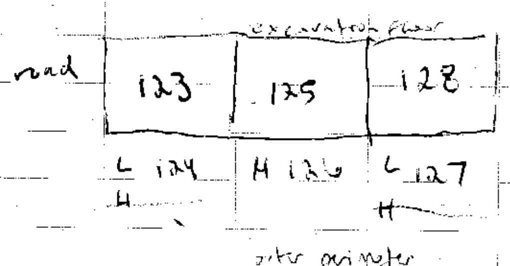
side view, W sidewall
Site 31

top view, W sidewall
Site 31

700 Health and Safety Meeting - high winds & Environmental Meeting



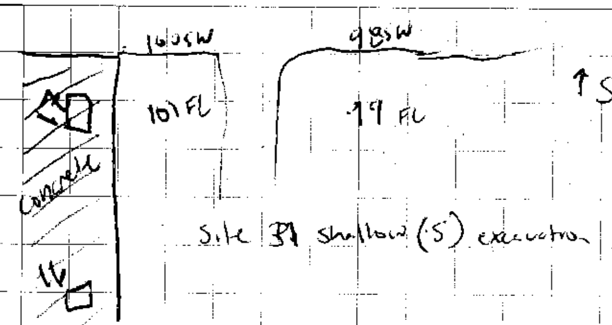
side view
south wall
site 31



top view
south wall
site 31

Location NE CAPE Date 7/17/12

Project / Client



Site 31 shallow (5') excavation

Full page sample location maps created for Env

Move to site 13, dig-out spot, begin bagging. High winds.

1730 End

10 hours [signature]

Location NE CAPE Date 7/18/12

Project / Client

700 Health and Safety Meeting
- Ron concerned about bucket sampling / decon procedure
- Environmental meeting @ site 13

get jars/Methanol vials together for site 23 sediment sampling with J. Clark, Charles Kava

Alconox rinse, DI rinse bottles prepared
start at Sauqi end and work up towards Mac

12NC28550001 - 12NC28550

Security aviation flight - swap @ AR
Teresa Crane w/ Aaron Sherman

Refrigerate samples
17:30 End
10 hours

Location NE CAPE Date 7/19/12

Project / Client

700 Health and Safety Meeting
~~High winds~~
Environmental Meeting
@ site 13
Site 28 sediment sampling with Jake Clark, Charles Kava. See J. Clark notes.

12NC28550 - 12NC28550036

17:30 End
10 hours

Location NE CAPE   Date 7/20/12

Project / Client

700 Health and Safety Meeting
- common mishaps (flat tire, tail open etc)
  vehicle walk-arounds
- eye contact with operators
- barge arrived at 1am

Environmental - will ship site 28 sed samples monday. Additional sample locations added - Jule consult with Aaron over sample locs.

Begin 12NC28SS037

collected 2 Dups, an MS/MSD (SS050)
used zodiac boat for the 3 deep pond samples
See J. Clark notes

1730
~~1730~~ End
JK 10 hours

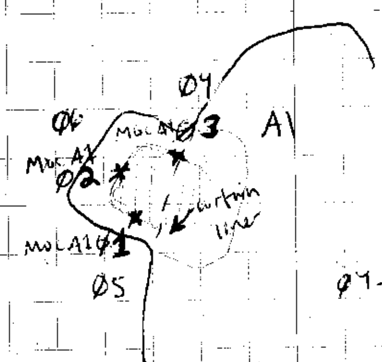
Location NE CAPE   Date 7/21/12

Project / Client

700 Health + Safety   partly cloudy, calm, 50's

Environmental Meeting - POL excavation start A1 - dig at spot @ NW side of excavation - Jamie will mark as well as G/H plume
+ one PCB GC down in lab (20 sample/day capacity)
Site 13 bucket sampling with E. Birchfill
Jack Willis excavate A1 spot - stockpile clean backfill, dig out + stockpile top 8' of 10' x 5' dig out section.

~~@ 8' bgs~~ LK fuel odor seems isolated to moist grey clayey silt - orange/brown silty sand has slight-to-no fuel odor



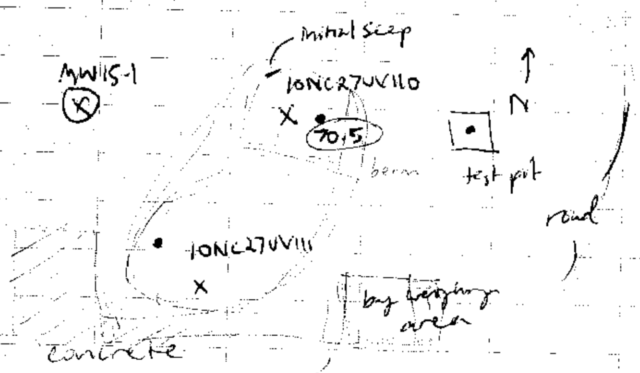
MOCA101 - 03
~14.5 - 15.5' bgs
silty grey

04 - 06 ~13-14' bgs
sandy

Location NE CAPE Date 7/21/12

Project / Client

Dig out @ 11NC27UV11Ø — water @ 5' bgs
water filling quickly from one small spot (2' wide)
on north side of excavation
Test pit 10' to E of H excavation has lower water



• 70.5 = water level elevation 17:00 7/21

Jamie surveyed water level in test pit, UV 110 dig out spot

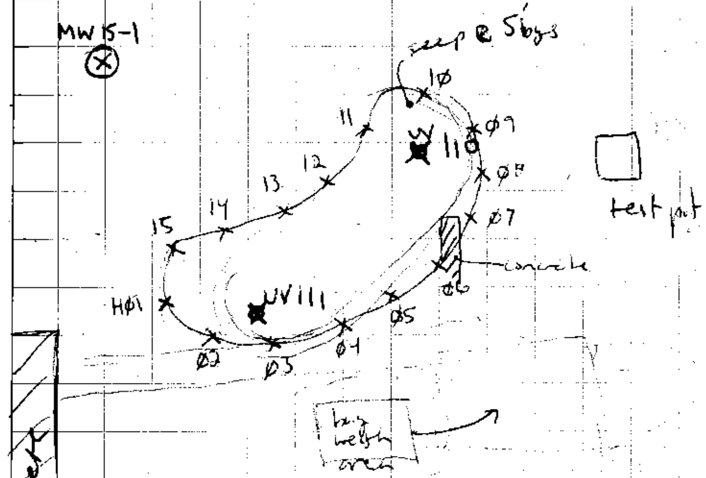
1730 End

10 hours

Location NE CAPE Date 7/22/12

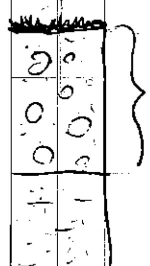
Project / Client

700	Health and Safety sunny, calm, warm
	Busy area at the MOC - POL and PCB digs
	Environmental



see

All field screening samples from bucket teeth with Jack Willis @ standing water level or slightly above



5' brown silty gravel, wood debris

clayey silt, grey with brown

Water in excavation has orange/brown oily foam with strong fuel odor

Location NE CAPE Date 7/22/12

Project / Client

Samples taken to lab - should be ready tomorrow. MOCH01-19

Site 13 results - additional dig-out spots

Farthest south site 13 excavation clean - collect confirmation sample.

J. Clark preparing site 28 soil sample chain of custody

1730 End / Dinner

10 hours

Location NE CAPE Date 7/23/12

Project / Client

700 Health and Safety

Heavy fog, should burn off by afternoon

use radios on road

Environmental Meeting

Begin bagging at Pad 98 - Aaron would like to try land screen material. Will try test @ 98

- turn in timesheets

Visit H excavation - HH03 @ 9864 mg/kg

water level has come up a bit - Jaime to survey elevation

A1-002 @ 19,185 mg/kg DRO

part of the deep sample gap - Jaime will survey to verify it is above 15' bgs - will use man-basket due to unstable slopes

Pad 98 - screening attempt unsuccessful - C. Copley + Aaron Sherman agree to bag pad soil on pad w/out screening rocks out

MOC 104A, B, C

Water elevations @ H: 7/21 70.5 (1900)

7/23 67.5 (2006)

Location NE CAPE Date 7/23/12

Project / Client

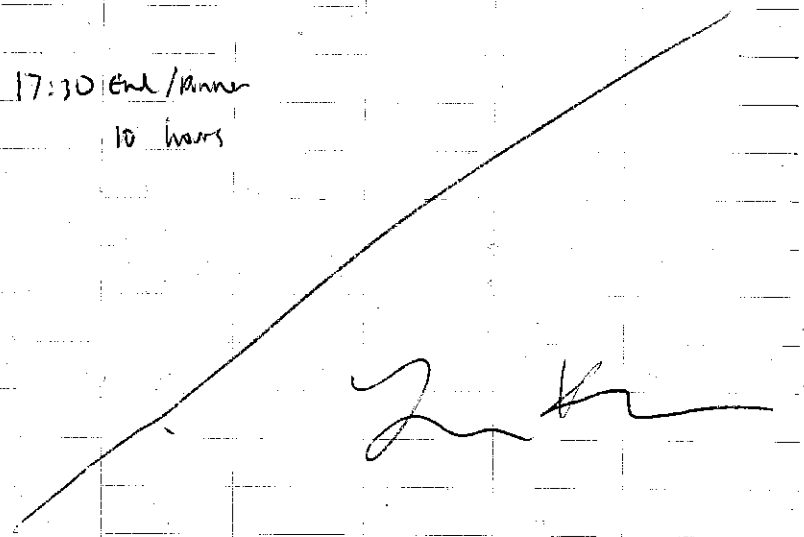
Berry Air Flight - Site 28 soil samples, rinsate sample shipped COC #

End 107 B

BW MOC 104, 105, 106 taken to lab all from H plume, wet silty grey material no screening

Jamie survey A1 field screening depths A1 Ø1 + Ø3

17:30 End / Runner 10 hours



Location NE CAPE Date 7/24/12 45

Project / Client

700 Health and Safety Rain, high winds

Environmental - Eric e site 13

Bagging at Pad 98

- bag remainder of H plume soil

MOC 107 C
D
E
F
G BW MOC 107

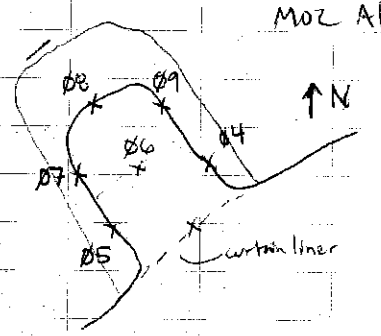
MOC 108 A
B
C
D

Move to A1 - Jamie's survey results indicate floor currently at 14', sample location ~ 13 ft. Jack excavating ~12ft bgs of clean overburden for stockpile.

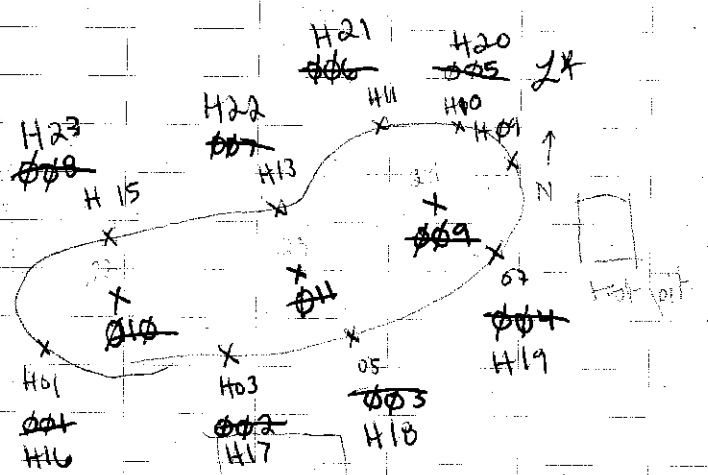
18 - 15' section taken for screening at Pad 98

Location NE CAPE Date 7/24/12

Project / Client



MW2 A1 field screening samples taken at ~14 ft bgs, silty grey gravel, moist, strong odor



~1' above GL
WL ~ 67.5

MS/MSD
DUP

Location NE CAPE Date 7/24/12

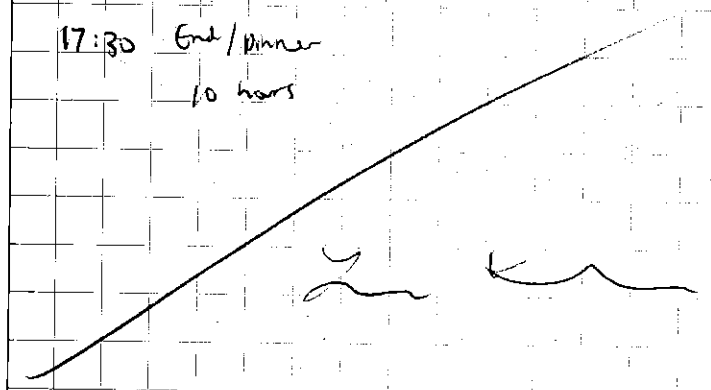
Project / Client

Ø12 DUP OF Ø9
Ø13 DUP OF Ø6 LK
Ø5 MS/MSD

- Water level is @ 67.4' from 70.1' elevation - water level dropped by 3'

confirmation samples will be used as field screening samples H16 - H23

17:30 End / Dinner
10 hours

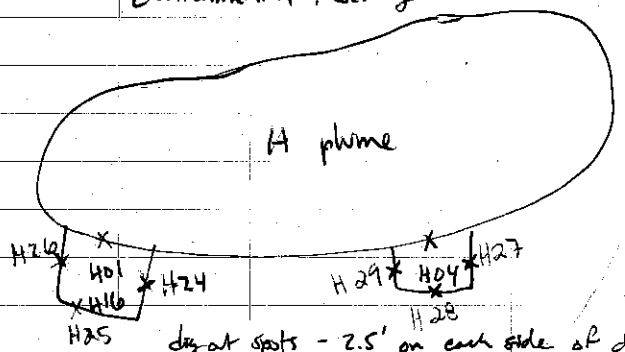


Location NE CAPE Date 7/25/12

Project / Client

700 Health and Safety

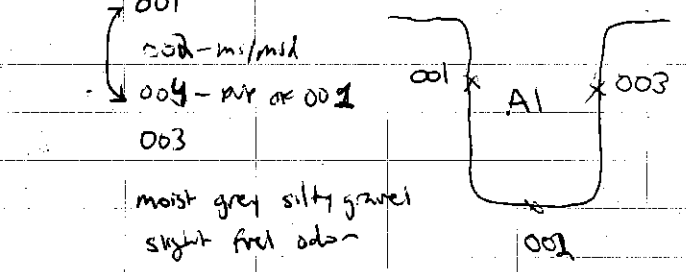
Environmental Meeting



dig at spots - 2.5' on each side of dirty sample location, 5' back. Stockpile first 6' of overburden, dig to 2' below water

A1 confirmation sampling

12 NCMoCSSØØ1 - ØØ4



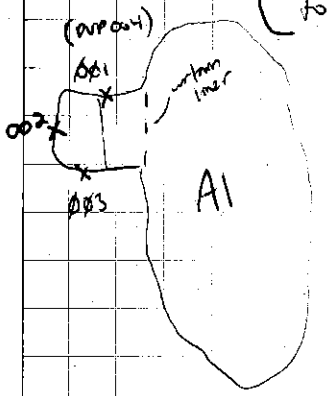
Location NE CAPE Date 7/25/12

Project / Client

1300	12NCMoCSSØØ1
13	12NCMoCSSØØ2 MS/MSD
13	12NCMoCSSØØ3
13	12NCMoCSSØØ4 dup of ØØ1

Begin at Fuel 98 BW MOC 108

Test Pit G1 (near UX108) to evaluate water level



Begin removal of overburden from G-2 water @ ~9' bgs

1730 End 10 hours

Location NE CAPE Date 7/26/12

Project / Client

700 Health and Safety Meeting
drizzly, overcast, calm 50's
- 4 people per load frame on windy days is safer
- eye contact with operators
- demarcation of excavations could be better
- new test pits @ G

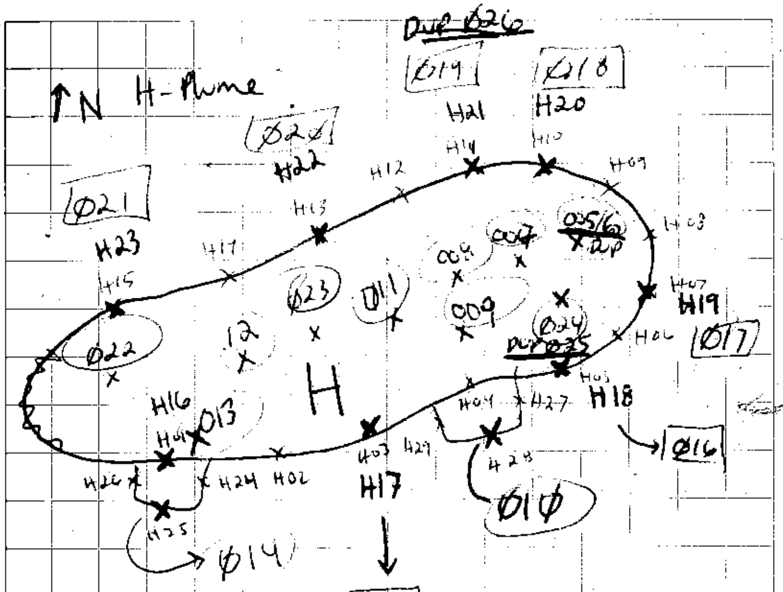
Environmental Meeting
- maybe move to site 31 in the afternoon
- re-screen material from H
- WL @ H as of yesterday 6.75'

Bagging at Pad 78: 109B – 109F
Jamie surveying confirmation sample locations at
A1 ØØ1 – ØØ4

Remove 6'-7' over-burden from G-2
water @ ~9' bgs
Remove 2'-3' dry, dirty material for screening, remove additional material (wet) from below water to 2' below for direct bagging

Location NE CAPE Date 7/26/12

Project / Client



11NCMOCSSØØ5 – Ø26 3 DUPLICATES
1 MS/MSD

Jack Willis – confirmation sampling
floor approx. 2300 sq ft
take 10 floor samples
(2 1st samples 250 sq ft + 1/250 sq ft additional)

use untared 8 oz amber jars
1430 → 5 min intervals/sample

1730 10 hours

Location NE CAPE 7/27/12

Project / Client

700 Health and Safety

High winds, rain expected through the day

vehicles fogging, communication

camp courtesy - visitor hours

Environmental Meeting

Lab caught up with samples - results for 13 in 14

create 12NC-008-01 to 12NC-008-03

for shipment of AI and H PCL

confirmation samples

- email COCs to Marty to verify/proof

- sample management - labels, bubble wrap

all in one cooler

2 MS/MSD sample ØØ2 and ØØ18

4 DUPLICATES ØØ1 DUP ØØ4 | 2e

ØØ5 DUP ØØ6 |

Ø19 DUP Ø26 | ØØ4 DUP Ø25

ØØ1 - ØØ4 AI plume

ØØ5 - Ø26 H plume cooler # 072712-01

ØØ5 - ØØ9, Ø11 - Ø13, Ø22 - Ø25

Floor samples 2' below water level

AK Air waybill #

Location NE CAPE Date 7/27/12

Project / Client

- need to collect floor samples from AI

- sidewall sample from backfill area?

Bagging @ Pad 98/MXC110 G

BW MXC 111 1500

BW MXC 112

MXC 113 B

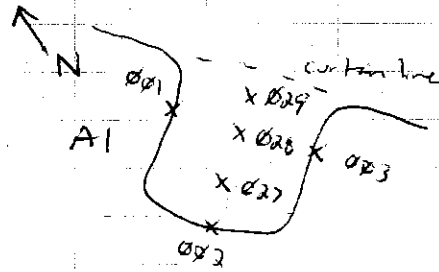
17:30

Location NE CAPE Date 7/28/12

Project / Client

700 Health and Safety
- Eric's tips for youth excursions / barge arrival
cool, calm, cloudy high 40's
- Environmental - lab processing PCB samples

A1 floor samples - 3 (~500 sq ft)
→ 12NCMOC55Ø27, Ø28, Ø29 (830, 835, 840)
slough cleared away, water infiltrating
samples wet-to waist @ 15' bgs
(Jamre to survey)



- Jamre overlay G1/2 + H plume on excavation extent - small dig-out spot at H to reach full extent in workplan

H 10/11 → co-located field screening samples and confirmation samples
Ø18 Ø19
H13 → Ø20

Location NE CAPE Date 7/28/12

Project / Client

Jamre surveying excavation extent, depth, sample locations at H plume → significant sloughing at dig-out spot
(Sample locations Ø14, Ø10 (sidewall) samples taken 1' above standing water (~67.4 ft) now under slough)
co-located confirmation samples
Ø18 → H09
Ø19 → H11/H12

Field screening samples @ G2
G2-01 to G2-17 1' above WL

Bagging at pad 98
113 A

1730 End
10 hours

Location NE CAPE Date 7/29/12

Project / Client

700 Health and Safety

high winds - heavy rain

safety award - awareness (Bruce + Dale)

Bagging at Pad 98 1148

BW MOC 114 wet, grey, silty G2 material

BW MOC 115

POL results from lab G201 - G215

G201-03 and G208-11 dirty

G201 = 18,357 mg/kg

(waiting on G216 + G217)

Dig out spots

Remove 5-6ft overburden

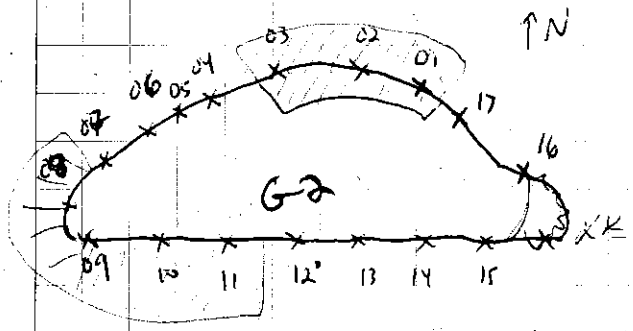
2' below groundwater

Location NE CAPE Date 7/29/12

Project / Client

G2-01 to 03

G2-08 to 11



1730 End

10 hours

Location NE CAPE Date 7/31/12

Project / Client

700 Health and Safety Meeting
- Improved weather - light wind, partly cloudy
- PPE - change gloves, under-clothes as they become wet or worn

Turn in time sheets - 3411008 Job # for POL tourage

G2 - remove lower 2' below water table at dig-out G2-01 to G2-03

Field screening G2
G2-18 to G2-26
26-29

G2-16 results in - dirty

Clean at Environmetal canvas
- sample for stock ok?
- Tamre to survey MW PVC casing, metal protective casing, ground surface

Bulkwaste sampling at site 31

17:30 End

Location NE CAPE Date 7/31/12

Project / Client

700 Health and Safety
Windy, cool, cloudy
-heat exhaustion, hypothermia symptoms
Environmental
Pad 98 Bagging
Eric field screen sampling e site 31

Pad 98 Bagging - G2 dig-at spots
116 C
BWMOC116
BWMOC117
BWMOC118
BWMOC119
MOC116A rebagged due to "oozing" - misshapen bag fell at of straps - mixed in with clover material e pad 98
MOC-120C
- QAR switch Jeremy Comer / Aaron Shewman
Security Aviation flight arrive

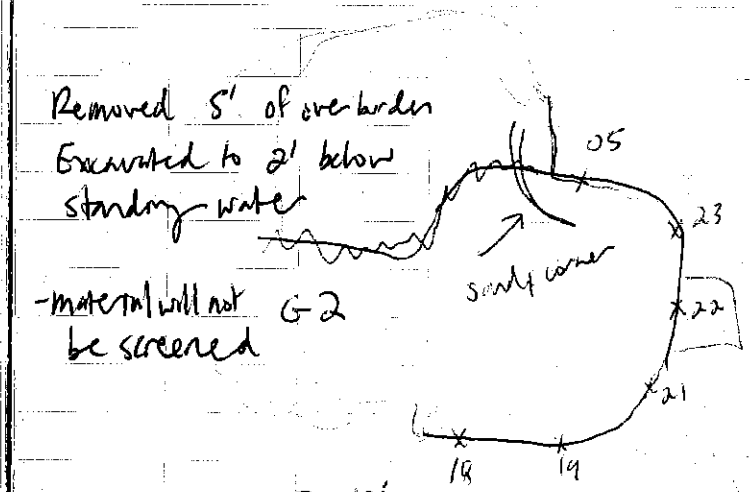
G2-30

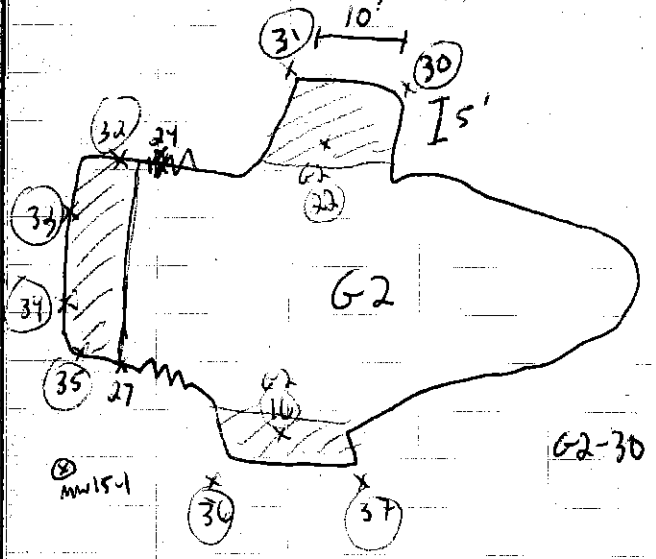
NE CAPE 7/31/12

Project / Client

Removed 5' of overburden
Excavated to 2' below standing water

-material will not be screened





G2-30 to G2-37

Heavy rain, winds

Location NE CAPE Date 7/31/12

Project / Client

2 samples taken at each field screening flag location – one 0.5-1.5 ft above WL and one 1' above lower sample

Bill Burke
Greg Jarrell
Jolene Clark
Curtis Dunkum
Carey Coiskaboom
Jeremy Craner
} security air flight

-emailed Test America regarding sample ID question 12NCMoc ss 008 vs 018 and MS/MSD

1730 End
10 hours

Location NE CAPE Date 8/01/12

Project / Client

700 Health and Safety
visitors on site today

Environmental Meeting
- visitors visit POL/PCB sites, take drive, site 28

Bagging at Pad 98 MX120D
POL site walk E Barnhill, L James, J Craver
C Dunkin (ADEC)
A1, G2, H → leave excavations with dirty floor samples 2' below current WL open for future excavation when WL is lower?
Curtis

H excavation first this season - unlikely to encounter lower WL during field season

- consult with Jamie of confirmation sample placements for survey

Pad 98 Bagging End 122 F

Location NE CAPE Date 8/a/12

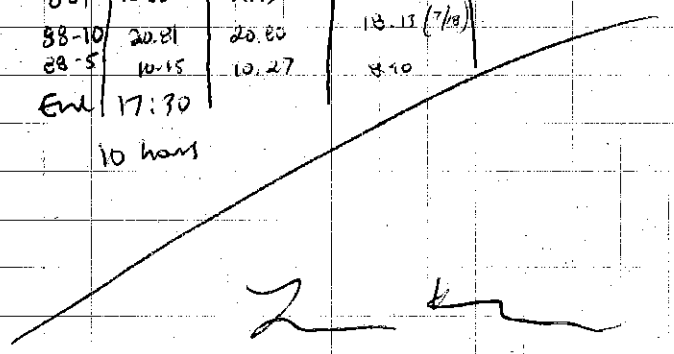
Project / Client

Teri Torres - will use sample
12NCMoCSS013 (920) as MS/MSD
and pull all volume from one jar
(008 incorrectly identified as MS/MSD on COC)

H and G2 narrative - estimates of captured material
→ H plume began 7/22
water level variation over time - earlier in the season lower water level? Look at well data. (88-1 and 88-10)
WL form, sampling sheet, recent measurements current?

Well ID	7/09/12	7/04/12	7/14/12
88-1	16.68	17.15	15.17
88-10	20.81	20.80	18.13 (7/13)
28-5	10.15	10.27	8.90
End	17:30		

10 hours



Location NE CAPE Date 8/02/12

Project / Client

700 Health and Safety Meeting
heavy fog, calm, cloudy, 40's F
move up to Site 31
Environmental Meeting
- outstanding POC results (20)
- begin excavation at E4

site walk with C. Croley, B. Burke, R. James
drum removal at slope immediately N of E4
- set up silt fencing, lined lay down area for drums, over-pack for liquid bearing drums

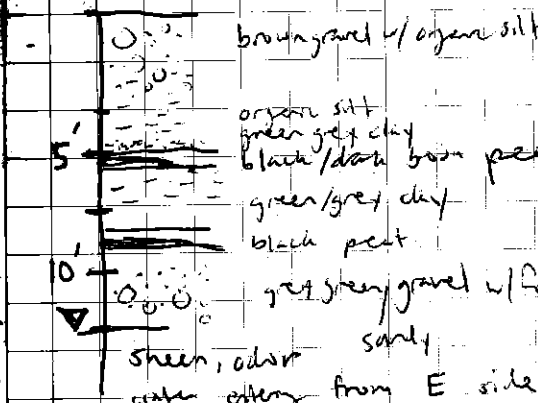
Bulk bag duplicate name - MOC120D
change 19 to MOC120D2

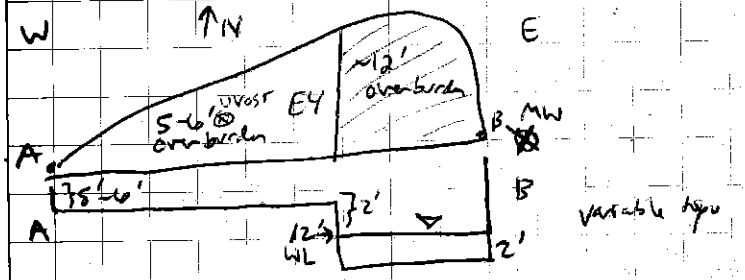
Jack removes crushed empty drums from slope
1 full drum, all on liner
Silt fence in place
Remove vegetated overburden for stockpile
5' of overburden

Location NE CAPE Date 8/02/12

Project / Client

LIF/2 probe 9-10' bgs MONCMOCUV009 25%





East side of E4 - no odor @ 5' bgs, 6' bgs
additional 3' excavated to separate "clean" stockpile for field screening - dry brown peat/grey clay - water @ ~12' bgs sheen
- strong odor at peat + clay on W side at 6' bgs ~ 5' overburden

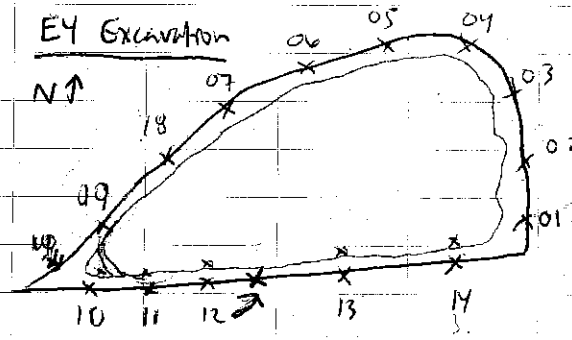
Location NE CAPE Date 8/02/12

Project / Client

10NC MOC UV008 – peak @ 4' bgs @ E3
009 – peak @ 9.5' bgs @ E4

sidewall samples @ 4' and 9.5' @ E3/E4 bound

E4 Excavation



E4-01 to E4-10 taken 1' above water in clayey grey gravel with sand

E4-11 to E4-14 H taken in black/brown peat layer directly above gravel ~4' above water

17:30 End
10 hours

Location NE CAPE Date 8/03/12

Project / Client

700 Health and Safety
The right tools for the right job
hoisting – chains vs straps vs cable
Environmental Meeting
Move from site 31 to 13

Excavate area to N of E4 plume on berm to 1' above WL per Civils – peat, dry organic material placed in separate stockpile to S of main stockpile

Buggy at Pad 98

MOC 123 G BW MOC 123

MOC 124 A
MOC 124 B
MOC 124 C
MOC 124 D
MOC 124 E
MOC 124 F
MOC 124 G BW MOC 124

Location NE CAPE Date 8/03/12

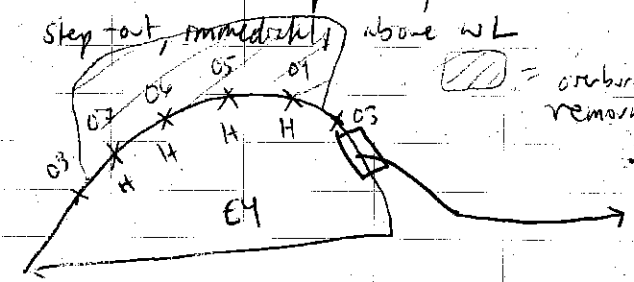
Project / Client

MoC 125 A
D
C
D
G
F
G Bw MoC 125

MoC 126 – Eric Barnhill collected Bw MoC 126

G2-38

E4-04 H to E4-07 H
taken in black peat layer at step-out, immediately above WL

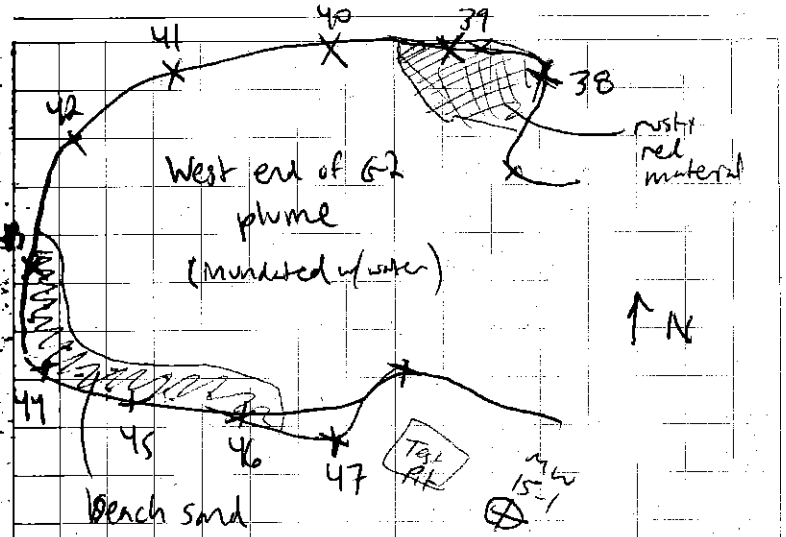


= overburden removal

peat layers above have no fuel odor
layer @ standing WL has strong fuel odor

Location NE CAPE Date 8/03/12

Project / Client



G2-38 to G2-47

38 – exclusively silty red material 39 – some red material
43+44 – primarily beach sand – possibly slough?
The rest are silty brown-grey gravel, moist

Soil profile @ E4, sample location E4-03

- silty gravel, brown
- black peat, no odor
- grey silty clay
- black peat, strong odor, wet droplets of oil

17:30 End
10 hours

Location NE CAPE Date 8/04/12

Project / Client

700 Health and Safety Meeting

Environmental Meeting - Eric pre POL stockpile sampling / site B confirmation

Pad 98 BW MOC 127 A and B

E4 - POL results for E4-01 to E4-14

E09 only dip at spot in sandy grey gravel layer beneath peat - 3 of 4 peat samples are super hot → E4-13H 413,225 mg/kg

Bgm E3 remove 2' overburden strong fuel odor at 1' - E3-01 to E3-07 taken to determine if less overburden should be removed - hauled at to just below lower peat layer, above water

water pooling in from NW side of E3 excavation @ 3' bgs

17:30 End

10 hours

Location NE CAPE Date 8/05/12

Project / Client

700 Health and Safety

Safety Award - recipient not present

attention to 4 wheelers, high winds

Environmental Meeting

Excavation at E3, Bagging @ Pad 98

Site B confirmation sampling

E3 excavation - water level slightly below contaminated peat layer

Pad 98 Bagging MOC 127 C

BW MOC 127

BW MOC 128

BW MOC 129

BW MOC 130 through D

High winds - lab goggles used instead of safety glasses

15:30 Shut down early due to high winds

8 hours

Location NE CAPE Date 8/06/12

Project / Client

700 Health and Safety Meeting
- injury yesterday due to high winds debris blown into eye during POL soil bagging, under safety glasses
- do not delay care

Eric to get site 13 confirmation samples ready for shipment

Pad 9B POL bagging - start MOC 130 E

POL results in E301-03:
01 dirty, 02 clean, 03 borderline dirty OK

E. Barnhill trade POL bulk waste sampling, confirmation sampling @ G-2

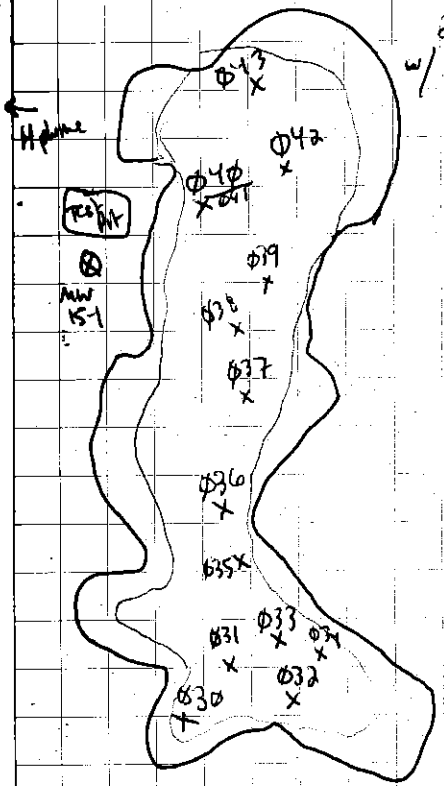
End bagging @ MOC 137 C

48 bags

Location NE CAPE Date 8/06/12

Project / Client

G2 Floor confirmation samples
2' ft below water
w/ toothed excavator bucket
J. Willis



1620 Ø30 sandy silt
1625 Ø31 MS/MSD sandy silt
1630 Ø32 coarse sandy gravel - wet
1635 Ø33 lean clay, grey, wet
1640 Ø34 " " with sheen
1645 Ø35 silt, sand, grey, wet
1647 Ø36
1648 Ø37
1650 Ø38 bottom settled silt, sheen
1700 Ø39 sandy silt
1705 1710 Ø40/Ø41 DUP silty sand brownish grey
1715 Ø42 sandy gravel, sheen, grey
1720 Ø43 brown clayey gravel

17:30 End 10 hours

Location NE CAPE Date 8/07/12 XL

Project / Client

700 Health and Safety Meeting

Environmental Meeting
- ~~Bagging~~ at Pad 9B
- Confirmation Sampling site 13

Pad 9B - material from E3 moist-to-dry black/brown peat, strong fuel odor
MOC 137 D

BW MOC 137
BW MOC 138
BW MOC 139
BW MOC 140
BW MOC 141
BW MOC 142
BW MOC 143 A-E

17:30 End
Honors

Location NE CAPE Date 8/08/12

Project / Client

700 Health and Safety Meeting
Carl's Birthday!
Environmental Meeting
Eric will send out site 13 confirmation samples

H plume - 3 spots exceeding 20' for confirmation sampling - add 3 new locations

H PLUME CONFIRMATION SAMPLES

12NCMOCSS 044	830	
045 (DUP 062) 1015	835	
046	840	

G2 PLUME CONFIRMATION SAMPLES

12NCMOCSS 047	900	058	955
048	905	059 DUP 069	1000/1003
049	910	060	1005
050	915	061	1010
051	920	~~062 (DUP OF 045) 1015~~	
052	925	063	1020
053	930	064	1025
054	935	065 DUP 068	1030/1033
055	940	066	1015
056	945	067	1070
057 MS/MSD	950	0	

Location NE CAPE Date 8/08/12

Project / Client

Dig at spot @ G2-41 and 45

hot spot G2-4 not excavated yet due to access issues 4/excavator. G2-4 excavated, 3 sidewall field screening samples taken: G2 48-50

MOC "during" soil excavation surface water sample event: E plume excavation underway

MOC surface water samples

1540/1550 loc ID ~~ØØ1~~ ØØ1 12NCMOCSWAØØ5 (DUP) culvert

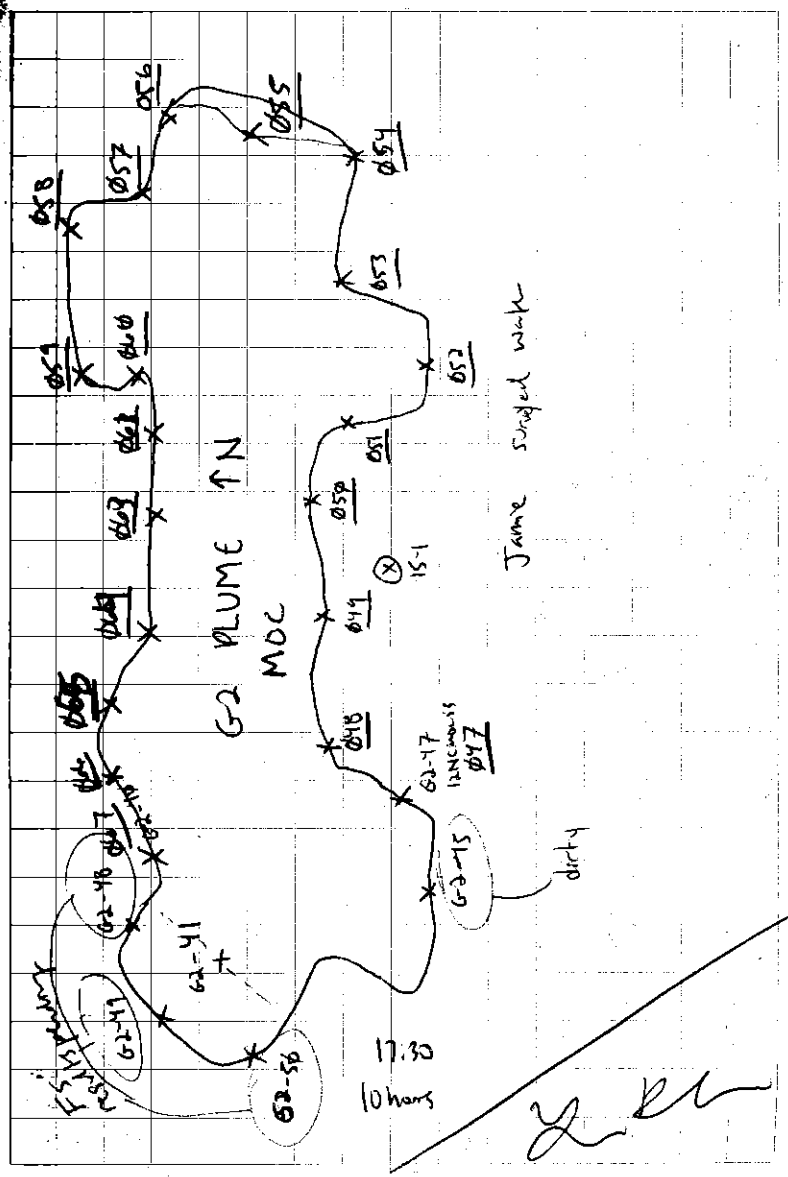
1600 loc ID ØØ2 12NCMOCSWAØØ6 middle

1620 loc ID ØØ3 12NCMOCSWAØØ7 (MS/MSD) E side of pond

- ØØ1 iron floc, ~~sheen~~, ~~slight~~ material odor ØØ5/ØØDUP
  - temp 13.06 ORP 35.8
  - sp cond 0.265 DO error (180%)
  - pH 6.66 turb. 42.1
- ØØ2 iron floc, no sheen, slight odor
  - temp 10.92 ORP 54.9
  - sp cond 0.100 DO 6.98
  - pH 6.01 turb. 260
- ØØ3 no floc, ~~biogenic~~ sheen present, no fuel odor
  - temp 10.46°C ORP 29.1 pH 5.61 MS/MSD
  - sp cond 0.104 turb 16.1 DO 3.50

