2012 Final

# Former Utica Mine Camp Site

# Remedial Investigation

# and

# Site Cleanup Report

WHPacific

300 W 31st Ave

Anchorage, Alaska 99503

## TABLE of CONTENTS

## TABLES

## FIGURES



## APPENDICIES

## LIST of ACRONYMS and ABBREVIATIONS

| | |
|---|---|
| AAC | Alaska Administrative Code |
| ADEC | Alaska Department of Environmental Conservation |
| AOC | Area of Concern |
| bgs | Below Ground Surface |
| BTEX | benzene, toluene, ethylbenzene, and xylenes |
| CFR | code of federal regulations |
| COC | contaminant of concern |
| COPC | contaminant of potential concern |
| CY | Cubic Yard |
| DRO | Diesel Range Organic Compounds |
| EPA | Environmental Protection Agency |
| ESA | Environmental Site Assessment |
| GPS | Global Positioning System |
| GRO | Gasoline Range Organic Compounds |
| mg/kg | Milligrams per kilogram |
| mil | millimeter |
| MS/MSD | matrix spike and matrix spike duplicate |
| MTGW | 18 AAC 75 Method Two Migration to Groundwater Cleanup Level |
| NRC | NANA Regional Corporation |
| PAH | Polycyclic Aromatic Hydrocarbon |
| PID | Photo Ionization Detector |
| POL | Petroleum, Oil, and Lubricants |
| ppm | Parts per million |
| RRO | Residual Range Organic Compounds |
| SSHSP | Site-specific health and safety plan |
| WHPacific | WHPacific, Inc. |
| TP | Test Pit |
| TPECI | Travis/Peterson Environmental Consulting, Inc. |
| USGS | United States Geological Survey |
| VOC | Volatile organic compounds |
| XRF | X-ray fluorescence |

# Introduction

Sivuniq, Inc. was tasked by NANA Regional Corporation (NRC) to provide environmental services at the Utica Mine Camp Site, south of Deering, Alaska. Under an existing master services agreement Sivuniq based the field investigation and remedial efforts within the legal framework of 18 Alaska Administrative Code (AAC) 70, 75, and 80. Effective October 1, 2012 WHPacific, Inc. announced the consolidation of Sivuniq, Inc. into the overall WHPacific operations. The environmental team members on the Utica project have not changed. The team members seamlessly retained their specific certifications such as OSHA Hazwoper and Alaska Department of Environmental Conservation (ADEC) qualified samplers. The purpose of this report is to document the 2012 field efforts and sampling results, particularly in relation to the ADEC approved work plan (Sivuniq, 2012) for these activities.

## Project Objectives

Objectives of the 2012 field work were to provide a comprehensive characterization of the contamination at the mine camp site and conduct limited removal activities. Tasks to meet these objectives were as follows:

- characterize the extent of contamination in the soils at eight different previously identified areas of concern (AOCs) through field screening and the collection of analytical samples
- characterize possible contamination in the soil and water at a suspected settling pond
- collect samples from undisturbed areas adjacent to the mine site to establish the natural background levels of metals
- construct a land farm on site for the remediation of hydrocarbon contaminated soils
- segregate soils with high metal concentrations into super sacks, regardless of high POL concentrations
- monitor AOCs with Areas of Potential Effect (archaeological) during investigation (AOCs 3, 5, 6, 7, 9, 10)

Information gained from these tasks will assist NRC with determining the remedial actions necessary in order to achieve site closure. Information will provide an environmental baseline and be useful for future land use decisions.

Remedial actions planned included moving metals contaminated soils from stockpiles into supersacks and constructing a landfarm for POL contaminated soils. Remedial efforts were limited due to mobilization constraints; efforts focused on conducting site characterization.

## History

The Utica Mine Site operated on the Inmachuk drainage from 1903 into the 1980s. The collective area was a placer gold mine with at least four dredges identified and evidence of hydraulic operations. The Utica Mine Camp Site included facilities for equipment maintenance shop, power generation, storage, and personnel housing and cooking.

Dredge tailings, the mineral and gravel materials which are displaced by dredge activities, are considered to remain intact in their naturally occurring physical state (pebbles, cobbles, granulation, etc.) without alteration to their mineral state beyond physical weathering. The majority of the mine camp site is believed to be built on leveled dredge tailings. Assay wastes, defined as crushed and concentrated mineral materials, are believed at this time to have only been disposed of in the immediate vicinity of AOC 2 – the former gold house.

The former Utica Mine Camp Site was determined by the Alaska Department of Environmental Conservation Contaminated Sites Department (ADEC - CS) in 2005 to meet the site and owner eligibility criteria for both the federal and State of Alaska definitions of a brownfield: thus making the site eligible for federal brownfield funding.

In 2005 the ADEC–CS contracted SLR Alaska (SLR) to perform a Phase I Environmental Site Assessment (ESA) to identify areas of concern (AOCs). The ESA concluded that petroleum and heavy metals were present in surface soils as well as potential presence of mercury in surface and ground water (SLR, 2007). The site reconnaissance was limited; the interior of buildings 7, 16, 19, and 21 as well as the north and south dumps were identified as impacted by petroleum and heavy metals. Additionally, ground under other buildings were suspected of petroleum contamination (not specifically identified by building number) and other areas in camp (not specifically identified) devoid of vegetation or composed of piles of soil fines were noted as locations with potential contamination.

Following the ESA by SLR, Travis/Peterson Environmental Consultants, Inc. (TPECI) performed a limited site characterization and vehicle fluids removal in 2007 (TPECI, 2007). TPECI conducted a series of activities from 2008 to 2010 (TPECI, 2008 2009, and 2011), including various remedial actions and additional investigation and characterizations. From these past efforts a list of the identified AOCs with their associated COPCs were developed (Table 1).

**Table 1 Identified AOCs and COPCs**

| AOC | Location | COPC |
|---|---|---|
| 1 | Power House | DRO |
| 2 | Gold House | DRO, lead, arsenic, chromium, selenium, silver, and mercury in the tailings piles |
| 3 | Machinist Shop | GRO, BTEX/VOC, DRO, RRO, arsenic, cadmium, chromium, mercury, and lead in the Machinist Shop footprint along with chromium to the west of the shop |
| 4 | South Dump | DRO, RRO |
| 5 | Bunkhouse | Chromium and mercury near northeast corner |
| 6 | Carpenter Shed | Mercury in soil within building footprint |
| 7 | Inmachuk River | Metals in sediment but not in surface water |
| 8 | Soil Stockpiles | DRO, metals |
| 9 | Pond | POL, BTEX, PAH, metals |
| 10 | Background | Metals |

## Archaeological Monitoring

The known use of the area by humans extends beyond one hundred years, with little archaeological, cultural, or historical surveying or documentation known and some local concerns expressed at community meetings. Consequently, an Archaeological Monitoring Plan was developed and followed for ground disturbing work. As detailed in the Archaeological Monitoring Report (Appendix A), monitoring was specifically conducted at AOCs 3, 5, 6, 7, 9, and 10. This consisted of the archaeologist being present when test pits were hand dug and soil from these pits being hand screened for artifacts. None were encountered.

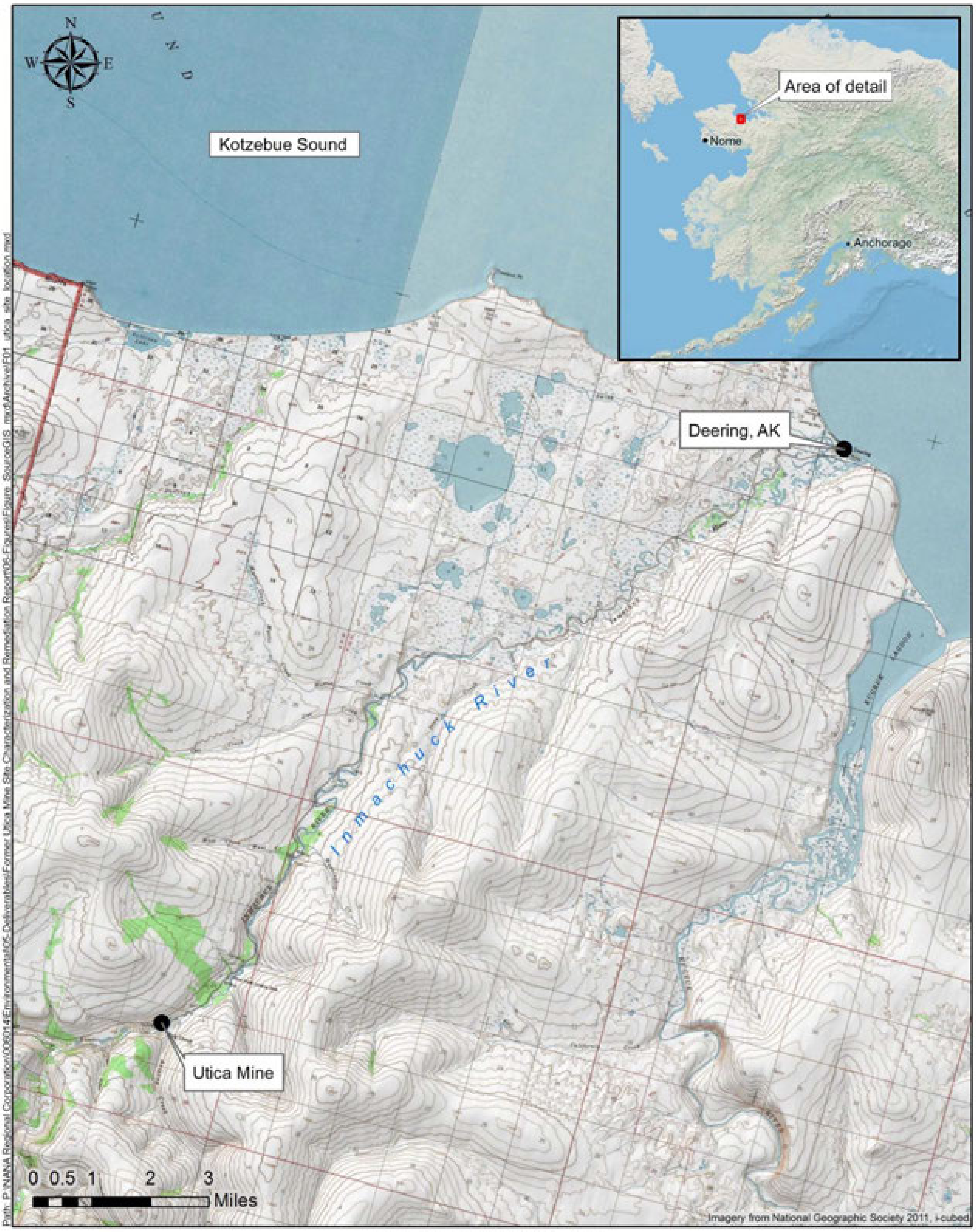
## Site Location

The former mine camp site is located approximately 18 road miles southwest of Deering, Alaska (Figure 1). The site is located on the west side of the Inmachuk River which flows to the north into Kotzebue Sound. The legal description is: Township 006 North, Range 021 East, Section 24, Kateel River Meridian at approximate latitude 65°53'59.74"N and longitude 163°00'34.91"W.

## Current Owner

The site is owned by NANA Regional Corporation, and currently administered by:

NANA Regional Corporation
Natural Resources Department
909 West 9th Avenue
Anchorage, AK 99501

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**Utica Mine Site Vicinity Map**
**2012 Former Utica Mne**
**Charaterization and Remediation Report**
**November, 2012**

Figure
**01**
Vicinity

## Cleanup Criteria

In 2011 the ADEC and NRC agreed to implement the most stringent clean up levels, generally the Under 40 Inch Zone - Migration to Groundwater (MTGW) pathway from the ADEC 18 AAC 75.341 Tables B1 and B2 for contamination in soils and 18 AAC 75.345 Table C for ground water and surface water contamination (Table 2). Surface water is additionally regulated under 18AAC 70. NRC is proposing an alternative site specific soil cleanup level based on background arsenic that has no anthropogenic source. ADEC tentatively approved a "to be considered background level" per email correspondence with NRC (Appendix F).

**Table 2 Method Two - Soil and Water Clean Up Levels**

| COPC | Under 40 Inch Zone | | | Water Cleanup Level mg/L | Laboratory Method |
|---|---|---|---|---|---|
| | Ingestion mg/Kg | Inhalation mg/Kg | Migration to Ground Water mg/Kg | | |
| GRO | 1,400 | 1,400 | 300 | 2.2 | AK 101 |
| DRO | 10,250 | 12,500 | 250 | 1.5 | AK 102 |
| RRO | 10,000 | 22,000 | 11,000 | 1.1 | AK 103 |
| VOC/BTEX | variable | | | | EPA 8260 |
| Arsenic | 4.5 | nd | 3.9 | 0.010 | EPA 6020 |
| Barium | 20,300 | nd | 1,100 | 2.0 | EPA 6020 |
| Cadmium | 79 | nd | 5 | 0.005 | EPA 6020 |
| Chromium | 300 | nd | 25 | 0.10 | EPA 6020 |
| Lead | 400 | nd | 400 | 0.015 | EPA 6020 |
| Mercury | 30 | 18 | 1.4 | 0.002 | EPA 7470 |
| Selenium | 510 | nd | 3.4 | 0.05 | EPA 6020 |
| Silver | 510 | nd | 11.2 | 0.10 | EPA 6020 |

nd = not defined on Table B-1 Method Two.

## 2012 Activities

Work was conducted in accordance with the 2012 Former Utica Mine Camp Site Characterization and Remediation Work Plan, including the Site Specific Health and Safety Plan (SSHSP) (Sivuniq, 2012), except deviations noted in each AOC section in this report. Table 3 below summarizes the planned tasks; locations are shown on Figure 2.

**Table 3 Task Summary of the Former Utica Mine Site**

| Location | Sample Analyses | Task Summary |
|---|---|---|
| General | None | • Mobilize to site<br>• Initial site reconnaissance: inspect AOCs and equipment<br>• Site survey, establish site control, define sample areas<br>• Set up staging and decontamination areas |
| **Site Characterization of Previously Identified Areas of Concern** | | |
| AOC 1<br>Power House | GRO, DRO, RRO, BTEX | • Soil sample collection to delineate extent of contamination remaining at previous excavation<br>• Complete excavation and stockpile soil<br>• Backfill excavation with clean fill |
| AOC 2<br>Gold House | GRO, DRO, RRO, BTEX, Metals | • Screen soil at building footprint to delineate extent of contamination<br>• Excavate and stockpile contaminated soil<br>• Collect confirmation samples from bottom of excavation and sidewalls<br>• Backfill excavation with clean fill |
| AOC 3<br>Machinist Shop | GRO, DRO, RRO, BTEX/VOC, PAH, Metals | • Earthen floor sample collection<br>• Institutional controls: permanently close building interior<br>• Soil sample collection outside structure to delineate extent of contamination<br>• Collect samples from over pack drums containing liquid waste<br>• Prepare drums for off-site transport |
| AOC 4<br>South Dump | GRO, DRO, RRO, BTEX | • Soil sample collection in south dump site surface soil footprint |
| AOC 5<br>Bunkhouse | Metals | • Soil sample collection to delineate metals contamination near bunkhouse 10 |
| AOC 6<br>Carpenter Shed | Metals | • Soil sample collection in footprint of the former shed location and to the northwest of the building to delineate contamination |
| AOC 7<br>Inmachuk River Bank | GRO, DRO, RRO, BTEX, PAH, Metals | • Characterize surface soils and sediment to the west of the river bank to evaluate potential contaminant migration into Inmachuk River |

| | | |
|---|---|---|
| AOC 8<br>Soil Stockpiles | GRO, DRO, RRO, BTEX, PAH, metals | • Collect samples from five stockpiles to determine whether soils can be used as "clean" backfill or should be moved to land farm, or staged for disposal. |
| **Site Characterization of New Areas of Concern** | | |
| AOC 9<br>Possible Settling Pond | GRO, DRO, RRO, BTEX, PAH, Metals | • Collect soil samples around perimeter, surface water and sediment samples at center to characterize water and sediment |
| **Baseline Monitoring** | | |
| Area 10<br>Background Metals | Metals | • Collect samples from areas upstream of Site with similar elevation and geology to assess naturally occurring background concentrations of metals |
| **Site Remediation Activities** | | |
| Land Farm | N/A | • Construct land farm for on-site remediation of POL contaminated soils<br>• Transport previously stockpiled POL soils to land farm |
| General | None | • Demobilize personnel, equipment, and materials |


WHPacific

**Areas of Concern**
**2012 Former Former Utica Mine Charaterization and Remediation Report**
April, 2013

Figure
**02**
AOC
Site Map

## First Site Reconnaissance

WHPacific conducted an initial site reconnaissance on June 28, 2012 to determine the current state of the site. A photographic and global positioning system (GPS) survey was completed of the various AOCs (Appendix B). The site consisted of eighteen buildings in various states of dilapidation situated along a loop off the main road up the Inmachuck River. The site slopes gently to the south-southeast towards the river. The area of the site was approximately 7.5 acres, much of which appeared to be former tailings piles graded to provide leveled areas for buildings and mining activities.

View of the Utica Mine Camp Site looking north July 12, 2012

Specific confirmation was made of location and conditions of the former machinist shop, bunkhouses, dump areas, monofill, and mine support buildings. The state of the stockpile covers was confirmed. The presence of the powerhouse excavation was confirmed. The photographic survey documented several drum containers, batteries, and equipment abandoned at the site. A later review of the survey in Anchorage, showed abandoned 72 pound mercury flasks.

## Second Site Reconnaissance

On July 12, 2012 WHPacific performed a second site reconnaissance. Objectives were to confirm the contents of the mercury flasks, collect background samples, determine the best access to the site, and best location for the field team encampment. A concurrent effort was undertaken in Deering to interview local residents about the past history of the Utica Mine Camp Site; a community information meeting concerning the Utica work plans was also conducted.

The condition of the AOC 9 potential settling pond was photographed to determine the sampling methods required. The mercury containers were found to be empty. The airstrip approximately one half mile north of the Utica Mine Camp Site was found to be usable for small aircraft. The road to Deering was passable for four wheeler all-terrain vehicles. However, a washout was discovered to be impassable for road vehicles.

The washout on the Deering to Utica road view looking south on 9/2012

The background samples of AOC 10 were collected on July 12, 2012 and transported to the laboratory for the analyses of natural metal constituents. The results are discussed in the AOC 10 section of this report.

## September Field Work

WHPacific mobilized six field scientists and an NRC representative to the Utica Mine Camp Site on September 8, 2012. The field crew encampment was set up near the airstrip to keep living and cooking areas separate from the work site. At the work site, a staging area for equipment and supplies was set up in Building #1. Site controls and restrictions were established through communication with the community and warning tape where appropriate. Bear guards were on duty 24 hours a day.

Upon arrival at the site, the field team performed a video survey at the time of initial entry for the purpose of documenting the site conditions "As Found".

The ten AOCs are addressed in numerical order in this report. However, during the actual field effort the AOCs were addressed in the following order: AOC 8, 1, 4, 3, 5, 6, 7, 3, and 2. The logistics of crew availability, delivery of the laboratory samples to turn around results for on-site use, and transportation of personnel and samples were the primary reasons for the order of work. Each section briefly describes the condition of the AOC when WHPacific arrived to perform field work, details the characterization work performed, documents remedial efforts performed, discusses any deviations from the work plan, and summarizes work remaining and future actions. Tables, figures, and passages of the text may not include all non-detected values. The complete laboratory reports are located in Appendix C.

Field screening for metals, especially mercury (Hg), was conducted at several AOCs according to the work plan. Part of the goal of this screening technique was to examine the usefulness of this tool in future remediation efforts. The results of the field screening compared to the laboratory results for Hg across all AOCs are shown in Table 4 and discussed below.

The concentration of Hg in soils was too low for detection at most sites. The gold house, machinist shop, Inmachuk River, and stockpiles had Hg concentrations high enough for detection by the Niton XRF. There was low direct correlation between small concentrations of Hg found through laboratory analysis, and the concentrations detected by the Niton XRF. While the highest field and lab results were detected at the gold house, the lower detected concentrations do not correlate consistently. This is likely due to the sensitivity of the instrument to the uniformity of the material being analyzed. Soil samples, even between similarly disturbed and proximal locations, have a high degree of variability. Overall, the Niton XRF would be useful for situations in which there are large concentrations of Hg in the samples. Definite quantitation of the concentration of Hg is not attainable through field analysis.

