Prepared for:

Alaska Department of
Environmental Conservation

Brownfields Cleanup Action

Joseph Guy Community Center
Kwethluk, Alaska

FINAL
June 2013

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ERM

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BROWNFIELDS CLEANUP ACTION
JOSEPH GUY COMMUNITY CENTER

KWETHLUK, ALASKA

June 2013

ERM Project # 0172736

Prepared By: ____________________________________

Lisa Nicholson
Project Manager

Reviewed By: ____________________________________

Max Schwenne
Program Manager

ERM Alaska, Inc.
825 West 8th Avenue
Anchorage, Alaska 99501
T: (907) 258-4880
F: (907) 258-4033

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ACRONYMS AND ABBREVIATIONS

AST .... aboveground storage tank
BSI .... Bethel Services, Inc.
BTEX .... benzene, toluene, ethylbenzene and total xylenes
°C .... degrees Celsius
CIS................... Alaska Community Database Community Information Summaries
COPC............. contaminant of potential concern
cy .... cubic yards
DEC................. Alaska Department of Environmental Conservation
DRO .... diesel-range organics
E&E .... Ecology and Environment, Inc.
EPA .... U.S. Environmental Protection Agency
ERM .... Environmental Resources Management
GPS .... global positioning system
GRO .... gasoline-range organics
J........................ estimated value
JGCC .... Joseph Guy Community Center
LCS/LCSD..... laboratory control sample/laboratory control sample duplicate
MDL................ method detection limit
mg/kg .... milligrams per kilogram
mg/L .... milligrams per liter
MS/MSD........ matrix spike/matrix spike duplicate
MTG................ migration to groundwater
ND................... not detected
OVK .... Organized Village of Kwethluk
PID .... photoionization detector
QA/QC .... quality assurance/quality control
%R................... percent recovery
RCRA............. Resource Conservation Recovery Act
RRO .... residual-range organics
SPLP................ synthetic precipitation leaching procedure
SVOC .... semi-volatile organic compounds
TAL .... target analyte list
TBA .... Targeted Brownfields Assessment
TCLP............... toxic characteristic leaching procedure
UB .... not detected due to blank contamination
XRF .... x-ray fluorescence analyzer

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EXECUTIVE SUMMARY

In 2012, ERM Alaska, Inc. (ERM), formerly OASIS Environmental, Inc. (OASIS), was contracted by the Alaska Department of Environmental Conservation (DEC) to complete the removal and cleanup associated with the brownfield site and burned structure known as the former Joseph Guy Community Center, in Kwethluk, Alaska. The project involved demolishing and removing the remaining building structure in order to access previously identified contamination associated with the building fire. A 2010 Targeted Brownfield Assessment indicated that site contaminants of potential concern included antimony, arsenic, chromium, cobalt, copper, nickel, diesel-range organics (DRO), and two semi-volatile organic compounds (SVOCs).

The metal shell and frame of the building were dismantled on April 5, 2012. The metal was then crushed and staged for hauling to Bethel for recycling and disposal. Thirteen truckloads of metal were transported to the Bethel Landfill in April 2012. The building had been supported by twelve steel pilings and cross beams. The cross beams were staged onsite for use by village residents. The piles were cut below grade and removed with the metal building materials. Approximately 30 cubic yards of non-hazardous small debris/soil was scraped up during the building demolition and transferred to the Kwethluk dump.

ERM returned to the site in June 2012 to excavate the DRO and SVOC contaminated soil noted above and to sample the building footprint for metals contamination. The cleanup crew found that spring flooding had apparently redistributed the remaining debris across the building footprint. Local laborers were hired to pick up and dispose of any the metal debris greater than about three inches across.

During the June field event, three small areas were excavated around the building perimeter; an area surrounding a former aboveground storage tank with DRO contamination and two areas with previous soil sample results exceeding cleanup levels for SVOCs. An average of ½ cubic yard of soil was removed from each of the three areas, placed in 1-cubic yard bulk sacks. DRO and SVOC sample results from the bulk sacks and from the floor and sidewalls of the excavations indicated that there were no regulatory criteria exceedences in the excavated soil. Synthetic precipitation leaching procedure (SPLP) samples were also analyzed for DRO and SVOC to determine the leachability of the contaminants. The results (all non-detect) indicated that the DRO and SVOC in the soil will not leach into the groundwater. The low SPLP results also indicated that the DEC migration to groundwater (MTG) cleanup levels for DRO and SVOC are not appropriate for the site and the less stringent direct contact cleanup levels should be used. The bulk sacks were transported to the Kwethluk dump.

Results of the footprint sampling indicated that antimony, chromium, cobalt, copper and nickel were present at concentrations above MTG cleanup levels but below direct contact cleanup levels. Arsenic concentrations were above both MTG and direct contact cleanup levels.

Due to the elevated metals concentrations in the footprint samples, ERM performed a waste determination for the remaining debris/soil. Although no toxic characteristic leaching procedure (TCLP) samples were collected during the June field event, calculations of maximum possible TCLP results for the footprint samples suggested that only three samples collected from the southwestern portion of the footprint could have TCLP results greater than Resource Conservation Recovery Act (RCRA) TCLP limits for arsenic and chromium. Any TCLP results less than the RCRA limits are considered non-hazardous and indicate that the metals contaminants should not leach into the groundwater. The low calculated TCLP results for all but the three southwestern sample locations also suggest that the MTG cleanup level may not be appropriate for the site and that the less stringent direct contact cleanup level should be used. Arsenic was the only metal in the footprint samples that had soil concentrations exceeding the direct contact cleanup level. All arsenic results exceeded the direct contact cleanup level.

ERM returned to the site in September 2012 to remove the material suspected to be hazardous based on the calculated TCLP results. Soil and debris surrounding the three sample locations noted above were excavated and placed into 1-cubic-yard (cy) bulk sacks. The action produced 13 cy of small debris/soil, 2 cy of polystyrene foam, and two steel pilings with attached treated wooden cribbing footers. The sacks were sampled for TCLP arsenic and chromium, the only two COPC metals regulated by RCRA. TCLP sample results were well below the RCRA TCLP limits for these two metals, supporting the use of direct contact rather than MTG cleanup levels for metals contamination. With approval from the DEC Solid Waste Program, the bulk sacks were transferred to the Kwethluk dump in June 2013.

ERM collected background metals samples from the source area for the JGCC pad. The background results were compared to site data to assess whether the elevated metals concentrations at the site are likely a result of site activities or can be attributed to naturally occurring metals in soil. The comparison indicated that the site antimony, cobalt, and nickel concentrations were either at or below background soil concentrations, suggesting that these metals may be attributable to naturally occurring concentrations in soil. The site arsenic, chromium, and copper results were consistently above background concentrations. The elevated concentrations of these three metals may be attributable to the presence of treated timbers supporting the building support pilings.

Arsenic is the only metal of the six COPC metals with results that exceed the direct contact cleanup level. The background soil arsenic concentrations also exceed the direct contact cleanup level. This finding suggests that site soils likely exceeded the direct contact cleanup levels prior to impact associated with the building. With the exception of the soil that was removed during the September excavation, the remaining site arsenic concentrations (10 to 18 mg/kg) are only slightly above background concentrations (4.9 to 12 mg/kg) and should not significantly increase risk to human health through direct contact. The slightly elevated arsenic levels at the site should be managed through institutional controls to prevent the material to be moved offsite to an environmentally sensitive area. Care should be taken when disturbing any native or site soil due to the presence of arsenic above the DEC soil cleanup level.

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1. INTRODUCTION

ERM Alaska, Inc. (ERM), formerly OASIS Environmental, Inc. (OASIS), was contracted by the Alaska Department of Environmental Conservation (DEC) to complete the first cleanup of a brownfield site under the DEC's Reuse & Redevelopment Program. This work involved the demolition of the burned Joseph Guy Community Center (JGCC), in Kwethluk, Alaska, disposal of the building materials, debris, and ash, assessment of the building footprint, and removal and disposal of known soil contamination on the perimeter of the building.

1.1. Site Description and Background

The following community and site information was gathered from the Alaska Community Database Community Information Summaries and from the 2010 Targeted Brownfields Assessment (TBA) by Ecology and Environment, Inc. (E&E 2011). Kwethluk is located approximately 12 miles east of Bethel, Alaska on the Kwethluk River, a tributary to the Kuskokwim River (Figure 1). The community lies at 60.81220° North Latitude and -161.435830° West Longitude (Section 05, T008N, R069W, Seward Meridian.) It is a Yup'ik community with a population of 741. The City of Kwethluk provides water treatment, honeybucket, washeteria and refuse services. Residents haul water for household use.

The community relies on air transportation for year-round freight and passenger service, with a state-owned gravel airstrip and seaplane base. Snow machine, all-terrain vehicles and skiffs are used for local travel and the river becomes an ice road during the winter.

The 5,000 square-foot JGCC was built between 1998 and 2002. It is owned by the Organized Village of Kwethluk (OVK) and housed the Kwethluk Indian Reorganization Act Council and eight village social services. It was also used for community functions. The center was primarily constructed of metal with steel I-beam supports and joists with corrugated sheet metal walls and roof. The floor was built of combustible materials. The building was built on a raised earthen platform covered by a geotextile liner and polystyrene foam. Interior walls were constructed of particle board and sheet rock. The building burned in April 2006. Figure 2 shows the building site location.

1.2. Brief Site History

In 2010 and at the request of the OVK, the U. S. Environmental Protection Agency (EPA) and its contractor E&E performed a TBA funded by the EPA Brownfield Program. The TBA involved collecting eight surface soil samples from the building exterior for analysis of Target Analyte List (TAL) metals and semi-volatile organic compounds (SVOC). Five of the eight samples were also analyzed for dioxins and furans.

All eight of the samples contained at least one TAL metal result that exceeded DEC cleanup levels. Only six of the twenty TAL metals exceeded cleanup levels including antimony, arsenic, chromium, cobalt, copper, and nickel. None of the samples exceeded DEC or EPA regulatory criteria for SVOCs or dioxins/furans.

Eighteen exterior co-located surface/subsurface soil samples were collected and analyzed for TAL metals and SVOC. Six of the samples were also analyzed for dioxins/furans. Two surface soil samples were listed as exceeding DEC cleanup levels for SVOCs; a sample located on the south side of the building had a n-nitroso-di-n-propylamine result of 0.042 milligrams per kilogram (mg/kg), exceeding the cleanup level of 0.0011 mg/kg; a sample located on the west side of the building had a bis(2-ethylhexyl)phthalate result of 2.7 mg/kg. The TBA stated that the result exceeded the DEC cleanup level of 1.3 mg/kg, but listed the cleanup level elsewhere in the document as 13 mg/kg (the correct cleanup level). None of the samples exceeded DEC cleanup levels for dioxins/furans.

Two surface soil samples were collected from the former location of an AST that contained heating oil and analyzed for diesel-range organics (DRO) and residual-range organics (RRO). One of the samples had a DRO result of 9,000 mg/kg, exceeding the DEC cleanup level for DRO of 250 mg/kg; however, the work was not centered on delineating the extent of potential impacts.

Eight wipe samples were collected from the interior and exterior building walls and analyzed for dioxins/furans. All of the wipe samples were positive for dioxins/furans. No regulatory criteria exist for wipe samples.

Twelve bulk samples were collected of suspected asbestos containing building materials. No asbestos was present in any of the samples.

In March 2012, Mike Roberts of the Alaska Native Tribal Health Consortium collected two three-point composite samples from the floor of the building for Toxic Characteristic Leaching Procedure (TCLP) analysis of antimony, arsenic, chromium, cobalt, copper, and nickel. Only arsenic and chromium are regulated by the Resource Conservation Recovery Act (RCRA) with TCLP limits of 5 mg/L for both metals. The results were either not detected (ND) or below 1 mg/L. The laboratory report and DEC data review checklist from the sampling is included in Appendix A. There were no quality assurance discrepancies associated with the results.

1.3. Regulatory Criteria

The contaminants of potential concern (COPCs) based on the 2010 TBA are included in Table 1 along with the corresponding regulatory criteria. Bis(2-ethylhexyl phthalate has been removed as a COPC as the TBA result was actually below the DEC cleanup level. All criteria in Table 1 are based on the DEC Method Two Soil Cleanup Levels for Migration to Groundwater (MTG) and Direct Contact except for the cobalt value. DEC does not publish a cleanup level for cobalt. The cobalt value is based on the Regional Screening Level for Soil to Groundwater and for Residential Soil (EPA 2012a and b).

TABLE 1: CONTAMINANTS OF POTENTIAL CONCERN

Contaminant	MTG Criteria (mg/kg)	Direct Contact Criteria (mg/kg)
Antimony	3.6	41
Arsenic	3.9	4.5
Chromium	25	300
Cobalt	0.21	370
Copper	460	4100
Nickel	86	2000
N-nitroso-di-n-propylamine	0.0011	0.52
DRO	250	10,250*

* DRO direct contact criteria based on Ingestion cleanup level for the Under 40" Zone

1.4. Project Objectives

The scope of work for the project is described below:

- Demolish the burned JGCC building.
- Remove burned debris, waste material, ash, and waste/soil mixtures within the burned building footprint.
- Excavate DRO contaminated soil from below the location where the day tank was previously located.
- Excavate two areas around the 2010 TBA sample locations that had SVOC concentrations above regulatory criteria.
- Sample the building footprint for the six TAL metals that exceeded the DEC cleanup levels during the 2010 TBA (antimony, arsenic, chromium, cobalt, copper, and nickel).

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2. FIELD ACTIVITIES

The field work was completed in four phases. The demolition phase was scheduled for early spring in order to utilize the ice road running along the frozen river between Kwethluk and Bethel. This phase of the project was performed between April 4 and April 10, 2012. The second phase, the soil excavation and footprint sampling, was completed between June 7 and 11, 2012. The third phase, debris/soil removal in the southwestern portion of the footprint, TCLP sampling of the containerized material, and background metals sampling was completed between September 10 and 13, 2012. During the fourth phase performed in June 2013, the bulk sacks from the September 2012 sampling were transferred to the Kwethluk dump. Field notes from the project are included in Appendix B. Select photographs of the field work are included in Appendix C.

A narrative of the field activities is included below for each of the project phases. All fieldwork was conducted and all field and laboratory quality assurance criteria for this project were performed in accordance with the January 2010 DEC *Draft Field Sampling Guidance,* the March 2012 *Joseph Guy Community Center Demolition Plan (OASIS 2012a)*, and the June 2012 *Joseph Guy Community Center Brownfield Cleanup Action Plan (OASIS 2012b).*

2.1. Phase 1 - Demolition Phase

Bethel Services, Inc. (BSI) provided demolition services for the project. BSI rented a local Komatsu PC 200 excavator from the Kwethluk Tribal Resident Council to demolish the building. One dump truck and one flatbed truck were rented from Dale Construction, Inc. in Bethel and used to haul the metal to the Bethel Landfill for eventual recycling.

The metal shell and frame of the building were dismantled on April 5, 2012 (Photograph 1 – Appendix C). The metal was then crushed and staged for hauling to Bethel (Photograph 2). Thirteen truckloads of metal (Photograph 3) were transported to the Bethel Landfill between April 5 and April 10, 2012. Figures 1 and 2 show the ice road route between Kwethluk and Bethel.

The building had been supported by twelve steel piles. The piles were connected by cross beams. BSI cut the cross beams away from the vertical piles and then cut off the piles below grade (Photographs 4 and 5). The cross beams were staged onsite per request by the OVK.

BSI then scraped the surface debris/soil within the building footprint to approximately 1 foot below grade or to the polystyrene foam board, whichever was shallower. March 2012 TCLP metal results suggested that the soil beneath the building footprint could be treated as polluted soil, rather than hazardous waste. Approximately 30 cubic yards (cy) of debris/soil was transported by dump truck to the Kwethluk dump (Photograph 6) with approval of the DEC Solid Waste Program.

2.2. Phase 2 - Building Footprint Sampling

In June 2012, ERM returned to Kwethluk to excavate soil associated with the 2010 TBA DRO and SVOC cleanup level exceedences and to collect confirmation samples from the building footprint.

Upon arrival at the site, ERM personnel observed significant amounts of metal debris located on and around the footprint. In May 2012, the Kuskokwim and Kwethluk Rivers had breached their banks and flooded the village of Kwethluk, including the Community Center site. The flooding likely re-distributed subsurface debris, not removed during the April field effort. Additional cleanup of the site was deemed necessary and ERM oversaw cleanup of debris large enough to be picked up by hand and transferred to the Kwethluk dump. Photographs 7 and 8 show the site before and after debris cleanup.

2.2.1. *X-ray Fluorescence Screening*

A portable X-ray Fluorescence analyzer (XRF) was used to screen the building footprint for metals, including antimony, arsenic, chromium, cobalt, copper, and nickel. This technique allowed for quick turnaround of metals results from 20 screening locations and selection of only nine locations for collection of analytical samples.

The building footprint was screened on a 15- by 15-foot grid spacing. At each screening location the crew removed any non-representative debris from the soil surface, including rocks, pebbles, twigs and leaves. Due to saturated soil conditions, an ex-situ screening technique was used in accordance with the DEC approved Joseph Guy Community Center Brownfield Cleanup Action Work Plan (OASIS 2012). Approximately 8 ounces (volumetric) of soil were collected into a re-sealable bag using clean, disposable sampling spoons at each screening location.

Each bag of soil was dried overnight (Photograph 9) then placed in a toaster oven for approximately 15 minute at 350°F to remove any remaining moisture. Screening samples were sieved to 60-mesh (Photograph 10), and placed into a sample cup provided as part of the soil kit for the XRF. The XRF analyzer was set to soil mode and all three element ranges were used (main, low, and high). A measurement time of 60 seconds on each range, totaling three minutes per location was used. Results were recorded by the analyzer for all detectable metals. ERM also recorded the concentrations of antimony, arsenic, chromium, cobalt, copper and nickel in the field notebook. The results are presented in Table 2 and Figure 3.

2.2.2. *Analytical Sampling*

Results from the XRF screenings were used to select nine footprint samples for laboratory analysis for antimony, arsenic, chromium, cobalt, copper and nickel using EPA Method 6020. The laboratory sample locations were selected based on the highest screening results and on spatial distribution (see Figure 3). Analytical samples were collected from the same locations as the screening samples using clean, disposable sampling spoons and placed into 4-ounce amber, non-preserved, sample jars. All samples were kept on ice to maintain the sample temperature at 4 degrees Celsius (°C) ± 2°C.

2.3. Phase 2 - Soil Excavations

The field team excavated contaminated soil from the AST location (Excavation Area 1 – Figure 3 and Photograph 11) and the two locations with SVOC contamination (Excavation Areas 2 and 3 – Figure 3 and Photographs 12 and 13). Excavation Areas 2 and 3 were at the same locations as samples collected during the TBA that were reported to have cleanup level exceedences; one for n-nitroso-di-n-propylamine and one for bis (2-ethylhexyl) phthalate. As mentioned in Section 1.2, the cleanup level for bis(2-ethylhexyl) phthalate was actually ten-times higher than cited in the TBA and the sample discussed above was actually below the correct cleanup level. The error in cleanup level for bis(2-ethylhexyl) phthalate had not been discovered prior to the June 2012 field event, so both SVOC areas were excavated.

ERM used visual approximations from the site plan and Global Positioning System (GPS) coordinates to determine the locations of the samples collected during the 2010 TBA. ERM found that the GPS coordinates for the 2010 TBA samples did not coincide with the work plan figure which was derived from the TBA site plan. ERM used professional judgment, the site plan, and the GPS coordinates to determine the location of the excavation areas. Local residents also gave ERM information about the location of the AST. In addition, the crew used a heated headspace technique to provide additional information regarding the excavation locations, as described below.

2.3.1. Photoionization Detector Screening

At each screening location, re-sealable, polyethylene, quart-size bags were partially filled (one-third to one-half) with soil, agitated for 15 seconds, and heated to 40°F using space heaters. Headspace vapors were allowed to develop for no longer than one hour. The soil was agitated again for 15 seconds, and then sampled using the PID.

ERM used a photoionization detector (PID) to aid in locating the SVOC TBA sample locations and the former AST location. Heated headspace PID samples were collected from the SVOC sample locations determined with a GPS and those estimated from the work plan site map. The PID results did not differ significantly between the two sample sets. ERM selected the SVOC excavation locations based on the work plan site map.

In order to determine the location of the former AST, ERM screened the soil on a 3 by 3 foot grid pattern starting at the southeast corner of the building footprint and extending 27 feet to the west and 6 feet to the south, completing a 10 x 3 grid array. Based on the highest PID result, a six foot by six foot area was excavated at the location shown in Figure 3. ERM collected four heated headspace sidewall samples at 1-foot depth for each of the proposed excavation areas. The PID sample locations and results are included on pages 32 to 35 of the field notes in Appendix B.

Due to the difficulty of excavating with a backhoe near the geotextile liner and polystyrene foam, excavations were completed by hand using shovels. Excavations were advanced until the geotextile liner or polystyrene foam was encountered or depth approximated 1 foot bgs. Estimated volumes removed from the Excavation Areas 1, 2, and 3 were 0.75, 0.50, 0.25 cy, respectively. Soil from each excavation was placed in separate 1 cy bulk polyethylene sacks and transported to the Kwethluk dump. The sacks are currently stored at the south end of the dump (Figure 4 and Photograph 14).

2.3.2. *Analytical Sampling*

2.3.2.1. Excavation Confirmation Samples

ERM collected at least two confirmation samples from each of the excavations; one from the floor and one from the sidewall. The sidewall sample location from each excavation was selected based on the highest PID reading of the four sidewall screening samples. Excavation Area 1 samples were analyzed for DRO using Alaska Method (AK) 102, gasoline-range organics (GRO) using AK 101, benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8021B, and SVOC using EPA Method 8270D. The SVOC excavation samples were analyzed for SVOC only.

The GRO/BTEX samples were collected first, placing a 25-gram sample of soil directly into a tared 4-ounce jar with a Teflon®-lined septum fused to the lid. The sample was immediately preserved with 25 milliliters of methanol. Any visible grit was removed from the jar threads before sealing the jar to prevent leakage of the methanol.

The DRO and SVOC samples were collected directly into 4-ounce amber, non-preserved, sample jars using clean, disposable sampling spoons.

Once the analytical samples were collected, Excavation Areas 2 and 3 were leveled back to original grade. Excavation Area 1 was very irregular prior to excavation, so the shallow excavation was not re-graded.

2.3.2.2. Bulk Sack Characterization Samples

One soil sample was collected from each bulk sack to characterize the contaminants in the sacks. The samples were collected into 8-ounce amber, non-preserved jars. All samples were refrigerated to maintain the sample temperature at 4 degrees Celsius (°C) ± 2°C.

The samples were analyzed for DRO and SVOC using the methods listed in the previous section and also analyzed using a Synthetic Precipitation Leaching Procedure (SPLP) to determine the potential for leaching of contaminants from the soil.

2.4. Phase 3 - September Field Activities

ERM and a BSI subcontractor returned to the site in September 2012 to remove additional debris and soil along the south edge of building footprint, based on elevated metal results from the June footprint sampling. This area of the footprint corresponds to the area that the demolition crew staged metal debris for loading onto dump trucks for transport to the Bethel landfill.

Due to the elevated metal concentrations in the footprint, the crew also collected background samples of the material source for the JGCC pad (Figures 2 and 4). The location of material source was provided by local residents involved during the construction of the JGCC.

2.4.1. *Excavation*

The September excavation was planned for a 45-ft by 15-ft area, surrounding June sample points A5, B5 and C5 (Figure 3). This sample plan was based on analytical results that had a high enough metal concentration that a TCLP sample collected from the same soil could exceed RCRA TCLP levels for arsenic and/or chromium (see explanation in Section 3)

Prior to excavating the material, ERM collected 24 XRF screening samples around locations A5, B5 and C5 to determine the lateral extent of metals contamination (Figure 5). Figure 5 also shows the area of excavation.

The crew excavated debris/soil to a depth where no debris was apparent in the soil (Photograph 15). The debris/soil was excavated and placed into 13 one-cy bulk sacks. Figure 6 shows the limits of excavation for each bulk sack. The bulk sacks were temporarily staged within the non-excavated building footprint. An additional 2 one-cy bulk sacks were filled with polystyrene foam removed during excavation.

The crew encountered wood cribbing foundation blocks with attached pilings as they excavated the debris. Per the request of the OVK, the piles and wood cribbing were removed and temporarily staged next to the bulk sacks. The temporary staging location of the sacks and pilings are shown in Photograph 16.

Each of the 13 debris/soil bulk sacks was sampled for TCLP arsenic and chromium, the only two of the six metal contaminants of concern that are regulated by RCRA. Once the excavation was complete, the ERM crew collected confirmation samples from each of the thirteen footprint areas to be held for analysis pending results of the TCLP sampling. If TCLP results were above RCRA limits, the footprint samples would be analyzed.

2.4.2. *Material Source Samples*

The field crew also collected six soil samples from clean stockpiled soil used to build the pad for the JGCC; five samples from Source Area A and one sample from Source Area B (Figure 4). The samples were collected to characterize the naturally occurring background metals concentrations in the source area of the fill underlying the building. The samples were analyzed for antimony, arsenic, chromium, cobalt, copper and nickel.

2.5. Phase 4 – Bulk Sack Transfer

ERM did not move the bulk sacks from the September field effort to their final resting place until June 6, 2013, after the DEC Solid Waste Program approved disposal of the sacks into the Kwethluk dump. The approval letter is included as Appendix D.

The field crew placed the sacks inside the west fence line near the south side of the dump (Photograph 17). Figure 4 shows the location of the sacks. The sacks could not be placed next to the sacks from the June 2012 field event as a result of ponding on the access road. The two building footers (cribbing and piles) were staged alongside the building footprint with the beams from the demolition phase, per request of the OVK.

3. FINDINGS

This section presents the screening and analytical results from the project samples. The laboratory analytical results are included in Appendix E.

3.1. Building Footprint Sampling

The XRF screening results from the June building footprint sampling are included in Table 2 and Figure 3. Notable all screening sample results exceed the DEC MTG and direct contact cleanup levels. Many of the antimony and copper results exceeded the MTG cleanup level with a subset exceeding the direct contact cleanup level. Nickel concentrations in one screening sample exceeded the MTG level only. All of the cobalt samples were ND. The ranges of screening results are described below:

- Antimony – ND to 1,416 parts per million (ppm)
- Arsenic – 9 to 1,451 ppm
- Chromium – 51 to 1,021 ppm
- Cobalt – all ND
- Copper – 29 to 11,000 ppm
- Nickel – ND to 184 ppm

The screening results were used to select nine samples for laboratory analysis. Samples were selected based on the highest screening results and spatial distribution. The analytical results for the building footprint sampling are included in Table 2 and Figure 3. The ranges of metals results are described below:

- Antimony – ND to 20.3 mg/kg
- Arsenic – 14 to 880 mg/kg
- Chromium – 23 to 200 ppm
- Cobalt – 9.0 to 24 mg/kg
- Copper – 25 to 2,500 mg/kg
- Nickel – 25 to 280 mg/kg

Many of the samples exceeded the MTG regulatory criteria for arsenic, chromium, and copper, but the highest concentrations are associated with locations A5, B5 and C5. All of the samples exceeded the MTG criterion for cobalt. The only antimony exceedences are associated with locations A5, B5, and C5 and the only nickel exceedence is associated with location C5. None of the samples exceeded the direct contact criteria for antimony, chromium, cobalt, copper, and nickel. As illustrated in Table 2 however, all of the arsenic results exceed the direct contact criterion.

The laboratory results for antimony, arsenic, chromium, copper and nickel were plotted against the corresponding XRF screening results, shown in Figure 7. Cobalt was not plotted as all XRF results were ND. Linear trendlines are included on the plots with the trendline equation and r^2 value included. The trend line equation gives the slope and y-intercept of the line and the r^2 value indicates how closely the data fit a linear trend.