Location NE CAPE Date 8/08/12

Project / Client



Location NE CAPE Date 8/9/12

Project / Client

700 Health and Safety Meeting
clear and calm 40's

outstanding qty of spars:
G2-42 E4-09

Erc bagging at site 31 / field screen sampling

E3 excavation - E301, E303 surface samples
above cleanup - scrape 1' overburden, restbo pad 98
take E4-15 to E4-18

Pad 98 bagging
MOC 143 F

BW MOC 143
BW MOC 144
BW MOC 145
BW MOC 146
BW MOC 147

MOC 148 A

1730 End - 10 hours

NE CAPE Date 8/10/12

/ Client

Health and Safety Meeting
foggy and rainy - bring proper gear
Environmental Meeting
- set up load fence at site 21 (5 bags)
Bagging at Pad 98 - MOC 148 B
Matt Faust, CQCSM filling for Russell

- COCs: H confirmation
G2 confirmation
MOC surface water

- site 21
- site 8
- radar dome

Pad 98 POL Bagging 0845

BW MOC 148
BW MOC 149
BW MOC 150
BW MOC 151

Site 10 Drum Removal 0857
one drum antifreeze - black overpack
one drum blue fluid - yellow overpack
two drums clear fluid - black overpack
↳ ammonia/thermal
+ fuel cdo -

Location NE CAPE Date 8/10/12

Project / Client

5 drums on overpack

10 drums on containment

↳ liquids on containment
light oil – (mineral?)
90 wt oil
antifreeze
solvent
brine fluid

liquids on containment pumped into 55 gal drum using peristaltic pump

Leesa Nelson in

17:30 End
10 hours

0806 6 h
057 5 h

NE CAPE Date 8/11/12

Client

Health and Safety Meeting

Environmental Meeting
Enter site 31 with Leesa 2 buggy operators

Pad 90 Buggies

BW MOC 155
BW MOC 156
BW MOC 157

BW MOC 158
BW MOC 159
BW MOC 160 C

17:30 End
10 hours
0808

Location NE CAPE Date 8/12/12

Project / Client

700 Health and Safety

Site 13 and Pad 98 buggy - lots of people and lots of equipment. Be mindful (Bruce's birthday)

Environmental Meeting

Celebrate Site 13, PCL buggy @ 98

MOC 160 D

MOC 160

MOC 161

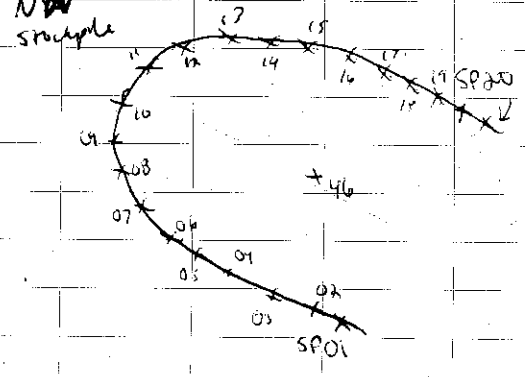
MOC 162

MOC 163

SP01 - SP20 SP-21 to SP-46 NW stockpile

MOC 164

MOC 165 D → Contains field screening Sam



NE CAPE Date 8/12/12

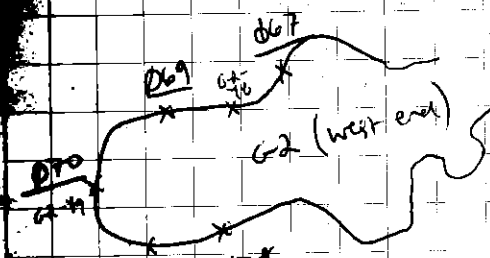
Client

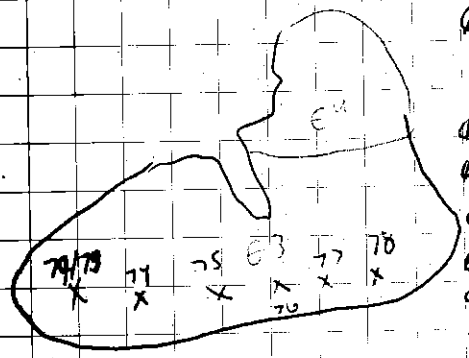
MOC soil confirmation sampling with excavator bucket

30 BNCMOCSS Ø69 ~1' above water level

35 Ø70

40 Ø71





Ø74 MS/MSD 1450

Ø73 1700

Ø74 1705 MS/MSD

Ø75 1710

Ø76 1715

Ø77

Ø78 1720 1725

Ø79 1730

17:30 End 10 hours

Ø79 and Ø73

Ø74 MS/MSD

Location NE CAPE Date 8/13/12

Project / Client

700 Health and Safety

Site ID drums - transfer fluid from drums - PPE

Environmental Meeting

E. Barhill, M. Faust, A. Smith out

Sample management

MOC SOIL CONFIRMATION SHIPMENT

2 Ø64 IDs: G2 DUP of Ø59 collected 8/04 renamed Ø72; sample Ø72 (DUP Ø73) renamed Ø79 (from plume E3)

DUPS for this shipment:

12NCMOCSSØ59 and Ø72

Ø65 and Ø68

Ø45 and Ø62

Ø41 and Ø40

MS/MSDs

Ø31

Ø57

Ø74

MOC SURFACE WATER

12NC MOCSWAØØ5 - ØØ8

Ø5 and Ø8 DUPS

Ø7 MS/MSD

Location NE CAPE Date 8/13/12

Project / Client

COC # 12NC-012-1 (surface water MOC)

COC # 12NC-013-1 to 4 (soil from H, G-2 and E3)

ØB1312:

cooler 01 → ENE PCB confirmation

cooler 02 → SWAØØ5 and SS Ø54-Ø72, 74

cooler 03 → SWAØØ6 - Ø64

cooler 04 → SSØ3Ø → Ø53

Rest of E3 floor samples take 8/12 held pending DEC guidance Ø73, Ø75-Ø79 (Ø73 DUP Ø79)

E2 Excavation: 4 ft overburden - dry brown silty gravel to 11 ft bgs - just above water contamination present in black/dark brown peat layer

17:30

10 hrs

Location NE CAPE Date 8/14/12

Project / Client

700 Health and Safety
- high winds building into tomorrow

Environmental Meeting
- bagging @ pad 98
- excavation at E2

Discontinuous upper peat lenses (strong fuel odor) with grey silty clay

Field screening
E-01 to E-35, sidewall in lower continuous peat layer

E 01 and E10 light brown silt
E 30 and 31 sphagnum moss

Jamie surveyed field screen location points

End 1730 # 0088
10 hrs

NE CAPE Date 8/15/12

Client

Health and Safety Meeting
- high winds

Environmental Meeting
- Arsenic dig
- site 13 dig-at spots

Arsenic dig - 5 bags removed
16k - 18000 lbs at excavation perimeter (already below 2' water)

~~to NCMRL~~ 12NC21550I3 (014 DUP)
bulk waste sample

12NC21550O1 - 12NC21550I2

0012 = MS/MSD, floor sample

0008 + 0011 DUP

End 1200 due to high winds (~70 mph, rain)
8 hrs # 0057

Location NE CAPE Date 8/16/12

Project / Client

700 Health and Safety
- assess wind damage, repairs
- high winds diminishing

Environmental Meeting
- site 13/31 dig-out spots
- excavation E plume

Arsenic Shipment COC #12NC-014-1

1100	12NC2155 001	reddish brown silty peat
1105	002	dark brown peat, moist
1110	003	" "
1115	004	" "
1120	005	reddish brown silty peat, moist
1125	006	dark brown peat, moist
1130	007	" "
1135	008	greyish brown silty peat, wet
1140	009	dark brown peat, moist
1145	010	reddish brown silty peat, moist
1150	011	DUP of 008
1155	012 MS/MSD N floor	greyish brown silty peat, wet
1050	013 → BW DUP	dark brown silty peat, wet
1055	014	

NE CAPE Date 8/16/12

Client

out of helium - results SP-41 to 46 pending

top of stockpiles samples SP-21 to 40

back hot

17:30 End

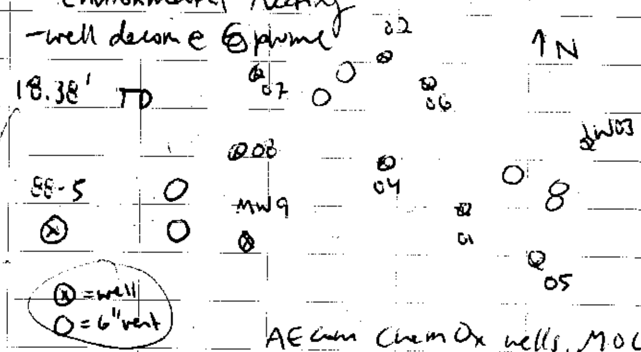
10 hrs

Location NE CAPE Date 8/17/12

Project / Client

700 Health and Safety
- winds shifting, rain anticipated
- Environmental Meeting
- well decom e E plume

18.38' TD



AECom ChemOx wells, MOC

PVC, no monument or outer casing
water @ 10.75'
⊗ 2" diameter (1COMW01?)

dig to 11' - abandon ~ 8ft
8 x 0.163 ≈ 1.3 gal bentonite
bentonite to 7.6 ft bgs
6" diameter PVC vents 4.5 - 6.5 ft bgs
88-5 2" TD 14.85
88-4 2" TD 15.31

granular bentonite - slurry
↳ sinks in water

17:00 End
10 hours

[signature]

Location NE CAPE Date 8/18/12

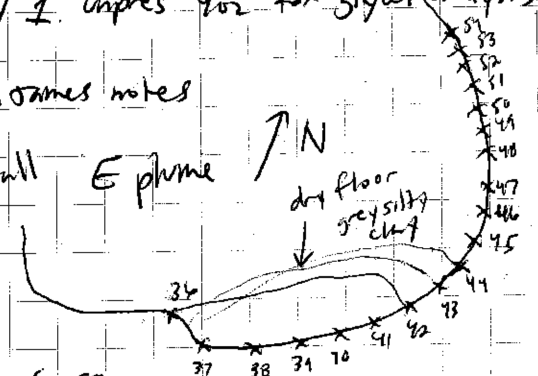
Project / Client

700 Health and Safety Meeting

Environmental Meeting - site 10 sampling with R. James - drum removal area
80' linear ft. 2/250 + 1/800 sq. ft floor
1 16 oz jar / 1 4oz methanol pres. tared jar / 1 unpres 4oz for glycol analysis

See R. James notes

E plume sidewall



Field screening
↓
E-36 to E-59
bucket sample with Allen Dennis - brown peat sidewall material

MS/MSD 12NC1055007 Site 10 drums
DUP 12NC1055005 /18 See R. James notes

1730
10 hours

[signature]

Location NE CAPE Date 8/19/12

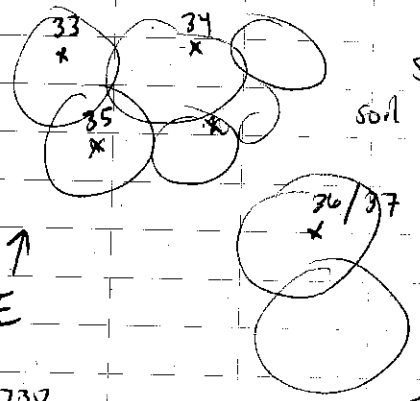
Project / Client

700 Health and safety
High winds

Environmental Meeting
- site 10 sampling PCB, PAH, DRO/RRO, metals
GRO/VOC (4oz methanol preserved)
glycol (4oz unpreserved)
MS/MSD 12NC10SS014
DUP 12NC10SS016/19 1040/1045
DUP 12NC10SS030/32

Finish lower site 10 drum area, stockpiles, upper drum removal area (east)

33-37 stockpile samples 12NC10SS033-37



Site 10 drum soil stockpile C MOC

samples taken ~2' below surface

1730

NE CAPE Date 8/20/12

/ Client

Health and safety
Land, rain
timesheets turned in
Environmental Meeting
Eric arrives today / NALEMP - Lisa to perform NALEMP sampling
COC # 12NC-15-1 MOC E phase flow
12NC-16-1 to 4

Lean stockpile re-sample after removal
SP47-63

Methanol preservation
dangerous goods in excepted quantities
Air hire specialist on extended
Leave → ship via NAC?

Sample management, floor confirmation notes

1730

Location NE CAPE Date 8/21/12

Project / Client

700 Health and Safety
- wind, rain, fog 40's
- security aviation flight

Environmental Meeting
Erin Site 10 dive characterization
Lesa NALEMP
E plume floor confirmation samples
2+ ft below water
bucket sampling approx 10' from excavation edge

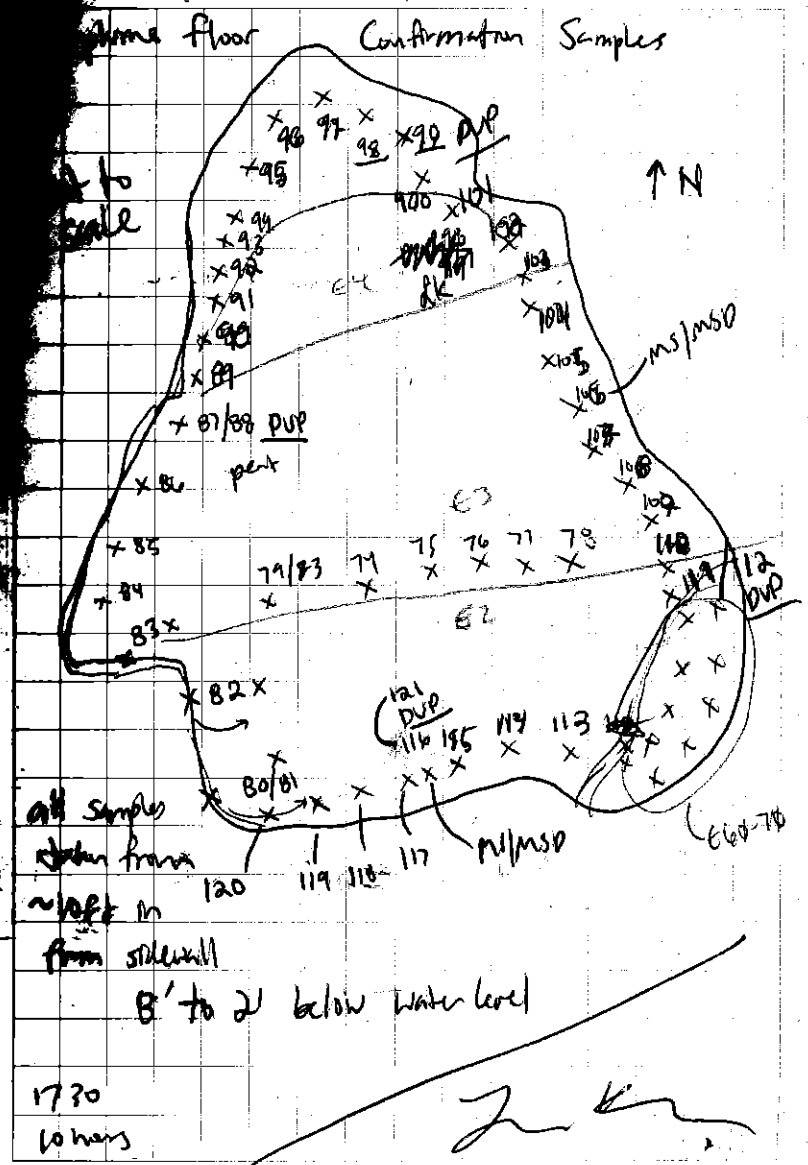
12NCMBCSS083_121
87+88 DUPS → dry peat
98+99 DUPS
112+111 DUPS

104 MS/MSD
116 MS/MSD → 116/121 DUP
120 MS/MSD

4 DUPS, 2 MS/MSD

NE CAPE Date 8/21/12

Client



Location NE CAPE Date 8/22/12

Project / Client

700 Health and Safety
foggy, calm
security aviation re-schedule

Environmental Meeting

12NC-17-1 to 4
12NCMOCSS083 - 12NCMOCSS121
4 DUPS, 2 MS/MSDS

shipment 12NC-15 and 16 still at Bering Air - no NAC flights today or yesterday due to weather
shipment 12NC-17

Emily Conway, Talon Ibargen arrive
→ MOC site orientation
E plume, site 10, G2/H

End 1730
10 hours

NE CAPE Date 8/23/12

Client

Health and Safety
- barge loading
- Eric safety gate

Environmental Meeting
- stockpile results - one hot spot SP-50
- site 8 LDU with E Conway
outfall water samples for DRO/RRO, PAH

E 52-59 clean → E sidewall of E plume

dry at spots @ E plume:
E 39, 42-44, 47, 51-53
E21-35 dirty (E29 clean)

E1-20 dry at, resampled

Calibrate YSI #3 and turbidimeter #1
new conductivity solution, new confidence solution

E Conway Site 8: collect YSI parameters, methane VOA vial samples, 500mL unpres HDPE for Hach kit MNA using peri pump

Location NE CAPE Date 8/23/12

Project / Client

12NC08SWA01 ~~/02~~ MS/MSD 1130
with Emily Conway no odor, clear, from
~~2.88°C~~ 40 spring near outlet to
~~0.730 mS/cm~~ Sugi river. No sheen, no
~~7.92 pH~~ ZK iron floc present.

1.75 °C 7.06 pH
0.656 mS/cm 76.0 ORP
2.34 mg/L DO Turb. 260

12NC08WA001 LDU D10 1300

9.01 °C 6.27 pH
0.151 mS/cm 535 Turb
3.47 mg/L DO 349 ORP

12NC08WA002 LDU C10 1305
2.32 °C 8.70 pH
0.913 mS/cm 106.6 ORP
~~2.01~~ mg/L 0.32 Turb.ty
2.01 ZK mg/L DO
Sample taken @ spring outflow location

NE CAPE Date 8/23/12

~~WA~~003 LDU A8 1310
°C 6.83 pH
.71 mS/cm 140.9 ORP
3 mg/L DO 126 NTU

~~8WA~~004 LDU B6 1315
5°C 5.69 pH
072 mS/cm 114.5 ORP
60 mg/L 68.9 NTU

~~C~~08WA005 LDU A5 1320
8.94°C 5.77 pH
0.072 mS/cm 187.8 ORP
7.52 mg/L DO 32.2 NTU

~~C~~08WA006 LDU D4 1330
9.31 °C 5.70 pH
0.072 mS/cm 160.2 ORP
6.04 mg/L DO 118 NTU

12NC08WA007 LDU B2 1335
9.04 °C 5.65 pH
0.081 mS/cm 108.9 ORP
6.99 mg/L DO 22.9 NTU

Location NE CAPE Date 8/23/12

Project / Client

12NC08WA008 LDU C1 1345

9.50 °C 5.69 pH
0.064 ms/cm 228.2 ORP
7.83 mg/L DO ~~228.2~~ 6.31 NTU

DUPLICATE 009 1390

12NC08SWA02/03 DUP 1500 / 1515
biogenic sheen, slight odor, iron floc present

8.56 °C 5.69 pH
0.078 ms/s 163.6 ORP
4.40 mg/L DO 19.6 NTU

12NC08SS001 1600
DUPLICATE 12NC08SS002 1610
composite sample LDU Site 8 – brown moist peat with grey silt strong fuel odor
D10/C10/AB/B6/A5/04/B2/C1

NE CAPE Date 8/23/12

ent

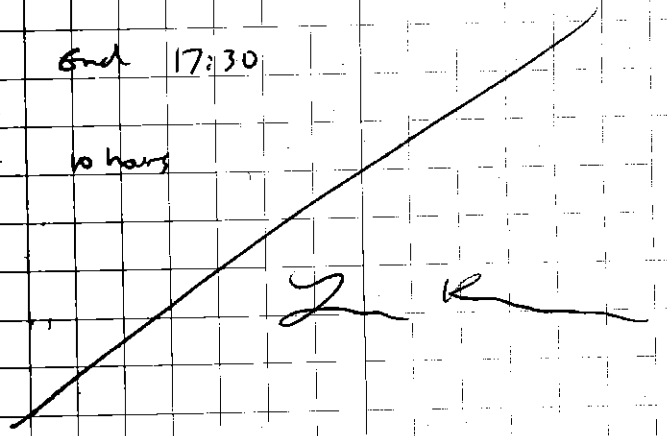
samples packaged

e 8 Mn, Fe, nitrate, sulfate, alkalinity Hach
- colorimeter standards not located
– acid digestion/filtration prior to reading?
Paul to email Mark + verify procedures from previous years, order standards

still need site 8 soil MS/MSD from upper unit, methane dups for each duration unit and MS/MSD for methane.

End 17:30

10 hours



Location NE CAPE Date 8/24/12

Project / Client

700 Health and Safety

High winds - no Yukon barge

Environmental Meeting

Package samples for shipment - site B outfall wate

Get figures from Jamie - QC check

collect SP-64 (dig at spot on SP-50)

need additional floor samples at G2, H

- dirty field screen spot @ G2
- dirty confirmation spot @ H sidewall

17:30 End

10 hours

NE CAPE Date 8/25/12

Health and Safety meeting

winds have died down, clear, calm

E plume backfill

floor samples - confirmation bucket sampling

E. Conway (see E Conway notes for map, soil samples) 2' feet below water level

12NCMCSS 128

129

130

131

132

133

134

135

- site B water sample shipment (2 coolers)
- Bonny Air flight at of camp
- AK Air afternoon flight

NOME → ANC

10:00 End

9 hours

104

Location NE CAPE Date 9/3/12

Project / Client

Return to NE Cape from leave in AN

1000 check-in for Ak Air → Nome

1400 Being Air arrive NE CAPE

environmental connex clean-out

Site 21 Arsenic results - 3 dig-at spots

12NC215005, 01, 10

all along E wall

1730 End

8 hours

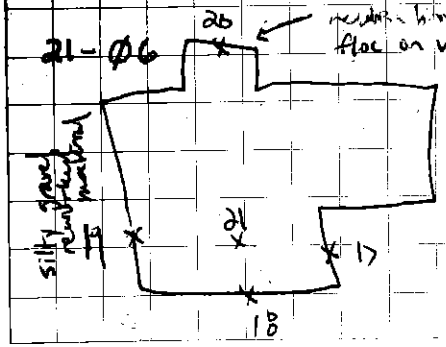
105

NE CAPE Date 9/4/12

Health and Safety

- disaster scenario applicability to camp
- environmental meeting
- 2 wells @ site 9, 1 well along cargo road to decommission
- site 21 Arsenic dig
- POL buggy (MOC 217 B)
- bag loading frame East (take from 31)
- MOC 204, 215
- Bulk Waste Bag IDs 21-06 to 21-10
- 12NC215505 - bulk waste 1400
- 12NC215506 - duplicate bw

21-06



Location NE CAPE Date 9/4/12

Project / Client

site 21 Arsenic 2nd 2012 excavation sampling:

12NC21SS015	1400	> moist brown peat / reddish brown silt
12NC21SS016	DUP 1405	
12NC21SS017	1450	reddish brown silty peat, mois
12NC21SS018	1455	red-brown silty peat, moist
12NC21SS019	1500	MS/MSD brown silty peat gravel,
12NC21SS020	1505	reddish brown silt with pe
12NC21SS021	1510	brownish grey silt with brown peat, wet

1730 End
10 hours

NE CAPE Date 9/5/12

Client

Health and Safety Meeting
- NE CAPE poem 21a Eric
- site 21 - more tonnage (1 bag)
- site 31 PCB dig-at spots

Environmental Meeting
- check arrows today, J. Cave QAK

Site 21 Arsenic - bulk waste sample to add to composite/DUP set 015/016

12NC21SS018 dig-at, re sampled at 910. Reddish brown wet silt with peat
→ 12NC21SS018 @ 910 9/5/12
(more tonnage needed)

12NC21WA001	1400	MS/MSD
002	1410	DUP

samples collected from water in excavation, dissolved arsenic samples filtered using peristaltic pump + filter

Location NE CAPE Date 9/5/12

Project / Client

Sample management Site 21 soil and water samples

Arsenic site 21 soil + excavation water
COC # 12NC-28-1

17:30 End
10 hours

E CAPE Date 9/6/12

alth and Safety

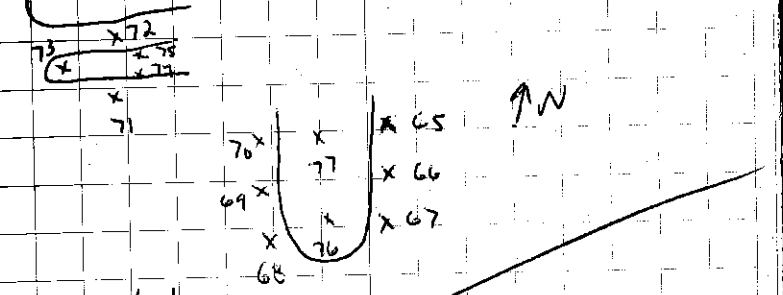
nmental Meeting
decommission wells (3)

to bottom 3.91 stick-up
" 6.55 " " plastic bailer inside
" 1.60 " " 7.90 to water

@ 6' - melt using 50 lb
bar on a rope

9-1, 9-3 removed by hand, filled with granular bentonite

POL stockpile
SP samples SP65-75



17:30 End
10 hours

Location NE CAPE Date 9/07/12

Project / Client

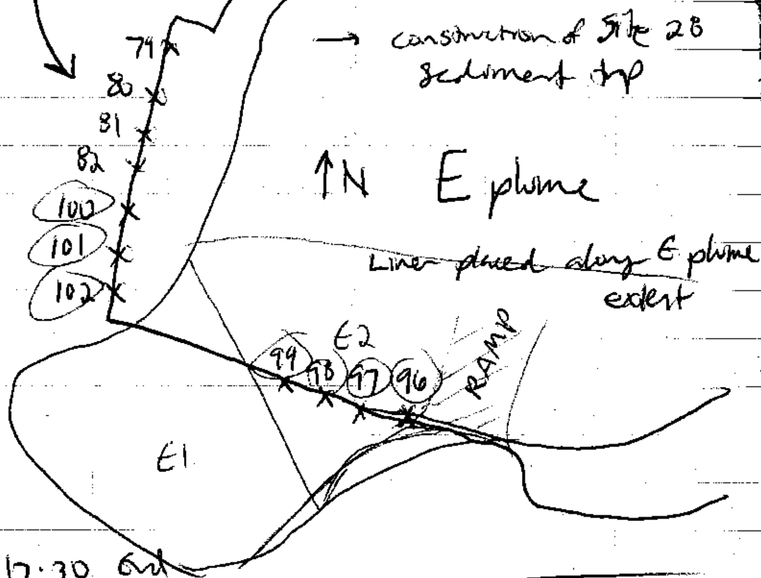
700 Health and Safety
- boat arrival @ 7pm tonight

Environmental
Dig out spots @ 13

E - 96 to 102 - updated map from Jamie

→ Finish abandonment decommission of 26MW3 w/ granular bentonite, excavator removal of PVC casing

→ construction of Site 28 sediment trap



17:30 End
10 hours

[signature]

CAPE Date 9/08/12

...th and Safety
- fatigue (mental + physical)
...mental
- all E plume field screen samples above clean-up
- haz bag placards

...haz bag manifests
... dig out spot at SP-68
(... corner of stockpile)
... bag placarding with R James + E ...
Placards, stickers, manifests for Arsenic and PCB haz bags

17:30 End
10 hours

[signature]

Location NE CAPE Date 9/09/

Project / Client

700 Heath and Safety
- anecdotes, loader traffic + visibility
Environmental Meeting
- site 28 sediment trap location/surface water sample locations TBA
- barge unloaded

haz waste manifests

17:30 End
10 hours

CAPE Date 9/10/12

[illegible] and Safety
PPE anecdotes / use of [illegible] dredge
[illegible]mental Meeting
[illegible] @ site 28 pad
dredge placement, sed. trap placement?

waste manifests for Suzanne
[illegible] 1KGB - 12

surface water sampling with Lesa Nelson
NALEMP 49029/40 4 hours

plane depart with R Bayles, Mel, Scott

4 1L amber, 3 VOA, 1 poly HNO_3
3 4oz jars, 1 4oz septa w/ MeOH
01-05 Ø5 dup of 11

4hrs NALEMP rest NE CAPE HTRW

17:30 End
10 hours

Location NE CAPE Date 9/11/12

Project / Client

700 Health and Safety
- dredge operation / barge @ ~
Environmental Meeting
- one more MI area to sample @ site 28 pad
- decide surface water sample locations
- 6 dig-out spots @ site 31
- POL bagging

Look up TestAmerica results for G

Eric Barnhill + I collect MI sample at site 28 pad

Site walk with R James to locate site 28 surface water sample locations

17:30 End
10 hours

Date 9/12/12

and Safety
role of fear and common sense
mental meeting
out spots at 31

490 29/40 3 hours
sample, prep + sample
coolers (8) with water samples
(2 excepted quantities coolers
) w/ Lesa Nelson
Lesa Nelson field notes)
@ Pad 98 MOC 217 G

Site 28 preparatory phase meeting
Chuck, Jeremy, J. Willis, Eric, Russell
- surface water samples
need filters
- dredge need ~12 ft - need "leap frog" pump + containment system

End 17:30
10 hours

Location NE CAPE Date 9/13/12

Project / Client

700 Health and Safety
- practical jokes, improvised safety
Environmental Meeting
- begin dredge test, containment construction

Sample labels for 12NCMOCSWA 009-0
12NC28WA01 - 03

calibrate YSI #3, turb #1
MOC "post" action surface water DRO/RRO
- 12NCMOCSWA009 / ~~012 Dup~~ 012 DUP 1400/~~1400~~ 1410
iron floc, sheen
5.75°C 6.16 pH 4.6 ORP
0.198 mS/cm 7.01 mg/L DO 45.2 NTU
loc ID SWA001

- 12NCMOCSWA 010 1420
no iron floc, blacky sheen
5.31°C 6.24 pH -23.7 ORP
0.164 mS/cm 3.27 mg/L DO 2.03 NTU
loc ID SWA002

- 12NCMOCSWA 011 1425
no iron floc, no sheen
5.71°C 3.25 mg/L DO 21.7 ORP
0.106 mS/cm 5.91 pH 3.50 NTU
loc ID SWA003

NE CAPE Date 9/13/12

12NC28WA01 1600 28-W-01
pond immediately N of proposed silt trap
iron floc, fuel sheen when disturbed, odor
DRO/RRO, DRO/RRO, tot + dissolved metals
turbidity, PAH, PCB
- dissolved metals collected in unpreserved
poly + filtered w/ peristaltic pump
at camp ⟶ 17.4 NTU

12NC28WA02 1630 28-W-02
mid way between sed. trap + step. (?)
small ponded area
orange iron floc, no sheen or odor 16.7 NTU

~~12NC28WA03 1700 28-W-03 MS/MSD~~
ZK

- Samples 12NC28WA01 and 02
refridgerated and packed at camp,
dissolved metals samples filtered using
peristaltic pump

End 1800
10.5 hrs

Location NE CAPE Date 9/14/

Project / Client

700 Health and Safety
windchill and cold weather
Environmental Meeting
-sample shipment
Site 28 "PRE REMOVAL" surface water samp
12NC28WAØ3 MS/MSD 0900
outlet to swamp - clear, no odor or non floc
-dissolved metals samples filtered in camp
using peristaltic pump
turbidity: 10.2 NTU

Sample shipment:
12NCMOCSWA 009
010
011
012 Dup of 009
12NC ~~MOC~~ 28 WA01
02
03 MS/MSD

COC# 12NC-33-1
TripBlank Ø91412
COC# 12NC-32-1

Shipped to Test America Denver
(4 coolers)

CAPE Date 9/14/12

... #1

... decision unit 12NCOBWA___

(D10)	slight fuel odor	Overrange
(...)	96.9 NTU	
(C8)	38 NTU	
(C7)	overrange	
(5D)	712	
(5A)	36.7 NTU	
(A3)	10.9 NTU	
(B1)	2.38 NTU	
...	Dup of 17	
19 (A10)	6.70 NTU	
... (A4)	32 NTU (flow)	allowed to settle 20.6 NTU
... (C9)	6.96 NTU	
22 (D6)	13.3 NTU	
23 (C6)	1.51 NTU	
24	Dup of 23	
25 C4	4.74 NTU	
26 (A3)	73 NTU	
27 (A2)	3.61 NTU	

End 17:30
10 hours

120

Location NE CAPE Date 9/15/

Project / Client

700 Health and Safety
- cold stress

Environmental Meeting
- dredge test, containment set-up

Sample label + bottle prep

site 28 sediment trap placement
- dug in ~3 ft below water
unrolled cellulose matting, placed 3 inside box

dredge pump test

17:30 End
10 hours

121

Date 9/16/12

...th and Safety
...ards
... liner for sump - difficulty with wind
...0 stockpile 12NC10SS036/37
... discrete bulk waste sampling

BAG ID #		
10-01A	- dug at spot (previously sampled)	
10-01B	- 12NC10BW01	~~BW02~~ MS/MSD
	920	~~925~~ ZK
10-01C	12NC10BW02/03	925/930
10-01D	12NC10BW04	945
10-01E	12NC10BW05	1000
10-01F	12NC10BW06	1010

Sampled in 4oz jar w/methanol for VOC analysis
Dups/MS/MSD homogenized

MOC 218 D, E

End logging at 15:30 due to rain/sleet + high winds
- began confirmation sampling QC

17:30 End
10 hours

Location NE CAPE Date 9/17/...

Project / Client

700 Health and Safety

- new snow on mountain, JP + Talia ...
  stay warm, timesheets

Environmental Meeting

- line intermediary samps, begin dredg...
  barge @ Pad 98

COC 12NC-34-1 Site 10 bulk waste

12NC10BW01 - 06 VOC

Trip Blank 091712 cooler # 091712

Excepted Quantity - ship via NAC

Env to collect 28-W-01 discharge samples

Pad 98 bagging MOC221B → MOC224

MOCBW 221, 222, 223, 224

17:30 End

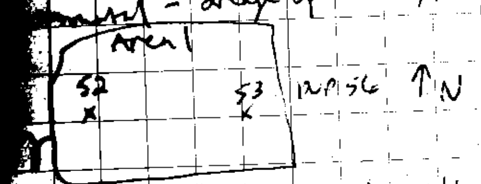
10 hours

(signature)

...CAPE Date 9/18/12

...h and Safety - increasing wind

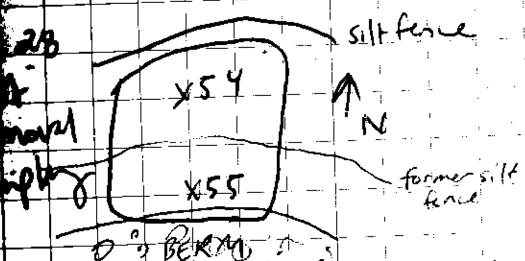
...mental - dredge operations, ... breakdown



...SS052 brownish grey, slatey silt with sand - moist, strong odor

sand seam is ~0.5' from bottom under silt

...28SS053 / DUP 056
1030 1035



12NC28SS054 organic silt with peat
1045 dry, strong odor, brown to dark brown

12NC28SS055 " " with light brown organic silt lense
1050

→ light organic material - 2x MeOH

Location NE CAPE Date 9/18/12

Project / Client

Pad 98 bagging MOC 225A

12NCMOCBW221	1300	9/17/12
12NCMOCBW222	1430	
12NCMOCBW223	1530	
12NCMOCBW224	1700	
12NCMOCBW225	1340	9/18/12

MOC 226B last bag

12NC28TWA01/02 DUP 1630/1700
taken from discharge - 2 discharges, each container 1/2 and 1/2 from the 2 discharges

1730 End
10 hrs

NE CAPE Date 9/19/12

Client

Health and Safety
Inclement weather - M. Hannah + Lab team at today, change at filter material @ site 29 water
last day of dredging
Environmental Meeting
impoundment water to be shipped to SGS - need MS/MSD - need list
12NC28TWA01/02, include MS/MSD

-need pre-treatment impoundment sample
-wait for treatment pumps to start
12NC28TWA03 1000 325 NTU
orange-brown, slight odor
12NC28TWA02 1045 DUPLICATE
taken from near geotube in containment
post treatment 12NC28TWA01 1030
orange-brown 219 NTU
taken directly from treatment outlet pipe from blue container scrubber

track down site 10 BW samples - in Tacoma!
12NC-34-1

Location NE CAPE Date 9/19

Project / Client

prepare 12NC-35-01 for TEST Am
Site 28 Soil sample

→ DRO BW samples from Pal 98
will stay pending more samples

12NC-36-01 SGS
impoundment samples

low fog, no plane

sample management, "during" dredge operations samples taken from 3 locations 28-W-1, 2, 3
by E Barnhill

17:30 End
10 hrs

NE CAPE Date 9/20/12

- Health and Safety
  - anticipated end Monday, bags to arrive on Casca today

- Ernie POL bagging operations

12NC28TWA04 - sample with R. James taken from treated water impoundment, site 28 - pump started 10 min prior to sampling

Site 28 surface water sampling with Doug Byers "post" sediment removal
3 locations

no sheen observed

1430 12NC28WA11
28-W-03 7.01 NTU
1445 12NC28WA12
28-W-02 7.20 NTU
1505 12NC28WA10
1515 12NC28WA13 } 7.92 NTU 28-W-01
← DUPLICATE

17:30

Location NE Cape Date 9/21

Project / Client

700 Health and Safety
— fly out today w/ J. Willis

Sample management — TWA and

cooler ID	I2NC28UA00_:
092112-01	07
02	07, 08, 09, 10, 11, 12
03	09
04	10/13
05	11/12

Booked coolers with AkAir
TWA to SGS for rapid turnaround

→ NOME → ANC arrive 22:30

Date

"Rite in the Rain"®
ALL-WEATHER
FIELD
No. 351

Russell James
NE Cape HTRW
Bristol Environmental Remediation
W911KB-06-D-0007 and
W911KB-12-C-0003
7/7/2012 - 8/2/2012
Book 1 of 3

INCH

"Rite in the Rain®"
ALL-WEATHER WRITING PAPER

Name Russell James - CQCSM
Bristol Environmental (BERS)
Address 111 W. 16th Ave, 3rd Floor
Anchorage, AK 99501
Phone (907) 563-0013

Project NE Cape HTRW Remedial Actions
Project No.: 34120057
Contract: W911KB-06-17-0007 Task Order 07
W911KB-12-C-0003

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CONTENTS

Fog, Cool B4120057

Winds NNW @ 3-5mph

0700 Safety: Barge arrived @ ~0400 and freight was unloaded.

- Use Radios in the thick fog.
- Use eye contact w/operators
- We'll be hauling loads to the MOC and the camp today from the beach
- Will be pulling liner from the excavations today - Use proper lifting techniques when pulling liners
- orientation will follow the safety Meeting
- Chuck requests time sheets filled out for yesterday
- Introduces the Medic, Abby
  - Gives intro about Medic facilities and work

0710 Staff Meeting: Barge/Equipment arrived. Freight on beach, but there is room for MI Sampling

- 40 flats arrived
- Barge will be back (Coreta) @ 5:00 am tomorrow morning

- Sampling supplies arrived on the Gareta
- Jeremy mentions DEC Comments
- Marty says take 10-20 g wipe samples for correlation - 1 sample to the lab and 1 sample to TestAmerica - Samples should be taken adjacent to each other

0730 Site orientation

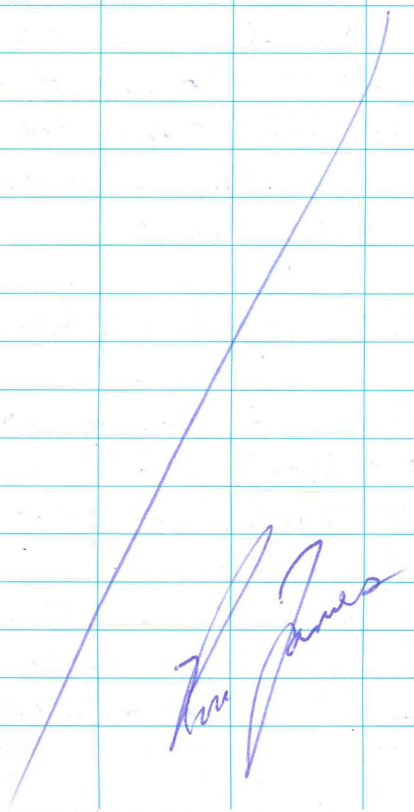
- Charles, Mylon, Michael, Albert, Scott, Myself, Chuck
- Handouts are passed around
- Use VPN on computer to download most recent version of Work Plan
- Talk to Craner about Job. He notes a couple concerns/details:
  1. Keep safety priority #1 at all times
  2. Keep in mind that even though the job is remote, we are very high profile
  3. Protect the MWs @ the MoC as best we can. Put flagging/lath/protective barriers around them

4. Add SWPPP inspections to the DQCRs and be sure to conduct them appropriately
5. Be alert/aware of all spills and Manage/mitigate ASAP
   - Do not hesitate to report a spill
6. Add/attach AHAs to the prep phase meeting checklists

- Begin Work (1430) on prep phase for Site 8 and MoC MWs
- Begin prep phase for TOL, PCB and As soil removal @ 1630
- Complete prep phase for Site 28 Sediment Mapping
- Removed Liner from part of Site 13
- 2 DUs @ Cargo Beach were sampled - Easternmost DU(10) was sampled in triplicate
  - The furthest west and the easternmost 2 DUs are complete

- GPS 2 DU corners @ Cargo Beach

End @ 1900(11)



7/8/2012 - Sunday NE Cape AFRW

34/20057 Foggy, Cool R. James

0700 Safety:

- Greta was loaded @ ~0500 this morning
- Fog - Be aware of traffic; Use Radios
- Prep for next boat today Moving flats around and loading bags
  - 3-point Mount/dismount
  - PPE- Vests - Stay Visible
  - Use spotters around the equipment and know the signals
- Landing Craft May return in ~ 2.5 - 3 days.