**Table 4 Niton XRF and Laboratory Range of Results for Hg by AOC**

| Site | Laboratory Range, mg/Kg | Niton XRF Range, ppm |
|---|---|---|
| AOC1 Power House | 0.0344-0.124 | None |
| AOC2 Gold House | 0.0594-84.3 | <LOD-161.73 |
| AOC3 Machinist Shop | 0.045-1.37 | <LOD-29.07 |
| AOC5 Bunkhouse | 0.0411-0.197 | <LOD |
| AOC6 Carpenter Shed | 0.0191-0.0808 | <LOD |
| AOC7 Inmachuk River | 0.0295-0.305 | <LOD-9.07 |
| AOC8 Stockpiles | 0.0258-2.97 | <LOD-7.07 |
| AOC 9 Settling Pond | 0.0198-0.863 | None |
| AOC 10 Background | 0.0197-0.0445 | None |

Table 5 summarizes the samples collected for laboratory analysis during the field efforts and the specific analyses requested. The location of each sample and their results are discussed for each AOC in the following sections.

**Table 5 Utica Mine Site Analytic Samples Collected and Requested Analyses**

| | SAMPLE ID | LAB SAMPLE ID | Collected Date & Time | AK 101 | AK 102 | AK 103 | SW 8260B | 8270D SIMS | SW 6020 | SW 7471B |
|---|---|---|---|---|---|---|---|---|---|---|
| AOC 1 | 1209UTI0101 | 112438 4001 | 09/11/2012 11:59 | x | x | x | x | | x | |
| | 1209UTI0101MS | 112438 4002 | 09/11/2012 11:59 | x | x | x | x | | x | |
| | 1209UTI0101MSD | 112438 4003 | 09/11/2012 11:59 | x | x | x | x | | x | |
| | 1209UTI0102 | 112438 4004 | 09/11/2012 11:53 | x | x | x | x | | x | |
| | 1209UTI0103 | 112438 4005 | 09/11/2012 11:51 | x | x | x | x | | x | |
| | 1209UTI0104 | 112438 4006 | 09/11/2012 11:45 | x | x | x | x | | x | |
| | 1209UTI0105 Duplicate of 1209UTI0104 | 112438 4007 | 09/11/2012 11:46 | x | x | x | x | | x | |
| | 1209UTI0106 | 112438 4008 | 09/11/2012 17:17 | x | x | x | x | | x | |
| | 1209UTI0107 | 112438 4009 | 09/11/2012 17:15 | x | x | x | x | | x | |
| | 1209UTI0108 | 112438 4010 | 09/11/2012 17:13 | x | x | x | x | | x | |
| | 1209UTI0109 | 112438 4011 | 09/11/2012 17:11 | x | x | x | x | | x | |
| AOC 2 | 1209UTI0201-0 | 112459 6001 | 09/20/2012 11:30 | | | | | | x | |
| | 1209UTI0201-1 | 112459 6002 | 09/20/2012 12:55 | | | | | | x | |
| | 1209UTI0201-2 | 112459 6003 | 09/20/2012 13:02 | | | | | | x | |
| | 1209UTI0202-0 | 112459 6004 | 09/20/2012 11:25 | | | | | | x | |
| | 1209UTI0202-0MS | 112459 6005 | 09/20/2012 11:25 | | | | | | x | |
| | 1209UTI0202-0MSD | 112459 6006 | 09/20/2012 11:25 | | | | | | x | |
| | 1209UTI0202-1 | 112459 6007 | 09/20/2012 13:22 | | | | | | x | |
| | 1209UTI0202-2 | 112459 6008 | 09/20/2012 13:29 | | | | | | x | |

| SAMPLE ID | LAB SAMPLE ID | Collected Date & Time | AK 101 | AK 102 | AK 103 | SW 8260B | 8270D SIMS | SW 6020 | SW 7471B |
|---|---|---|---|---|---|---|---|---|---|
| 1209UTI0203-1 | 1124596009 | 09/20/2012 14:52 | | | | | | x | |
| 1209UTI0203-2 | 1124596010 | 09/20/2012 15:02 | | | | | | x | |
| 1209UTI0204-0 | 1124596011 | 09/20/2012 11:40 | | | | | | x | |
| 1209UTI0204-1 | 1124596012 | 09/20/2012 15:10 | | | | | | x | |
| 1209UTI0204-2 | 1124596013 | 09/20/2012 15:19 | | | | | | x | |
| 1209UTI0204-2MS | 1124596014 | 09/20/2012 15:19 | | | | | | x | |
| 1209UTI0204-2MSD | 1124596015 | 09/20/2012 15:19 | | | | | | x | |
| 1209UTI0205-0 | 1124596016 | 09/20/2012 11:45 | | | | | | x | |
| 1209UTI0205-1 | 1124596017 | 09/20/2012 15:10 | | | | | | x | |
| 1209UTI0205-2 | 1124596018 | 09/20/2012 15:15 | | | | | | x | |
| 1209UTI0206-0 | 1124596019 | 09/20/2012 11:52 | | | | | | x | |
| 1209UTI0206-1 | 1124596020 | 09/20/2012 15:04 | | | | | | x | |
| 1209UTI0206-2 | 1124596021 | 09/20/2012 15:12 | | | | | | x | |
| 1209UTI0207-0 | 1124596022 | 09/20/2012 12:06 | | | | | | x | |
| 1209UTI0207-1 | 1124596023 | 09/20/2012 15:22 | | | | | | x | |
| 1209UTI0207-2 | 1124596024 | 09/20/2012 15:29 | | | | | | x | |
| 1209UTI0208-0 | 1124596025 | 09/20/2012 12:15 | | | | | | x | |
| 1209UTI0208-2 | 1124596026 | 09/20/2012 14:51 | | | | | | x | |
| 1209UTI0209-0 | 1124596027 | 09/20/2012 12:12 | | | | | | x | |
| 1209UTI0209-1 | 1124596028 | 09/20/2012 12:19 | | | | | | x | |
| 1209UTI0209-2 | 1124596029 | 09/20/2012 12:27 | | | | | | x | |

| | SAMPLE ID | LAB SAMPLE ID | Collected Date & Time | AK 101 | AK 102 | AK 103 | SW 8260B | 8270D SIMS | SW 6020 | SW 7471B |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1209UTI0210-0 | 1124596030 | 09/20/2012 11:39 | | | | | | x | |
| | 1209UTI0210-1 | 1124596031 | 09/20/2012 12:37 | | | | | | x | |
| | 1209UTI0210-2 | 1124596032 | 09/20/2012 14:42 | | | | | | x | |
| AOC 3 | 1209UTI0301 | 1124597001 | 09/19/2012 14:43 | x | x | x | x | | x | |
| AOC 3 | 1209UTI0302 | 1124597002 | 09/19/2012 14:46 | x | x | x | x | | x | |
| AOC 3 | 1209UTI0302MS | 1124597003 | 09/19/2012 14:46 | x | x | x | x | | x | |
| AOC 3 | 1209UTI0302MSD | 1124597004 | 09/19/2012 14:46 | x | x | x | x | | x | |
| AOC 3 | 1209UTI0303 | 1124597005 | 09/19/2012 14:51 | x | x | x | x | | x | |
| AOC 3 | 1209UTI0304 | 1124597006 | 09/19/2012 14:54 | x | x | x | x | | x | |
| AOC 3 | 1209UTI0305 | 1124597007 | 09/19/2012 14:58 | x | x | x | x | | x | |
| AOC 3 | 1209UTI0306 | 1124597008 | 09/19/2012 15:01 | x | x | x | x | | x | |
| AOC 3 | 1209UTI0307 | 1124597009 | 09/19/2012 15:10 | x | x | x | x | | x | |
| AOC 3 | 1209UTI0308 | 1124597010 | 09/19/2012 15:12 | x | x | x | x | | x | |
| AOC 3 | 1209UTI0309 | 1124597011 | 09/19/2012 15:16 | x | x | x | x | | x | |
| AOC 3 | 1209UTI0310 | 1124597012 | 09/19/2012 15:18 | x | x | x | x | | x | |
| AOC 3 | 1209UTI0311 | 1124597013 | 09/19/2012 15:22 | x | x | x | x | | x | |
| AOC 3 | 1209UTI0312 | 1124597014 | 09/19/2012 15:25 | x | x | x | x | | x | |
| AOC 3 | 1209UTI0313 | 1124597015 | 09/19/2012 15:26 | x | x | x | x | | x | |
| AOC 3 | 1209UTI0314 | 1124597016 | 09/19/2012 15:32 | x | x | x | x | | x | |
| AOC 3 | 1209UTI0315-3 | 1124436001 | 09/16/2012 15:55 | x | x | x | x | | x | |
| AOC 3 | 1209UTI0316-3 | 1124436002 | 09/16/2012 16:00 | x | x | x | x | | x | |

| | SAMPLE ID | LAB SAMPLE ID | Collected Date & Time | AK 101 | AK 102 | AK 103 | SW 8260B | 8270D SIMS | SW 6020 | SW 7471B |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1209UTI0317-3 | 112443 6003 | 09/16/20 12 16:05 | x | x | x | x | | x | |
| | 1209UTI0318-3 | 112443 6004 | 09/16/20 12 16:15 | x | x | x | x | | x | |
| | 1209UTI0319-2 | 112443 6005 | 09/16/20 12 16:14 | x | x | x | x | | x | |
| | 1209UTI0319-3 | 112443 6006 | 09/16/20 12 16:12 | x | x | x | x | | x | |
| | 1209UTI0320-0 | 112443 6007 | 09/16/20 12 16:54 | x | x | x | x | | x | |
| | 1209UTI0320-1 | 112443 6008 | 09/16/20 12 16:50 | x | x | x | x | | x | |
| | 1209UTI0320-2 | 112443 6009 | 09/16/20 12 16:47 | x | x | x | x | | x | |
| | 1209UTI0320-3 | 112443 6010 | 09/16/20 12 16:44 | x | x | x | x | | x | |
| | 1209UTI0321-3 | 112443 6011 | 09/16/20 12 16:32 | x | x | x | x | | x | |
| | 1209UTI0321-3MS | 112443 6012 | 09/16/20 12 16:32 | x | x | x | x | | x | |
| | 1209UTI0321-3MSD | 112443 6013 | 09/16/20 12 16:32 | x | x | x | x | | x | |
| | 1209UTI0322-3 Duplicate of 1209UTI0321 | 112443 6014 | 09/16/20 12 16:31 | x | x | x | x | | x | |
| | 1209UTI0323 Duplicate of 1209UTI0313 | 112459 7017 | 09/19/20 12 15:27 | x | x | x | x | | x | |
| AOC 4 | 1209UTI401 | 112443 7001 | 09/11/20 12 16:55 | x | x | x | x | | | |
| | 1209UTI402 | 112443 7002 | 09/11/20 12 17:00 | x | x | x | x | | | |
| | 1209UTI403 | 112443 7003 | 09/11/20 12 17:06 | x | x | x | x | | | |
| | 1209UTI404 | 112443 7004 | 09/11/20 12 17:25 | x | x | x | x | | | |
| | 1209UTI405 | 112443 7005 | 09/11/20 12 17:40 | x | x | x | x | | | |
| | 1209UTI406 | 112443 7006 | 09/11/20 12 16:20 | x | x | x | x | | | |

| | SAMPLE ID | LAB SAMPLE ID | Collected Date & Time | AK 101 | AK 102 | AK 103 | SW 8260B | 8270D SIMS | SW 6020 | SW 7471B |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1209UTI407 | 1124437007 | 09/11/2012 16:25 | x | x | x | x | | | |
| | 1209UTI408 | 1124437008 | 09/11/2012 16:30 | x | x | x | x | | | |
| | 1209UTI409 | 1124437009 | 09/11/2012 16:40 | x | x | x | x | | | |
| | 1209UTI410 | 1124437010 | 09/11/2012 16:45 | x | x | x | x | | | |
| | 1209UTI411 Duplicate of 1209UTI410 | 1124437011 | 09/11/2012 16:46 | x | x | x | x | | | |
| AOC 5 | 1209UTI0501-1 | 1124437012 | 09/14/2012 12:31 | | | | | | x | |
| AOC 5 | 1209UTI0501-2 | 1124437013 | 09/14/2012 12:29 | | | | | | x | |
| AOC 5 | 1209UTI0502-1 | 1124437014 | 09/14/2012 12:36 | | | | | | x | |
| AOC 5 | 1209UTI0502-2 | 1124437015 | 09/14/2012 12:34 | | | | | | x | |
| AOC 5 | 1209UTI0503-1 | 1124437016 | 09/14/2012 12:39 | | | | | | x | |
| AOC 5 | 1209UTI0503-2 | 1124437017 | 09/14/2012 12:37 | | | | | | x | |
| AOC 5 | 1209UTI0504-1 Duplicate of 1209UTI0503-1 | 1124437018 | 09/14/2012 12:40 | | | | | | x | |
| AOC 6 | 1209UTI0601-1 | 1124437019 | 09/14/2012 12:58 | | | | | | x | |
| AOC 6 | 1209UTI0601-2 | 1124437020 | 09/14/2012 12:54 | | | | | | x | |
| AOC 6 | 1209UTI0602-1 | 1124437021 | 09/14/2012 13:01 | | | | | | x | |
| AOC 6 | 1209UTI0602-2 | 1124437022 | 09/14/2012 13:00 | | | | | | x | |
| AOC 6 | 1209UTI0603-1 | 1124437023 | 09/14/2012 13:06 | | | | | | x | |
| AOC 6 | 1209UTI0603-2 | 1124437024 | 09/14/2012 13:04 | | | | | | x | |
| AOC 6 | 1209UTI0604-1 | 1124437025 | 09/14/2012 12:47 | | | | | | x | |

| | SAMPLE ID | LAB SAMPLE ID | Collected Date & Time | AK 101 | AK 102 | AK 103 | SW 8260B | 8270D SIMS | SW 6020 | SW 7471B |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1209UTI0604-2 | 1124437026 | 09/14/2012 12:45 | | | | | | x | |
| | 1209UTI0605-1 Duplicate of 1209UTI0603-1 | 1124437027 | 09/14/2012 13:07 | | | | | | x | |
| AOC 7 | 1209UTI0701 | 1124436015 | 09/16/2012 11:57 | x | x | x | x | | x | |
| | 1209UTI0702 | 1124436016 | 09/16/2012 12:02 | x | x | x | x | | x | |
| | 1209UTI0702MS | 1124436017 | 09/16/2012 12:02 | x | x | x | x | | x | |
| | 1209UTI0702MSD | 1124436018 | 09/16/2012 12:02 | x | x | x | x | | x | |
| | 1209UTI0703 | 1124436019 | 09/16/2012 12:09 | x | x | x | x | | x | |
| | 1209UTI0704 | 1124436020 | 09/16/2012 12:14 | x | x | x | x | | x | |
| | 1209UTI0705 | 1124436021 | 09/16/2012 12:25 | x | x | x | x | | x | |
| | 1209UTI0706 | 1124436022 | 09/16/2012 11:59 | x | x | x | x | | x | |
| | 1209UTI0707 | 1124436023 | 09/16/2012 12:05 | x | x | x | x | | x | |
| | 1209UTI0708 | 1124436024 | 09/16/2012 12:12 | x | x | x | x | | x | |
| | 1209UTI0709 | 1124436025 | 09/16/2012 12:15 | x | x | x | x | | x | |
| | 1209UTI0710 | 1124436026 | 09/16/2012 12:21 | x | x | x | x | | x | |
| | 1209UTI0711 | 1124436027 | 09/16/2012 12:31 | x | x | x | x | | x | |
| | 1209UTI0712 | 1124436028 | 09/16/2012 13:02 | x | x | x | x | | x | |
| | 1209UTI0713 | 1124436029 | 09/16/2012 13:08 | x | x | x | x | | x | |
| | 1209UTI0714 | 1124436030 | 09/16/2012 12:39 | x | x | x | x | | x | |
| | 1209UTI0715 | 1124436031 | 09/16/2012 12:45 | x | x | x | x | | x | |

| Area | SAMPLE ID | LAB SAMPLE ID | Collected Date & Time | AK 101 | AK 102 | AK 103 | SW 8260B | 8270D SIMS | SW 6020 | SW 7471B |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1209UTI0716 Duplicate of 1209UTI0709 | 1124436032 | 09/16/2012 12:15 | x | x | x | x | | x | |
| | 1209UTI0717 Duplicate of 1209UTI07014 | 1124436033 | 09/16/2012 12:40 | x | x | x | x | | x | |
| AOC 8 Stockpiles | 1209UTI0801 | 1124310001 | 09/09/2012 15:38 | x | x | x | x | | x | |
| | 1209UTI0802 | 1124310002 | 09/09/2012 15:39 | x | x | x | x | | x | |
| | 1209UTI0803 | 1124310003 | 09/09/2012 15:40 | x | x | x | x | | x | |
| | 1209UTI0804 | 1124310004 | 09/09/2012 15:43 | x | x | x | x | | x | |
| | 1209UTI0804MS | 1124310005 | 09/09/2012 15:43 | x | x | x | x | | x | |
| | 1209UTI0804MSD | 1124310006 | 09/09/2012 15:43 | x | x | x | x | | x | |
| | 1209UTI0805 | 1124310007 | 09/09/2012 15:06 | x | x | x | x | | x | |
| | 1209UTI0806 | 1124310008 | 09/09/2012 15:07 | x | x | x | x | | x | |
| | 1209UTI0807 | 1124310009 | 09/09/2012 15:15 | x | x | x | x | | x | |
| | 1209UTI0808 | 1124310010 | 09/09/2012 15:16 | x | x | x | x | | x | |
| | 1209UTI0809 | 1124310011 | 09/09/2012 14:58 | x | x | x | x | | x | |
| | 1209UTI0810 | 1124310012 | 09/09/2012 14:53 | x | x | x | x | | x | |
| | 1209UTI0811 | 1124310013 | 09/09/2012 14:58 | x | x | x | x | | x | |
| | 1209UTI0812 | 1124310014 | 09/09/2012 14:56 | x | x | x | x | | x | |
| | 1209UTI0813 | 1124310015 | 09/09/2012 15:03 | x | x | x | x | | x | |
| | 1209UTI0814 | 1124310016 | 09/09/2012 16:15 | x | x | x | x | | x | |
| | 1209UTI0815 | 1124310017 | 09/09/2012 16:12 | x | x | x | x | | x | |

| SAMPLE ID | | LAB SAMPLE ID | Collected Date & Time | AK 101 | AK 102 | AK 103 | SW 8260B | 8270D SIMS | SW 6020 | SW 7471B |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1209UTI0816 | 112431 0018 | 09/09/20 12 16:10 | x | x | x | x | | x | |
| | 1209UTI0817 | 112431 0019 | 09/09/20 12 16:25 | x | x | x | x | | x | |
| | 1209UTI0817MS | 112431 0020 | 09/09/20 12 16:25 | x | x | x | x | | x | |
| | 1209UTI0817MSD | 112431 0021 | 09/09/20 12 16:25 | x | x | x | x | | x | |
| | 1209UTI0818 | 112431 0022 | 09/09/20 12 16:16 | x | x | x | x | | x | |
| | 1209UTI0819 | 112431 0023 | 09/09/20 12 16:18 | x | x | x | x | | x | |
| | 1209UTI0820 | 112431 0024 | 09/09/20 12 15:23 | x | x | x | x | | x | |
| | 1209UTI0821 | 112431 0025 | 09/09/20 12 15:34 | x | x | x | x | | x | |
| | 1209UTI0822 | 112431 0026 | 09/09/20 12 15:29 | x | x | x | x | | x | |
| | 1209UTI0823 | 112431 0027 | 09/09/20 12 15:03 | x | x | x | x | | x | |
| AOC 9 | 1209UTIP00901SD | 112431 0028 | 09/09/20 12 15:45 | x | x | x | x | x | x | |
| | 1209UTIP00902SD | 112431 0029 | 09/09/20 12 16:00 | x | x | x | x | x | x | |
| | 1209UTIP00903SD | 112431 0030 | 09/09/20 12 16:05 | x | x | x | x | x | x | |
| | 1209UTIP00904SD | 112431 0031 | 09/09/20 12 16:10 | x | x | x | x | x | x | |
| | 1209UTIP0B0901SD | 112431 0032 | 09/10/20 12 18:10 | x | x | x | x | x | x | |
| | 1209UTIP0B0902SD | 112431 0033 | 09/10/20 12 18:20 | x | x | x | x | x | x | |
| | 1209UTIP00901SW | 112438 4013 | 09/10/20 12 12:51 | x | x | x | x | x | x | |
| | 1209UTIP00902SW | 112438 4014 | 09/10/20 12 13:40 | x | x | x | x | x | x | |
| | 1209UTIP00903SW | 112438 4015 | 09/10/20 12 16:50 | x | x | x | x | x | x | |
| | 1209UTIP00904SW | 112438 4016 | 09/10/20 12 17:15 | x | x | x | x | x | x | |
| | 1209UTIRI0901SW | 112438 4017 | 09/11/20 12 10:15 | | | | | | x | |

| | SAMPLE ID | LAB SAMPLE ID | Collected Date & Time | AK 101 | AK 102 | AK 103 | SW 8260B | 8270D SIMS | SW 6020 | SW 7471B |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1209UTIRI0902SW | 112438 4018 | 09/11/20 12 10:30 | | | | | | x | |
| AOC 10 | 0712UTI01 | 112299 0001 | 07/12/20 12 11:05 | | | | | | x | x |
| | 0712UTI02 | 112299 0002 | 07/12/20 12 11:30 | | | | | | x | x |
| | 0712UTI03 | 112299 0003 | 07/12/20 12 11:40 | | | | | | x | x |
| | 0712UTI04 | 112299 0004 | 07/12/20 12 12:30 | | | | | | x | x |
| | 0712UTI05 | 112299 0005 | 07/12/20 12 13:05 | | | | | | x | x |
| | 0712UTI05MS | 112299 0006 | 07/12/20 12 13:05 | | | | | | x | x |
| | 0712UTI05MSD | 112299 0007 | 07/12/20 12 13:05 | | | | | | x | x |
| | 0712UTI06 | 112299 0008 | 07/12/20 12 13:40 | | | | | | x | x |
| | 0712UTI07 | 112299 0009 | 07/12/20 12 13:55 | | | | | | x | x |
| | 0712UTI08 | 112299 0010 | 07/12/20 12 14:15 | | | | | | x | x |
| | 0712UTI09 | 112299 0011 | 7/12/201 2 12:30 | | | | | | x | x |

"x" denotes sample collected for analyses in 2012

## AOC 1 - Former Power House

The Former Power House (Building #21) was previously demolished and its footprint excavated to approximately 6 feet below ground surface (bgs) by TPECI in 2008 and 2009. The extent of the site characterization and the remedial efforts by TPECI was incomplete with analytical sample results of 453 and 297 mg/kg of diesel range organics (DRO) identified on the western edge of the building's footprint (Figure 3).