The plots illustrate that in all cases except nickel, the laboratory results were a fraction of the screening results, i.e. the slope of the line is greater than 1.0. Also, the r^2 values indicate that the there is a fairly good correlation between the laboratory and XRF values for antimony, arsenic, and chromium (r^2 between 0.74 and 0.86). The r^2 values for copper and nickel suggest a more random trend. These correlations suggest that the screening locations with no corresponding laboratory sample would also likely have laboratory results that were a fraction of the XRF results for antimony, arsenic, and chromium.

The high metal concentrations in the southwestern portion of the footprint suggested that the debris/soil from locations A5 to D5 might be considered hazardous waste. No TCLP samples were collected during the field effort.

In order to determine if any of the sample locations may contain hazardous waste, ERM calculated the maximum possible TCLP results for the arsenic and chromium samples. Arsenic and chromium are the only two metals regulated by RCRA. The calculations involved dividing the concentrations by 20 (on a wet weight basis). This calculation simulates a 20 times sample dilution that is part of the TCLP process. ERM determined that the maximum calculated TCLP may have been above RCRA limits at locations A5, B5, and C5, see Table 3. These locations cover an area of approximately 675 square feet or 15 feet by 45 feet.

3.2. Material Source Sampling

The materials source (background) sample results are presented in Table 4. Figure 8 presents double quantile plots for each of the metals comparing the distribution of the background data and the site data. The metal results for site locations A5, B5, and C5 have not been included in the majority of the plots in order to illustrate the difference in concentrations at values closer to background values. The concentrations of all metals exceed background concentrations in samples from A5, B5 and C5.

The comparison of metals results from the remaining site locations is illustrated in the double quantile plots. Concentrations of arsenic, chromium, and copper in the remaining site samples are consistently greater than those of the background samples. Antimony concentrations in the remaining site samples are below those of the background samples. Site cobalt and nickel concentrations in the remaining site samples are approximately the same as background concentrations. The site antimony, cobalt, and nickel concentrations may be attributable to background metals in soil. Since the elevated arsenic, chromium and copper results exceed background concentrations they must be explained by some site characteristic. Arsenic, chromium, and copper are metals used in producing treated lumber. The elevated levels of these metals may be related to treated lumber used in constructing the foundation for the building, as well as preserved decking material along one side of the structure.

Table 4 includes the mean of each set of metals results and the MTG and direct contact cleanup criteria. Note that the mean concentration for background arsenic in soil is greater than both the MTG and direct contact cleanup criteria.

3.3. Excavation Sampling

3.3.1. June Soil Excavations

The confirmation screening and laboratory sample locations are shown on Figure 3 and the corresponding results are shown in Tables 5, 6 and 7.

3.3.1.1. AST Excavation

The excavated soil from the AST excavation contained DRO, ethylbenzene, 1,4-dichlorobenzene, benzo(b)fluoranthene, di-n-ocytl phthalate, phenanthrene and pyrene in estimated quantities below the laboratory reporting limit but above the method detection limit (MDL). All other analyte results were below MDLs. All detected analyte concentrations were well below the regulatory criteria listed in Tables 5 and 6.

DRO, ethylbenzene and di-n-octyl phthalate were also detected in the excavation confirmation samples, but again at concentrations well below the regulatory criteria.

The MDLs for several SVOCs from all the AST excavation samples were above the very stringent EPA regional screening levels (see Table 6). There is no reason to infer that these analytes were present at concentrations above the screening levels when the concentrations of other analytes are so low.

3.3.1.2. SVOC Excavations

The excavated soil and confirmation samples from the two SVOC excavations contained estimated concentrations of dimethyl phthalate and di-n-octyl phthalate below the laboratory reporting limits and above the MDLs. No other SVOCs were detected above the MDL in SVOC excavation samples. The detected analyte results were well below the regulatory criteria. As mentioned in the section above, several SVOC MDLs were above the very low EPA screening levels, but there is no reason to infer that these analytes are present in the samples.

3.3.1.3. SPLP Samples

Table 7 presents the SPLP sample results from the three bulk sacks. None of the analytes (DRO and SVOCs) were detected in the SPLP samples. The ND results suggest that DRO and SVOCs will not leach into the groundwater.

3.3.2. *September Soil Excavation*

During the September 2012 field event, the field crew screened the area to be excavated using an XRF. They then removed 13 cy of debris/soil, 2 cy of polystyrene foam, and two H-piles attached to treated timbers that were used as the building foundation.

3.3.2.1. X-ray Fluorescence Screening Results

The XRF screening results are presented in Table 8. The ranges for each metal are as follows:

- Antimony - ND to 113 ppm
- Arsenic - 15 to 2,497 ppm
- Chromium - 68 to 2,373 ppm
- Cobalt - All ND
- Copper - 17 to 3.334 ppm
- Nickel - All ND

A sketch map of the screening locations is also included on page 2 of the September 2012 field notes.

3.3.2.2. September 2012 Bulk Sack Sampling Results

The TCLP sampling results from the bulk sack samples are presented in Table 9. The arsenic results ranged from 0.064 to 0.71 milligrams per liter (mg/L) and the chromium results ranged from ND to 0.025 mg/L. These results are well below the RCRA TCLP limits for arsenic and chromium of 5 mg/L indicating that the material in the sacks did not need to be managed as a hazardous waste. The footprint confirmation samples that had been held were not analyzed because of the low TCLP metals concentrations in the bulk sack samples.

The low TCLP results for the metals indicate that the metals should not leach into the groundwater. This suggests that the direct contact cleanup level rather than the MTG cleanup level may be more appropriate for the site.

3.4. Metals Concentrations Remaining at the Site

The following table presents the building footprint sample results for debris/soil remaining at the site.

TABLE 10: CURRENT SITE METALS CONCENTRATIONS

Location	Antimony	Arsenic	Chromium	Cobalt	Copper	Nickel
A1	0.14	**10**	23	9.0	25	25
B2	0.2	**18**	28	10	79	31
B4	0.079	**14**	30	10	36	28
C1	0.35	**14**	24	9.6	41	26
C3	0.32	**16**	33	9.7	670	26
D4	0.53	**15**	30	9.6	900	28
Mean Background Concentration	0.61	**8.1**	24	11	18	29
Regulatory Criteria	41 [a]	4.5 [a]	300 [a]	370 [b]	4100 [a]	2000 [a]

Notes:

All laboratory results and regulatory criteria are in milligrams per kilogram
Bolded values denote results above cleanup levels
[a] DEC Method Two Direct Contact Soil Cleanup Level, Under 40-inch Zone
[b] EPA Regional Residential Soil Screening Level

Note that arsenic is the only metal that exceeds the regulatory criterion. Further, note that the average naturally occurring arsenic concentrations in the clean soil used to build the JGCC pad are also above the regulatory criterion.

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4. QUALITY ASSURANCE REVIEW

Three sample shipments were sent to TestAmerica for analysis; one for TCLP samples collected in March 2012 (work order AVC0008); one for the June 2012 field event (work order AVF0030) and one for the September 2012 field event (work order AVI0027). A DEC laboratory data checklist was completed for each laboratory work order. A data usability review was performed by the ERM project chemist using the United States EPA National Functional Guidelines for Superfund Organic Methods Data Review (EPA 2008) and EPA National Functional Guidelines for Superfund Inorganic Methods Data Review (EPA 2010) as a reference for qualification.

This review focuses on quality assurance/quality control (QA/QC) parameters and their effect on the quality and usability of the data. This section summarizes the full QA review included in Appendix F.

The data was within acceptability limits required by the EPA guidelines with the following exceptions:

- AVF0030: GRO and toluene were present in the trip blank. GRO and toluene were also present in the method blank. Results in the trip blank were qualified as not detected due to method blank contamination (UB).
- AVI0027: The field team incorrectly requested total metals analysis for duplicate 12-JGCC-SS-14, while the parent sample, 12-JGCC-SS-1 was analyzed for TCLP metals. Therefore, there are no acceptable duplicate results for this SDG.
- AVF0030: GRO and toluene were present in the method blank. The associated results included 12-JGCC-109-SO, 12-JGCC-101-TB, 12-JGCC-110-SO, 12-JGCC-111-SO, and 12-JGCC-112-SO. Positive results were qualified as not detected due to blank contamination (UB). Not detected results did not require qualification. Antimony, copper and nickel were detected in the method blank. The associated samples included 12-JGCC-113-SO, 12-JGCC-114-SO, 12-JGCC-115-SO, 12-JGCC-116-SO, 12-JGCC-117-SO, 12-JGCC-118-SO, 12-JGCC-119-SO, 12-JGCC-120-SO, 12-JGCC-121-SO, and 12-JGCC-122-SO. Sample results greater than the reporting limit did not require qualification. Sample results that were greater than or equal to the MDL but less than the reporting limit, were qualified as not detected (UB). Dimethyl phthalate and bis(2-ethyl hexyl)phthalate were present in the method blank. Associated samples included 12-JGCC-102-SO, 12-JGCC-103-SO, 12-JGCC-104-SO, 12-JGCC-105-SO, 12-JGCC-106-SO, 12-JGCC-107-SO, 12-JGCC-108-SO, 12-JGCC-109-SO, 12-JGCC-110-SO, 12-JGCC-111-SO, and 12-JGCC-112-SO. Dimethyl phthalate results in samples where the result was less than the reporting limit were qualified as not detected (UB). Dimethyl phthalate results equal to or greater than the reporting limit and the blank contamination did not require qualification. Positive bis(2-ethyl hexyl)phthalate results in all samples were qualified as not detected (UB) due to method blank contamination.

- AVF0030: The matrix spike/matrix spike duplicate (MS/MSD) samples percent recovery (%R) was low in antimony and high in copper. The MS %R was outside the limits in arsenic, chromium and cobalt. All associated laboratory control sample/laboratory control sample duplicate (LCS/LCSD) %R were within limits; therefore, no data required qualification.

No data were rejected based on the QA/QC review. In general, the overall quality of the data was acceptable and the associated sample results are considered usable for the purpose of this investigation.

5. CONCEPTUAL SITE MODEL

5.1. Contaminants of Potential Concern (COPC)

Table 11 presents the updates COPC and the corresponding regulatory criteria. All criteria are based on the DEC Method Two Direct Contact Soil Cleanup Levels except for the cobalt value. The DEC does not specify a cleanup level for cobalt. The cobalt value is based on the EPA Regional Residential Soil Screening Level. The MTG cleanup levels have been eliminated from the table because the TCLP metals results indicate that metals will not leach from the soil at concentrations above MTG cleanup levels (see Section 3.3.2.2).

TABLE 11: UPDATED COPCS

Contaminant	Direct Contact Criteria (mg/kg)
Antimony	41
Arsenic	4.5
Chromium	300
Cobalt	370
Copper	4100
Nickel	2000

DRO and n-nitroso-di-n-propylamine have been eliminated from the COPC list as these analytes were not detected in the project samples.

5.2. Exposure Pathways Determination

As detailed in the conceptual site model scoping form and associated graphics (Appendix G), exposure via the following pathways may occur at the site:

- Incidental soil ingestion;
- Dermal absorption of contaminants from soil; and
- Inhalation of fugitive dust

Arsenic concentrations in site samples exceed the direct contact cleanup level and arsenic is able to permeate the skin, so the incidental soil ingestion and dermal absorption of contaminants from soil pathways are complete. Notably, the naturally occurring arsenic concentrations in the background soil samples also exceed the direct contact cleanup level.

The DEC direct contact cleanup levels are protective of the inhalation of fugitive dust pathway for most metals because most dust particles are incidentally ingested instead of inhaled to the lower lungs. This is not true for chromium. The inhalation of fugitive dust pathway is therefore complete for chromium.

Groundwater contamination has not been evaluated at the site, but SPLP and TCLP results from site samples indicate that contaminants will not migrate to groundwater or surface water and thus, do not pose a risk for ingestion of groundwater as drinking water. Site contaminants (metals) are not volatile so inhalation of indoor air and outdoor air pathways are incomplete.

The ingestion of wild and farmed foods pathway is considered incomplete because the site is in an open, cleared area that would not likely be used for harvesting foods or as habitat, and it is strongly proposed that a new structure will be built over the site once funding is obtained.

5.3. Receptors

The site is not currently used as a residence and is not expected to be used for this purpose in the future, so residents are not considered receptors. It is not currently used as a place of work but may be once the building is replaced so commercial workers are considered future receptors only.

Site visitors and trespassers may occupy the site for short periods and can be considered both current and future receptors. Construction workers during construction of a new building on the property are considered future receptors. As mentioned above, subsistence harvesters/consumers are not considered receptors as the building is located on a cleared piece of land.

6. CONCLUSIONS

The five project objectives described in Section 1.4 were accomplished in April and June 2013. The DRO and SVOC excavation samples indicated that DRO and SVOCs were not present above regulatory criteria. The excavated material was transferred to the Kwethluk dump.

The building footprint samples had concentrations of the six TAL metals above migration to groundwater regulatory criteria. High metals concentrations around sample locations A5, B5, and C5 were likely to exceed RCRA TCLP limits. The possibility of the TCLP limit exceedences indicated the need to further evaluate this area, and excavate additional debris/soil around the southwestern portion of the footprint and treat or dispose of the material accordingly.

The material was excavated in September 2012. The TCLP results for sample collected from the excavated material were below RCRA TCLP limits indicating that the material was not a hazardous waste and the metals would not leach into the groundwater. SPLP samples collected from the DRO and SVOC excavations also suggested that DRO and SVOC would not leach to the groundwater. For this reason, ERM believes that direct contact rather than migration to groundwater cleanup levels are appropriate for the site.

ERM collected background samples to evaluate the naturally occurring concentrations of metals in clean soil. The background results indicated that the footprint metals concentrations of antimony, cobalt, and nickel are likely related to naturally occurring concentrations in the soil. The arsenic, chromium, and copper concentrations in the footprint are higher than the background levels and may be associated with treated timbers used in the construction of the building.

Arsenic, chromium, and copper concentrations in the building footprint exceed the migration to groundwater cleanup criteria. When the three metals are compared to direct contact cleanup levels, only arsenic concentrations exceed regulatory criteria. Notably, background arsenic concentrations also exceed the DEC cleanup levels and the site arsenic concentrations are only slightly above background.

The residual arsenic contamination should not significantly increase the risk to human health, but should still be managed through institutional controls that ensure that the material is not transported offsite to an environmentally sensitive area. DEC will likely allow the material to remain in place during the construction of a new building. Care should be taken nonetheless when disturbing any native or site soil due to the presence of arsenic above the DEC soil cleanup level.

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7. REFERENCES

DEC, 2010. Draft Field Sampling Guidance. January.

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OASIS Environmental, Inc. (OASIS), 2012a. Joseph Guy Community Center, Kwethluk, Alaska, Brownfield Cleanup Action Plan. June 5.

OASIS, 2012b. Work Plan Addendum for Kwethluk Continued Cleanup, Former Joseph Guy Community Center. August 17 letter.

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TABLES

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TABLE 2: BUILDING FOOTPRINT SAMPLE RESULTS - JUNE 2012
FORMER JOSEPH GUY COMMUNITY CENTER CLEANUP ACTION
KWETHLUK, ALASKA

Location	Sample ID	Antimony		Arsenic		Chromium		Cobalt		Copper		Nickel	
		XRF	Lab	XRF	Lab	XRF	Lab	XRF	Lab	XRF	Lab	XRF	Lab
A1	12-JGCC-115-SO	**52**	0.14 J UB	**54**	**10**	**96**	23	ND	**9.0**	**691**	25	ND	25
A2		**32**		**18**		**85**		ND		212		ND	
A3		**13**		**32**		**134**		ND		244		23	
A4		**171**		**169**		**231**		ND		**2437**		42	
A5	12-JGCC-122-SO	**1416**	**20**	**1451**	**660**	**1021**	**200**	ND	**11**	**4921**	**580**	64	29
B1		ND		**198**		**304**		ND		**654**		ND	
B2	12-JGCC-117-SO	**53**	0.2 J UB	**227**	**18**	**356**	**28**	ND	**10**	**1766**	79	31	31
B3		ND		**194**		**813**		ND		**1286**		45	
B4	12-JGCC-119-SO	**22**	0.079 J UB	**48**	**14**	**203**	**30**	ND	**10**	438	36	29	28
B5	12-JGCC-121-SO	**70**	**11**	**521**	**440**	**362**	**110**	ND	**22**	**11100**	**2500**	ND	72
C1	12-JGCC-113-SO	**17**	0.35	**21**	**14**	**51**	24	ND	**9.6**	262	41	36	26
C2		**28**		**38**		**93**		ND		349		41	
C3	12-JGCC-116-SO	**22**	0.32	**61**	**16**	**190**	**33**	ND	**9.7**	**670**	**670**	26	26
C4		**26**		**20**		**107**		ND		**972**		25	
C5	12-JGCC-118-SO	**57**	**4.8**	**786**	**880**	**676**	**190**	ND	**24**	**3566**	**2500**	**184**	**280**
C5 Dup	12-JGCC-120-SO	**57**	**4.8**	**786**	**740**	**676**	**130**	ND	**22**	**3566**	**1800**	**184**	60
D1		**11**		**9**		**95**		ND		29		ND	
D2		**15**		**11**		**90**		ND		64		ND	
D3		ND		**31**		**131**		ND		308		38	
D4	12-JGCC-114-SO	**35**	0.53	**61**	**15**	**171**	**30**	ND	**9.6**	**2981**	**900**	65	28
D5		**181**		**299**		**61**		ND		**1126**		ND	
MTG Cleanup Levels		3.6 [a]		3.9 [a]		25 [a]		0.21 [b]		460 [a]		86 [a]	
DC Cleanup Levels		41 [a]		4.5 [a]		300 [a]		370 [b]		4100 [a]		2000 [a]	

See page 2 for notes

TABLE 2: BUILDING FOOTPRINT SAMPLE RESULTS - JUNE 2012
FORMER JOSEPH GUY COMMUNITY CENTER CLEANUP ACTION
KWETHLUK, ALASKA

Notes:
XRF = X-ray Fluorescence Analyzer results (in parts per million)
Lab = Laboratory results in milligrams per kilogram
UB = Result is considered not detected due to blank contamination.
J = Result is less than the reporting limit but greater than the method detection limit and the concentration is an approximate value
MTG = Migration to groundwater
DC = Direct contact
All laboratory results and regulatory criteria are in milligrams per kilogram
Bolded values with no shading denote XRF results above MTG cleanup levels
Bolded values shaded green denote XRF results above DC cleanup levels
Bolded values shaded blue denote laboratory results above MTG cleanup levels
Bolded values shaded pink denote laboratory results above MTG and DC cleanup levels
[a] DEC Method Two Soil Cleanup Level, MTG and DC, Under 40-inch Zone
[b] EPA Regional Soil Screening Level, Groundwater Supporting and Resident Soil

TABLE 3: MAXIMUM POSSIBLE TCLP CONCENTRATIONS - ARSENIC AND CHROMIUM
FORMER JOSEPH GUY COMMUNITY CENTER CLEANUP ACTION
KWETHLUK, ALASKA

Location	Sample ID (12-JGCC-XXX-SO)	Arsenic Concentration Dry Weight Basis [mg/kg]	Total Solids	Arsenic Concentration Total Sample Wet Weight Basis [mg/kg]	Maximum Possible TCLP Result [mg/kg]
C1	113	14	81.9%	11	0.57
D4	114	15	86.0%	13	0.65
A1	115	10	86.3%	9	0.43
C3	116	16	81.7%	13	0.65
B2	117	28	78.7%	22	1.1
C5	118	880	65.6%	577	**29**
B4	119	14	75.9%	11	0.5
C5 dup	120	740	63.3%	468	**23**
B5	121	440	65.4%	288	**14**
A5	122	660	80.7%	533	**27**

Location	Sample ID (12-JGCC-XXX-SO)	Chromium Concentration Dry Weight Basis [mg/kg]	Total Solids	Chromium Concentration Total Sample Wet Weight Basis [mg/kg]	Maximum Possible TCLP Result [mg/kg]
C1	113	24	81.9%	20	0.98
D4	114	30	86.0%	26	1.3
A1	115	23	86.3%	20	0.99
C3	116	33	81.7%	27	1.3
B2	117	28	78.7%	22	1.1
C5	118	190	65.6%	125	**6.2**
B4	119	30	75.9%	23	1.1
C5 dup	120	130	63.3%	82	**4.1**
B5	121	110	65.4%	72	3.6
A5	122	200	80.7%	161	**8.1**

Metal	EPA Hazardous Waste Code	RCRA TCLP Limit (mg/L)
Arsenic	D004	5
Chromium	D007	5

Notes:
Shaded bolded values exceed RCRA TCLP Limits
RCRA = Resource Conservation Recovery Act
TCLP = Toxic characteristic leaching procedure

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TABLE 4: BACKGROUND METALS RESULTS - SEPTEMBER 2012
FORMER JOSEPH GUY COMMUNITY CENTER CLEANUP ACTION
KWETHLUK, ALASKA

Sample ID	Metals Results (mg/kg)					
	Antimony	**Arsenic**	**Chromium**	**Cobalt**	**Copper**	**Nickel**
12-SourceA-01	0.66	11	25	11	21	31
12-SourceA-02	0.49	7.1	21	10	14	26
12-SourceA-03	0.79	8.3	29	11	27	33
12-SourceA-04	0.90	12	27	15	24	35
12-SourceA-05	0.42	4.9	22	11	11	26
12-SourceB-06	0.39	5.1	19	9.8	10	24
Mean concentration	0.61	8.1	24	11	18	29
MTG cleanup criteria	3.6*	3.9*	25*	0.21**	460*	86*
DC cleanup criteria	41*	4.5*	300*	370**	4100*	200*

Notes:
* DEC Method Two Soil Cleanup Level
** EPA Regional Screening Level
mg/kg = milligram per kilogram
MTG = migration to groundwater
DC = direct contact

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TABLE 5: AST EXCAVATION RESULTS FOR DRO, GRO, AND BTEX - JUNE 2012
FORMER JOSEPH GUY COMMUNITY CENTER CLEANUP ACTION
KWETHLUK, ALASKA

Sample Number	Location	PID Result	Analytical Results (mg/kg)					
			DRO	GRO	Benzene	Toluene	Ethylbenzene	Xylenes
12-JGCC-109-SO	Center of floor	4.5	16.0 J J-LD	0.708 J UB	ND (0.00240)	0.00624 J UB	ND (0.00464)	ND (0.0232)
12-JGCC-110-SO	Center of floor (dup)	4.5	ND (7.04)	0.865 J UB	ND (0.00348)	0.00700 J UB	0.00509 J	ND (0.0235)
12-JGCC-111-SO	North sidewall	3.9	15.1 J	0.773 J UB	ND (0.00352)	ND (0.00635)	ND (0.00508)	ND (0.0254)
12-JGCC-112-SO	Bulk sack	NS	13.9 J	0.689 J UB	ND (0.00381)	0.0124 J UB	0.00806 J	ND (0.0239)
Regulatory Criteria*			250	300	0.025	6.5	6.9	63

Notes:
DRO - Diesel-range organics
dup - duplicate sample
GRO - Gasoline-range organics
mg/kg - milligram per kilogram
ND - Not detected at method detection limit listed in parentheses
NS - Not screened
UB - Detected result is considered not detected due to blank contamination. Refer to QAR for additional details.
J-LD - Result is estimated due to laboratory duplicate sample not meeting quality control criteria.
* Based on DEC Method Two Migration to Groundwater cleanup levels

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TABLE 6: SVOC RESULTS - JUNE 2012
FORMER JOSEPH GUY COMMUNITY CENTER CLEANUP ACTION
KWETHLUK, ALASKA
(all results in mg/kg)