Objective:

① Pull bags from around site 31

② Prep bags for loading the next landing craft

③ Continue MI Sampling @ Cargo Beach

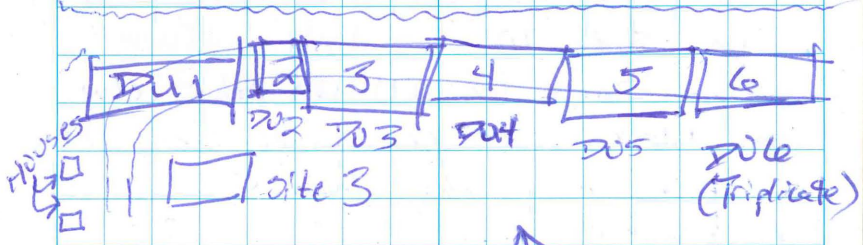
- Talk to Chuck about the APP
  - Has to go over the APP w/the crew
  - Mentioned the Equipment checklist is still needing to be done

- order Macrocore and Sludge Sampler from TTT
- order sleeves

- Prep phase meetings are held for:
① Site 8 MNA / Mac GW Wells
② Site 28 Sediment Mapping
- It was determined during the Site 28 meeting that a variety of tools will be ordered for probing the sediment, including:
ⓐ Clam Guns
ⓑ Macrocore Sampler w/sleeves
ⓒ Sludge Sampler w/sleeves
- The definition of sediment was determined to include any loose Material, ~~fine~~ Organic or mineral
- 0900 - Scanning prep phase papers and converting to PDFs
- 1400 - DU4 is Sampled @ Cargo Beach

Mac Wells Sampled today:
① 22MW2
② 20MW1

Note on Cargo Beach DUs:



Monday, 7/9/2012, R. James, NE Cape HITRW
Clear, Cool NNW Winds

0700 safety:
- PPE for cutting the poles
- Communications

Staff Meeting:
- Chuck discusses getting started on Site 10
- Says he will get the crew working on containerizing the poles and the debris

- Prep phase for Soil Removal is conducted
- All decision units are completed by 1200 hrs. 2 DUs were completed today @ Cargo Beach
  - photos of the final DU (the smallest DU) were taken. View is to the West
- Bering Air is scheduled to arrive this afternoon
- Bering Air Navajo arrives @ 1400 hrs
  - Murty Hannah, Dan Menslave and Abby depart the site, George Mack and Allen Dennis arrive

- 1430 - Begin MI Sampling @ the Bulk Bag staging area across the Road from the fuel containment within the MOC Perimeter Rd
- 1537 took photos of Lindsey sampling well 88-1
  - 20MW-1, 88-10, 88-1 and 17MW-1 were completed today
- [illegible] brought up some concerns about the SOW that he does not want to overlook:
  ① 3 SW sampling events associated w/Soil Removal @ Site 28
  ② Concrete Risers from MW should be used for backfill in POL excavations

R. James

Tuesday 7/10/2012 NE Cape HTRW

341200 57. Partly Cloudy w/Fog R. James

0700 safety: ① Medic is off-site, but a replacement is on the way
② Chuck presents the WP and APP to the crew. Goes through the APP point by point

- I Relay to SS Coley the information that Cranes passed on to me yesterday regarding the SW samples @ site 28 and the concrete debris associated w/the Monitoring wells

= Work on DQCR for 7/9/2012
- Visit site 28
- Excavations Begin @ Site 10 - Drums are found and some are pulled out and placed on ~~HR~~ a liner
- All MOC GW wells were completed today
  - 3 wells total
- Excavation @ site 10 began, QAR Cranes requested that excavated soil be placed on a liner

Wednesday 7/11/2012 NE Cape HTRW R. James

Clear, Cool 341200 57

0700 safety
- Eric Reads over the AHAs
Including: ① Debris Removal/Staging
② Vehicle Operation
③ Equipment operations
④ Drum Removal
⑤ Excavations
⑥ Equipment Operations
⑦ Contaminated Sed Removal

- Barge - Sam Toalet was loaded this Morning @ ~0700 hrs

- Environmental Team spent the Morning packing coolers for Shipping
  - 12 cooler will be shipped this afternoon: 9 samples from TU5 (MK Samples).
  - 3 SW samples from ~~the~~ ~~MOC~~ site 28 ⇒ Pre-samples for MOC dig
  - 10 GW samples from MOC GW Monitoring Wells

- COCs were sent to M. Hannah for QC/QA checks prior to shipping
- Bering Air arrives ~14:30 hrs
  - Coolers are shipped off-site on the Navajo @ 1440 hrs
  - Medic AMY arrived on-site
- Complete ~~Rock~~ for yesterday's work
- Bag loading frame is being installed @ Site 31
- Site 10 is uncovering >50 drums - Most are empty, but some have water/oil mix
  - photo taken
- There is some water in the Site 10 excavation at the Northern end. - Contains oil/sheen on the waters

3411200S7, R. James, Light Rain, low/no Wind
Winds North 1-2 mph, 47°F

0700 Safety Meeting

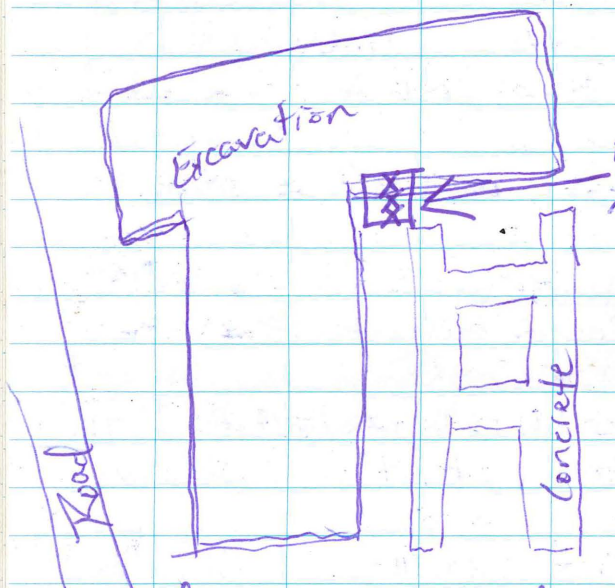
① PCBs Excavation PPE and Decon
  - setting up boot wash
  - Nitrile Gloves
② Excavator Safety - watch swing radius; watch out for Movement, Make eye contact

Staff Meeting

QAR Craner suggests Removing ~18" of Material from the floor of the excavations and 12" from the Sidewalls per iteration of Removal

- 0607 hrs email From Maureen Fitzgerald stating that the Nunaniq will arrive ~2100 hrs tonight

- Site 31 PCB Excavation Field Sample Locations



* Field Samples collected from excavator bucket to be submitted to the field lab

- More drums were uncovered @ Site 10. Containing oil and antifreeze. Chuck wants to ask USACE How they would like us to proceed w/Recovering the drums and the oil. It appears

that there may be more liquid than the scoped amount in the contract.
  - 5 gallon containers are being encountered w/oil and antifreeze
- 15 bags completed @ Site 31
  - 5 Samples (PCB) taken to the lab ⇒ 3 sidewall and 2 WC
- Site 10 Field Samples:
  - 10FS01 - 10FS09
  - 10SP01 - 10SP04
  - 10FS10 - 10FS18
- Site 31 Field Samples
  - FSW31-21 → BW3-22
  - 31-1 thru 31-3

- The Numaniq is loaded @ ~2100hrs

(10.5)

Friday 7/13/2012 NLS Cape Hatew R. James
34/2005 °F, High Clouds, Cool

0700 Safety: Slower is faster - Take the time to do it Right
- There was an issue w/ hydraulics yesterday on a piece of equipment
- GPS the spill this morning and take photos of hydraulic spill
- Croley indicates to cranes (QAR) that we will be reaching the contract limits @ Site 10
- Find out if we are prepared to sample Site 8

• 0800 GPS the hydraulic spill areas from the 988
① 1 area on the beach where sand has been piled up
② 1 area on Cargo Beach Rd between site 7 and the "Y" - This area consists of a linear shape ~6' wide - there is heavier staining where the 988 was stopped - the leak began as

the 988 was running down the road toward the Shop Pad and stopped when the forks Jammed into the Ground

• 1400 hrs - 13 DRO/RRO Sample Results were received from the Field Lab, 3 samples exceeded site specific cleanup levels and will require Removal:
① 10FS04 ② 10FS08
③ 10FS09

~1500 hrs - Fire breaks out @ the trash burner. A pallet next to the burner w/a tote containing trash sets Fire. The diesel fuel line running from 55-gal drum to the Eliminator sets fire and catches a 2nd fuel line (diesel) on fire that is connected to a 2nd 55-gal drum. L Kleppin noticed the fire and Kleppin and James

attempt to extinguish the fire w/fire extinguishers. SS Croley arrives and uses an extinguishes to aide K. Black also assists w/Fire extinguisher. The fire is put out. Some damage occurred to the trash burner (eliminator).

- Work on DQCRs and pass on to SS Croley for Review.

- Site 28 Proving is continuing
  - C. Kava is assisting Jutie

- Boeing Air King Air arrives @ 1715 hrs
  Jebb Atkins leaves the site
- 23 bags weighed @ Site 31
  - 19 FL Samples ⇒ 31-4 thru 31-22
  - 3 BW Samps ⇒ BW 31-23 thru 25
  1700 temp = 56° F; Wind 4 mph from E
- Begin Work on DQCR For today

End 1900 hrs (11)

/Fred James

High clouds, Cool, 31/20057

0700 safety ① ~~safety~~ Fire @ the trash burner - Be aware of what is being thrown away - Compress H_2O bottles empty aerosols + cans and note - Will have to order more fire extinguishers
② Give people room to work - If not directly involved, keep distance
③ Housekeeping is important

Science Meeting

- Re: Spill - Croley plans to send a sample of beach sand mixed w/hydraulic oil to the lab for "fingerprinting" the oil from the 988 loader
- POL Results received from the field lab.
- Printed out POL Form 265-E and passed on to SS Croley to fill out re: the fire @ the trash burner yesterday
- Completed the DQCR for yesterday and forwarded to Croley

- Work @ Site 31 continues today
- The surveyors are staking points @ Site 13 for PCB removal @ that site
- PCB sample Results 31-001 thru 31-018 Received from Field lab FW31-21 and FW31-22 were also Received
  - Samples 1, 3 thru 7, 10 thru 12, 14 and 18 remain above cleanup levels and will be excavated further
- 16 bulk bags filled @ Site 31
  - Ended on 31-28A

K. James, Rainy, Cool

0700 safety

- Rain - can affect concentration and awareness. Reduces visibility.
- Dress appropriately
- Safety Award - Lyndsey Kleppin

Science Meeting

- Corey mentions that Site 6 is opening up and is almost ready for MI sampling
- Crane requests that we put some room down @ Site 10 on the oily water.
- Crane Mentions SWPP BMPs and wants to make sure we have them in place
- Crane suggests adding:
  - # of poles that we have gathered to the DQCR
  - Weight 2 drums @ Site 10
    - Estimate the weight and add to the DQCR

- Complete DQCRs up through 7/14/12 and email to M. Welker, G. Jarrel, and J. Crane
  - Still have not sent USACE copies of DQCRs 1, 2, and 3 - Awaiting completion from SS Croley
- 3 BW samples from Site 31 were submitted to the lab (field lab) BW31-28-30
- PCB results received from field lab: 31-023; 31-040 thru 055, and BW31 023, 024 and 025 - 12 of 20 results are above cleanup level
- 1800- Work on DQCR for todays activities

End @ 1900
(11)

34 120 57. Cloudy, Cool

0700 safety

① PADS - Physical Agent Data Sheets - Chuck Reviews w/crew: ⓐ Heat ⓑ Cold ⓒ Noise ⓓ Lasers ⓔ UV Radiation

- SSMO Croley reads the cold stress PADS and heat stress PADS

② Keep equipment clean, especially the windows

Staff Meeting

- EB will continue @ Site 6 MI Sampling
- LK is guiding the excavation @ Site 31
- ECO-LAND is producing the Site 28 sediment Map
- 2 DU's were completed @ Site 6 - 2 samples collected to be analyzed for DRO and PCBs
- Bulk Bags are being hauled to the beach

- PCB sample results received for 9 samples (All Waste Characterization)
  - 7 were above cleanup levels (0.8 is our threshold for excavation)
  - of the 4 bags (H01, H02, H03, and H04) marked for haz waste, H02, H03 and H04 were all above 50mg/kg

Tuesday 7/17/2012 NE Cape HTRW R. James

34120057 Cloudy, cool. S winds ~20mph

0700 Safety

Winds-up to 25mph-Point vehicles into wind, open 1 door @ a time. Keep secure hold on doors. Good Housekeeping - Keep debris out of wind.

Staff Meeting

- Eric will sample @ site 31 (Field Lab) and then move to site 13 for PCB excavation

~0830 - Meet w/ J. Clark and J. Granes Regarding site 28 sed sampling - Decision is made to produce a draft sampling location map showing the proposed areas to be sampled. J. Clark will work on the map.

~1034 - SSW Winds 20-25mph
46°F, Wind Chill = 36°F

- Beginning excavation @ NW corner of site 13. Strong fuel odor
- Very high winds ~25-30 Mph

- Received PCB sample results 31-056 thru 31-075 from Field Lab, 8 of them will require over excavation 31-067 had the highest concentration @ 9.6 MG/kg

end Mod(11)

34/2005 T. Windy. Cloudy. Cool

0700 safety
- Winds - Eyewash
- Crane brings up an observation from K. Broyles regarding sampling from excavator and decon. Suggests placing the bucket on ground for both activities

Science Meeting
- Eric Requests J. Allen survey a few items - site 13 and site 6
- Excavation Continues @ site 13
- Security Aviation arrives @ ~1230
- Aaron Shewman arrives and Crane departs

Thursday 7/19/2012 NE Cape HTRW

3/12005T R. James, Cloudy, Fog, Cool

0700 safety

- Fog/Rain - Affect visibility. Keep windows clean
- Keep vehicles away from the work site. Allow workers room to work.

- Request that Aaron receive the emails from the lab.
- Complete DQCR for 7/18
- Excavation @ Site 13 - Results are received from Site 13 w/ some hot spots that are excavated
- Soil sampling continued @ Site 28
- Bags are hauled to the beach

- 37 total samples collected @ Site 28
- Landing Craft was loaded @ ~1300 hrs. Greta took 20 flats

R. James

3/12005T, Partly Cloudy, Cool 45-50°F

0700 safety

① Vehicle - Equipment safety. Walk around inspection. Secure loads in back of trucks. Be aware of parking area. Check attack packs for proper equipment. Don't walk up behind operators.

- Landing Craft is loaded this morning @ ~0530 hrs - Takes 12 flats 20-Island (Nunania)
  - Crew loaded on short notice
  - E. Barnhill lead the safety Meeting
- Site 13 excavation continued
- Site 28 soil sampling was completed
- Bering Air arrived ~1800 with groceries. K. Black left the site.

R. James

34120057, Partly, Cloudy, Cool, 45°F
Calm North Winds 0-5 mph

0700 Safety
- Communications-Use radios, relay messages
- Hand Signals-Make them clear and if unclear, then find out what the signals are

Objectives: ① Sampling @ site 13
② Begin Excavation @ the A1 Hot Spot

- Hot spot @ A1 (11NCMOC50068) is being uncovered. Curtain liner is intact.
- Fuel pipe @ site 13 shows stained soil beneath. Will require excavation/Bagging
- G+H Plume excavations began-Water infiltrated excavations. Water levels & excavation depths were surveyed

Sunny, clear, cool NE Wind 1mph 34120057
44°F

0700 safety
- Use boot wash outside the wash tent
- Keep up the good communications, especially in the tight areas
- Mel Bryant got the safety award for making sure people were clear of equipment during bagging operations

- Groundwater is visible in the deepest parts of the site 13 excavation.
- Excavation plan is discussed w Aaron Shewmake.
- Excavation depths are approaching or exceeding 15' in some places. Aaron will find out if further excavation will be necessary

Monday 7/25/2012 NE Cape HTRW R.James

34120057 Foggy, Cool 44°F W Winds 2mph

- 0330 hrs - loaded the Sam Tanlak w/21 flats (42 bags). Took off 160
- Ask Aaron about Screen plant
  - He requests screening the dry stuff

0700 Safety ① Fog - Radio Communications
② Bag, Pol e Pad 98 - Keep aware of surrounding equipment

Staff Meeting
- Aaron requests screening of dry Pol Soil
- Lyndsey recommends keeping a distance from the AI excavation
- Pol excavations @ Pad 98 today
- Winds steadily increasing throughout the day, becoming South 20-25mph w/heavier gusts.

Tuesday 7/24/2012 NE Cape HTRW R. James

34120057 Strong South Winds 20-30mph

0700 Safety
① Winds - Point vehicles into wind. Hang on securely to door handles
② Watch for children, especially near the fish camp.

Objectives
Bag PCB and Pol soils @ Pad 98 and site 13
- The concrete utilidor is removed from the site 13 excavation
  ⇒ Will be wipe sampled

Wednesday 7/25/12 NC Cape HTRW

341200S7. Rain, S Winds 20-30mph

R. James

- 0400 Sam Taalak - ~~FP~~ 22F flats

0700 safety

① Poor Weather - strong winds around 30 mph - was gusting to 50 m/h overnight - Wears PPE and have secure rigid on doors

Objectives: ① still have some ~~spots~~ to dig @ site 13, might move up to site 31

② Poc Results will be delivered early this morning.

- Confirmation samples collected from A1

Thursday 7/26/12 NC Cape HTRW R. James

341200S7 Light Rain

0700 safety

- Individuals adding commentary about safety

① More hands helping when it's windy is helpful

② Don't throw trash to get it out of the way

③ Keep hard hats on at all times

④ Always use spotter

⑤ Eye Contact ⑥ Always let excavator operator know when a bag is ready to be loaded

⑦ Mark the excavations

Objectives:

① Bag @ Pad 98

② Test pits to find water levels at G Plumes ③ Re-run some material through the screen plant

④ MI Sampling @ the MEC Bags staging area south of the fuel containment

QAR - A. Shewman instructed Bristol to proceed w/PCB excavations @ Site 13 and 31 to attempt to clean up the sites. USACE will fund the operation by transferring Money from the POL quantities (converting the quantities to PCB)

- Sam ~~Tuck~~ Tadak loaded @ 1900 with 22 flats (44 bags). 10 flats w/no bags were sent off-site.
- Confirmation samples were collected from G ~~and A~~ plumes
- 3 PCB samples (13-200 thru 13-202) submitted to the field

Friday 7/27/12 NE Cape ATRW R. James

34120057 Rain, Winds S 14 Mph 47°F
Wind Chill - 39°F

0700 Safety

① Prepare for Rain & Wind
② Camp courtesy - visitors must be accompanied and start leaving camp @ 9:00 pm

- Landing craft is expected to arrive @ ~ 0700 tomorrow Morning
- PCB results are expected @ ~ 1000 hrs
  - print a copy for Aaron

- Field Lab results received from the field Lab ~ 0930 hrs. There are additional locations @ site 13 that will require excavation
- Bulk Bag operations @ 1300
  - start w/Bag MOC - 111F

Saturday 7/28/12 NE Cape HTRW

R. James, Cloudy, ~45°F Low Wind

- 0630 hrs - head to Cargo Beach to load bulk bags onto Sam Taalak
- Excavating @ site 31
- Loading bags @ Pad 98

~~MOC-10811~~ MOC-10889 was punctured - Will be loaded into another bag.

- Running material through the screen plant @ Pad 98, the reject material appears to have quite a bit of fines attached to it and the machine is a wet, dirty, mess

(10.5)

Sunday 7/29/12 NE Cape HTRW R. James

341200S7 Rain, N Winds 20mph 44°F Wind Chill 34°F

0700 Safety

① Admin announcement - Put hours worked @ each site on timesheets

② Material that goes into bags is variable, we have to adapt our strategies

③ Safety Award, 2 ppl - Jake Winslow and Bruce Sonneves

④ Wind chill is in the 30's

Staff Meeting:

- Keep on @ site 31 and Pad 98
- Results will come in this morning from G Plume

- Winds are blowing 25-30mph @ 0715 hrs

- 0815 hrs - 20 PCB results received for site 13 - 4 of the samples contain PCBs in excess of cleanup levels

- 0830 hrs - POL Results received from the field lab from samples collected in the G2 excavation - Of 15 samples, 7 were above cleanup levels and will be excavated further

— 46°F @ 1730 hrs
NW Winds 10 - 20 mph —

3412 0057, Clear, light SW Winds Cool

0700 Safety

- PPE - Level D. Wear appropriate gear, clothes, etc... If you need to change clothes or gear, then do it.
- Stay warm, stay dry, stay comfortable
- Aaron requests a ride to the Radar dome sampling site. Will take some UTVs up there today
- Excavation @ Site 13 - 2 ft bags filled. Field Screening samples collected
- Dozer makes a way up to the radar dome. A. Snowman and I take a UTV up to the Radar dome road and inspect the site for stressed/bare vegetation.

End 1730 hrs
(10)

K. James

Tuesday 7/31/12 NE Cape HTRW R. James

34120057. Clear, cool 45°F

Winds 10mph East

0700 Safety

① Heat and Cold Stress - Hydration, not only water, but juice, eg. orange juice Replenish the electrolytes and sugars

- Visitors will be on site today, ERR Cranes will return and A. Shewman will leave

Objectives: ① Bag Pcb-soil @ Pad 98

② Collect PCB samples @ site 31

Note: A. Shewman asks about the DUs @ the Bag Staging area south of the fuel Containment. Does it need to be expanded? or do additional DUs need to be added? Ask Curtis vic Jeremy

- Security arrives @ 1245 hrs

Arrive: Carrie Cossaboom, G. Jarrell, Bill Burke, J. Clark, J. Craner, Curtis Dunkin

Leave: C. Cossaboom, Aaron Shewman

Wednesday 8/1/12 NE Cape HTRW R. James

34120057, Partly Cloudy, no wind

0700 Safety

① Visitors on-site - Introduces Curtis Dunkin, Bill Burke, Greg Jarrell

② Heavy equipment has the right-of-way

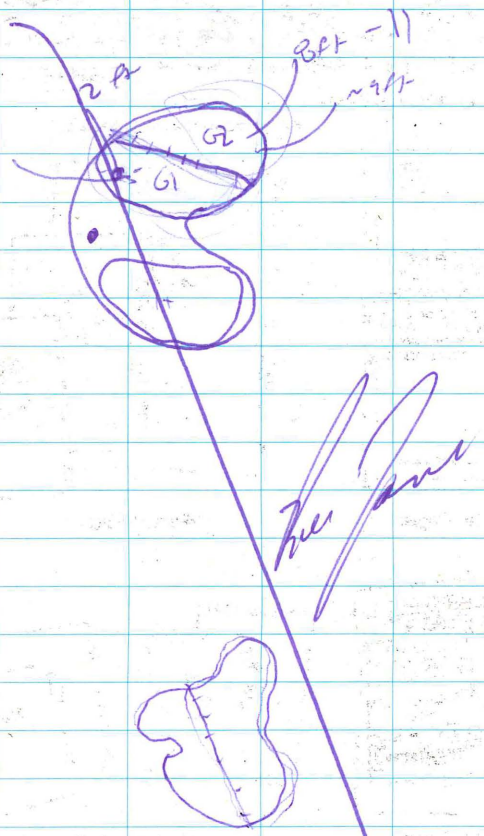
- Visit site 31, 13 and MOC w/Craner and Dunkin
- Note @ MOC - Water elevations over time - Report these numbers
- ~~Visit site 13 w/ Cu Rd~~
- Visit the Radar dome Road w/ Dunkin and Craners. Curtis recommends collecting the samples directly along each side of the Road and to collect approximately 2 background samples in the vicinity.

 Thursday 8/2/12 NW Cape AIRW
R. James. Cloudy, No Rain, Low Winds

0700 Safety
- Fog-Use Radios
- Slow this Morning-New POL excavation will be opened
• Directions for correlation Sampling @ Field lab for PCBs received.
Correlation Samples (PCB):
~~BW31-1406~~ RS
~~BW13-50~~ RS
~~31-144~~ RS
~~31-178~~ RS
~~31-207~~ RS

- The PE Sample (known PCB concentration) is submitted to Field Lab.
- DQCRs complete and handed over to Craner for comments @ 1300 hrs.
• E plume is being excavated
- Beginning today.
- Drums @ the north edge are going to be removed

• Northeast Side of E4 plume has product on the water and spilling in from the sides
• ~15 drums were recovered from North of E plume, one contains product ~45-50 gallons



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"Rite in the Rain"®

ALL-WEATHER

FIELD

No. 351

Russell James

NE Cape HTRW

Bristol Environmental Remediation

W911KB-06-D-0007 Task Order 0007

W911KB-12-C-0003

8/3/2012 – 9/7/2012

Book 2 of 3

"Rite in the Rain®"
ALL-WEATHER WRITING PAPER

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Project NE Cape HTRW Remedial Actions
Project No: 34120057
Contract: W911KB-06-D-0007, Task Order 0007; W911KB-12-C-0003

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Friday 8/3/12 NE Cape HTRW R. James

34/20057, Fog Low Wind

0700 Safety

- Proper tools for the jobs.
  ex: Chaps last year
- Steps vs. Chains - ex: Using chains for weighing at Cape Jafe. Generally will not use chain for hoisting
- Check Radios

- Will load a 55-gal drum into overpack today
- Watch out for excavations @ the MOC and Site 31
- Short time today @ 31 and then crew will be bagging @ Pad 98
- Complete TDRs for 7/31 and 8/1 and email to distribution list.

Saturday 8/4/12 NE Cape HTRW R. James

34/20057, Fog 46°F. Winds 2 mph West

0700 Safety

- Transition day.

- Yesterday's Field Samples:
  - 31-215 thru 238
  - BWMax 122 thru 126
- New stockpile area (POL) is being sampled today
  - Liner is laid down
- Bagging @ Site 13
- Excavating E4 into E3
- 18 Confirmation samples collected @ Site 13

Weather 1700 hrs: 49°F NW Winds 5 mph

Sunday 8/5/12 NE Cape HTRW

R. James 3412005T, Cloudy, cool 40°F, 15-20 mph SW Winds

0700 Safety

① Bagging operations. Be aware of equipment and traffic

Objectives

① Confirmation samples @ Site 13

② Excavate POL ③ Bag POL @ Pad 98

Yesterday's Field Lab Samples:

31-156, 31-150, PE Sample
E4-041t thru E4-074
G2-38 thru G2-47
PSP-1 thru PSP-31
13-248 thru 13-255

- Sustained wind ~30 mph in the morning. Much higher gusts
- Excavating the E3 plume + hauling to Pad 98
- Confirmation Sampling southern excavation @ Site 13
- Bagging @ Pad 98
- Surveyin @ E Plume
- 1245 hrs Avg Wind Speed in Camp = 30 mph SSW

- End shift @ 1530 hrs due to high winds (weather)

Todays Field Lab Samples:

E3-01 to E3-03 - POL x 3
BW MOC 127 to 129 - POL x 3

(10)

Monday 8/6/12 NE Cape ATRW R. James
34/20057, cloudy 46°F

0700 Safety ① Close proximity work - Be aware
② worker got sand in eye and didn't use eye
wash - use eyewash right away don't try
to rub it out

Notes: ① Survey stockpile of overburden &
the MOC to get the volume.
② Ask Jamie for a map of the H Plume
w/confirmation locations
③ Ship PCB samples today
④ South excavation @ 13 has been sampled
⑤ Excavations yesterday @ G2 locations
⑥ Incident forms have been filled out for
Scott and will be given to USACE

- Correlation Samples are collected
and packaged for shipment to
lab. Sample IDs:
① 12NCCRPE ② 12NCCR31-196
③ 12NCCR31-204
④ 12NCCR31-150 ⑤ 12NCCR31-156
⑥ 12NCCRTSW31-40

- Samples will be shipped to
TestAmerica and analyzed for
PCBs. Results will be
compared to these Results
received from our field lab.
- Bering Air arrives @ 1400
- Richard Losche leaves,
R. Dean Pearson leaves
- Scott Kingeekuk arrives
and Paul Money arrives
- Rec @ Pad 98
- L Keppin is collecting Confirm
samples @ G2
- Turn in 2 WC samples from MOC
to lab - DRO

- 030-043 @ G2 Confirmation

8 Tuesday 8/7/12 NE Cape ATRW R. James

Clear, Cool - N Winds 5-10mph 341/20057

47°F

0700 Safety

- Moderate weather for the next couple days - temps will be relatively high. Keep sun glare off the windows and keep them clean.

Objectives

- Bagging @ Pad 98
- PCB confirmation Sampling

0715 Winds 12 mph N, 47°F

- Waste characterization sample collected from oil drum @ 1400
  - 12NCDRUM01 - will be analyzed for DRO/RRO, TCLP VOC/SVOC, TCLP Metals, Ignite, corrosivity

1730 Weather: N wind 4mph, 51°F

Wednesday 8/8/12 NE Cape ATRW R. James

341/20057 Clear,

No Wind, 48°F

0700 Safety

- Nice day - Stay Cool in Tyvek
- PCB Bagging

Objectives:

① Confirmation sampling of Floors @ the E Plume, Sidewalls @ the G Plume

② Prepare PCB samples

③ Excavate @ Site 13

Note:
- Mid-Construction MOC SW samples
- Containment water sample

- Package PCB samples and Oil Samples for shipment

- Met w/Cranes this morning regarding:
  - ① Radar Dome Road - proceed w/ sampling
  - ② Rock (large) sampling - still unsure if this will be done - Await further decisions

⑤ Backfill of G and H - the sites will be backfilled this year

④ Debris and concrete @ site 13 - will be backfilled into the excavation deeper than 6 feet

⑤ Grassy area of E3 plume, west side - will not be excavated at the moment - may be part of site 28 instead

⑥ Arsenic cleanup level @ site 21 - USACE wants to investigate whether it should classify as soil or sediment

⑦ Site 28 Removal methods - proceed as planned

1400 Boring Air

Thursday 8/9/12 NE Cape HTRW M. Faust
34120057 Clear, 43°, 10 mph wind

0700 Safety meeting: Another nice day, watch the wind, eye protection. Watch each other
Objectives Continue to dig on the E plume, dig up hot spots @ site 31

Today we took soil out of 31 & we stacked field screens. Also took POC soil of of E Plume excavation & bagged soil off Pad 98.

1700 Temp = 58°F Wind Ave 7mph

Friday 8/10/12 NE Cape HTRW M. Faust
3412 0057 Cloudy, 48°F, Ave wind 8 MPH

0700 Safety meeting topics include scalloped rain showers forecast for today, keep rain gear handy even if you're not wearing it all day
Objectives Bassing dirt off of Pad 98, setting up a load frame @ site 21
~~Start~~ Work removing drums/ debris @ site 10.

Site 10 removed 5 x 55 gallon drums into 85-gallon over packs. Some antifreeze, some orange or blue liquid, some clear. All mostly full. Also 10 x 55 gallon drums into a containment area (out of over-packs) rissed on a platform. All @ least partially full. Also 7-8 ~~4~~ oil buckets, & 3 drum remnants.

~~Fri~~ Saturday 8/11/12 NE Cape HTRW
M. Faust ~~Scattered Showers~~ Cloudy
54°F, Ave Wind 11 mph -55, 9 ~~mph~~

0700 ~~Safety Meeting~~ wind, eye protectors
Objectives Bassing go-backs @ sites 13 & 31, bassing PO2-soil @ Pad 98
1200 Lunch
After lunch, @ Site 31 observing removal operation
1730 Dinner, end of shift

Sunday 8/12/12 NE Cape HTRW M.Faust
34120057 Foggy, 45°F, winds Ave 3mph

Safety Meeting — Close quarters, w/ lots of heavy equipment, Watch out for others

Objectives — May be some sampling of G plume DIs & sites 13 & 31, bagging @ Pad 98

1200 Lunch
After lunch, helping Eric sample MOC enpoundment as well as Lyndsey do stock pile sample

1730 End of day

Monday 8/13/12 NE Cape HTRW M.Faust
34120057 Light rain, 51°F, wind Ø

Safety Meeting — PPE for dealing w/ drums: Tyvek if needed, hand protection due to sharp metal edges.

- Bering Air Beech 1900 arrives @ 1600 hrs
  - R. James, R. Losche, J. Majors, and J. Arms arrive
  - E. Barnhill, A. Smith, M. Faust, J. Orarck leave the site @ 1630 hrs

- 57°F - S winds 15 mph

16 Tuesday 8/14/12 NC Cape ATRW R. James

34/20057 - cloudy, S winds

0700 Safety

- Prepare for winds, they are supposed to build over the next couple days. 15-30 mph today.
- Be careful around doors. Park into wind. Be aware of Connex doors.

Objective: Bag loading @ Pad 98 - watch out for dust/dirt blowing in wind

- Site 10 - Waste Sampling for drum oil and soil Sampling
- Review QAPP Comments from USACE
- Populate Bulk Bag and Field Lab sample spreadsheets
- Work on DACR for 8/13/2012
- Note: Liquid drums should be labeled; Consolidate the open top's liquid into bung tops
- Sampling - Field Lab Sampling @ E Flume

Tim James

Wednesday 8/15/12 NC Cape ATRW R. James 17

34/20057 - Cloudy, Very Strong S Winds

55°F, Avg S winds 25 mph

@700 Safety

- High Winds this Thursday - Wind is gusting to 50 mph.
- Will try to get some work done, but primarily, stay safe.
- Will work site 21 - 5 bags - prepare w/wind shelters
- Excavate E and haul to Pad 98
- Will chase PCBs @ 13 and 31

Note: check when the SW sample @ site 21 should be collected, before or after excavation

- Wind Gusts to 50 mph
- 5 bags filled from site 21
- Field Crew shift ended @1200 hrs due to weather. - Winds gusting to 40 mph
- Complete DACRs

Tim James

18 Thursday 8/16/2012 NE Cape HTRW R. James

34120057 ~ Mostly Cloudy, Strong S winds

0700 safety

- Secure the work area - yesterday's winds hit at least 76 mph - a connex was blown over @ the MOC
- Assess all work sites for wind damage and take note
- Check if anything was blown away

Objectives: ① Remove POL soil from the overburden stockpiles that were high for DRO/RRO

② Excavate PCB hot spots

Note: Check for PCB confirmation sample Results

- NALEMP will be here Monday

Drum Contents

DD1 = Mangled drum; Minimal soil (~ 55-gal - Odor

DD2, Yellow Overpack - Empty, cut drum w/very Minimal liquid

- Bulk Bagging POL @ Pad 98
- Excavating @ Plume
- Bering air @ 1830 - Maze Thompson & Gary (Camp Maint) arrive. Talia leaves

Thor James

Friday 8/17/2012 NE Cape HTRW R. James 19

34120057 - Partly Cloudy, 47°F

Wind - 3 mph South

0700 safety

- Winds predicted to switch to North
- Rain predicted - Keep Raingear on hand
- NALEMP will be here next week and will use 1 vehicle

Objectives: Bag - Pad 98 and Excavate @ E. Plume

Note: Arsenic Samples were shipped to TestAmerica Yesterday

QAR Comments

- Carey re. Site 10 drums
- POL floor confirmation samples

- MW 88-4 was decommissioned/ Removed - Bentonite Slurry used
- MW 88-5 will be decommed
- ICOMW01 will also be decom'ed

Thor James

Saturday 8/11/2012 NE Cape NTRW

R. James - 34120057 - Mist/Rain, High ~~RF~~ winds
E winds - 18 mph - 50°F

0700 safety

- Wind + Rain - keep rain gear on hand - stay comfortable and hydrated.
- Fuel Containment was reconstructed yesterday - Maze thanked the crew for job well done
- Note: check on SP sample Results
- Informed Crew of PCB results

Site 10 Sampling - Soil

GRO, VOCs, DRO/RRO, ~~PAHs~~, PCBs, Metals, Glycol

1. 12NC10SS01 @ 1500
2. 12NC10SS02 @ 1530
3. 12NC10SS05 @ 1540
4. 12NC10SS04 @ 1550
5. 12NC10SS05 @ 1555 Dupe: 18 @ 1705
6. 12NC10SS06 @ 1600
7. 12NC10SS07 @ 1610 (MS/MSD)
8. 12NC10SS08 @ 1615
9. 12NC10SS09 @ 1620
10. 12NC10SS10 @ 1630
11. ~~12NC10SS11 @ 1635 RJ~~

~~12NC10SS12 @ 1640 RJ~~

1730 - Return samples to Enviro Comm
- label 12NC10SS07 MS/D Jars
- Complete DQCR and email to Group

End 1900

Rob James

Sunday 8/19/2012 NE Cape ATRW F. James

3412057 - Windy, Misty, 43°F, 32°F Chill
N Winds Avg 20mph

@700 Safety

- Safety Award - Allen Dennis and Dale Winslow - Efforts during the windy day
- Weather - High winds and cool temps
- Keep up good Radio communications and general communications
- Feel free to contribute project ideas to the Foreman or SS

@Objectives: ① Site 10 Soil Sampling ② Remove the hot spots from the Pol stockpile ③ PCB removal @ Sites 31 and 13

- Work on DQCR 047

1300 - Follow up Inspections for:

① Site 8/Mac GW
② Soil Excavation
③ MI Sampling

- Prep Phase held for:

① MW Abandonment

Field Lab Samples:

3 x PCB Field Screen ① 13-277, BW 13-57+58 (Bulk Waste x2)
→ WAL-293+294

Fall James

Monday 8/20/2012 NE Cape ATRW

F. James, 3412057, Partly Cloudy
43°F, SW Winds 5 mph

0700 Safety

- Various small projects today - wear the appropriate PPE and have it nearby, including Rain Gear
- New arrivals to camp today
- Site 10 was sampled yesterday

Objectives: ① PCB field Screening samples will be collected

Note: Think of survey needs

1440 - Bering Air arrives - NALEMP Crew arrives on site. E. Barnhill arrives

- Stockpile Pol Field Lab samples were collected
- Site 13 PCB Field Screening Samples were collected
- 2 confirmation samples collected from the floor of the E excavation
- Flats are arranged on the Beach

F. James

Tuesday 8/21/2012 NE Cape HTRW R. James

34120057, S Winds strong, Cloudy. Mist
S Winds 24 mph, 48°F

0700 Safety

- Wear Tyvek and Nitrile Gloves during drum removal @ site 10
- Be aware of wind

Objectives: ① Drum Recovery - Windblown/ Sandblasted drums recovered from Site 10 are marked electrical insulated Oil.

Note: Samples need alternative shipper

Note: Barge may be offshore early tomorrow morning - Flats will be staged at the beach in prep

- Site 10 - Drums are being recovered - Clear Oil is recovered - Suspected as Electrical Insulating Oil - Can Read ~~SUE~~ as much on one of the old drums - Sample is collected
- Boot washes are brought to the site
- 11 liquid drums as of 1400 hrs plus one old drum filled w/ oil

49°F @ 1730 - End - ~~Tail Lame~~

Wednesday 8/22/2012 NE Cape HTRW

R. James, 34120057 - 47°F, S Winds 13 mph

0700 Safety

Objectives: ① Site 10 Drum Removal/Prep
② Build Flats @ Beach
③ Prep Samples for shipment (E Plume floor samples)

- Additional Drums and Gas Cylinders are in Nome - May have to be Air Freight out here

Field Lab Samples Yesterday:
E100 - 15 70 from E Plume excavation

- Site 10 Drums pulled from the excavation including 50/10 wt oil and solvent - Alcohol Smell

Tail Lame

Thursday 8/23/2012 NE Cape HTRW

R. James - 3412005Z - 40°F - 3mph SW Winds

0500 - Load Sam Taalak w/ 25 flats

Site 31 Sampling
- Discuss Rock Sampling w/ A. Shewman
- Site 8 sampling - 1 SW sample and LDU is completed
- Site 10 drums are being cut and loaded into overpacks
- Mark Site 10 drums
- 1630 - Load 25 flats on Sam Taalak
- Rain in the afternoo ~1630
  - Winds S ~20 mph
- 2nd SW sample collected @ Site 8
- Sam Taalak returns @ 1845 and is loaded w/ 25 flats
- AI Excavation was backfilled today

[signature]

Friday 8/24/2012 NE Cape HTRW R James

3412005Z, Cloudy, Cool, S Winds 25-30 mph

48°F - Avg Wind 29 mph South

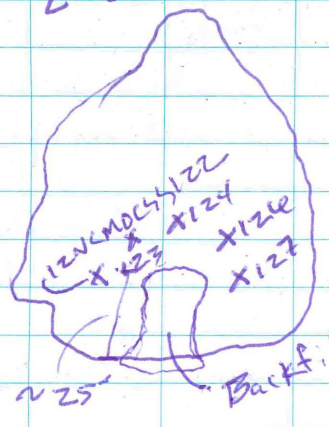
0700 Safety
- High Winds - Big storm across Bering straight/Norton Sound areas
  - Protective Eyewear - Keep it on
  - Keep trash picked up

objectives: ① Site 10 Drum cutting
② Backfill Haul
③ Stockpile Hot Spot Removed
④ PCB Confirmation Samples @ 31
⑤ Survey bottom of excavation

Note: Look into Hach Kits - Do they need calibration or SOPs?