WHPacific was tasked to complete the site characterization and remedial effort. The effort was separated into four phases:

- field screening the surface of the sidewalls and floor of the TPECI excavation,
- field screening four test pits at step out locations of the western edge of the footprint,
- advancing excavation, if required, to obtain clean margins, and
- collecting confirmation samples for closure.

### Field Effort

During the first site reconnaissance, WHPacific noted that the excavation had either been partially backfilled or the walls had undergone extensive collapse.

On September 11, 2012 WHPacific conducted field screenings with a photoionization detector (PID) of the floor and sidewalls of the former powerhouse previously excavated by TPECI. The results of 30 screening samples ranged from 0.1 to 56.5 parts per million (ppm). The highest value was identified in a localized area of the floor near the southeast wall.

Four test pits were dug to a target depth of 6 feet bgs with an excavator along the northwest wall of the TPECI excavation. The sample locations were a step out to the northwest of the previous TPECI sample locations to further define the extent of contamination. Once the excavator reached the target depth, field screening samples from side walls at approximate depths of 3 feet and 6 feet (the bottom of the excavation) were collected directly from the excavator bucket. The screening sample results were below 1.1 ppm. Four primary samples, a field duplicate sample, and a matrix spike and matrix spike duplicate (MS/MSD) pair were collected for laboratory analyses of GRO, DRO, RRO, BTEX, and metals.

Samples were identified as 1209UTI0101 through 1209UTI0105. The burden from each test pit was replaced in the excavation.

An excavation of the floor near the corner of the southeast wall was advanced guided by the highest PID field screenings (Figure 3 brown polygon). Approximately 5 cubic yards (CY) of soil were removed and stockpiled at the south east edge of the excavation on a 20 mil woven liner to meet the specifications of 18 AAC 75.370. Margins of this excavation, referred to as the “2012 Sivuniq/WHPacific excavation” on Figure 3, were field screened with PID results of 0 to 0.4 ppm. Three confirmation samples were collected from the excavation floor and walls, 1209UTI0106 through 1209UTI0108. One sample was collected from the stockpile, 1209UTI0109. The four samples were included with the test pit samples for laboratory analyses of GRO, DRO, BTEX and metals.

Further work on this AOC had to be postponed due to malfunctioning equipment. The stockpiled soil was covered securely with a 6 mil reinforced polyethylene top cover. Soils will be land farmed in a future field season. The excavation was secured with steel fence posts, orange safety fencing, and caution tape to restrict access until further remedial action can be accomplished.

AOC 1 excavation fencing, looking north, as left by the WHPacific Field Crew on 9/23/2012

**Laboratory Analyses Results**

Results from the analytical samples collected at AOC 1 are summarized in Table 6 and Figure 3. Results that exceeded clean up levels are highlighted in yellow. Sample results indicate that one of the four test pits near the road had levels of DRO above the ADEC cleanup level of 250 mg/kg (269 mg/kg, sample location #0104). Although the ADEC guidance requires the use of the higher result of the primary and duplicate samples, it is noted that the duplicate sample (#0105) for measuring field precision at that test pit had a lower DRO result (200 mg/kg), with an acceptable level of precision of 29% relative difference.

The test pits were originally intended to characterize and refine any further contamination extent (based on previous TPECI work), while the floor and wall samples were intended to confirm existing excavation extents were ready for backfill and closure. Field screening revealed one hot spot on the floor, which was excavated, and subsequent field screening of the excavation indicated the area was ready for confirmation sampling. These sample results were above DRO clean up level of 250 mg/kg (#0106 = 350 and #0107 = 333 mg/kg; Figure 3) despite their low field screening results.

The laboratory samples had measurable concentrations of one or more metals. However, the analysis results indicate that the concentrations of all metal COCs were either below the most conservative ADEC Method Two cleanup level or are comparable to or less than the background levels proposed to the ADEC by NRC as a result of the 2012 AOC 10 background study.

**Table 6 AOC 1 Utica Mine Site Former Power House Analytical Results**

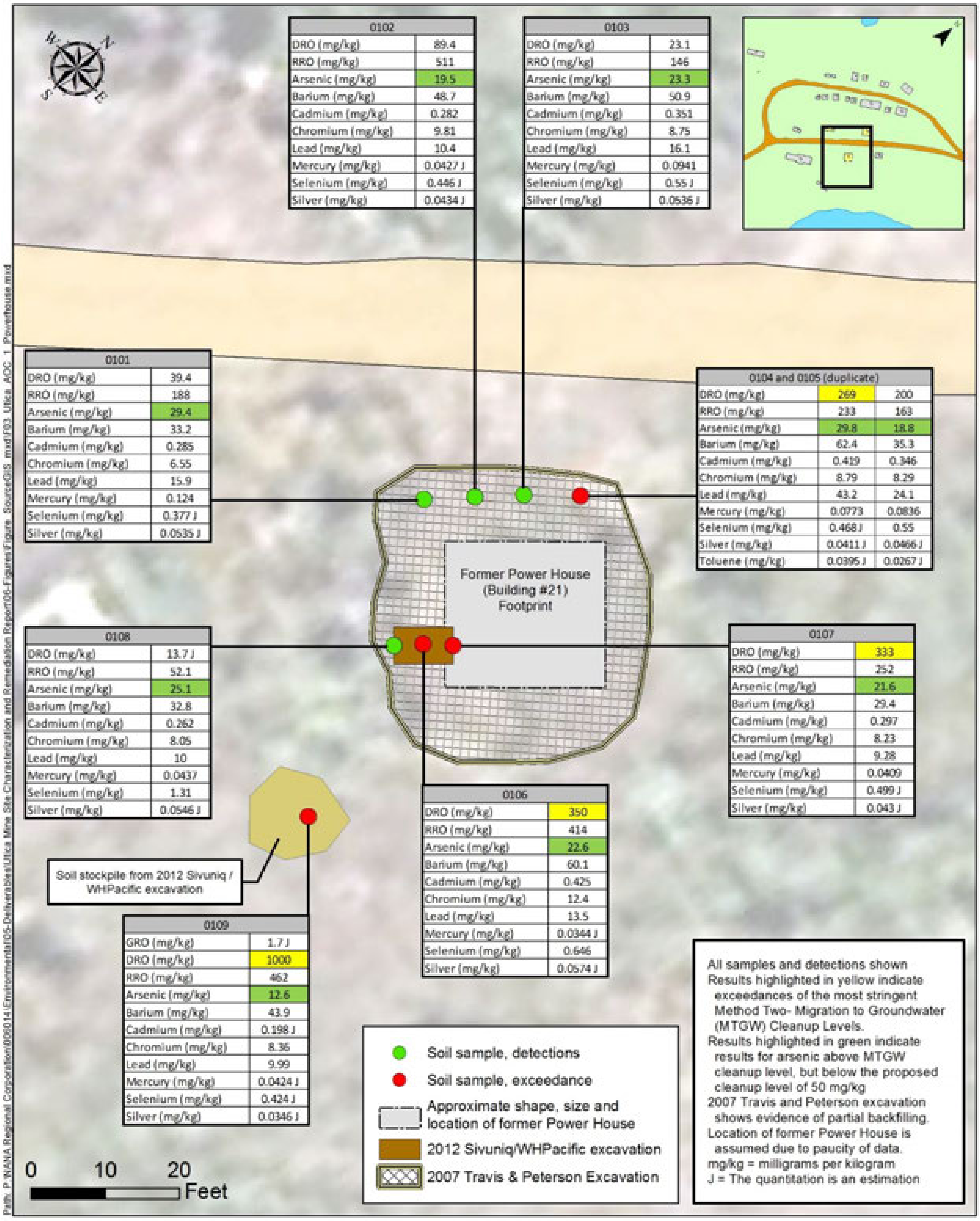
| ANALYTE | Units | METHOD | ADEC Cleanup Level | 1209 UTI 0101 | 1209 UTI 0102 | 1209 UTI 0103 | 1209 UTI 0104 | 1209 UTI0105 Duplicate of 1209 UTI0104 | Duplicate Pair RPD | 1209 UTI 0106 | 1209 UTI 0107 | 1209 UTI 0108 | 1209 UTI 0109 Stockpile 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | mg/Kg | AK101 | 300 | ND | ND | ND | ND | ND | NC | ND | ND | ND | 1.7 J |
| Diesel Range Organics | mg/Kg | AK102 | 250 | 39.4 | 89.4 | 23.1 | 269 | 200 | 29 | 350 | 333 | 13.7 J | 1000 |
| Residual Range Organics | mg/Kg | AK103 | 11000 | 188 | 511 | 146 | 233 | 163 | 35 | 414 | 252 | 52.1 | 462 |
| Benzene | mg/Kg | SW8260B | 0.025 | ND | ND | ND | ND | ND | NC | ND | ND | ND | ND |
| Ethylbenzene | mg/Kg | SW8260B | 6.9 | ND | ND | ND | ND | ND | NC | ND | ND | ND | ND |
| o-Xylene | mg/Kg | SW8260B | 63 (total) | ND | ND | ND | ND | ND | NC | ND | ND | ND | ND |
| P & M - Xylene | mg/Kg | SW8260B | | ND | ND | ND | ND | ND | NC | ND | ND | ND | ND |
| Toluene | mg/Kg | SW8260B | 6.5 | ND | ND | ND | 0.0395 J | 0.0267 J | 36 | ND | ND | ND | ND |
| Arsenic | mg/Kg | SW6020 | 3.9 | 29.4 | 19.5 | 23.3 | 29.8 | 18.8 | 45 | 22.6 | 21.6 | 25.1 | 12.6 |
| Barium | mg/Kg | SW6020 | 1100 | 33.2 | 48.7 | 50.9 | 62.4 | 35.3 | 55 | 60.1 | 29.4 | 32.8 | 43.9 |
| Cadmium | mg/Kg | SW6020 | 5 | 0.285 | 0.282 | 0.351 | 0.419 | 0.346 | 19 | 0.425 | 0.297 | 0.262 | 0.198 J |
| Chromium | mg/Kg | SW6020 | 25 | 6.55 | 9.81 | 8.75 | 8.79 | 8.29 | 6 | 12.4 | 8.23 | 8.05 | 8.36 |
| Lead | mg/Kg | SW6020 | 400 | 15.9 | 10.4 | 16.1 | 43.2 | 24.1 | 57 | 13.5 | 9.28 | 10 | 9.99 |
| Mercury | mg/Kg | SW6020 | 1.4 | 0.124 | 0.0427 J | 0.0941 | 0.0773 | 0.0836 | 8 | 0.0344 J | 0.0409 | 0.0437 | 0.0424 J |
| Selenium | mg/Kg | SW6020 | 3.4 | 0.377 J | 0.446 J | 0.55 J | 0.468 J | 0.55 | 16 | 0.646 | 0.499 J | 1.31 | 0.424 J |
| Silver | mg/Kg | SW6020 | 11.2 | 0.0535 J | 0.0434 J | 0.0536 J | 0.0411 J | 0.0466 J | 13 | 0.0574 J | 0.043 J | 0.0546 J | 0.0346 J |

NC= Not calculated, ND = not detected, J=estimated concentration, RPD = relative percent difference

RPDs are calculated between the primary and duplicate analyses presented in the preceding columns; QA failures are highlighted in green

Yellow shaded cells indicate the exceedance of ADEC clean up levels.

ADEC Table B1. Method Two - Soil Cleanup Level, Migration to Groundwater




WHPacific

**Power House (AOC 1) Analytical Samples**
**2012 Former Utica Mine**
**Charaterization and Remediation Report**
**April, 2013**

Figure
**03**
Power House AOC 1

**Deviations from the Work Plan**

The lack of operational heavy equipment curtailed field efforts to complete the proposed remedial action at AOC 1.

**Discussion**

The levels of contamination remaining at the AOC 1 Former Power House excavation are above the most stringent levels of ADEC soil cleanup where ground water may be impacted. During 2012 site operations it was noted the nature of the soils at the Utica site are of sorted mine tailings and ground water was not encountered at the excavation depth of 8 feet bgs.

The method two cleanup level for under 40 inch zone ingestion pathway may be protective of site workers with a DRO cleanup level of 10,250 mg/Kg. The contamination is in a localized area over 8 feet bgs and less than 5 x 10 foot surface area. WHPacific estimates an approximate volume of 2 cubic yards of contaminated soil. Once the excavation is backfilled, there will be minimal contact pathway with buried contaminated soil remaining in place below the 10,250 mg/kg level.

**Remaining Work**

Work left to complete includes further excavation of the AOC 1 site hotspots already identified or no additional excavation if the cleanup level is changed to 10,250 mg/kg. Confirmation sample collection for closure will be required before backfill is completed. If soil is removed it will require internment in a land farm constructed with lined berms, bottom liner, and cover. Soil will need to be transported to the land farm and spread in six inch lifts (in accordance with the DEC approved work plan for 2012). The land farmed soil will require periodic tilling and testing for contaminant reduction. Final closure request will be made once analyses prove the soil remediated.

## AOC 2- Former Gold House

The Former Gold House (Building #17) was demolished and the remains were burned in 2008 or 2009. When WHPacific examined AOC 2 in June of 2012 there was a pile of disturbed soil of unknown origin that was intermixed with burned wooden building remnants, machinery consistent with small mill operations, and three mercury flasks.

Westward facing view of AOC 2 on 7/12/2012

Past efforts to characterize the metals contamination at AOC 2 were not successful in delineating the vertical and horizontal extent of contamination and resulting in miscellaneous data gaps. WHPacific personnel mobilized with an X-ray Fluoresence (XRF) metal specific field detector to build a correlation with laboratory analyses. The objective to fill the data gaps was accomplished on September 19, 2012

**Field Work**

WHPacific used a Niton brand XRF detector to perform 104 field screenings of the surface soils focusing on the area of disturbed soil at AOC 2. Locations were determined with a precision GPS unit and presented in Figure 4.

Analytical soil samples were collected at levels from surface to two feet bgs in ten test pits advanced by hand (surface=0, 1’ bgs, and 2’ bgs). The collected samples (25 primary; table 5) were submitted for laboratory analysis of metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver). Three duplicate samples and one MS/MSD sample were collected for data quality purposes.

View looking north of AOC 2 on 9/19/2012.

The empty mercury flasks were containerized in plastic tubs for transport offsite. To limit the spread of contaminated soils due to wind-blown dust or water infiltration, the area of disturbed soil was covered with 6 mil reinforced polyethylene liner material pending analytical results and possible removal action.

**Bevill Amendment**

The contaminated soils from this AOC were exempted by the Environmental Protection Agency (EPA) in 2011 under the Bevill Amendment 40 CFR 261.4 (b)(7) from designation as RCRA hazardous waste due to their direct association with the mining, beneficiation, and/or processing of ores. The Bevill amendment is not an exemption of ADEC remedial requirements. The documentation for the EPA exemption is provided in Appendix E.

**Laboratory Analyses Results**

The results from the 28 analytical samples taken from AOC 2 are summarized in Table 7. The detectable concentrations are depicted on Figure 5.

Concentrations of arsenic ranged from 10.8 to 228 mg/Kg in the Gold House samples and exceeded the ADEC method two migration to ground water cleanup level of 3.9 mg/Kg.

Mercury was detected in seven of the ten test pits at concentrations above the most stringent ADEC method two migration to ground water cleanup level of 1.4 mg/kg. Test Pits 03, 04, 05, and 07 had concentrations exceeding the cleanup level of mercury at the deepest depth sampled. Two of these

Test Pits (04 and 07), were located in the debris pile of soil near the road at the east side of AOC 2. TPECI documents do not identify this piled soil and it was not documented as a stockpile. Test Pit 01 is approximately 17 feet uphill and to the north of the area of disturbed soil and the burnt remains of the former Gold House, suggesting contamination was not limited to the building's footprint. One possibility is that Gold House waste products could have been graded into the surrounding area when they had accumulated into a stockpile so large that it hindered operations.

The ADEC lead cleanup level of 400mg/kg was exceeded from soils in Test Pit 08, where detected levels were 2980 mg/kg. The remaining samples yielded results with detectable levels of lead below the cleanup levels.

All samples exhibited detectable levels of chromium, while Test Pit 01 had the highest chromium result of 26.9 mg/kg, exceeding the ADEC method two migration to ground water cleanup level of 25 mg/kg.