Analyte	Sample Number (12-JGCC-XXX-SO) and Location											Regulatory Criteria
	102	103	104	105	106	107	108	109	110	111	112	
	EA3 center of floor	EA3 (dup) center of floor	EA3 south sidewall	EA3 bulk sack	EA2 bulk sack	EA2 center of floor	EA2 east sidewall	EA1 center of floor	EA1 (dup) center of floor	EA1 north sidewall	EA1 bulk sack	
1,1'-Biphenyl	ND (0.065)	ND (0.068)	ND (0.062)	ND (0.058)	ND (0.060)	ND (0.059)	ND (0.056)	ND (0.059)	ND (0.058)	ND (0.058)	ND (0.057)	0.0087 **
1,2,4,5-Tetrachlorobenzene	ND (0.064)	ND (0.067)	ND (0.060)	ND (0.057)	ND (0.059)	ND (0.058)	ND (0.055)	ND (0.058)	ND (0.057)	ND (0.057)	ND (0.056)	0.0058 **
1,2,4-Trichlorobenzene	ND (0.037)	ND (0.038)	ND (0.034)	ND (0.033)	ND (0.034)	ND (0.033)	ND (0.031)	ND (0.033)	ND (0.033)	ND (0.033)	ND (0.032)	0.85 *
1,2-Dichlorobenzene	ND (0.029)	ND (0.030)	ND (0.027)	ND (0.026)	ND (0.027)	ND (0.026)	ND (0.025)	ND (0.026)	ND (0.026)	ND (0.026)	ND (0.025)	5.1 *
1,3-Dichlorobenzene	ND (0.016)	ND (0.016)	ND (0.015)	ND (0.014)	ND (0.014)	ND (0.014)	ND (0.013)	ND (0.014)	ND (0.014)	ND (0.014)	ND (0.014)	28 *
1,4-Dichlorobenzene	ND (0.018)	ND (0.019)	ND (0.017)	ND (0.016)	ND (0.016)	ND (0.016)	ND (0.015)	ND (0.016)	ND (0.016)	ND (0.016)	0.071 J	0.64 *
1,4-Dioxane	ND (0.086)	ND (0.090)	ND (0.081)	ND (0.077)	ND (0.080)	ND (0.078)	ND (0.074)	ND (0.078)	ND (0.077)	ND (0.077)	ND (0.076)	0.21 *
2,3,4,6-Tetrachlorophenol	ND (0.18)	ND (0.19)	ND (0.17)	ND (0.16)	ND (0.17)	ND (0.16)	ND (0.15)	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.16)	1.1 **
2,4,5-Trichlorophenol	ND (0.013)	ND (0.014)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.011)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.011)	67 *
2,4,6-Trichlorophenol	ND (0.013)	ND (0.014)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.011)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.011)	1.4 *
2,4-Dichlorophenol	ND (0.013)	ND (0.014)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.011)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.011)	1.3 *
2,4-Dimethylphenol	ND (0.086)	ND (0.090)	ND (0.081)	ND (0.077)	ND (0.080)	ND (0.078)	ND (0.074)	ND (0.078)	ND (0.077)	ND (0.077)	ND (0.076)	8.8 *
2,4-Dinitrophenol	ND (0.43)	ND (0.45)	ND (0.41)	ND (0.39)	ND (0.40)	ND (0.39)	ND (0.37)	ND (0.39)	ND (0.39)	ND (0.39)	ND (0.38)	0.54 *
2,4-Dinitrotoluene	ND (0.086)	ND (0.090)	ND (0.081)	ND (0.077)	ND (0.080)	ND (0.078)	ND (0.074)	ND (0.078)	ND (0.077)	ND (0.077)	ND (0.076)	0.0093 *
2,6-Dinitrotoluene	ND (0.037)	ND (0.038)	ND (0.034)	ND (0.033)	ND (0.034)	ND (0.033)	ND (0.031)	ND (0.033)	ND (0.033)	ND (0.033)	ND (0.032)	0.0094 *
2-Chloronaphthalene	ND (0.013)	ND (0.014)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.011)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.011)	120 *
2-Chlorophenol	ND (0.027)	ND (0.029)	ND (0.026)	ND (0.024)	ND (0.025)	ND (0.025)	ND (0.023)	ND (0.025)	ND (0.024)	ND (0.024)	ND (0.024)	1.5 *
2-Methylnaphthalene	ND (0.025)	ND (0.026)	ND (0.023)	ND (0.022)	ND (0.023)	ND (0.022)	ND (0.021)	ND (0.022)	ND (0.022)	ND (0.022)	ND (0.022)	6.1 *
2-Methylphenol	ND (0.017)	ND (0.018)	ND (0.016)	ND (0.015)	ND (0.016)	ND (0.015)	ND (0.014)	ND (0.015)	ND (0.015)	ND (0.015)	ND (0.015)	15 *
2-Nitroaniline	ND (0.065)	ND (0.068)	ND (0.062)	ND (0.058)	ND (0.060)	ND (0.059)	ND (0.056)	ND (0.059)	ND (0.058)	ND (0.058)	ND (0.057)	0.062 **
2-Nitrophenol	ND (0.013)	ND (0.014)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.011)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.011)	NL
3 & 4 Methylphenol	ND (0.043)	ND (0.045)	ND (0.041)	ND (0.038)	ND (0.040)	ND (0.039)	ND (0.037)	ND (0.039)	ND (0.038)	ND (0.038)	ND (0.038)	1.5 *
3,3'-Dichlorobenzidine	ND (0.12)	ND (0.12)	ND (0.11)	ND (0.10)	ND (0.11)	ND (0.11)	ND (0.10)	ND (0.11)	ND (0.10)	ND (0.10)	ND (0.10)	0.19 *
3-Nitroaniline	ND (0.095)	ND (0.099)	ND (0.090)	ND (0.085)	ND (0.088)	ND (0.086)	ND (0.081)	ND (0.086)	ND (0.085)	ND (0.085)	ND (0.084)	0.0039 **
4,6-Dinitro-2-methylphenol	ND (0.43)	ND (0.45)	ND (0.41)	ND (0.38)	ND (0.40)	ND (0.39)	ND (0.37)	ND (0.39)	ND (0.38)	ND (0.38)	ND (0.38)	0.002 **
4-Bromophenyl phenyl ether	ND (0.025)	ND (0.026)	ND (0.023)	ND (0.022)	ND (0.023)	ND (0.022)	ND (0.021)	ND (0.022)	ND (0.022)	ND (0.022)	ND (0.022)	NL
4-Chloro-3-methylphenol	ND (0.086)	ND (0.090)	ND (0.081)	ND (0.077)	ND (0.080)	ND (0.078)	ND (0.074)	ND (0.078)	ND (0.077)	ND (0.077)	ND (0.076)	NL
4-Chloroaniline	ND (0.11)	ND (0.11)	ND (0.10)	ND (0.095)	ND (0.099)	ND (0.096)	ND (0.091)	ND (0.097)	ND (0.095)	ND (0.095)	ND (0.094)	0.0057 *
4-Chlorophenyl phenyl ether	ND (0.027)	ND (0.029)	ND (0.026)	ND (0.024)	ND (0.025)	ND (0.025)	ND (0.023)	ND (0.025)	ND (0.024)	ND (0.024)	ND (0.024)	NL
4-Nitroaniline	ND (0.095)	ND (0.099)	ND (0.089)	ND (0.084)	ND (0.088)	ND (0.085)	ND (0.081)	ND (0.086)	ND (0.084)	ND (0.084)	ND (0.083)	0.00017 **
4-Nitrophenol	ND (0.13)	ND (0.13)	ND (0.12)	ND (0.11)	ND (0.12)	ND (0.11)	ND (0.11)	ND (0.11)	ND (0.11)	ND (0.11)	ND (0.11)	NL
Acenaphthene	ND (0.013)	ND (0.014)	ND (0.013)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.011)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.012)	180 *
Acenaphthylene	ND (0.022)	ND (0.023)	ND (0.021)	ND (0.020)	ND (0.021)	ND (0.020)	ND (0.019)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.019)	180 *
Acetophenone	ND (0.026)	ND (0.027)	ND (0.025)	ND (0.023)	ND (0.024)	ND (0.023)	ND (0.022)	ND (0.024)	ND (0.023)	ND (0.023)	ND (0.023)	NL
Anthracene	ND (0.022)	ND (0.023)	ND (0.021)	ND (0.020)	ND (0.021)	ND (0.020)	ND (0.019)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.019)	3000 *
Atrazine	ND (0.048)	ND (0.050)	ND (0.046)	ND (0.043)	ND (0.045)	ND (0.043)	ND (0.041)	ND (0.044)	ND (0.043)	ND (0.043)	ND (0.042)	0.00017 **
Benzaldehyde	ND (0.088)	ND (0.091)	ND (0.082)	ND (0.078)	ND (0.081)	ND (0.079)	ND (0.075)	ND (0.079)	ND (0.078)	ND (0.078)	ND (0.077)	0.33 **
Benzo[a]anthracene	ND (0.026)	ND (0.027)	ND (0.025)	ND (0.023)	ND (0.024)	ND (0.023)	ND (0.022)	ND (0.024)	ND (0.023)	ND (0.023)	ND (0.023)	3.6 *
Benzo[a]pyrene	ND (0.026)	ND (0.027)	ND (0.025)	ND (0.023)	ND (0.024)	ND (0.023)	ND (0.022)	ND (0.024)	ND (0.023)	ND (0.023)	ND (0.023)	2.1 *
Benzo[b]fluoranthene	ND (0.034)	ND (0.036)	ND (0.032)	ND (0.030)	ND (0.032)	ND (0.031)	ND (0.029)	ND (0.031)	ND (0.030)	ND (0.030)	0.032 J	12 *
Benzo[g,h,i]perylene	ND (0.021)	ND (0.022)	ND (0.020)	ND (0.019)	ND (0.019)	ND (0.019)	ND (0.018)	ND (0.019)	ND (0.019)	ND (0.019)	ND (0.018)	38700 *
Benzo[k]fluoranthene	ND (0.052)	ND (0.054)	ND (0.049)	ND (0.046)	ND (0.048)	ND (0.047)	ND (0.045)	ND (0.047)	ND (0.047)	ND (0.046)	ND (0.046)	120 *
Bis(2-chloroethoxy)methane	ND (0.030)	ND (0.031)	ND (0.028)	ND (0.027)	ND (0.028)	ND (0.027)	ND (0.026)	ND (0.027)	ND (0.027)	ND (0.027)	ND (0.026)	NL

TABLE 6: SVOC RESULTS - JUNE 2012
FORMER JOSEPH GUY COMMUNITY CENTER CLEANUP ACTION
KWETHLUK, ALASKA
(all results in mg/kg)

Analyte	Sample Number (12-JGCC-XXX-SO) and Location											Regulatory Criteria
	102	103	104	105	106	107	108	109	110	111	112	
	EA3 center of floor	EA3 (dup) center of floor	EA3 south sidewall	EA3 bulk sack	EA2 bulk sack	EA2 center of floor	EA2 east sidewall	EA1 center of floor	EA1 (dup) center of floor	EA1 north sidewall	EA1 bulk sack	
Bis(2-chloroethyl)ether	ND (0.022)	ND (0.023)	ND (0.020)	ND (0.019)	ND (0.020)	ND (0.020)	ND (0.018)	ND (0.020)	ND (0.019)	ND (0.019)	ND (0.019)	0.0022 *
Bis(2-ethylhexyl) phthalate	0.11 J UB	0.13 J UB	0.098 J UB	0.13 J UB	0.15 J UB	0.13 J UB	0.1 J UB	0.12 J UB	0.1 J UB	0.15 J UB	0.1 J UB	13 *
Butyl benzyl phthalate	ND (0.056)	ND (0.059)	ND (0.053)	ND (0.050)	ND (0.052)	ND (0.051)	ND (0.048)	ND (0.051)	ND (0.050)	ND (0.050)	ND (0.049)	920 *
Caprolactam	ND (0.14)	ND (0.14)	ND (0.13)	ND (0.12)	ND (0.13)	ND (0.12)	ND (0.12)	ND (0.13)	ND (0.12)	ND (0.12)	ND (0.12)	1.9 **
Carbazole	ND (0.047)	ND (0.049)	ND (0.044)	ND (0.042)	ND (0.043)	ND (0.042)	ND (0.040)	ND (0.043)	ND (0.042)	ND (0.042)	ND (0.041)	65 *
Chrysene	ND (0.035)	ND (0.037)	ND (0.033)	ND (0.031)	ND (0.033)	ND (0.032)	ND (0.030)	ND (0.032)	ND (0.031)	ND (0.031)	ND (0.031)	360 *
Dibenz(a,h)anthracene	ND (0.025)	ND (0.026)	ND (0.023)	ND (0.022)	ND (0.023)	ND (0.022)	ND (0.021)	ND (0.022)	ND (0.022)	ND (0.022)	ND (0.022)	4.0 *
Dibenzofuran	ND (0.026)	ND (0.027)	ND (0.025)	ND (0.023)	ND (0.024)	ND (0.023)	ND (0.022)	ND (0.024)	ND (0.023)	ND (0.023)	ND (0.023)	11 *
Diethyl phthalate	ND (0.034)	ND (0.035)	ND (0.032)	ND (0.030)	ND (0.031)	ND (0.031)	ND (0.029)	ND (0.031)	ND (0.030)	ND (0.030)	ND (0.030)	130 *
Dimethyl phthalate	ND (0.030)	0.28 J UB	ND (0.028)	ND (0.027)	0.41	ND (0.027)	0.48	ND (0.027)	ND (0.027)	ND (0.027)	ND (0.026)	1100 *
Di-n-butyl phthalate	ND (0.038)	ND (0.039)	ND (0.036)	ND (0.034)	ND (0.035)	ND (0.034)	ND (0.032)	ND (0.034)	ND (0.034)	ND (0.034)	ND (0.033)	80 *
Di-n-octyl phthalate	0.12 J	ND (0.020)	ND (0.018)	0.11 J	0.13 J	0.11 J	ND (0.016)	ND (0.017)	ND (0.017)	0.16 J	0.1 J	3800 *
Fluoranthene	ND (0.047)	ND (0.049)	ND (0.044)	ND (0.042)	ND (0.043)	ND (0.042)	ND (0.040)	ND (0.043)	ND (0.042)	ND (0.042)	ND (0.041)	1400 *
Fluorene	ND (0.024)	ND (0.025)	ND (0.022)	ND (0.021)	ND (0.022)	ND (0.021)	ND (0.020)	ND (0.021)	ND (0.021)	ND (0.021)	ND (0.021)	220 *
Hexachlorobenzene	ND (0.038)	ND (0.039)	ND (0.036)	ND (0.034)	ND (0.035)	ND (0.034)	ND (0.032)	ND (0.034)	ND (0.034)	ND (0.034)	ND (0.033)	0.047 *
Hexachlorobutadiene	ND (0.013)	ND (0.014)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.011)	ND (0.012)	ND (0.012)	ND (0.012)	ND (0.011)	62 *
Hexachlorocyclopentadiene	ND (0.065)	ND (0.068)	ND (0.062)	ND (0.058)	ND (0.060)	ND (0.059)	ND (0.056)	ND (0.059)	ND (0.058)	ND (0.058)	ND (0.057)	1.3 *
Hexachloroethane	ND (0.028)	ND (0.029)	ND (0.026)	ND (0.025)	ND (0.026)	ND (0.025)	ND (0.024)	ND (0.025)	ND (0.025)	ND (0.025)	ND (0.024)	0.21 *
Indeno[1,2,3-cd]pyrene	ND (0.029)	ND (0.030)	ND (0.027)	ND (0.026)	ND (0.027)	ND (0.026)	ND (0.025)	ND (0.026)	ND (0.026)	ND (0.026)	ND (0.025)	41 *
Isophorone	ND (0.022)	ND (0.023)	ND (0.021)	ND (0.020)	ND (0.021)	ND (0.020)	ND (0.019)	ND (0.020)	ND (0.020)	ND (0.020)	ND (0.019)	3.1 *
Naphthalene	ND (0.040)	ND (0.042)	ND (0.038)	ND (0.036)	ND (0.037)	ND (0.036)	ND (0.035)	ND (0.037)	ND (0.036)	ND (0.036)	ND (0.036)	20 *
Nitrobenzene	ND (0.029)	ND (0.030)	ND (0.027)	ND (0.026)	ND (0.027)	ND (0.026)	ND (0.025)	ND (0.026)	ND (0.026)	ND (0.026)	ND (0.025)	0.094 *
N-Nitrosodi-n-propylamine	ND (0.040)	ND (0.042)	ND (0.038)	ND (0.036)	ND (0.037)	ND (0.036)	ND (0.035)	ND (0.037)	ND (0.036)	ND (0.036)	ND (0.036)	0.0011 *
N-Nitrosodiphenylamine	ND (0.027)	ND (0.029)	ND (0.026)	ND (0.024)	ND (0.025)	ND (0.025)	ND (0.023)	ND (0.025)	ND (0.024)	ND (0.024)	ND (0.024)	15 *
Pentachlorophenol	ND (0.43)	ND (0.45)	ND (0.41)	ND (0.38)	ND (0.40)	ND (0.39)	ND (0.37)	ND (0.39)	ND (0.38)	ND (0.38)	ND (0.38)	0.047 *
Phenanthrene	ND (0.022)	ND (0.023)	ND (0.021)	ND (0.020)	ND (0.021)	ND (0.020)	ND (0.019)	ND (0.020)	ND (0.020)	ND (0.020)	0.022 J	3000 *
Phenol	ND (0.024)	ND (0.025)	ND (0.022)	ND (0.021)	ND (0.022)	ND (0.021)	ND (0.020)	ND (0.021)	ND (0.021)	ND (0.021)	ND (0.021)	68 *
Pyrene	ND (0.016)	ND (0.016)	ND (0.015)	ND (0.014)	ND (0.015)	ND (0.014)	ND (0.013)	ND (0.014)	ND (0.014)	ND (0.014)	0.025 J	1000 *

Notes:
EA1 = AST Excavation (south side of building)
EA2 = SVOC Excavation (west side of building)
EA3 = SVOC Excavation (north side of building)
UB - Detected result is considered not detected due to blank contamination. Refer to QAR in Appendix F for additional details.
Shaded results indicate method detection limit exceeds regulatory criteria
* DEC Soil Cleanup Level, Migration to Groundwater.
** EPA Regional Screening Level (RSL) Soil to Groundwater Supporting

TABLE 7: SPLP RESULTS - JUNE 2012
JOSEPH GUY COMMUNITY CENTER CLEANUP ACTION
KWETHLUK, ALASKA
(all results in mg/L)

Analyte	Sample Number (12-JGCC-XXX-SO)		
	105	106	112
DRO	NA	NA	ND (0.29)
1,1'-Biphenyl	ND (0.0018)	ND (0.0018)	ND (0.0018)
1,2,4,5-Tetrachlorobenzene	ND (0.0017)	ND (0.0017)	ND (0.0017)
1,2,4-Trichlorobenzene	ND (0.00028)	ND (0.00028)	ND (0.00028)
1,2-Dichlorobenzene	ND (0.00023)	ND (0.00023)	ND (0.00023)
1,3-Dichlorobenzene	ND (0.00030)	ND (0.00030)	ND (0.00030)
1,4-Dichlorobenzene	ND (0.00032)	ND (0.00032)	ND (0.00032)
1,4-Dioxane	ND (0.0017)	ND (0.0017)	ND (0.0017)
2,3,4,6-Tetrachlorophenol	ND (0.0020)	ND (0.0020)	ND (0.0020)
2,4,5-Trichlorophenol	ND (0.00045)	ND (0.00045)	ND (0.00045)
2,4,6-Trichlorophenol	ND (0.00029)	ND (0.00029)	ND (0.00029)
2,4-Dichlorophenol	ND (0.00064)	ND (0.00064)	ND (0.00064)
2,4-Dimethylphenol	ND (0.00058)	ND (0.00058)	ND (0.00058)
2,4-Dinitrophenol	ND (0.010)	ND (0.010)	ND (0.010)
2,4-Dinitrotoluene	ND (0.0017)	ND (0.0017)	ND (0.0017)
2,6-Dinitrotoluene	ND (0.0019)	ND (0.0019)	ND (0.0019)
2-Chloronaphthalene	ND (0.00026)	ND (0.00026)	ND (0.00026)
2-Chlorophenol	ND (0.0020)	ND (0.0020)	ND (0.0020)
2-Methylnaphthalene	ND (0.00029)	ND (0.00029)	ND (0.00029)
2-Methylphenol	ND (0.00098)	ND (0.00098)	ND (0.00098)
2-Nitroaniline	ND (0.0017)	ND (0.0017)	ND (0.0017)
2-Nitrophenol	ND (0.00039)	ND (0.00039)	ND (0.00039)
3 & 4 Methylphenol	ND (0.00025)	ND (0.00025)	ND (0.00025)
3,3'-Dichlorobenzidine	ND (0.0020)	ND (0.0020)	ND (0.0020)
3-Nitroaniline	ND (0.0020)	ND (0.0020)	ND (0.0020)
4,6-Dinitro-2-methylphenol	ND (0.0040)	ND (0.0040)	ND (0.0040)
4-Bromophenyl phenyl ether	ND (0.00043)	ND (0.00043)	ND (0.00043)
4-Chloro-3-methylphenol	ND (0.0024)	ND (0.0024)	ND (0.0024)
4-Chloroaniline	ND (0.0021)	ND (0.0021)	ND (0.0021)
4-Chlorophenyl phenyl ether	ND (0.0017)	ND (0.0017)	ND (0.0017)
4-Nitroaniline	ND (0.0020)	ND (0.0020)	ND (0.0020)
4-Nitrophenol	ND (0.0012)	ND (0.0012)	ND (0.0012)
Acenaphthene	ND (0.00028)	ND (0.00028)	ND (0.00028)
Acenaphthylene	ND (0.00049)	ND (0.00049)	ND (0.00049)
Acetophenone	ND (0.00024)	ND (0.00024)	ND (0.00024)
Anthracene	ND (0.00042)	ND (0.00042)	ND (0.00042)
Atrazine	ND (0.00073)	ND (0.00073)	ND (0.00073)
Benzaldehyde	ND (0.0020)	ND (0.0020)	ND (0.0020)
Benzo[a]anthracene	ND (0.00035)	ND (0.00035)	ND (0.00035)
Benzo[a]pyrene	ND (0.00031)	ND (0.00031)	ND (0.00031)
Benzo[b]fluoranthene	ND (0.00053)	ND (0.00053)	ND (0.00053)
Benzo[g,h,i]perylene	ND (0.00050)	ND (0.00050)	ND (0.00050)
Benzo[k]fluoranthene	ND (0.00046)	ND (0.00046)	ND (0.00046)
Bis(2-chloroethoxy)methane	ND (0.00097)	ND (0.00097)	ND (0.00097)
Bis(2-chloroethyl)ether	ND (0.00041)	ND (0.00041)	ND (0.00041)
Bis(2-ethylhexyl) phthalate	0.0024	0.0023	0.0022
Butyl benzyl phthalate	ND (0.0010)	ND (0.0010)	ND (0.0010)
Caprolactam	ND (0.0050)	ND (0.0050)	ND (0.0050)
Carbazole	ND (0.00043)	ND (0.00043)	ND (0.00043)
Chrysene	ND (0.00054)	ND (0.00054)	ND (0.00054)
Dibenz(a,h)anthracene	ND (0.00051)	ND (0.00051)	ND (0.00051)
Dibenzofuran	ND (0.00029)	ND (0.00029)	ND (0.00029)
Diethyl phthalate	ND (0.00038)	ND (0.00038)	ND (0.00038)
Dimethyl phthalate	ND (0.00021)	ND (0.00021)	ND (0.00021)
Di-n-butyl phthalate	ND (0.0012)	ND (0.0012)	ND (0.0012)
Di-n-octyl phthalate	0.0027	0.0026	0.0026
Fluoranthene	ND (0.00020)	ND (0.00020)	ND (0.00020)
Fluorene	ND (0.00031)	ND (0.00031)	ND (0.00031)
Hexachlorobenzene	ND (0.00066)	ND (0.00066)	ND (0.00066)
Hexachlorobutadiene	ND (0.0033)	ND (0.0033)	ND (0.0033)
Hexachlorocyclopentadiene	ND (0.010)	ND (0.010)	ND (0.010)
Hexachloroethane	ND (0.0021)	ND (0.0021)	ND (0.0021)
Indeno[1,2,3-cd]pyrene	ND (0.00065)	ND (0.00065)	ND (0.00065)
Isophorone	ND (0.00021)	ND (0.00021)	ND (0.00021)
Naphthalene	ND (0.00029)	ND (0.00029)	ND (0.00029)
Nitrobenzene	ND (0.00081)	ND (0.00081)	ND (0.00081)
N-Nitrosodi-n-propylamine	ND (0.00035)	ND (0.00035)	ND (0.00035)
N-Nitrosodiphenylamine	ND (0.00044)	ND (0.00044)	ND (0.00044)
Pentachlorophenol	ND (0.020)	ND (0.020)	ND (0.020)
Phenanthrene	ND (0.00026)	ND (0.00026)	ND (0.00026)
Phenol	ND (0.0020)	ND (0.0020)	ND (0.0020)
Pyrene	ND (0.00037)	ND (0.00037)	ND (0.00037)

Notes:
DRO - Diesel-range organics
NA - Not analyzed

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TABLE 8: BUILDING FOOTPRINT SCREENING RESULTS - SEPTEMBER 2012
FORMER JOSEPH GUY COMMUNITY CENTER CLEANUP ACTION
KWETHLUK, ALASKA

Map Location	Areal Location	X-ray Fluorescence Screening Results (ppm)					
		Antimony	Arsenic	Chromium	Cobalt	Copper	Nickel
A5 (1)	A5 / 11.25' N	23	22	95	ND	48	ND
A5 (2)	A5 / 7.5' N / 3.75' W	113	42	68	ND	116	ND
A5 (3)	A5 / 7.5' N	13	45	127	ND	96	ND
A5 (4)	A5 / 7.5' N / 7.5' E	11	42	103	ND	65	ND
A5 (5)	A5 / 3.75' N	43	139	205	ND	125	ND
A5 (6)	A5 / 3.75' W	87	191	87	ND	83	ND
A5 (7)	A5 / 7.5' E	ND	81	145	ND	27	ND
A5 (8)	A5 / 3.75' S / 3.75' W	27	43	175	ND	57	ND
A5 (9)	A5 / 3.75' S	ND	27	115	ND	17	ND
A5 (10)	A5 / 3.75' S / 7.5' E	12	254	421	ND	256	ND
B5 (1)	B5 / 11.25' N	69	71	144	ND	55	ND
B5 (2)	B5 / 7.5' N	28	91	178	ND	119	ND
B5 (3)	B5 / 7.5' N / 7.5' E	10	42	184	ND	42	ND
B5 (4)	B5 / 3.75' N	17	166	521	ND	344	ND
B5 (5)	B5 / 7.5' E	11	84	227	ND	197	ND
B5 (6)	B5 / 3.75' S	17	878	2358	ND	1967	ND
B5 (7)	B5 / 3.75' S / 7.5' E	ND	569	2238	ND	914	ND
C5 (1)	C5 / 11.25' N	ND	18	108	ND	49	ND
C5 (2)	C5 / 7.5' N	17	44	145	ND	145	ND
C5 (3)	C5 . 7.5' N / 5' E	ND	45	127	ND	447	ND
C5 (4)	C5 / 3.75' N	14	2497	2373	ND	3334	ND
C5 (5)	C5 / 5' E	ND	397	1434	ND	663	ND
C5 (6)	C5 / 3.75' S	ND	15	103	ND	ND	ND
C5 (7)	C5 / 3.75' S / 5' E	ND	42	110	ND	29	ND
MTG Regulatory Criteria		3. 6 [a]	3.9 [a]	25 [a]	0.21 [b]	460 [a]	86 [a]
DC Regulatory Criteria		41 [a]	4.5 [a]	300 [a]	23 [b]	4100 [a]	2000 [a]

Note:

Areal location denotes feet and direction from reference nodes A5, B5, and C5.

DC - direct contact

MTG - migration to groundwater

ppm - parts per million

Bolded values with denote exceedence of MTG regulatory criteria.

Bolded values highlighted green denote exceedence of DC regulatory criteria

[a] DEC Method Two Soil Cleanup Level, MTG and DC, Under 40-inch Zone.

[b] EPA Regional Groundwater Supporting and Residential Soil Screening Level

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TABLE 9: BULK SACK TCLP SAMPLE RESULTS - SEPTEMBER 2012
FORMER JOSEPH GUY COMMUNITY CENTER CLEANUP ACTION
KWETHLUK, ALASKA

Location	TCLP Sample Results (mg/L)	
	Arsenic	Chromium
RCRA TCLP Limit	**5**	**5**
12-SS-1	0.71	ND (0.025)
12-SS-2	0.37	ND (0.025)
12-SS-3	0.17	ND (0.025)
12-SS-4	0.54	ND (0.025)
12-SS-5	0.1	ND (0.025)
12-SS-6	0.064	ND (0.025)
12-SS-7	0.11	ND (0.025)
12-SS-8	0.16	ND (0.025)
12-SS-9	0.11	ND (0.025)
12-SS-10	0.13	0.025
12-SS-11	0.13	ND (0.025)
12-SS-12	0.087	ND (0.025)
12-SS-13	0.32	ND (0.025)

Notes:
mg/L = milligrams per liter
ND = not detected at concentration in parentheses

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FIGURES

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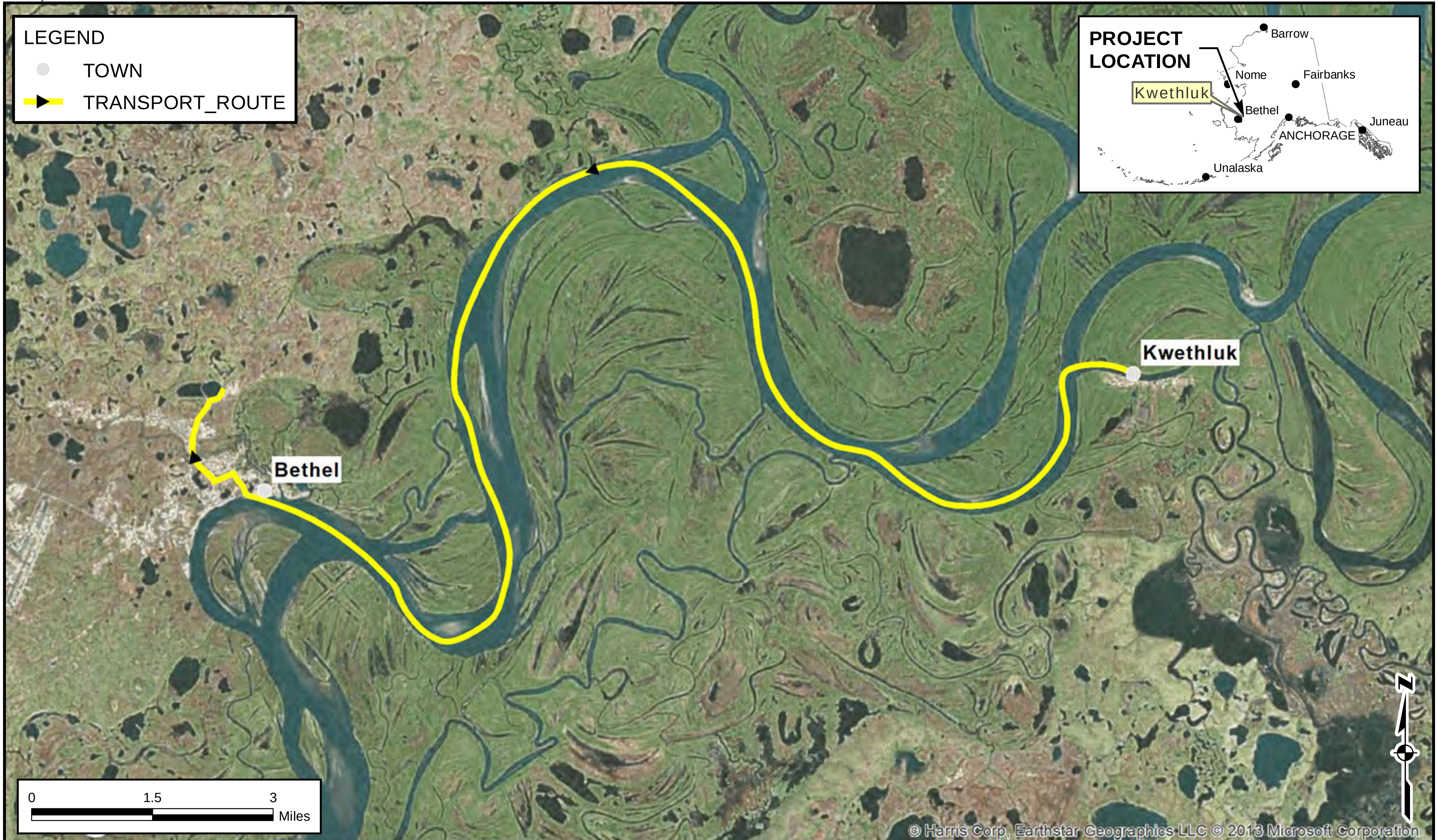
J:\Projects\0158196_Kwethluk\mxd\ICE_ROADS_CLEANUP.mxd



ERM	DATE: JUNE 2013 CHKD: L.C.N. DRWN: D.R.F. PROJ. No.: 0172736 825 W. 8th Ave., Anchorage, AK 99501, (907) 258-4880	**SITE LOCATION MAP WITH ICE ROAD TRANSPORT ROUTE** JGCC BROWNFIELDS CLEANUP ACTION Kwethluk, Alaska	FIGURE **1**

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DATE: JUNE 2013
CHKD: L.C.N.
DRAWN: D.R.F.
PROJ. No.: 0172736

825 W. 8th Ave., Anchorage, AK 99501, (907) 258-4880

SITE MAP

JGCC BROWNFIELDS CLEANUP ACTION
Kwethluk, Alaska

FIGURE 2

V:\PROJECT DRAWINGS\ADEC\KWETHLUK BROWN FIELDS\CLEAN UP PLAN\0172736-3_F2.dwg Jun 11, 2013.