Confirmation Sampling @ E Plume
Analyzing for DRO/RRO
@ 12NCMOCSS122 @ 1550
- Gray Moist Clay - from beneath groundwater - moderate odor
@ 12NCMOCSS123 @ 1556
- Beneath water - Fine sand w/ organic clay

E- Excavation



③ 12NCMOC124 @ 1600 - dupe is 125
④ 12NCMOC126 @ ~~1610~~ - MS/D
@ 1612 hrs
⑤ 12NCMOC127 @ 1620
- All beneath GW - All a gray silty clay

(11.5')

34/20057, Partly Cloudy, Windy
98°F, 14 mph SW Winds
0700 Safety - Tyvek, gloves and hearing protection @ the drum cutting @ Site 10

Objectives: ① Site 10 Drums
② Excavation Backfill
③ E Excavation Floor Confirmation sampling
④ Site 13 PCB Removal

0800 - Load Sam Taalak w/25 Flats

- Radar Dome Road Sampling
12NCRDSS01 @ 1445
12NCRDSS02 @ 1450 } Brown sandy silt, some gravel
- Duplicate SS08
Sampling for GRO, BTEX, ~~TRO/RRO~~, PAHs, PCBs, Metals
12NCRDSS03 @ 1510 - MS/D
12NCRDSS04 @ 1525
12NCRDSS05 @ 1530
12NCRDSS06 @ 1535
12NCRDSS07 @ 1540 ← Background

- 1830 - Load Sam Taalak w/25 flats
- 2100 - Sam Taalak Returns for another load of 25 flats
- Loaded 3 loads onto the Landing Craft today - The Sam is passing (pass-pass) the flats to the Port & Joe Barge in Kitnayak Bay and returning to the Beach (cargo Beach)
- 150 flats have been loaded since the Sam Taalak and the Barge arrived on 8/23/12

(13)

Sunday 8/26/2012 NE cape HTRW
3412005 7- Clouds/Fog, Cool R. James
45°F - W Winds 6 MPH

- 0500 Hrs - Landing Craft loading - 25 flats

0700 Safety
- Complacency
- Site Hazards

- 0830 hrs - Landing Craft - 26 flats - This completes the Barge's goal of 200 flats since 8/23. The Barge will leave and the Sam will pick up one more load on this evening's tide @ ~1900 hrs
- E excavation Backfill
- Site 13 excavation
- POL Excavation @ Pad 98
- Silt Fence Install North of E Plume - Boom was placed in the E-Excavation
- 1900 hrs - Sam Taalak returns - 9 flats, some debris containers and Fuel ISOs are loaded

Monday 8/27/2012 NE Cape HTRW

R. James - 3412057 - Clear, Cool

10Mph SW Winds, 78°F

0700 Safety

- Nice Weather - Bagging Operations - Stay Hydrated
- Keep good Communications
- Safety Award - George Mack

Objectives: ① POL Removal @ G Plume
② Sample Shipment

0730 - Mark the Hot Spots @ the G Plume for Removal
- overburden will be Removed and then contaminated soil will be hauled to Pad 98

0800 - Pad 98 POL Bagging
First bag will be PQ2 B

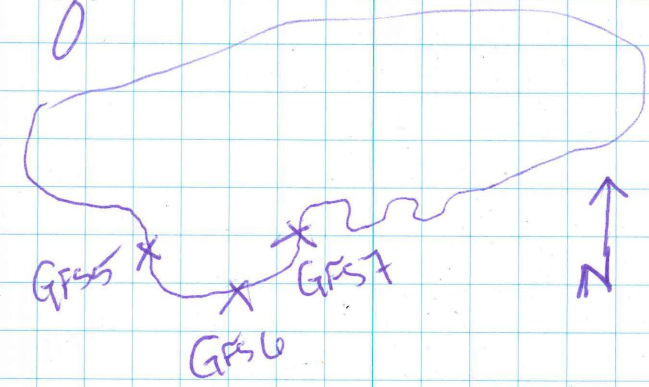
Field Screen @ G

- Field Screen Samples GFS1 and GFS2 collected directly above water level - Mix of Gray silty clay and a brown sandy soil
- GFS3 - Gray, wet mix of sand, silt, clay
- GFS4 - Brown sand mixed w/ gray clay

1015 hrs - Pad 98 - MOC193C is filled

1045 hrs - Sample MOCBW193 - for Field Lab - DRO/RRO

Field Screening SW Corner of G excavation



1130 hrs - Bering Air arrives - CASA - Bags Arrive

1400 hrs - Bering Air arrives
- Jitendra Patel, Medic arrive
- John Majors and Paul Monroy left the site

1800 - Enter weights from today's bags

Tuesday 8/28/2012 NE Cape HTRW

34120057 - Fog, Cool, 45°F R-James

0700 ~~Safety~~
- Weather - High winds in the forecast
- Keep aware

Objectives: ① Fol Bagging @ Pad 98
② Excavate E Plume
③ Site 8 Sampling

- Eric and Charles collected water samples from ~~the~~ all DUs @ Site 8

- Excavation @ E
- Bagging @ Pad 98
- Bags were hauled from Site 6 and staged on flats @ the beach ~ 15 flats were built from 12:30pm to 5:30pm

 Wednesday 8/29/2012 NE Cape HTRW

R. James - Job no: 34120057, Misty, Cool
46°F, 10 mph NE winds

<u>0700 Safety</u>

- Watch out for traffic on the road to the beach
- Winds turning to the North

<u>Objectives:</u>

- Continue Bagging
- Build Flats on Beach

- Building flats on Beach
- Hauling Backfill
- Load bags @ Pad 98
- Bering Air ~ 1830 hrs
  - Suzanne Lovell, Jamison Allan, Ryan Pomrenke arrive
  - Rhonda Nicazio and Charles Kava leave

[signature]

Thursday 8/30/2012 NE Cape HTRW

Job No. 34120057 - Cool, Clouds R. James
42°F - W winds 13 mph

<u>0700 Safety</u>

- High winds from N today - predicted to gust to 40 mph
- Take care entering/exiting equipment and vehicles
- Return tools/equipment ~~to~~ where you got them when you're finished using them.

<u>Note:</u> Survey: ① PCB ~~field screen~~ Confirm sampling ② G Hot Spot (049) ③ Overburden stockpile ④ site 8 DA Corners and Samp locs ⑤ G Plume extent ⑥ Water levels

1245 hrs - Bering Air CASA arrived - Bags + Compressed Gas
1500 Bering Air CASA
1520 - Bering Air and Security Aviation leave
- 1700 weather - 14 mph NW winds 41°F

- Bering Air CASA @ 1750
  - 11 bags, 160 Liners

Friday 8/31/2012 NE Cape HTRW

R. James 34120057 - Light Rain

NW Winds 24 mph, 39°F

0700 Safety

- Lab Safety - stay out of GC Room and Extraction Room
- Cold Stress - PADS

Objectives:

① Stage floats on Beach
② Dig Hot spots @ G and E

Bering Air Navajo @ 1500 w/Groceries - E. Conway left site

- Bering Air @ 1545 CASA Drums and Bulk Bags
  - 3 single Bags, 23 on 2 Pallets
    26 total Bags today received

1715 hrs - NW winds 17 mph 40°F

Saturday 9/1/2012 NE Cape HTRW
K. James - Job 34120057 - 39°F
WNW winds 15 mph
0700 Safety ① Sleep
② Be flexible w/work activities
③ Excavator Safety ④ PPE
⑤ Radio Communication
⑥ Be prepared ⑦ Equipment Check
⑧ Communicate objectives
⑨ Slower is faster
Objectives: ① Bagging @ Pad 98
② Haul Bags to Beach

Yesterday's Field Lab Samples:
- G51 - G56 - For Field Screen
- BWMOC205 - BWMOC207

1100 hrs - Checking liquid drum contents @ Site 10.
Drum D20 = Amber Oil, low/no odor
D19 = lightweight clear oily? liquid - thicker than water
D18 - Thick viscous amber oil w/alcohol odor
D13 - watery appearance, alcohol odor

D14 - clear, oily water appearance
D15 - Heavy amber oil, alcohol odor
D16 - Dark Brown, black oil/H_2O mix, oil odor
1200 - lunch
1230 - Sample from the G excavation sidewall
- Bulk Bagging @ Pad 98
- Hauling Backfill to MOC
- DQCR 60

Drum Samples
① KNC10DM20 @ 1600
② 19 @ 1610
③ 18 @ 1630
④ 17 @ 1650
⑤ 16 @ 1715

Field Lab Samples
E83-95 (13) \ 16 Field Screen
G57-59 (3) /
BW MOC 208 - 211 (4) Waste Char
DM 16, 18, 19 (3) Waste Char
↳ Water - can't be analyzed

Sunday 9/2/2012 NE @ the time
R. James - 34/2005-7, Partly Cloudy 38°F
E Winds - 6 MPH
0700 Safety
Safety Award - Allen Dennis

- DOCR
- Backfill East side of E excavation
- Backfill E excavation
- Pump Drums @ Site 10
- Stack flats @ Beach

Drum Sampling @ Site 10
DM21 - Trichloroethylene @ 1520
DM22 - oil/water @ 1535
DM23 - Milky liquid @ 1545
DM24 - oil/water Mix @ 1600
DM15 - Honey-like, sticky Amber oil @ 1610
DM14 - Pink, low viscosity liquid @ 1625
*DM13 - Alcohol - Similar to DM10 @ 1635
DM12 - oil/water Mix @ 1645
DM11 - tan oil/water mix @ 1700
*DM10 - Alcohol, Like DM13 @ 1710
DM09 - Amber Oil @ 1720

Will combine 22+24, 10+13, 12+11
Will be analyzed for DRO/KRO, Total Halogens, Metals, Flashpoint, PCB's,

VOCs, Corrosivity and Glycol
- Will be 8 samples from this group DM21-24, 9-15

- 0151 sample was collected from drum containing what appears To be tar @ 1630
- Survey Crew surveyed the Radar Dome sample locations
- Rock Samples were collected from the PCB excavations and placed into a tote. - Will be stripped tomorrow

Monday 9/3/2012 NE Cape HTRW

341-20057. Windy, Rain, Cold 41°F

NW Winds 25 mph

- Timesheets - Signatures

0700 Safety: PADs - Vibration

Objectives: ① Fagging @ Pad 98 ② Fuel Containment and 150 tank placement ③ Site 10 ④ Build Flats

- DEOCR completed
- 1415 hrs - Navajo arrives - L. Klepper arrives - Bulk Bags arrive
- 1500 hrs - CASA arrives - Bulk Bags arrive

~72-75 bags arrive today

Note: Pick up wire laying by the A1 excavation

R. James - 341-20057 - Fog

37°F - SW Winds 9 mph

0700 Safety

- Zombie Apocalypse related to our site safety
- Clean Windows, lights, etc. to fight against the mud

~1430 hrs - Security arrives on-site. C-Cossaboom, Carl Sadler, Steve Johnson and Jeremy Cramer arrive. Depart @ 1630 w. 4th Cossaboom, Ron Broyles, Steve Johnson, and Carl Sadler

Wednesday 9/5/2012 NE Cape HTRW

R. James - 34120057 - Cloudy, cool
41°F 13 mph NW Winds

0700 Safety: Safety Brief by E. Barnhill

- Site 31 Excavation
- Site 21 - 1 Bag
- Pad 95 - 1 Bag

Field Lab Samples

Wal 295 - 305 (11)
BW Wal 50-51 (2)
BW MOC 2W6 (1)

Thursday 9/6/2012 NE Cape HTRW

34120057 - 37°F - SW 12mph wind - R. James

0700 Safety

- Work transitions over the next few days

objectives -

- Site 31 excavation
- MW Abandon
- Stage flats for LCs
- 5 wipe sample locations
- Site 10 Drum Chopping

→ Boring 9-3 and 9-1

- Wipe Sample WS13-01 will be duplicated and sent to the lab @ TestAmerica. Also sent to the field lab. Piece of concrete was sampled in triplicate.

1730 hrs - 41°F - ~~SW~~ 3mph wind North

48 Friday 9/7/2012 NECAPE HTRW R-James
J41200057 · 38°F, light Rain
2 mph NE Winds

0700 Safety

· Crew Contributions · Tidy-up vehicles · Yield to heavy equipment

Objectives: ① Excavate @ Site 13
② Drums @ Site 10

QAR indicates that USACE wants to proceed as planned w/site 28

- MW 2 & MW 3 will be abandoned today

[signature]

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TRANSIT

Waterproof Notebook
No. 601

Russell James - Bristol Environmental
NE Cape HTRW

Contract:
W911KB-12-C-0003

9-8-2012 Thru 9-23-2012

Book 3 of 3

4 5/8" x 7" - 48 Numbered Pages

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Name Russell James - Bristol Environmental Remediation

Address 111 W 16th Ave, Third Floor Anchorage, AK 99504

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Project NE Cape HTRW

Project No. 34120057

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CONTENTS

PAGE	REFERENCE	DATE

2 Saturday 9/8/2012 NE Cape HTRW
34120057 R. James
39°F N winds 16 mph
0700 safety
- Haz Waste Manifests were filled out and bulk bags were placarded and labelled for shipping
- Drum containerization @ site 10 was completed
- Flats are being built on Cargo Beach
- Sed trap is being constructed at wharf Pad
- Backfill @ E excavation

1745 - 39°F N winds 11 mph

[signature]

Sunday 9/9/2012 NE Cape HTRW 3
R. James 34120057
37°F N winds 3 mph
0700 Safety
Loader Safety - Operators have limited site when hauling
- 2 LCs this morning - Sam Taalak and Greta
- DQCRs - 2
- Pipes & Hoses are being set up @ site 28
- Backfilling w/overburden stockpiles
- Flats are being staged @ Cargo Beach for future LCs

1800 hrs 2 LCs - Sam + Greta
- The Nunaniq arrived @ 2130 hrs

End @ 2230 hrs

[signature]

Monday 9/10/2012 NE Cape HTRW

R. James 34120057

0700 Safety

0715 - 41°F Winds N 12mph

0600 hrs - Greta and Sam Taalak
- 23 flats each
- Bering Air CASA
~~Bering~~ Bering Air arrives @ 1500 hrs
- Rich Losche, Scott Kingeekuk, Patrick Braley, Jess Reynolds, and Jake Ollanna leave the site
- Dave Eppinger arrived on site
- MI Sampling @ the Site 28 Pad/Impound
- Greta and Sam Taalak @ 1800 hrs - 4/6 flats are shipped off
- E plume excavation is being backfilled
- Manifest the next load @ 2300 hrs.
- will have 20 flats

~~RS (15)~~
(15.5)

Tuesday 9/11/2012 NE Cape HTRW

R. James 34120057

43°F. Partly Cloudy, Winds N 12mph

0700 Safety
- Pump Safety -
- Water Safety

0800 - 43°F NE Winds 11mph

0900 - Sam Taalak - 20 flats
- Complete MI sampling of the Site 28 Pad/Impound

1730 weather 45°F N winds 12mph

- Site 31 PCB soil Removal
- 7 bags @ 93.29 tons
- Hauled borrow Material for backfill.

6 Wednesday 9/12/2012 NE Cape HTRW

R. James 3412005Z, Partly Cloudy
39°F, NW Winds 6 mph

0700 safety
- Maxine email regarding geomophobia/paranoia/fear

Objectives: ① Site 31 ② Look for Site 10 sample results ③ Prep phase for Site 28 @ 2:00pm (1400 hrs)
- Site 31 Completed @ 1400 hrs
- Bering Air arrives @ 1500 hrs
  - 11 pp' leave site including Lesa Nelson, Robert, Elmer, Eugene Teolie, Carl Calugan
- Prep phase meeting for Site 28 Sod Removal held @ 1530 hrs.
  - will be attached to DACR
- POL bagging @ Pad 98

Ron James

Thursday 9/13/2012 NE Cape HTRW R James 7

3412005Z - Misty, Cool
35°F, NW Winds 3 mph

0700 safety
Proper tools, PPE and Planning for the job

Objectives: ① Site 31 - One (1) removal area ② Build flats on the beach in prep for Northland ③ Site 28 preparations

- Containment was built @ Site 28 and Geotubes were set in place
- The dredge pump was tested
- Water Samples were collected from Site 28 (surface water) the post-construction MOC surface water sample and the pre-construction Site 28 surface water was collected
- Flats were staged @ the beach
- Meeting @ Site 28 Areas land 2 to discuss excavation opt

Ron James

8 Friday 9/14/2012 NE Cape NTRW R. James

341200S7 - Windy, Clear, Cool
40°F, N winds 13 mph

0700 safety
- Wind Chill handout/chart - stay warm & dry

Objectives: ① Remove the hot spot at G-Pawne ② Site 28 setup
③ Bag the Pere hot spot from the liner @ the MOC

- Bering Air arrives @ 1330 hrs
  - Samples are shipped out, PCTS soil samples and SW samples from Site 28
  - Waders, Tyvek, Metal, Tape, Paper was received

9 Saturday 9/15/2012 NE Cape NTRW

341200S9, Windy, Cool R. James
35°F

0700 safety
- Working near/in water today
- stay dry

Objectives: ① Install Silt trap
② Test the dredge @ the site
③ Remove sed areas 1 and 2
④ Bag PCE sample @ the site
10 stockpile

1330 hrs. Installing the Sed trap @ Site 28

341200S7, Windy, Cool R. James
37°F 26 mph N winds
0700 Safety

- Winds - Advisory through afternoon
- Safety Awards - ~~Samp~~ Bagging Crew, E. Barnhill, M. Thompson, R. James

Objective: ① MI sampling @ site 28
② Bagging soils from Site 10 stockpile, then @ Pad 98

Complete DQCR
- Check on Seal Tap @ 1600 hrs
  - Water is flowing through and appears clean on the outflow - photos taken
  - Water on upstream side is not backing up
- MI Samples from Site 28 where sumps will be installed during pumping activities.
- Dirty stockpile from Site 10 was bagged

1530 weather = 36°F 31 mph N winds - Rain/Snow

R James 341200S7,
36°F, WNW winds 11 mph
0700 Safety: Carefully work w/ lines, watch footing on uneven ground

Objectives: ① Remove Sed from areas 1 and 2 @ Site 28.
② Set up pump-sumps @ Site 28

0950 hrs - Areas 1 and 2 @ Site 28 are excavated - appears very organic soil. ~ 25 yd³
- Asked Jeremy about Confirmation Sampling - Are we going to sample from the excavated area? He said he'll ask USACE office
- 1115 hrs - Both sumps @ Site 28 have been installed. Pumping is ready to begin and will commence later today.

Dredging on Area 4 @ Site 28 begins @ 1430 hrs
- Sheen on water in 1st sump - Very watery and dark in color
- Water pumped into the Sed collection tube. Too early to tell how effective the tube will be
- photos taken of the sumps and the tube containment
- Obvious fuel odor in the tube containment
- QAR Crane informs Bristol that USACE wants to take sample @ Site 28 from areas that have had Sed Removal @ the same frequency as the earlier Sed Mapping samples. ~15 total
- Bering Air arrived this afternoon
- J. Patel, T. Ibarguen left
- M. Hannan arrived on-Site.

Ted James

Tuesday 9/18/2012 NE Cape HTRW
341200S7, Windy, Cool R. James
39°F, N winds 14 mph, 31°F Chill
0700 Safety: Containment/Liner installation - Proper lifting techniques

Objectives: ① Liner installation
② Pad 28 bagging operations

- Four sails were bagged @ Pad 28
- 4 Soil Samples were collected @ Site 28 Areas 1 and 2
- Dredging operations in the afternoon -
- Impoundment water was screened and pumped into secondary containment
- Impoundment water sample collected
- Surface water sample collected north of Sed Trap
- 1800 - 2000 hrs - Mylon & Albert continued water scrubbing after dinner
1715 weather - N 15 mph winds 38°F

Wednesday 9/19/2012 NE Cape HTRW

34/2005?, Mist, Cool R. James

39°F, NNW Winds 15 mph

0700 Safety

- Winds - Wind direction

Objectives: ① Pump water today and continue dredging @ Site 28 ② Change filter media in the water scrubbers ③ Impound water sample ④ Site 28 impound water sample

- Today will be last day of dredging.
- Samples collected from Impoundment

- 1330 hrs - begin dredging @ Site 28, Area 4
- New Impoundment is being installed North of the Work Pad
- Complete/Stop dredging ~1530 hrs
- New impoundment installed
- Dozer uncovered @ beach - Photo taken

Thursday 9/20/2012 NE Cape HTRW

34/2005?, Cool R. James

0700 Safety

- Tear down/Camp Break down activities

Objectives: ① Site clean-up and break down

Security arrives ~ 1100 hrs

- M Hannah, J Arms, D Effinger, Croner leaves site

Bering Air arrives (8857) @ 1415 hrs

- Water Scrubber totes
- Bags + Liners
- Sample Coolers/Bottles

Bering air arrives @ 1800 hrs

- 3 pallets of bags
- Coolers + Bottles

- Dale Winslow left on the Security flight today

16 Friday 9/21/2012 NE Cape HTRW

3412059, Cool, 36°F R. James

N winds 7 mph

0700 Safety: Bagging Operations

objectives: ① Bag @ Pad 98 and bag the soil/sed from site 28 Areas 1 and 2 ② Ship samples

- Bag POL Soils @ Pad 98
- Bag Site 28 Sediment
- GPS Pole Locations

- Bering Air CASA @ 1230 hrs
- Bering Air NAVAJO ~1400 hrs
- Tyler Ellingboe arrived
- L. Klepfin, J. Willis, J. Allan, R. Pomrenke (Eco-Land), B. Olnes (Fairweather) left the site.
- Drums were labeled and Connex was placarded
- Site 31 sides were taped

1700 hrs weather - 38°F N winds 8 mph

Saturday 9/22/12 NE Cape HTRW 17

3412005Z, Breezy, Cool R. James

35°F - N winds - 23° Chill

0700 Safety

- Winds and building
- Safety Goggle/Glasses

Objectives: ① Placard Drum Connex ② Drainage for drum connex ③ NALEMP Waste Organization ④ Metal Detect @ Site 10 ⑤ Site 28 Containment

- 0900 - N winds 22 mph
- Placard the Drum Connex on all sides
- GPS Mag anomalies @ Site 10
- Organize Enviro Connex
- Teardown Personal equipment
- PDCRs 81 and 82 Final PDCRs
- Get Supersack Shipping spreadsheet from Chuck
- Sample burn pit soil for NALEMP
- Pack up gear

Sunday 9/23/2012 NE Cape HTRW

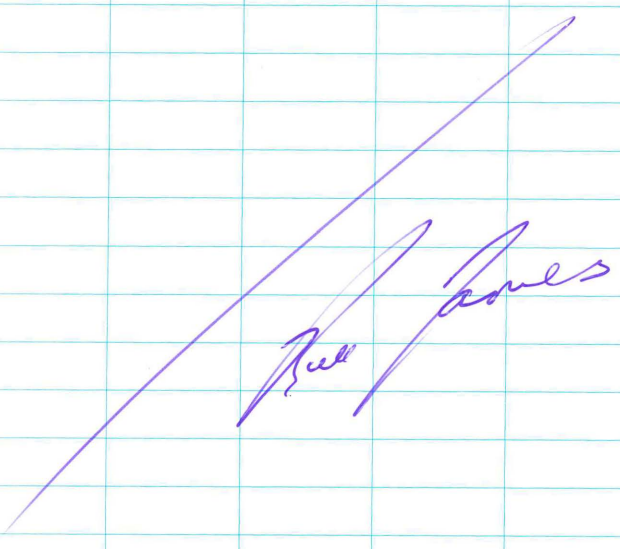
341200S7, Clear, Cold R. James

0700 Safety

- Cold Temps - Below freezing this morning. Be aware of pipes/pumps/drains - Don't let freeze

Objectives: Consolidate equipment around the work sites

- Depart Site -



APPENDIX D

Discharge Authorization Permit

Alaska Department of Environmental Conservation
Wastewater Discharge Authorization Programs

STATE OF ALASKA WASTEWATER GENERAL PERMIT

2009DB0004

Contained Water GP

This permit is issued under provisions of Alaska Statutes 46.03, the Alaska Administrative Code as amended, and other applicable State laws and regulations. This permit may be terminated, modified, or renewed under provisions of Alaska Statute and the Alaska Administrative Code. This permit supersedes State wastewater general permit 2003DB0089.

This wastewater discharge general permit is available for use by persons responsible for the discharge of contained water that meets the eligibility criteria in this permit. Contained water means water isolated from the environment in a manmade container or a lined impoundment structure.

The owners and operators of facilities covered under this general permit are authorized to discharge to the lands and waters of the State of Alaska in accordance with discharge point(s) effluent limitations, monitoring requirements, and other conditions set forth herein.

This general permit shall become effective **March 19, 2009**

This general permit and the authorization to discharge shall expire at midnight, **March 18, 2014**.

SIGNATURE ON FILE	3/19/2009
Signature	Date
Sharmon M Stambaugh	Wastewater Discharge Program Manager
Printed Name	Title

Wastewater Discharges Eligible For Coverage Under this Permit. This general permit applies to:

- contained water including, but not limited to: hydrostatic test water or chlorinated water from tanks, pipelines, swimming pools, and other containers that hold wastewater that meets state water quality standards in 18 AAC 70 and the effluent limitations in Section 1.2.2 of this permit;

Wastewater Discharges Not Covered by this Permit. This general permit does not apply to:

- Contaminated groundwater where halogenated hydrocarbons are the primary contaminant of concern;
- A discharge to waters listed by the state as impaired, where the impairment is wholly or partially caused by a pollutant contained within the proposed discharge;
- A discharge from a sewage lagoon or other treatment works subject to a different State wastewater discharge permit;
- A discharge permitted under storm water general permits;
- A discharge to groundwater under a response action, a cleanup, or a corrective action approved under 18 AAC 70.005; or
- A wastewater discharge originating from water accumulations within secondary containment areas as regulated under 18 AAC 75.075 (d), AND is intended to be discharged to a surface water.

Notice of Intent (NOI) Requirements

- An NOI under Section 1.1.1 and prior written authorization from the Department are required for one-time discharge (i.e., no more than one discharge per year) of a volume of water greater than or equal to 10,000 gallons through discharge to the land surface or to a surface water body; or
- An NOI is not required for a one-time discharge of a volume of water less than 10,000 gallons, however, all terms and conditions of this permit, including the effluent limitations in Section1.2.2, still apply.

General Provisions

A wastewater discharge authorized under this general permit is subject to the terms and conditions specified in Sections 1 and 2 of this permit. All discharges made under the authority of this permit, regardless of size, are subject to the terms and conditions contained herein. Approval to operate under this permit shall be valid for not longer than 12 months. This permit does not relieve the permittee of the responsibility of obtaining other required permits if any.

The Department will require a person to obtain an individual permit when the wastewater discharge does not meet the eligibility criteria of this general permit, contributes to pollution, has the potential to cause or causes an adverse impact on public health or water quality, or a change occurs in the availability of technology or practices for the control or abatement of pollutants contained in the discharge.

TABLE OF CONTENTS

1 OPERATIONAL REQUIREMENTS

1.1 NOTICE OF INTENT

1.1.1 An applicant wishing to conduct a discharge activity under this permit and whose total discharge volume is equal to or greater than 10,000 gallons, must submit a Notice of Intent to the Alaska Department of Environmental Conservation. The Notice of Intent form can be found at http://www.dec.state.ak.us/water/wwdp/index.htm or by sending a request to DEC.Water.WQPermit@alaska.gov. The Notice of Intent must be submitted to ADEC at least thirty (30) days prior to the start of the discharge activity at:

Alaska Department of Environmental Conservation
Division of Water
Wastewater Discharge Authorization Programs
555 Cordova Street
Anchorage, Alaska 99501
Phone (907)-269-6285
Fax (907)-269-3487
Email DEC.Water.WQPermit@alaska.gov
http://www.dec.state.ak.us/water/wwdp/index.htm

1.1.2 A Notice of Intent is **not** required for discharges of less than a total of 10,000 gallons. However the water quality standards in 18 AAC 70 and the terms and conditions in this permit still apply to all activities conducted under this permit even if submittal of a Notice of Intent is not required.

1.1.3 The Notice of Intent must be accompanied by the appropriate fee as found in 18 AAC 72.956 or any such regulations as amended. The permit fees can be found the Department's website at: www.state.ak.us\dec\water\wwdp\online permitting\fees.htm

1.1.4 An applicant must have written authorization from the Department before conducting a discharge activity under this permit which results in a total discharge of 10,000 gallons or more of contained water. The Department will, in its discretion, deny use of this permit, or attach or waive conditions appropriate for a specific discharge activity in the authorization.

1.1.5 The written authorization is effective for the period beginning on the effective date of the authorization and lasting through its expiration date. If this permit is modified or renewed during the term of the authorization, the new permit requirements apply.

1.2 TERMS AND CONDITIONS

1.2.1 The permittee is authorized to discharge wastewater as specified in this subsection.

1.2.2 Wastewater discharged shall not exceed the following limitations:

Effluent Characteristic	**Maximum Value**
Turbidity	5 NTU above background[1]
Settleable Solids	0.2 mL/L (milliliters per liter)
Total Chlorine	11 µg/L fresh water or 7.5 µg/L saltwater (micrograms per liter)
pH	Between 6.5 and 8.5 pH units or within 0.2 units (marine water), or 0.5 units (fresh water) of the receiving water pH at all times.
Total Aqueous Hydrocarbons (TAqH)	15 µg/L (micrograms per liter)
Total Aromatic Hydrocarbons (TAH)	10 µg/L (micrograms per liter)

1.2.3 The discharge shall not cause thermal or physical erosion.

1.2.4 The discharge shall not cause re-suspension of sediments upon discharge to receiving waters.

1.2.5 The discharge shall be free of (a) any additives such as antifreeze solutions, methanol, solvents, and corrosion inhibitors; (b) solid wastes and garbage; (c) toxic substances; (d) grease or oils which exceed the effluent limitations in Section 1.2.2 or produce sheen; (e) foam in other than trace amounts; or (f) other contaminants.

1.2.6 The discharge shall not cause a violation of the Alaska Water Quality Standards (18 AAC 70).

1.2.7 The discharge shall not cause adverse effects to aquatic or plant life, their reproduction or habitats.

1.2.8 The Department will, in its discretion, attach terms and conditions to the written authorization required by Section1.1.4, as appropriate.

1 Applies to discharges to the waters of the state only. Not in effect for disposals which freeze upon discharge. Shall not have more than 10% increase in turbidity when the natural condition is more than 50 NTU, not to exceed a maximum increase of 15 NTU. Shall not exceed 5 NTU over natural conditions for all lake waters.

1.2.9 This permit does not constitute a grant of water rights.

1.2.10 An applicant must contact the Department of Fish & Game, Office of Habitat Management and Permitting, http://www.habitat.adfg.alaska.gov/ , two weeks prior to any discharge, if the discharged water will enter fish-bearing waters.

1.2.11 If a toxic pollutant (including oil, grease, or solvents) concentration standard is established in accordance with 18 AAC 70 for a pollutant present in this discharge, and such standard is more stringent than the limitation in this permit, this permit is considered to be modified in accordance with the toxic pollutant concentration standard.

1.3 MONITORING

1.3.1 Test procedures used for sample analysis shall conform to methods cited in 18 AAC 70.020(c), or as such regulations may be amended. The permittee may substitute alternative methods of monitoring or analysis upon receipt of prior written approval from the Department.

1.3.2 The permittee shall use current calibrated equipment when taking field measurements, and shall use bottles and sampling procedures provided by the laboratory when taking samples for laboratory analysis.

1.3.3 Samples and measurements taken shall be representative of the volume and nature of the monitored activity.

1.3.4 For discharges equal to or greater than 10,000 gallons, the permittee shall monitor the contained water, background natural condition, or the wastewater stream of the discharge in the following manner and frequency. Monitoring results from all before discharge samples must be received and reviewed by the permittee before discharging in order to insure compliance with the conditions in Section 1.2.2.

For discharges less than 10,000 gallons, the permittee is required to conduct the Field monitoring to insure compliance with the conditions in Section 1.2.2, but is not required to conduct the TAqH or TAH Lab monitoring unless there is sheen.
In accordance with this section, the following requirements apply:

Effluent Characteristic	**Sample Location**	**Minimum Frequency**	**Sample Type**	**Sample method**
Total Flow	Effluent	Daily	Estimate or Measured	Field
Turbidity (NTU)	Effluent & Background	Before discharge and 1 per week	Grab	Field
Settleable Solids	Effluent	Before discharge and 1 per week	Grab	Field (see note 11 to 18 AAC 70.020(b))
Total Chlorine	Containment	Before discharge	Grab	Field
pH	Containment	Before discharge	Grab	Field
Total Aqueous Hydrocarbons (TAqH)	Containment	Before discharge	Grab	Lab method 602 or 624 (see note 7 to 18 AAC 70.020(b))
Total Aromatic Hydrocarbons (TAH)	Containment	Before discharge	Grab	Lab method 610 or 625 (see note 7 to 18 AAC 70.020(b))

1.3.5 If the permittee monitors any contained water, discharge, or surface water characteristic identified in this permit more frequently than required, the results of such monitoring shall be reported to the Department in the monitoring report required under Section 1.4 of this permit.

1.3.6 Additional monitoring parameters and increased monitoring frequency may be required on a case-by-case basis.

1.3.6 Specific requirements for monitoring may be waived by the Department in the authorization to discharge under this permit if the information submitted in the Notice of Intent demonstrates no reasonable potential to exceed the effluent limitations in Section 1.2.2 of this permit.

1.4 REPORTING

For a discharge equal to or greater than 10,000 gallons, monitoring results shall be recorded on a Discharge Monitoring Report (DMR) and submitted no later than the 14th day of the month following the month that each sampling occurs. Reporting shall begin when the discharge starts. Reporting shall be done on the electronic form included with the written authorization or on the form located at the website address provided below. The reports shall be emailed AND signed copies of the monitoring results and all other reports required herein shall be submitted to the Department office at the following address:

Alaska Department of Environmental Conservation
Division of Water
Compliance Section
555 Cordova Street
Anchorage, Alaska 99501
Toll free 1-877-569-4114 (outside Anchorage service area)
In Anchorage service area 907-269-4114
Fax (907) 269-4604
Email: dec-wqreporting@alaska.gov
http://www.dec.state.ak.us/water/Compliance/index.htm

A false statement knowingly made by the permittee, the operator, or other employee, including a contractor, on any such report may result in the imposition of criminal penalties as provided for under AS 46.03.790.

1.5 RECORDS RETENTION

All records and information resulting from the monitoring activities required by this permit, including all records of analyses performed, calibration and maintenance of instrumentation, and recordings from continuous monitoring instrumentation shall be retained in Alaska for three years for observation by the Department. Upon request from the Department, the permittee shall submit certified copies of such records.

1.6 CHANGE IN DISCHARGE

A discharge authorized herein shall comply with the terms and conditions of this permit. The discharge of any pollutant or toxic material more frequently than specified, or at a concentration or limit not authorized, shall constitute noncompliance with the permit. Any anticipated construction changes, flow increases, or process modifications which will result in new, different, or increased discharge of pollutants and will cause a violation of this permit's limitations are not allowed under this permit and must be reported by submission of an individual waste discharge permit application or a revision of the Notice of Intent. Physical changes to the treatment process may be subject to plan review.

1.7 ACCIDENTAL DISCHARGES

The permittee shall provide protection from accidental discharges not in compliance with the terms and conditions of this permit. Facilities to prevent such discharges shall be maintained in good working condition at all times.

1.8 NONCOMPLIANCE NOTIFICATION

1.8.1 If, for any reason, the permittee does not comply with or will be unable to comply with any term or condition specified in this permit, the permittee shall report the noncompliance to the Department within 72 hours of becoming aware of such noncompliance. This report shall be by telephone, fax, email, or in the absence of these avenues, by mail to the address information provided in Section 1.4.

1.8.2 A written follow-up report shall be sent to the Department within seven (7) days of the noncompliance event. The written report shall contain, but is not limited to:

1.8.2.1 Times and dates on which the event occurred, and if not corrected, the anticipated time the noncompliance is expected to continue;

1.8.2.2 A detailed description of the event, including quantity and type of materials causing the noncompliance;

1.8.2.3 Details of any actual or potential impact on the receiving environment or public health;

1.8.2.4 Details of actions taken or to be taken to correct the cause(s) of the event and to remedy any damage that result from the event.

1.8.2.5 A permittee may use the ADEC non-compliance notification form to provide the required information of this section. Go to the website address provided in Section 1.4 or send a request to the email address provided in Section 1.4.

1.9 RESTRICTION OF PERMIT USE

The department will require a person with a general permit authorization to obtain an individual permit if the department determines that the discharge does not meet the requirements of this permit, the discharge contributes to pollution, there is a change in technology, or the environment or public health are not protected.

1.10 TRANSFER OF OWNERSHIP

In the event of any change in control or ownership of the permitted facility, the permittee shall notify the succeeding owner or controller of the existence of this permit and the authorization by letter or by using the Change in Ownership Form. A copy of the letter or form shall be forwarded to the Department at the address listed in Section1.1. The original permittee remains responsible for permit compliance unless and until the succeeding owner or controller agrees in writing to assume such responsibility and the Department approves assignment of the permit. The Department will not unreasonably withhold such approval.

2 GENERAL REQUIREMENTS

2.1 ACCESS AND INSPECTION

The permittee shall allow the department access to the permitted facilities at reasonable times to conduct scheduled or unscheduled inspections or tests to determine compliance with this permit, the terms of the authorization to operate under this permit, State laws, and regulations.

2.2 INFORMATION ACCESS

Except where protected from disclosure by applicable state or federal law, all records and reports submitted in accordance with the terms and conditions of this permit shall be available for public inspection at the appropriate State of Alaska Department of Environmental Conservation office.

2.3 CIVIL AND CRIMINAL LIABILITY

Nothing in this permit shall relieve the permittee from any potential civil or criminal liability for noncompliance with this permit, their authorization to operate, or applicable laws and regulations.

2.4 AVAILABILITY

The permittee shall post or maintain a copy of this permit and their authorization available to the public at the discharge facility.

2.5 ADVERSE IMPACT

The permittee shall take all necessary means to minimize any adverse impacts to the receiving waters or lands resulting from noncompliance with any limitation or condition specified in this permit, including additional monitoring needed to determine the nature and impact of the non-complying activity. The permittee shall clean up and restore all areas adversely impacted by the non-complying activity.

2.6 CULTURAL OR PALEONTOLOGICAL RESOURCES

If cultural or paleontological resources are discovered as a result of this discharge activity, work which would disturb such resources is to be stopped, and the State Historic Preservation Office, Division of Parks and Outdoor Recreation, Department of Natural Resources (907) 762-2622, is to be notified immediately.

2.7 OTHER LEGAL OBLIGATIONS

This permit does not relieve the permittee from the duty to obtain any other necessary permits or approvals from the Department or other local, state, or federal agencies, and to comply with the requirements contained in any such permits. All activity conducted and all plan approvals implemented by the permittee pursuant to

the terms of this permit shall comply with all applicable local, state, and federal laws and regulations.

2.8 POLLUTION PREVENTION

In order to prevent and minimize present and future pollution, when making management decisions that affect waste generation, the permittee shall consider the following order of priority options as outlined in AS 46.06.021:

- Wastewater source reduction;
- Wastewater recycling;
- Wastewater treatment; and
- Wastewater discharge to the environment.

THE STATE of ALASKA
GOVERNOR SEAN PARNELL

Department of Environmental Conservation
DIVISION OF WATER
Wastewater Discharge Authorization Program

555 Cordova Street
Anchorage, Alaska 99501-2617
Main: 907.269.6285
fax: 907.334.2415
www.dec.alaska.gov/water/wwdp

August 31, 2012

DEC File No.: 475.48.001

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

Re: **Authorization 2009DB0004-0216: Bristol Environmental Remediation Services, LLC-Northeast Cape HTRW Remedial Actions**

Dear Permittee:

The Alaska Department of Environmental Conservation (DEC) has completed its review of your 2009DB0004 Contained Water Notice of Intent (NOI) for the Northeast Cape HTRW Remedial Actions and is issuing authorization number 2009DB0004-0216 for this project. The discharge from this project is authorized in accordance with the terms of the general permit and any site specific requirements in this authorization. An electronic copy of the Contained Water general permit will be attached to the PDF portfolio which includes this authorization letter which is posted to the DEC water permit search.

The authorization effective date is August 31, 2012.

The authorization to discharge expires at midnight on August 30, 2013.

The authorized discharge location is to a gravel pad upland of a vegetated area as described in the NOI.

The following site specific conditions apply:

1) Before water discharge, the permittee must collect contained water samples for TAH and TAqH. If the analytical results exceed the effluent limits established by the permit, the water must be treated to meet the requirements of the permit and retested prior to discharge.

2) At startup, a visual check for petroleum sheen is required. If an oil sheen is observed corrective action must be taken to remove the hydrocarbon contamination prior to discharge.

3) Visual checks for sheen in the effluent must be recorded daily, and daily estimates of flow must be taken to accurately estimate the total wastewater discharged monthly and for the total project.

4) Monitoring for the following parameters are waived by this authorization: pH, turbidity, settleable solids, and total chlorine.

A copy of the General Permit 2009DB0004 and this authorization must be kept at the project site. This authorization does not relieve the permittee from other local, state, or federal government permitting requirements.

The Discharge Monitoring Report can be found and completed on the following website, http://www.dec.alaska.gov/water/Compliance/permittee.html. Once the DMR is completed it shall be submitted to the following address:

Department of Environmental Conservation
Division of Water
Compliance and Enforcement Program
555 Cordova Street
Anchorage, Alaska 99501
Telephone Nationwide (877) 569-4114
In Anchorage Area/International (907) 269-4114
Fax (907) 269-4114
Email: dec-wqreporting@alaska.gov

If you have any questions concerning this authorization, please contact Jake Greuey at (907) 269-8117 or Jake.Greuey@alaska.gov.

Sincerely,

James Rypkema
Section Manager, Storm Water and Wetlands

Department of Environmental Conservation

Water Online Application System

Admin Pages:

Home
Activate / Deactivate Permits
O2D Administrator

This page shows the current status of the permit you selected to view. On this page you can view and update or change the status. To change the status, just select another option from the dropdown list, and click the 'Set ... Status' button next to the list. This will update the permit to the state you have selected in that dropdown list.