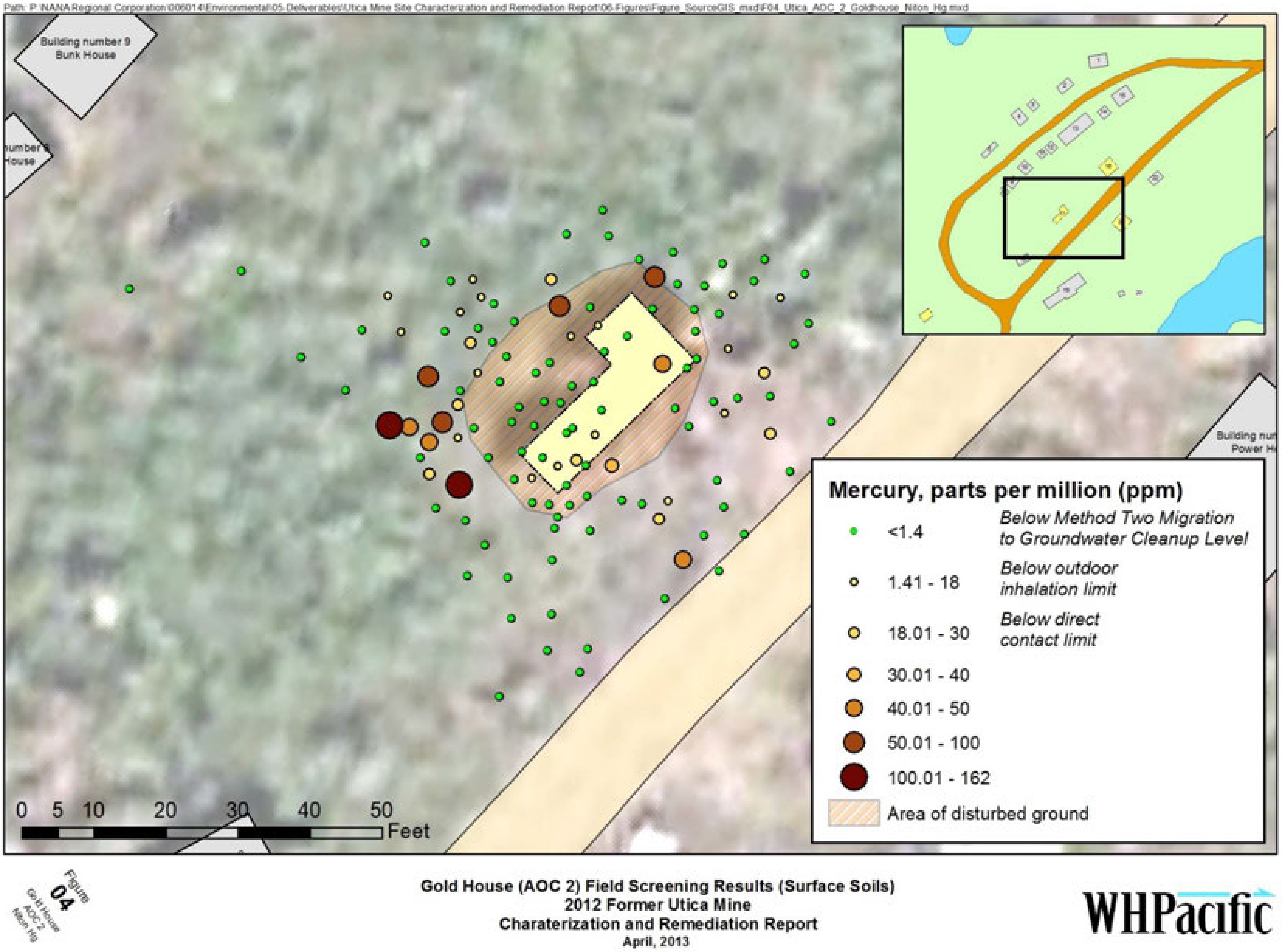
**Table 7 AOC 2 Utica Mine Site Former Gold House Analytical Samples**

| ANALYTE | Arsenic | Barium | Cadmium | Chromium | Lead | Mercury | Selenium | Silver |
|---|---|---|---|---|---|---|---|---|
| Units | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg |
| ANALYTICAL METHOD | SW6020 | SW6020 | SW6020 | SW6020 | SW6020 | SW6020 | SW6020 | SW6020 |
| ADEC Cleanup level (mg/Kg) | 3.9 | 1100 | 5 | 25 | 400 | 1.4 | 3.4 | 11.2 |
| Sample ID | | | | | | | | |
| 1209UTI0201-0 | 27.3 | 75.8 J | 0.256 | 14.2 J | 97.4 | 2.77 | 0.536 J | 0.0664 J |
| 1209UTI0201-1 | 15.1 | 142 J | 0.107 J | 20 J | 24 | 0.842 | 0.654 J | 0.0665 J |
| 1209UTI0201-2 | 10.8 | 189 J | ND | 26.9 J | 14.4 | 0.398 | 0.72 | 0.0774 J |
| 1209UTI0202-0 | 58.9 | 44.2 | 0.368 | 13.1 | 36.9 | 4.97 | 0.388 J | 0.0745 J |
| 1209UTI0202-1 | 21.4 | 23.5 J | 0.22 | 8.03 J | 8.15 | 0.152 | 0.361 J | ND |
| 1209UTI0202-2 | 13.4 | 18.3 J | 0.201 | 6.23 J | 8.67 | 0.279 | 0.215 J | ND |
| 1209UTI0203-1 | 189 | 43 | 0.407 | 13.2 | 391 | 84.3 | 0.601 | 0.911 |
| 1209UTI0203-2 | 42.3 | 44 | 0.264 | 8.54 | 56.8 | 27.8 | 0.179 J | 0.113 |
| 1209UTI0204-0 | 50.4 | 57.5 | 0.385 | 15.1 | 252 | 11.6 | 0.515 | 0.499 |
| 1209UTI0204-1 | 55.7 | 54.2 | 0.556 | 10.6 | 272 | 22.8 | 0.601 | 0.666 |
| 1209UTI0204-2 | 40.8 | 31.7 | 0.365 | 8.15 | 130 | 9.76 | 0.501 J | 0.253 |
| 1209UTI0205-0 | 67.9 | 49.9 | 0.331 | 13.4 | 253 | 32.7 | 0.659 | 0.562 |
| 1209UTI0205-1 | 18.8 | 43.8 | 0.338 | 11.9 | 17.2 | 1.36 | 0.281 J | 0.0431 J |

| ANALYTE | Arsenic | Barium | Cadmium | Chromium | Lead | Mercury | Selenium | Silver |
|---|---|---|---|---|---|---|---|---|
| 1209UTI0205-2 | 23.1 | 35 | 0.208 | 9.09 | 15.5 | 2.85 | 0.349 J | 0.0425 J |
| 1209UTI0206-0 | 18.6 | 76.8 | 0.571 | 20.2 | 65.7 | 0.575 | 0.548 J | 0.0619 J |
| 1209UTI0206-1 | 21.2 | 79.5 | 0.56 | 13.1 | 79.9 | 0.531 | 0.45 J | 0.0402 J |
| 1209UTI0206-2 | 31.4 | 99.5 | 0.353 | 8.41 | 50.9 | 0.696 | 0.411 J | ND |
| 1209UTI0207-0 | 100 | 44.3 | 0.801 | 10.4 | 175 | 64.7 | 0.557 J | 0.676 |
| 1209UTI0207-1 | 27 | 40.7 | 0.292 | 11.7 | 14.2 | 2.5 | 0.439 J | 0.0397 J |
| 1209UTI0207-2 | 40.2 | 47.6 | 0.226 | 9.58 | 25.7 | 5.4 | 0.416 J | 0.0673 J |
| 1209UTI0208-0 | 228 | 75.3 | 0.64 | 19.9 | 2980 | 42 | 1.09 | 6.36 |
| 1209UTI0208-2 | 60 | 27.3 | 1 | 10.5 | 74.4 | 0.857 | 0.497 J | 0.0903 J |
| 1209UTI0209-0 | 19.7 | 32.5 | 0.288 | 8.26 | 70.8 | 0.419 | 0.47 J | 0.0669 J |
| 1209UTI0209-1 | 13.1 | 37.2 | 0.15 J | 9.8 | 6.65 | 0.0708 | 0.524 | ND |
| 1209UTI0209-2 | 31.6 | 66.5 | 0.294 | 10.9 | 12.4 | 0.0594 | 0.492 J | 0.0435 J |
| 1209UTI0210-0 | 25.8 | 43.6 | 0.412 | 11.2 | 47.6 | 1.22 | 0.436 J | 0.0826 J |
| 1209UTI0210-1 | 15.9 | 63.2 | 0.246 | 7.84 | 16.5 | 0.144 | 0.259 J | ND |
| 1209UTI0210-2 | 20.9 | 29.1 | 0.356 | 8.59 | 10.6 | 0.0971 | 0.574 | ND |

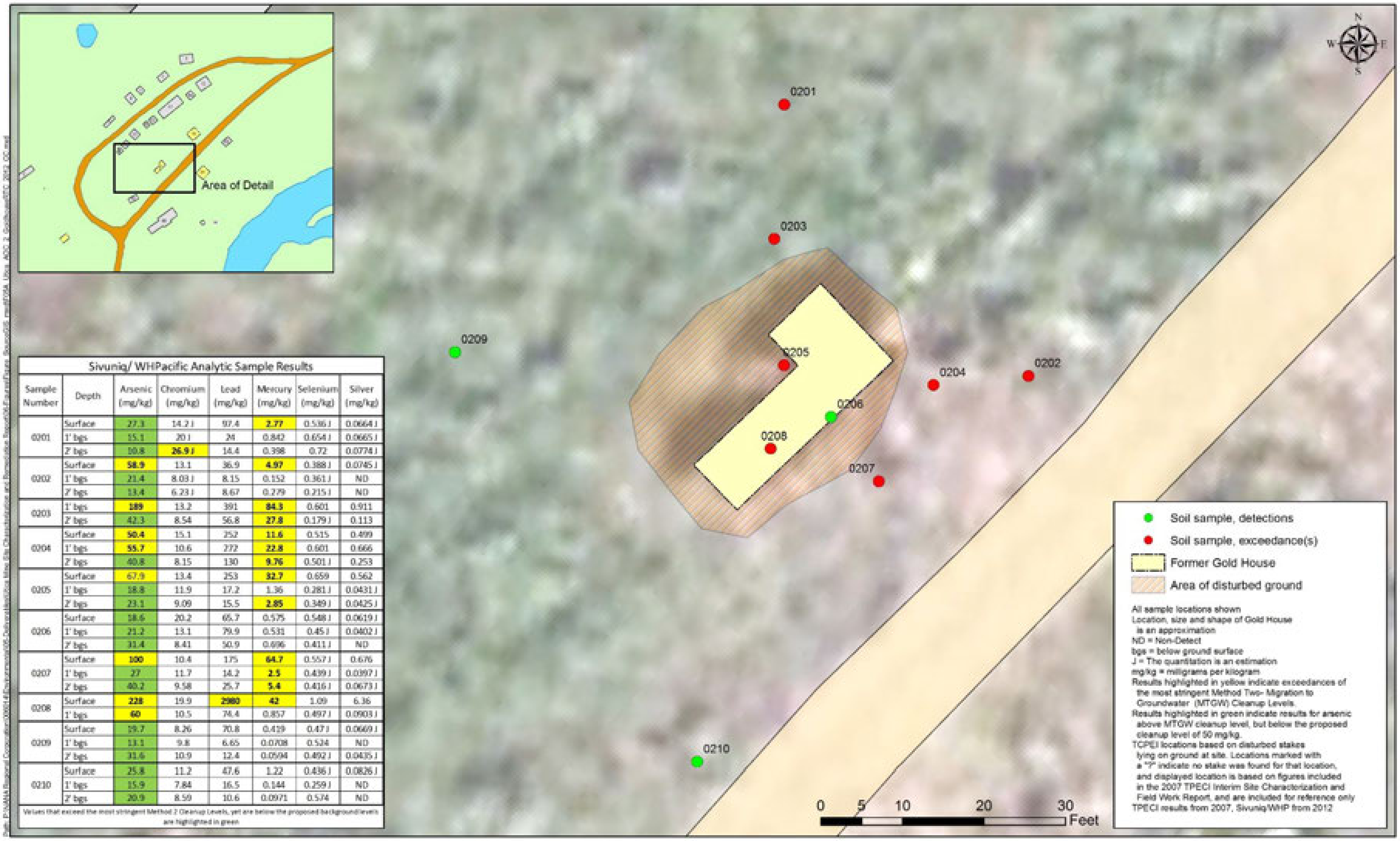
The sample ID suffix "-0, -1, and -2" indicates sample collected at surface, one foot deep, and two feet deep.

Yellow shaded cells indicate the exceedance of ADEC clean up levels.




Gold House (AOC 2) Field Screening Results (Surface Soils)
2012 Former Utica Mine
Charaterization and Remediation Report
April, 2013

WHPacific




**Sivuniq/ WHPacific Analytic Sample Results**

| Sample Number | Depth | Arsenic (mg/kg) | Chromium (mg/kg) | Lead (mg/kg) | Mercury (mg/kg) | Selenium (mg/kg) | Silver (mg/kg) |
|---|---|---|---|---|---|---|---|
| 0201 | Surface | 27.3 | 14.2 J | 97.4 | 2.77 | 0.536 J | 0.0664 J |
| | 1' bgs | 15.1 | 20 J | 24 | 0.842 | 0.654 J | 0.0665 J |
| | 2' bgs | 10.8 | 26.9 J | 14.4 | 0.398 | 0.72 | 0.0774 J |
| 0202 | Surface | 58.9 | 13.1 | 36.9 | 4.97 | 0.388 J | 0.0745 J |
| | 1' bgs | 21.4 | 8.03 J | 8.15 | 0.152 | 0.361 J | ND |
| | 2' bgs | 13.4 | 6.23 J | 8.67 | 0.279 | 0.215 J | ND |
| 0203 | 1' bgs | 189 | 13.2 | 391 | 84.3 | 0.601 | 0.911 |
| | 2' bgs | 42.3 | 8.54 | 56.8 | 27.8 | 0.179 J | 0.113 |
| 0204 | Surface | 50.4 | 15.1 | 252 | 11.6 | 0.515 | 0.499 |
| | 1' bgs | 55.7 | 10.6 | 272 | 22.8 | 0.601 | 0.666 |
| | 2' bgs | 40.8 | 8.15 | 130 | 9.76 | 0.501 J | 0.253 |
| 0205 | Surface | 67.9 | 13.4 | 253 | 32.7 | 0.659 | 0.562 |
| | 1' bgs | 18.8 | 11.9 | 17.2 | 1.36 | 0.281 J | 0.0431 J |
| | 2' bgs | 23.1 | 9.09 | 15.5 | 2.85 | 0.349 J | 0.0425 J |
| 0206 | Surface | 18.6 | 20.2 | 65.7 | 0.575 | 0.548 J | 0.0619 J |
| | 1' bgs | 21.2 | 13.1 | 79.9 | 0.531 | 0.45 J | 0.0402 J |
| | 2' bgs | 31.4 | 8.41 | 50.9 | 0.696 | 0.411 J | ND |
| 0207 | Surface | 100 | 10.4 | 175 | 64.7 | 0.557 J | 0.676 |
| | 1' bgs | 27 | 11.7 | 14.2 | 2.5 | 0.439 J | 0.0397 J |
| | 2' bgs | 40.2 | 9.58 | 25.7 | 5.4 | 0.416 J | 0.0673 J |
| 0208 | Surface | 228 | 19.9 | 2980 | 42 | 1.09 | 6.36 |
| | 1' bgs | 60 | 10.5 | 74.4 | 0.857 | 0.497 J | 0.0903 J |
| 0209 | Surface | 19.7 | 8.26 | 70.8 | 0.419 | 0.47 J | 0.0669 J |
| | 1' bgs | 13.1 | 9.8 | 6.65 | 0.0708 | 0.524 | ND |
| | 2' bgs | 31.6 | 10.9 | 12.4 | 0.0594 | 0.492 J | 0.0435 J |
| 0210 | Surface | 25.8 | 11.2 | 47.6 | 1.22 | 0.436 J | 0.0826 J |
| | 1' bgs | 15.9 | 7.84 | 16.5 | 0.144 | 0.259 J | ND |
| | 2' bgs | 20.9 | 8.59 | 10.6 | 0.0971 | 0.574 | ND |

Values that exceed the most stringent Method 2 Cleanup Levels, yet are below the proposed background levels are highlighted in green

WHPacific

**Gold House (AOC 2) Analytical Samples**
**2012 Former Utica Mine**
**Charaterization and Remediation Report**
**April, 2015**

Figure
**05**
Gold House
AOC 2

**Deviations from the Work Plan**

The lack of suitable heavy equipment hindered both the characterization effort and made the containerization of the large volumes of soils which had already been characterized as contaminated above cleanup levels impractical.

**Discussion**

The Former Gold House was located across the Utica Mine Camp Site road from AOC 1, the Former Power House. The grade of the location and the soils were consistent with AOC 1. Groundwater below AOC 2 would be expected to be similar to AOC 1, greater than eight feet deep.

The extent of elevated levels of arsenic and lead at the Former Gold House were generally within the area of mercury contamination. Both the 2012 and the historical analyses results have indicated that there are few locations where another metal exceedance was observed and mercury was not. Therefore, eliminating the exposure risk for mercury would likely simultaneously eliminate the majority of the potential risks associated with other metal contaminant exceedances.

When compared with the historical mercury concentrations, presented in the 2012 Sivuniq Utica Work Plan Figure 5, the extent of contamination at AOC 2 remains undetermined in the northern and eastern directions. However, field screening and analytical results indicate the vertical mercury concentrations decrease with depth potentially indicating a surface release with little downward progression.

**Remaining Work**

Remaining work at the Gold House is contingent upon pending decisions. A remedial excavation of soils with chromium, mercury and lead content would be a volume estimated at greater than 300 CY.

## AOC 3- Machinist Shop

The 2005 SLR Phase 1 identified four locations where petroleum contamination was evident. The 2011 site characterization by TPECI included the analyses of residual range hydrocarbons from floor soil samples of the Machinist Shop. Further analyses were not completed. WHPacific was tasked to complete a site investigation of the AOC 3 Machinist shop floor and surrounding area with preference towards the Inmachuck River to determine the presence of offsite migration.

The Machinist Shop has a packed earth floor throughout most of the structure. Wooden floors are limited to an attached small parts room on the northwestern end of the building and against the eastern wall of the Machinist Shop main room. Inside the Machinist shop, WHPacific found several areas of surface staining on the earthen portions of the floor. Machinery and tools including a parts washer, oxygen generator, a large press and a large metal lathe were found inside. A structural assessment of the building has not been completed. The roof is in poor condition and the windows are missing glass yet the structure actively sheds precipitation.

**Field Work**

On September 16, 2012 seven test pits were advanced by hand to collect samples of the interior floor for field screening. Archaeological monitoring was conducted at this site during excavation. A PID was used to perform the field screenings at one foot intervals between the surface and three feet bgs. The field screening readings ranged from 0.3 to 24.5 ppm. Samples were collected from the highest PID reading for further laboratory analyses (24 primary for AOC 3; table 5). Two duplicate samples and two MS/MSD samples were collected from AOC 3 for data quality purposes. The Machinist Shop laboratory samples were analyzed for GRO, DRO, RRO, BTEX and metals content.

Test Pit 20 was excavated immediately in front of the parts washer. Analytical soil samples were collected at the surface and at one, two and three feet bgs. The sample analyses of Test Pit 20 included the POL and metals analyses with the addition of a full list of volatile compounds (VOC) representative of solvent use, samples 1209UTI0320-0 to 1209UTI0320-23.

On September 19, 2012 outside of the Machinist Shop, WHPacific advanced 14 test pits by hand to the depth of two feet bgs. Samples were collected and field screened and analytic samples were collected from the highest PID result. One MS/MSD sample and one duplicate sample were collected from the soils surrounding the Machinist Shop for data quality purposes.  The samples were submitted to a laboratory for DRO, GRO, BTEX, and metals analysis

Machinist shop test pits inside and outside were backfilled with the soils removed from each test pit once sample collection was completed and their locations were recorded with a precision GPS unit.

On September 9, 2012 eleven drums previously identified by the TPECI investigation were found at the south end of the Machinist shop.  Three of the drums contained enough non-aqueous liquid product to collect samples.  Samples were submitted to a laboratory for oil burn specification analysis

View looking north of AOC 3 on 9/19/2012.

**Laboratory Analyses Results**

The analytical sample results from AOC 3 are summarized in Table 8 and Figures 6 and 7. The exterior of the Machinist Shop had one result above the ADEC DRO cleanup level (250 mg/kg), 1640 mg/kg at 2 feet bgs in Test Pit 13. Test Pits 12 and 14, which are on either side of Test Pit 13, had analytical sample results of 108 and 31.2 mg/kg DRO, respectively.

Concentrations of VOCs at the location of the parts washer, Test Pit 20, were below ADEC clean up levels. However, Test Pit 20 did have a cadmium result of 8.45 mg/kg at the surface, exceeding the ADEC cleanup level of 5 mg/kg. The sample results from the interior floor of the building indicate areas of DRO and RRO contamination above ADEC cleanup levels, with results that ranged from non-detect to 17,300 mg/kg DRO and 38,700 mg/kg RRO.

One area of the inside floor, Test Pit 21 (near the northeastern wall), had a surface soil sample result of benzene at 0.083 mg/kg which is above the ADEC cleanup level of 0.025 mg/kg.

The duplicate comparisons had acceptable precision for DRO and RRO concentrations. The VOC and metals analyses precision was not an effective comparison as many of the concentrations were at or near the quantitation limits where the difference between small concentrations is magnified.