SOURCE: DCRA COMMUNITY PROFILE MAPS, SEPT. 07 2007, 2 FT. PER PIXEL

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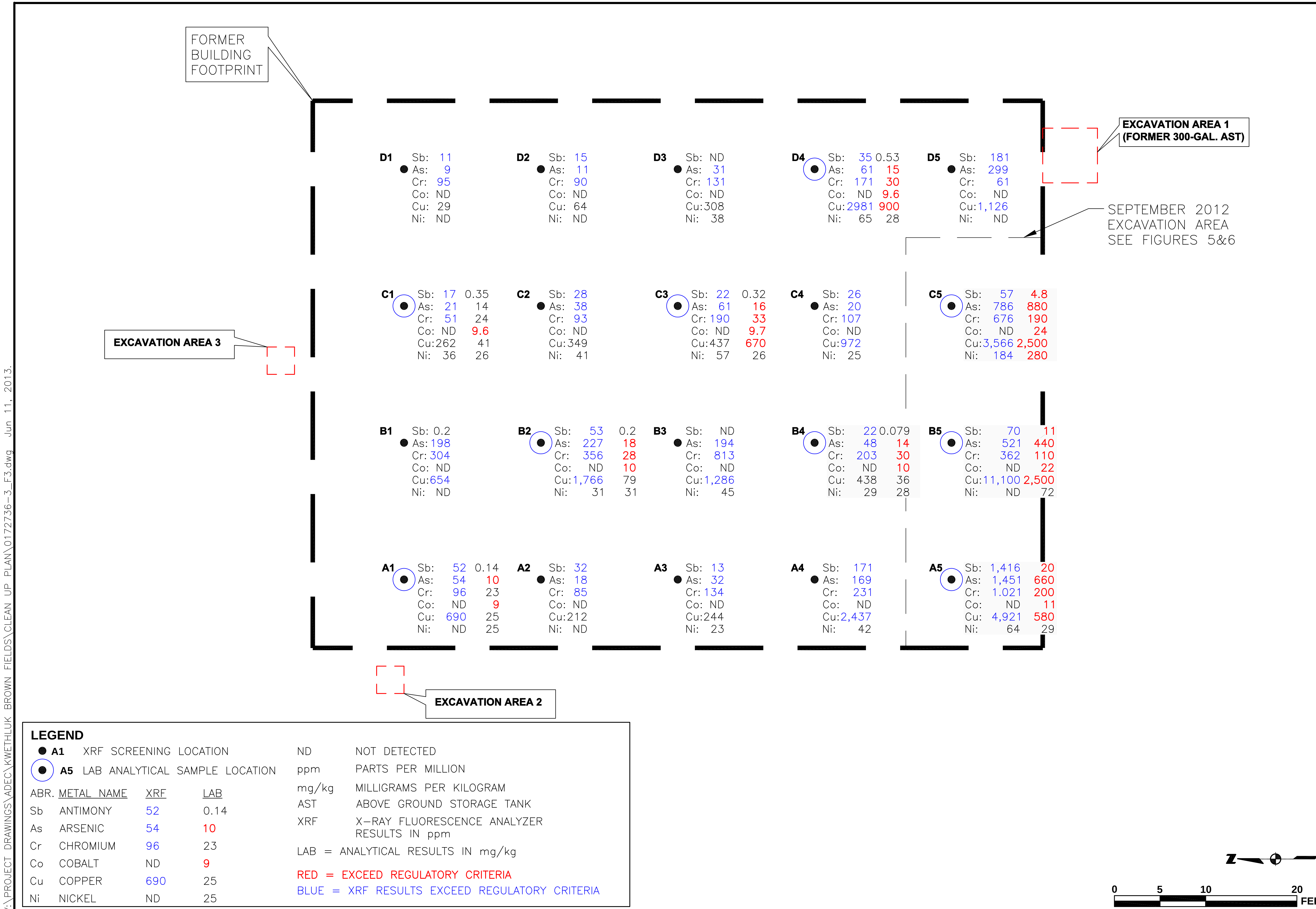

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FIGURE 3

BUILDING FOOTPRINT SAMPLE RESULTS JUNE 2012

JGCC BROWNFIELDS CLEANUP ACTION
Kwethluk, Alaska

DATE: DEC. 2012
CHKD: L.C.N.
DRAWN: D.R.F
PROJ. No.: 0172736

ERM
825 W. 8th Ave., Anchorage, AK 99501, (907) 258-4880

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V:\PROJECT DRAWINGS\ADEC\KWETHLUK BROWN FIELDS\CLEAN UP PLAN\0172736-3_F4.dwg Jun 11, 2013.

ERM

DATE: JUNE 2013
CHKD: L.C.N.
DRAWN: D.R.F.
PROJ. No.: 0172736
825 W. 8th Ave., Anchorage, AK 99501, (907) 258-4880

BULK SACK AND BACKGROUND SAMPLE LOCATIONS

JGCC BROWNFIELDS CLEANUP ACTION
Kwethluk, Alaska

FIGURE
4

SOURCE: DCRA COMMUNITY PROFILE MAPS, SEPT. 07 2007, 2 FT. PER PIXEL

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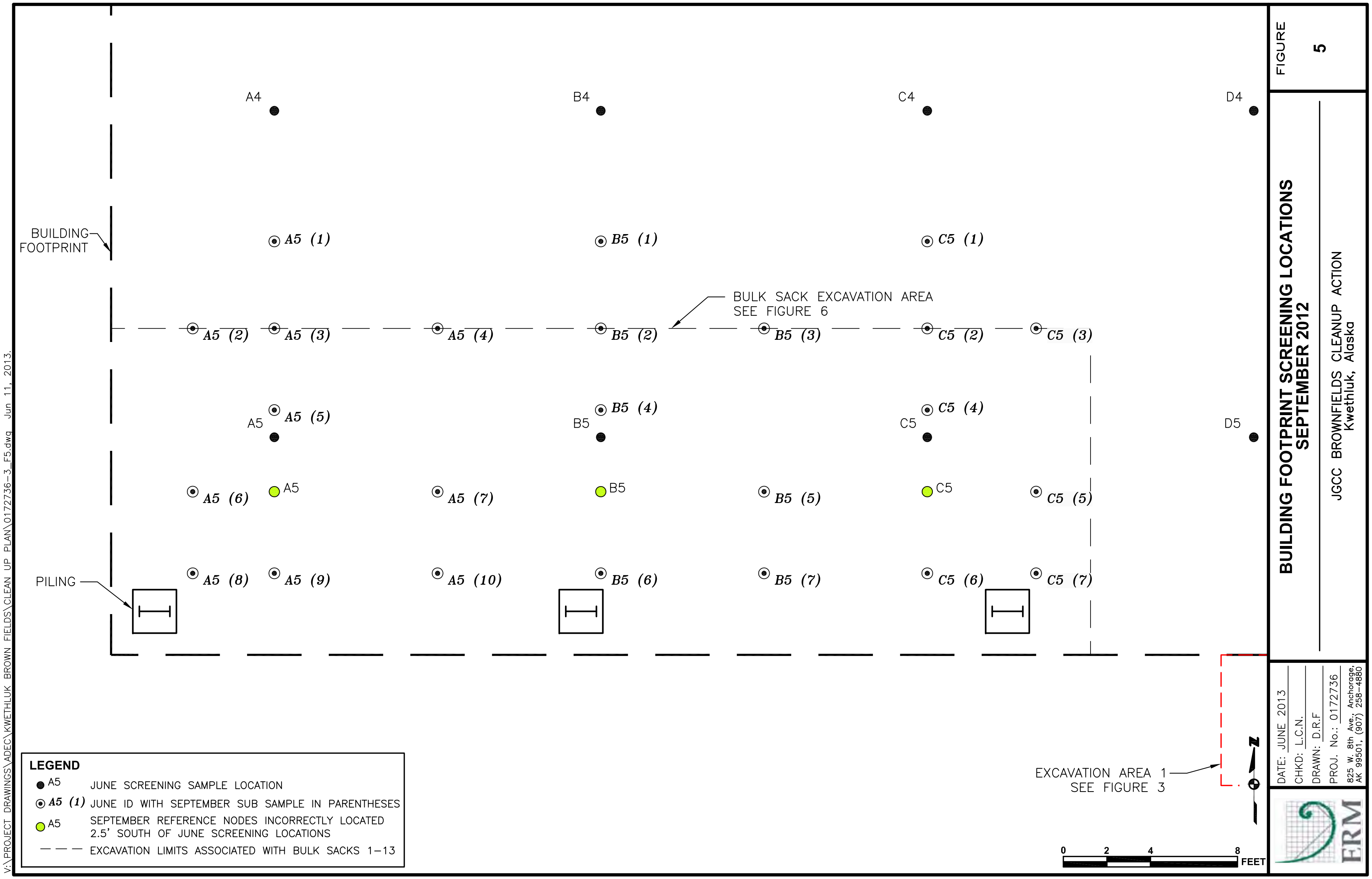

FIGURE 5
BUILDING FOOTPRINT SCREENING LOCATIONS
SEPTEMBER 2012
JGCC BROWNFIELDS CLEANUP ACTION
Kwethluk, Alaska
DATE: JUNE 2013
CHKD: L.C.N.
DRAWN: D.R.F
PROJ. No.: 0172736
825 W. 8th Ave., Anchorage, AK 99501, (907) 258-4880
ERM
A4
B4
C4
D4
A5 (1)
B5 (1)
C5 (1)
BUILDING FOOTPRINT
BULK SACK EXCAVATION AREA
SEE FIGURE 6
A5 (2)
A5 (3)
A5 (4)
B5 (2)
B5 (3)
C5 (2)
C5 (3)
A5 (5)
B5 (4)
C5 (4)
A5
B5
C5
D5
A5 (6)
A5
A5 (7)
B5
B5 (5)
C5
C5 (5)
PILING
A5 (8)
A5 (9)
A5 (10)
B5 (6)
B5 (7)
C5 (6)
C5 (7)
EXCAVATION AREA 1
SEE FIGURE 3
N
0
2
4
8
FEET
LEGEND
A5 JUNE SCREENING SAMPLE LOCATION
A5 (1) JUNE ID WITH SEPTEMBER SUB SAMPLE IN PARENTHESES
A5 SEPTEMBER REFERENCE NODES INCORRECTLY LOCATED 2.5' SOUTH OF JUNE SCREENING LOCATIONS
EXCAVATION LIMITS ASSOCIATED WITH BULK SACKS 1–13
V:\PROJECT DRAWINGS\ADEC\KWETHLUK BROWN FIELDS\CLEAN UP PLAN\0172736-3_F5.dwg Jun 11, 2013.

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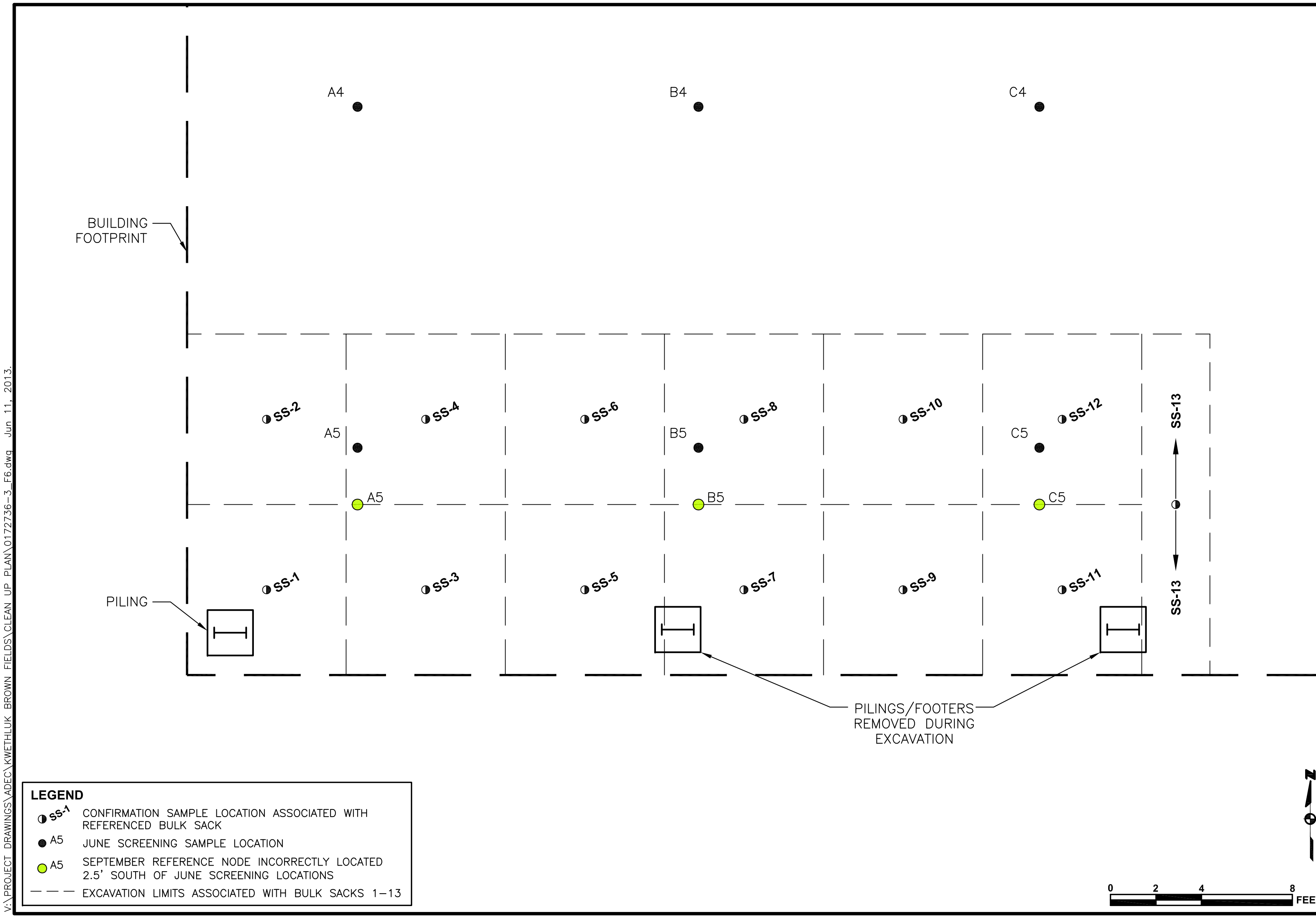

V:\PROJECT DRAWINGS\ADEC\KWETHLUK BROWN FIELDS\CLEAN UP PLAN\0172736-3_F6.dwg Jun 11, 2013.

FIGURE 6

BULK SACK EXCAVATION LIMITS AND CONFIRMATION SAMPLE LOCATIONS - SEPTEMBER 2012

JGCC BROWNFIELDS CLEANUP ACTION
Kwethluk, Alaska

DATE: JUNE 2013
CHKD: L.C.N.
DRAWN: D.R.F
PROJ. No.: 0172736

825 W. 8th Ave., Anchorage, AK 99501, (907) 258-4880

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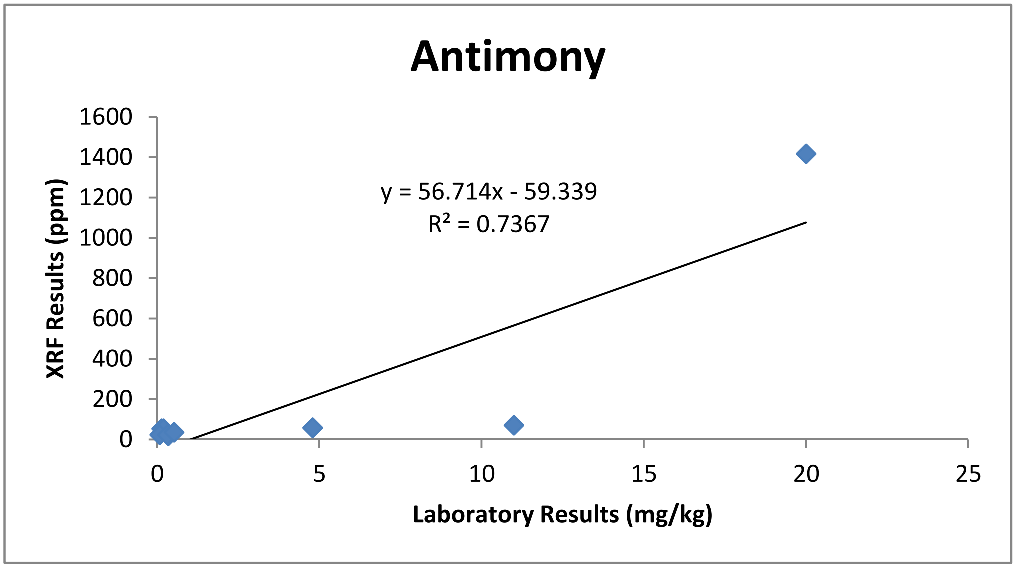
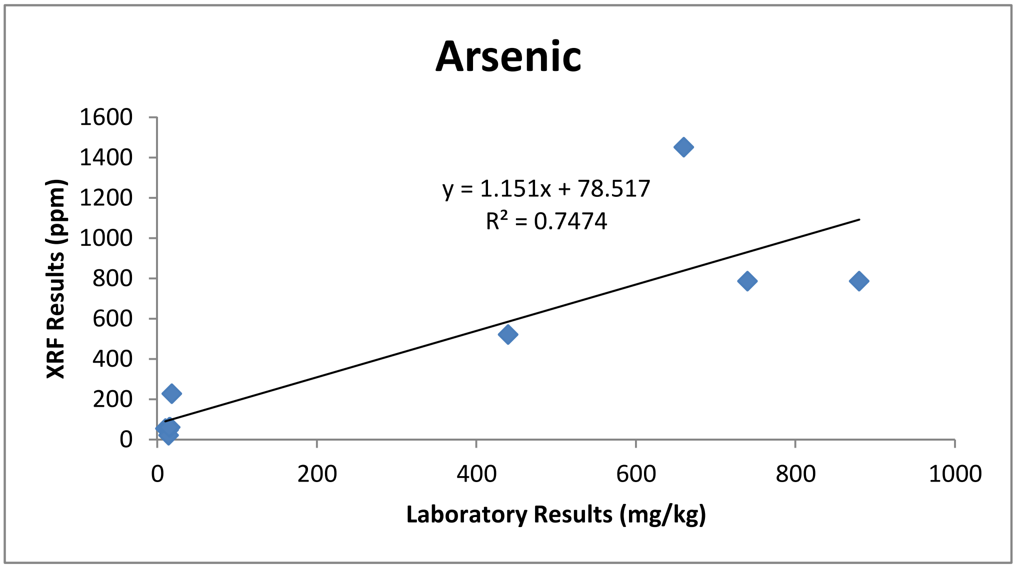
FIGURE 7: COMPARISON OF LABORATORY AND XRF SCREENING RESULTS
FORMER JOSEPH GUY COMMUNITY CENTER CLEANUP ACTION
KWETHULK, ALASKA





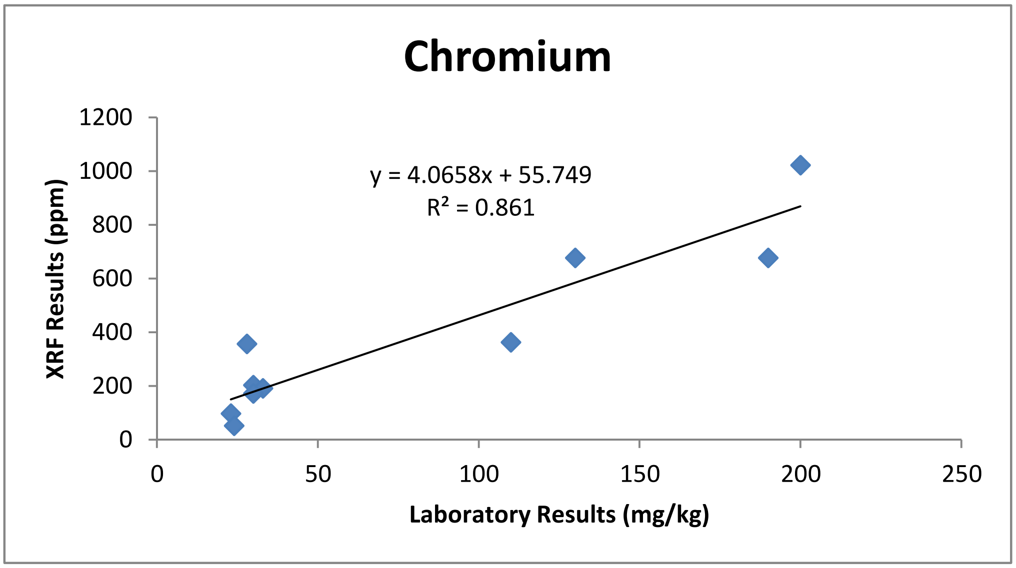
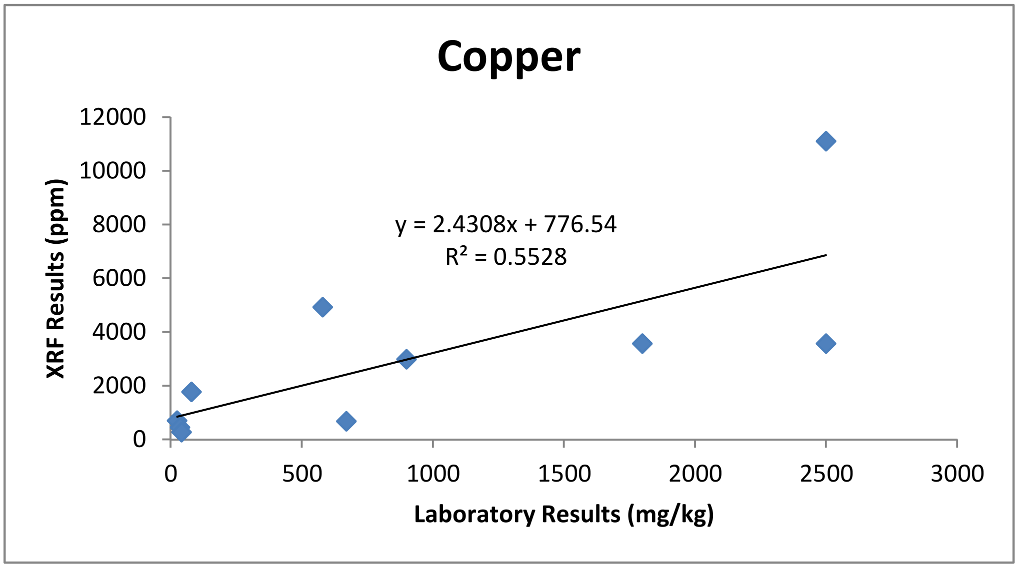
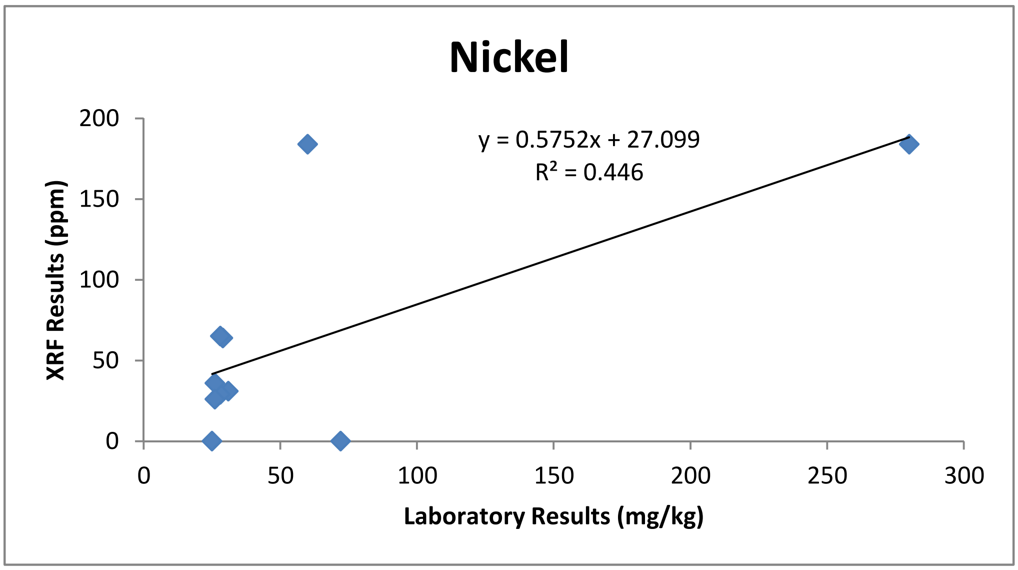


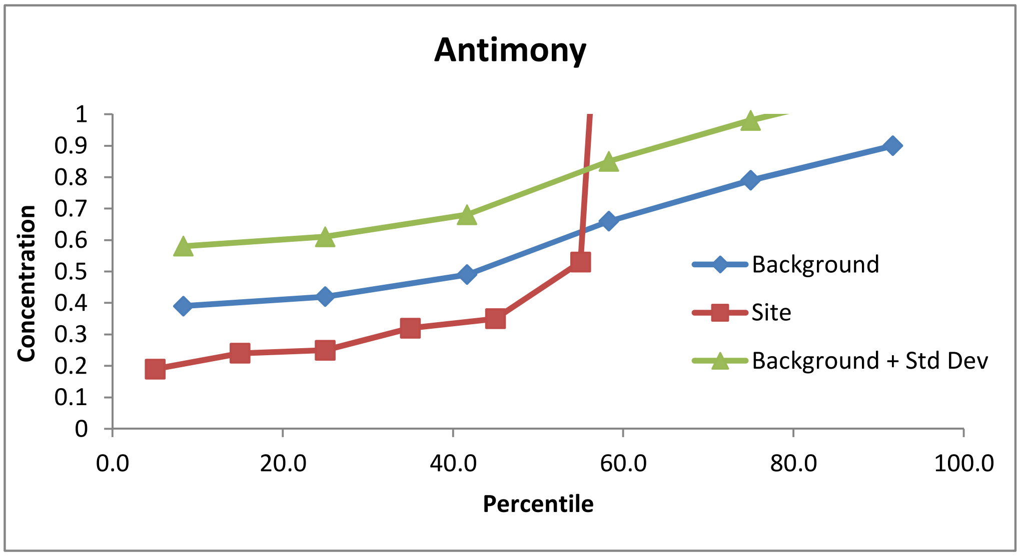
FIGURE 7: COMPARISON OF LABORATORY AND XRF SCREENING RESULTS
FORMER JOSEPH GUY COMMUNITY CENTER CLEANUP ACTION
KWETHULK, ALASKA