Created By:	DEREK TANNAHILL on 8/28/2012 2:12:35 PM	**Last Modified:**	8/29/2012 10:20:29 AM

Status	Details	Options	Change Status
Signed	Administratively signed on 8/29/2012 10:20:29 AM	Signed	Set Signed Status
Paid	Paid on 8/28/2012 2:35:43 PM	Paid	Set Payment Status
Fee Amount	$350.00		Void

Application Data (Completed)

Tracking #:	2009DB0004-0216	**Facility:**	Northeast Cape HTRW Remedial Actions	**Permit Type:**	Contained Water Permit

Project Information	***Details***
Project Name	Northeast Cape HTRW Remedial Actions
On-site Address Line 1	Main Operations Complex, Site 28
On-site Address Line 2	
Nearest City	Savoonga
State	AK
Nearest Zip Code	99769
Country	USA
On-site Phone	8773700628
On-site Fax	
On-site Email	
Description of project	
NAICS Code	I do not know

Contacts	***Details***	
On-Site Contact	Name:	Chuck Croley
	Title	Site Superintendent
	Organization:	Bristol Environmental Remediation Services, LLC
	Address:	111 W. 16th Avenue, Third Floor
	City:	Anchorage
	State:	AK
	Zip:	99501
	Country:	USA
	Phone:	9075630013
	Cell:	
	Fax:	
	Email:	

	Website:	
Applicant, Billing Contact	Name:	Greg Jarrell
	Title	Project Manager
	Organization:	Bristol Environmental Remediation Services, LLC
	Address:	111 W. 16th Avenue, Third Floor
	City:	Anchorage
	State:	AK
	Zip:	99501
	Country:	USA
	Phone:	9075630013
	Cell:	
	Fax:	
	Email:	
	Website:	
Responsible Party	Name:	Carey Cossaboom
	Title	Project Manager
	Organization:	US Army Engineer District, Alaska
	Address:	P.O. Box 6898
	City:	JBER
	State:	AK
	Zip:	99506
	Country:	USA
	Phone:	9077538689
	Cell:	
	Fax:	
	Email:	
	Website:	

Discharge Information	***Details***
Is this a discharge of hydrostatic test water?	No
Does the water contain chlorine or other toxic substances?	No
End of pipe latitude (1) Converter	
End of pipe longitude (1)	
Additional end of pipe latitudes and longitudes	
Mapping Technique	GPS Unit
Description of Wastewater Treatment Plan	
The water processing site will consist of a Geotube placed atop an impermeable liner. The Geotube will contain the sediment while allowing water to pass through the pore spaces. The wastewater will be captured by the liner and directed toward a primary water impoundment. Water samples will be collected from the primary water impoundment and analyzed at a laboratory for all COCs. Water from the primary impoundment will be treated through a granular activated carbon filtering system and discharged into a secondary impoundment. Wastewater samples will be collected from the secondary impoundment and analyzed at a laboratory for all COCs. Water will remain in the secondary impoundment until sample results confirm that all contaminant concentrations are below discharge criteria presented in the State of Alaska Wastewater General Permit 2009DB0004. If results indicate concentrations below discharge criteria, then the treated water will be discharged to the ground.	
Maximum anticipated discharge flow rate (gallons per day - GPD)	
Average anticipated discharge flow rate (gallons per day - GPD)	
Total anticipated discharge (gallons)	
Discharge velocity at end of pipe (feet per second - FPS)	
Anticipated start date	09/03/2012
Anticipated completion date	10/05/2012

Receiving Area Information	***Details***
Receiving Area Name	Water Processing Area
Receiving Area Type	Unvegetated Area

Description of receiving area Gravel pad upland of drainage area.	
Supply for aquaculture	No
Supply for industrial use	No
Primary contact recreation	I do not know
Secondary contact recreation	I do not know
Catalogued anadromous spawning area	I do not know
Harvesting for consumption of raw mollusks or other raw aquatic life	No

Attachments	***Title (Type), Description***
FIG10-SITE28-JULY12.pdf	**PROPOSED PHASE 1 SEDIMENT REMOVAL AREAS (Project Description Material)**

Creator	Date	Comment		
jjgreuey	08/29/2012 10:19	Received e-mailed signature page on 8/28/12 from Greg Jarrell. Admin signed	Edit	Delete

Add Comment

Home

THE STATE of ALASKA
GOVERNOR SEAN PARNELL

Department of Environmental Conservation
DIVISION OF WATER
Wastewater Discharge Authorization Program

555 Cordova Street
Anchorage, Alaska 99501-2617
Main: 907.269.6285
fax: 907.334.2415
www.dec.alaska.gov/water/wwdp

August 31, 2012

DEC File No.: 475.48.001

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

Re: **Authorization 2009DB0004-0216: Bristol Environmental Remediation Services, LLC-Northeast Cape HTRW Remedial Actions**

Dear Permittee:

The Alaska Department of Environmental Conservation (DEC) has completed its review of your 2009DB0004 Contained Water Notice of Intent (NOI) for the Northeast Cape HTRW Remedial Actions and is issuing authorization number 2009DB0004-0216 for this project. The discharge from this project is authorized in accordance with the terms of the general permit and any site specific requirements in this authorization. An electronic copy of the Contained Water general permit will be attached to the PDF portfolio which includes this authorization letter which is posted to the DEC water permit search.

The authorization effective date is August 31, 2012.

The authorization to discharge expires at midnight on August 30, 2013.

The authorized discharge location is to a gravel pad upland of a vegetated area as described in the NOI.

The following site specific conditions apply:

1) Before water discharge, the permittee must collect contained water samples for TAH and TAqH. If the analytical results exceed the effluent limits established by the permit, the water must be treated to meet the requirements of the permit and retested prior to discharge.

2) At startup, a visual check for petroleum sheen is required. If an oil sheen is observed corrective action must be taken to remove the hydrocarbon contamination prior to discharge.

3) Visual checks for sheen in the effluent must be recorded daily, and daily estimates of flow must be taken to accurately estimate the total wastewater discharged monthly and for the total project.

4) Monitoring for the following parameters are waived by this authorization: pH, turbidity, settleable solids, and total chlorine.

A copy of the General Permit 2009DB0004 and this authorization must be kept at the project site. This authorization does not relieve the permittee from other local, state, or federal government permitting requirements.

The Discharge Monitoring Report can be found and completed on the following website, http://www.dec.alaska.gov/water/Compliance/permittee.html. Once the DMR is completed it shall be submitted to the following address:

Department of Environmental Conservation
Division of Water
Compliance and Enforcement Program
555 Cordova Street
Anchorage, Alaska 99501
Telephone Nationwide (877) 569-4114
In Anchorage Area/International (907) 269-4114
Fax (907) 269-4114
Email: dec-wqreporting@alaska.gov

If you have any questions concerning this authorization, please contact Jake Greuey at (907) 269-8117 or Jake.Greuey@alaska.gov.

Sincerely,

James Rypkema
Section Manager, Storm Water and Wetlands

APPENDIX E

Chemical Data Verification Report
ADEC Checklists

CHEMICAL DATA VERIFICATION REPORT

TABLE OF CONTENTS

SECTION **PAGE**

TABLES

ACRONYMS AND ABBREVIATIONS

ADEC	Alaska Department of Environmental Conservation
Bristol	Bristol Environmental Remediation Services, LLC
BTEX	benzene, toluene, ethylbenzene, and xylenes
CCV	continuing calibration verification
CoC	chain-of-custody
DL	detection limit
DoD	Department of Defense
DQO	data quality objective
DRO	diesel range organics
EDD	electronic data deliverable
GRO	gasoline range organics
HTRW	hazardous, toxic, and radioactive waste
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LOD	limit of detection
LOQ	limit of quantitation
MB	method blank
MOC	Main Operations Complex
MI	MULTI INCREMENT®
MS	matrix spike
MSD	matrix spike duplicate
NE Cape	Northeast Cape, St. Lawrence Island, Alaska
PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
QAPP	Quality Assurance Project Plan
QC	quality control
Report	Data Verification Report

ACRONYMS AND ABBREVIATIONS (continued)

RPD	relative percent difference
RRO	residual range organics
RSD	relative standard deviation
SGS	SGS North America, Inc. Anchorage, Alaska
SIM	selected ion mode
SW	U.S. EPA Soil Waste Method
TA	TestAmerica Laboratories, Inc.
TA-Denver	TestAmerica Laboratories, Inc., Denver, Colorado
TA-Tacoma	TestAmerica Laboratories, Inc., Tacoma, Washington
TOC	total organic carbon
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency

1.0 INTRODUCTION

This Data Verification Report (Report) has been completed on the submitted data packages in accordance with an agreement between Bristol Environmental Remediation Services, LLC (Bristol), and the U.S. Army Corps of Engineers (USACE), Alaska District. As per this agreement, all laboratory results were generated as part of work on the Remedial Actions at Northeast Cape (NE Cape), St. Lawrence Island, Alaska. The USACE assigned this project to Bristol under Contract No. W911KB-06-D-0007.

Data verification for this report was performed by AECOM on the data collected as part of the Remedial Actions at Site 28 at NE Cape in 2012. Data verification is a process for evaluating the completeness, correctness, consistency, compliance with method procedures and quality control (QC) requirements, and identification of anomalous data. The reported project sample values, as well as any method laboratory control samples extracted or prepared with the project samples were reviewed. Specifically, the following items were reviewed in this data verification:

- Sample receipt conditions:
  - Sample preservation,
  - Cooler temperatures upon receipt,
  - Chain-of-custody (CoC) condition/correspondence to submitted sample set, and
  - Presence/absence of custody seals.
- Extraction and analytical procedures:
  - Holding times,
  - Method blanks (MBs),
  - Laboratory control samples (LCSs)/laboratory control sample duplicates (LCSDs),
  - Matrix spike (MS)/matrix spike duplicate (MSD),
  - Duplicate samples, and
  - Surrogate recoveries.

- Sampling procedures:
  - Trip blanks,
  - Equipment blanks, and
  - Field duplicate samples.
- Correspondence to method criteria and project data quality objectives (DQOs)

Unless otherwise discussed in this document, the above parameters were within control limits specified in the NE Cape HTRW Remedial Actions Quality Assurance Project Plan Addendum, Revision 2 (QAPP) dated August 2012. If control limits were not specified in the QAPP, 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 not used for data review unless specifically noted.

No information on internal standards, calibrations, instrument tunes, chromatograms, quantitation reports, spectra, summaries identifying any analytical irregularities, and the subsequent corrective action taken by the laboratories, and results from any other analytical procedures other than those listed above were reviewed and are not included in this Report. Laboratory narratives were examined and any documented calibration or other QC outliers were included as appropriate in this Report.

Data verification was performed in accordance with:

- *NE Cape HTRW Remedial Actions Northeast Cape, St. Lawrence Island, Alaska Quality Assurance Project Plan Addendum (QAPP), Revision 2,* (August, 2012);
- *Department of Defense (DoD) Quality Systems Manual*, Version 4.2 (2010); and
- Alaska Department of Environmental Conservation (ADEC) Technical Memorandum: *Environmental Laboratory and Quality Assurance Requirements* (Updated March 2009).

Precision and accuracy were assessed by comparing surrogate, MS/MSD and LCS/LCSD recoveries and relative percent differences (RPDs) to the QAPP-specified control limits.

The frequency of QC samples was compared to the frequency specified in the QAPP. The MSs/MSDs performed on non-project samples are not applicable, and were not evaluated.

Samples were analyzed at one of three laboratories:

- TestAmerica (TA) Laboratories, Inc., Tacoma, Washington (TA-Tacoma)
- TA Laboratories, Inc, Denver, Colorado (TA-Denver)
- SGS North America, Inc. Anchorage, Alaska (SGS)

Both TA-Tacoma and TA-Denver were identified as project laboratories in the QAPP and data review was conducted using QAPP information. SGS was approved for use by the U.S. Army Corp of Engineers (USACE) Project Chemist in an email 9/19/12 and surrogates and laboratory limits approved for use in the email were used for review.

The reviewed data sets include data from samples collected for the NE Cape Remedial Actions at Site 28 in September 2012. Samples were analyzed by the following methods:

- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by U.S. Environmental Protection Agency (USEPA) Soil Waste (SW-846) Methods 5035/8260B (soil) or Methods 5030B/8260B (water);
- Gasoline-range organics (GRO) by ADEC method AK101;
- Diesel range organics (DRO) and residual-range organics (RRO) by ADEC methods AK102/103;
- DRO and RRO by ADEC methods AK102/103 with silica gel clean-up;
- Polynuclear aromatic hydrocarbons (PAHs) by SW-846 method 3550B/8270C (soil) and 3520C/8270C (waters) using selected ion mode (SIM) at TA labs and 3520C/8270D (waters) using SIM at SGS;
- Polychlorinated biphenyls (PCBs) by SW-846 method 3550B/8082 (soils) and 3510C/8082 (waters) at TA labs and 3520C/8082A (waters) at SGS;
- Total organic carbon (TOC)-Quad by SW-846 9060;
- Metals by SW-846 method 3050B/6020 (soils) and 3005A/6020 (waters) at TA labs and 3010A/6020 (waters) at SGS;
- Mercury by SW-846 method 7471A/7470A at TA labs and by SW-846 method 6020 at SGS.

- Incremental sample preparation (soil) in conjunction with the preparation and analytical methods listed above for DRO/RRO, DRO/RRO with silica gel cleanup, PAHs, PCBs, metals, and TOC.

The sampling event and laboratory work order numbers are presented in Table 1-0.

Table 1-0 Laboratory Work Order Numbers

Sampling Event	Laboratory	Matrix	Work Order Number	Date
Site 28	TA-Denver	Water	280-33360-1	10/2/12
Site 28	TA-Tacoma	Water	580-35085-1	10/12/12
Site 28	TA-Tacoma	Water	580-35092-1	10/15/12
Site 28	TA-Tacoma	Soil	580-35084-1	10/29/12
Site 28	TA-Tacoma	Soil	580-35140-1	10/15/12
Site 28	TA-Tacoma	Soil	580-35168-1	10/15/12
Site 28	SGS	Water	1124556	10/23/12

This Report is specific to samples collected from Site 28. In two of the above laboratory work orders, samples from other sites were included. Quality control information for these were reviewed and included in an alternate Data Verification Report. These samples are:

- 580-33360-1: Data quality for the four samples from the Main Operations Complex (MOC),
- 280-33360-2: Seven rock samples logged on a rush turn-around-time,
- 580-35168-1: Nine samples from the MOC

The following data qualifiers may be 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:

- J – Positive result is less than the LOQ and is considered an estimate
- H – Sample was analyzed past hold time
- R – Analyte result is rejected – result is not usable. Note that "R" replaces the chemical result (no result shall be reported with an "R" flag).

- B – Analyte result is considered a high estimated value due to contamination present in the method or trip blank. Results less than 10 times the reported method blank concentration will be B flagged to indicate bias.
- MH, ML, MN – Analyte result is considered an estimated value biased (high, low, uncertain) due to matrix effects.
- QH, QL, QN – Analyte result is considered an estimated value biased (high, low, uncertain) due to a quality control failure such as surrogate recoveries outside of acceptance limits.

When both a Q and M qualifier apply to a single result, a judgment was made and the qualifier considered to have the most affect on the data was used.

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2.0 DATA VERIFICATION

The following samples were included in the reviewed data sets:

- Five soil samples, one soil field duplicate, and volume for an MS/MSD pair,
- Four MULTI INCREMENT® (MI) soil samples, two field replicates, and volume for an MS/MSD pair,
- Fourteen water samples, three water field duplicates, and volume for MS/MSD pairs,
- Five aqueous trip blanks and two methanol trip blanks.

Field sample numbers and corresponding laboratory numbers are presented in Table 2-0.1.

Table 2-0.1 Sample Identification and Analysis

Field Sample ID	Laboratory Sample Number	Location ID	Matrix	GRO (AK101)	BTEX (SW8260B)	DRO/RRO (AK102/103)	DRO/RRO with Silica Gel (AK102/103)	PCB (SW8082)	PAHs (8270C SIM)	Total Metals (SW6020/7471A/7470A)	Dissolved Metals (SW6020/7471A/7470A)	TOC (9060)	Remarks
Lab: SGS													
12NC28TWA01	1124556001	12NC28TWA01	Water	X	X	X		X	X	X	X		
12NC28TWA02	1124556004	12NC28TWA02	Water	X	X	X		X	X	X	X		FD of 12NC28TWA03
12NC28TWA03	1124556005	12NC28TWA03	Water	X	X	X		X	X	X	X		
12NC28TWA04	1124556006	12NC28TWA04	Water	X	X	X		X	X	X	X		
TripBlank 091912-01	1124556008	Trip Blank	Water	X	X								
TripBlank091912-03	1124556007	Trip Blank	Water	X	X								
Lab: TA-Denver													
12NC28WA01	280-33360-8	28-W-01	Water	X	X	X		X	X		X		MS/MSD for GRO
12NC28WA02	280-33360-9	28-W-02	Water	X	X	X		X	X		X		

Table 2-0.1 Sample Identification and Analysis (continued)

Field Sample ID	Laboratory Sample Number	Location ID	Matrix	GRO (AK101)	BTEX (SW8260B)	DRO/RRO (AK102/103)	DRO/RRO with Silica Gel (AK102/103)	PCB (SW8082)	PAHs (8270C SIM)	Total Metals (SW6020/7471A/7470A	Dissolved Metals (SW6020/7471A/7470A	TOC (9060)	Remarks
Lab: TA-Denver													
12NC28WA03	280-33360-10	28-W-03	Water	X	X	X		X	X		X		MS/MSD for GRO, BTEX, DRO/RRO, PCBs, PAHs, and dissolved metals
TRIPBLANK091412	280-33360-11TB	Trip Blank	Water	X	X								
Lab: TA-Tacoma													
12NC28WA04	580-35085-1	28-W-01	Water		X	X		X	X	X	X		MS/MSD for BTEX, DRO/RRO, PCBs, PAHs, and total and dissolved metals
12NC28WA05	580-35085-2	28-W-01	Water		X	X		X	X	X	X		
12NC28WA06	580-35085-3	28-W-01	Water		X	X		X	X	X	X		FD of 12NC28WA05
TripBlank 091912	580-35085-4	Trip Blank	Water		X								

Table 2-0.1 Sample Identification and Analysis (continued)

Field Sample ID	Laboratory Sample Number	Location ID	Matrix	GRO (AK101)	BTEX (SW8260B)	DRO/RRO (AK102/103)	DRO/RRO with Silica Gel (AK102/103)	PCB (SW8082)	PAHs (8270C SIM)	Total Metals (SW6020/7471A/7470A	Dissolved Metals (SW6020/7471A/7470A	TOC (9060)	Remarks
Lab: TA-Tacoma													
12NC28WA07	580-35092-1	28-W-01	Water		X	X		X	X	X	X		MS/MSD for BTEX, DRO/RRO, PCBs, PAHs, and total and dissolved metals
12NC28WA08	580-35092-2	28-W-02	Water		X	X		X	X	X	X		
12NC28WA09	580-35092-3	28-W-03	Water		X	X		X	X	X	X		
12NC28WA10	580-35092-4	28-W-01	Water		X	X		X	X	X	X		
12NC28WA11	580-35092-5	28-W-03	Water		X	X		X	X	X	X		
12NC28WA12	580-35092-6	28-W-02	Water		X	X		X	X	X	X		
12NC28WA13	580-35092-7	28-W-01	Water		X	X		X	X	X	X		FD of 12NC28WA10
Trip Blank 092112-01	580-35092-7	Trip Blank	Water		X								

Table 2-0.1 Sample Identification and Analysis (continued)

Field Sample ID	Laboratory Sample Number	Location ID	Matrix	GRO (AK101)	BTEX (SW8260B)	DRO/RRO (AK102/103)	DRO/RRO with Silica Gel (AK102/103)	PCB (SW8082)	PAHs (8270C SIM)	Total Metals (SW6020/7471A/7470A	Dissolved Metals (SW6020/7471A/7470A	TOC (9060)	Remarks
Lab: TA-Tacoma													
12NC28MI001 [a]	580-35084-1	28-MI-01	Soil			X	X	X	X	X		X	MS/MSD for DRO/RRO, DRO/RRO with silica gel, PCBs, PAHs, and metals
12NC28MI002 [a]	580-35084-2	28-MI-02	Soil			X	X	X	X	X		X	
12NC28MI003 [a]	580-35084-3	28-MI-03	Soil			X	X	X	X	X		X	Field replicate of 12NC28MI002
12NC28MI004 [a]	580-35084-4	28-MI-04	Soil			X	X	X	X	X		X	Field replicate of 12NC28MI002
12NC28MI005 [a]	580-35084-5	28-MI-05	Soil			X	X	X	X	X		X	
12NC28MI006 [a]	580-35084-6	28-MI-06	Soil			X	X	X	X	X		X	
12NC28SS052	580-35140-1	12NC28S52	Soil	X	X	X		X	X	X			
12NC28SS053	580-35140-2	12NC28S53	Soil	X	X	X		X	X	X			

Table 2-0.1 Sample Identification and Analysis (continued)

Field Sample ID	Laboratory Sample Number	Location ID	Matrix	GRO (AK101)	BTEX (SW8260B)	DRO/RRO (AK102/103)	DRO/RRO with Silica Gel (AK102/103)	PCB (SW8082)	PAHs (8270C SIM)	Total Metals (SW6020/7471A/7470A	Dissolved Metals (SW6020/7471A/7470A	TOC (9060)	Remarks
Lab: TA-Tacoma													
12NC28SS054	580-35140-3	12NC28S54	Soil	X	X	X		X	X	X			MS/MSD for GRO, BTEX, DRO/RRO, PCBs, PAHs, and metals
12NC28SS055	580-35140-4	12NC28S55	Soil	X	X	X		X	X	X			
12NC28SS056	580-35140-5	12NC28S53	Soil	X	X	X		X	X	X			FD of 12NC28SS053
Trip Blank 091912-02	580-35140-6	Trip Blank	Methanol	X	X								
12NC28BW01	580-35168-10	12NC28BW01	Waste	X	X	X		X	X	X		X	MS/MSD for TOC
Trip Blank 092312-1	580-35168-11	Trip Blank	Methanol	X	X								

Notes:

[a]All analyses performed on bulk samples and as multi increment samples. The bulk samples were analyzed in error and have not been reviewed.

AK = State of Alaska Method
BTEX = benzene, toluene, ethylbenzene, xylenes
DRO = diesel range organics
FD = field duplicate
GRO = gasoline range organics
ID = identifier
metals = 6020: arsenic, barium, cadmium, chromium, lead, nickel selenium, silver, vanadium, and zinc. 7471A/7470A: mercury
MS = matrix spike
MSD = matrix spike duplicate
PAHs = polynuclear aromatic hydrocarbons
PCBs = polychlorinated biphenyls
RRO = residual range organics
SIM = selective ion monitoring
TOC = total organic carbon

2.1 SAMPLE RECEIPT CONDITIONS

Samples were received within 0-6 degrees Celsius and in good condition, except as noted below.

2.1.1 Laboratory Work Order 280-33360-1

One of the thirteen one liter unpreserved amber containers submitted for sample 12NC28WA03 (280-33360-10) was received at the laboratory broken. Sufficient containers remained to proceed with the requested analyses.

2.1.2 Laboratory Work Order 580-35085

The container label for the following samples did not match the information listed on the CoC: 12NC28WA05 (580-35085-2) and TripBlank091912 (580-35085-4).

The container labels on the HCl preserved VOA vials for sample 12NC28WA05 (580-35085-2) do not list a sampling time. The CoC lists a time of 15:00 for this sample. The sample was logged in per the CoC.

The container labels list Trip Blank, 9/9/12 and no time for sample TripBlank091912 (580-35085-4). The CoC lists TripBlank091912, 9/14/12 and 11:00. The sample ID was logged in per CoC, the sample date was set to the earliest sample date, 09/17/2012.

2.1.3 Laboratory Work Order 580-35092

The CoC mistakenly requested a DRO/RRO analysis for the trip blank. The analysis was not performed.

The container label for the following samples did not match the information listed on the CoC: 12NC28WA07 (580-35092-1), 12NC28WA07 (580-35092-1 MS), 12NC28WA07 (580-35092-1 MSD) and 12NC28WA08 (580-35092-2). 12NC28WA07 (580-35092-1): had a time of 15:00 on all containers while the CoC had a time of 15:50. 12NC28WA08 (580-35092-2): had a time of 15:15 on all containers while the CoC had a time of 15:00. Samples were logged in per CoC.

12NC28WA07 (580-35092-1): The ID on two amber bottles was not completely filled out on the container label. The sample times were matched and logged in according to the CoC.

12NC28WA08 (580-35092-2): The HNO_3 preserved polyethylene bottle for dissolved metals was received without the ID completely filled in and without a sample time. All other HNO_3 preserved polyethylene bottles were accounted for and, by the process of elimination, the ID was determined to be 12NC28WA08 (580-35092-2).

2.1.4 Laboratory Work Order 580-35084

Samples were initially logged in as grab samples rather than MI samples. Volume was removed from the sample containers to perform the bulk analyses prior to processing the entire sample mass by the MI protocol. Therefore, the sample was altered and the results for the sample may not be considered representative of the decision unit. However, given the volume of the MI sample compared to the volume needed for the bulk analyses, data usability is unlikely affected. Both the bulk and MI sample results and associated QC are reported in the hardcopy. Only MI results were reviewed and are reported in the electronic data deliverable (EDD).

The container label for the following samples did not match the information listed on the CoC: 12NC28MI002 (580-35084-2), 12NC28MI003 (580-35084-3) and 12NC28MI004 (580-35084-4). The container labels lists times of 11:10, 11:30 and 11:40, respectively. The

CoC lists times of 15:50, 15:00 and 15:30, respectively. The samples were logged in per the CoC.

2.1.5 Laboratory Work Order 580-35140

The temperature of the temperature blank was 8.9 °C. The cooler temperature was also measured and was at 0.3 °C. The sample cooler was delayed in transit, being relinquished on 9/19/12 and received at the laboratory on 9/24/12. The sample receipt form did indicate that ice was present but melting. No qualifiers were assigned since the cooler temperature was <6 °C.

2.1.6 Laboratory Work Order 580-35168

The container label for the following sample did not match the information listed on the CoC: 12NC28BW01 (580-35168-10). The container labels lists a date of 09/21/2012. The CoC lists a date of 9/1212012. The sample was logged in per the container label.

The container label for the following sample did not match the information listed on the CoC: Trip Blank 092312-1 (580-35168-11). The container label lists the ID as 092312-1. The CoC lists the sample date as 9/2132012. The sample was logged in with a date of 09/23/2012 per Trip Blank label Sample ID.

2.2 HOLDING TIMES

Holding times were within the requirements listed on Worksheet #19 of the QAPP with the exceptions noted below. All results analyzed or extracted outside holding time were H qualified and have the potential for a low bias.

Laboratory Work Order 580-35084: The six soil samples included in this laboratory work order were collected using MI sampling procedures. The laboratory initially analyzed these samples as routine bulk samples rather than MI samples. Upon receipt of the data, Bristol requested the laboratory to process the bulk samples as MI samples and re-perform

all of the requested analyses. The re-analyses occurred outside holding time requirements as follows:

Sample ID	Lab ID	Analyte	Days to Extraction	Days to Analysis	Hold Time Requirement
12NC28MI001	580-35084-1	Mercury	-	31	28 days to analysis
12NC28MI002	580-35084-2		-	38	
12NC28MI003	580-35084-3		-	38	
12NC28MI004	580-35084-4		-	38	
12NC28MI005	580-35084-5		-	33	
12NC28MI006	580-35084-6		-	33	
12NC28MI001	580-35084-1	PAHs	30	38	14 days from collection to extraction; 40 days from extraction until analysis
12NC28MI002	580-35084-2		29	37	
12NC28MI003	580-35084-3		29	37	
12NC28MI004	580-35084-4		29	37	
12NC28MI005	580-35084-5		24	32	
12NC28MI006	580-35084-6		24	32	
12NC28MI001	580-35084-1	DRO	30	37	14 days from collection to extraction; 40 days from extraction until analysis
12NC28MI002	580-35084-2		29	36	
12NC28MI003	580-35084-3		29	36	
12NC28MI004	580-35084-4		29	36	
12NC28MI005	580-35084-5		24	31	
12NC28MI006	580-35084-6		24	31	
12NC28MI001	580-35084-1	DRO with silica gel cleanup	30	43	14 days from collection to extraction; 40 days from extraction until analysis
12NC28MI002	580-35084-2		29	42	
12NC28MI003	580-35084-3		29	42	
12NC28MI004	580-35084-4		29	42	
12NC28MI005	580-35084-5		24	37	
12NC28MI006	580-35084-6		24	37	
12NC28MI001	580-35084-1	RRO	30	37	14 days from collection to extraction; 40 days from extraction until analysis
12NC28MI002	580-35084-2		29	37	
12NC28MI003	580-35084-3		29	37	
12NC28MI004	580-35084-4		29	37	
12NC28MI005	580-35084-5		24	32	
12NC28MI006	580-35084-6		24	32	
12NC28MI001	580-35084-1	RRO with silica gel cleanup	30	43	14 days from collection to extraction; 40 days from extraction until analysis
12NC28MI002	580-35084-2		29	42	
12NC28MI003	580-35084-3		29	42	
12NC28MI004	580-35084-4		29	42	
12NC28MI005	580-35084-5		24	37	
12NC28MI006	580-35084-6		24	37	
12NC28MI001	580-35084-1	Total organic carbon	-	33	28 days to analysis

- = Not specified

Laboratory Work Order 580-35085: The QAPP specified hold time to extraction for DRO was 14 days while the hold time to extraction for RRO was listed as 7 days. The QAPP hold times were in error and 14 days is the correct time from collection to extraction. No RRO results were qualified for holding time exceedance due to the QAPP error.

2.3 BTEX ANALYSES

Samples were analyzed for BTEX by SW-846 method 8260B. The sample QC batches are summarized in Table 2-3.1.

Table 2-3.1 BTEX QC Batches

Lab	Laboratory Work Order	QC Batch	QC Batch Date	Matrix
SGS	1124556	VXX24062	24-Sep-12	Water
TA-Denver	280-33360-1	280-138812	24-Sep-12	Water
		280-139061	26-Sep-12	Water
TA-Tacoma	580-35085-1	580-121782	01-Oct-12	Water
		580-121783	02-Oct-12	Water
	580-35092-1	580-120962	26-Sep-12	Water
	580-35140-1	580-121054	27-Sep-12	Soil
	580-35168-1	580-121355	01-Oct-12	Waste

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 analyzed with each batch with the following exceptions:

- Batch 280-138812 did not have an associated LCSD or MS/MSD from a project sample. The omission of an LCSD and project MS/MSD for BTEX was due to a laboratory error. However, precision for this batch was assessed using the non-project MS/MSD pair and was within QAPP limits; therefore, there is no significant impact to data quality that would lead to data qualifications. The project MS/MSD specified on the CoC was extracted in prep batch 280-139061. Three project samples and a trip blank were submitted with this SDG. The MS/MSD sample and trip blank were extracted in prep batch 280-139061.

- Batch 280-139061 did not have an associated LCSD. Precision was assessed using the associated project MS/MSD pair and was within QAPP limits.
- Batch 580-121783 did not include results from a project MS/MSD pair due to laboratory error. The CoC stated MS/MSD was included in batch 580-121782 in SDG 580-35085-1 and the overall MS/MSD frequency for this laboratory work order was 33%. The LCS/LCSD in batch 580-121783 met control limits for accuracy and precision.
- Batch 580-121355 did not have an associated LCSD or MS/MSD from a project sample. Precision was assessed using the non-project MS/MSD pair and was within QAPP limits. The batch consisted of a single project sample used to aid in waste disposal decisions.

The following items were reviewed and met QAPP criteria: MB, surrogate recoveries, LCS/LCSD recoveries and RPDs, and MS/MSD RPDs.

Surrogates used did not match those specified in the QAPP for water samples in laboratory work orders 580-35085-1 and 580-35092-1 as follows:

QAPP Specified	Reported
1,2-Dichloroethane-d4	Fluorobenzene
4-Bromofluorobenzene	**4-Bromofluorobenzene**
Dibromofluoromethane	Trifluorotoluene
Toluene d8	**Toluene d8**
	Ethylbenzene-d10

Note: Bold – both QAPP specified and reported.

The QAPP surrogates had recoveries within the QAPP criteria. All other surrogates met the laboratory provided control limits.

For soils, all QAPP specified surrogates were analyzed as well as three additional surrogates. The data review was performed using surrogates and control limits provided on QAPP Table 12-5 (i.e. 4-bromofluorobenzene and toluene-d_8). The QAPP surrogates were in control.

MS/MSDs recoveries outside control limits are noted below.

Spiked Sample	Lab ID	Analyte	%R	Control Limits (%R)
12NC28SS054	580-35140-3	Ethylbenzene	133/--	75-125
		o-Xylene	147/131	75-125

Note: -- - in control

Recoveries for the associated LCS/LCSD pair were in control and qualification (MH) was limited to the spiked sample to indicate an estimated value due to matrix, with a high bias.

o-Xylene and m,p-xylene were reported from both the 1x and 5x dilutions for sample 12NC28SS055 (580-35140-4). The higher dilution was required to bring the concentration within the calibration range on the instrument. Results for the higher dilution are preferred, while the results for the lower dilution are not preferred. Results for the lower dilution should not be reported.

2.4 GRO ANALYSES

Samples were analyzed for GRO by ADEC method AK101. The sample QC batches are summarized in Table 2-4.1.

Table 2-4.1 GRO QC Batches

Lab	Laboratory Work Order	QC Batch	QC Batch Date	Matrix
SGS	1124556	VXX24070	26-Sep-12	Water
TA-Denver	280-33360-1	280-137996	18-Sep-12	Water
		280-138101	19-Sep-12	Water
TA-Tacoma	580-35140-1	580-121054	27-Sep-12	Soil
	580-35168-1	580-121355	01-Oct-12	Waste

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 were analyzed with each batch with the following exception:

- Batch 580-121355 did not have an associated MS/MSD from a project sample. Precision was assessed using LCS/LCSD pair and was within QAPP limits. The batch consisted of a single project sample used to aid in waste disposal decisions.

The following items were reviewed and met QAPP criteria: LCS/LCSD recoveries and RPDs, and MS/MSD recoveries and RPDs.

Surrogates were outside control limits as shown below.

Sample No.	Lab ID	Surrogate	%R	Control Limits
12NC28SS054	580-35140-3	a,a,a-Trifluorotoluene	6	50-150
12NC28BW01	580-35168-10	a,a,a-Trifluorotoluene	45	50-150

The samples listed above had detected concentrations and results were ML qualified to indicate the potential for low bias. The laboratory narratives indicated the low recoveries were due to matrix.

The QAPP specified the surrogate a,a,a-trifluorotoluene for GRO analysis. TestAmerica also reported surrogate recoveries for 4-bromofluorobenzene. Since this was not a QAPP required surrogate, recoveries for this surrogate were not evaluated.

GRO was detected in the method blanks as follows:

Matrix	Units	Concentration (µg/L)	Analysis Batch	Comments
Soil	mg/kg	0.752	580-121054	Associated results >10x blank concentration
Soil	mg/kg	1.05	580-121355	Associated results >10x blank concentration

All associated project sample concentrations were greater than 10x the method blank concentration. Trip blanks with GRO concentrations within 10 times the associated method blank concentration were qualified B.

MS/MSD control limits provided by the laboratory were not those specified in the QAPP. Recoveries and RPDs were within the QAPP Table 12-1 and 12-10 control limits for samples analyzed at Test America and within approved control limits for SGS.

2.5 PCB ANALYSES

Samples were analyzed by method SW-846 8082. The extraction batches are summarized in Table 2-5.1.

Table 2-5.1 PCB QC Batches

Lab	Laboratory Work Order	QC Batch	QC Batch Dates	Matrix
SGS	1124556	XXX28068	25-Sep-12	Water
		XXX28164	4-Oct-12	Water
TA-Denver	280-33360-1	280-137829	18-Sep-12	Water
TA-Tacoma	580-35085-1 580-35092-1	580-120779	24-Sep-12	Water
	580-35084-1	580-122065	10-Oct-12	Soil
	580-35140-1	580-121051	27-Sep-12	Soil
	580-35168-1	580-121380	01-Oct-12	Waste

Notes:
PCB = polychlorinated biphenyl
QC = quality control

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 analyzed with each batch with the following exceptions:

- Batch XXX28164 did not have an associated MS/MSD from a project sample due to laboratory communication error. An MS/MSD was included in the second extraction batch included in laboratory work order 1124556 and the overall MS/MSD frequency for this laboratory work order was 25%.
- Batch 580-121380 did not have an associated MS/MSD from a project sample. Precision was assessed using the LCS/LCSD pair and was within QAPP limits. The batch consisted of a single project sample used to aid in waste disposal decisions.

The following items were reviewed and met QAPP criteria: surrogate recoveries, MB, LCS/LCSD recoveries and RPDs, and MS recoveries.

The QAPP specifies the addition of two surrogates for PCB determination. However, for SDG 580-33360-1, the lab followed the method which requires only one surrogate,

decachlorobiphenyl (DCB), with an optional second surrogate, tetrachloro-m-xylene (TCMX). The surrogate DCB is more closely associated with PCBs and no action was required due to the lack of TCMX recovery information.

MS/MSDs recoveries and RPDs outside the QAPP Table 12-4 and 12-13 control limits are noted below:

Spiked Sample	Lab ID	Analyte	%R	Control Limits (%R)	RPD	Control Limits (RPD)
Soil:						
12NC28MI001	580-35084-1	PCB-1016	--/--	40-140	42	<20
Water:						
12NC28WA03	280-33360-10	PCB-1016	--/158	25-145	33	<30

No qualifiers are assigned for not detected spiked sample results associated with a high RPD or high recovery. All PCB-1016 results were not detected and qualification was not required.

2.6 PAH ANALYSES

Samples were analyzed at TA-Denver and TA-Tacoma by SW-846 method 8270C SIM and at SGS by SW-846 method 8270D for PAHs. The extraction batches are summarized in Table 2-6.1.

Table 2-6.1 PAH QC Batches

Lab	Laboratory Work Order	QC Batch	QC Batch Dates	Matrix
SGS	1124556	XXX28058	24-Sep-12	Water
		XXX28069	25-Sep-12	Water
TA-Denver	280-33360-1	280-138074	19-Sep-12	Water
TA-Tacoma	580-35085-1 580-35092-1	580-120766	24-Sep-12	Water
	580-35084-1	580-122068	10-Oct-12	Soil
	580-35140-1	580-121046	27-Sep-12	Soil
	580-35168-1	580-121388	01-Oct-12	Waste

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 were analyzed with each batch with the following exceptions:

- Batch XXX28069 did not have an associated MS/MSD from a project sample. An MS/MSD was included in the second extraction batch included in laboratory work order 1124556 and the overall MS/MSD frequency for this laboratory work order was 25%.
- Batch 580-121388 did not have an associated MS/MSD from a project sample. Precision was assessed using the LCS/LCSD pair and was within QAPP limits. The batch consisted of a single project sample used to aid in waste disposal decisions.

Surrogate outliers, method blank contamination, LCS/LCSD recoveries and RPDs and MS/MSD recoveries and RPDs outside control limits are discussed below.

The 2-fluorobiphenyl surrogate recovery for sample 12NC28TWA04 (1124556006) was low. The laboratory reported a recovery of 41.7%, while the acceptable recovery range is 50 to 110%. All PAH results for sample 12NC28TWA04 were QL qualified to indicate the potential for a low bias.

The LCSD for batch 280-138074 did not contain the spiking solution resulting in out of control recoveries and RPDs. The recoveries in the LCS met criteria. Additionally, the

recoveries and RPDs for the MS/MSD for this batch were in control. No qualifiers were assigned due to the LCSD outliers.

The RPD for naphthalene for the LCS/LCSD pair for batch 28069 was 36% which is outside the control limit of <30%. The single associated result had been QL qualified due to a low surrogate recovery and further qualification was not required.

Analytes were detected in the method blanks as follows:

Analyte	Concentration (µg/L)	Analysis Batch	Comments
Benzo(a)anthracene	0.122	280-138074	Associated results <10x blank concentration
Benzo(b)fluoranthene	0.0569	280-138074	All associated results not detected
Benzo(k)fluoranthene	0.0424	280-138074	All associated results not detected
Benzo(a)pyrene	0.0433	280-138074	Associated results <10x blank concentration
Benzo(g,h,i)perylene	0.0439	280-138074	Associated results <10x blank concentration
Chrysene	0.141	280-138074	Associated results <10x blank concentration
Fluoranthene	0.0976	280-138074	Associated results <10x blank concentration
Pyrene	0.121	280-138074	Associated results <10x blank concentration

All associated results were detected at concentrations less than the blank concentration and should be considered laboratory contamination. These results were B qualified to indicate the potential for a high bias.

MS/MSDs recoveries and RPDs outside the control limits as specified on QAPP Table 12-6 and 12-15 are noted below.

Spiked Sample	Lab ID	Analyte	%R	Control Limits (%R)	RPD	RPD Control Limits	Comments
12NC28MI001	580-35084-1	Benzo(a)pyrene	49/--	50-110	--	<30	
		Indeno(1,2,3-cd)pyrene	38/35	40-120	--	<30	
		Dibenz(a,h)anthracene	30/28	40-125	--	<30	
		Benzo(g,h,i)perylene	22/20	40-125	--	<30	
12NC28SS054	580-35140-3	1-Methylnaphthalene	1617/381	50-150	--	<30	Sample concentration >4x spike concentration
		2-Methylnaphthalene	2842/440	45-105	--	<30	Sample concentration >4x spike concentration
		Acenaphthene	314/306	45-110	--	<30	
		Acenaphthylene	211/182	45-105	--	<30	
		Anthracene	--/130	55-105	33	<30	
		Fluorene	131/--	50-110	--	<30	Sample concentration >4x spike concentration
		Naphthalene	1279/213	40-10	--	<30	Sample concentration >4x spike concentration
		Phenanthrene	--/132	50-110	--	<30	
12NC28TWA01	1124556001	1-Methylnaphthalene	--/121	47-107	--	<30	Sample concentration >4x spike concentration
		2-Methylnaphthalene	--/111	45-105	--	<30	Sample concentration >4x spike concentration
		Acenaphthene	119/123	45-110	--	<30	Associated sample result ND
		Acenaphthylene	0/--	50-105	--	<30	
		Benzo(g,h,i) perylene	0/--	40-125	--	<30	

Spiked Sample	Lab ID	Analyte	%R	Control Limits (%R)	RPD	RPD Control Limits	Comments
		Dibenzo[a,h]anthracene	0/--	40-125	--	<30	
		Indeno[1,2,3-c,d] pyrene	0/0	45-125	--	<30	
		Naphthalene	108/139	40-100	--	<30	Sample concentration >4x spike concentration

For the above spiked samples, the associated LCS/LCSD recoveries and RPDs were in control and qualification due to MS/MSD outliers was limited to the spiked sample. Detected results associated with high recoveries were MH qualified and all results associated with low recoveries were ML qualified. Results associated with the high RPD were not detected and qualification was not required. Results associated with sample concentrations greater than 4x the spike concentration were not qualified since the spike addition is negligible in relation to the sample concentration.

Sample 12NC28TWA01 (1124556001), used for the MS/MSD and several compounds were outside acceptance limits. Some of these results were associated with initial concentrations that were more than four times the spike concentration, or had recoveries above acceptance limits associated with non-detect sample results, and no qualifications were made.

Analytes listed below were diluted to bring the sample concentrations within the calibration range of the instrument:

Sample No.	Lab ID	Analyte	Dilution
12NC28SS052	580-35140-1	1-Methylnaphthalene	1x & 20x
12NC28SS053	580-35140-2	2-Methylnaphthalene	
12NC28SS056	580-35140-5	Naphthalene	
12NC28SS054	580-35140-3	1-Methylnaphthalene	20x & 100x
12NC28SS055	580-35140-4	2-Methylnaphthalene	
		Naphthalene	
12NC28BW01	580-35168-10	1-Methylnaphthalene	10x & 100x
		2-Methylnaphthalene	

Results from the high dilution should be used, and the lower dilution results should not be reported. Only results for analytes that exceeded the instrument calibration range were reported at dilution.

The following samples were analyzed at a dilution because the sample extract was dark, an indication of matrix interference. The chromatograms were reviewed and matrix interference was found, supporting the need for dilution.