**Table 8 AOC 3 Utica Mine Site Machinist Shop Analytical Results**

| EXTERIOR | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ANALYTE | ADEC Cleanup Level | 1209 UTI 0301 | 1209 UTI 0302 | 1209 UTI 0303 | 1209 UTI 0304 | 1209 UTI 0305 | 1209 UTI 0306 | 1209 UTI 0307 | 1209 UTI 0308 | 1209 UTI 0309 | 1209 UTI 0310 | 1209 UTI 0311 | 1209 UTI 0312 | 1209 UTI 0313 | 1209UTI 0323 (dup of 0313) | RPD |
| Gasoline Range Organics | 300 | 2.56 J | ND | 2.4 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NC |
| Diesel Range Organics | 250 | 7.72 J | 7.49 J | 76.5 | ND | 99.6 | 105 | ND | 10.5 J | 17.2 J | ND | 10.7 J | 108 | 1640J | 1510J | 8 |
| Residual Range Organics | 11000 | 59.3 | 37.4 | 104 | 34.2 | 269 | 160 | 41.6 | 69.5 | 128 | 26.4 | 84.8 | 1170 | 343 | 398 | 15 |
| Benzene | 0.025 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NC |
| Ethyl-benzene | 6.9 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NC |
| o-Xylene | 63 (total) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NC |
| P & M - Xylene | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NC |
| Toluene | 6.5 | ND | 0.0253 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NC |
| Arsenic | 3.9 | 22.1 | 21 | 23.9 | 19.2 | 29.7 | 21 | 29.3 | 36 | 20.7 | 18.8 | 23.6 | 15.3 | 19 | 37 | 64 |
| Barium | 1100 | 41.7 | 29 | 34.5 | 34.5 | 40 | 56.1 | 68.6 | 62.3 | 35 | 33.4 | 37.7 | 34.6 | 16.5 | 27.2 | 45 |
| Cadmium | 5 | 0.255 | 0.209 | 0.252 | 0.239 | 0.357 | 0.319 | 0.331 | 0.42 | 0.27 | 0.2 J | 0.234 | 0.521 | 0.218 | 0.279 | 25 |
| Chromium | 25 | 8.71 | 6.6 | 7.58 | 7.88 | 10.8 | 10 | 8.19 | 11.6 | 7.82 | 5.95 | 7.69 | 9.3 | 4.8 | 7.76 | 47 |
| Lead | 400 | 8.01 | 7.71 | 12.4 | 7.71 | 12.2 | 11.2 | 9.25 | 17.1 | 115 | 6.38 | 8.08 | 12 | 76.1 | 17.4 | 126 |
| Mercury | 1.4 | 0.0637 | 0.0628 | 0.0701 | 0.0502 | 0.0908 | 0.076 | 0.045 | 0.0634 | 0.0601 | 0.0193 J | 0.0533 | 0.125 | 0.0523 | 0.0807 | 43 |
| Selenium | 3.4 | 0.395 J | 0.45 J | 0.521 | 0.349 J | 0.446 J | 0.625 | 0.484 J | 0.623 | 0.39 J | 0.388 J | 0.557 | 0.479 J | 0.308 | 1.01 | 107 |
| Silver | 11.2 | 0.0407 J | 0.0482 J | 0.0325 J | ND | 0.0337 J | 0.0395 J | 0.0374 J | 0.0412 J | 0.0341 J | ND | 0.0791 J | 0.0366 J | ND | 0.0607J | ND |

## INTERIOR

| ANALYTE | ADEC Cleanup Level | 1209 UTI 0314 | 1209 UTI 0315-3 | 1209 UTI 0316-3 | 1209 UTI 0317-3 | 1209 UTI 0318-3 | 1209 UTI 0319-2 | 1209 UTI 0319-3 | 1209 UTI 0320-0 | 1209 UTI 0320-1 | 1209 UTI 0320-2 | 1209 UTI 0320-3 | 1209 UTI 0321-3 | 1209UTI0322-3 Duplicate of 1209UTI0321-3 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GRO | 300 | ND | ND | ND | 30.6 J | 2.2 J | ND | ND | ND | ND | 3.13 | ND | ND | ND | NC |
| DRO | 250 | 31.2 J | 52.7 | 1890 | 3470 | 69.4 | 21.6 J | 51.5 | 17300 J | 51.2 | 190 | 1040 J | 288 | 248 | 15 |
| RRO | 11000 | 248 | 377 | 5000 J | 179 | 93.3 | 161 | 308 | 38700 J | 123 | 662 | 3330 J | 1080 | 1120 | 4 |
| 1,1,1,2-Tetrachloroethane | | | | | | | | | ND | ND | ND | ND | | | |
| 1,1,1-Trichloroethane | | | | | | | | | ND | ND | ND | ND | | | |
| 1,1,2,2-Tetrachloroethane | | | | | | | | | ND | ND | ND | ND | | | |
| 1,1,2-Trichloroethane | | | | | | | | | ND | ND | ND | ND | | | |
| 1,1-Dichloroethane | | | | | | | | | ND | ND | ND | ND | | | |
| 1,1-Dichloroethene | | | | | | | | | ND | ND | ND | ND | | | |
| 1,1-Dichloropropene | | | | | | | | | ND | ND | ND | ND | | | |
| 1,2,3-Trichlorobenzene | | | | | | | | | ND | ND | ND | ND | | | |

| ANALYTE | ADEC Cleanup Level | 1209 UTI 0314 | 1209 UTI 0315-3 | 1209 UTI 0316-3 | 1209 UTI 0317-3 | 1209 UTI 0318-3 | 1209 UTI 0319-2 | 1209 UTI 0319-3 | 1209 UTI 0320-0 | 1209 UTI 0320-1 | 1209 UTI 0320-2 | 1209 UTI 0320-3 | 1209 UTI 0321-3 | 1209UTI0322-3 Duplicate of 1209UTI0321-3 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,2,3-Trichloropropane | | | | | | | | | ND | ND | ND | ND | | | |
| 1,2,4-Trichlorobenzene | | | | | | | | | ND | ND | ND | ND | | | |
| 1,2,4-Trimethylbenzene | | | | | | | | | ND | ND | ND | ND | | | |
| 1,2-Dibromo-3-chloropropane | | | | | | | | | ND | ND | ND | ND | | | |
| 1,2-Dibromoethane | | | | | | | | | ND | ND | ND | ND | | | |
| 1,2-Dichlorobenzene | | | | | | | | | ND | ND | ND | ND | | | |
| 1,2-Dichloroethane | | | | | | | | | ND | ND | ND | ND | | | |
| 1,2-Dichloropropane | | | | | | | | | ND | ND | ND | ND | | | |
| 1,3,5-Trimethylbenzene | | | | | | | | | 0.018 J | ND | 0.0129 J | ND | | | |
| 1,3-Dichlorobenzene | | | | | | | | | ND | ND | ND | ND | | | |
| 1,3-Dichloropropane | | | | | | | | | ND | ND | ND | ND | | | |
| 1,4-Dichlorobenzene | | | | | | | | | ND | ND | ND | ND | | | |

| ANALYTE | ADEC Cleanup Level | 1209 UTI 0314 | 1209 UTI 0315-3 | 1209 UTI 0316-3 | 1209 UTI 0317-3 | 1209 UTI 0318-3 | 1209 UTI 0319-2 | 1209 UTI 0319-3 | 1209 UTI 0320-0 | 1209 UTI 0320-1 | 1209 UTI 0320-2 | 1209 UTI 0320-3 | 1209 UTI 0321-3 | 1209UTI0322-3 Duplicate of 1209UTI0321-3 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,2-Dichloropropane | | | | | | | | | ND | ND | ND | ND | | | |
| 2-Butanone (MEK) | | | | | | | | | ND | ND | ND | ND | | | |
| 2-Chlorotoluene | | | | | | | | | ND | ND | ND | ND | | | |
| 2-Hexanone | | | | | | | | | ND | ND | ND | ND | | | |
| 4-Chlorotoluene | | | | | | | | | ND | ND | ND | ND | | | |
| 4-Isopropyltoluene | | | | | | | | | ND | ND | ND | ND | | | |
| 4-Methyl-2-pentanone (MIBK) | | | | | | | | | ND | ND | ND | ND | | | |
| Benzene | 0.025 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.083 | ND | NC |
| Bromobenzene | | | | | | | | | ND | ND | ND | ND | | | |
| Bromochloromethane | | | | | | | | | ND | ND | ND | ND | | | |
| Bromodichloromethane | | | | | | | | | ND | ND | ND | ND | | | |
| Bromoform | | | | | | | | | ND | ND | ND | ND | | | |

| ANALYTE | ADEC Cleanup Level | 1209 UTI 0314 | 1209 UTI 0315-3 | 1209 UTI 0316-3 | 1209 UTI 0317-3 | 1209 UTI 0318-3 | 1209 UTI 0319-2 | 1209 UTI 0319-3 | 1209 UTI 0320-0 | 1209 UTI 0320-1 | 1209 UTI 0320-2 | 1209 UTI 0320-3 | 1209 UTI 0321-3 | 1209UTI0322-3 Duplicate of 1209UTI0321-3 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromomethane | | | | | | | | | ND | ND | ND | ND | | | |
| Carbon disulfide | | | | | | | | | ND | ND | ND | ND | | | |
| Carbon tetrachloride | | | | | | | | | ND | ND | ND | ND | | | |
| Chlorobenzene | | | | | | | | | ND | ND | ND | ND | | | |
| Chloroethane | | | | | | | | | ND | ND | ND | ND | | | |
| Chloroform | | | | | | | | | ND | ND | ND | ND | | | |
| Chloromethane | | | | | | | | | ND | ND | ND | ND | | | |
| cis-1,2-Dichloroethene | | | | | | | | | ND | ND | ND | ND | | | |
| cis-1,3-Dichloropropene | | | | | | | | | ND | ND | ND | ND | | | |
| Dibromochloromethane | | | | | | | | | ND | ND | ND | ND | | | |
| Dibromomethane | | | | | | | | | ND | ND | ND | ND | | | |
| Dichlorodifluoromethane | | | | | | | | | ND | ND | ND | ND | | | |

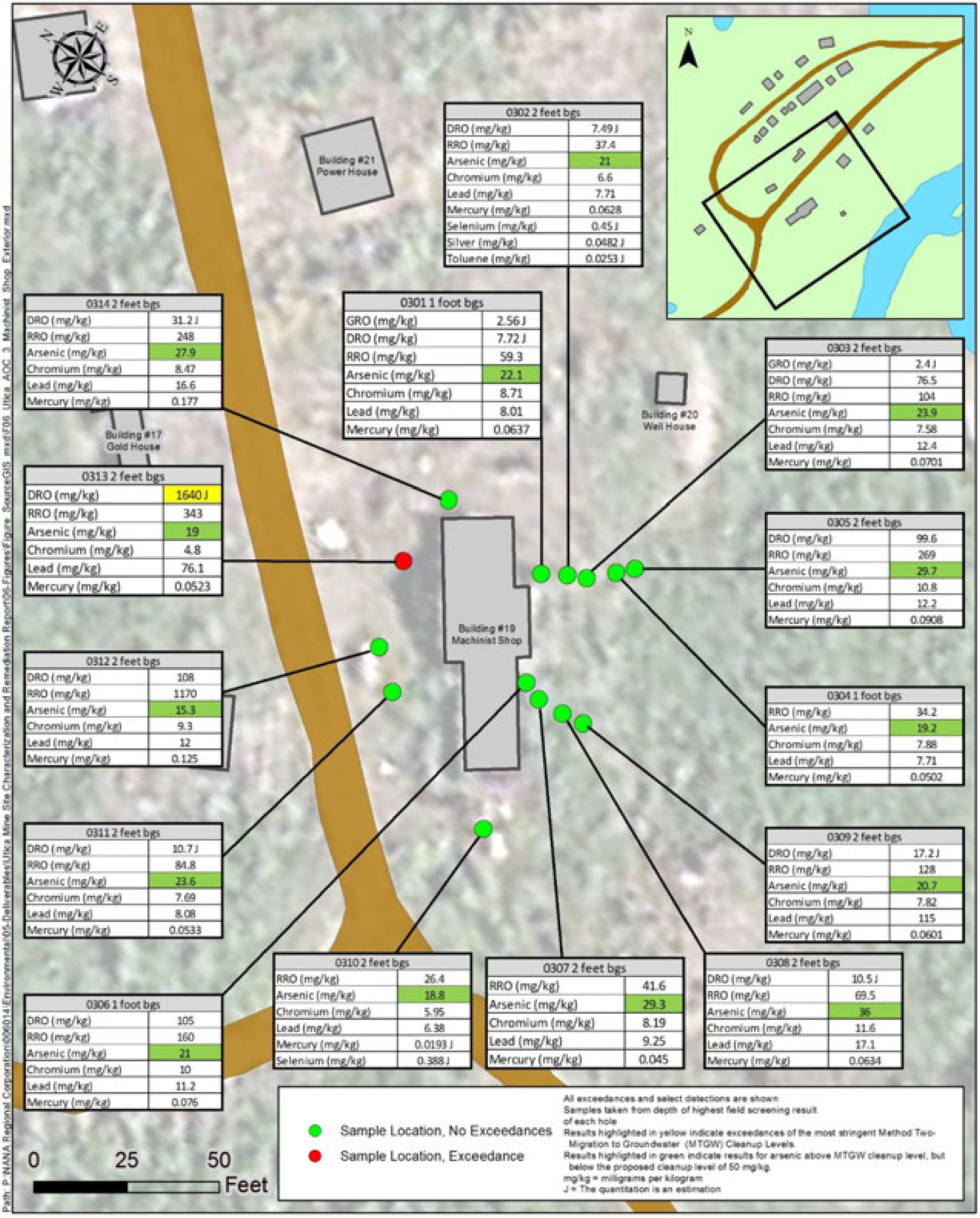
| ANALYTE | ADEC Cleanup Level | 1209 UTI 0314 | 1209 UTI 0315-3 | 1209 UTI 0316-3 | 1209 UTI 0317-3 | 1209 UTI 0318-3 | 1209 UTI 0319-2 | 1209 UTI 0319-3 | 1209 UTI 0320-0 | 1209 UTI 0320-1 | 1209 UTI 0320-2 | 1209 UTI 0320-3 | 1209 UTI 0321-3 | 1209UTI0322-3 Duplicate of 1209UTI0321-3 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ethylbenzene | 6.9 | ND | 0.0149 J | ND | ND | ND | ND | 0.0376 J | ND | ND | ND | ND | 0.217 | 0.0262 J | 157 |
| Hexachlorobutadiene | | | | | | | | | ND | ND | ND | ND | | | |
| Isopropylbenzene (Cumene) | | | | | | | | | ND | ND | ND | ND | | | |
| Methylene chloride | | | | | | | | | ND | ND | ND | ND | | | |
| Methyl-t-butyl ether | | | | | | | | | ND | ND | ND | ND | | | |
| Naphthalene | | | | | | | | | ND | ND | ND | ND | | | |
| n-Butylbenzene | | | | | | | | | ND | ND | ND | ND | | | |
| n-Propylbenzene | | | | | | | | | 0.0187 J | ND | ND | ND | | | |
| o-Xylene | 63 (total) | ND | ND | ND | ND | ND | ND | 0.0811 | ND | ND | ND | ND | 0.106 | 0.0514 | 69 |
| P & M -Xylene | | ND | ND | ND | ND | ND | ND | 0.0984 J | ND | ND | ND | ND | 0.0711 J | 0.0631 J | 12 |
| sec-Butylbenzene | | | | | | | | | ND | ND | ND | ND | | | |
| Styrene | | | | | | | | | ND | ND | ND | 0.0163 J | | | |

| ANALYTE | ADEC Cleanup Level | 1209 UTI 0314 | 1209 UTI 0315-3 | 1209 UTI 0316-3 | 1209 UTI 0317-3 | 1209 UTI 0318-3 | 1209 UTI 0319-2 | 1209 UTI 0319-3 | 1209 UTI 0320-0 | 1209 UTI 0320-1 | 1209 UTI 0320-2 | 1209 UTI 0320-3 | 1209 UTI 0321-3 | 1209UTI0322-3 Duplicate of 1209UTI0321-3 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| tert-Butylbenzene | | | | | | | | | ND | ND | ND | ND | | | |
| Tetrachloroethene | | | | | | | | | ND | ND | ND | ND | | | |
| Toluene | 6.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.04 J | ND | NC |
| trans-1,2-Dichloroethene | | | | | | | | | ND | ND | ND | ND | | | |
| trans-1,3-Dichloropropene | | | | | | | | | ND | ND | ND | ND | | | |
| Trichloroethene | | | | | | | | | ND | ND | ND | ND | | | |
| Trichlorofluoromethane | | | | | | | | | ND | ND | ND | ND | | | |
| Vinyl chloride | | | | | | | | | ND | ND | ND | ND | | | |
| Xylenes (total) | 63 | | | | | | | | ND | ND | ND | ND | | | |
| Arsenic | 3.9 | 27.9 | 25.5 | 22.9 | 20.7 | 21.5 | 23.5 | 19.9 | 22.7 | 22.7 | 24.5 | 27.1 | 25.6 | 35.8 | 33 |
| Barium | 1100 | 24.3 | 45.3 | 55.5 | 38.6 | 47.8 | 51.3 | 57.3 | 112 | 40.5 | 32.7 | 44.4 | 32.1 | 34.9 | 8 |
| Cadmium | 5 | 0.242 | 0.608 | 0.594 | 0.339 | 0.353 | 0.31 | 0.268 | 8.45 | 0.35 | 0.33 | 4.04 | 0.381 | 0.347 | 9 |

| ANALYTE | ADEC Cleanup Level | 1209 UTI 0314 | 1209 UTI 0315-3 | 1209 UTI 0316-3 | 1209 UTI 0317-3 | 1209 UTI 0318-3 | 1209 UTI 0319-2 | 1209 UTI 0319-3 | 1209 UTI 0320-0 | 1209 UTI 0320-1 | 1209 UTI 0320-2 | 1209 UTI 0320-3 | 1209 UTI 0321-3 | 1209UTI0322-3 Duplicate of 1209UTI0321-3 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium | 25 | 8.47 | 16.5 | 41.8 | 11.5 | 7.8 | 9.84 | 10.1 | 24 | 8.45 | 7.11 | 9.19 | 9.86 | 8.3 | 17 |
| Lead | 400 | 16.6 | 49 | 28.9 | 11.8 | 10.6 | 8.62 | 9.16 | 226 | 10.7 | 10.2 | 11.2 | 12.3 | 14.3 | 15 |
| Mercury | 1.4 | 0.177 | 0.52 | 0.227 | 0.0952 | 0.0671 | 0.103 | 0.125 | 1.37 | 0.104 | 0.118 | 0.073 | 0.123 | 0.14 | 13 |
| Selenium | 3.4 | 0.465 J | 0.459 J | 0.418 J | 0.28 J | 0.374 J | 0.449 J | 0.395 J | 0.31 J | 0.464 J | 0.681 | 0.434 J | 0.451 J | 0.395 J | 13 |
| Silver | 11.2 | 0.0517 J | ND | ND | ND | ND | ND | ND | 0.0498 J | ND | ND | ND | ND | 0.0333 J | NC |

Yellow shaded cells indicate the exceedance of ADEC clean up levels

RPDs are calculated between the primary and duplicate analyses presented in the preceding columns; QA failures are highlighted in green

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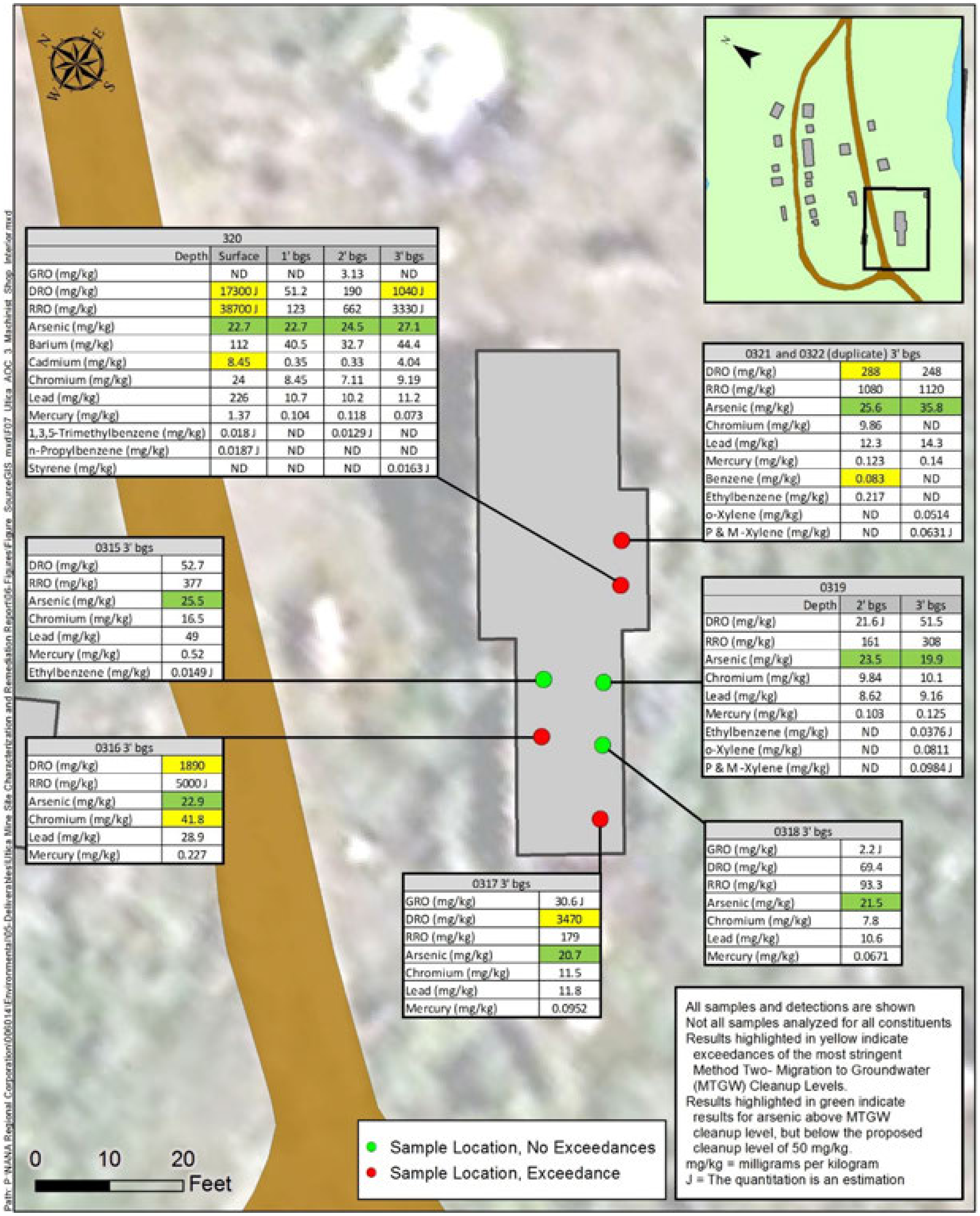
**Machinist Shop (AOC 3) Exterior Samples**
**2012 Former Utica Mine**
**Charaterization and Remediation Report**
**April, 2013**