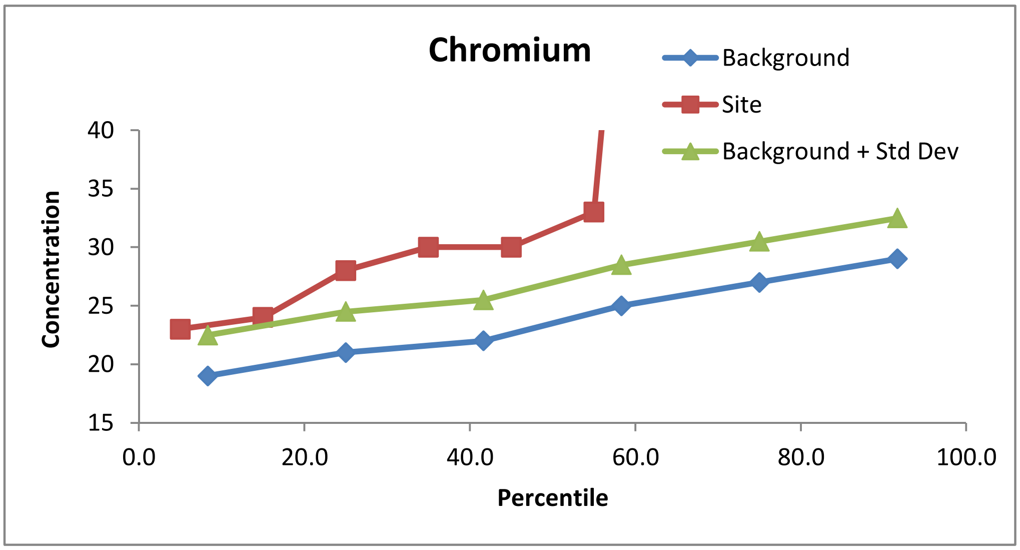




Notes:
mg/kg = milligram per kilogram
ppm = parts per million
XRF = x-ray fluorescence spectrometer

FIGURE 8: COMPARISON OF SITE AND BACKGROUND METALS RESULTS
FORMER JOSEPH GUY COMMUNITY CENTER CLEANUP ACTION
KWETHLUK, ALASKA





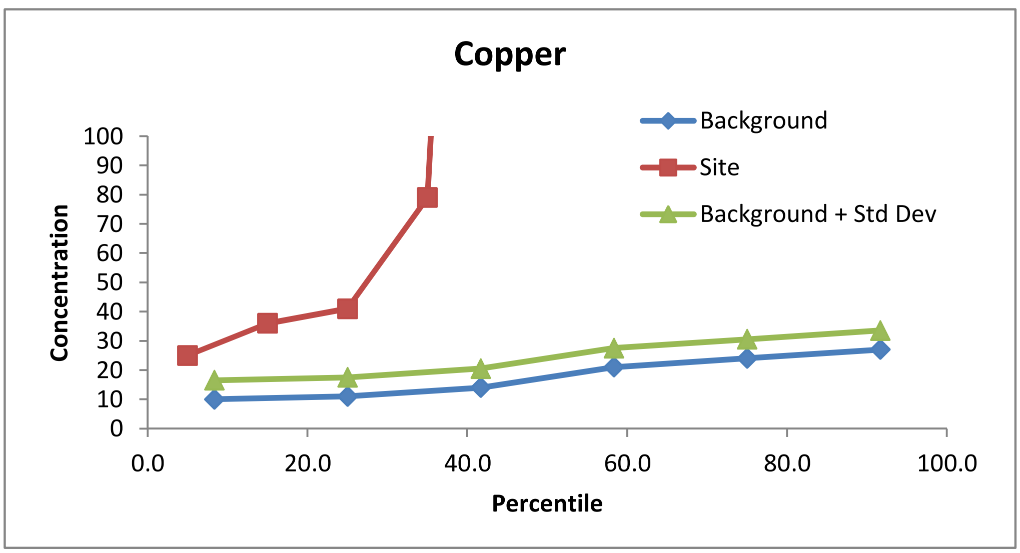
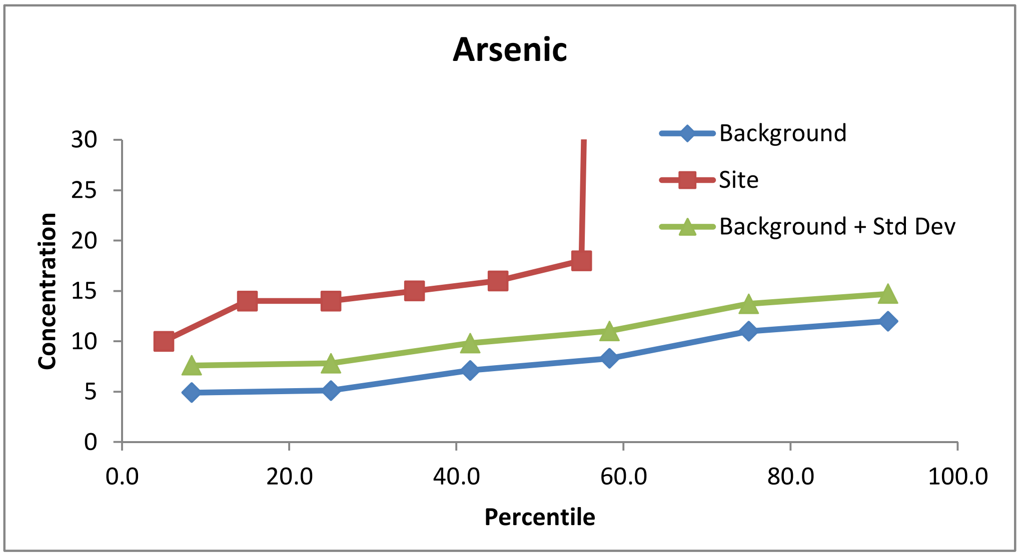
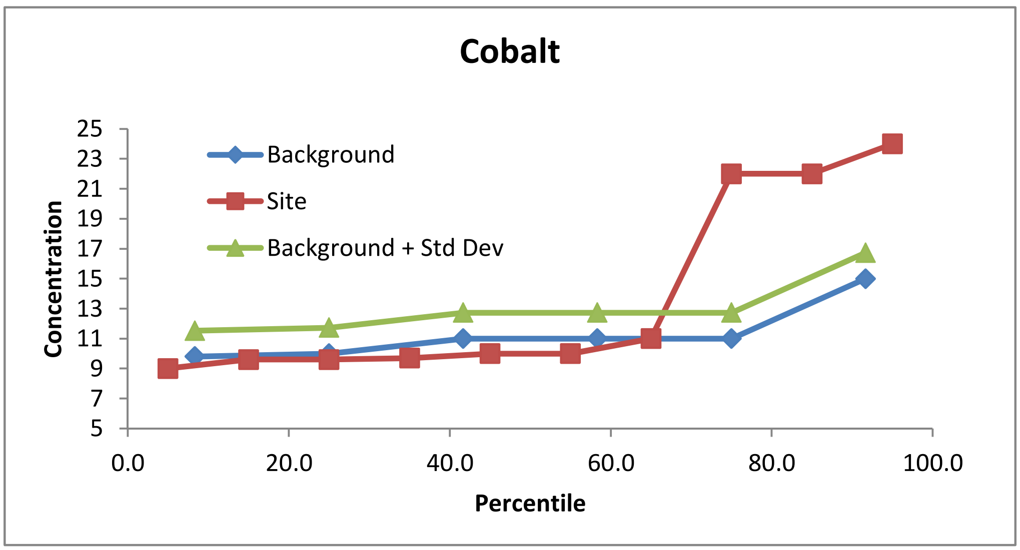
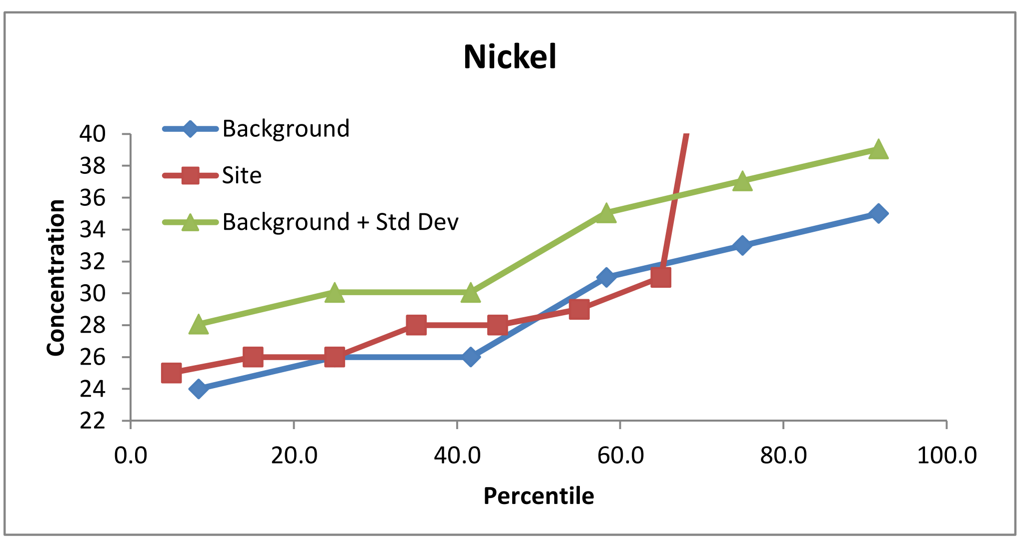


FIGURE 8: COMPARISON OF SITE AND BACKGROUND METALS RESULTS
FORMER JOSEPH GUY COMMUNITY CENTER CLEANUP ACTION
KWETHLUK, ALASKA







APPENDIX A

March 2012 TCLP Results

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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

1 2 3 4 5 6 7 8 9 10 11 12 13

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Anchorage
2000 West International Airport Road Suite A10
Anchorage, AK 99502-1119
Tel: (907) 563-9200

TestAmerica Job ID: AVC0008
Client Project/Site: 0158196 Phase 3
Client Project Description: Kwethluk Demo

For:
Oasis Environmental, Inc.
825 W 8th Ave, ste 200
Anchorage, AK/USA 99501-4427

Attn: Lisa Nicholson

Authorized for release by:
3/22/2012 3:02:48 PM

Johanna L Dreher
Client Services Manager
johanna.dreher@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Client: Oasis Environmental, Inc. TestAmerica Job ID: AVC0008

Project/Site: 0158196 Phase 3

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Oasis Environmental, Inc.   TestAmerica Job ID: AVC0008
Project/Site: 0158196 Phase 3

Job ID: AVC0008

Laboratory: TestAmerica Anchorage

Narrative

Receipt
All samples were received in good condition within temperature requirements at all laboratories.

Subcontracted
This data set was subcontracted to TestAmerica Seattle from TestAmerica Anchorage.

Laboratory: TestAmerica Seattle

Narrative

Receipt
All samples were received in good condition within temperature requirements.

Metals
No analytical or quality issues were noted.

General Chemistry
No analytical or quality issues were noted.

Client Sample ID: 03131201 — Lab Sample ID: AVC0008-01

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.064		0.0040		mg/L	10		6020	TCLP
Copper	0.33		0.010		mg/L	10		6020	TCLP
Cobalt	0.017		0.0040		mg/L	10		6020	TCLP

Client Sample ID: 03131202 — Lab Sample ID: AVC0008-02

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.30		0.010		mg/L	10		6020	TCLP
Chromium	0.0067		0.0040		mg/L	10		6020	TCLP
Antimony	0.036		0.0040		mg/L	10		6020	TCLP
Copper	0.43		0.010		mg/L	10		6020	TCLP
Cobalt	0.027		0.0040		mg/L	10		6020	TCLP

Client Sample ID: 03131201 Lab Sample ID: AVC0008-01

Date Collected: 03/13/12 12:00 **Matrix: Soil**
Date Received: 03/14/12 13:20

Method: 6020 - Metals (ICP/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.010		mg/L		03/19/12 13:29	03/20/12 15:38	10
Chromium	ND		0.0040		mg/L		03/19/12 13:29	03/20/12 15:38	10
Antimony	**0.064**		0.0040		mg/L		03/19/12 13:29	03/20/12 15:38	10
Nickel	ND		0.030		mg/L		03/19/12 13:29	03/20/12 15:38	10
Copper	**0.33**		0.010		mg/L		03/19/12 13:29	03/20/12 15:38	10
Cobalt	**0.017**		0.0040		mg/L		03/19/12 13:29	03/20/12 15:38	10

Client Sample ID: 03131202 Lab Sample ID: AVC0008-02

Date Collected: 03/13/12 12:30 **Matrix: Soil**
Date Received: 03/14/12 13:20

Method: 6020 - Metals (ICP/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.30**		0.010		mg/L		03/19/12 13:29	03/20/12 15:43	10
Chromium	**0.0067**		0.0040		mg/L		03/19/12 13:29	03/20/12 15:43	10
Antimony	**0.036**		0.0040		mg/L		03/19/12 13:29	03/20/12 15:43	10
Nickel	ND		0.030		mg/L		03/19/12 13:29	03/20/12 15:43	10
Copper	**0.43**		0.010		mg/L		03/19/12 13:29	03/20/12 15:43	10
Cobalt	**0.027**		0.0040		mg/L		03/19/12 13:29	03/20/12 15:43	10

Client: Oasis Environmental, Inc.
Project/Site: 0158196 Phase 3

TestAmerica Job ID: AVC0008

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 580-107500/22-A
Matrix: Solid
Analysis Batch: 107631

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 107500

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.010		mg/L		03/19/12 13:29	03/20/12 14:45	10
Chromium	ND		0.0040		mg/L		03/19/12 13:29	03/20/12 14:45	10
Antimony	ND		0.0040		mg/L		03/19/12 13:29	03/20/12 14:45	10
Nickel	ND		0.030		mg/L		03/19/12 13:29	03/20/12 14:45	10
Copper	ND		0.010		mg/L		03/19/12 13:29	03/20/12 14:45	10
Cobalt	ND		0.0040		mg/L		03/19/12 13:29	03/20/12 14:45	10

Lab Sample ID: LCS 580-107500/23-A
Matrix: Solid
Analysis Batch: 107631

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 107500

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	4.00	3.79		mg/L		95	80 - 120
Chromium	0.400	0.372		mg/L		93	80 - 120
Antimony	3.00	2.71		mg/L		90	80 - 120
Nickel	1.00	0.935		mg/L		94	80 - 120
Copper	0.500	0.469		mg/L		94	80 - 120
Cobalt	1.00	0.930		mg/L		93	80 - 120

Lab Sample ID: LCSD 580-107500/24-A
Matrix: Solid
Analysis Batch: 107631

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 107500

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	4.00	3.78		mg/L		94	80 - 120	0	20
Chromium	0.400	0.372		mg/L		93	80 - 120	0	20
Antimony	3.00	2.72		mg/L		91	80 - 120	0	20
Nickel	1.00	0.931		mg/L		93	80 - 120	0	20
Copper	0.500	0.469		mg/L		94	80 - 120	0	20
Cobalt	1.00	0.930		mg/L		93	80 - 120	0	20

Metals

Leach Batch: 107420

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
AVC0008-01	03131201	TCLP	Soil	1311	
AVC0008-02	03131202	TCLP	Soil	1311	

Prep Batch: 107500

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
AVC0008-01	03131201	TCLP	Soil	3010A	107420
AVC0008-02	03131202	TCLP	Soil	3010A	107420
LCS 580-107500/23-A	Lab Control Sample	Total/NA	Solid	3010A	
LCSD 580-107500/24-A	Lab Control Sample Dup	Total/NA	Solid	3010A	
MB 580-107500/22-A	Method Blank	Total/NA	Solid	3010A	

Analysis Batch: 107631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
AVC0008-01	03131201	TCLP	Soil	6020	107500
AVC0008-02	03131202	TCLP	Soil	6020	107500
LCS 580-107500/23-A	Lab Control Sample	Total/NA	Solid	6020	107500
LCSD 580-107500/24-A	Lab Control Sample Dup	Total/NA	Solid	6020	107500
MB 580-107500/22-A	Method Blank	Total/NA	Solid	6020	107500

General Chemistry

Analysis Batch: 107596

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
AVC0008-01	03131201	Total/NA	Soil	D 2216	
AVC0008-02	03131202	Total/NA	Soil	D 2216	

Client: Oasis Environmental, Inc. TestAmerica Job ID: AVC0008
Project/Site: 0158196 Phase 3

Client Sample ID: 03131201 Lab Sample ID: AVC0008-01

Date Collected: 03/13/12 12:00 **Matrix: Soil**
Date Received: 03/14/12 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			107420	03/18/12 12:28	RS	TAL SEA
TCLP	Prep	3010A			107500	03/19/12 13:29	PAB	TAL SEA
TCLP	Analysis	6020		10	107631	03/20/12 15:38	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	107596	03/20/12 15:06	RD	TAL SEA

Client Sample ID: 03131202 Lab Sample ID: AVC0008-02

Date Collected: 03/13/12 12:30 **Matrix: Soil**
Date Received: 03/14/12 13:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			107420	03/18/12 12:28	RS	TAL SEA
TCLP	Prep	3010A			107500	03/19/12 13:29	PAB	TAL SEA
TCLP	Analysis	6020		10	107631	03/20/12 15:43	FCW	TAL SEA
Total/NA	Analysis	D 2216		1	107596	03/20/12 15:06	RD	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Certification Summary

Client: Oasis Environmental, Inc. TestAmerica Job ID: AVC0008
Project/Site: 0158196 Phase 3

Laboratory	Authority	Program	EPA Region	Certification ID
TestAmerica Anchorage	Alaska	State Program	10	AK00975
TestAmerica Anchorage	Alaska (UST)	State Program	10	UST-067
TestAmerica Anchorage	Alaska (UST)	State Program	10	UST-093
TestAmerica Seattle	Alaska (UST)	State Program	10	UST-022
TestAmerica Seattle	California	NELAC	9	1115CA
TestAmerica Seattle	Florida	NELAC	4	E871074
TestAmerica Seattle	L-A-B	DoD ELAP		L2236
TestAmerica Seattle	L-A-B	ISO/IEC 17025		L2236
TestAmerica Seattle	Louisiana	NELAC	6	05016
TestAmerica Seattle	Montana (UST)	State Program	8	N/A
TestAmerica Seattle	Oregon	NELAC	10	WA100007
TestAmerica Seattle	USDA	Federal		P330-11-00222
TestAmerica Seattle	Washington	State Program	10	C553

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

Method Summary

Client: Oasis Environmental, Inc.
Project/Site: 0158196 Phase 3

TestAmerica Job ID: AVC0008

Method	Method Description	Protocol	Laboratory
6020	Metals (ICP/MS)	SW846	TAL SEA
D 2216	Percent Moisture	ASTM	TAL SEA

Protocol References:

ASTM = ASTM International

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Sample Summary

Client: Oasis Environmental, Inc.
Project/Site: 0158196 Phase 3

TestAmerica Job ID: AVC0008

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
AVC0008-01	03131201	Soil	03/13/12 12:00	03/14/12 13:20
AVC0008-02	03131202	Soil	03/13/12 12:30	03/14/12 13:20

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-8244 — 425-420-9200 FAX 420-9210 ☐
11922 E. First Ave, Spokane, WA 99206-5302 — 509-924-9200 FAX 924-9290 ☐
9405 SW Nimbus Ave, Beaverton, OR 97008-7145 — 503-906-9200 FAX 906-9210 ☐
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 — 907-563-9200 FAX 563-9210 ☒

CHAIN OF CUSTODY REPORT

Work Order #: AVC0008

CLIENT: Oasis Environmental
REPORT TO: Lisa Nicholson
ADDRESS: 825 W. 8th Ave, Anchorage AK 99507
PHONE: 264-4460 FAX:
PROJECT NAME: Kwethluk Demo
PROJECT NUMBER:
SAMPLED BY: Mike Roberts

INVOICE TO: OASIS Lisa Nicholson
P.O. NUMBER:

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 (STD.) 7 ☒5 4 3 2 1 <1
Petroleum Hydrocarbon Analyses: 5 (STD.) 4 3 2 1 <1
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

PRESERVATIVE: N/A

REQUESTED ANALYSES

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	Metals TCLP	~~TCLP~~											MATRIX (W, S, O)	# OF CONT.	LOCATION/ COMMENTS	TA WO ID
1	03131201	3-13-12 12:00	X												S	1	North End of Building	01
2	03131202	3-13-12-12:30	X												S	1	South End of Building	02
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

RELEASED BY: Mike Roberts (signature) PRINT NAME: Mike Roberts FIRM: ANTHC DATE: 3-14-12 TIME: 10:22AM
RECEIVED BY: (signature) PRINT NAME: Lisa Nicholson FIRM: OASIS/ERM DATE: 3/14/12 TIME: 10:22 AM

RELEASED BY: (signature) PRINT NAME: Lisa Nicholson FIRM: OASIS/ERM DATE: 3/14/12 TIME: 1135
RECEIVED BY: (Released by) PRINT NAME: Joe Casey FIRM: OASIS/ERM DATE: 3/14/12 TIME: 1135

TEMP: 1.1 °C PAGE 1 OF 1

ADDITIONAL REMARKS: TCLP extraction; EPA 6020 for antimony, arsenic, chromium, cobalt, copper, & nickel
Rush

rec'd by (signature) Anchorage 03/14/12 1320

TAL-1000(0408)

Test America Cooler Receipt Form

(Army Corps. Compliant)

WORK ORDER # AVC0008 CLIENT: Oasis-ERM PROJECT: Kwethluk Demo

Date /Time Cooler Arrived 03/14/12 13:20 Cooler signed for by: Johanna Dreher (Print name)

Preliminary Examination Phase:

Date cooler opened: ☒ same as date received or ___/___/___

Cooler opened by (print) Johanna Dreher (sign) [signature]

1. Delivered by ☐ ALASKA AIRLINES ☐ Fed-Ex ☐ UPS ☐ NAC ☐ LYNDEN ☒ CLIENT ☐ Other: hand
   Shipment Tracking # if applicable NA (include copy of shipping papers in file)
2. Number of Custody Seals 0 Signed by ________ Date ___/___/___
   Were custody seals unbroken and intact on arrival? ☐ Yes ☐ No
3. Were custody papers sealed in a plastic bag? ☒ Yes ☐ No
4. Were custody papers filled out properly (ink, signed, etc.)? ☒ Yes ☐ No
5. Did you sign the custody papers in the appropriate place? ☒ Yes ☐ No
6. Was ice used? ☒ Yes ☐ No Type of ice: ☐ blue ice ☒ gel ice ☐ real ice ☐ dry ice Condition of Ice: solid
   Temperature 1.1 °C (corrected) Thermometer # rcc #5
7. Packing in Cooler: ☒ bubble wrap ☐ styrofoam ☐ cardboard ☐ Other: ________
8. Did samples arrive in plastic bags? ☒ Yes ☐ No
9. Did all bottles arrive unbroken, and with labels in good condition? ☒ Yes ☐ No
10. Are all bottle labels complete (ID, date, time, etc.) ☒ Yes ☐ No
11. Do bottle labels and Chain of Custody agree? ☒ Yes ☐ No
12. Are the containers and preservatives correct for the tests indicated? ☒ Yes ☐ No
13. Conoco Phillips, Alyeska, BP H2O samples only, pH <2? ☐ Yes ☐ No ☒ N/A
14. Is there adequate volume for the tests requested? ☒ Yes ☐ No
14. Is there dry weight volume provided? ☐ Yes ☒ No TCLP samples
15. Were VOA vials free of bubbles? ☒ N/A ☐ Yes ☐ No
    If "NO" which containers contained "head space" or bubbles? ________
16. Are methanol soils immersed in methanol? ☐ Yes ☐ No ☒ N/A

Log-in Phase:

Date of sample log-in 03/14/12

Samples logged in by (print) Johanna Dreher (sign) [signature]

1. Was project identifiable from custody papers? ☒ Yes ☐ No
2. Do Turn Around Times and Due Dates agree? ☒ Yes ☐ No
3. Was the Project Manager notified of status? ☒ Yes ☐ No
4. Was the Lab notified of status? ☒ Yes ☐ No
5. Was the COC scanned and copied? ☒ Yes ☐ No

AK-FORM-SPL-005 5 October 2011

APPENDIX B

Field Notes

- Page Intentionally Left Blank -

Joseph Guy
Community Center
Brownfield Cleanup Action

Rite in the Rain®
ALL-WEATHER
FIELD
№ 353

4/3/2012 to

Logbook 1 of

Project 0158196

CONTENTS

~~4/3/2011 L. Nicholson~~

~~0800 Awaiting call from Corey Kurtz~~ LN
~~with Bethel Services~~ LN
~~Weather: 10°F in Bethel~~ LN

4/3/2012 L. Nicholson

1730 Arrive Anchorage Airport

1845 Fly to Bethel

2000 Arrive Bethel. Taxi to Bentley's B&B. Checkin

Prep for field word

2100 End of day

L. Nicholson

Lisa Nicholson

4/4/2012 L. Nicholson.

Weather 10°F; slight breeze; light snow

0800 Awaiting Corey Karcz, site super from BSI. He ~~was~~ has flown in from Anchorage - arrived ~ 0800.

0930 Corey calls - heads over to pick me up with Shawn Codman from Dale Construction. Shawn will be running the excavator.

0950 Drive to Kwethluk on the ice road. Road stopped being maintained by the city after March 31. It is one lane wide with frequent pull outs.

The entrance to the Kwethluk River is a very narrow area due to shallow water/ice along one bank. This area ~~need~~ to Kwethluk will need extra grading. The plan is to start grading tomorrow morning. ~~While~~

1045. Arrive Kwethluk. Stop at burned building. There is some fiberglass that will not be

[signature]

4/4/2012 (cont'd)

accepted by Bethel ~~Do~~ landfill.

1100 To Village Council office to talk to Max Angellan and to Peter Jackson. Discuss the plan for demolishing the building. Meet Caroline Fisher, the Kwethluk IGAP coordinator. She has been on the job 3 days. We discussed where she would like us to stage any haz. mat we find. Expect to find only computers and other electronics

11~~35~~ - To city office to speak with David Epchook

He is not in.

Note: Peter tells us that he will need backhoe today so we won't be able to start until tomorrow.

1205 ~~1155~~ To OVK. Hermann Evan is out at lunch - won't be back until 13:00

1210 To school - talk to Darrell Richar (principal) re. possible lodgings

[signature]

4/4/11 (cont'd)

and discuss having heavy equipment near the school. He will have the teachers tell the kids to stay away from the area. We will also police the area to keep kids away.

- Ira Hardy arrived on yesterday flight and checked out the site for good angles & places to set up his equipment. Ira decides to stay in Kwethluk today to interview some people who know about the community center.

1230 Lisa, Corey, and Shawn drive back to Bethel. Corey and Shawn will pick up fuel filter and oil filter for backhoe. Drop Lisa at B&B.