Sample No.	Lab ID	Analyte	Dilution
12NC28TWA01	1124556001	All PAHs	5X
12NC28TWA02	1124556004		
12NC28TWA03	1124556005		

2.7 DRO/RRO ANALYSES

Samples were analyzed for DRO/RRO following ADEC methods AK102/103. When both DRO/RRO and DRO/RRO with silica gel cleanup were performed on a sample, prep batches were the same for both. However, different analytical batches were used for the silica gel cleanup. Both the prep batches and the analysis batches are summarized in Table 2-7.1.

Table 2-7.1 DRO/RRO QC Batches

Lab	Laboratory Work Order	Analyses	Prep Batch	Prep Date	Analysis Batch	Analysis Date	Matrix
SGS	1124556	DRO/RRO	XXX28095	9/27/2012	XFC10627	29-Sep-12	Water
TA-Denver	280-33360-1	DRO/RRO	280-138169	20-Sep-12	280-138885	24-Sep-12	Water
TA-Tacoma	580-35085-1 580-35092-1	DRO/RRO	580-121069	27-Sep-12	580-121166	28-Sep-12	Water
	580-35084-1	DRO/RRO	580-122067	10-Oct-12	580-122607	17-Oct-12	Soil
	580-35084-1	RRO	580-122067	10-Oct-12	580-122714	18-Oct-12	Soil
	580-35084-1	DRO/RRO w/silica gel	580-122067	10-Oct-12	580-123074	23-Oct-12	Soil
	580-35140-1	DRO/RRO	580-121043	27-Sep-12	580-121303	01-Oct-12	Soil
	580-35168-1	DRO/RRO	580-121392	01-Oct-12	580-121527	03-Oct-12	Waste

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 were analyzed with each batch with the following exception:

- Batch 580-121392 did not have an associated MS/MSD from a project sample. Precision was assessed using the LCS/LCSD pair and was within QAPP limits. The batch consisted of a single project sample used to aid in waste disposal decisions.

The following items were reviewed and met QAPP/method criteria: LCS/LCSD recoveries and RPDs and MS/MSD RPDs.

Surrogate recoveries were outside control limits as follows:

Sample No.	Lab ID	Affected Analyte	Surrogate	%R	Control Limits
12NC28MI005	580-35084-5	RRO	n-Triacontane-d62	154	50-150
12NC28SS054	580-35140-3	RRO	n-Triacontane-d62	162	50-150
12NC28MI001	580-35084-1	RRO with SGC	n-Triacontane-d62	215	50-150

Note: SGC – Silica gel cleanup

Results associated with a high recovery were QH qualified to indicate a potential for high bias.

Analytes were detected in the method blanks as follows:

Analyte	Concentration (mg/kg)	Analysis Batch	Comments
DRO	1.48	580-122607	Associated results >10x blank concentration
DRO	1.05	580-123074	Associated results >10x blank concentration

The DRO results for samples within 10 times the associated method blank concentration were qualified B.

MS/MSD recovery limits listed in the TestAmerica laboratory reports were different than those listed in the QAPP Tables 12-2 and 12-3. Recovery and RPDs criteria specified in the QAPP was used during data review and recoveries outside control limits are noted below. All RPDs were in control.

Spiked Sample	Lab ID	Analyte	%R	Control Limits (%R)	Comments
12NC28MI001	580-35084-1	DRO	--/131	72-128	
12NC28SS054	580-35140-3	DRO	856/448	72-128	Sample concentration>4x spike concentration
12NC28MI001	580-35084-1	DRO w/SGC	135/--	72-128	
12NC28MI001	580-35084-1	RRO	226/198	53-116	Sample concentration>4x spike concentration
12NC28WA07	580-35092-1	RRO	--/149	53-118	
12NC28MI001	580-35084-1	RRO w/SGC	352/325	53-116	Sample concentration>4x spike concentration

Notes:
-- = In control
w/SGC = with silica gel cleanup

For the above spiked samples, the associated LCS/LCSD recoveries and RPDs were in control and qualification due to MS/MSD outliers was limited to the spiked sample. Detected results associated with high recoveries were MH qualified. Results associated with sample concentrations greater than 4x the spike concentration were not qualified since the spike addition is negligible in relation to the sample concentration.

According to the laboratory narrative, the continuing calibration verification (CCV) for analytical batch 580-122607 recovered above the upper control criteria for RRO. With one exception, the affected samples were reanalyzed within a passing CCV bracket and reported in analytical batch 580-122714. The single sample reported from 580-122607 (12NC28MI001) was QH qualified due to the high associated CCV.

The case narratives provided qualitative information with regards to the type of petroleum identified, if the pattern appeared weathered or degraded, or was possible biogenic interference.

2.7.1 DRO/RRO with Silica Gel Cleanup

Soil and sediment samples from Site 28 were analyzed for DRO/RRO with silica gel cleanup to remove polar compounds, which are most associated with natural organic material. Samples in SDG 580-35140 (post-sediment removal) were not analyzed for DRO/RRO with silica gel cleanup or TOC because the analyses were not requested on the CoC due to a Bristol oversight. Samples will be re-collected and submitted for DRO/RRO, DRO/RRO with silica gel, and TOC analyses.

SDG 580-35084 (Site 28 MI samples) was submitted for DRO/RRO with silica gel and TOC analyses. The results for the Site 28 MI samples indicate that DRO and RRO are reduced by roughly 55% with silica gel cleanup. Chromatographic interpretation suggests that the DRO and RRO are of biogenic origin due to the lack of the typical bell shape or humps from petroleum constituents. The chromatograms display sharp peeks that extend beyond the RRO range, which is most often an indication of biogenic presence. None of the MI results exceeded cleanup levels for any CoCs.

2.8 TOC ANALYSES

TestAmerica analyzed samples for TOC-Quad by SW-846 method 9060. The QC batches are summarized in Table 2-8.1.

Table 2-8.1 TOC QC Batches

Laboratory Work Order	QC Batch	QC Batch Date	Matrix
580-35084-1	580-122413	10-Oct-12	Soil
580-35168-1	580-122088	09-Oct-12	Waste

Required QC for a batch of up to 20 samples includes an MB, LCS/LCSD pair, and MS/MSD pair. A MB, LCS/LCSD, MS/MSD pair, and a laboratory duplicate were analyzed per batch with the following exception:

- TOC prep batch 580-122413 did not have an associated MS/MSD from a project sample. Precision was assessed using the LCS/LCSD pair and was within QAPP limits. The MS/MSD was performed on non-project samples which also met acceptance criteria.

The following items were reviewed and met QAPP criteria: method blank, LCS/LCSD %Rs and RPDs, MS/MSD %Rs and RPDs, and laboratory duplicate RPDs.

It should be noted that the LCS/LCSD and MS/MSD recovery and RPD limits listed on the laboratory reports were different than those specified in QAPP Table 12-9. Recoveries and RPDs were within QAPP limits.

2.9 METALS ANALYSES

TestAmerica laboratories analyzed all metals except mercury by SW-846 method 6020. SGS analyzed all metals, including mercury by SW-846 method 6020. The mercury method used by SGS differed from the method approved for use, SW-846 7470A. SGS is certified by the Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP) to analyze mercury by method 6020 and no action was taken due to the change in method.

Nickel, vanadium, and zinc were analyzed in addition to the metals list approved for SGS. Laboratory control limits were used for review of these additional SGS metals.

The QC batches are summarized in Table 2-9.1.

Table 2-9.1 Metals QC Batches

	Laboratory Work Order	QC Batch	QC Batch Date	Matrix
SGS	124556	MXX25909	22-Sep-12	Water
TA-Denver	280-33360-1	280-138995	26-Sep-12	Water
TA-Tacoma	580-35085-1	580-121187	28-Sep-12	Water
	580-35092-1	580-121186	28-Sep-12	Water
	580-35084-1	580-122770	18-Oct-12	Soil
	580-35140-1	580-121562	03-Oct-12	Soil
	580-35168-1	580-122003	09-Oct-12	Waste

Note:
QC = quality control

Required QC for a batch of up to 20 samples includes an MB, LCS/LCSD pair, and MS/MSD pair. An MB, LCS/LCSD, and project MS/MSD pair were analyzed per batch with the following exceptions:

- No LCSD was provided with batch MXX25909. Precision for this batch was assessed through the associated MS/MSD pair.
- No LCSD was provided with batch 280-138995. Precision for this batch was assessed through the associated MS/MSD pair.
- Batch 580-122003 did not have an associated MS/MSD from a project sample. Precision was assessed using the LCS/LCSD pair and was within QAPP limits. The batch consisted of a single project sample used to aid in waste disposal decisions.

The following items were reviewed and met QAPP criteria: MB, LCS/LCSD recoveries and RPDs, and MS/MSD RPDs.

For SDG 580-35084-1, the LOQs for the method blank were approximately 5x the LOQs reported for project samples. All method blank results were not detected; however, since the LOQ was higher than that reported for project samples, low concentrations detected in samples have the potential to be associated with blank contamination. Clean-up criteria identified on QAPP Table 15-1 are greater than 5x the LOQ reported for project samples and the higher method blank LOQs should not affect data usability.

MS/MSDs recoveries are noted below when they were outside QAPP Table 12-7 control limits:

Spiked Sample	Analyte	%R	%R Control Limits	Comments
12NC28MI001	Barium	170/191	80-120	
(580-35084-1)	Chromium	194/213	80-120	Sample concentration >4x spike concentration
	Lead	121/127	80-120	
	Nickel	122/139	80-120	
	Vanadium	161/181	80-120	
	Zinc	167/189	80-120	

Associated LCS/LCSD recoveries were in control and qualification was limited to the spiked sample. Detected results associated with high spike recoveries were MH qualified to indicate bias due to a matrix effect. No qualification was required if the sample concentration was >4x the spike concentration.

For SDG 580-35084-1, the %RPD between results for selenium in the parent sample and the serial dilution were above the criteria of <10%. However, the sample concentrations were all <50X the LOD and the dilution test was not applicable.

According to the laboratory narrative, for SDG 580-33360-1, the ICSA solution associated with batch 580-138995 was above the LOD for cadmium and nickel. The laboratory confirmed with the vendor that these elements are trace impurities in the ICSA solution and no qualifiers were assigned.

2.10 MERCURY ANALYSES

TA analyzed samples for mercury by SW-846 methods 7471A and 7470A. The QC batches are summarized in Table 2-10.1.

Table 2-10.1 Mercury QC Batches

Lab	Laboratory Work Order	QC Batch	QC Batch Date	Matrix
TA-Denver	280-33360-1	280-137788	18-Sep-12	Water
TA-Tacoma	580-35085-1	580-121083	27-Sep-12	Water
	580-35092-1	580-121091	27-Sep-12	Water
	580-35084-1	580-122238	11-Oct-12	Soil
	580-35140-1	580-121566	03-Oct-12	Soil
	580-35168-1	580-121573	03-Oct-12	Waste

Required QC for a batch of up to 20 samples includes an MB, LCS/LCSD pair, and an MS/MSD pair. An MB, LCS/LCSD pair, and project MS/MSD pair were analyzed per batch with the following exceptions:

- No LCSD was provided with batch 280-137788. Precision for this batch was assessed through the associated MS/MSD pair.
- Batch 580-121573 did not have an associated MS/MSD from a project sample. Precision was assessed using the LCS/LCSD pair and was within QAPP limits. The batch consisted of a single project sample used to aid in waste disposal decisions.

The following items were reviewed and met QAPP criteria: LCS/LCSD recoveries and RPDs, MS recoveries and MS/MSD RPDs.

Analytes were detected in the method blanks as follows:

Analyte	Concentration (mg/L)	Analysis Batch	Comments
Mercury	0.0000545	580-121083	Associated results <10x blank concentration
	0.0000513	580-121091	Associated results <10x blank concentration

The mercury results for samples within 10 times the associated method blank concentration were qualified B.

MS/MSDs recoveries are noted below when they are outside QAPP Table 12-8 or 12-17 control limits:

Spiked Sample	Analyte	%R	%R Control Limits
12NC28MI001	Mercury	--/65	80-120

Associated LCS/LCSD recoveries were in control and qualification was limited to the spiked sample. The spiked sample was ML qualified to indicate low bias due to a matrix effect.

2.11 FIELD QA/QC

Field QC samples included field duplicate pairs, MS/MSD pairs, equipment blanks, and trip blanks. The same methods used to analyze the investigative samples were used to analyze the field QC samples.

2.11.1 Field Sample Duplicates

Comparison of field sample duplicate results to the associated parent sample results provides precision information for the overall sample collection and analytical process, including possible variability related to sample collection, handling, shipping, storage, preparation, and analysis. The RPD between the primary (parent) sample and field duplicate sample also accounts for the variation of target analyte concentrations within a matrix. This variability is assessed by evaluating the calculated RPDs between the field duplicates and the associated parent samples. If target analytes were detected in one sample greater than the LOQ and not detected in the duplicate, both detected and non-detected results should be flagged to indicate imprecision. Data which is J flagged was detected between the LOQ and the DL and an RPD was not calculated. The RPD assessment criteria in the QAPP of ≤50% for soils and ≤30% for waters were used to evaluate the field duplicates.

For MI samples, one primary and two field replicate samples were collected; therefore, the calculation is percent relative standard deviation (%RSD), not RPD. The RSD assessment criteria was <30% RSD.

Field Duplicate Frequencies

Field sample duplicate pairs are required by the QAPP at a rate of 10%. Field duplicates were collected at the following frequencies per method and matrix:

- One field duplicate pair was collected for five soil samples at a frequency of 20% for GRO, BTEX, DRO/RRO, PCBs, PAHs, and metals.
- One triplicate sample set was collected for four MI soil samples at a frequency of 25% for DRO/RRO, DRO/RRO with silica gel, PCBs, PAHs, metals, and total organic carbon.
- Three field duplicate pairs were collected for fourteen water samples at a frequency of 21% for BTEX, DRO/RRO, PCBs, PAHs, and total and dissolved metals.

- One field duplicate pair was collected for the six water samples at a frequency of 17% for GRO analysis.

Field Duplicate RPDs and RSDs

Table 2-11.1 lists the RPDs calculated between the field duplicate and parent sample results for target analytes that were detected above the LOQ in both the parent and field duplicate sample.

Table 2-11.2 lists the %RSD calculated between the primary sample and two replicate samples with target analytes that were detected above the LOQ.

Table 2-11.1 Field Sample Duplicate Pair Results

Parent Field ID Location (Lab ID)	FD ID Location (Lab ID)	Target Analytes	Units	Parent Result	FD Result	RPD (%)
12NC28WA05 (580-35085-2)	12NC28WA06 (580-35085-3)	Barium (dissolved)	mg/L	0.011	0.011	0
		Barium (total)	mg/L	0.017	0.017	0
		Lead (total)	mg/L	0.00049 J	0.00051 J	nc
		Zinc (total)	mg/L	ND (0.005)	0.0044 J	nc
		Mercury (dissolved)	mg/L	0.000058 J	0.000063 J	nc
		Mercury (total)	mg/L	0.000053 J	0.000061 J	nc
		Ethylbenzene	µg/L	0.38 J	0.38 J	nc
		m-Xylene & p-Xylene	µg/L	0.75 J	0.8 J	nc
		o-Xylene	µg/L	0.42 J	0.47 J	nc
		1-Methylnaphthalene	µg/L	0.81	0.87	7
		2-Methylnaphthalene	µg/L	0.13	0.27	**70**
		Acenaphthene	µg/L	0.084 J	0.093 J	nc
		Fluorene	µg/L	0.17	0.18	6
		Naphthalene	µg/L	0.3	0.36	18
		Phenanthrene	µg/L	0.034 J	0.036 J	nc
		Diesel range organics	mg/L	0.82	0.85	4
		Residual range organics	mg/L	0.24	0.3	22
12NC28WA10 (580-35092-4)	12NC28WA13 (580-35092-7)	Barium (dissolved)	mg/L	0.0098	0.0096	2
		Barium (total)	mg/L	0.011	0.013	17
		Mercury (dissolved)	mg/L	0.000056 J	0.000065 J	nc
		Mercury (total)	mg/L	0.000054 J	0.000063 J	nc
		Ethylbenzene	µg/L	0.34 J	0.34 J	nc
		m-Xylene & p-Xylene	µg/L	0.45 J	0.44 J	nc
		1-Methylnaphthalene	µg/L	0.61	0.45	30
		2-Methylnaphthalene	µg/L	0.13	0.088 J	nc
		Acenaphthene	µg/L	0.09 J	0.074 J	nc
		Fluorene	µg/L	0.19	0.16	17
		Naphthalene	µg/L	0.39	0.33	17
		Diesel range organics	mg/L	0.77	0.66	15
		Residual range organics	mg/L	0.2	0.22	10

Table 2-11.1 Field Sample Duplicate Pair Results (continued)

Parent Field ID Location (Lab ID)	FD ID Location (Lab ID)	Target Analytes	Units	Parent Result	FD Result	RPD (%)
12NC28TWA03 (1124556005 and 1124556013)	12NC28TWA02 (1124556004 and 1124556012)	Arsenic (dissolved)	µg/L	13.4	11.4	16
		Barium (dissolved)	µg/L	37.8	36.6	3
		Chromium (dissolved)	µg/L	1.85 J	1.57 J	nc
		Lead (dissolved)	µg/L	2.34	2.21	6
		Mercury (dissolved)	µg/L	0.45	0.377	18
		Nickel (dissolved)	µg/L	0.988 J	1.28 J	nc
		Zinc (dissolved)	µg/L	12.4 J	13.7 J	nc
		Arsenic	µg/L	14.9	16.4	10
		Barium	µg/L	46.3	50.7	9
		Chromium	µg/L	2.23 J	2.53 J	nc
		Lead	µg/L	3.08	3.5	13
		Mercury	µg/L	0.701	0.703	0
		Nickel	µg/L	1.39 J	1.62 J	nc
		Vanadium	µg/L	ND (12.4)	6.89 J	nc
		Zinc	µg/L	16.2 J	20.6 J	nc
		Aroclor-1260	µg/L	0.19	ND (0.062)	**nc**
		1-Methylnaphthalene	µg/L	2.35	3.17	30
		2-Methylnaphthalene	µg/L	1.99	2.21	10
		Acenaphthene	µg/L	0.173 J	ND (0.15)	nc
		Fluoranthene	µg/L	0.11 J	0.169 J	nc
		Fluorene	µg/L	0.344	0.455	28
		Naphthalene	µg/L	1.2	1.16	3
		Phenanthrene	µg/L	0.234 J	0.291	nc
		Diesel Range Organics	mg/L	0.336 J	0.702	nc
		Gasoline Range Organics	mg/L	0.052 J	0.0624 J	nc
		Ethylbenzene	µg/L	0.67 J	0.97 J	nc
		o-Xylene	µg/L	2.11	2.78	27
		P & M -Xylene	µg/L	2.83	3.86	**31**
		Toluene	µg/L	1.11	1.04	7

Table 2-11.1 Field Sample Duplicate Pair Results (continued)

Parent Field ID Location (Lab ID)	FD ID Location (Lab ID)	Target Analytes	Units	Parent Result	FD Result	RPD (%)
12NC28SS053 (580-35140-2)	12NC28SS056 (580-35140-5)	Arsenic	mg/kg	3.3	4.5	31
		Barium	mg/kg	58	65	11
		Cadmium	mg/kg	0.19 J	0.27	35
		Chromium	mg/kg	16	16	0
		Lead	mg/kg	13	17	27
		Nickel	mg/kg	10	11	10
		Selenium	mg/kg	0.67 J	0.79 J	nc
		Silver	mg/kg	0.056 J	0.06 J	nc
		Vanadium	mg/kg	23	26	12
		Zinc	mg/kg	39	47	19
		Mercury	mg/kg	0.017	0.028	49
		PCB-1260	mg/kg	0.082	0.084	2
		Ethylbenzene	µg/kg	830	1000	19
		m,p-Xylene	µg/kg	2600	3200	21
		o-Xylene	µg/kg	970	1200	21
		Toluene	µg/kg	5.3 J	ND (19)	nc
		1-Methylnaphthalene	µg/kg	22000	30000	31
		2-Methylnaphthalene	µg/kg	32000	44000	32
		Acenaphthene	µg/kg	490	360	31
		Acenaphthylene	µg/kg	200	170	16
		Benzo[a]anthracene	µg/kg	16	17	6
		Benzo[a]pyrene	µg/kg	6.6	7.5	13
		Benzo[b]fluoranthene	µg/kg	10	11	10
		Benzo[g,h,i]perylene	µg/kg	4.9 J	6 J	nc
		Benzo[k]fluoranthene	µg/kg	3.1 J	5.1 J	nc
		Chrysene	µg/kg	19	22	15
		Dibenz(a,h)anthracene	µg/kg	ND (3.1)	3.4 J	nc

Table 2-11.1 Field Sample Duplicate Pair Results (continued)

Parent Field ID Location (Lab ID)	FD ID Location (Lab ID)	Target Analytes	Units	Parent Result	FD Result	RPD (%)
12NC28SS053 (580-35140-2) continued	12NC28SS056 (580-35140-5) continued	Fluoranthene	µg/kg	34	42	21
		Fluorene	µg/kg	510	490	4
		Indeno[1,2,3-cd]pyrene	µg/kg	4.8 J	5.5 J	nc
		Naphthalene	µg/kg	12000	16000	29
		Phenanthrene	µg/kg	440	510	15
		Pyrene	µg/kg	31	36	15
		Gasoline range organics	mg/kg	78	110	34
		Diesel range organics	mg/kg	6500	8600	28
		Residual range organics	mg/kg	1100	1400	24

Notes:

Bold = exceeds acceptance criteria

J = The analyte was positively identified at a concentration below the LOQ and is considered estimated

% = percent
µg/kg = micrograms per kilogram
µg/L = micrograms per liter
FD = field duplicate
ID = identifier
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
nc = not calculated, one or more concentration below the LOQ
ND ( ) = Not detected. Value in parenthesis is the limit of detection.
RPD = relative percent difference

Table 2-11.2 Field Sample Triplicate Results

FD ID Location (Lab ID)	Target Analytes	Units	Parent Result	First Replicate Result	Second Replicate Result	RSD (%)
12NC28MI002 (580-35084-2) (580-35084-3) (580-35084-4)	Arsenic	mg/kg	6.3	5.4	5.8	8
	Barium	mg/kg	47	46	48	2
	Cadmium	mg/kg	0.19 J	0.17 J	0.18 J	nc
	Chromium	mg/kg	8	8.6	8.4	4
	Lead	mg/kg	22	21	22	3
	Nickel	mg/kg	8.1	8.2	8.5	3
	Selenium	mg/kg	0.89	0.86	0.87	2
	Silver	mg/kg	0.078 J	0.077 J	0.077 J	nc
	Vanadium	mg/kg	17	18	18	3
	Zinc	mg/kg	41	41	41	0
	PCB-1260	mg/kg	0.011	0.0071	0.0098	21
	1-Methylnaphthalene	µg/kg	2.2	3.3	2.1	26
	2-Methylnaphthalene	µg/kg	3.3	4.4	3.5	16
	Acenaphthene	µg/kg	0.64 J	1.4 J	0.98 J	nc
	Anthracene	µg/kg	ND (0.81)	0.77 J	0.52 J	nc
	Benzo[a]anthracene	µg/kg	0.7 J	0.85 J	0.8 J	nc
	Benzo[b]fluoranthene	µg/kg	0.82 J	0.93 J	1.1 J	nc
	Benzo[g,h,i]perylene	µg/kg	0.61 J	ND (0.81)	0.9 J	nc
	Chrysene	µg/kg	1.7	2	1.9	8
	Fluoranthene	µg/kg	1.5 J	4	2.2	**50**
	Fluorene	µg/kg	ND (0.81)	1.4 J	0.58 J	nc
	Indeno[1,2,3-cd]pyrene	µg/kg	1 J	0.5 J	1.2 J	nc
	Naphthalene	µg/kg	2.1	2.8	3	18
	Phenanthrene	µg/kg	2.2	4.4	2.6	**38**
	Pyrene	µg/kg	1.3 J	3	2	**41**
	Diesel range organics w/SGC	mg/kg	6.6	7.2	7.1	5
	Diesel range organics	mg/kg	11	12	12	5
	Residual range organics w/SCG	mg/kg	41	43	42	2
	Residual range organics	mg/kg	79	83	81	2

Notes:
Bold = exceeds acceptance criteria
J = The analyte was positively identified at a concentration below the LOQ and is considered estimated
% = percent
µg/kg = micrograms per kilogram
ID = identifier
LOQ = limit of quantitation
mg/kg = milligrams per kilogram
nc = not calculated, one or more concentration below the LOQ
ND ( ) = Not detected. Value in parenthesis is the limit of detection.
RPD = relative percent difference
w/SGC = with silica gel cleanup

The field duplicate RPDs and field triplicate RSDs were within control limits with the exceptions shown in bold on Tables 2-11.1 and 2-11.2. For these results, the parent, duplicate, and triplicate sample results, as applicable, were QN qualified to indicate estimated results with an unknown bias. The Aroclor-1260 results collected at 12NC28TWA03 had detection above the LOQ in the parent sample and a non-detected in the duplicate pair. Both results were QN qualified to indicate estimated results with an unknown bias.

2.11.2 Matrix Spikes and Matrix Spike Duplicates

The MS/MSD samples are spiked in the laboratory with known concentrations of target analytes. The MS/MSD sample results provide information on possible matrix effects encountered during sample extraction, digestion, and analysis. Analytical results from MS/MSD samples are used to evaluate the sample matrix, method efficiency and applicability, accuracy, and precision. Accuracy was assessed by calculating the percent recovery of the target analytes added to the primary sample; precision was assessed by calculating the RPD for the MS/MSD sample pairs.

The MS/MSD sample pairs are required by the QAPP at a rate of one MS/MSD pair per 20 samples per matrix. MS/MSD pairs were collected at the following frequencies per method and matrix:

- One MS/MSD pair was collected for five soil samples at a frequency of 20% for GRO, BTEX, DRO/RRO, PCBs, PAHs, metals.

- One MS/MSD pair was collected for four MI soil samples at a frequency of 25% for DRO/RRO, DRO/RRO with silica gel, PCBs, PAHs, and metals.
- Three MS/MSD pairs were collected for fourteen water samples at a frequency of 21% for BTEX, DRO/RRO, PCBs, PAHs, and dissolved metals.
- Two MS/MSD pairs were collected for fourteen water samples at a frequency of 14% for GRO and total metals.

The MS and MSD recoveries and RPDs are discussed in Sections 2.2 through 2.10.

2.11.3 Equipment Blank

An equipment blank is collected to determine if field-sampling equipment could be a source of contamination to primary samples. An equipment blank is made by pouring organic-free (distilled) water for organic analyses and de-ionized water for inorganic analyses into or through decontaminated field sampling equipment (bailer, pump tubing, soil sampling equipment, etc.). The water is collected in the same type of sample container, with the same preservative (if applicable), and analyzed by the same methods as the associated primary samples.

All samples were collected using disposable or dedicated equipment and an equipment blank was not required.

2.11.4 Trip Blanks

Samples submitted to the laboratory for BTEX and GRO analyses are shipped with trip blanks. Methanol trip blanks are included in shipments containing soil samples and aqueous trip blanks are used for shipments containing water samples. Trip blanks are collected to assess the potential for BTEX or GRO cross-contamination introduced by sample bottles, from sample handling during field operations, shipping, or storage at the laboratory.

Trip blanks were included with shipments containing samples for BTEX and GRO analysis and were free of target analytes with the exceptions noted below.

- GRO was detected at concentrations greater than the detection limit but less than the LOQ in one methanol trip blank shipped with samples on 9/19/12 at a concentration of 1.1 mg/kg. This trip blank detect was previously determined to be laboratory contamination. All associated GRO results were >10x the trip blank concentration and qualifiers were not assigned.
- GRO was detected at concentrations greater than the LOQ in one methanol trip blank shipped with samples on 9/25/12 at a concentration of 7.0 mg/kg. The single associated GRO result was >10x the trip blank concentration and qualifiers were not assigned.

2.12 SAMPLE QUALIFIERS

Sample qualifiers are presented in Table 2-12.

Table 2-12 Sample Qualifiers

Field Sample Identification	Laboratory Sample Number	Compounds Affected	Reason	Flag	Bias
12NC28SS054	580-35140-3	Ethylbenzene o-Xylene	High MS or MSD Recovery	MH	High
12NC28SS054 12NC28BW01	580-35140-3 580-35168-10	GRO	Low surrogate recovery	ML	Low
Trip Blank 091912-02 Trip Blank 092312-1	580-35140-6 580-35168-11	GRO	Lab blank contamination	B	High
12NC28MI001 12NC28MI002 12NC28MI003 12NC28MI004 12NC28MI005 12NC28MI006	580-35084-1 580-35084-2 580-35084-3 580-35084-4 580-35084-5 580-35084-6	PAHs	Hold time exceedance	QL	Low
12NC28MI001	580-35084-1	Benzo[a]pyrene Indeno[1,2,3-cd]pyrene Dibenz[a,h]anthracene Benzo[g,h,,i]perylene	Hold time exceedance and low MS or MSD recovery	QL, ML	Low
12NC28WA01 12NC28WA02 12NC28WA03	280-33360-8 280-33360-9 280-33360-10	Benzo[g,h,i]perylene Fluoranthene Pyrene	Lab blank contamination. Sample concentrations less than lab blank	B	High

Table 2-12 Sample Qualifiers (continued)

Field Sample Identification	Laboratory Sample Number	Compounds Affected	Reason	Flag	Bias
12NC28WA02	280-33360-9	Benzo[a]anthracene Benzo[a]pyrene Chrysene	Lab blank contamination. Sample concentrations less than lab blank	B	High
12NC28TWA01	1124556001	Acenaphthylene Indeno[1,2,3-cd]pyrene Dibenz[a,h]anthracene Benzo[g,h,,i]perylene	Low MS and/or MSD recovery	QL	Low
12NC28TWA04	1124556006	PAHs	Low surrogate recovery	QL	Low
12NC28SS054	580-35140-3	Acenaphthylene Acenaphthene Phenanthrene	High MS and/or MSD recovery	MH	High
12NC28MI005 12NC28MI006	580-35084-5 580-35084-6	DRO DRO with silica gel	Hold time exceedance	QL	Low
12NC28MI001	580-35084-1	DRO DRO with silica gel	Hold time exceedance, high MS or MSD recovery	QL, MH	Unknown
12NC28MI002 12NC28MI003 12NC28MI004	580-35084-2 580-35084-3 580-35084-4	DRO DRO with silica gel	Hold time exceedance and lab blank contamination	QL, B	Unknown
12NC28MI002 12NC28MI003 12NC28MI004 12NC28MI006	580-35084-2 580-35084-3 580-35084-4 580-35084-6	RRO	Hold time exceedance	QL	Low
12NC28MI001	580-35084-1	RRO	Hold time exceedance and high CCV recovery	QL, QH	High
12NC28MI005	580-35084-5	RRO	Hold time exceedance and high surrogate recovery	QL, QH	Unknown
12NC28SS054	580-35140-3	RRO	High surrogate recovery	QH	High
12NC28WA07	580-35092-1	RRO	High MSD Recovery	MH	High

Table 2-12 Sample Qualifiers (continued)

Field Sample Identification	Laboratory Sample Number	Compounds Affected	Reason	Flag	Bias
12NC28MI001	580-35084-1	RRO with silica gel cleanup	Hold time exceedance and high surrogate recovery	QL, QH	Unknown
12NC28MI002 12NC28MI003 12NC28MI004 12NC28MI005 12NC28MI006	580-35084-2 580-35084-3 580-35084-4 580-35084-5 580-35084-6	RRO with silica gel cleanup	Hold time exceedance	QL	Low
12NC28MI001	580-35084-1	TOC	Hold time exceedance	QL	Low
12NC28MI001	580-35084-1	Barium Lead Nickel Vanadium Zinc	High MS/MSD recovery	MH	High
12NC28MI001	580-35084-1	Mercury	Hold time exceedance and low MSD recovery	QL, ML	Low
12NC28MI002 12NC28MI003 12NC28MI004 12NC28MI005 12NC28MI006	580-35084-2 580-35084-3 580-35084-4 580-35084-5 580-35084-6	Mercury	Hold time exceedance	QL	Low
12NC28WA04 12NC28WA05 12NC28WA06 12NC28WA07 12NC28WA08 12NC28WA09 12NC28WA10 12NC28WA11 12NC28WA12 12NC28WA13	580-35085-1 580-35085-2 580-35085-3 580-35092-1 580-35092-2 580-35092-3 580-35092-4 580-35092-5 580-35092-6 580-35092-7	Total and dissolved mercury	Lab blank contamination	B	High
12NC28WA05 12NC28WA06	580-35085-2 580-35085-3	2-Methylnaphthalene	Field duplicate imprecision	QN	Unknown

Table 2-12 Sample Qualifiers (continued)

Field Sample Identification	Laboratory Sample Number	Compounds Affected	Reason	Flag	Bias
12NC28MI002 12NC28MI003 12NC28MI004	580-35084-2 580-35084-3 580-35084-4	Fluoranthene Phenanthrene Pyrene	High field triplicate %RSD	QN	Unknown
12NC28TWA02 12NC28TWA03	1124556004 1124556005	P & M -Xylene Aroclor-1260	Field duplicate imprecision	QN	Unknown

Notes:

CCV = continuing calibration verification
DRO = diesel range organics
GRO = gasoline range organics
MS = matrix spike
MSD = matrix spike duplicate
PAHs = polynuclear aromatic hydrocarbons
RPD = relative percent difference
RRO = residual-range organics

B = blank contamination
H = high bias; used in conjunction with a Q or M
H = hold time exceedance
L = low bias; used in conjunction with a Q or M
M = quality control failure due to matrix
N = unknown bias ; used in conjunction with a Q or M
Q = quality control failure

3.0 SUMMARY

This Report evaluates the analytical data generated during the NE Cape Remedial Actions conducted at Site 28 during September 2012. This assessment evaluated whether program objectives and data quality goals were met. The assessment reviewed sample receipt conditions, extraction and analytical procedures, sampling procedures, and correspondence to method criteria and project DQOs. The following conclusions were drawn based on this assessment of the analytical data:

- Sample receipt conditions were acceptable based on temperatures upon receipt and CoC correspondence to submitted sample set. There were instances when the information on the container labels did not match the COC. For these instances, the laboratory made a determination as to which information to use and provided documentation in the laboratory narrative. One 1-liter amber jar was received broken, sufficient volume was available to perform all requested analyses.
- Extraction and analytical procedures were acceptable based on holding times, MBs, LCS/LCSDs, MS/MSDs, and surrogates except as noted below:
  - MI soil samples were initially analyzed as bulk samples. These samples were re-analyzed outside holding time requirements using the incremental sample preparation procedures. All MI results for PAHs, DRO/RRO, DRO/RRO with silica gel cleanup, and mercury and one MI results for total organic carbon were H qualified to indicate the analysis occurred outside holding time requirements.
  - Detected results were qualified as estimated with a high bias (QH) due to high surrogate recoveries as follows:
  - Detected RRO in two samples, and
  - Detected RRO after silica gel cleanup in one sample
  - Detected RRO results for one soil sample were qualified as estimated with a high bias (QH) due to a high CCV recovery.
  - Results were qualified as estimated with a low bias (QL) due to low surrogate recoveries as follows:
    - GRO results for 2 samples,
    - PAH results for 1 sample

- One naphthalene result had a high RPD between the LCS and LCSD. The result had been qualified due to a low surrogate recovery (QL) and further qualification was not required.
- The following results were B qualified due to associated method blank contamination at a concentration <10x the sample concentration:
  - GRO results in two trip blanks
  - Benzo[g,h,i]perylene, fluoranthene, and pyrene results in three water samples
  - Benzo[a]anthracene, benzo[a]pyrene, and chrysene results in one water sample
  - DRO and DRO following silica gel cleanup in three soil samples
  - Total and dissolved mercury in ten water samples.
- Samples were qualified due to either high (MH) or low (ML) MS/MSD recoveries to indicate potential bias due to a matrix effect. Qualification was limited to the spiked sample since no trends were observed. An MN qualifier was used to indicate a matrix effect with an unknown bias when both a high and low MS/MSD recovery were observed or for a high MS/MSD RPD, unassociated with bias. Qualified organic samples were:
  - Ethylbenzene and o-xylene results for one sample were MH qualified,
  - Benzo[a]pyrene, indeno[1,2,3-cd]pyrene, dibenz[a,h]anthracene, and benzo[g,h,i]perylene results for one sample were ML qualified,
  - Acenaphthene , acenaphthylene, and phenanthrene results for one sample were MH qualified,
  - DRO and DRO with silica gel cleanup for one soil sample were MH qualified,
  - RRO results for one water sample were MH qualified,
  - Barium, lead, nickel, vanadium, and zinc were MH qualified in one soil sample
  - Mercury was ML qualified in one soil sample.

- Multiple sample results were reported when sample concentrations exceeded the calibration range of the instrument. The result associated with the higher dilution and within the instrument calibration range was reported. Results for the lower dilution should not be reported for the following:
  - m&p-Xylene and o-xylene results for sample 12NC28SS055,
  - 1-Methylnaphthalene, 2-methylnaphthalene and naphthalene results for samples 12NC28SS052 through 12NC28SS056, and

  - 1-Methylnaphthalene and 2-methylnaphthalene results for sample 12NC28BW01.

- Field quality control results met QAPP criteria with the following exceptions:
  - Imprecision was observed in field duplicate samples for:
    - 2-methylnaphthalene in one water field duplicate pair
    - Fluoranthene, phenanthrene, and pyrene in one MI triplicate set
    - p & m-Xylene and Aroclor-1260 in one water field duplicate pair.
- In all cases, the majority of duplicate sample results met the control criteria and qualification as estimated with an unknown bias (QN) was limited to the field duplicate pair or triplicate set, as applicable.

Based on this review, the analytical data generated during the NE Cape Remedial Action at Site 28 are complete, correct, consistent, and compliant with method procedures and QC requirements, and are usable as qualified.

(Intentionally blank)

ADEC CHECKLISTS

Laboratory Data Review Checklist

Completed by: Julie Sharp-Dahl

Title: Chemist Date: 11/14/2012 (revised 4/3/13)

CS Report Name: Northeast Cape Report Date: 10/2/12

Consultant Firm: Bristol Environmental Remediation Services

Laboratory Name: TestAmerica-Denver Laboratory Report Number: 580-33360-1

ADEC File Number: 475.38.013 ADEC RecKey Number: Haz ID. 212

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 not transferred to another lab.

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

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

      The laboratory failed to perform MS/MSD analyses on project samples for BTEX, even though it was specified on the CoC.

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:

      One of 4 coolers was received at a temperature of 1.9 ^{o}C. The other 3 coolers were within range. There was no indication that samples were frozen or broken (other than as noted below) due to the slightly depressed temperature; therefore, there are no qualifications necessary on this basis.

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:

One of 13 unpreserved amber 1L bottle for sample 12NC28WA03 was received at the laboratory broken; there was an adequate number of sample containers to perform all requested analyses. All other samples were received in good condition.

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

X Yes No □ NA (Please explain.) Comments:

As noted above.

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

Comments:

See above.

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:

Most topics – such as method blank contamination, LCS/LCSD recoveries, and MS/MSD recoveries, are addressed in the case narrative are addressed further in the following sections or in the QA summary.

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:

All results are usable for project purposes with qualifiers applied to results with quality control issues. No results were rejected.

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?
      X Yes No □NA (Please explain.) Comments:

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

      Samples are of water, not soil.

   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:

      No

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:

      Eight compounds were detected in a 8270SIM method blank: benzo(a)anthracene, chrysene, fluoranthene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, and pyrene. Benzo(b)fluoranthene and benzo(k)fluoranthene in the associated samples were not detected. The other six compounds had associated samples within ten times the blank concentration and resulted in associated sample result qualifications and B flags. See section 2.6 and Table 2-12 of CDQR for further details.

      iii. If above PQL, what samples are affected?

      Detected sample results less than 10 times the reported concentration in the method blank are B flagged to indicate potential high bias.

Comments:

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:

Affected sample results are B flagged.

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

Affected sample results are usable for project purposes though a potential for high bias as indicated by the reported concentrations in the method blank.

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:

One LCS/LCSD was reported for 8270SIM, AK101, AK102/103, and 8082. One LCS was reported for 8260. Batch precision information for 8260 analyses was obtained from non-project MS/MSDs in batch 138812. The failure to extract and analyze an LCSD and project MS/MSDs was due to laboratory error and doesn't follow QSM requirements; however, the non-project MS/MSD analyzed with this batch met precision and accuracy requirements. The project MS/MSD specified on the CoC was extracted in prep batch 280-139061.

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

One LCS was reported, but not an LCSD or laboratory duplicate. Batch precision information will be from the MS/MSDs performed. The 7470 and 6020 serial dilutions and the 6020 post-digestion spike were performed on project sample 12NC28WA03.

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:

The LCSD for 8270SIM did not contain the spiking solution. The %R in the LCS met criteria. Batch precision information for this method will be from the MS/MSD performed.

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:

The %RPD for the LCS/LCSD for the 8270SIM analysis did not meet criteria due to the fact the spiking solution was not added to the LCSD. RPDs for all other analyses were within criteria, including the non-project BTEX MS/MSD results for batch 138812.

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

See above.

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

No qualifications are necessary on the basis of LCS/LCSDs.

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

See above about batch precision information relying on MS/MSDs for several analyses. The results are still usable for project purposes.

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)
X 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 X NA (Please explain.) Comments:

Not Applicable.

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

Data quality and usability are 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.)
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:

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

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

Not Applicable.

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

Not Applicable.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
X Yes No NA (Please explain.) Comments:

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)

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

□X Yes No NA (Please explain.) Comments:

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

Comments:

No exceedances, therefore, data quality and usability is not affected.

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

□Yes □ No X NA (Please explain.) Comments:

All samples were collected by dipping a clean sample bottle into the water so no equipment blank was required.

i. All results less than PQL?

□Yes □ No X□NA (Please explain.) Comments:

Not Applicable.

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:

Flags/qualifiers are on the data tables and are also discussed in the QA summary, which was not prepared until after this checklist.

Laboratory Data Review Checklist

Completed by: Julie Sharp-Dahl

Title: Chemist Date: 11/20/2012 (revised 3/19/13)

CS Report Name: Northeast Cape Report Date: 10/29/12

Consultant Firm: Bristol Environmental Remediation Services

Laboratory Name: TestAmerica-Tacoma Laboratory Report Number: 580-35084

ADEC File Number: 475.38.013 ADEC RecKey Number: Haz ID. 212

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 not transferred to another lab.

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

   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:

All samples received in good condition.

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

The container label for the following samples did not match the information listed on the Chain-of-Custody (COC): 12NC28MI002, 12NC28MI003 and 12NC28MI004. The container labels listed times of 11:10, 11:30 and 11:40 respectively, but the COC lists times of 15:50, 15:00 and 15:30 respectively. The samples were logged in per the COC.