Figure
**06**
Machinist Shop AOC 3




| 320 | | | | |
|---|---|---|---|---|
| Depth | Surface | 1' bgs | 2' bgs | 3' bgs |
| GRO (mg/kg) | ND | ND | 3.13 | ND |
| DRO (mg/kg) | 17300 J | 51.2 | 190 | 1040 J |
| RRO (mg/kg) | 38700 J | 123 | 662 | 3330 J |
| Arsenic (mg/kg) | 22.7 | 22.7 | 24.5 | 27.1 |
| Barium (mg/kg) | 112 | 40.5 | 32.7 | 44.4 |
| Cadmium (mg/kg) | 8.45 | 0.35 | 0.33 | 4.04 |
| Chromium (mg/kg) | 24 | 8.45 | 7.11 | 9.19 |
| Lead (mg/kg) | 226 | 10.7 | 10.2 | 11.2 |
| Mercury (mg/kg) | 1.37 | 0.104 | 0.118 | 0.073 |
| 1,3,5-Trimethylbenzene (mg/kg) | 0.018 J | ND | 0.0129 J | ND |
| n-Propylbenzene (mg/kg) | 0.0187 J | ND | ND | ND |
| Styrene (mg/kg) | ND | ND | ND | 0.0163 J |

| 0321 and 0322 (duplicate) 3' bgs | | |
|---|---|---|
| DRO (mg/kg) | 288 | 248 |
| RRO (mg/kg) | 1080 | 1120 |
| Arsenic (mg/kg) | 25.6 | 35.8 |
| Chromium (mg/kg) | 9.86 | ND |
| Lead (mg/kg) | 12.3 | 14.3 |
| Mercury (mg/kg) | 0.123 | 0.14 |
| Benzene (mg/kg) | 0.083 | ND |
| Ethylbenzene (mg/kg) | 0.217 | ND |
| o-Xylene (mg/kg) | ND | 0.0514 |
| P & M-Xylene (mg/kg) | ND | 0.0631 J |

| 0315 3' bgs | |
|---|---|
| DRO (mg/kg) | 52.7 |
| RRO (mg/kg) | 377 |
| Arsenic (mg/kg) | 25.5 |
| Chromium (mg/kg) | 16.5 |
| Lead (mg/kg) | 49 |
| Mercury (mg/kg) | 0.52 |
| Ethylbenzene (mg/kg) | 0.0149 J |

| 0319 | | |
|---|---|---|
| Depth | 2' bgs | 3' bgs |
| DRO (mg/kg) | 21.6 J | 51.5 |
| RRO (mg/kg) | 161 | 308 |
| Arsenic (mg/kg) | 23.5 | 19.9 |
| Chromium (mg/kg) | 9.84 | 10.1 |
| Lead (mg/kg) | 8.62 | 9.16 |
| Mercury (mg/kg) | 0.103 | 0.125 |
| Ethylbenzene (mg/kg) | ND | 0.0376 J |
| o-Xylene (mg/kg) | ND | 0.0811 |
| P & M-Xylene (mg/kg) | ND | 0.0984 J |

| 0316 3' bgs | |
|---|---|
| DRO (mg/kg) | 1890 |
| RRO (mg/kg) | 5000 J |
| Arsenic (mg/kg) | 22.9 |
| Chromium (mg/kg) | 41.8 |
| Lead (mg/kg) | 28.9 |
| Mercury (mg/kg) | 0.227 |

| 0318 3' bgs | |
|---|---|
| GRO (mg/kg) | 2.2 J |
| DRO (mg/kg) | 69.4 |
| RRO (mg/kg) | 93.3 |
| Arsenic (mg/kg) | 21.5 |
| Chromium (mg/kg) | 7.8 |
| Lead (mg/kg) | 10.6 |
| Mercury (mg/kg) | 0.0671 |

| 0317 3' bgs | |
|---|---|
| GRO (mg/kg) | 30.6 J |
| DRO (mg/kg) | 3470 |
| RRO (mg/kg) | 179 |
| Arsenic (mg/kg) | 20.7 |
| Chromium (mg/kg) | 11.5 |
| Lead (mg/kg) | 11.8 |
| Mercury (mg/kg) | 0.0952 |

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**Machinist Shop (AOC 3) Interior Samples**
**2012 Former Utica Mine**
**Charaterization and Remediation Report**
**April, 2013**

Figure
**07**
Machinist Shop AOC 3

**Deviations from the Work Plan**

The lack of appropriate equipment for the transportation of drums precluded moving them offsite. The drums were placed on a 20 mil liner and covered with 6 mil plastic sheeting to minimize stormwater impact. Field screening of the soils under the drums was not completed as they are stored in the same location as found. The soils will be screened once the drums are moved offsite.

**Discussion**

The 2012 sample results of the Machinist shop interior confirm high levels of surface contamination. Specifically, the surface location of the parts washer was contaminated above the maximum allowable concentration of the ADEC Method two for both DRO and RRO at 12,500 and 22,000 mg/Kg, respectively.

Contamination of DRO at three feet bgs was confirmed at four locations inside the Machinist Shop. However, the exterior DRO concentrations at 1 to 2 feet bgs confirmed that off-site migration was not occurring from the contaminated soils within the Machinist Shop interior.

The Test Pit 13 outside of the Machinist shop was bracketed by samples that were below the ADEC DRO clean up limits. This was a localized volume of contamination and could be included in a future field remediation effort.

**Remaining Work**

Work remaining at AOC 3 consists of three main task categories:

- drum removal
    - Empty drum disposal can be made at the local land fill in Deering, AK.
    - Drums with contents that passed the oil burn specifications can be reused for heat recovery.
- Excavation and transportation of soils at Test Pit 13 to the landfarm for remediation.
- Restricting access of the public to the contamination remaining inside the Machinist Shop.

## AOC 4- South Dump Site

On September 11, 2012 the South Dump Site was observed to have numerous automotive and heavy machine parts on site and adjacent to the area. The South Dump Site exists on a hill sloping towards the river, with an area of graded fill material on top and a sparsely vegetated steep slope terminating in a heavily vegetated area that appears to be seasonally covered in shallow surface water. The exact location of the former POL Shed (Building #7) footprint could not be identified as much of the area near the former location was disturbed by previous site activities.

### Field Activities

The AOC 4 test pit locations were chosen where POL stains were evident. Five locations were chosen along the top and slope of the hill, and an additional five locations along the toe of the slope to characterize any potential down-slope transport of hydrocarbons. An additional test pit location, 0411, was identified to further characterize the extent of any potential contamination. The eleven test pits were advanced with hand shovels to a depth of two feet bgs. The soils were a heavy cobble from the surface to 2 feet begs. The effort to collect a representative sample required the field team to sort a large volume of cobble to obtain sufficient fines. The removed soils from each test pit were field screened using a PID. The field screening results ranged from 0.2 to 7.0 ppm. The two highest field screening results were associated with soils directly beneath visible surface stains. The Test Pit 0411 soil had a PID result of 0.3 ppm, an analytical sample was not collected from this location. All other test pit locations had analytical samples collected (10 primary; table 5) from fines extending through their entire depths for GRO, BTEX, DRO and RRO analysis. One MS/MSD sample and one duplicate sample was collected from AOC 4 for data quality purposes. After the samples had been collected the test pits were backfilled with the removed soils. Sample locations were recorded with a precision GPS unit.

### Laboratory Analyses Results

Test pit data is summarized in Table 9 and detectable concentrations are shown on Figure 8. The two test pit samples (1209UTI401 and 1209UTI402) adjacent to the former location of the POL shed had DRO results in exceedance of the 18 AAC 75 ADEC Method Two migration to ground water cleanup level and are highlighted in yellow. There were no further exceedances of the ADEC cleanup levels at AOC 4.

**Deviations from the Work Plan**

The extra test pit was dug to the south of the South Dump site to characterize the extent of contamination. The field team was required to modify sample collection of heavily cobbled soils by sorting out fines from a larger volume of material collected from the entire depth of the test pit.

**Discussion**

The South Dump Site, AOC 4, was found to have a minor DRO impact of soils in an area near the location of a former POL shed.  There were no further concentrations of POL or BTEX constituents at or near the most stringent ADEC migration to ground water limits.  Ground water was not encountered in the test pit excavations.

**Remaining Work**

The area appears to be sorted tailings graded level.  AOC 4 is considered a potential location for a land farm.  The site is accessible and requires no further preparation such as clearing and grubbing of plants or the removal of automobiles as nearby candidate sites require.

**Table 9 AOC 4 Utica Mine Site South Dump Site Analytical Results**

| ANALYTE | Units | ADEC Cleanup Level | 1209 UTI401 | 1209 UTI402 | 1209 UTI403 | 1209 UTI404 | 1209 UTI405 | 1209 UTI406 | 1209 UTI407 | 1209 UTI408 | 1209 UTI409 | 1209 UTI4 10 | 1209UTI411 Duplicate of 1209UTI410 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | mg/kg | 100 | 7.39 | 9.49 | 14.6 | 16.4 | 8.39 | 6.29 | 27.5 | 7.68 | 17.7 | 10.2 | 14.7 | 36 |
| Diesel Range Organics | mg/Kg | 250 | 1200 | 2130 | ND | 20.7 J | ND | ND | 8.09 J | ND | 54.7 J | 17.8 J | 31.1 J | 54 |
| Residual Range Organics | mg/Kg | 11000 | 771 | 6450 | ND | 166 | ND | 30.9 | 52.3 | 25.5 | 578 | 145 | 300 | 70 |
| | | | | | | | | | | | | | | |
| Benzene | mg/Kg | 0.025 | ND | ND | 0.0153 J | ND | ND | ND | ND | ND | ND | ND | ND | NC |
| Ethylbenzene | mg/Kg | 6.9 | ND | ND | 0.0365 J | ND | ND | ND | ND | ND | ND | ND | ND | NC |
| o-Xylene | mg/Kg | 63 (total) | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NC |
| P & M -Xylene | mg/Kg | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NC |
| Toluene | mg/Kg | 6.5 | ND | ND | 0.0978 | 0.0336 J | 0.0137 J | ND | ND | ND | ND | ND | 0.0422 J | NC |

Yellow shaded cells indicate the exceedance of ADEC clean up levels
RPDs are calculated between the primary and duplicate analyses presented in the preceding columns; QA failures are highlighted in green

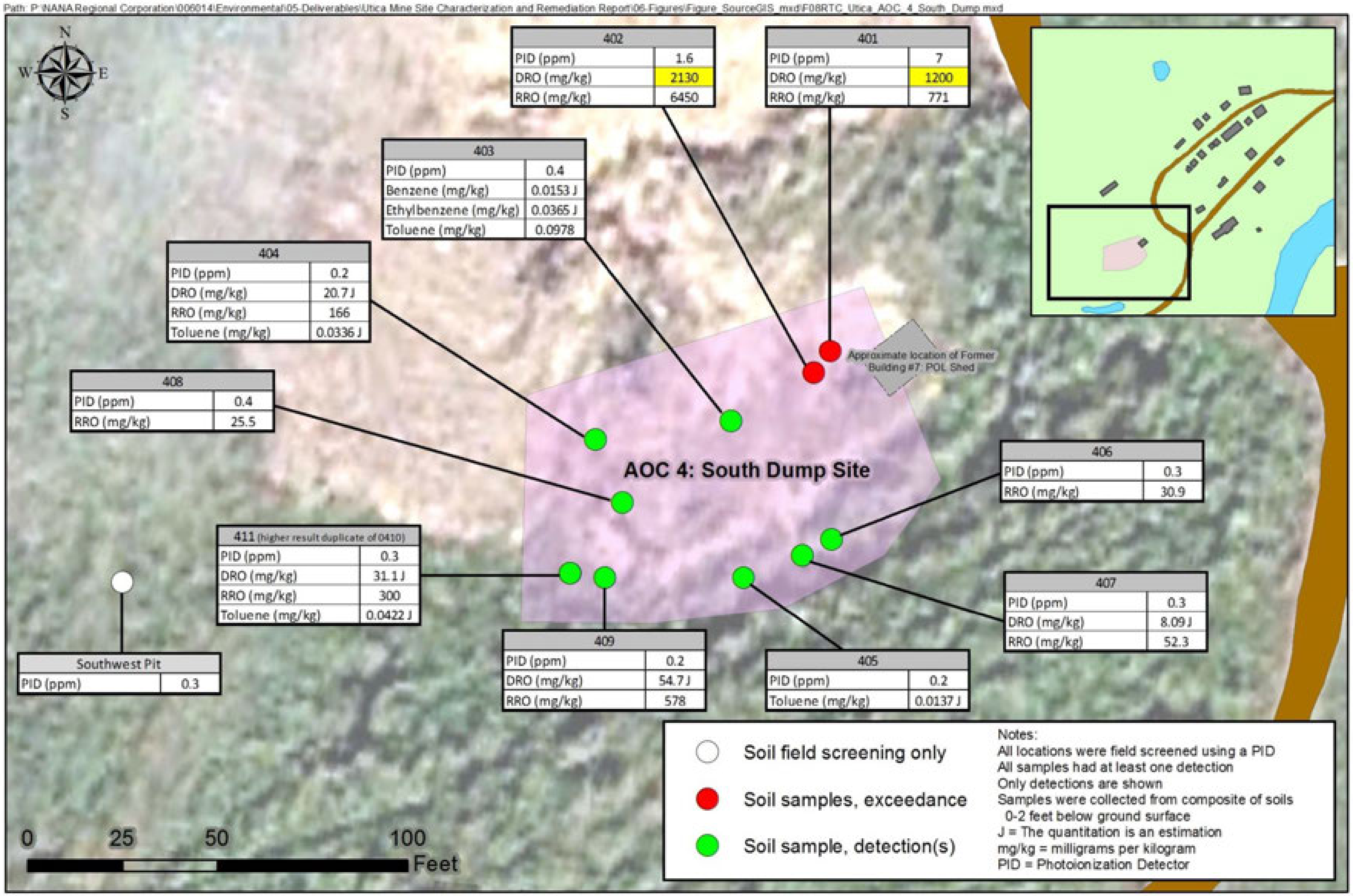


Figure 08 South Dump AOC 4

**South Dump (AOC 4) Samples**
**2012 Former Utica Mine**
**Charaterization and Remediation Report**
**April, 2013**

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## AOC 5- Bunkhouse

Buildings in the upper loop of the Utica Mine road were primarily living quarters and food preparation facilities. The AOC 5 Bunkhouse (Building #10) is a wooden structure located in this area. During the TPECI 2007 site investigation three transects across the mine Site were completed (A, B, C). Transect A identified chromium concentrations at the north east corner of this bunkhouse.

**Field Activities**

On September 14, 2012 three test pits were advanced by hand shovel. Archaeological monitoring was conducted at this site during excavation. The surface to a depth of approximately 6 inches was a root mat. Analytical samples (6 primary; table 5) were collected for metals at the one and two feet bgs levels, below the vegetation, of each test pit. One duplicate sample was collected at the Bunkhouse for data quality purposes.

Once sampling activities were completed, the test pits were backfilled with the removed soils and the locations of test pits collected using a precision GPS unit.

**Laboratory Analyses Results**

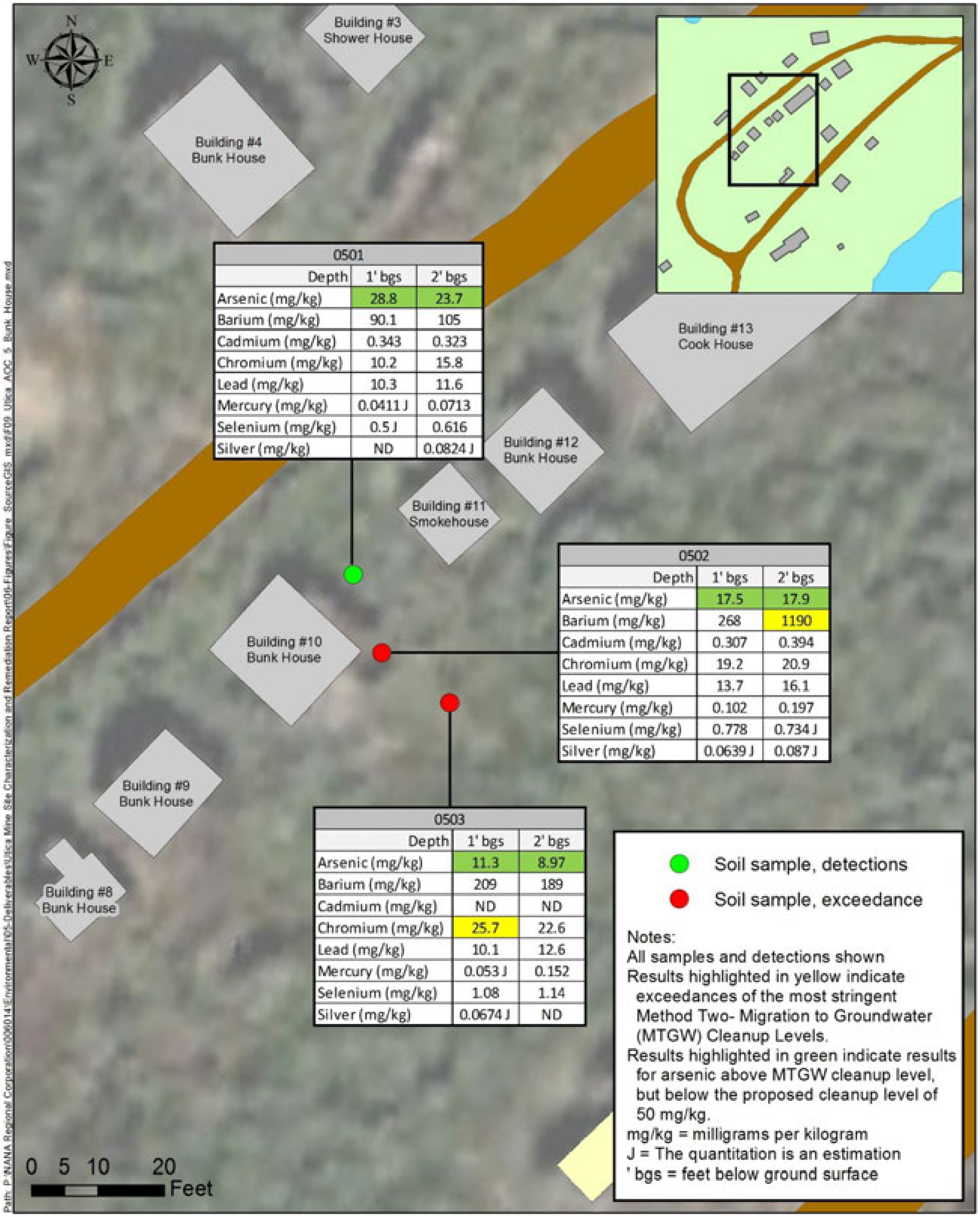
The analytical sample results from AOC 5 are summarized in Table 10. Detectable concentrations are plotted on Figure 9. The arsenic concentrations in the samples of AOC 5 were between 8.8 and 28.8 mg/Kg, above the ADEC method two migration to ground water cleanup level of 3.9mg/Kg. However, these values are comparable to the natural conditions found at the Utica Mine Camp Site and surrounding area.