1345 End of field day.

[signature]

 [signature]

4/5/2012 L. Nicholson; Corey Karcz

Weather 8°F 11 knot wind from SE. cloudy.

0810 Shawn arrives at B&B. We take two trucks to Kwethluk. Shawn says that they (Dale Const) will start grading the ice road this morning.

0910 Arrive Kwethluk. Check in with Herman Evan. We will cut the H-piles flush with the the ground.

0930 Safety meeting; Corey Karcz Ira Hardy; Lisa Nicholson and ~~Sean~~ Shaun Coolman.

0945 ~~Sean~~ Shaun uses Komatsu PC 200 rented from Tribal council to first push down the front awning and then pull the sides off of the building

1050 Shaun and Corey switch off running excavator. Shaun goes to Bethel to check on grader & trucks

 [signature]

4/5/2012 (cont'd) Kwethluk Demolition

~~2/~~ ⓐ ———————————————— LA

1145 Corey finishes getting the west side of the building loose & ready to haul.

1230 Corey, Lisa, and Ira to Bethel

1330 Arrive Bethel. Corey to Dale Construction. Lisa & Ira to B&B

1445 Corey calls to say that one truck and the grader are working. and he wants to make a run with 1 load of metal today

1500 At B&B, Ira is downloading footage from morning's video cards. Finishes. ~~To~~ Leave to go

ⓐ ~~1515~~ Ira lunch

1515 Leave for Kwethluk. Apparently truck is already on ice road. Catch up to truck where it has gotten stuck trying to go around stalled minivan. Help dig out around the truck & it is able to make it around.

Lisa Ar[signature]

4/5/2012 (cont'd) Kwethluk Demolition

1620 Arrive Kwethluk ice road access. Dump truck can't make it up the hill onto landing. Find Peter Jackson and ask him to use dozer to ~~push~~ ⓐ pull truck up bank.

1700 Dozer pushed truck uphill

1745 Finished filling truck.

~~1830 Catch~~ ———————— ⓐ

~~Truck starts back along ice road~~ ⓐ

Truck driver has noticed that he has a fuel leak beneath the engine. It is a pinhole in the fuel line. He cuts the fuel line & reconnects it.

1830 Truck leaves site for Bethel with full load. Once the truck is moved, we find an approx. 15 sq. ft. area has been affected by the diesel fuel. It has hit the ~1" of snow on top of ice and spread this far.

Corey gets 2 ~~bu~~ ⓐ 5-gallon

Lisa Ar[signature]

buckets from Peter Jackson and shovels all affected snow into the buckets. Estimate that about 2 cups of diesel spilled. Take buckets of snow back to Bethel. Dale Construction will take them to be melted, separate and burned.

1810 Lisa, Corey, and Ira leave site. Catch up to haul truck at site of abandoned minivan. Several ~~~~ cars are held up here. Five men shovel the snow and lift the minivan off the roadway.

1920 Arrive Bentley's B&B. Corey wants to pick up a truck from Bethel Services yard. The Dale Construction truck he is renting uses too much fuel. Change trucks at Bethel yard. Return Dale Const. truck. Dump truck is next to their yard, still full of metal – landfill was closed.

4/5 Lisa [signature]

Corey has suggested to Dale Const. that they not work on the grader – just get the other truck running. The dump truck made it to Kwethluk and back w/o grading the road.

2000 End of field day

[signature]

5/5 Lisa [signature]

4/6/2012 L. Nicholson, Corey Karcz & Ira Hardy -8°F; clear calm.

0845 Leave B&B.

0935 Arrive Kwethluk. Visit Tribal Council office. Talk to Max Angellan and Richard Long (Asst. IGAP Coord.) about yesterday's spill. They asked for copy of our proposal to DEC. ~~Gave~~. Emailed copy of techical proposal text to Richard. and gave him my contact information.

1020 Corey stops to talk to Herman Evan.

Truck not here yet. Excavator is running to warm up. Peter J. also has dozer running.

Peter changes filters in excavator.

1025 Awaiting haul truck.

1045 Haul truck arrives

1100 Safety meeting

1115 Start to load truck

1135 Truck leaves for Bethel. Must wait for truck to get back to

[signature]

4/6/2012 (cont'd)

Bethel before other truck to start up road since they cannot pass on the road.

1200 Lunch & wait for trucks. Assume 2+ hours turnaround time.

1340 Truck 2 arrives in Kwethluk

1420 Truck filled; park to side of road - metal has been strapped down

1435 Truck 1 (dumptruck) arrives Load truck.

1515 Trucks leave for Bethel - due back ~~~~ @ 1730 or 1800.

Corey loosens up additional metal in building area. Uses large circular saw with chainsaw body to cut steel beams between H piles.

Locals ~~~~ want to keep as many good beams as possible to use to move houses that are too close to river

1830 Both trucks return to Kwethluk Loads Truck 2 (flatbed) first

[signature]

4/6/2012 (cont'd)

1930 Finish loading ~~secon~~ Truck 1. Truck 2 is strapped down.

1940 Everyone leaves site. ~~En~~

2100 End of field day

3/2

4/7/2012 L. Nicholson, C. Karcz, I. Hardy

Weather 10°F; slight breeze from east; overcast

0820: Leave B&B

0920 Arrive site. Gear up. ~~Corey starts~~

1030 Truck 1 (dump) arrives. Load truck. Truck 2 arrives.

1110 Finish loading truck. Safety meeting.

1115 Load Truck 2.

1135 Finish loading truck. Strap metal down.

1150 Truck 2 leaves for Bethel landfill

1155 Corey and Peter grease backhoe.

1230 Lunch

1240 Corey starts prepping metal for next load.

1310 Corey finishes making piles for trucks. Cuts floor beams and ~~adds them to piles~~ piles them for locals.

1420 Truck 1 arrives

1445 Truck 1 leaves; Truck 2 arrives

1500 Finish loading truck 2; strap metal down

1/2

4/7/2012 (cont'd)

~~Corey returns to cutting.~~
Corey cuts off pieces that stick off sides of truck

1515 Truck 2 leaves for Bethel. Corey cuts floor beams and pulls surface debris away from pilings to see whether he will be able to cut them off with circular saw. In the process, Corey hits styrofoam ~3 inches below grade. Stops. He will carefully move debris away from pilings and cut them as close to ground surface as possible

1630 Corey tells me that the trucks are not coming back today. Ira went to interview someone about ten minutes ago. Corey will continue working until Ira is back.

1735 Leave site for Bethel.

1830 Arrive Bethel. End of day.

2/20

4/8/2012. L. Nicholson; I. Hardy; C. Karcz

Weather 30°F; ~~overcast~~ Overcast; Strong wind gusting to 11 mph.

0820 Leave B&B. Corey finds out that Buck with Dale Construction has already left with the dump truck for Kwethluk. The ice road is drifted over. We make it about 1.5 miles where the dump is stuck. We get stuck trying to get closer to the dump truck. Spend ~ 45 minutes to 1 hour getting unstuck & turned around. All 4 of us head back to Bethel. Pick up a 966 Cat to plow the way to the big truck.

1030 Lisa & Ira stay at B&B while the rest of the crew gets the truck unstuck & turned around. Won't be able to make it to Kwethluk today. Hope it will stop blowing tomorrow & will try then to use the loader

1/2

4/8/2012 (cont'd)

to get to Kwethluk & bring last 1.5 loads back to Bethel.

1330/1400? Corey returns. The semi is back in Bethel ← (initials)

End of field day ← (initials)

[signature]

2/2 [signature]

4/9/2012 L. Nicholson, C. Karcz; I. Hardy

Weather 31°F; 2 mph from SE; light snow

0715 Corey leaves to pick up Buck. They will take pickup out to Kwethluk to check the ice road and decide if it's possible to get out with semi. Wind has died down but there is a light snow.

0950 Corey calls. They were unable to make it out past the point we got stuck yesterday

1345 Corey calls. He is coming back to pick us up. They have plowed almost all the way to Kwethluk

1515 Arrive site. Corey loads end dump Shaun and Buck take loader and grader to make a turnaround for the dump truck to back into the Kwethluk landfill

1615? Truck, loader, and grader head to town. Corey cleans up metal. Peter uses dozer to scrape surface of pad.

1/2 [signature]

4/9/2012 (cont'd)

There are now two piles. One is metal and the other is miscellaneous debris mixed with soil.

2015 Truck arrives - load debris/soil pile - take to dump (Kwethluk) dump in front of burn pile. Truck gets stuck trying to turn around (twice).

2115? Give up trying to take remaining debris/soil to Kwethluk dump tonight. Load metal and some of beams into truck.

2145 Leave Kwethluk for Bethel.

2255 Arrive Bethel

2315 End of field day.

4/10/2012 L. Nicholson; C. Karcz; I. Hardy;

Weather 32°F; wind 10mpH; overcast.

0730 - Leave B&B. Follow Buck to BSI yard to drop off loader.

0800 - Leave Bethel for Kwethluk. Wet spots on ice road

0855 Arrive Kwethluk. Get excavator ready to go. Awaiting Buck with end dump. He had to drop off last night's load at dump.

1000 Buck and Shaun arrive in end dump. Load truck with metal

1030 Truck leaves for Bethel [Shaun] Buck; Corey, & Peter work on leaking hydraulic line in Cat

1225 Shaun arrives back in Kwethluk with end dump. Load with debris/soil - take to Kwethluk dump.

1315 Load second load of debris/soil

1330 Truck returns from dump. Load 3rd load of debris/soil

1430 Truck leaves w/ last load. Corey, Lisa, & Ira visit Herman Evan & Caroline

Rite in the Rain

4/10/2012 (cont'd)

and Richard KTRC. Everyone seems happy about the job we did. Max Angellan was not in.

1505 Leave Kwethluk

1600 Arrive Bethel. Pick up bags at B&B. Corey drops us at airport.

2040 Fly to Anchorage

2165 Leave airport. End of day

2/2

Photo Log Demolition Phase

ID (DSCNO...)	Description
80	Back of building before demo (NE)
81	Back of building before demo (NW)
82	Safety meeting - L-R = Peter Jackson, Corey Karcz; Ira Hardy; Shaun Codman
83	Building demo. (SE)
84	Building demo (SE)
85	Building demo (SE)
86	Building demo ~~(SE)~~ (SW)
87	Building demo (SW)
88	Building demo (SW)
89	Building demo (SW)
90	Building demo (S-SE)
91	Building demo (S-SE) complete.
92	Prep metal to load on truck (S)
93	Prep metal to load on truck (E)
94	Prep metal to load on truck (S)
95	Prep metal to load on truck (SE)
96	Prep metal to load on truck (NE)
97	Prep metal to load on truck (SE)
98	Demolished building (SW)
99	Demolished building (SW)
100	River ice road narrows marker (SW)
101-106	Ice road on river

1/4

Photo Log Demolition Phase (cont'd)

107 Bethel ice road access (East Ave) (N)
108 End dump on ice road.
109 End dump at Kwethluk ice road access - unable to climb hill to Kwethluk (N-NW)
110 Cat pushing end dump uphill off ice road (NW)
111 Loading truck (SE)
112 Loading truck (S)
113 Loading truck (SE)
114 Fuel line spill site @ mid ~~post~~ clean-up (S) ~~(N)~~
115 Fuel line spill site - mid cleanup ~~(N)~~ (S)
116 Kusko classic breakup pyramid
117 Bentley's River House (Bethel)
118 Bentley's B&B (Bethel
119 Loading end dump (E)
120 Loading end dump (E)
121 Loading end dump (E)
122 Loading flat bed (E)
123 Loading flatbed (E)
124 Loading flat bed (E)
125 Loading flat bed (NE)
126 Loading flatbed (NE)
127 Loading flatbed (NE)

Photo Log Demolition Phase (cont'd)

128 Strapping down metal (S)
129 Separating metal into piles for dump & flatbed
130 Cutting beams with circular saw (S)
131 Cutting beams with circular saw (S)
132 Cutting metal with circular saw (SE)
133 Loading flatbed (SE)
134 Loading flatbed (SW)
135 Loading flatbed (SW)
136 Loading flatbed (SW)
137 Loading flatbed (SW)
138 Strapping system for flatbed
139 Circular saw on chainsaw body
140 Greasing excavator
141 non-project related (deleted)
142 Making separate pile of H beams for town's people.
143 Metal pile ready for loading (S)
144 Metal pile ready for loading (SE)
145 Metal to be prepped for loading (SE)
146 Loading flat bed (S)
147 View of site from school (S)
148 View of site from school (S)
149 Cut-off piling

Photo Log (cont'd) - Demolition

150 Cutting interior piling
151 Loading end dump (SW)
152 Taking circular saw to cut beams
153 Scraping pad to remove small debris (SE)
154 Scraping debris from pad (SE)
155 Scraping pad (S)
156 Two piles remaining (debris/soil in foreground; metal in background
157 Re-useable beams for community
158 Debris/soil being dumped at landfill (S).
159 Debris/soil being dumped at landfill ~~(SE)~~ (S)
160 Debris/soil being dumped at landfill (S)
161 Prepping metal pile for loading (S)
162 Loading end dump (SW)
163 Loading last of metal (SW)
164 Project complete (S)
165 Project complete (SE)
166 Project complete (NE)
167 Project complete (N-NW)

4/4 [signature]

6-7-12 R. Bryan, L. Davis 45°F, rain

1400 arrive in Kwethluk via Bethel & Anchorage from Fairbanks on Era-Hageland
Ira Jackson (Kwethluk school maintainance) is at airport in his truck, the school does not have our lodging reservation on file
arrive at school, meet Chris (a lady), we'll check with Lisa about if we have pre-paid for lodging & let Chris know tomorrow
Opt to sleep in library, office in classroom/computer room, food storage in teachers' lounge
Kwethluk roads construction workers will be staying in annexes.
1500 pickup gear from Richard Long at IGAP office with Ira Jackson & his truck
gear is ready to go on IGAP front porch, visit site, unpack gear & sample bottles

[signature]

65°F, Sunny

6-6-13 Kwethluk JGCC Monette Rhodes

1200 Rhodes arrives in Kwethluk w/ Gregg Monette (BSI) to begin supersack transport → from JGCC footprint to Kwethluk landfill.

1415 Lunch, tailgate safety meeting, then proceed to JGCC footprint to begin task. Will be staying in Kwethluk school.

1445 Onsite at JGCC. Call Peter Jackson to get backhoe key. Rig up super sack SS-13. for lifting.

1520 Pick SS-13 and begin transport to dump (Landfill)

1530 Arrive @ Landfill. Unable to access south fenceline due to ponded water near SW corner. Will place sacks inside fenceline along western fence going North from the SW corner.

1545 Pick SS-7, begin transport to landfill.

1/3 William Rhodes (WR)

65°F, Sunny

Monette Rhodes Kwethluk JGCC 6-6-13

1555 Place SS-7 in Landfill.
1620 Pick SS-4, begin transport to landfill.
1640 Place SS-4 in landfill.
1700 Pick SS-3, begin transport.
1710 Place SS-3 in Landfill.
1725 Pick SS-2, begin transport.
1735 Place SS-2 in landfill.
1750 Pick SS-8, begin transport.
1815 Place SS-8 in Landfill.
1825 Pick SS-12, begin transport
1840 Place SS-12 in landfill.
1855 Pick SS-6, begin transport.
1905 place SS-6 in landfill.
1915 Pick SS-5, begin transport.
1930 Place SS-5 in landfill.
1940 Pick SS-1, begin transport
1955 Place SS-1 in landfill.
2005 Pick SS-9, begin transport
2015 Place SS-9 in landfill
2025 Pick SS-11, begin transport
2040 Place SS-11 in landfill.
2050 Pick SS-10, begin transport
2100 Place SS-10 in landfill.

(WR) William Rhodes 2/3

60 °F, Sunny
6-6-13 Kwethluk JGCC Monette Rhodes

2115 load two supersacks Containing styrofoam insulation into bucket for transport to landfill.

2125 place SS w/ styrofoam in landfill

2140 Move 2 footers off of footprint onto pile of steel I Beams East of footprint.

2150 Shut down backhoe, return key to peter Jackson → Off site.

Wirth Rhodes

(3/3) (WR)

6-7-12 R. Bryan, L. Davis 45°F, rain

530 make sense of gear, sample bottles, & work plan
discover missing super sacks
1630 call IGAP, leave message, walk to IGAP to ask if there is 1 extra big box or 6 extra small boxes with the maverick super sacks,
1640 nothing extra at IGAP office upstairs according to lady working there
1650 try Richard Long on his cell phone: 907-757-2550, leave message
1655 buy 2 gallon size ziplocks at Sports Store for organizing sample bottles
Sports Store is open till 6, Food store is open till 7
walk back to school, finish organizing gear & questions
1730 call Lisa home & cell
Work on XRF operation
1930 talk to Lisa. Peter Jackson

[signature] 2 of 3

6-7-12 R. Bryan, L. Davis 45°F, rain

will be our excavator operator
We will also talk to him about carefully removing another 2-3 in of soil from footprint & dump truck for hauling ash/soil/debris to Kwethluk landfill
talked to Lisa about computer/electronic parts & metal debris -- will send photos
talked to Lisa about 10 heated headspace PIDs at each excavation to delineate area to be excavated horizontally
Super sacks are likely in Bethel
Ira Hardy will arrive tomorrow at 1345 from Bethel, overnights in Anchorage tonight due to interview today in Anchorage
2010 break for dinner
2100 take photos of debris at site
2145 name & send photos to Lisa
End of day

[signature] 3 of 3

6-8-12 R. Bryan, L. Davis 42°F, rain

0730 check email for directions from Lisa

0815 calibrate PID MiniRae 2000 S/N: 110-013060

Fresh air Cal = 0.0 ppm

Span Cal w/ 100 ppm Isobutylene = 100 ppm

0930 meet Richard Long & Peter Jackson at school. They have located the 6 Super Sacks.

Ira Hardy delayed in Anchorage new ETA in Kwethluk 1645

Talked PPE & safety with Peter.

Heard back from Lisa - client (ADEC) & Max Angellan decided ~~against~~ (RB) adequate soil / ash / debris was removed from footprint in April. Max will oversee Peter remove large metal shards. OASIS will proceed with excavation area delineations based on <u>both</u> the work plan Figure 3 <u>and</u> the GPS coordinates

1200 break for lunch

1235 locate & pin flag excavation

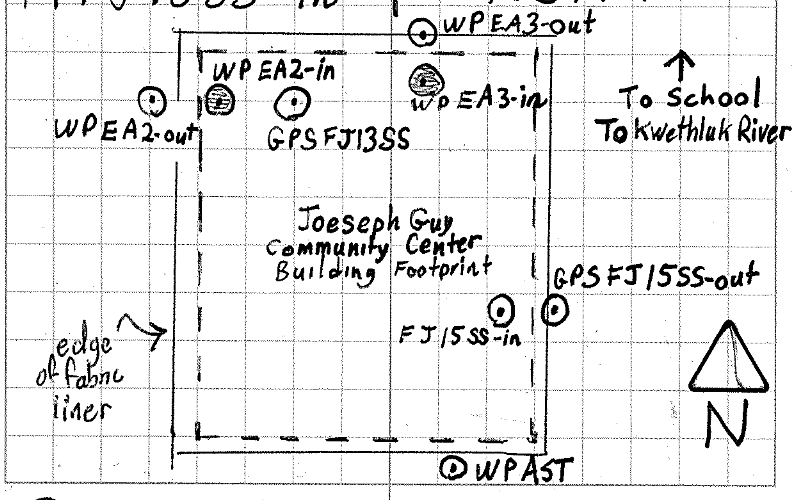
[signature] 1 of 8

6-8-12 R. Bryan, L. Davis 48°F, overcast

area 'hotspots'; collect heated headspace PID samples

Heat heated head space samples for >10 minutes next to space heater

	Location	headspace PID result
1	WP AST	3.6 ppm
2	GPS FJ19SS	5.3 ppm
3	WP EA2-out	1.0 ppm
4	WP EA2-in	5.5 ppm
5	GPS FJ13SS	0.7 ppm
6	WP EA3-out	3.8 ppm
7	WP EA3-in	3.8 ppm
8	GPS FJ15SS-out	4.5 ppm
9	FJ15SS-in	4.2 ppm

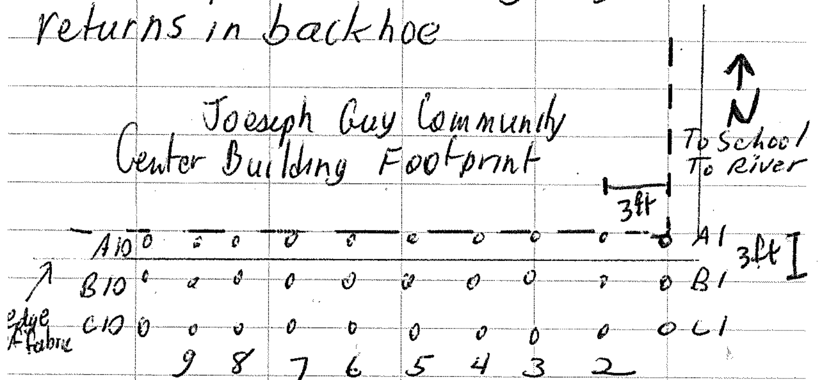


[signature] 2 of 8

1400 Ira Hardy arrived in Kwethluk
meet Lena Andrews, Herman Evan
collect insitu PID reading along
south end of burned building
to try to find any AST contamination
-- all PID results = 0.0 ppm
Lena Andrews, attempts to find
Hazwoper operator Harry Jackson
who is unavailable
Herman Evan (in place of Max
Angellan) gives permission for
metal debris to be cleaned up
by hand, He would like to see
the old building footprint "Clean
up, Green up". He hopes it may
revegetate some day. He is not sure
it is a safe site for a community
Center due to river flooding or
change of riverbank in the next
50-60 yrs.
1530 talk to Lisa about headspace &
insitu PID results, Lena, and Herman
Lisa talks to Peter (and Corey)
about finding more help for footprint

cleanup
Peter finds Carl Andrews
1600 Carl Andrews onsite,
conduct ERM Daily Safety meeting
Documentation form
1615 Peter Jackson & Carl Andrews
load metal pieces by hand into
backhoe bucket, The plan is
to load up the bucket until it is
full, Then Peter will drive the
backhoe to ~~the dump truck, the~~ (RB)
~~dump truck will be dumped at~~ the
Kwethluk landfill
Rena & Leslie collect heated
headspace samples in a 3ft x
3ft grid on the south side
of the building, east of the
building's back entrance
Carl Andrews confirms that
the heating oil tank was
located east of the back entrance
Ira snaps photographs & video
Peter also tells us that the flood
at breakup was covering the

entire site and further South
1745 Peter takes first load of metal scraps & any loose debris that could be harmful to people to ~~dump truck~~ landfill, Carl Andrews continues to pile scraps up for second load
1815 complete 3ft x 3ft grid, Peter returns in backhoe



	lat	long
A1	60°48'35.3883"N	-161°25'24.2525"W
C1	60°48'35.3380"N	-161°25'24.2100"W
A10	60°48'35.3790"N	-161°25'24.8527"W
C10	60°48'35.2985"N	-161°25'24.8440"W

No Fix, high error on GPS, could not store the points
1845 Peter takes second load to

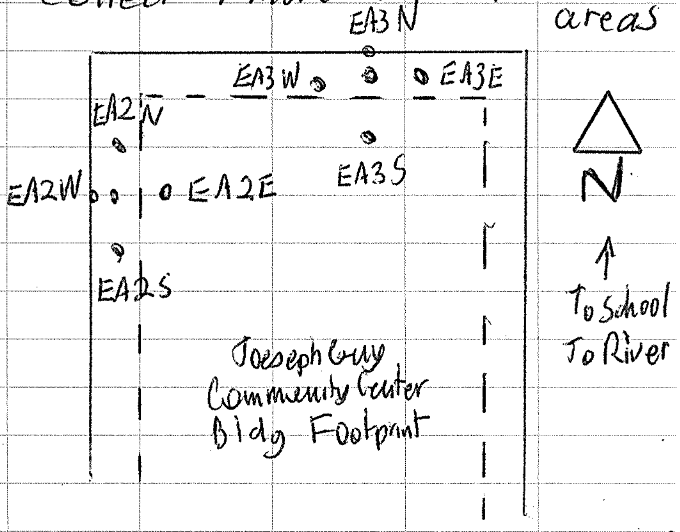
landfill, Peter & Carl offsite, sign out
1910 Bump check PID MiniRae 2000
100 ppm Isobutylene = 98.2
Bump check good

	Location	headspace PID result
10	A1	2.5 ppm
11	B1	2.8 ppm
12	C1	2.4 ppm
13	A2	5.6 ppm
14	B2	2.2 ppm
15	C2	1.3 ppm
16	A3	3.9 ppm
17	B3	4.5 ppm
18	C3	2.2 ppm
19	A4	1.3 ppm
20	B4	1.4 ppm
21	C4	2.9 ppm
22	A5	2.8 ppm
23	B5	3.2 ppm
24	C5	2.6 ppm
25	A6	3.6 ppm
26	B6	1.8 ppm
27	C6	3.4 ppm
28	A7	3.8 ppm

6-8-12 R. Bryan, L. Davis 45°F, overcast

	Location	headspace PID result
29	B7	3.7 ppm
30	C7	3.6 ppm
31	A8	2.9 ppm
32	B8	3.5 ppm
33	C8	2.5 ppm
34	A9	2.8 ppm
35	B9	4.1 ppm
36	C9	2.0 ppm
37	A10	2.4 ppm
38	B10	2.3 ppm
39	C10	4.1 ppm

2200 collect 4 more PID samples at SVOC areas



Rennllen 7 of 8

6-8-12 R. Bryan, L. Davis 45°F, overcast, rain

	Location	headspace PID result
40	EA2 N	3.0 ppm
41	EA2 S	2.9 ppm
42	EA2 W	3.0 ppm
43	EA2 E	3.3 ppm
44	EA3 N	3.1 ppm
45	EA3 S	4.4 ppm
46	EA3 W	5.8 ppm
47	EA3 E	6.1 ppm

2245 End of day

Rennllen

8 of 8

6-9-12 R. Bryan, L. Davis SW wind 40°F, rain

0815 Bump check PID mini Rae 2000
100 ppm Isobutylene = 95.1
Bump check good.

0820 Calibrate PID mini Rae 2000
S/N: 110-013060
Fresh air Cal: 0.0 ppm
Span cal w/ 100 ppm isobutylene = 100 ppm

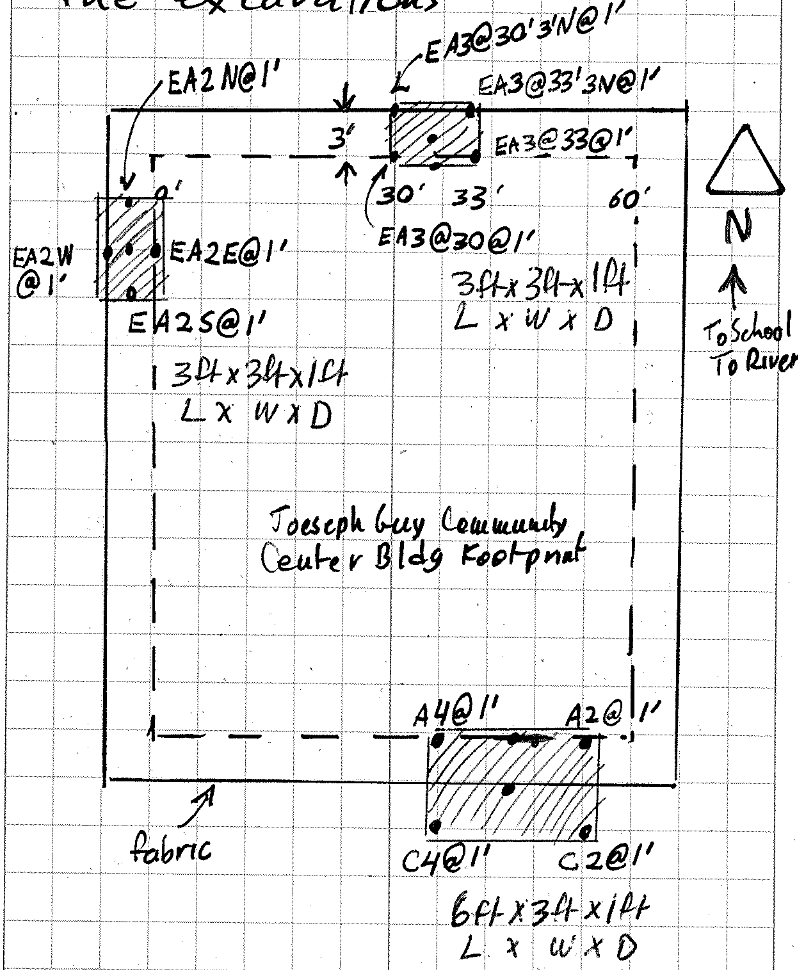
0900 hand dig to 1 foot at the sidewalls of the proposed excavation to collect 4 heated headspace sidewall samples at each excavation area (1, 2, & 3)
spoke to Era agent regarding changing flights, confirmed space available 6/11/2

0905 Examined gear & calculated weights for flight Kwethluk to Bethel. Called Era cargo and got price quote $417 in excess baggage fees. Charter $275 for passengers & baggage. Spoke with Lisa & decided to charter flight out of Kwethluk to save money. Called Era & confirmed charter for Monday @ 8:30

Rumluun 1 of 6

6-9-12 R. Bryan, L. Davis SW wind 40°F, rain

0945 Peter onsite to discuss the excavations



1015 sidewall soils are heated to 40°F for PID screening to confirm excavation

Rumluun 2 of 6

6-9-12 R. Bryan, L. Davis SW wind 40°F, rain

Peter & Carl back onsite discuss safety & PPE, leave to get hardhats & vests

115 completed headspace screening

	Location	headspace PID result
48	A2 @ 1'	3.9 ppm
49	C2 @ 1'	2.5 ppm
50	A4 @ 1'	3.0 ppm
51	C4 @ 1'	4.2 ppm
52	EA2N @ 1'	2.2 ppm
53	EA2S @ 1'	3.0 ppm
54	EA2W @ 1'	2.9 ppm
55	EA2E @ 1'	2.8 ppm
56	EA3@30 @ 1'	1.8 ppm
57	EA3@30' 3'N @ 1'	1.4 ppm
58	EA3@33 @ 1'	3.2 ppm
59	EA3@ 33' 3'N @ 1'	1.5 ppm

130 safety meeting - begin excavation

Began excavation of EA2 & AST area

Too difficult to excavate with backhoe. Decide to complete by hand

1230 break for lunch. Peter & Carl will return with shovels after lunch to finish excavating

R

6-9-12 R. Bryan, L. Davis SW wind 40°F, rain

1325 continue excavating by hand

bump check PID MiniRae 2000

100 ppm Isobutylene = 97.7 ppm

bump check good.