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

Data quality and usability were not affected by the sampling time discrepancies. Hold times were impacted anyway, as described below.

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:

Most topics – such as method blank contamination, surrogate recoveries, and MS/MSD recoveries are addressed in the case narrative and are addressed further in the following sections or in the QA summary.

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:

Although not discussed specifically in the case narrative, all results are usable for project purposes with qualifiers applied to results with quality control issues. No results were rejected.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

X Yes □ No □NA (Please explain.) Comments:

The laboratory initially logged in the samples as bulk samples rather than as MI samples, and performed all requested analyses on the bulk samples. Upon receipt of the data Bristol requested the laboratory to process the bulk samples as MI samples and re-perform all of the requested analyses, which the laboratory did. Both the bulk and MI sample results and associated QC are reported in the hardcopy, only the MI prep results are reported in the EDD. Only the MI analyses will be discussed in detail in this checklist.

b. All applicable holding times met?

Yes X No □NA (Please explain.) Comments:

Hold times for the samples processed using the MI protocol and analyzed for PAH by 8270SIM, DRO & RRO by AK102 and by AK 102/103 with silica gel clean up, mercury by 7471, and total organic carbon by 9060 had been exceeded by the time Bristol determined that the laboratory had prepared and analyzed the bulk sample rather than preparing and analyzing the samples as MI samples. Hold times for metals other than mercury, five TOC results, and for PCBs, were met. See CDQR for further details including Table 2-12 which summarizes sample results qualified including reason.

c. All soils reported on a dry weight basis?

X Yes □ No □ NA (Please explain.) Comments:

Data report pages for the MI sample data indicate that the sample was not dry weight corrected. However, the MI preparation method requires the samples to be air dried prior to particle size reduction, extraction, and analysis. So the sample data is reported on a dry weight basis even though the report pages state otherwise.

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:

Data quality is affected since sample aliquots were removed from the sample container prior to processing the entire sample mass by the MI protocol; therefore, the sample itself was altered and the results for the sample may not be considered representative of the decision unit.

Also, technical hold times for a majority of the analyses were missed. All MI results associated with hold time exceedances should be considered estimated with low bias and flagged H. The data is usable for project purposes as qualified.

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?
      X Yes No □NA (Please explain.) Comments:

      All method blank results were less than the LOQ; however, DRO was detected the MI method blanks associated with both the samples with and without silica gel cleanup. Three samples without silica gel cleanup - 12NC28MI002, 12NC28MI003, and 12NC28MI004 – are B flagged and considered estimated with a potential high bias. These three samples have their DRO results with silica gel cleanup B flagged. See section 2.6 and Table 2-12 of CDQR for further details.

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

      See above.

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

      See above.

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

      See above.

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

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

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

      A LCS and LCSD were analyzed in each batch. A laboratory sample duplicate was not reported for both the 7471 mercury analysis and for the analysis of other metals by 6020. A serial dilution sample was analyzed by 6020.

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)

X Yes □ No □NA (Please explain.) Comments:

Four PAH compounds had low MS/MSD recoveries for sample 12NC28MI001 and results were ML qualified. Six metals had MS/MSD recoveries outside acceptance criteria for sample 12NC28MI001. Results for sample 12NC28MI001 were MH or ML qualified, unless the sample concentration was greater than 4x the spike concentration. See CDQR including Table 2-12 for further details.

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:

The %RPDs for the LCS/LCSDs were all within criteria. The %RPD between results for selenium in the parent sample and the serial dilution were above the comparison criteria, but because both a LCS and LCSD were included in the analytical batch precision is evaluated on the basis of the LCS/LCSD.

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

Comments:

No samples are affected since both the %R and RPD for the LCS/LCSDs were within limits.

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

Yes □ No □X NA (Please explain.) Comments:

See above.

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

Comments:

No qualifications are necessary on the basis of the LCS/LCSD.

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 surrogate %R for the RRO analysis was above criteria for the following samples: 12NC28MI005, -001 MS, and -001MSD by AK102/103 and 12NC28MI001 by AK102/103 with silica gel cleanup. The RRO result for 12NC28MI005 and the RRO result with silica gel cleanup for 12NC28MI001 are flagged QH and considered an estimated result with a high bias.

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:

See above.

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

Comments:

See above.

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

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes □ No X□NA (Please explain.) Comments:

No volatile samples in this SDG.

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 X□NA (Please explain.) Comments:

Not Applicable.

iii. All results less than PQL?

Yes □ No X NA (Please explain.) Comments:

Not Applicable

iv. If above PQL, what samples are affected?

Comments:

Not Applicable.

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

Comments:

Not Applicable.

e. Field Duplicate

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

Yes X No NA (Please explain.) Comments:

Field replicates (2) were submitted with the parent sample.

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)

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

□ Yes X No NA (Please explain.) Comments:

The samples submitted represent one primary and two field replicate samples therefore the calculation is %RSD, not %RPD. The RSD was within the <30% RSD criteria for all analytes with detected concentrations greater than the reporting limit with the exception of three PAHs: fluoranthene, phenanthrene, and pyrene.

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

Comments:

Three samples had these three PAH compounds qualified as estimated with an undetermined bias on this basis and flagged QN. See section 2.11.1 and Table 2-12 of the CDQR for further details.

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

□Yes □ No X□NA (Please explain.) Comments:

All samples were collected using disposable or dedicated equipment.

i. All results less than PQL?

□Yes □ No X□NA (Please explain.) Comments:

Not Applicable.

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:

Flags/qualifiers are on the data tables and are also discussed in the QA summary, which was not prepared until after this checklist.

Laboratory Data Review Checklist

Completed by: Keather McLoone

Title: Project Chemist Date: 11/19/2012(revised 3/19/13)

CS Report Name: Northeast Cape (Site 28) Report Date: 10/12/12

Consultant Firm: Bristol Environmental Remediation Services

Laboratory Name: TestAmerica-Tacoma Laboratory Report Number: 580-35805

ADEC File Number: 475.38.013 ADEC RecKey Number: Haz ID. 212

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 not transferred to another lab.

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

   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:

All samples received in good condition.

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

The container label for 12NC28WA05 and TripBlank091912 did not match the information listed COC. The container labels on the HCl preserved VOA vials for sample 12NC28WA05 did not list a sampling time. The COC listed a time of 15:00 for this sample. The sample was logged in per COC. The container labels listed Trip Blank, 9/9/12 and no time for sample TripBlank091912. The COC listed TripBlank091912, 9/14/12 and 11:00. The sample ID was logged in per COC, the sample date was set to the earliest sample date, 09/17/2012.

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

Results are usable without qualification.

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:

Method blank contamination and MS/MSD are the two issues that could impact data quality that are mentioned in the case narrative. Method blanks are discussed below and MS/MSD will be discussed in the QA Summary.

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:

Case narrative does not discuss usability. See method blank section below and CDQR for additional details regarding usability.

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?
X Yes □ No □NA (Please explain.) Comments:

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

Water samples only.

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:

No.

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?
X Yes No □NA (Please explain.) Comments:

All method blanks were less than the LOQ; however, mercury was detected in method blank MB 580-121083/20-A. The three total mercury and three dissolved mercury sample results should be considered estimated with a potential high bias and are flagged B. See section 2.6 and Table 2-12 of CDQR for further details.

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

See above.

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:

Affected sample results are B flagged.

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

Comments:

Affected sample results are usable for project purposes though a potential for high bias as indicated by the reported concentrations in the method blank.

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:

Metals results included LCS/LCSD and a sample duplicate.

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)

X□Yes □ No □NA (Please explain.) Comments:

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)

X Yes No □NA (Please explain.) Comments:

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

Comments:

n/a

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

Yes □ No □X NA (Please explain.) Comments:

No exceedances or qualifications on this basis.

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

Comments:

No impact to data usability on the basis of LCS/LCSD.

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)
X□Yes No □NA (Please explain.) Comments:

All sample surrogates were within acceptance criteria.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
□Yes □ No X NA (Please explain.) Comments:

No qualifications on this basis.

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

No effect on sample data quality or usability on this basis.

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 X NA (Please explain.) Comments:

One trip blank submitted in this three cooler shipment.

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 □X No □NA (Please explain.) Comments:

Not clearly indicated on the CoC but is indicated on the Login Sample Cooler Check List that all the 40 mL VOA vials were in cooler 091912-03.

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

v. If above PQL, what samples are affected?

Comments:

Not applicable as all trip blank results reported as not detected.

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

Comments:

No impact to usability on the basis of trip blanks.

e. Field Duplicate

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

X Yes No NA (Please explain.) Comments:

One field duplicates was submitted with this SDG containing 3 samples. Duplicate frequency calculated on a project basis, rather than per SDG.

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)

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

□ Yes X No NA (Please explain.) Comments:

2-methylnaphthalene had a RPD of 70 percent for duplicate pair 12NC28WA05 and 12NC28WA06; therefore, these two results will be flagged QN to indicate estimated results with an unknown bias direction. See also Section 2.11.1 and Table 2-12 of the CDQR.

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

Comments:

No qualifications on this basis for this SDG.

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

All samples were collected using disposable or dedicated equipment.

□Yes □ No X□NA (Please explain.) Comments:

i. All results less than PQL?

□Yes □ No X□NA (Please explain.) Comments:

All samples were collected using disposable or dedicated equipment.

ii. If above PQL, what samples are affected?

Comments:

n/a

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

Comments:

n/a

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

a. Defined and appropriate?

X Yes □ No □NA (Please explain.) Comments:

Flags/qualifiers are on the data tables and are also discussed in the QA summary, which was not prepared until after this checklist.

Laboratory Data Review Checklist

Completed by: Keather McLoone

Title: Project Chemist Date: 11/19/2012 (revised 3/13/13)

CS Report Name: Northeast Cape (Site 28) Report Date: 10/15/12

Consultant Firm: Bristol Environmental Remediation Services

Laboratory Name: TestAmerica-Tacoma Laboratory Report Number: 580-35092

ADEC File Number: 475.38.013 ADEC RecKey Number: Haz ID. 212

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 not transferred to another lab.

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

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

      CoC mistakenly requested a DRO/RRO analysis for the trip blank. No impact to data usability.

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:

      One of the five coolers in this shipment had the cooler temperature recorded at 1.6 degrees Celsius. There were no issues with sample integrity noted such as frozen samples or broken containers; therefore, there is no impact to data quality or usability.

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:

All samples received in good condition.

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

The container label for the following samples did not match the information listed on the COC: 12NC28WA07 and the MS/MSD containers and 12NC28WA08. 12NC28WA07 had a time of 15:00 on all containers. 12NC28WA08 had a time of 15:15 on all containers. Samples logged in per COC. Also for sample, 12NC28WA07, the ID on two ambers was not completely filled out on the container label. Matched up per time and logged in according to the COC. Also for sample, 12NC28WA08, the HNO3 poly for dissolved metals was received with the ID not completely filled in and no sample time either. All other HNO3 poly bottles were accounted for and assumed ID was 12NC28WA08.

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

Results are usable without qualification.

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:

Method blank contamination and MS/MSD are the two issues that could impact data quality that are mentioned in the case narrative. Method blanks are discussed below and MS/MSD will be discussed in the QA Summary.

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:

See above.

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?

X Yes No □NA (Please explain.) Comments:

c. All soils reported on a dry weight basis?

Yes □ No □X NA (Please explain.) Comments:

Water samples only.

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:

No.

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?

X Yes No □NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

No method blanks above LOQ; however the mercury method blank was detected between the LOQ and DL. Mercury was detected in method blank MB 580-121091/21-A associated with both total and dissolved mercury sample results. All associated total and dissolved mercury sample results were within ten times the concentration in the blank. These results are B flagged. See section 2.6 and Table 2-12 of CDQR for further details

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

X Yes □ No □NA (Please explain.) Comments:

Affected sample results are B flagged.

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

Comments:

Affected sample results are usable for project purposes though a potential for high bias as indicated by the reported concentrations in the method blank.

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:

Both 6020 and 7470 analyses reported both a LCS/LCSD and a sample duplicate.

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)

X□Yes □ No □NA (Please explain.) Comments:

Sample 12NC28WA07 had a high MSD recovery for RRO and the result was MH qualified.

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)

X Yes No □NA (Please explain.) Comments:

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

See above.

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

See above.

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

Results were usable as qualified.

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)
X□Yes No □NA (Please explain.) Comments:

All sample surrogates were within acceptance criteria.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
□Yes □ No X NA (Please explain.) Comments:

No qualifications on this basis.

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

No effect on sample data quality or usability on this basis.

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

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

One trip blank submitted in this shipment including five coolers.

Yes □X 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 □X No □NA (Please explain.) Comments:

Although this information is not clearly indicated on the CoC, there are five cooler receipt forms. Four of these have a N/A marked next to the following questions "If present, were voa vials checked for the absence of air bubble and noted if found?" and "Adequate volume of voa vials received per sample?" The fifth cooler receipt form, for Cooler Id No. 092112-03 had a yes indicated in answer to those questions. This is further corroborated by the Login Sample Cooler Check List provided by the lab shortly following sample receipt. This form indicates that the only cooler containing 40 mL VOA vials was cooler 092112-03. Therefore, it is reasonable to assume that this documentation suffices to show that all volatile samples were packed with the trip blank.

iii. All results less than PQL?

X Yes □ No NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

No trip blank detections above LOQ or DL.

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

Comments:

No qualifications necessary on the basis of trip blanks.

e. Field Duplicate

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

X Yes No NA (Please explain.) Comments:

One field duplicate was submitted with this SDG containing 7 samples. Duplicate frequency calculated on a project basis, rather than per SDG.

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)

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

□X Yes No NA (Please explain.) Comments:

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

Comments:

No qualifications on this basis for this SDG.

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

□Yes □ No X□NA (Please explain.) Comments:

All samples were collected using disposable or dedicated equipment.

i. All results less than PQL?

□Yes □ No X□NA (Please explain.) Comments:

All samples were collected using disposable or dedicated equipment.

ii. If above PQL, what samples are affected?

Comments:

n/a

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

Comments:

n/a

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

a. Defined and appropriate?

X Yes □ No □NA (Please explain.) Comments:

Flags/qualifiers are on the data tables and are also discussed in the QA summary, which was not prepared until after this checklist.

Laboratory Data Review Checklist

Completed by: Julie Sharp-Dahl

Title: Chemist Date: 11/20/2012 (revised 3/19/13)

CS Report Name: Northeast Cape Report Date: 10/15/12

Consultant Firm: Bristol Environmental Remediation Services

Laboratory Name: TestAmerica-Tacoma Laboratory Report Number: 580-35140

ADEC File Number: 475.38.013 ADEC RecKey Number: Haz ID. 212

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 not transferred to another lab.

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

      The cooler temperature was recorded at 0.3°C. The temperature blank was recorded at 8.9°C. The samples were shipped on 9-19-12 and received at the laboratory on 9-24-12. The sample receipt form indicated that the ice was melting upon receipt. No qualifiers were assigned since the cooler temperature was less than 6 degrees C.

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:

All samples received in good condition.

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

No discrepancies noted.

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

No. See above.

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:

Most topics – such as method blank contamination, surrogate recoveries, and MS/MSD recoveries are addressed in the case narrative and are addressed further in the following sections or in the QA summary.

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:

All results are usable for project purposes with qualifiers applied to results with quality control issues. No results were rejected.

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?
      X Yes No □NA (Please explain.) Comments:

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

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

   e. Data quality or usability affected?
      Comments:

      No.

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?
      X Yes No □NA (Please explain.) Comments:

      All method blank results were less than the LOQ; however, GRO was detected in a method blank between the LOQ and DL. One sample, the trip blank, had GRO detected within ten times the amount in the method blank. The trip blank GRO result is B flagged to indicate an estimated result with a potential high bias.

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

      See above.

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

See above.

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

See above.

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

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

The MS/MSD for sample 12NC28SS054 had high recoveries for 2 BTEX compounds and 8 PAHs. Detected analytes were MH qualified unless the sample concentration was greater than 4x the spiking solution. See the CDQR, including Table 2-12, for additional details.

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:

%RPD between MS/MSD in the AK101 analysis %R for sample 12NC28SS054 was 20%. %RPD between the MS/MSD for anthracene in the 8270SISIM analysis for sample 12NC28SS054 was above criteria (%R in the MSD was also above criteria).

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

Sample 12NC28SS054 is affected by MS/MSD precision for anthracene. The parent result was non-detect so no flagging was assigned based on MSD recoveries or precision.

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

See CDQR sections 2.3 and 2.6 as well as Table 2-12 for additional details.

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

Results are usable as qualified.

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:

TFT %R by 8260 for samples 12NC28SS054 and 12NCSS054 MS/MSD were below criteria. TFT is the field surrogate for AK101 (GRO) and is considered a secondary surrogate for 8260 analysis, is not a QAPP required surrogate, and results were not qualified on the basis of this surrogate for this analysis. %R of BFB by AK101 was above criteria for samples 12NC28SS052, -053, -055, -056 (and -054MS). BFB is not a QAPP required surrogate for GRO analysis and no qualifiers were assigned. The %R for TFT was below criteria for the GRO analysis for samples12NC28SS054 (and -054MSD). The recovery of this surrogate for sample 12NC28SS054 was less than 10 percent (6%); however, since the result was a detected concentration it was qualified as estimated with a low bias (ML) rather than rejected. %R of NTC by AK 102/103 for sample 12NC28SS054 was above criteria; therefore, the RRO result associated with this sample should be flagged QH as an estimated result with a high bias.

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:

See above.

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

See above.

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:

iii. All results less than PQL?

X Yes □ No NA (Please explain.) Comments:

All results were less than the LOQ; however, GRO was detected between the LOQ and DL. This result is B flagged due to method blank contamination. Also, there were no associated samples with GRO results within ten times the amount in the trip blank. Therefore, no qualifications are necessary on the basis of trip blank contamination.

iv. If above PQL, what samples are affected?

Comments:

See above.

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

Comments:

See above.

e. Field Duplicate

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

X Yes No NA (Please explain.) Comments:

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)

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

□ X Yes No NA (Please explain.) Comments:

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

Comments:

No. %RPD between the field duplicates met criteria.

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

□Yes □ No X□NA (Please explain.) Comments:

All samples were collected using disposable or dedicated equipment.

i. All results less than PQL?

□Yes □ No X□NA (Please explain.) Comments:

Not Applicable.

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:

Flags/qualifiers are on the data tables and are also discussed in the QA summary, which was not prepared until after this checklist.

Laboratory Data Review Checklist

Completed by: Marty Hannah

Title: Project Chemist Date: 12-3-12 (revised 3/19/13)

CS Report Name: NE Cape Site 28 Phase I Sediment Removal Report Report Date: 10-15-12

Consultant Firm: Bristol Environmental Remediation Services

Laboratory Name: TestAmerica-Tacoma Laboratory Report Number: 580-35168

ADEC File Number: 475.38.013 ADEC RecKey Number: Haz ID. 212

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:

      All analyses were performed by TestAmerica-Tacoma

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      X Yes ☐ 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:

      Samples were shipped from NE Cape and picked up by Bristol personnel who hand delivered to TA-Anchorage where the cooler temperature was 2.5 degrees C and forwarded by TA-Anchorage personnel to TA-Tacoma. The cooler temperature upon receipt in Tacoma was 0.1 degrees C and the temperature blank was 2.4 degrees C. Samples were not affected by the cooler temperature.

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:

All samples were received in good condition.

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

The sample container for 12NC28BW01 listed a collection date of 9/21/12 and the CoC listed a date of 9/1212012, likely a typing error, the sample was logged in per the sample container. Sample Trip blank 092312-1 listed a collection date of 9/2132012, likely another entry error, the sample was logged in as a collection date of 09/23/12 per the sample container.

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

No, sample results or holding times were not affected.

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:

The GRO surrogate had a low recovery for sample 12NC28BW01, GRO was detected in the MB, the RRO surrogate failed high for samples 12NCMOCBW222 and –BW229. The case narrative states that metals MS/MSD had recovery and/or RPD exceedances and concluded matrix interference. Not stated on the case narrative, but discussed further in the CDQR, the MS/MSD was performed on a non-project sample.

c. Were all corrective actions documented?

□Yes X No □NA (Please explain.) Comments:

Corrective actions were not taken by the laboratory for these quality control and matrix related issues. The laboratory indicated a matrix interference for sample 12NC28BW01, as this sample had a 45 % moisture content associated with a GRO surrogate recovery of 45 % which was slightly below the lower limit of 50 %. Moisture is considered interference as per AK Method 101. The GRO detected in the method blank was detected at a level less than ½ the LOQ. The QSM considers the method blank to be contaminated if the amount in the blank is greater than ½ the reporting limit. The laboratory indicate matrix interference, due to target analyte presence at fairly high concentrations resulting in surrogate recoveries of 173 and 162 percent for samples 12NCMOCBW222 and –BW229, respectively, which are above the upper acceptance limit of 150 percent. According to TestAmerica's SOP for this method, surrogate recoveries outside limits due to matrix effects will be flagged and discussed in case narrative. Since a metals MS/MSD was not performed on a project sample, precision and accuracy will be evaluated using other QC criteria.

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

Comments:

Sample results are usable for project purposes with some qualifications. The results will be used for waste sample characterization and disposal.

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?

X Yes □ No □NA (Please explain.) Comments:

c. All soils reported on a dry weight basis?

X Yes □ No □NA (Please explain.) Comments:

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

X Yes □ No □NA (Please explain.) Comments:

e. Data quality or usability affected?

Comments:

Sample results are usable for project purposes without qualification in respect to sample reporting limits and holding times.

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?
      X Yes □ No □NA (Please explain.) Comments:

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

      GRO was detected in the method blank, trip blank and sample 12NC28BW01. The concentration in sample –BW01 was greater than 10 times the concentration reported in the method blank and trip blank so no qualification is necessary. The trip blank can be considered estimated, flagged B, and with a high bias.

      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:

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

      Sample results are usable for project purposes without qualification in respect to method blank analysis and reporting.

   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)
      X□Yes □ No □NA (Please explain.) Comments:

      LCS/LCSD recoveries were within acceptance criteria.

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:

The MS/MSD on the non-project sample failed RPD for chromium, and nickel.

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

Comments:

MS/MSD results on non-project samples are not applicable for data evaluation. Only sample 12NC28BW01 was analyzed for metals and results were used for waste disposal decisions. The lack of MS/MSD information on a project sample will not affect data usability. No data qualifiers were assigned.

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

Yes □ No X□NA (Please explain.) Comments:

No results were qualified on the basis of LCS/LCSD or MS/MSD.

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

Comments:

No results were qualified on the basis of LCS/LCSD or MS/MSD.

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:

Trifluorotoluene, the field surrogate for GRO analyses, had surrogate recovery in sample 12NC28BW01 below acceptance criteria for both GRO and 8260 analyses. The sample had high % moisture, which may bias the surrogate recovery.

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

□ Yes X No □NA (Please explain.) Comments:

The GRO sample result for 12NC28BW01 is flagged ML for matrix interference with low bias.

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

Comments:

Sample results are usable for project purposes, which is waste characterization and disposal. The bulk waste contained high concentrations of DRO, 1-methylnaphthalene and 2-methylnaphthalene, which necessitate proper disposal in a TSDF facility. The waste is not considered hazardous.

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:

Only 1 cooler was shipped.

iii. All results less than PQL?

□Yes X No □NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

Only sample 12NC28BW01 was analyzed for GRO and its GRO concentration was greater than 10 times the concentration reported in the both the trip blank and method blank so no qualification is necessary.

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

Comments:

While the GRO blanks (trip blank and method blank) both had reportable GRO, neither result affected the usability of the GRO result in sample 12NC28BW01. The results are usable for project purposes, which is waste characterization and disposal.

e. Field Duplicate

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

X Yes □ No □NA (Please explain.) Comments:

No field duplicate samples were collected with this SDG. The overall 10% field duplicate frequency was met for the project.

ii. Submitted blind to lab?

□Yes □ No □NA (Please explain.) Comments:

Not applicable

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

□Yes □ No □NA (Please explain.) Comments:

Not applicable

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

Comments:

The overall field duplicate goal of 10% frequency was met for the project.

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

□Yes X No □NA (Please explain.) Comments:

All samples were collected with disposable sampling equipment.

i. All results less than PQL?

□Yes □ No □NA (Please explain.) Comments:

Not applicable.

ii. If above PQL, what samples are affected?

Comments:

Not applicable

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

Comments:

No equipment blank was necessary as all samples were collected with disposable sampling equipment.

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

a. Defined and appropriate?

X Yes □ No □NA (Please explain.) Comments:

Data flags are defined in the ADEC checklist, CDQR and in the appropriate results tables.

Laboratory Data Review Checklist

Completed by: Keather McLoone

Title: Project Chemist Date: 11/8/2012 (revised 3/19/13)

CS Report Name: Northeast Cape (MOC G&E plume) Report Date: 10/22/12

Consultant Firm: Bristol Environmental Remediation Services

Laboratory Name: SGS Laboratory Report Number: 1124556

ADEC File Number: 475.38.013 ADEC RecKey Number: Haz ID. 212

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 not transferred.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      X Yes ☐ 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:

      Four coolers in this shipment was received at the lab at 1.5, 0.7, 1.6, and 1.2 degrees Celsius; however, there were no broken containers or ice noted. No qualifications necessary on this basis.

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:

All samples received in good condition.

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

No discrepancies.

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

Results are usable without qualification.

4. Case Narrative
a. Present and understandable?
X Yes □ No □NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?
Yes □ No X□NA (Please explain.) Comments:

Most topics in the case narrative are addressed further in the following sections. Some of the main topics were sample dilutions required, surrogate recoveries, LCS/LCSD RPD, and MS/MSD recoveries and RPD. See QA summary for additional details.

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:

All results are usable for project purposes with qualifiers applied to results with quality control issues. No results were rejected.

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?
X Yes No □NA (Please explain.) Comments:

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

Water samples only.

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:

No.

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?
X Yes No □NA (Please explain.) Comments:

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

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

No qualifications necessary.

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

No effect on data quality or usability.

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)

X□Yes □ No □NA (Please explain.) Comments:

The PAH MS/MSD on sample12NC28TWA01 had recoveries in one or both spiked samples outside of acceptance limits for 1-methylnaphthalene, 2, methylnaphthalene, acenaphthene, acenaphtalene (0%), benzo(g,h,i) perylene (0%), dibenzo[a,h]anthracene (0%), indeno[1,2,3-c,d] pyrene (0%) and naphthalene. If the initial concentration was greater than 4 times the spike concentration no qualification is necessary. If the recoveries were greater than control limits and the initial sample result was ND no qualification is necessary. Acenaphthylene, benzo(g,h,i) perylene, dibenzo[a,h]anthracene, and indeno[1,2,3-c,d] pyrene results were associated with recoveries below control limits and these results are flagged QL to indicate a quality control failure and a low bias.

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:

RPD for the naphthalene LCS/LCSD associated with sample 12NC28TWA04 was greater than the 30 % limit at 36 %; therefore, these results should be considered estimated and flagged QN and considered estimated without a directional bias.

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

Comments:

See above.

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

X Yes □ No □ NA (Please explain.) Comments:

Flags are defined above, in the results table notes and on the QA summary.

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

See above. Results are usable for project purposes with some qualifications.

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:

2-Fluorobiphenyl surrogate associated with sample 12NC28TWA04 was below acceptance criteria; therefore, this sample's PAH results will be flagged QL to indicate an estimated result with a low bias due to a quality control failure.

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:

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

See above.

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

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

The laboratory's container ID notations show that the volatile samples did not go into the same cooler as the trip blanks.

iii. All results less than PQL?

X Yes □ No NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

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

Comments:

The detected values for GRO and BTEX in the samples can't be assessed for potential cross contamination.

e. Field Duplicate

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

Yes No NA (Please explain.) Comments:

One set of water duplicates submitted in this SDG of 4 samples. Duplicate frequency calculated on a project basis, rather than per SDG.

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)

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

□ Yes X No NA (Please explain.) Comments:

Duplicate pair 12NC28TWA02 and 12NC28TWA03 had RPDs < 30 % for all compounds except for DRO, ethylbenzene, and p&m-xylene at 70.5, 36.6, and 30.8 respectively. DRO and ethylbenzene RPD calculations involved results reported below the LOQ; therefore, these results are not qualified due to the inherent poor precision below the LOQ. The p&m-xylene results will be flagged QN as an estimated result with no directional bias. The RPD for Aroclor could not be calculated because one result was reported not detected; however, the other result was reported above the LOQ. Therefore, this result will also be flagged QN.

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

Comments:

See above.

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

□Yes □ No X□NA (Please explain.) Comments:

All samples were collected using disposable or dedicated equipment.

i. All results less than PQL?

□Yes □ No X□NA (Please explain.) Comments:

All samples were collected using disposable or dedicated equipment.

ii. If above PQL, what samples are affected?

Comments:

n/a

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

Comments:

n/a

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

a. Defined and appropriate?

X Yes □ No □NA (Please explain.) Comments:

Flags/qualifiers are on the data tables and are also discussed in the QA summary, which was not prepared until after this checklist.

Sample Summary Sheet

Laboratory ID	Sample ID	Matrix	Date/Time Collected	Sample Depth	Analytical Methods	Analysis Laboratory	QC	Location ID	Sampler Initials	Field Preservation	Cooler Name	Turn around Time	Container Type/Volume
280-33360-1 Site 28 water													
280-33360-8	12NC28WA01	Water	9/13/2012 16:00	0"	8260B/DoD	TestAmerica Denver		28-W-01	LK	Hydrochloric Acid	091412-03 & -05	15_Days	Voa Vial 40ml - Hydrochloric Acid
280-33360-8	12NC28WA01	Water	9/13/2012 16:00	0"	8270C SIM/DoD	TestAmerica Denver		28-W-01	LK	cool <4 C	091412-03 & -05	15_Days	Amber Glass 1 liter - unpreserved
280-33360-8	12NC28WA01	Water	9/13/2012 16:00	0"	AK101	TestAmerica Denver		28-W-01	LK	Hydrochloric Acid	091412-03 & -05	15_Days	Voa Vial 40ml - Hydrochloric Acid
280-33360-8	12NC28WA01	Water	9/13/2012 16:00	0"	8260B/DoD	TestAmerica Denver		28-W-01	LK	Hydrochloric Acid	091412-03 & -05	15_Days	Voa Vial 40ml - Hydrochloric Acid
280-33360-8	12NC28WA01	Water	9/13/2012 16:00	0"	6020	TestAmerica Denver		28-W-01	LK	Nitric Acid	091412-03 & -06	15_Days	Plastic 250ml - w/nitric - dis
280-33360-8	12NC28WA01	Water	9/13/2012 16:00	0"	7470A	TestAmerica Denver		28-W-01	LK	Nitric Acid	091412-03 & -07	15_Days	Plastic 250ml - w/nitric - dis
280-33360-8	12NC28WA01	Water	9/13/2012 16:00	0"	8082	TestAmerica Denver		28-W-01	LK	cool <4 C	091412-03 & -08	15_Days	Amber Glass 1 liter - unpreserved
280-33360-8	12NC28WA01	Water	9/13/2012 16:00	0"	AK102 & 103	TestAmerica Denver		28-W-01	LK	Hydrochloric Acid	091412-03 & -09	15_Days	Amber Glass 1 liter - Hydrochloric
280-33360-9	12NC28WA02	Water	9/13/2012 16:30	0"	8270C SIM/DoD	TestAmerica Denver		28-W-02	LK	cool <4 C	091412-04 & -05	15_Days	Amber Glass 1 liter - unpreserved
280-33360-9	12NC28WA02	Water	9/13/2012 16:30	0"	6020A	TestAmerica Denver		28-W-02	LK	Nitric Acid	091412-04 & -05	15_Days	Amber Glass 1 liter - Hydrochloric
280-33360-9	12NC28WA02	Water	9/13/2012 16:30	0"	8260B/DoD	TestAmerica Denver		28-W-02	LK	Hydrochloric Acid	091412-04 & -05	15_Days	Voa Vial 40ml - Hydrochloric Acid
280-33360-9	12NC28WA02	Water	9/13/2012 16:30	0"	AK101	TestAmerica Denver		28-W-02	LK	Hydrochloric Acid	091412-03 & -05	15_Days	Voa Vial 40ml - Hydrochloric Acid
280-33360-9	12NC28WA02	Water	9/13/2012 16:30	0"	6020	TestAmerica Denver		28-W-02	LK	Nitric Acid	091412-03 & -06	15_Days	Plastic 250ml - w/nitric - dis
280-33360-9	12NC28WA02	Water	9/13/2012 16:30	0"	7470A	TestAmerica Denver		28-W-02	LK	Nitric Acid	091412-03 & -07	15_Days	Plastic 250ml - w/nitric - dis
280-33360-9	12NC28WA02	Water	9/13/2012 16:30	0"	8082	TestAmerica Denver		28-W-02	LK	cool <4 C	091412-03 & -08	15_Days	Amber Glass 1 liter - unpreserved
280-33360-9	12NC28WA02	Water	9/13/2012 16:30	0"	AK102 & 103	TestAmerica Denver		28-W-02	LK	Hydrochloric Acid	091412-03 & -09	15_Days	Amber Glass 1 liter - Hydrochloric
280-33360-10	12NC28WA03	Water	9/14/2012 9:00	0"	8260B/DoD	TestAmerica Denver	MS/MSD	28-W-03	LK	Hydrochloric Acid	091412-02,-04 &-05	15_Days	Voa Vial 40ml - Hydrochloric Acid
280-33360-10	12NC28WA03	Water	9/14/2012 9:00	0"	8270C SIM/DoD	TestAmerica Denver	MS/MSD	28-W-03	LK	cool <4 C	091412-02,-04 &-05	15_Days	Amber Glass 1 liter - unpreserved
280-33360-10	12NC28WA03	Water	9/14/2012 9:00	0"	6020A	TestAmerica Denver	MS/MSD	28-W-03	LK	Nitric Acid	091412-02,-04 &-05	15_Days	Plastic 250ml - w/nitric - dis
280-33360-10	12NC28WA03	Water	9/14/2012 9:00	0"	7470A	TestAmerica Denver	MS/MSD	28-W-03	LK	Nitric Acid	091412-02,-04 &-06	15_Days	Plastic 250ml - w/nitric - dis
280-33360-10	12NC28WA03	Water	9/14/2012 9:00	0"	8082A	TestAmerica Denver	MS/MSD	28-W-03	LK	cool <4 C	091412-02,-04 &-05	15_Days	Amber Glass 1 liter - unpreserved
280-33360-10	12NC28WA03	Water	9/14/2012 9:00	0"	AK102 & 103	TestAmerica Denver	MS/MSD	28-W-03	LK	Hydrochloric Acid	091412-02,-04 &-05	15_Days	Amber Glass 1 liter - Hydrochloric
280-33360-10	12NC28WA03	Water	9/14/2012 9:00	0"	AK101	TestAmerica Denver	MS/MSD	28-W-03	LK	Hydrochloric Acid	091412-02,-04 &-05	15_Days	Voa Vial 40ml - Hydrochloric Acid
280-33360-11	TRIPBLANK091412	Water	9/14/2012 11:00		AK101	TestAmerica Denver	Trip Blank		LK	Hydrochloric Acid	091412-02	15_Days	Voa Vial 40ml - Hydrochloric Acid
280-33360-11	TRIPBLANK091412	Water	9/14/2012 11:00		8260B/DoD	TestAmerica Denver	Trip Blank		LK	Hydrochloric Acid	091412-02	15_Days	Voa Vial 40ml - Hydrochloric Acid
280-33360-12	12NCMOCSWA009	Water	9/13/2012 14:00	0"	AK102 & 103	TestAmerica Denver		MOCSW01	LK	Hydrochloric Acid	091412-02,-04 &-06	15_Days	Amber Glass 1 liter - Hydrochloric
280-33360-13	12NCMOCSWA010	Water	9/13/2012 14:20	0"	AK102 & 103	TestAmerica Denver		MOCSW02	LK	cool <4 C	091412-03	15_Days	Amber Glass 1 liter - unpreserved
280-33360-14	12NCMOCSWA011	Water	9/13/2012 14:25	0"	AK102 & 103	TestAmerica Denver		MOCSW03	LK	Hydrochloric Acid	091412-03	15_Days	Voa Vial 40ml - Hydrochloric Acid
280-33360-15	12NCMOCSWA012	Water	9/13/2012 14:10	0"	AK102 & 103	TestAmerica Denver	Field Dup of MOCSWA009	MOCSW01	LK	Hydrochloric Acid	091412-03	15_Days	Voa Vial 40ml - Hydrochloric Acid
580-35085 Site 28 Waters													
580-35085-1	12NC28WA04	Water	9/17/2012 15:50	0"	6020	TestAmerica Seattle	MS/MSD	28-W-01	EB	Nitric Acid	091912-01	10_Days	Plastic 250ml - w/nitric - dis
580-35085-1	12NC28WA04	Water	9/17/2012 15:50	0"	7470A	TestAmerica Seattle	MS/MSD	28-W-01	EB	Nitric Acid	091912-01	10_Days	Plastic 250ml - w/nitric - dis
580-35085-1	12NC28WA04	Water	9/17/2012 15:50	0"	8082	TestAmerica Seattle	MS/MSD	28-W-01	EB	cool <4 C	091912-01	10_Days	Amber Glass 1 liter - unpreserved
580-35085-1	12NC28WA04	Water	9/17/2012 15:50	0"	8260B/DoD	TestAmerica Seattle	MS/MSD	28-W-01	EB	Hydrochloric Acid	091912-03	10_Days	Voa Vial 40ml - Hydrochloric Acid
580-35085-1	12NC28WA04	Water	9/17/2012 15:50	0"	8270C SIM/DoD	TestAmerica Seattle	MS/MSD	28-W-01	EB	cool <4 C	091912-01	10_Days	Amber Glass 1 liter - unpreserved
580-35085-1	12NC28WA04	Water	9/17/2012 15:50	0"	AK102 & 103	TestAmerica Seattle	MS/MSD	28-W-01	EB	Hydrochloric Acid	091912-02	10_Days	Amber Glass 1 liter - Hydrochloric
580-35085-2	12NC28WA05	Water	9/18/2012 15:00	0"	6020	TestAmerica Seattle		28-W-01	EB	Nitric Acid	091912-01	10_Days	Plastic 250ml - with Nitric Acid
580-35085-2	12NC28WA05	Water	9/18/2012 15:00	0"	7470A	TestAmerica Seattle		28-W-01	EB	Nitric Acid	091912-02	10_Days	Plastic 250ml - w/nitric - dis
580-35085-2	12NC28WA05	Water	9/18/2012 15:00	0"	8082	TestAmerica Seattle		28-W-01	EB	cool <4 C	091912-02	10_Days	Amber Glass 1 liter - unpreserved
580-35085-2	12NC28WA05	Water	9/18/2012 15:00	0"	8260B/DoD	TestAmerica Seattle		28-W-01	EB	Hydrochloric Acid	091912-03	10_Days	Voa Vial 40ml - Hydrochloric Acid
580-35085-2	12NC28WA05	Water	9/18/2012 15:00	0"	8270C SIM/DoD	TestAmerica Seattle		28-W-01	EB	cool <4 C	091912-02	10_Days	Amber Glass 1 liter - unpreserved
580-35085-2	12NC28WA05	Water	9/18/2012 15:00	0"	AK102 & 103	TestAmerica Seattle		28-W-01	EB	Hydrochloric Acid	091912-02	10_Days	Amber Glass 1 liter - Hydrochloric
580-35085-3	12NC28WA06	Water	9/18/2012 15:30	0"	6020	TestAmerica Seattle	Field Dup of 28WA05	28-W-01	EB	Nitric Acid	091912-02	10_Days	Plastic 250ml - w/nitric - dis
580-35085-3	12NC28WA06	Water	9/18/2012 15:30	0"	7470A	TestAmerica Seattle	Field Dup of 28WA05	28-W-01	EB	Nitric Acid	091912-02	10_Days	Plastic 250ml - w/nitric - dis
580-35085-3	12NC28WA06	Water	9/18/2012 15:30	0"	8082	TestAmerica Seattle	Field Dup of 28WA05	28-W-01	EB	cool <4 C	091912-03	10_Days	Amber Glass 1 liter - unpreserved
580-35085-3	12NC28WA06	Water	9/18/2012 15:30	0"	8260B/DoD	TestAmerica Seattle	Field Dup of 28WA05	28-W-01	EB	Hydrochloric Acid	091912-03	10_Days	Voa Vial 40ml - Hydrochloric Acid
580-35085-3	12NC28WA06	Water	9/18/2012 15:30	0"	8270C SIM/DoD	TestAmerica Seattle	Field Dup of 28WA05	28-W-01	EB	cool <4 C	091912-03	10_Days	Amber Glass 1 liter - unpreserved
580-35085-3	12NC28WA06	Water	9/18/2012 15:30	0"	AK102 & 103	TestAmerica Seattle	Field Dup of 28WA05	28-W-01	EB	Hydrochloric Acid	091912-02	10_Days	Amber Glass 1 liter - Hydrochloric
580-35085-4	TripBlank091912	Water	9/17/2012 11:00		8260B/DoD	TestAmerica Seattle	Trip Blank		EB	Hydrochloric Acid	091912-03	10_Days	Voa Vial 40ml - Hydrochloric Acid