Test Pit 02 analytical results of barium at 1190 mg/kg at the depth of 2 feet bgs, exceed the cleanup level of 1100 mg/kg. In Test Pit 03, a result of 25.7 mg/kg of chromium was detected at 1 foot bgs, exceeding the cleanup level of 25 mg/kg. The field duplicate study provided an acceptable level of precision as did the MS/MSD comparisons. However, the accuracy of the matrix spikes for both barium and chromium were biased high by approximately 10% suggesting the true concentrations of barium and chromium are lower than the laboratory reported values.

**Table 10 AOC 5 Bunkhouse Analytical Results**

| ANALYTE | Units | ADEC Cleanup Level | 1209 UTI0501-1 | 1209 UTI0501-2 | 1209 UTI502-1 | 1209 UTI502-2 | 1209 UTI503-1 | 1209 UTI504-1 Duplicate of 1209 UTI503-1 | RPD | 1209 UTI503-2 |
|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | mg/Kg | 3.9 | 28.8 | 23.7 | 17.5 | 17.9 | 11.3 | 8.8 | 25 | 8.97 |
| Barium | mg/Kg | 1100 | 90.1 | 105 | 268 | 1190 | 209 | 173 | 19 | 189 |
| Cadmium | mg/Kg | 5 | 0.343 | 0.323 | 0.307 | 0.394 | ND | ND | NC | ND |
| Chromium | mg/Kg | 25 | 10.2 | 15.8 | 19.2 | 20.9 | 25.7 | 22.5 | 13 | 22.6 |
| Lead | mg/Kg | 400 | 10.3 | 11.6 | 13.7 | 16.1 | 10.1 | 9.13 | 10 | 12.6 |
| Mercury | mg/Kg | 1.4 | 0.0411 J | 0.0713 | 0.102 | 0.197 | 0.053 J | 0.0694 J | 27 | 0.152 |
| Selenium | mg/Kg | 3.4 | 0.5 J | 0.616 | 0.778 | 0.734 J | 1.08 | 0.782 J | 32 | 1.14 |
| Silver | mg/Kg | 11.2 | ND | 0.0824 J | 0.0639 J | 0.087 J | 0.0674 J | 0.0601 J | 11 | ND |

Yellow shaded cells indicate the exceedance of ADEC clean up levels
RPDs are calculated between the primary and duplicate analyses presented in the preceding columns; QA failures are highlighted in green.




| 0501 | | |
|---|---|---|
| Depth | 1' bgs | 2' bgs |
| Arsenic (mg/kg) | 28.8 | 23.7 |
| Barium (mg/kg) | 90.1 | 105 |
| Cadmium (mg/kg) | 0.343 | 0.323 |
| Chromium (mg/kg) | 10.2 | 15.8 |
| Lead (mg/kg) | 10.3 | 11.6 |
| Mercury (mg/kg) | 0.0411 J | 0.0713 |
| Selenium (mg/kg) | 0.5 J | 0.616 |
| Silver (mg/kg) | ND | 0.0824 J |

| 0502 | | |
|---|---|---|
| Depth | 1' bgs | 2' bgs |
| Arsenic (mg/kg) | 17.5 | 17.9 |
| Barium (mg/kg) | 268 | 1190 |
| Cadmium (mg/kg) | 0.307 | 0.394 |
| Chromium (mg/kg) | 19.2 | 20.9 |
| Lead (mg/kg) | 13.7 | 16.1 |
| Mercury (mg/kg) | 0.102 | 0.197 |
| Selenium (mg/kg) | 0.778 | 0.734 J |
| Silver (mg/kg) | 0.0639 J | 0.087 J |

| 0503 | | |
|---|---|---|
| Depth | 1' bgs | 2' bgs |
| Arsenic (mg/kg) | 11.3 | 8.97 |
| Barium (mg/kg) | 209 | 189 |
| Cadmium (mg/kg) | ND | ND |
| Chromium (mg/kg) | 25.7 | 22.6 |
| Lead (mg/kg) | 10.1 | 12.6 |
| Mercury (mg/kg) | 0.053 J | 0.152 |
| Selenium (mg/kg) | 1.08 | 1.14 |
| Silver (mg/kg) | 0.0674 J | ND |

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**Bunk House (AOC 5) Samples**
**2012 Former Utica Mine**
**Charaterization and Remediation Report**
**April, 2013**

Figure
**09**
Bunk House
AOC 5

**Deviations from the Work Plan**

The Bunkhouse test pits were field screened for metals on September 22, 2012. Not on September 14 when the analytical samples were taken from multiple depths.

An archeological screen and review of the Bunkhouse soils was completed to determine possible cultural sensitivities. The results from this activity are included in the Archeological section.

**Discussion**

The chromium metal concentrations of the soils at the Bunkhouse are comparable to the natural background of the Utica area described in section AOC 10. No further action relative to chromium was considered.

The barium concentration at two feet bgs was not within the range of the AOC 10 background study barium levels and could be related to the human activities at the site. Barium is a prevalent chemical associated with many consumer goods, housing materials, and industrial uses.

**Remaining Work**

No further action is proposed for the AOC 5 Bunkhouse.

## AOC 6 - Former Carpenter Shed

During the TPECI 2007 site investigation three transects across the mine site were completed (A, B, C). Transect B identified mercury concentrations upslope of the former carpenter shed (AOC 6). When WHPacific arrived on site, the footprint of the former carpenter shed was partially covered by stockpiles 2 and 3, which TPECI had deposited at this location.

### Field Activities

On September 14, 2012 WHPacific and a contracted local equipment operator removed stockpile 2 from the building footprint. The moved soils were placed on top of a 20 mil liner, for storage, at the north end of stockpile 3. The soils were covered with a 6 mil reinforced polyethylene liner and secured.

Four test pits were advanced by hand with shovels to two feet bgs. Two test pits were in the former building footprint, and two upslope to the northwest. Removed soils were placed on a 20 mil plastic liner to minimize the spread of possible contaminants while samples were taken. Archaeological monitoring was conducted at this site during excavation. Soil samples were taken from one and two feet bgs in the four test pits (8 primary; table 5). A field duplicate sample was collected. However, these samples were batched with the AOC 5 Bunkhouse samples where the MS/MSD sample pair sufficed to measure the accuracy and precision of both AOCs. The removed soils were backfilled from their respective test pits when sample collection had concluded.

### Laboratory Analyses Results

A summary of the analytical sample results for AOC 6 is provided in Table 11 with detectable results plotted in Figure 10.

The sample taken from 1 foot bgs in test pit 4 had an elevated concentration of chromium at 29.1 mg/Kg, slightly above the ADEC migration to groundwater limit of 25 mg/Kg. However, the MS/MSD pair (associated with AOC 5) with this sample batch were shown to have a high bias with true concentrations of chromium less than the laboratory result reported; the result was also comparable to background concentrations.

While detectable amounts of mercury (approximately 0.019 to 0.08 mg/kg) were found in all soil samples, none were above the ADEC migration to ground water cleanup level of 1.4 mg/kg. The sample taken from 1 foot bgs in test pit 3 had an elevated concentration of arsenic at 77.2 mg/kg. This level was higher than found in AOC 10 background study however still comparable to local levels.

**Deviation from Work Plan**

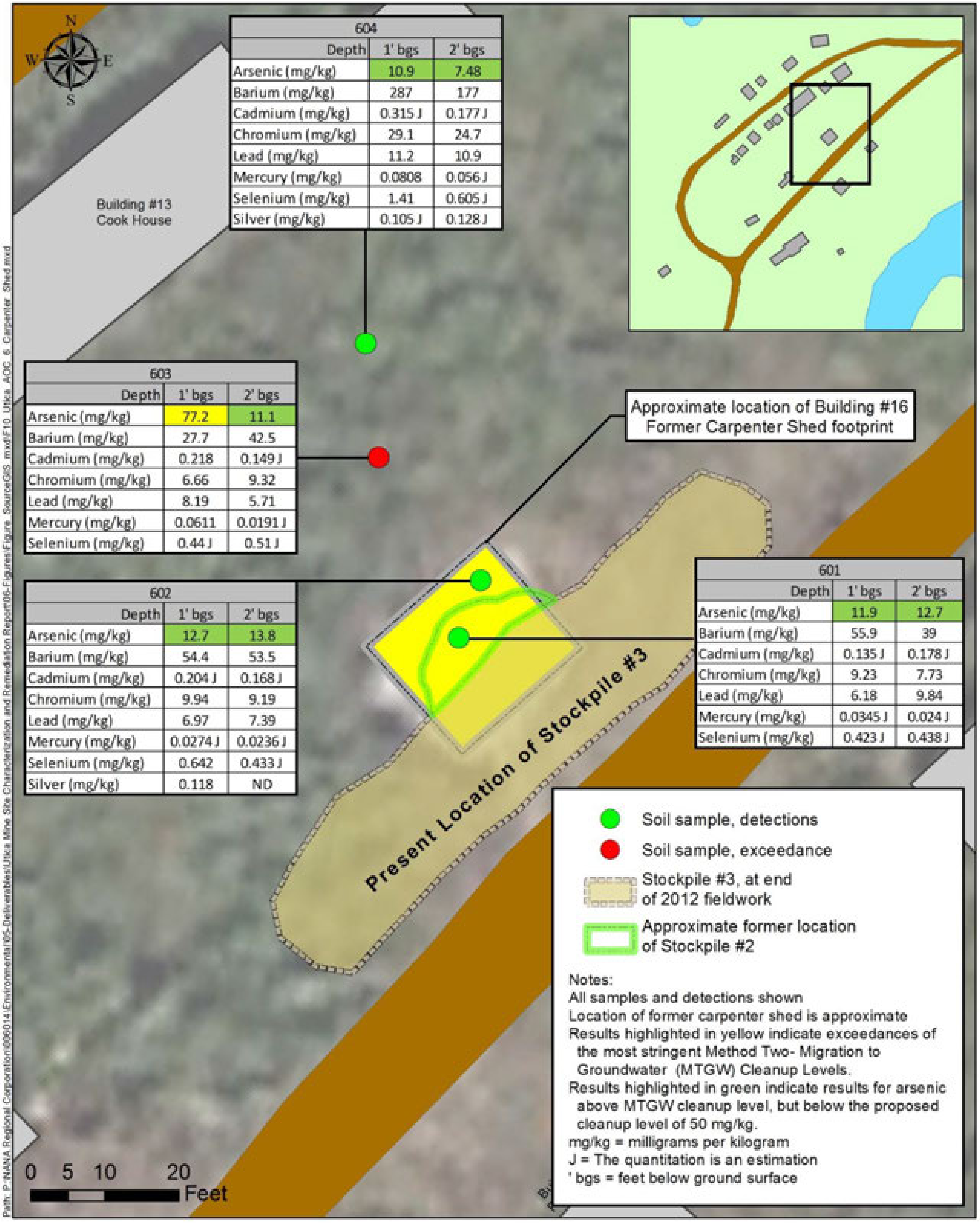
There were no deviations from the work plan at AOC 6.

## Table 11 AOC 6 Utica Mine Camp Site Former Carpenter Shed Analytical Results

| ANALYTE | Units | ADEC Cleanup Level | 1209 UTI601-1 | 1209 UTI601-2 | 1209 UTI602-1 | 1209 UTI602-2 | 120 9UTI603-1 | 1209 UTI605-1 Duplicate of 1209 UTI603-1 | RPD | 1209 UTI603-2 | 1209 UTI604-1 | 1209 UTI604-2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | mg/Kg | 3.9 | 11.9 | 12.7 | 12.7 | 13.8 | 77.2 | 20.4 | 116 | 11.1 | 10.9 | 7.48 |
| Barium | mg/Kg | 1100 | 55.9 | 39 | 54.4 | 53.5 | 27.7 | 35.8 | 26 | 42.5 | 287 | 177 |
| Cadmium | mg/Kg | 5 | 0.135 J | 0.178 J | 0.204 J | 0.168 J | 0.218 | 0.21 | 4 | 0.149 J | 0.315 J | 0.177 J |
| Chromium | mg/Kg | 25 | 9.23 | 7.73 | 9.94 | 9.19 | 6.66 | 6.52 | 2 | 9.32 | 29.1 | 24.7 |
| Lead | mg/Kg | 400 | 6.18 | 9.84 | 6.97 | 7.39 | 8.19 | 8.94 | 9 | 5.71 | 11.2 | 10.9 |
| Mercury | mg/Kg | 1.4 | 0.0345 J | 0.024 J | 0.0274 J | 0.0236 J | 0.0611 | 0.0296 J | 69 | 0.0191 J | 0.0808 | 0.056 J |
| Selenium | mg/Kg | 3.4 | 0.423 J | 0.438 J | 0.642 | 0.433 J | 0.44 J | 0.479 J | 8 | 0.51 J | 1.41 | 0.605 J |
| Silver | mg/Kg | 11.2 | ND | ND | 0.118 | ND | ND | ND | NC | ND | 0.105 J | 0.128 J |

Yellow shaded cells indicate the exceedance of ADEC clean up levels

RPDs are calculated between the primary and duplicate analyses presented in the preceding columns; QA failures are highlighted in green




| 604 | | |
|---|---|---|
| Depth | 1' bgs | 2' bgs |
| Arsenic (mg/kg) | 10.9 | 7.48 |
| Barium (mg/kg) | 287 | 177 |
| Cadmium (mg/kg) | 0.315 J | 0.177 J |
| Chromium (mg/kg) | 29.1 | 24.7 |
| Lead (mg/kg) | 11.2 | 10.9 |
| Mercury (mg/kg) | 0.0808 | 0.056 J |
| Selenium (mg/kg) | 1.41 | 0.605 J |
| Silver (mg/kg) | 0.105 J | 0.128 J |

| 603 | | |
|---|---|---|
| Depth | 1' bgs | 2' bgs |
| Arsenic (mg/kg) | 77.2 | 11.1 |
| Barium (mg/kg) | 27.7 | 42.5 |
| Cadmium (mg/kg) | 0.218 | 0.149 J |
| Chromium (mg/kg) | 6.66 | 9.32 |
| Lead (mg/kg) | 8.19 | 5.71 |
| Mercury (mg/kg) | 0.0611 | 0.0191 J |
| Selenium (mg/kg) | 0.44 J | 0.51 J |

| 602 | | |
|---|---|---|
| Depth | 1' bgs | 2' bgs |
| Arsenic (mg/kg) | 12.7 | 13.8 |
| Barium (mg/kg) | 54.4 | 53.5 |
| Cadmium (mg/kg) | 0.204 J | 0.168 J |
| Chromium (mg/kg) | 9.94 | 9.19 |
| Lead (mg/kg) | 6.97 | 7.39 |
| Mercury (mg/kg) | 0.0274 J | 0.0236 J |
| Selenium (mg/kg) | 0.642 | 0.433 J |
| Silver (mg/kg) | 0.118 | ND |

| 601 | | |
|---|---|---|
| Depth | 1' bgs | 2' bgs |
| Arsenic (mg/kg) | 11.9 | 12.7 |
| Barium (mg/kg) | 55.9 | 39 |
| Cadmium (mg/kg) | 0.135 J | 0.178 J |
| Chromium (mg/kg) | 9.23 | 7.73 |
| Lead (mg/kg) | 6.18 | 9.84 |
| Mercury (mg/kg) | 0.0345 J | 0.024 J |
| Selenium (mg/kg) | 0.423 J | 0.438 J |

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**Carpenter Shed (AOC 6) Samples**
**2012 Former Utica Mine**
**Charaterization and Remediation Report**
**April, 2013**

Figure
**10**
Carpenter Shed
AOC 6

**Discussion**

Samples collected at AOC 6 were found to be representative of the natural metals concentrations in the Utica Mine Site area (AOC 10, table 15). Arsenic was slightly higher than the ADEC most stringent cleanup level. However, arsenic levels hundreds of times higher have been found in nearby natural samples. It is difficult to determine the extent and influence of anthropogenic disturbance, undisturbed, and natural disturbance (from erosion and other hydrologic activity) on the natural soils at the Utica Mine Site because of the long history and many types of mining that have taken place in the area. All of these disturbance mechanisms breakdown surface material and concentrate or dilute minerals and metals. However, as noted in the site history section earlier in this report, we believe the Utica Mine Camp Site (including AOC 6) is primarily composed of dredge tailings that were leveled for building the camp.

**Remaining Work**

The sample results did not confirm the TPECI findings. We propose that they did provide a comparison with the background samples of AOC 10 and that no non-background contaminants are present. No further action is proposed for AOC 6.

## AOC 7- Inmachuck River Bank and Down-Slope Sampling

The area between the main road through the site and the river has a natural gentle slope, similar to the rest of the river valley. The area directly to the southeast of the camp buildings is a pad made from what appears to be repurposed dredge tailings. The natural grade is covered by low lying bushes, mosses, and lichens typical of the region. Some areas of bare ground are apparent where vegetation has failed to colonize former tailings and rocky areas. The Inmachuck riverbank is composed of sand and gravel.

### Field Activities

On September 12, 2012 WHPacific advanced fifteen test pits by hand with shovels to 2 feet bgs. Archaeological monitoring was conducted at this site during excavation. Field screenings were conducted with a PID at two depths for each pit, generally at one and two feet bgs. Test Pit 07 was placed in the ephemeral watercourse of AOC 9, where the suspected Settling Pond outflow joins the Inmachuck River. Soil samples were collected for analysis of GRO, DRO, RRO, BTEX, and metal constituents from the depth at each pit which yielded the highest PID results (15 primary, 2 duplicates, 1 MS/MSD; table 5). The test pits were backfilled with the removed soil, and where applicable, any vegetative mat present was replaced at the surface to minimize impact. The test pit locations were recorded with a precision GPS unit for later mapping.

### Laboratory Analyses Results

Table 12 shows a summary of the analytical sample results for AOC 7. Detectable concentrations are plotted on Figure 11. There were no concentrations of GRO, DRO, RRO, BTEX, or metals above ADEC established cleanup levels with the exception of arsenic. NRC is currently proposing an alternative cleanup level for this COC due to elevated background concentrations. ADEC tentatively approved a "to be considered background level" per email correspondence with NRC (Appendix F).

### Discussion

The Inmachuck Riverbank samples were collected from locations characterized as [dredge?] tailings graded level and now overgrown with vegetation. The location is minimally impacted by industrial activity other than abandoned metal debris. The sample results indicate there were no measureable POL impacts to the area. The metals results were comparable to the background characterization performed at AOC 10.

Results of no detectable POL concentrations down gradient of the AOC 3 Machinist Shop and the AOC 1 Former Power House suggest there is no active pathway of POL contamination.

**Deviations from the Work Plan**

There were no deviations from the work plan.