Decide not to collect any more heated headspace PID sample

No contamination detectable by the PID appears to exist at any of the 3 excavation areas

Will proceed with collection of analytical samples from one sidewall & the floor of each excavation area

Time	Sample ID	Location
1350	12-JGCC-101-TB	Trip blank
1430	12-JGCC-102-SO	EA3 center of floor
1435	12-JGCC-103-SO	EA3 center of floor dup
1440	12-JGCC-104-SO	EA3 interior sidewall (S)
1445	12-JGCC-105-SO	EA3 supersack
1500	12-JGCC-106-SO	EA2 supersack
1503	12-JGCC-107-SO	EA2 center of floor
1508	12-JGCC-108-SO	EA2 interior sidewall (E)
1520	12-JGCC-109-SO	EA1 center of floor
1525	12-JGCC-110-SO	EA1 center of floor dup

R

6-9-12 R. Bryan, L. Davis SW Wind 40°F, rain

Time	Sample ID	Location
1530	12-JGCC-111-SO	EA1 interior sidewall (N)
1540	12-JGCC-112-SO	EA1 supersack

1615 road to landfill is closed due to sewer/water construction make a plan with Peter to meet tomorrow at 1pm to transport supersacks to Kwethluk landfill

1630 Peter & Carl offsite, QC soil samples

1900 collect XRF screening samples in 15'x15' grid

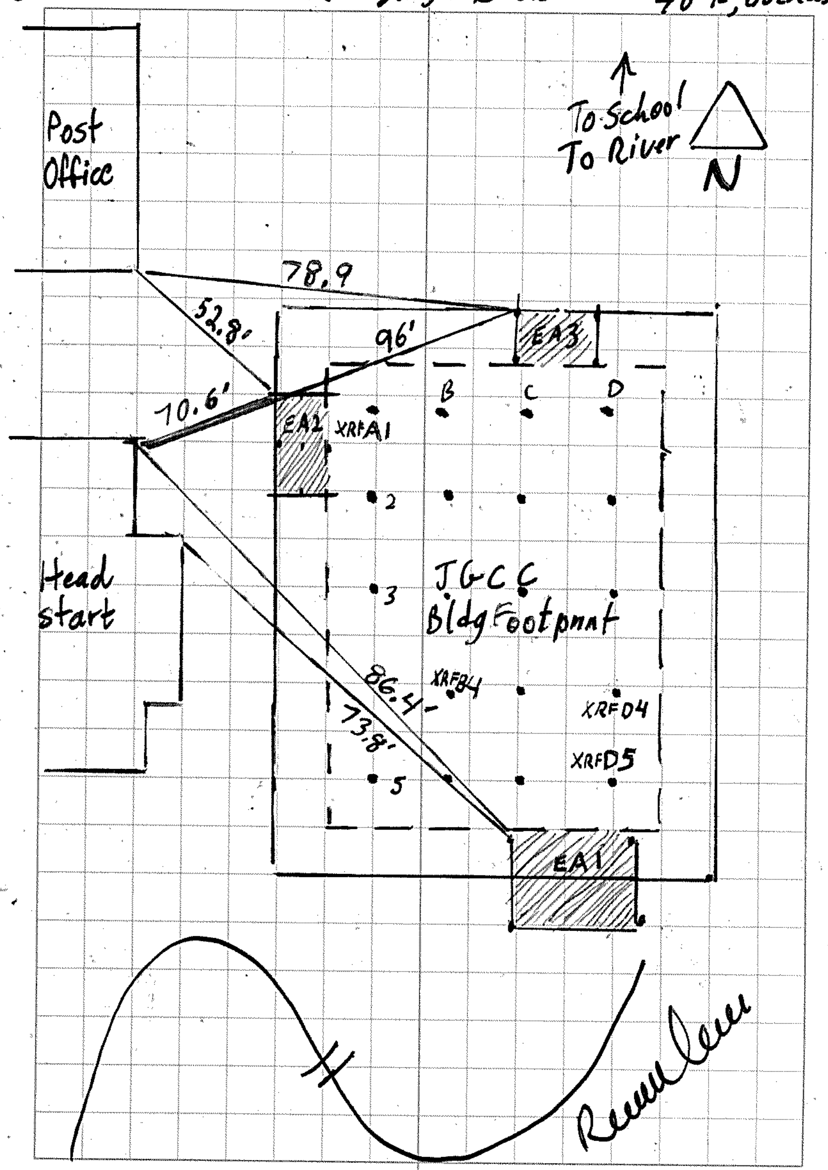
2030 finish collecting XRF screening sample, swingtie excavation pits

2115 lay out XRF screening samples to dry, will try to air dry soil in foil boats overnight

2150 End of day

R[illegible]

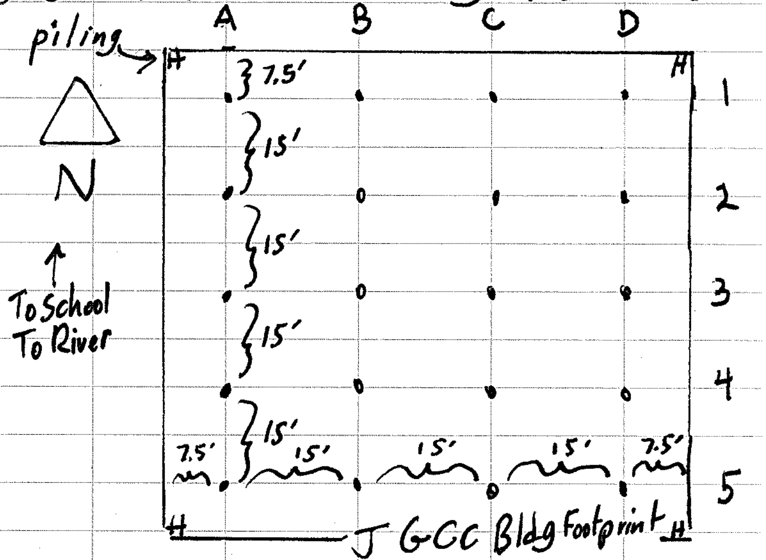
6-9-12 R. Bryan, L. Davis SW Wind 40°F, overcast



R[illegible]

6-10-12 R. Bryan, L. Davis ~~SW wind~~ 45°F, sun

0815 XRF screening locations



0830 download & name photos from previous 2 days, XRF soils mostly dry, toast for 10 mins each

0940 Performed system check on Niton XL3t -- system check ok

0945 Drying soils seems to take ~15 mins @ 350°F

1000 Check Niton XL3t against NIST 2780 standard & begin sieving the samples through 4-mesh,

6-10-12 R. Bryan, L. Davis 45°F, sun

then quartering, then crushing with mortar and pestle, then sieving through 60-mesh. NIST 2780 QC check results were out of acceptable ranges of accompanying certificate of calibration sheet. Performed QC check on SiO_2 (blank). QC check was ok.

10:30 Performed additional system check. System check OK. Performed QC check w/ NIST 2780 standard from SN37424 Niton XL3t rental kit. (same standard as above) & NIST 2780 standard from 420-014 XL3 mining kit. Both standards showed reference values below range for S, K, Ti, Pb. Performed QC check w/ Till-4 standard, Ti was below reference range. Due to elements being NON-COPC we will proceed w/ general screening protocal for contaminants of concern (metals).

System check & QC records

Sample ID	QC standard	result
#3 System check	N/A	OK

6-10-12 R. Bryan, L. Davis 45 °F, SUN

Sample ID	QC Standard	Results (cont')
#4 soils	NIST 2780	NOT OK, Sr, Ti, Pb
#5 soils	SiO_2 (Blank)	OK
#6 system ✓	N/A	OK
#7 system ✓	N/A	OK
#8 soils	NIST 2780	NOT OK
#9 soils	NIST 2780	NOT OK
#10 soils	NIST 2780 FROM soil kit	NOT OK
#11 soils	Till-4PP	NOT OK-Ti

1230 break for lunch

1300 meet Peter & Carl at site for transfer of supersacks to Kwethluk landfill, conduct onsite daily safety meeting

1330 Decide to use excavator for transfer of supersacs b/c backhoe not operating well & concerns regarding lifting sacs w/ backhoe. Peter + Carl left site + will return w/ excavator.

13:45 Peter + Carl return w/ excavator Load + chain EA-2 & move to South END OF Landfill.

14:20 Arrive at landfill & offload

[signature] 3 of 9

6-10-12 R. Bryan, L. Davis 45°F, SUN

EA-2 supersac.

14:30 Head back to site.

14:40 Arrive at site. Load EA3 onto 4-wheeler trailer for transport and use excavator to transport EA-1 AST super sac.

15:30 Arrive at landfill. Off load EA1-AST & EA3 at South end of landfill

Estimated volume of each sac:

EA1-AST ~ 0.75 y^3

EA2-SVOC 0.50

EA3-SVOC ~ 0.25

1645 Peter stopped by to talk about tomorrow's plan & the past week's work

Equipment time

Backhoe 3hrs total

Excavator 2hrs total

Peter's time

June 8	~~2hrs~~ (RB) 6 hrs
June 9	7 hrs
June 10	5 hrs
June 11	~ 2 hrs

Carl's time

[signature] 4 of 9

6-10-12 R. Bryan, L. Davis 45°F, sun

June 8 3 hrs
June 9 7 hrs
June 10 4 hrs

1715 Peter levels Excavation areas EA2 & EA3 back to original grade. EA1 was very irregular prior to excavation so plan not to re-grade.
Pack 32mm sample cups for XRF screening
1830 break for walk & dinner
2015 Begin XRF screening, System check ok

A1

Antimony (Sb)	52 ppm
Arsenic (As)	54 ppm
Chromium (Cr)	96 ppm
Cobalt (Co)	ND
Copper (Cu)	690 ppm
Nickel (Ni)	ND

A2

Sb	32 ppm
As	18 ppm
Cr	85 ppm
Co	ND
Cu	212 ppm
Ni	ND

A3

Sb	13 ppm
As	32 ppm
Cr	134 ppm
Co	ND
Cu	244 ppm
Ni	23 ppm

5 of 9

R [signature]

6-10-12 R. Bryan, L. Davis 45°F, Sun

A4

Sb	171 ppm
As	169 ppm
Cr	231 ppm
Co	ND
Cu	~~2~~ RB 2437 ppm
Ni	42 ppm

A5

Sb	1416 ppm
As	1451 ppm
Cr	1021 ppm
Co	ND
Cu	4921 ppm
Ni	64 ppm

B1

Sb	ND
As	198 ppm
Cr	304 ppm
Co	ND
Cu	654 ppm
Ni	ND

B2

Sb	53 ppm
As	227 ppm
~~Co~~ RB Cr	356 ppm
~~Cu~~ RB Co	ND
Cu	1766 ppm
Ni	31 ppm

B3

Sb	ND
As	194 ppm
Cr	313 ppm
Co	ND
Cu	1286 ppm
Ni	45 ppm

B4

Sb	22 ppm
As	48 ppm
Cr	203 ppm
Co	ND
Cu	438 ppm
Ni	29 ppm

R [signature]

6 of 9 RB

6-10-12 R. Bryan, L. Davis 45F, Sun

B5

Sb	70	ppm
As	521	ppm
Cr	362	ppm
Co	ND	
Cu	11.1K	ppm
Ni	ND	

C1

Sb	17	ppm
As	21	ppm
Cr	51	ppm
Co	ND	
Cu	262	ppm
Ni	36	ppm

C2 ~~Sb~~ (RB)

Sb	28	ppm
As	38	ppm
Cr	93	ppm
Co	ND	
Cu	349	ppm
Ni	41	ppm

C3

Sb	22	ppm
As	61	ppm
Cr	190	ppm
Co	ND	
Cu	437	ppm
Ni	57	ppm

C4

Sb	26	ppm
As	20	ppm
Cr	107	ppm
Co	ND	
Cu	972	ppm
Ni	25	ppm

C5

Sb	57	ppm
As	786	ppm
Cr	676	ppm
Co	ND	
Cu	3566	ppm
Ni	184	ppm

[illegible signature]

6-10-12 R. Bryan, L. Davis 45°F, sun

D1

Sb	11	ppm
As	9	ppm
Cr	95	ppm
Co	ND	
Cu	29	ppm
Ni	ND	

D2

Sb	15	ppm
As	11	ppm
Cr	90	ppm
Co	ND	
Cu	64	ppm
Ni	ND	

D3

Sb	ND	
~~Cr~~ RB As	31	ppm
~~Co~~ RB Cr	131	ppm
~~Cu~~ RB Co	ND	
~~Ni~~ RB Cu	308	ppm
Ni	38	ppm

D4

Sb	35	ppm
~~Cr~~ RB As	61	ppm
Cr	171	ppm
Co	ND	
Cu	2901	ppm
Ni	65	ppm

D5

Sb	181	ppm
As	299	ppm
Cr	61	ppm
Co	ND	
Cu	1126	ppm
Ni	ND	

2220 (RB)

~~2220~~ QC TILL-4PP, choose sample locations based on highest XRF screening result & on spatial

6-10-12 R. Bryan, L. Davis 40°F, sun

distribution

Time	Sample ID	Location
2301	12-JGCC-113-SO	XRF C1
2309	12-JGCC-114-SO	XRF D4
2312	12-JGCC-115-SO	XRF A1
2313	12-JGCC-116-SO	XRF C3
~~2314~~	~~12-JGCC-116-SO~~	~~XRF B2~~ RB
~~2315~~	~~12-JGCC-117-SO~~	~~XRF C5~~ RB
~~2316~~	~~12-JGCC-118-SO~~	~~XRF B4~~ RB
~~2317~~	~~12-JGCC-119-SO~~	~~XRF C5~~ RB
2314	12-JGCC-117-SO	XRF B2
2315	12-JGCC-118-SO	XRF C5
2316	12-JGCC-119-SO	XRF B4
2317	12-JGCC-120-SO	XRF C5 dup
2318	12-JGCC-121-SO	XRF B5
2319	12-JGCC-122-SO	XRF A5

2330 put away samples & pack up
2400 End of day

6-11-12 R. Bryan, L. Davis 45°F, sun

0815 pack up
1030 arrive in Bethel
1100 complete chain of custody, ship cargo

OASIS-ERM field cell phone 907-328-8584

John Carnahan - 907-451-2166

Melinda Brunner - 907-451-5174

Dennis Harwood - 907-269-7547

Corey ~~Ha~~ Karcz - 907-748-7770
(Site Superintendent) GCI 907-545-0350

→ Field Cell Phone 907-328-8584

Max Schwenne - 907-317-3788

Kwethluk School - 907-757-6014

Darrell Richard home - 757-6006
(Principal)

Bentley's B&B 907-543-3552

Chuck Willard 907-543-3110
(Public Works)

Richard L_Long@yahoo.com 757-6030
↳ asst. IGAP Coord

Clinic - 757-6627 or 6670

Peter Jackson 757-2304 cell

KTRC (Kwethluk Tribal Resident Council)
757-6063

David Epchook (City Manager)
757-6022

Ira - school maintenance 757-2157

Lena ~~Andrew~~ Jackson KTRC

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Project Kwethluk Brownfield Cleanup

CONTENTS

55°F, Cloudy

Adams
Rhodes

Kwethluk - JGCC 9-10-12

1345 Arrive in Kwethluk, head to School. Speak w/ Darrel Richard re: lodging, etc. Will stay and Work in the robotics room.

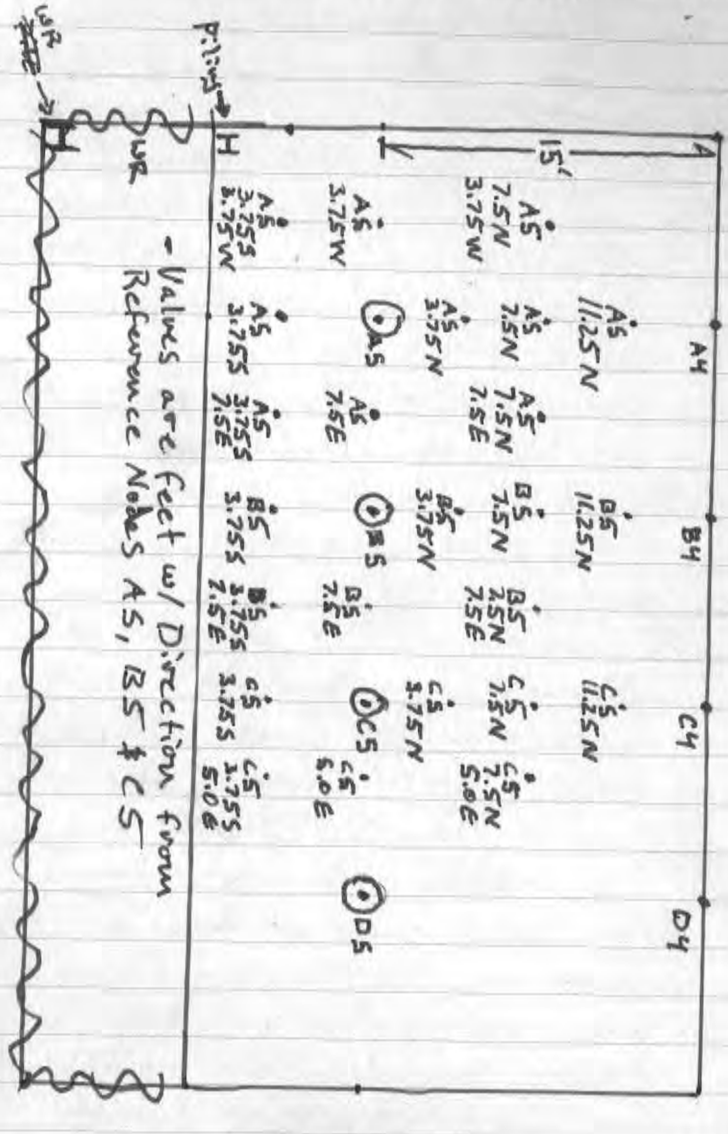
1530 Locate KTRC in attempt to obtain equip. Speak w/ Peter Jackson & Max angellan about work. Find that gear is at post office. Try to get Exc. or backhoe lined up.

1600 obtain gear & prep for XRF Screening Sample collection.

1700 Arrive @ JGCC footprint & Begin Laying out Grid w/ New Screening locations, Concentrating on "Hot" SW Corner. Swing tie locate A5, B5 & C5 and distribute 24 screening locations surrounding "Hot" Nodes. Mark locations w/ pin flags & label points. Collect samples using trowel, place in Ziplocks See next page for layout.

(WR) Will Rhodes

9-10-12 Kwethluk JGCC



(WR) Willi Rhodes (2/2)

40°F, Cloudy

Adams
Rhodes

Kwethluk JGCC 9-11-12

0630 Begin Heating Screening samples in toaster oven & on hot plates, Sieving & Crushing.

0830 Perform system check & Run Standard 180-436 RCRA As, Ba, Cd, Cr, Pb, Se, Ag. Standard results within acceptable range.

A5 / 3.75' S / 3.75' W

Sb: 27	Co: ND
As: 43	Cu: 57
Cr: 175	Ni: ND

A5 / 3.75' W

Sb: 87	Co: ND
As: 191	Cu: 83
Cr: 87	Ni: ND

A5 / 7.5' N / 3.75' W

Sb: 113	Co: ND
As: 42	Cu: 116
Cr: 68	Ni: ND

A5 / 3.75 S

Sb: ND	Co: ND
As: 27	Cu: 17
Cr: 115	Ni: ND

(WR) Willi Rhodes (1/6)

50°F, cloudy

9-11-12 Kwethluk JGCC

Adams
Rhodes

A5 / 3.75' N

Sb: 43	Co: ND
As: 139	Cu: 125
Cr: 205	Ni: ND

A5 / 7.5' N

Sb: 13	Co: ND
As: 45	Cu: 96
Cr: 127	Ni: ND

A5 / 11.25' N

Sb: 23	Co: ND
As: 22	Cu: 48
Cr: 95	Ni: ND

A5 / 3.75' S / 7.5' E

Sb: 12	Co: ND
As: 254	Cu: 256
Cr: 421	Ni: ND

A5 / 7.5' E

Sb: ND	Co: ND
As: 81	Cu: 27
Cr: 145	Ni: ND

A5 / 7.5' N / 7.5' E

Sb: 11	Co: ND
As: 42	Cu: 65
Cr: 103	Ni: ND

 Willie Rhodes WR

55°F, cloudy

Adams
Rhodes

Kwethluk JGCC 9-11-12

B5 / 3.75' S

Sb: 17	Co: ND
As: 878	Cu: 1967
Cr: 2358	Ni: ND

B5 / ~~3.75' N~~ 11.25' N

Sb: 69	Co: ND
As: 71	Cu: 55
Cr: 144	Ni: ND

B5 / 3.75' N

Sb: 17	Co: ND
As: 166	Cu: 344
Cr: 521	Ni: ND

B5 / 7.5' N

Sb: 20	Co: ND
As: 91	Cu: 119
Cr: 178	Ni: ND

B5 / 3.75' S / 7.5' E

Sb: ND	Co: ND
As: 569	Cu: 914
Cr: 2238	Ni: ND

B5 / 7.5' E

Sb: 11	Co: ND
As: 84	Cu: 197
Cr: 227	Ni: ND

WR Willie Rhodes

55°F, cloudy

9-11-12 Kwethluk JGCC

Adams
Rhodes

B5/7.5' N / 7.5' E

Sb: 10	Co: ND
As: 42	Cu: 42
Cr: 184	Ni: ND

C5 / 3.75'S

Sb: N	Co: ND
As: 15	Cu: ND
Cr: 103	Ni: ND

C5 / 3.75'N

Sb: 14	Co: ND
As: 2497	Cu: 3334
Cr: 2373	Ni: ND

C5 / 7.5' N

Sb: 17	Co: ND
As: 44	Cu: 145
Cr: 145	Ni: ND

C5 / 11.25' N

Sb: ND	Co: ND
As: ~~44~~ WR 18	Cu: 49
Cr: ~~145~~ WR 108	Ni: ND

C5 / 3.75 S / 5' E

Sb ND	Co ND
As 42	Cu 29
Cr 110	Ni ND

[signature]

WR

55°F, Cloudy

Adams
Rhodes

Kwethlok JGCC

9-11-12

C5 / 5.0' E

Sb: ND	Co: ND
As: 397	Cu: 663
Cr: 1434	Ni: ND

C5 / 7.5' N / 5.0' E

Sb: ND	Co: ND
As: 45	Cu: 447
Cr: 127	Ni: ND

~~06~~1815 Arrive @ "Material source" (A) West of dump. Will collect 5 samples / various locations. Will try to collect waypoints if fix is obtainable with Trimble.