Laboratory ID	Sample ID	Matrix	Date/Time Collected	Sample Depth	Analytical Methods	Analysis Laboratory	QC	Location ID	Sampler Initials	Field Preservation	Cooler Name	Turn around Time	Container Type/Volume
580-35092 Site 28 water													
580-35092-1	12NC28WA07	Water	9/19/2012 15:50	0"	6020	TestAmerica Seattle	MS/MSD	28-W-01	EB	Nitric Acid	092112-01 & -02	10_Days	Plastic 250ml - with Nitric Acid
580-35092-1	12NC28WA07	Water	9/19/2012 15:50	0"	7470A	TestAmerica Seattle	MS/MSD	28-W-01	EB	Nitric Acid	092112-01 & -02	10_Days	Plastic 250ml - with Nitric Acid
580-35092-1	12NC28WA07	Water	9/19/2012 15:50	0"	8082	TestAmerica Seattle	MS/MSD	28-W-01	EB	cool <4 C	092112-01 & -02	10_Days	Amber Glass 1 liter - unpreserved
580-35092-1	12NC28WA07	Water	9/19/2012 15:50	0"	8260B/DoD	TestAmerica Seattle	MS/MSD	28-W-01	EB	Hydrochloric Acid	092112-01 & -02	10_Days	Voa Vial 40ml - Hydrochloric Acid
580-35092-1	12NC28WA07	Water	9/19/2012 15:50	0"	8270C SIM/DoD	TestAmerica Seattle	MS/MSD	28-W-01	EB	cool <4 C	092112-01 & -02	10_Days	Amber Glass 1 liter - unpreserved
580-35092-1	12NC28WA07	Water	9/19/2012 15:50	0"	AK102 & 103	TestAmerica Seattle	MS/MSD	28-W-01	EB	Hydrochloric Acid	092112-01 & -02	10_Days	Amber Glass 1 liter - Hydrochloric
580-35092-2	12NC28WA08	Water	9/19/2012 15:00	0"	6020	TestAmerica Seattle		28-W-02	EB	Nitric Acid	092112-02	10_Days	Plastic 250ml - with Nitric Acid
580-35092-2	12NC28WA08	Water	9/19/2012 15:00	0"	7470A	TestAmerica Seattle		28-W-02	EB	Nitric Acid	092112-02	10_Days	Plastic 250ml - with Nitric Acid
580-35092-2	12NC28WA08	Water	9/19/2012 15:00	0"	8082	TestAmerica Seattle		28-W-02	EB	cool <4 C	092112-02	10_Days	Amber Glass 1 liter - unpreserved
580-35092-2	12NC28WA08	Water	9/19/2012 15:00	0"	8260B/DoD	TestAmerica Seattle		28-W-02	EB	Hydrochloric Acid	092112-03	10_Days	Voa Vial 40ml - Hydrochloric Acid
580-35092-2	12NC28WA08	Water	9/19/2012 15:00	0"	8270C SIM/DoD	TestAmerica Seattle		28-W-02	EB	cool <4 C	092112-02	10_Days	Amber Glass 1 liter - unpreserved
580-35092-2	12NC28WA08	Water	9/19/2012 15:00	0"	AK102 & 103	TestAmerica Seattle		28-W-02	EB	Hydrochloric Acid	092112-02	10_Days	Amber Glass 1 liter - Hydrochloric
580-35092-3	12NC28WA09	Water	9/19/2012 15:30	0"	6020	TestAmerica Seattle		28-W-03	EB	Nitric Acid	092112-02 & -03	10_Days	Plastic 250ml - with Nitric Acid
580-35092-3	12NC28WA09	Water	9/19/2012 15:30	0"	7470A	TestAmerica Seattle		28-W-03	EB	Nitric Acid	092112-02 & -03	10_Days	Plastic 250ml - with Nitric Acid
580-35092-3	12NC28WA09	Water	9/19/2012 15:30	0"	8082	TestAmerica Seattle		28-W-03	EB	cool <4 C	092112-02 & -03	10_Days	Amber Glass 1 liter - unpreserved
580-35092-3	12NC28WA09	Water	9/19/2012 15:30	0"	8260B/DoD	TestAmerica Seattle		28-W-03	EB	Hydrochloric Acid	092112-02 & -03	10_Days	Voa Vial 40ml - Hydrochloric Acid
580-35092-3	12NC28WA09	Water	9/19/2012 15:30	0"	8270C SIM/DoD	TestAmerica Seattle		28-W-03	EB	cool <4 C	092112-02 & -03	10_Days	Amber Glass 1 liter - unpreserved
580-35092-3	12NC28WA09	Water	9/19/2012 15:30	0"	AK102 & 103	TestAmerica Seattle		28-W-03	EB	Hydrochloric Acid	092112-02 & -03	10_Days	Amber Glass 1 liter - Hydrochloric
580-35092-4	12NC28WA10	Water	9/20/2012 15:05	0"	6020	TestAmerica Seattle		28-W-01	LK	Nitric Acid	092112-02 & -04	10_Days	Plastic 250ml - with Nitric Acid
580-35092-4	12NC28WA10	Water	9/20/2012 15:05	0"	7470A	TestAmerica Seattle		28-W-01	LK	Nitric Acid	092112-02 & -04	10_Days	Plastic 250ml - with Nitric Acid
580-35092-4	12NC28WA10	Water	9/20/2012 15:05	0"	8082	TestAmerica Seattle		28-W-01	LK	cool <4 C	092112-02 & -04	10_Days	Amber Glass 1 liter - unpreserved
580-35092-4	12NC28WA10	Water	9/20/2012 15:05	0"	8260B/DoD	TestAmerica Seattle		28-W-01	LK	Hydrochloric Acid	092112-02 & -04	10_Days	Voa Vial 40ml - Hydrochloric Acid
580-35092-4	12NC28WA10	Water	9/20/2012 15:05	0"	8270C SIM/DoD	TestAmerica Seattle		28-W-01	LK	cool <4 C	092112-02 & -04	10_Days	Amber Glass 1 liter - unpreserved
580-35092-4	12NC28WA10	Water	9/20/2012 15:05	0"	AK102 & 103	TestAmerica Seattle		28-W-01	LK	Hydrochloric Acid	092112-02 & -04	10_Days	Amber Glass 1 liter - Hydrochloric
580-35092-5	12NC28WA11	Water	9/20/2012 14:30	0"	6020	TestAmerica Seattle		28-W-03	LK	Nitric Acid	092112-02 & -05	10_Days	Plastic 250ml - with Nitric Acid
580-35092-5	12NC28WA11	Water	9/20/2012 14:30	0"	7470A	TestAmerica Seattle		28-W-03	LK	Nitric Acid	092112-02 & -05	10_Days	Plastic 250ml - with Nitric Acid
580-35092-5	12NC28WA11	Water	9/20/2012 14:30	0"	8082	TestAmerica Seattle		28-W-03	LK	cool <4 C	092112-02 & -05	10_Days	Amber Glass 1 liter - unpreserved
580-35092-5	12NC28WA11	Water	9/20/2012 14:30	0"	8260B/DoD	TestAmerica Seattle		28-W-03	LK	Hydrochloric Acid	092112-02 & -05	10_Days	Voa Vial 40ml - Hydrochloric Acid
580-35092-5	12NC28WA11	Water	9/20/2012 14:30	0"	8270C SIM/DoD	TestAmerica Seattle		28-W-03	LK	cool <4 C	092112-02 & -05	10_Days	Amber Glass 1 liter - unpreserved
580-35092-5	12NC28WA11	Water	9/20/2012 14:30	0"	AK102 & 103	TestAmerica Seattle		28-W-03	LK	Hydrochloric Acid	092112-02 & -05	10_Days	Amber Glass 1 liter - Hydrochloric
580-35092-6	12NC28WA12	Water	9/20/2012 14:45	0"	6020	TestAmerica Seattle		28-W-02	LK	Nitric Acid	092112-02 & -05	10_Days	Plastic 250ml - with Nitric Acid
580-35092-6	12NC28WA12	Water	9/20/2012 14:45	0"	7470A	TestAmerica Seattle		28-W-02	LK	Nitric Acid	092112-02 & -05	10_Days	Plastic 250ml - with Nitric Acid
580-35092-6	12NC28WA12	Water	9/20/2012 14:45	0"	8082	TestAmerica Seattle		28-W-02	LK	cool <4 C	092112-02 & -05	10_Days	Amber Glass 1 liter - unpreserved
580-35092-6	12NC28WA12	Water	9/20/2012 14:45	0"	8260B/DoD	TestAmerica Seattle		28-W-02	LK	Hydrochloric Acid	092112-02 & -05	10_Days	Voa Vial 40ml - Hydrochloric Acid
580-35092-6	12NC28WA12	Water	9/20/2012 14:45	0"	8270C SIM/DoD	TestAmerica Seattle		28-W-02	LK	cool <4 C	092112-02 & -05	10_Days	Amber Glass 1 liter - unpreserved
580-35092-6	12NC28WA12	Water	9/20/2012 14:45	0"	AK102 & 103	TestAmerica Seattle		28-W-02	LK	Hydrochloric Acid	092112-02 & -05	10_Days	Amber Glass 1 liter - Hydrochloric
580-35092-7	12NC28WA13	Water	9/20/2012 15:15	0"	6020	TestAmerica Seattle	Field Dup of 28WA10	28-W-01	LK	Nitric Acid	092112-02 & -04	10_Days	Plastic 250ml - with Nitric Acid
580-35092-7	12NC28WA13	Water	9/20/2012 15:15	0"	7470A	TestAmerica Seattle	Field Dup of 28WA10	28-W-01	LK	Nitric Acid	092112-02 & -04	10_Days	Plastic 250ml - with Nitric Acid
580-35092-7	12NC28WA13	Water	9/20/2012 15:15	0"	8082	TestAmerica Seattle	Field Dup of 28WA10	28-W-01	LK	cool <4 C	092112-02 & -04	10_Days	Amber Glass 1 liter - unpreserved
580-35092-7	12NC28WA13	Water	9/20/2012 15:15	0"	8260B/DoD	TestAmerica Seattle	Field Dup of 28WA10	28-W-01	LK	Hydrochloric Acid	092112-02 & -04	10_Days	Voa Vial 40ml - Hydrochloric Acid
580-35092-7	12NC28WA13	Water	9/20/2012 15:15	0"	8270C SIM/DoD	TestAmerica Seattle	Field Dup of 28WA10	28-W-01	LK	cool <4 C	092112-02 & -04	10_Days	Amber Glass 1 liter - unpreserved
580-35092-7	12NC28WA13	Water	9/20/2012 15:15	0"	AK102 & 103	TestAmerica Seattle	Field Dup of 28WA10	28-W-01	LK	Hydrochloric Acid	092112-02 & -04	10_Days	Amber Glass 1 liter - Hydrochloric
580-35092-8	Trip Blank 092112-01	Water	9/21/2012 12:00		8260B/DoD	TestAmerica Seattle	Trip Blank		LK	Hydrochloric Acid	092112-03	10_Days	Voa Vial 40ml - Hydrochloric Acid

Laboratory ID	Sample ID	Matrix	Date/Time Collected	Sample Depth	Analytical Methods	Analysis Laboratory	QC	Location ID	Sampler Initials	Field Preservation	Cooler Name	Turn around Time	Container Type/Volume
580-35140 Site 28 sediment trap water samples													
580-35140-1	12NC28SS052	Solid	9/18/2012 10:20		6020	TestAmerica Seattle		12NC28S52	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-1	12NC28SS052	Solid	9/18/2012 10:20		7471A	TestAmerica Seattle		12NC28S52	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-1	12NC28SS052	Solid	9/18/2012 10:20		8082/DOD	TestAmerica Seattle		12NC28S52	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-1	12NC28SS052	Solid	9/18/2012 10:20		8270C SIM/DoD	TestAmerica Seattle		12NC28S52	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-1	12NC28SS052	Solid	9/18/2012 10:20		AK101	TestAmerica Seattle		12NC28S52	LK	Methanol	091912-08	15_Days	Soil jar 4oz - with Methanol
580-35140-1	12NC28SS052	Solid	9/18/2012 10:20		AK102 & 103	TestAmerica Seattle		12NC28S52	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-1	12NC28SS052	Solid	9/18/2012 10:20		D 2216	TestAmerica Seattle		12NC28S52	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-2	12NC28SS053	Solid	9/18/2012 10:30		6020	TestAmerica Seattle		12NC28S53	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-2	12NC28SS053	Solid	9/18/2012 10:30		7471A	TestAmerica Seattle		12NC28S53	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-2	12NC28SS053	Solid	9/18/2012 10:30		8082/DOD	TestAmerica Seattle		12NC28S53	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-2	12NC28SS053	Solid	9/18/2012 10:30		8260B/DoD	TestAmerica Seattle		12NC28S53	LK	Methanol	091912-08	15_Days	Soil jar 4oz - with Methanol
580-35140-2	12NC28SS053	Solid	9/18/2012 10:30		8270C SIM/DoD	TestAmerica Seattle		12NC28S53	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-2	12NC28SS053	Solid	9/18/2012 10:30		AK101	TestAmerica Seattle		12NC28S53	LK	Methanol	091912-08	15_Days	Soil jar 4oz - with Methanol
580-35140-2	12NC28SS053	Solid	9/18/2012 10:30		AK102 & 103	TestAmerica Seattle		12NC28S53	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-2	12NC28SS053	Solid	9/18/2012 10:30		D 2216	TestAmerica Seattle		12NC28S53	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-3	12NC28SS054	Solid	9/18/2012 10:45		6020	TestAmerica Seattle	MS/MSD	12NC28S54	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-3	12NC28SS054	Solid	9/18/2012 10:45		7471A	TestAmerica Seattle	MS/MSD	12NC28S54	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-3	12NC28SS054	Solid	9/18/2012 10:45		8082/DOD	TestAmerica Seattle	MS/MSD	12NC28S54	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-3	12NC28SS054	Solid	9/18/2012 10:45		8260B/DoD	TestAmerica Seattle	MS/MSD	12NC28S54	LK	Methanol	091912-08	15_Days	Soil jar 4oz - with Methanol
580-35140-3	12NC28SS054	Solid	9/18/2012 10:45		8270C SIM/DoD	TestAmerica Seattle	MS/MSD	12NC28S54	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-3	12NC28SS054	Solid	9/18/2012 10:45		AK101	TestAmerica Seattle	MS/MSD	12NC28S54	LK	Methanol	091912-08	15_Days	Soil jar 4oz - with Methanol
580-35140-3	12NC28SS054	Solid	9/18/2012 10:45		AK102 & 103	TestAmerica Seattle	MS/MSD	12NC28S54	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-3	12NC28SS054	Solid	9/18/2012 10:45		D 2216	TestAmerica Seattle		12NC28S54	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-4	12NC28SS055	Solid	9/18/2012 10:50		6020	TestAmerica Seattle		12NC28S55	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-4	12NC28SS055	Solid	9/18/2012 10:50		7471A	TestAmerica Seattle		12NC28S55	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-4	12NC28SS055	Solid	9/18/2012 10:50		8082/DOD	TestAmerica Seattle		12NC28S55	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-4	12NC28SS055	Solid	9/18/2012 10:50		8260B/DoD	TestAmerica Seattle		12NC28S55	LK	Methanol	091912-08	15_Days	Soil jar 4oz - with Methanol
580-35140-4	12NC28SS055	Solid	9/18/2012 10:50		8270C SIM/DoD	TestAmerica Seattle		12NC28S55	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-4	12NC28SS055	Solid	9/18/2012 10:50		AK101	TestAmerica Seattle		12NC28S55	LK	Methanol	091912-08	15_Days	Soil jar 4oz - with Methanol
580-35140-4	12NC28SS055	Solid	9/18/2012 10:50		AK102 & 103	TestAmerica Seattle		12NC28S55	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-4	12NC28SS055	Solid	9/18/2012 10:50		D 2216	TestAmerica Seattle		12NC28S55	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-5	12NC28SS056	Solid	9/18/2012 10:35		6020	TestAmerica Seattle	Field Dup of 28SS053	12NC28S53	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-5	12NC28SS056	Solid	9/18/2012 10:35		7471A	TestAmerica Seattle	Field Dup of 28SS053	12NC28S53	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-5	12NC28SS056	Solid	9/18/2012 10:35		8082/DOD	TestAmerica Seattle	Field Dup of 28SS053	12NC28S53	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-5	12NC28SS056	Solid	9/18/2012 10:35		8260B/DoD	TestAmerica Seattle	Field Dup of 28SS053	12NC28S53	LK	Methanol	091912-08	15_Days	Soil jar 4oz - with Methanol
580-35140-5	12NC28SS056	Solid	9/18/2012 10:35		8270C SIM/DoD	TestAmerica Seattle	Field Dup of 28SS053	12NC28S53	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-5	12NC28SS056	Solid	9/18/2012 10:35		AK101	TestAmerica Seattle	Field Dup of 28SS053	12NC28S53	LK	Methanol	091912-08	15_Days	Soil jar 4oz - with Methanol
580-35140-5	12NC28SS056	Solid	9/18/2012 10:35		AK102 & 103	TestAmerica Seattle	Field Dup of 28SS053	12NC28S53	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-5	12NC28SS056	Solid	9/18/2012 10:35		D 2216	TestAmerica Seattle	Field Dup of 28SS053	12NC28S53	LK	cool <4 C	091912-08	15_Days	Soil jar 16oz
580-35140-6	Trip Blank 091912-02	Solid	9/19/2012 0:00		AK101	TestAmerica Seattle	Trip Blank		LK	Methanol	091912-08	15_Days	Soil jar 4oz - with Methanol
580-35140-6	Trip Blank 091912-02	Solid	9/19/2012 0:00		8260B/DoD	TestAmerica Seattle	Trip Blank		LK	Methanol	091912-08	15_Days	Soil jar 4oz - with Methanol

Laboratory ID	Sample ID	Matrix	Date/Time Collected	Sample Depth	Analytical Methods	Analysis Laboratory	QC	Location ID	Sampler Initials	Field Preservation	Cooler Name	Turn around Time	Container Type/Volume
580-35168 Site 28 bulk waste													
580-35168-10	12NC28BW01	Solid	9/21/2012 15:21	0"	6020	TestAmerica Seattle		12NC28BW01	EB	cool <4 C	092312-01	10_Days	Soil jar 16oz
580-35168-10	12NC28BW01	Solid	9/21/2012 15:21	0"	7471A	TestAmerica Seattle		12NC28BW01	EB	cool <4 C	092312-01	10_Days	Soil jar 16oz
580-35168-10	12NC28BW01	Solid	9/21/2012 15:21	0"	8082/DOD	TestAmerica Seattle		12NC28BW01	EB	cool <4 C	092312-01	10_Days	Soil jar 16oz
580-35168-10	12NC28BW01	Solid	9/21/2012 15:21	0"	8260B/DoD	TestAmerica Seattle		12NC28BW01	EB	Methanol	092312-01	10_Days	Soil jar 4oz - with Methanol
580-35168-10	12NC28BW01	Solid	9/21/2012 15:21	0"	8270C SIM/DoD	TestAmerica Seattle		12NC28BW01	EB	cool <4 C	092312-01	10_Days	Soil jar 16oz
580-35168-10	12NC28BW01	Solid	9/21/2012 15:21	0"	9060	TestAmerica Seattle	MS/MSD	12NC28BW01	EB	cool <4 C	092312-01	10_Days	Soil jar 16oz
580-35168-10	12NC28BW01	Solid	9/21/2012 15:21	0"	AK101	TestAmerica Seattle		12NC28BW01	EB	Methanol	092312-01	10_Days	Soil jar 4oz - with Methanol
580-35168-10	12NC28BW01	Solid	9/21/2012 15:21	0"	AK102 & 103	TestAmerica Seattle		12NC28BW01	EB	cool <4 C	092312-01	10_Days	Soil jar 16oz
580-35168-10	12NC28BW01	Solid	9/21/2012 15:21	0"	D 2216	TestAmerica Seattle		12NC28BW01	EB	cool <4 C	092312-01	10_Days	Soil jar 16oz
580-35168-1	12NCMOCBW221	Solid	9/17/2012 13:00	0"	AK102 & 103	TestAmerica Seattle		MOCBW221	LK	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-1	12NCMOCBW221	Solid	9/17/2012 13:00	0"	D 2216	TestAmerica Seattle		MOCBW221	LK	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-2	12NCMOCBW222	Solid	9/17/2012 14:30	0"	AK102 & 103	TestAmerica Seattle		MOCBW222	LK	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-2	12NCMOCBW222	Solid	9/17/2012 14:30	0"	D 2216	TestAmerica Seattle		MOCBW222	LK	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-3	12NCMOCBW223	Solid	9/17/2012 15:30	0"	AK102 & 103	TestAmerica Seattle		MOCBW223	LK	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-3	12NCMOCBW223	Solid	9/17/2012 15:30	0"	D 2216	TestAmerica Seattle		MOCBW223	LK	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-4	12NCMOCBW224	Solid	9/17/2012 17:00	0"	AK102 & 103	TestAmerica Seattle		MOCBW224	LK	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-4	12NCMOCBW224	Solid	9/17/2012 17:00	0"	D 2216	TestAmerica Seattle		MOCBW224	LK	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-5	12NCMOCBW225	Solid	9/18/2012 13:40	0"	AK102 & 103	TestAmerica Seattle		MOCBW225	LK	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-5	12NCMOCBW225	Solid	9/18/2012 13:40	0"	D 2216	TestAmerica Seattle		MOCBW225	LK	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-6	12NCMOCBW226	Solid	9/21/2012 9:45	0"	AK102 & 103	TestAmerica Seattle		MOCBW226	EB	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-6	12NCMOCBW226	Solid	9/21/2012 9:45	0"	D 2216	TestAmerica Seattle		MOCBW226	EB	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-7	12NCMOCBW227	Solid	9/21/2012 10:36	0"	AK102 & 103	TestAmerica Seattle		MOCBW227	EB	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-7	12NCMOCBW227	Solid	9/21/2012 10:36	0"	D 2216	TestAmerica Seattle		MOCBW227	EB	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-8	12NCMOCBW228	Solid	9/21/2012 11:36	0"	AK102 & 103	TestAmerica Seattle		MOCBW228	EB	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-8	12NCMOCBW228	Solid	9/21/2012 11:36	0"	D 2216	TestAmerica Seattle		MOCBW228	EB	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-9	12NCMOCBW229	Solid	9/21/2012 14:00	0"	AK102 & 103	TestAmerica Seattle		MOCBW229	EB	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-9	12NCMOCBW229	Solid	9/21/2012 14:00	0"	D 2216	TestAmerica Seattle		MOCBW229	EB	cool <4 C	092312-01	10_Days	Soil Jar 4oz Amber
580-35168-11	Trip Blank 092312-1	Solid	9/21/2012 0:00		AK101	TestAmerica Seattle	Trip Blank		EB	Methanol	092312-01	10_Days	Soil jar 4oz - with Methanol
580-35168-11	Trip Blank 092312-1	Solid	9/21/2012 0:00		8260B/DoD	TestAmerica Seattle	Trip Blank		EB	Methanol	092312-01	10_Days	Soil jar 4oz - with Methanol

Laboratory ID	Sample ID	Matrix	Date/Time Collected	Sample Depth	Analytical Methods	Analysis Laboratory	QC	Location ID	Sampler Initials	Field Preservation	Cooler Name	Turn around Time	Container Type/Volume
1124556-SGS Site 28 Water													
1124556001	12NC28TWA01	Water	9/19/2012 10:30	0"	8270D SIMS (PAH)	SGS North America Inc.		12NC28TW01	LK	cool <4 C	091912-05, 06, & 07	2 Days	Amber Glass 1 liter - unpreserved
1124556001	12NC28TWA01	Water	9/19/2012 10:30	0"	AK101	SGS North America Inc.		12NC28TW01	LK	Hydrochloric Acid	091912-05, 06, & 07	2 Days	Voa Vial 40ml - Hydrochloric Acid
1124556001	12NC28TWA01	Water	9/19/2012 10:30	0"	AK102 & 103	SGS North America Inc.		12NC28TW01	LK	Hydrochloric Acid	091912-05, 06, & 07	2 Days	Amber Glass 1 liter - Hydrochloric
1124556001	12NC28TWA01	Water	9/19/2012 10:30	0"	SW6020 (total)	SGS North America Inc.		12NC28TW01	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556001	12NC28TWA01	Water	9/19/2012 10:30	0"	SW7471 (total)	SGS North America Inc.		12NC28TW01	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556001	12NC28TWA01	Water	9/19/2012 10:30	0"	SW8082A	SGS North America Inc.		12NC28TW01	LK	cool <4 C	091912-05, 06, & 07	2 Days	Amber Glass 1 liter - unpreserved
1124556001	12NC28TWA01	Water	9/19/2012 10:30	0"	SW8260B	SGS North America Inc.		12NC28TW01	LK	Hydrochloric Acid	091912-05, 06, & 07	2 Days	Voa Vial 40ml - Hydrochloric Acid
1124556002	12NC28TWA01 MS	Water	9/19/2012 10:30	0"	8270D SIMS (PAH)	SGS North America Inc.		12NC28TW01	LK	cool <4 C	091912-05, 06, & 07	2 Days	Amber Glass 1 liter - unpreserved
1124556002	12NC28TWA01 MS	Water	9/19/2012 10:30	0"	AK101	SGS North America Inc.	MS	12NC28TW01	LK	Hydrochloric Acid	091912-05, 06, & 07	2 Days	Voa Vial 40ml - Hydrochloric Acid
1124556002	12NC28TWA01 MS	Water	9/19/2012 10:30	0"	AK102 & 103	SGS North America Inc.	MS	12NC28TW01	LK	Hydrochloric Acid	091912-05, 06, & 07	2 Days	Amber Glass 1 liter - Hydrochloric
1124556002	12NC28TWA01 MS	Water	9/19/2012 10:30	0"	SW6020 (total)	SGS North America Inc.	MS	12NC28TW01	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556002	12NC28TWA01 MS	Water	9/19/2012 10:30	0"	SW7471 (total)	SGS North America Inc.	MS	12NC28TW01	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556002	12NC28TWA01 MS	Water	9/19/2012 10:30	0"	SW8082A	SGS North America Inc.	MS	12NC28TW01	LK	cool <4 C	091912-05, 06, & 07	2 Days	Amber Glass 1 liter - unpreserved
1124556002	12NC28TWA01 MS	Water	9/19/2012 10:30	0"	SW8260B	SGS North America Inc.	MS	12NC28TW01	LK	Hydrochloric Acid	091912-05, 06, & 07	2 Days	Voa Vial 40ml - Hydrochloric Acid
1124556003	12NC28TWA01 MSD	Water	9/19/2012 10:30	0"	8270D SIMS (PAH)	SGS North America Inc.	MSD	12NC28TW01	LK	cool <4 C	091912-05, 06, & 07	2 Days	Amber Glass 1 liter - unpreserved
1124556003	12NC28TWA01 MSD	Water	9/19/2012 10:30	0"	AK101	SGS North America Inc.	MSD	12NC28TW01	LK	Hydrochloric Acid	091912-05, 06, & 07	2 Days	Voa Vial 40ml - Hydrochloric Acid
1124556003	12NC28TWA01 MSD	Water	9/19/2012 10:30	0"	AK102 & 103	SGS North America Inc.	MSD	12NC28TW01	LK	Hydrochloric Acid	091912-05, 06, & 07	2 Days	Amber Glass 1 liter - Hydrochloric
1124556003	12NC28TWA01 MSD	Water	9/19/2012 10:30	0"	SW6020 (total)	SGS North America Inc.	MSD	12NC28TW01	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556003	12NC28TWA01 MSD	Water	9/19/2012 10:30	0"	SW7471 (total)	SGS North America Inc.	MSD	12NC28TW01	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556003	12NC28TWA01 MSD	Water	9/19/2012 10:30	0"	SW8082A	SGS North America Inc.	MSD	12NC28TW01	LK	cool <4 C	091912-05, 06, & 07	2 Days	Amber Glass 1 liter - unpreserved
1124556003	12NC28TWA01 MSD	Water	9/19/2012 10:30	0"	SW8260B	SGS North America Inc.	MSD	12NC28TW01	LK	Hydrochloric Acid	091912-05, 06, & 07	2 Days	Voa Vial 40ml - Hydrochloric Acid
1124556004	12NC28TWA02	Water	9/19/2012 10:45	0"	8270D SIMS (PAH)	SGS North America Inc.	Duplicate of TWA03	12NC28TW02	LK	cool <4 C	091912-05, 06, & 07	2 Days	Amber Glass 1 liter - unpreserved
1124556004	12NC28TWA02	Water	9/19/2012 10:45	0"	AK101	SGS North America Inc.	Duplicate of TWA03	12NC28TW02	LK	Hydrochloric Acid	091912-05, 06, & 07	2 Days	Voa Vial 40ml - Hydrochloric Acid
1124556004	12NC28TWA02	Water	9/19/2012 10:45	0"	AK102 & 103	SGS North America Inc.	Duplicate of TWA03	12NC28TW02	LK	Hydrochloric Acid	091912-05, 06, & 07	2 Days	Amber Glass 1 liter - Hydrochloric
1124556004	12NC28TWA02	Water	9/19/2012 10:45	0"	SW6020 (total)	SGS North America Inc.	Duplicate of TWA03	12NC28TW02	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556004	12NC28TWA02	Water	9/19/2012 10:45	0"	SW7471 (total)	SGS North America Inc.	Duplicate of TWA03	12NC28TW02	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556004	12NC28TWA02	Water	9/19/2012 10:45	0"	SW8082A	SGS North America Inc.	Duplicate of TWA03	12NC28TW02	LK	cool <4 C	091912-05, 06, & 07	2 Days	Amber Glass 1 liter - unpreserved
1124556004	12NC28TWA02	Water	9/19/2012 10:45	0"	SW8260B	SGS North America Inc.	Duplicate of TWA03	12NC28TW02	LK	Hydrochloric Acid	091912-05, 06, & 07	2 Days	Voa Vial 40ml - Hydrochloric Acid
1124556005	12NC28TWA03	Water	9/19/2012 10:00	0"	8270D SIMS (PAH)	SGS North America Inc.		12NC28TW03	LK	cool <4 C	091912-05, 06, & 07	2 Days	Amber Glass 1 liter - unpreserved
1124556005	12NC28TWA03	Water	9/19/2012 10:00	0"	AK101	SGS North America Inc.		12NC28TW03	LK	Hydrochloric Acid	091912-05, 06, & 07	2 Days	Voa Vial 40ml - Hydrochloric Acid
1124556005	12NC28TWA03	Water	9/19/2012 10:00	0"	AK102 & 103	SGS North America Inc.		12NC28TW03	LK	Hydrochloric Acid	091912-05, 06, & 07	2 Days	Amber Glass 1 liter - Hydrochloric
1124556005	12NC28TWA03	Water	9/19/2012 10:00	0"	SW6020 (total)	SGS North America Inc.		12NC28TW03	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556005	12NC28TWA03	Water	9/19/2012 10:00	0"	SW7471 (total)	SGS North America Inc.		12NC28TW03	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556005	12NC28TWA03	Water	9/19/2012 10:00	0"	SW8082A	SGS North America Inc.		12NC28TW03	LK	cool <4 C	091912-05, 06, & 07	2 Days	Amber Glass 1 liter - unpreserved
1124556005	12NC28TWA03	Water	9/19/2012 10:00	0"	SW8260B	SGS North America Inc.		12NC28TW03	LK	Hydrochloric Acid	091912-05, 06, & 07	2 Days	Voa Vial 40ml - Hydrochloric Acid
1124556006	12NC28TWA04	Water	9/20/2012 11:00	0"	8270D SIMS (PAH)	SGS North America Inc.		12NC28TW04	LK	cool <4 C	092012-01	2 Days	Amber Glass 1 liter - unpreserved
1124556006	12NC28TWA04	Water	9/20/2012 11:00	0"	AK101	SGS North America Inc.		12NC28TW04	LK	Hydrochloric Acid	092012-01	2 Days	Voa Vial 40ml - Hydrochloric Acid
1124556006	12NC28TWA04	Water	9/20/2012 11:00	0"	AK102 & 103	SGS North America Inc.		12NC28TW04	LK	Hydrochloric Acid	092012-01	2 Days	Amber Glass 1 liter - Hydrochloric
1124556006	12NC28TWA04	Water	9/20/2012 11:00	0"	SW6020 (total)	SGS North America Inc.		12NC28TW04	LK	Nitric Acid	092012-01	2 Days	Plastic 250ml - with Nitric Acid
1124556006	12NC28TWA04	Water	9/20/2012 11:00	0"	SW7471 (total)	SGS North America Inc.		12NC28TW04	LK	Nitric Acid	092012-01	2 Days	Plastic 250ml - with Nitric Acid
1124556006	12NC28TWA04	Water	9/20/2012 11:00	0"	SW8082A	SGS North America Inc.		12NC28TW04	LK	cool <4 C	092012-01	2 Days	Amber Glass 1 liter - unpreserved
1124556006	12NC28TWA04	Water	9/20/2012 11:00	0"	SW8260B	SGS North America Inc.		12NC28TW04	LK	Hydrochloric Acid	092012-01	2 Days	Voa Vial 40ml - Hydrochloric Acid
1124556009	12NC28TWA01	Water	9/19/2012 10:30	0"	SW6020 (dissolved)	SGS North America Inc.		12NC28TW01	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556009	12NC28TWA01	Water	9/19/2012 10:30	0"	SW7471(dissolved)	SGS North America Inc.		12NC28TW01	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556010	12NC28TWA01	Water	9/19/2012 10:30	0"	SW6020 (dissolved)	SGS North America Inc.	MS	12NC28TW01	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556010	12NC28TWA01	Water	9/19/2012 10:30	0"	SW7471(dissolved)	SGS North America Inc.	MS	12NC28TW01	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556011	12NC28TWA01	Water	9/19/2012 10:30	0"	SW6020 (dissolved)	SGS North America Inc.	MSD	12NC28TW01	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556011	12NC28TWA01	Water	9/19/2012 10:30	0"	SW7471(dissolved)	SGS North America Inc.	MSD	12NC28TW01	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556012	12NC28TWA02	Water	9/19/2012 10:45	0"	SW6020 (dissolved)	SGS North America Inc.	Duplicate of TWA03	12NC28TW02	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556012	12NC28TWA02	Water	9/19/2012 10:45	0"	SW7471(dissolved)	SGS North America Inc.	Duplicate of TWA03	12NC28TW02	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556013	12NC28TWA03	Water	9/19/2012 10:00	0"	SW6020 (dissolved)	SGS North America Inc.		12NC28TW03	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556013	12NC28TWA03	Water	9/19/2012 10:00	0"	SW7471(dissolved)	SGS North America Inc.		12NC28TW03	LK	Nitric Acid	091912-05, 06, & 07	2 Days	Plastic 250ml - with Nitric Acid
1124556014	12NC28TWA04	Water	9/20/2012 11:00	0"	SW6020 (dissolved)	SGS North America Inc.		12NC28TW04	LK	Nitric Acid	092012-01	2 Days	Plastic 250ml - with Nitric Acid
1124556014	12NC28TWA04	Water	9/20/2012 11:00	0"	SW7471(dissolved)	SGS North America Inc.		12NC28TW04	LK	Nitric Acid	092012-01	2 Days	Plastic 250ml - with Nitric Acid
1124556008	TripBlank 091912-01	Water	9/20/2012 11:00		AK101	SGS North America Inc.	Trip Blank		LK	Hydrochloric Acid	092012-01	2 Days	Voa Vial 40ml - Hydrochloric Acid
1124556008	TripBlank 091912-01	Water	9/20/2012 11:00		SW8260B	SGS North America Inc.	Trip Blank		LK	Hydrochloric Acid	092012-01	2 Days	Voa Vial 40ml - Hydrochloric Acid
1124556007	TripBlank091912-03	Water	9/19/2012 10:00		AK101	SGS North America Inc.	Trip Blank		LK	Hydrochloric Acid	091912-05, 06, & 07	2 Days	Voa Vial 40ml - Hydrochloric Acid
1124556007	TripBlank091912-03	Water	9/19/2012 10:00		SW8260B	SGS North America Inc.	Trip Blank		LK	Hydrochloric Acid	091912-05, 06, & 07	2 Days	Voa Vial 40ml - Hydrochloric Acid

Sample Summary Sheet

Laboratory ID	Sample ID	Matrix	Date/Time Collected	Sample Depth	Analytical Methods	Analysis Laboratory	QC	Location ID	Sampler Initials	Field Preservation	Cooler Name	Turn around Time	Container Type/Volume
580-35084 - Site 28 MI Soil													
580-35084-1	12NC28MI001	Soil	9/10/2012 16:10	0-4"	AK102 & 103	TestAmerica Seattle		28-MI-01	EB	cool <4 C	091912-04	15_Days	1 gallon Ziploc bag (for all analyses)
580-35084-1	12NC28MI001	Soil	9/10/2012 16:10	0-4"	AK102 & 103 SG	TestAmerica Seattle		28-MI-01	EB	cool <4 C	091912-04	15_Days	
580-35084-1	12NC28MI001	Soil	9/10/2012 16:10	0-4"	SW8082A	TestAmerica Seattle		28-MI-01	EB	cool <4 C	091912-04	15_Days	
580-35084-1	12NC28MI001	Soil	9/10/2012 16:10	0-4"	8270D SIMS (PAH)	TestAmerica Seattle		28-MI-01	EB	cool <4 C	091912-04	15_Days	
580-35084-1	12NC28MI001	Soil	9/10/2012 16:10	0-4"	SW6020	TestAmerica Seattle		28-MI-01	EB	cool <4 C	091912-04	15_Days	
580-35084-1	12NC28MI001	Soil	9/10/2012 16:10	0-4"	SW9060	TestAmerica Seattle		28-MI-01	EB	cool <4 C	091912-04	15_Days	
580-35084-2	12NC28MI002	Soil	9/11/2012 15:50	0-4"	AK102 & 103	TestAmerica Seattle		28-MI-02	EB	cool <4 C	091912-04	15_Days	1 gallon Ziploc bag (for all analyses)
580-35084-2	12NC28MI002	Soil	9/11/2012 15:50	0-4"	AK102 & 103 SG	TestAmerica Seattle		28-MI-02	EB	cool <4 C	091912-04	15_Days	
580-35084-2	12NC28MI002	Soil	9/11/2012 15:50	0-4"	SW8082A	TestAmerica Seattle		28-MI-02	EB	cool <4 C	091912-04	15_Days	
580-35084-2	12NC28MI002	Soil	9/11/2012 15:50	0-4"	8270D SIMS (PAH)	TestAmerica Seattle		28-MI-02	EB	cool <4 C	091912-04	15_Days	
580-35084-2	12NC28MI002	Soil	9/11/2012 15:50	0-4"	SW6020	TestAmerica Seattle		28-MI-02	EB	cool <4 C	091912-04	15_Days	
580-35084-2	12NC28MI002	Soil	9/11/2012 15:50	0-4"	SW9060	TestAmerica Seattle		28-MI-02	EB	cool <4 C	091912-04	15_Days	
580-35084-3	12NC28MI003	Soil	9/11/2012 15:00	0-4"	AK102 & 103	TestAmerica Seattle	Field Repl. of 28MI002	28-MI-03	EB	cool <4 C	091912-04	15_Days	1 gallon Ziploc bag (for all analyses)
580-35084-3	12NC28MI003	Soil	9/11/2012 15:00	0-4"	AK102 & 103 SG	TestAmerica Seattle	Field Repl. of 28MI002	28-MI-03	EB	cool <4 C	091912-04	15_Days	
580-35084-3	12NC28MI003	Soil	9/11/2012 15:00	0-4"	SW8082A	TestAmerica Seattle	Field Repl. of 28MI002	28-MI-03	EB	cool <4 C	091912-04	15_Days	
580-35084-3	12NC28MI003	Soil	9/11/2012 15:00	0-4"	8270D SIMS (PAH)	TestAmerica Seattle	Field Repl. of 28MI002	28-MI-03	EB	cool <4 C	091912-04	15_Days	
580-35084-3	12NC28MI003	Soil	9/11/2012 15:00	0-4"	SW6020	TestAmerica Seattle	Field Repl. of 28MI002	28-MI-03	EB	cool <4 C	091912-04	15_Days	
580-35084-3	12NC28MI003	Soil	9/11/2012 15:00	0-4"	SW9060	TestAmerica Seattle	Field Repl. of 28MI002	28-MI-03	EB	cool <4 C	091912-04	15_Days	
580-35084-4	12NC28MI004	Soil	9/11/2012 15:30	0-4"	AK102 & 103	TestAmerica Seattle	Field Repl. of 28MI002	28-MI-04	EB	cool <4 C	091912-04	15_Days	1 gallon Ziploc bag (for all analyses)
580-35084-4	12NC28MI004	Soil	9/11/2012 15:30	0-4"	AK102 & 103 SG	TestAmerica Seattle	Field Repl. of 28MI002	28-MI-04	EB	cool <4 C	091912-04	15_Days	
580-35084-4	12NC28MI004	Soil	9/11/2012 15:30	0-4"	SW8082A	TestAmerica Seattle	Field Repl. of 28MI002	28-MI-04	EB	cool <4 C	091912-04	15_Days	
580-35084-4	12NC28MI004	Soil	9/11/2012 15:30	0-4"	8270D SIMS (PAH)	TestAmerica Seattle	Field Repl. of 28MI002	28-MI-04	EB	cool <4 C	091912-04	15_Days	
580-35084-4	12NC28MI004	Soil	9/11/2012 15:30	0-4"	SW6020	TestAmerica Seattle	Field Repl. of 28MI002	28-MI-04	EB	cool <4 C	091912-04	15_Days	
580-35084-4	12NC28MI004	Soil	9/11/2012 15:30	0-4"	SW9060	TestAmerica Seattle	Field Repl. of 28MI002	28-MI-04	EB	cool <4 C	091912-04	15_Days	
580-35084-5	12NC28MI005	Soil	9/16/2012 11:30	0-4"	AK102 & 103	TestAmerica Seattle		28-MI-05	EB	cool <4 C	091912-04	15_Days	1 gallonZiploc bag (for all analyses)
580-35084-5	12NC28MI005	Soil	9/16/2012 11:30	0-4"	AK102 & 103 SG	TestAmerica Seattle		28-MI-05	EB	cool <4 C	091912-04	15_Days	
580-35084-5	12NC28MI005	Soil	9/16/2012 11:30	0-4"	SW8082A	TestAmerica Seattle		28-MI-05	EB	cool <4 C	091912-04	15_Days	
580-35084-5	12NC28MI005	Soil	9/16/2012 11:30	0-4"	8270D SIMS (PAH)	TestAmerica Seattle		28-MI-05	EB	cool <4 C	091912-04	15_Days	
580-35084-5	12NC28MI005	Soil	9/16/2012 11:30	0-4"	SW6020	TestAmerica Seattle		28-MI-05	EB	cool <4 C	091912-04	15_Days	
580-35084-5	12NC28MI005	Soil	9/16/2012 11:30	0-4"	SW9060	TestAmerica Seattle		28-MI-05	EB	cool <4 C	091912-04	15_Days	
580-35084-6	12NC28MI006	Soil	9/16/2012 14:30	0-4"	AK102 & 103	TestAmerica Seattle		28-MI-06	EB	cool <4 C	091912-04	15_Days	1 gallon Ziploc bag (for all analyses)
580-35084-6	12NC28MI006	Soil	9/16/2012 14:30	0-4"	AK102 & 103 SG	TestAmerica Seattle		28-MI-06	EB	cool <4 C	091912-04	15_Days	
580-35084-6	12NC28MI006	Soil	9/16/2012 14:30	0-4"	SW8082A	TestAmerica Seattle		28-MI-06	EB	cool <4 C	091912-04	15_Days	
580-35084-6	12NC28MI006	Soil	9/16/2012 14:30	0-4"	8270D SIMS (PAH)	TestAmerica Seattle		28-MI-06	EB	cool <4 C	091912-04	15_Days	
580-35084-6	12NC28MI006	Soil	9/16/2012 14:30	0-4"	SW6020	TestAmerica Seattle		28-MI-06	EB	cool <4 C	091912-04	15_Days	
580-35084-6	12NC28MI006	Soil	9/16/2012 14:30	0-4"	SW9060	TestAmerica Seattle		28-MI-06	EB	cool <4 C	091912-04	15_Days	