1820 Collect sample @ NW end
ID: 12-Source A-01 @ 1820, 9-11-12

1825 Collect sample SW of 01
ID: 12-SourceA-02 @ 1825, 9-11-12

1830 Collect sample S of 02
ID: 12-SourceA-03 @ 1830, 9-11-12

1840 Collect Sample S of 03
ID: 12-SourceA-04 @ 1840, 9-11-12

1845 collect Sample E of 02 in central portion of pit.
ID: 12-SourceA-05 @ 1845, 9-11-12

WR

[signature]

55°F, Cloudy

9-11-12 Kwethluk JGCC Adams Rhodes

1900 Collect sample @ "Source area" (B). Not sure if this a legitamate Material source.
ID: 12- Source B-06 @ 1900,
- Will try to talk to Max Angelkan again to verify "Material Source area" (B). May be able to revisit the location
1945 Attempt to pick-up super sacks @ KTRC connex w/ Greg (operator - arrived @ 1400). Only person w/key has gone Hunting for the evening, Should be able to pick-up @ 0900 tomorrow.
- Also, Excavator was in use today until 2000 on another project precluding our start on the excavation.
2015 Eat dinner, end of day

[signature]

4/6 WR

45°F, Cloudy

Adams Rhodes Kwethluk JGCC 9-12-12

0700 layout field screen data on scratch paper to get sense of "Hot areas". To be conservative we will excavate ~6" to 8" accross entire area (15' x 45').
0830 on-site to layout area of exc. Warm up excavator. Waiting to get supersacks from locked connex. For super sack layout see next page
0930 Begin filling Super sack-1 (SS-1)
Collect Composite TCLP
ID: 12-SS-1 @ 0945
Collect confirmation in center of SS-1. All samples collected in center of SS area
ID: 12-JGCC-SS-1 @ 0950
1000 Begin filling SS-2
Collect TCLP
ID: 12-SS-2 @ 1010
Collect Confirmation
ID: 12-JGCC-SS-2 @ 1020
1030 Wait for fuel
1100 Begin filling SS-3
Collect TCLP
ID: 12-SS-3 @ 1105

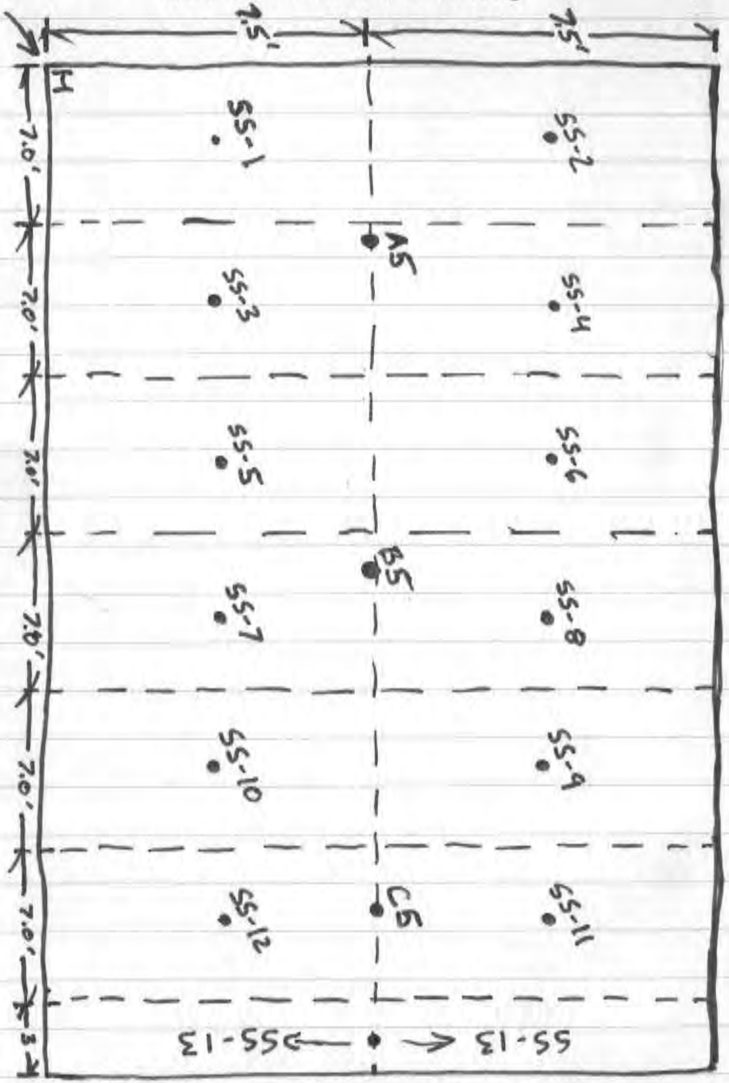
* Take Duplicate @ SS-1
ID: 12-JGCC-SS-14 @ 1615

WR [signature] 1/6

50°F, Cloudy

9-12-12 Kwethluk JGCC Adams Rhodes

*SS denotes super-sack



- Super sack excavation Site plan

WR — Dill Rhodes — 2/6

Adams Rhodes

50°F, Cloudy

Kwethluk JGCC 9-12-12

1100 Cont. filling SS-3
Collect Confirmation
ID: 12-JGCC-SS-3 @ 1120

1125 Begin filling SS-4
Collect Composite TCLP
ID: ~~12-JG~~ WR 12-SS-4 @ 1135
Collect Confirmation
ID: 12-JGCC-SS-4 @ 1140

1140 Begin filling SS-5
Collect TCLP
ID: 12-SS-5 @ 1145
Collect ~~composite~~ WR Confirmation
ID: 12-JGCC-SS-5 @ 1155

* Hit wood cribbing foundation Block for piling South of B5. Talk w/ Lisa about proceeding.

1215 Begin filling SS-6
Collect TCLP
ID: 12-SS-6 @ 1220
Collect Confirmation
ID: 12-JGCC-SS-6 @ 1230

1340 Begin filling SS-7
Collect TCLP
ID: 12-SS-7 @ 1345

WR Dillion Rhodes 3/6

1340 Continue @ SS-7
Collect confirmation
ID: 12-JGCC-SS-7 @ 1350
1400 Begin filling SS-8
Collect composite TCLP
ID: 12-SS-8 @ 1405
Collect confirmation
ID: 12-JGCC-SS-8 @ 1415
1425 Begin filling SS-9
Collect TCLP
ID: 12-SS-9 @ 1430
Collect Confirmation
ID: 12-JGCC-SS-9 @ 1440
1450 Begin filling SS-10
Collect TCLP
ID: 12-SS-10 @ 1455
Collect Confirmation
ID: 12-JGCC-SS-10 @ 1450
1505 Begin filling SS-11
Collect TCLP
ID: 12-SS-~~1?~~ @ 1510
Collect Confirmation
ID: 12-JGCC-SS-~~10~~ WR 11
@ 1515

1530 Begin filling SS-12
Collect TCLP
ID: 12-SS-12 @ 1535
Collect Confirmation
ID: 12-JGCC-SS-12 @ 1545
1550 Begin filling SS-13
Collect TCLP
ID: 12-SS-13 @ 1555
Collect confirmation
ID: 12-JGCC-SS-13 @ 1600
1630 Continue cleaning up around site – grading, closing super sack covers, Haz waste labels etc.
1745 get cargo to Daniel Jackson for shipping.
1815 head back to site to take final photos. Head to Room to label & pack samples.

– Notes –

- 13 Super sacks w/ soil and 2 sup. sacks w/ Styrofoam
- Remove 2 post & pad footers @ south perimeter of site.

9-12-12 55°F, Cloudy
Kwethluk JGCC
Adams
Rhodes

1815 Continued
- Will Store remaining Super sacks @ KTRC Connex.
- OVK will like to know results ASAP - Want to move Sup. Sacks to dump if below toxicity Characteristic.

2030 Complete sample labeling, COC, etc. End of day.

[signature]

6/6 DWR

Adams
Rhodes
Kwethluk JGCC 9-13-12

0800 Completed packing, find that flight is delayed due to dense fog.

1430 Eventually fly out of Kwethluk.

[signature]

DWR 1/1

APPENDIX C

Photographs

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PHOTOGRAPH 1: DISMANTLING THE FRAME AND STRUCTURE OF THE JGCC BUILDING (LOOKING SOUTH).

PHOTOGRAPH 2: STAGING AND CRUSHING METAL DEBRIS FOR TRANSPORT TO BETHEL LANDFILL (LOOKING SOUTHEAST).

PHOTOGRAPH 3: DUMP TRUCK LOADED AND READY TO HAUL ACROSS ICE ROAD TO BETHEL LANDFILL (LOOKING EAST)

PHOTOGRAPH 4: CUTTING BEAMS AWAY FROM STEEL PILES (LOOKING SOUTH).

PHOTOGRAPH 5: CUTTING VERTICAL PILES BELOW GRADE (LOOKING WEST)

PHOTOGRAPH 6: DUMPING DEBRIS/SOIL AT KWETHLUK DUMP (LOOKING SOUTH).

PHOTOGRAPH 7: BUILDING FOOTPRINT AFTER SPRING FLOODING AND BEFORE DEBRIS CLEANUP (LOOKING SOUTH).

PHOTOGRAPH 8: BUILDING FOOTPRINT AFTER METAL CLEANUP (LOOKING NORTH).

PHOTOGRAPH 9: DRYING SOIL FOR XRF ANALYSIS.

PHOTOGRAPH 10: SIEVED AND SAMPLED SOIL FOR XRF ANALYSIS.

PHOTOGRAPH 11: EXCAVATION AREA 1 – JUNE 2012 (LOOKING NORTH)

PHOTOGRAPH 12: EXCAVATION AREA 2 WITH BULK SACK – JUNE 2012 (LOOKING SOUTH).

PHOTOGRAPH 13: EXCAVATION AREA 3 WITH BULK SACK (LOOKING EAST).

PHOTOGRAPH 14: JUNE 2012 BULK SACKS STORED INSIDE SOUTH FENCE LINE OF KWETHLUK DUMP (LOOKING NORTHEAST).

PHOTOGRAPH 15: SEPTEMBER 2012 EXCAVATION AROUND LOCATIONS A5, B5, AND C5 (LOOKING EAST).

PHOTOGRAPH 16: STAGING LOCATION FOR BULK SACKS AND PILING PENDING ANALYTICAL RESULTS (LOOKING SOUTHWEST).

PHOTOGRAPH 17: 1-CY BULK SACKS PLACED INSIDE THE WEST FENCE LINE OF THE KWETHLUK DUMP (LOOKING SOUTHWEST).

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APPENDIX D

Bulk Sack Disposal Approval Letter

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THE STATE of ALASKA

GOVERNOR SEAN PARNELL

Department of Environmental Conservation

DIVISION OF ENVIRONMENTAL HEALTH
Solid Waste Program

555 Cordova Street
Anchorage, Alaska 99501
Main: 907.269.7642
fax: 907.269.7600

May 31, 2013

Certified Mail #7012 1010 0003 0389 6148
Return Receipt Requested

John Carnahan
Alaska Department of Environmental Conservation
Contaminated Sites – Reuse & Redevelopment Program
610 University Avenue
Fairbanks, AK 99709

Subject: Polluted Soil Disposal from the Former Joseph Guy Community Center Cleanup - Kwethluk, Alaska

Dear Mr. Carnahan:

The Alaska Department of Environmental Conservation (ADEC) has reviewed the proposal, dated May 20, 2013, for the disposal of 13 super sacs of polluted soil, generated by cleanup of the Former Joseph Guy Community Center, in the Kwethluk Landfill. The plan was submitted by Environmental Resources Management, on behalf of the ADEC Brownsfield Program. Title 18, Chapter 60, Part 025 of the Alaska Administrative Code (18 AAC 60.025) allows the disposal of polluted soil in a landfill when it is demonstrated that the contaminants in the soil will not migrate from that landfill or cause a threat to the public or environment.

Based on the TCLP sample results and plans for moving and disposing the soil at the landfill, it has been demonstrated that the contaminants in the 13 super sacs will not likely pose a threat to the environment or negatively impact surface water. To prevent any future impacts and further reduce the contact with the public and the environment, ADEC recommends that the super sacs containing polluted soil be covered with a minimum of 6 inches of non-polluted cover material at the earliest opportunity. **ADEC approves the one time disposal of polluted soil generated by the Former Joseph Guy Community Center Cleanup at the Kwethluk landfill as described in the proposal and work plan.**

This authorization is specific to 13 bags of material staged in super sacs from the Former Joseph Guy Community Center Cleanup intended for disposal at the Kwethluk Landfill and does not represent a general ADEC policy. Similarly, the conditions reflected in this authorization are site-specific conditions applicable only to this project.

Any person who disagrees with this decision may request an adjudicatory hearing in accordance with 18 AAC 15.195 - 18 AAC 15.340 or an informal review by the Division Director in accordance with 18 AAC 15.185. **Informal review requests** must be delivered to the Division Director, Alaska Department of Environmental Conservation, 555 Cordova Street, Anchorage, AK 99501 within 15 days of the permit decision. **Adjudicatory hearing requests** must be delivered to the Commissioner of the Department of Environmental Conservation, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99801, within 30 days of the permit decision. If a hearing is not requested within 30 days, the right to appeal is waived. More information regarding submitting a request for an informal review or adjudicatory hearing may be found at www.dec.state.ak.us/commish/ReviewGuidance.htm. Even if an adjudicatory hearing has been requested and granted, all conditions remain in effect unless a stay has been granted.

Please contact Doug Huntman at (907) 269-7642 or by email at Doug.Huntman@Alaska.gov if you have any comments or questions.

Sincerely,

Lori Aldrich
Solid Waste Program Coordinator

Ecc: Lisa Baughman, PND Engineers, Inc
Melinda Brunner, ADEC Brownsfield Program

APPENDIX E

Project Laboratory Analytical Results

(Electronically Submitted)

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APPENDIX F

Quality Assurance Review and Laboratory Data Checklists

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1. QUALITY ASSURANCE REVIEW

Laboratory QA/QC data associated with the analysis of project samples was reviewed to evaluate the integrity of the analytical data generated during and the June and September 2012 Joseph Guy Community Center sampling event.

Soil samples were analyzed by TestAmerica in Anchorage, Alaska for the following analyses:

- Gasoline-Range Organics (GRO), Alaska (AK) Method 101;
- Diesel-Range Organics (DRO), AK 102;
- Benzene, toluene, ethylbenzene and total xylenes (BTEX), United Stated Environmental Protection Agency (EPA) Method 8021B;
- Metals, EPA Method 6020;
- Metals, EPA Method 6010B; and
- Polynuclear Aromatic Hydrocarbons (PAH); EPA Method 8270C.

TestAmerica reported results in two sample delivery groups (SDG), AVF0030 and AVI0027.

In SDG AVF0030, samples were subcontracted from TestAmerica in Anchorage, AK to TestAmerica in Denver, Colorado for Method 8270C and percent moisture.

In SDG AVI0027, samples were subcontracted from TestAmerica in Anchorage, AK to TestAmeric in Seattle, Washington for Methods 6010B and 6020.

The data usability review was performed using the United States EPA National Functional Guidelines for Superfund Organic Methods Data Review (EPA 2008) and EPA National Functional Guidelines for Superfund Inorganic Methods Data Review (EPA 2010) as a reference for qualification.

A completeness check was performed by the ERM Project Chemist. The Alaska Department of Environmental Conservation (ADEC) laboratory data checklists were completed for this project (ADEC 2010). This data review focuses on criteria for QA/QC parameters and their effect on the quality of data and usability.

All results are considered usable for project objectives. Some results are considered estimated due to quality control criteria not being met. The completeness for this project is 100%. The details of this review and qualification of the data are summarized in the following sections.

1.1. Chain of Custody, Sample Receipt and Laboratory Sample Preparation

Sample coolers were delivered with custody seals in place, unbroken and intact. All sample containers in the sample coolers were received at the laboratory intact, with proper documentation, and within the specified temperature range of 4°C ± 2°C.

1.2. Holding Times

All samples were extracted, digested, and/or analyzed within the holding time criteria for the applicable analytical methods and in accordance with the work plan specifications.

1.3. Field QA/QC

Field QA/QC protocols are designed to monitor for possible contamination during collection and transport of samples collected in the field. Collection and analysis of field duplicates also facilitates an evaluation of precision that takes into account potential variables associated with sampling procedures and laboratory analyses. For this project, trip blanks and field duplicates were submitted for analysis.

1.3.1. Trip Blanks

A trip blank was prepared by the laboratory, shipped to the site with the empty sample bottles/containers, stored with sample containers during the field event, and transported with the collected samples back to the laboratory for analysis. Trip blanks accompanied the sample shipments. The trip blanks were placed the same cooler as the other project volatile organics samples (GRO/BTEX). All trip blanks were non-detect (ND) for all analytes, with the following exceptions.

- AVF0030: GRO and toluene were present in the trip blank. GRO and toluene were also present in the method blank. Results in the trip blank were qualified as not detected due to method blank contamination (UB).

1.3.2. Duplicates

Out of 51 samples submitted, 3 field duplicate sample sets were collected. The frequency of field duplicate collection did not meet the 10% frequency requirements specified in the work plan. When analytes were present in concentrations below the MDL in one or both samples, no valid comparison could be made.

- AVF0030: Three field duplicates were submitted – primary 12-JGCC-102-SO with duplicate 12-JGCC-103-SO; primary 12-JGCC-109-SO with duplicate 12-JGCC-110-SO; and primary 12-JGCC-118-SO with duplicate 12-JGCC-120-SO. Relative percent difference (RPD) between primary and duplicate met ADEC limits of <50% in soil samples with one exception. The RPD in nickel analysis exceeded the limits at 129% and results were qualified as estimated (JD).

- AVI0027: The field team incorrectly requested total metals analysis for duplicate 12-JGCC-SS-14, while the parent sample, 12-JGCC-SS-1 was analyzed for TCLP metals. Therefore, there are no acceptable duplicate results for this SDG.

1.4. Laboratory QA/QC

1.4.1. Method Blanks

Method blanks were analyzed concurrent with a batch of 20 or fewer primary samples for each of the analytical procedures performed for this project. Method blanks were analyzed at the required frequency and target analytes were not detected (ND) in the blanks at concentrations above the analytical method detection limit, with exceptions listed below.

- AVF0030: GRO and toluene were present in the method blank. The associated results included 12-JGCC-109-SO, 12-JGCC-101-TB, 12-JGCC-110-SO, 12-JGCC-111-SO, and 12-JGCC-112-SO. Positive results were qualified as not detected due to blank contamination (UB). Not detected results did not require qualification. Antimony, copper and nickel were detected in the method blank. The associated samples included 12-JGCC-113-SO, 12-JGCC-114-SO, 12-JGCC-115-SO, 12-JGCC-116-SO, 12-JGCC-117-SO, 12-JGCC-118-SO, 12-JGCC-119-SO, 12-JGCC-120-SO, 12-JGCC-121-SO, and 12-JGCC-122-SO. Sample results greater than the reporting limit did not require qualification. Sample results that were greater than or equal to the MDL but less than the reporting limit, were qualified as not detected (UB). Dimethyl phthalate and bis(2-ethyl hexyl)phthalate were present in the method blank. Associated samples included 12-JGCC-102-SO, 12-JGCC-103-SO, 12-JGCC-104-SO, 12-JGCC-105-SO, 12-JGCC-106-SO, 12-JGCC-107-SO, 12-JGCC-108-SO, 12-JGCC-109-SO, 12-JGCC-110-SO, 12-JGCC-111-SO, and 12-JGCC-112-SO. Dimethyl phthalate results in samples where the result was less than the reporting limit were qualified as not detected (UB). Dimethyl phthalate results equal to or greater than the reporting limit and the blank contamination did not require qualification. Positive bis(2-ethyl hexyl)phthalate results in all samples were qualified as not detected (UB) due to method blank contamination.

1.4.2. Laboratory Duplicate Samples

Two sample aliquots of the same sample are taken in the analytical laboratory and analyzed separately with identical procedures. Analyses of the sample and duplicate give a measure of the precision associated with laboratory procedures but not with sample collection, preservation or storage procedures. Precision is expressed as Relative Percent Difference (RPD). All laboratory duplicates met QC goals in all SDGs, with any exceptions noted below.

- AVF0030: The laboratory duplicate RPDs in DRO and toluene analysis exceeded the quality control limits. The associated result was 12-JGCC-109-SO and results were qualified as estimated (J-LD), unless otherwise qualified as not detected (UB).

1.4.3. *Laboratory Control Samples*

Analysis of laboratory control samples (LCS) and LCS duplicates (LCSD) for target analytes met laboratory and project QC goals for target analytes.

1.4.4. *Matrix Spikes*

Extra volumes of primary field samples were collected and submitted to the laboratory for matrix spike/matrix spike duplicate (MS/MSD) analyses. Matrix spikes have a known quantity of target analytes are added (spiked) to field samples. Spike recoveries are calculated and are used to evaluate both site conditions and laboratory quality control. MS/MSD percent recoveries (%R) and relative percent differences (RPDs) were within limits, with the following exceptions.

- AVF0030: The MS/MSD %R was low in antimony and high in copper. The MS %R was outside the limits in arsenic, chromium and cobalt. All associated LCS/LCSD %R were within limits; therefore, no data required qualification.

1.4.5. *Surrogates*

System Monitoring Compounds (Surrogates) are specified for organic chromatographic analytical procedures. Surrogates are compounds similar to target analytes. These compounds are added to each sample prior to collection or extraction. Subsequent surrogate recovery indicates overall method performance. Surrogate recoveries were within prescribed control limits for all primary samples, LCS/LCSD and MS/MSD.

1.4.6. *Laboratory Detection Limits (Sensitivity)*

In accordance with reporting conventions, reported positive results below the sample specific reporting limit (RL) and above the method detection limit (adjusted for sample volume and dilution factors) should be considered estimated (J).

1.5. Precision and Accuracy

Precision criteria monitor analytical reproducibility. Accuracy criteria monitor agreement of measured results with “true values” established by spiking applicable samples with a known quantity of analyte or surrogate. Precision and accuracy were evaluated by comparing LCS/LCSDs and MS/MSDs for this project. Recoveries and RPDs for all LCS/LSCD and MS/MSD samples were within required limits, with any exceptions noted in previous sections.

1.5.1. *Completeness*

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). The overall project completeness goal is 90%:

$$\% \text{ completeness} = \frac{\text{number of valid (i.e., non-R flagged) results}}{\text{number of possible results}}$$

All requested analyses were performed in accordance with work plan specifications. No results were qualified as rejected. Some results are considered estimated due to quality control criteria not being met. The completeness for this project is 100%.

1.6. Data Summary

In general, the overall quality of the data was acceptable. The EPA National Functional Guidelines (EPA 2008; 2010) were used to evaluate the acceptability of the data. Overall, data quality met the DQOs established in the work plan for this project. The associated sample results are usable for the purpose of this investigation.

2. REFERENCES

ADEC. 2009. Technical Memorandum: Environmental Laboratory Data and Quality Assurance Requirements. March.

ADEC. 2010. Laboratory Data Review Checklist. January.

ADEC. 2012. Technical Memorandum: Guidelines for Data Reporting, Data Reduction, and Treatment of Non-detect Values. June.

EPA. 2008. Contract Laboratory Program National Functional Guidelines for Organic Superfund Data Review. June. (EPA 540-R-08-01).

EPA. 2010. Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review. January. (EPA-540-R-10-011).

OASIS. 2012. Pad 13 Work Plan. February 23.

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APPENDIX G

Conceptual Site Model

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HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Joseph Guy Community Center
Brownfield Cleanup Action

Completed By: Lisa Nicholson
Date Completed: 5/3/2013

***Instructions**: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.*

(1) *Check the media that could be directly affected by the release.*

(2) *For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.*

Media / Transport Mechanisms

[✓] Surface Soil (0-2 ft bgs)
- Direct release to surface soil → check soil
- [ ] Migration to subsurface → check soil
- [ ] Migration to groundwater → check groundwater
- [ ] Volatilization → check air
- [ ] Runoff or erosion → check surface water
- [ ] Uptake by plants or animals → check biota
- [ ] Other (list):__________

[ ] Subsurface Soil (2-15 ft bgs)
- Direct release to subsurface soil → check soil
- [ ] Migration to groundwater → check groundwater
- [ ] Volatilization → check air
- [ ] Uptake by plants or animals → check biota
- [ ] Other (list):__________

[ ] Ground-water
- Direct release to groundwater → check groundwater
- [ ] Volatilization → check air
- [ ] Flow to surface water body → check surface water
- [ ] Flow to sediment → check sediment
- [ ] Uptake by plants or animals → check biota
- [ ] Other (list):__________

[ ] Surface Water
- Direct release to surface water → check surface water
- [ ] Volatilization → check air
- [ ] Sedimentation → check sediment
- [ ] Uptake by plants or animals → check biota
- [ ] Other (list):__________

[ ] Sediment
- Direct release to sediment → check sediment
- [ ] Resuspension, runoff, or erosion → check surface water
- [ ] Uptake by plants or animals → check biota
- [ ] Other (list):__________

(3) *Check all exposure media identified in (2).*

(4) *Check all pathways that could be complete. The pathways identified in this column **must** agree with Sections 2 and 3 of the Human Health CSM Scoping Form.*

(5) *Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.*

Exposure Media / Exposure Pathway/Route / Current & Future Receptors

Exposure Media	Exposure Pathway/Route	Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
[✓] soil	[✓] Incidental Soil Ingestion		F	C/F	C/F	C/F	C/F	
	[✓] Dermal Absorption of Contaminants from Soil		F	C/F	C/F	C/F	C/F	
	[✓] Inhalation of Fugitive Dust		F	C/F	C/F	C/F	C/F	
[ ] groundwater	[ ] Ingestion of Groundwater							
	[ ] Dermal Absorption of Contaminants in Groundwater							
	[ ] Inhalation of Volatile Compounds in Tap Water							
[ ] air	[ ] Inhalation of Outdoor Air							
	[ ] Inhalation of Indoor Air							
	[ ] Inhalation of Fugitive Dust							
[ ] surface water	[ ] Ingestion of Surface Water							
	[ ] Dermal Absorption of Contaminants in Surface Water							
	[ ] Inhalation of Volatile Compounds in Tap Water							
[ ] sediment	[ ] Direct Contact with Sediment							
[ ] biota	[ ] Ingestion of Wild or Farmed Foods							

Revised, 10/01/2010

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Print Form

Human Health Conceptual Site Model
Scoping Form

Site Name: Joseph Guy Community Center, Kwethluk, Alaska

File Number: 2424.57.001

Completed by: Lisa Nicholson

Introduction
The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

General Instructions: Follow the italicized instructions in each section below.

1. General Information:

Sources *(check potential sources at the site)*

- ☐ USTs
- ☒ ASTs
- ☐ Dispensers/fuel loading racks
- ☐ Drums
- ☐ Vehicles
- ☐ Landfills
- ☐ Transformers
- ☒ Other: Burned building debris

Release Mechanisms *(check potential release mechanisms at the site)*

- ☐ Spills
- ☒ Leaks
- ☐ Direct discharge
- ☒ Burning
- ☐ Other:

Impacted Media *(check potentially-impacted media at the site)*

- ☒ Surface soil (0-2 feet bgs*)
- ☒ Subsurface soil (>2 feet bgs)
- ☐ Air
- ☐ Sediment
- ☐ Groundwater
- ☐ Surface water
- ☐ Biota
- ☐ Other:

Receptors *(check receptors that could be affected by contamination at the site)*

- ☐ Residents (adult or child)
- ☒ Commercial or industrial worker
- ☒ Construction worker
- ☐ Subsistence harvester (i.e. gathers wild foods)
- ☐ Subsistence consumer (i.e. eats wild foods)
- ☒ Site visitor
- ☒ Trespasser
- ☒ Recreational user
- ☐ Farmer
- ☐ Other:

* bgs - below ground surface

2. **Exposure Pathways:** *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.) ☒

If the box is checked, label this pathway complete: Complete

Comments:

Surface soil may contain the arsenic concentrations that exceed cleanup criteria

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.) ☒

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)? ☒

If both boxes are checked, label this pathway complete: Complete

Comments:

Soil contains arsenic, a contaminant that can permeate the skin.

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future? ☐

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the ground-water is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350. ☒

If both boxes are checked, label this pathway complete: Incomplete

Comments:

SPLP and TCLP results suggest that contaminants are not likely to migrate to groundwater.

2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future? ☐

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities). ☒

If both boxes are checked, label this pathway complete: Incomplete

Comments:

SPLP and TCLP samples indicate that contaminants are not likely to migrate to surface water.

3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods? ☐

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)? ☒

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.) ☒

If all of the boxes are checked, label this pathway complete: Incomplete

Comments:

The site would not likely be used for subsistence hunting or harvesting. A new building is being planned for the site.

c) Inhalation-

1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.) ☒

Are the contaminants in soil volatile (see Appendix D in the guidance document)? ☐

If both boxes are checked, label this pathway complete: Incomplete

Comments:

No volatile contaminants were detected in the samples from the site.

2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminted soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures) ☒

Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)? ☐

If both boxes are checked, label this pathway complete: Incomplete

Comments:

No volatile contaminants were detected in the samples from the site.

3. **Additional Exposure Pathways:** *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

Dermal Exposure to Contaminants in Groundwater and Surface Water

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

Inhalation of Volatile Compounds in Tap Water

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM_{10}). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.
- Chromium is present in soil that can be dispersed as dust particles of any size.

Generally, DEC direct contact soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because it is assumed most dust particles are incidentally ingested instead of inhaled to the lower lungs. The inhalation pathway only needs to be evaluated when very small dust particles are present (e.g., along a dirt roadway or where dusts are a nuisance). This is not true in the case of chromium. Site specific cleanup levels will need to be calculated in the event that inhalation of dust containing chromium is a complete pathway at a site.

Check the box if further evaluation of this pathway is needed: ☒

Comments:

Soil remaining in footprint of building contains up to 33 mg/kg chromium.

Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

4. Other Comments *(Provide other comments as necessary to support the information provided in this form.)*

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APPENDIX H

Response to Comments

(Electronically Submitted)

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