**Remaining Work**

The sample results indicate the surface soils and sediment west of the riverbank do not harbor contaminants migrating into the Inmachuk River.  No non-background contaminants are present.  No further action is proposed for the AOC 7 Inmachuck Riverbank

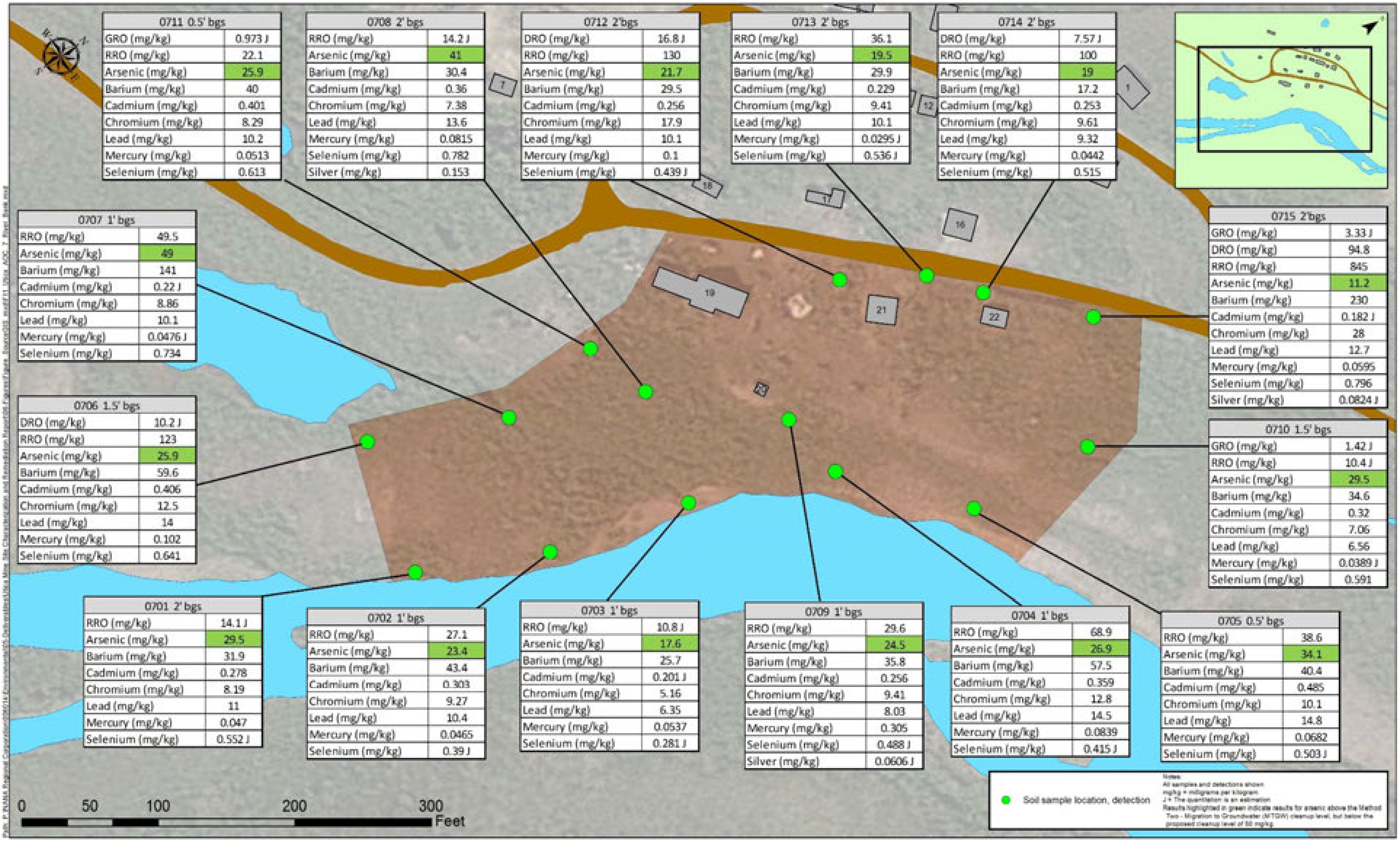
**Table 12 AOC 7 Utica Mine Site Inmachuck Riverbank Analytical Results**

| ANALYTE | 1209 UTI 0701 | 1209 UTI 0702 | 1209 UTI 0703 | 1209 UTI 0704 | 1209 UTI 0705 | 1209 UTI 0706 | 1209 UTI 0707 | 1209 UTI 0708 | 1209 UTI 0709 | 1209 UTI0716 Dup. of 0709 | RPD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | ND | ND | ND | ND | ND | ND | ND | ND | ND | 2.07 J | ND |
| Diesel Range Organics | ND | ND | ND | ND | ND | 10.2 J | ND | ND | ND | ND | NC |
| Residual Range Organics | 14.1 J | 27.1 | 10.8 J | 68.9 | 38.6 | 123 | 49.5 | 14.2 J | 29.6 | 44.2 | 40 |
| | | | | | | | | | | | |
| Benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NC |
| Ethyl-benzene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NC |
| o-Xylene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NC |
| P & M - Xylene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NC |
| Toluene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NC |
| | | | | | | | | | | | |
| Arsenic | 29.5 | 23.4 | 17.6 | 26.9 | 34.1 | 25.9 | 49 | 41 | 24.5 | 29.2 | 18 |
| Barium | 31.9 | 43.4 | 25.7 | 57.5 | 40.4 | 59.6 | 141 | 30.4 | 35.8 | 40.9 | 13 |
| Cadmium | 0.278 | 0.303 | 0.201 J | 0.359 | 0.485 | 0.406 | 0.22 J | 0.36 | 0.256 | 0.315 | 21 |
| Chromium | 8.19 | 9.27 | 5.16 | 12.8 | 10.1 | 12.5 | 8.86 | 7.38 | 9.41 | 10 | 6 |
| Lead | 11 | 10.4 | 6.35 | 14.5 | 14.8 | 14 | 10.1 | 13.6 | 8.03 | 12.3 | 42 |
| Mercury | 0.047 | 0.0465 | 0.0537 | 0.0839 | 0.0682 | 0.102 | 0.0476 J | 0.0815 | 0.305 | 0.0679 | 127 |
| Selenium | 0.552 J | 0.39 J | 0.281 J | 0.415 J | 0.503 J | 0.641 | 0.734 | 0.782 | 0.488 J | 0.685 | 34 |
| Silver | ND | ND | ND | ND | ND | ND | ND | 0.153 | 0.0606 J | ND | NC |

| ANALYTE | 1209 UTI0710 | 1209 UTI0711 | 1209 UTI0712 | 1209 UTI0713 | 1209 UTI0714 | 1209UTI0717 Duplicate of 1209UTI0714 | RPD | 1209 UTI0715 |
|---|---|---|---|---|---|---|---|---|
| Gasoline Range Organics | 1.42 J | 0.973 J | ND | ND | ND | 1.38 J | NC | 3.33 J |
| Diesel Range Organics | ND | ND | 16.8 J | ND | 7.57 J | 9.78 J | 25 | 94.8 |
| Residual Range Organics | 10.4 J | 22.1 | 130 | 36.1 | 100 | 109 | 9 | 845 |
| Benzene | ND | ND | ND | ND | ND | 0.00603 J | NC | ND |
| Ethylbenzene | ND | ND | ND | ND | ND | 0.0188 J | NC | ND |
| o-Xylene | ND | ND | ND | ND | ND | ND | NC | ND |
| P & M - Xylene | ND | ND | ND | ND | ND | ND | NC | ND |
| Toluene | ND | ND | ND | ND | ND | ND | NC | ND |
| Arsenic | 29.5 | 25.9 | 21.7 | 19.5 | 19 | 23.4 | 21 | 11.2 |
| Barium | 34.6 | 40 | 29.5 | 29.9 | 17.2 | 20.6 | 18 | 230 |
| Cadmium | 0.32 | 0.401 | 0.256 | 0.229 | 0.253 | 0.265 | 5 | 0.182 J |
| Chromium | 7.06 | 8.29 | 17.9 | 9.41 | 9.61 | 7.51 | 25 | 28 |
| Lead | 6.56 | 10.2 | 10.1 | 10.1 | 9.32 | 9.38 | 1 | 12.7 |
| Mercury | 0.0389 J | 0.0513 | 0.1 | 0.0295 J | 0.0442 | 0.0425 | 4 | 0.0595 |
| Selenium | 0.591 | 0.613 | 0.439 J | 0.536 J | 0.515 | 0.505 J | 2 | 0.796 |
| Silver | ND | ND | ND | ND | ND | 0.0427 J | NC | 0.0824 J |

Yellow shaded cells indicate the exceedance of ADEC clean up levels

RPDs are calculated between the primary and duplicate analyses presented in the preceding columns; QA failures are highlighted in green




| 0711 0.5' bgs | |
|---|---|
| GRO (mg/kg) | 0.973 J |
| RRO (mg/kg) | 22.1 |
| Arsenic (mg/kg) | 25.9 |
| Barium (mg/kg) | 40 |
| Cadmium (mg/kg) | 0.401 |
| Chromium (mg/kg) | 8.29 |
| Lead (mg/kg) | 10.2 |
| Mercury (mg/kg) | 0.0513 |
| Selenium (mg/kg) | 0.613 |

| 0708 2' bgs | |
|---|---|
| RRO (mg/kg) | 14.2 J |
| Arsenic (mg/kg) | 41 |
| Barium (mg/kg) | 30.4 |
| Cadmium (mg/kg) | 0.36 |
| Chromium (mg/kg) | 7.38 |
| Lead (mg/kg) | 13.6 |
| Mercury (mg/kg) | 0.0815 |
| Selenium (mg/kg) | 0.782 |
| Silver (mg/kg) | 0.153 |

| 0712 2'bgs | |
|---|---|
| DRO (mg/kg) | 16.8 J |
| RRO (mg/kg) | 130 |
| Arsenic (mg/kg) | 21.7 |
| Barium (mg/kg) | 29.5 |
| Cadmium (mg/kg) | 0.256 |
| Chromium (mg/kg) | 17.9 |
| Lead (mg/kg) | 10.1 |
| Mercury (mg/kg) | 0.1 |
| Selenium (mg/kg) | 0.439 J |

| 0713 2' bgs | |
|---|---|
| RRO (mg/kg) | 36.1 |
| Arsenic (mg/kg) | 19.5 |
| Barium (mg/kg) | 29.9 |
| Cadmium (mg/kg) | 0.229 |
| Chromium (mg/kg) | 9.41 |
| Lead (mg/kg) | 10.1 |
| Mercury (mg/kg) | 0.0295 J |
| Selenium (mg/kg) | 0.536 J |

| 0714 2' bgs | |
|---|---|
| DRO (mg/kg) | 7.57 J |
| RRO (mg/kg) | 100 |
| Arsenic (mg/kg) | 19 |
| Barium (mg/kg) | 17.2 |
| Cadmium (mg/kg) | 0.253 |
| Chromium (mg/kg) | 9.61 |
| Lead (mg/kg) | 9.32 |
| Mercury (mg/kg) | 0.0442 |
| Selenium (mg/kg) | 0.515 |

| 0707 1' bgs | |
|---|---|
| RRO (mg/kg) | 49.5 |
| Arsenic (mg/kg) | 49 |
| Barium (mg/kg) | 141 |
| Cadmium (mg/kg) | 0.22 J |
| Chromium (mg/kg) | 8.86 |
| Lead (mg/kg) | 10.1 |
| Mercury (mg/kg) | 0.0476 J |
| Selenium (mg/kg) | 0.734 |

| 0715 2'bgs | |
|---|---|
| GRO (mg/kg) | 3.33 J |
| DRO (mg/kg) | 94.8 |
| RRO (mg/kg) | 845 |
| Arsenic (mg/kg) | 11.2 |
| Barium (mg/kg) | 230 |
| Cadmium (mg/kg) | 0.182 J |
| Chromium (mg/kg) | 28 |
| Lead (mg/kg) | 12.7 |
| Mercury (mg/kg) | 0.0595 |
| Selenium (mg/kg) | 0.796 |
| Silver (mg/kg) | 0.0824 J |

| 0706 1.5' bgs | |
|---|---|
| DRO (mg/kg) | 10.2 J |
| RRO (mg/kg) | 123 |
| Arsenic (mg/kg) | 25.9 |
| Barium (mg/kg) | 59.6 |
| Cadmium (mg/kg) | 0.406 |
| Chromium (mg/kg) | 12.5 |
| Lead (mg/kg) | 14 |
| Mercury (mg/kg) | 0.102 |
| Selenium (mg/kg) | 0.641 |

| 0710 1.5' bgs | |
|---|---|
| GRO (mg/kg) | 1.42 J |
| RRO (mg/kg) | 10.4 J |
| Arsenic (mg/kg) | 29.5 |
| Barium (mg/kg) | 34.6 |
| Cadmium (mg/kg) | 0.32 |
| Chromium (mg/kg) | 7.06 |
| Lead (mg/kg) | 6.56 |
| Mercury (mg/kg) | 0.0389 J |
| Selenium (mg/kg) | 0.591 |

| 0701 2' bgs | |
|---|---|
| RRO (mg/kg) | 14.1 J |
| Arsenic (mg/kg) | 29.5 |
| Barium (mg/kg) | 31.9 |
| Cadmium (mg/kg) | 0.278 |
| Chromium (mg/kg) | 8.19 |
| Lead (mg/kg) | 11 |
| Mercury (mg/kg) | 0.047 |
| Selenium (mg/kg) | 0.552 J |

| 0702 1' bgs | |
|---|---|
| RRO (mg/kg) | 27.1 |
| Arsenic (mg/kg) | 23.4 |
| Barium (mg/kg) | 43.4 |
| Cadmium (mg/kg) | 0.303 |
| Chromium (mg/kg) | 9.27 |
| Lead (mg/kg) | 10.4 |
| Mercury (mg/kg) | 0.0465 |
| Selenium (mg/kg) | 0.39 J |

| 0703 1' bgs | |
|---|---|
| RRO (mg/kg) | 10.8 J |
| Arsenic (mg/kg) | 17.6 |
| Barium (mg/kg) | 25.7 |
| Cadmium (mg/kg) | 0.201 J |
| Chromium (mg/kg) | 5.16 |
| Lead (mg/kg) | 6.35 |
| Mercury (mg/kg) | 0.0537 |
| Selenium (mg/kg) | 0.281 J |

| 0709 1' bgs | |
|---|---|
| RRO (mg/kg) | 29.6 |
| Arsenic (mg/kg) | 24.5 |
| Barium (mg/kg) | 35.8 |
| Cadmium (mg/kg) | 0.256 |
| Chromium (mg/kg) | 9.41 |
| Lead (mg/kg) | 8.03 |
| Mercury (mg/kg) | 0.305 |
| Selenium (mg/kg) | 0.488 J |
| Silver (mg/kg) | 0.0606 J |

| 0704 1' bgs | |
|---|---|
| RRO (mg/kg) | 68.9 |
| Arsenic (mg/kg) | 26.9 |
| Barium (mg/kg) | 57.5 |
| Cadmium (mg/kg) | 0.359 |
| Chromium (mg/kg) | 12.8 |
| Lead (mg/kg) | 14.5 |
| Mercury (mg/kg) | 0.0839 |
| Selenium (mg/kg) | 0.415 J |

| 0705 0.5' bgs | |
|---|---|
| RRO (mg/kg) | 38.6 |
| Arsenic (mg/kg) | 34.1 |
| Barium (mg/kg) | 40.4 |
| Cadmium (mg/kg) | 0.485 |
| Chromium (mg/kg) | 10.1 |
| Lead (mg/kg) | 14.8 |
| Mercury (mg/kg) | 0.0682 |
| Selenium (mg/kg) | 0.503 J |

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**Down Gradient Slope to River (AOC 7) Samples**
**2012 Former Utica Mine**
**Charaterization and Remediation Report**
April, 2013

Figure
**11**
Slope to River
AOC 7

## AOC 8- Soil Stockpiles

The AOC 8 Soil Stockpiles were given the highest priority as WHPacific arrived at the Former Utica Mine Camp Site. Samples were collected and analyzed with a fast turnaround time to base the decision for materials to be land farmed or packaged and transported off site for disposal.

WHPacific noted several stockpiles on site during the first June site visit, and continued to use the stockpile numbers established by TPECI in Figure 2 of the 2010 Site Characterization Work Plan. The soil stockpiles were not covered when WHPacific arrived on site. Grasses and small bushes were growing out of most stockpiles. A thin plastic material used for bottom liners was disintegrating when found. It was apparent that the same liner bottom material had been used as stockpile covers. The material had been shredded by winds and scattered across the site. Approximately five contractor bags of plastic liner were recovered over the two weeks WHPacific was on site and disposed of in the local landfill at Deering.

The following provides a summary of the stockpiles present when WHPacific arrived:

- Stockpile 1: Approximately 10 CY; located between the Former Power Shed and the Machinist Shop.
- Stockpile 2: Approximately 25 CY; formerly located on the building footprint of the Former Carpenter Shed (moved to the current location at the north end of stockpile 3 by WHPacific in the course of AOC 6 fieldwork).
- Stockpile 3: Approximately 300 CY; partially covering the Former Carpenter Shed footprint to the northwest of the main road through the site.
- Stockpiles 4 and 5: Approximately 40 CY total. While TPECI describes these as two separate features, WHPacific found them as one continuous mass of what appears to have possibly been 4 semi-distinct stockpiles before erosion or some other unknown process conjoined them. WHPacific will consider them to be one mass of soil for sampling and treatment purposes, but continue to use the descriptor “Stockpiles 4 and 5” to preserve continuity.
- Stockpile 6: Approximately 5 CY; located between Stockpile 1 and the Machinist Shop.

Stockpile 7 was created as a result of the AOC 1 excavation performed by WHPacific.

**Field Work**

On September 9, 2012 WHPacific used hand shovels to collect samples approximately one foot into several locations on each stockpile. Field screenings using a PID were conducted, and a total of 23 analytical samples, including one MS/MSD and one duplicate sample were collected. The location of each sample was recorded using a precision GPS unit.

**Laboratory Analyses Results**

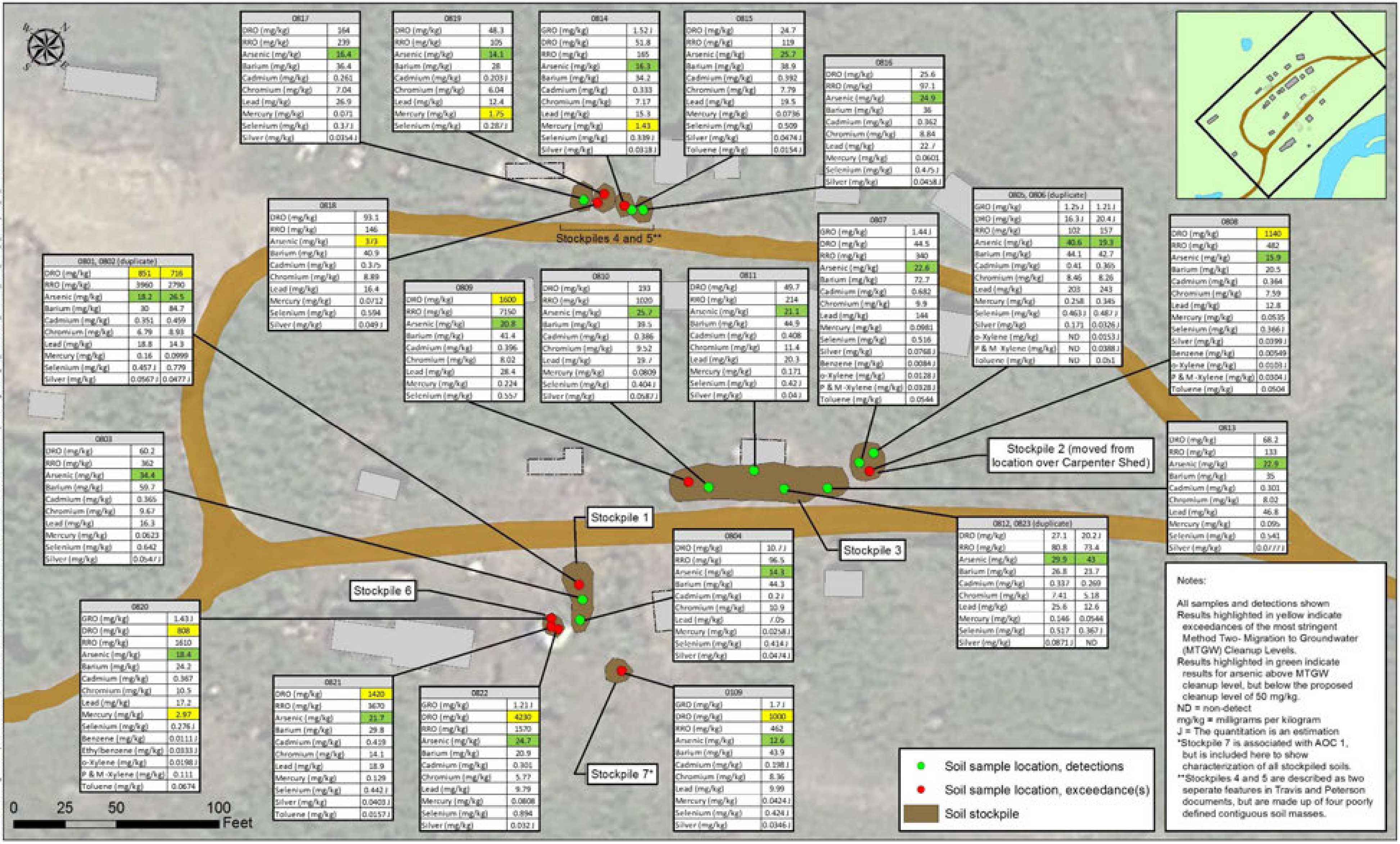
Table 13 summarizes analytical sample results for AOC 8. DRO concentrations above the ADEC migration to ground water cleanup level of 250 mg/kg were detected in every stockpile except 4 and 5. GRO and RRO were not detected above the ADEC cleanup level of 300 and 11,000 mg/kg, respectively. Trace amount of BTEX constituents were found in Stockpiles 2, 4, 5, and 6. Metals were found in concentrations below ADEC cleanup levels in all stockpiles, except Stockpiles 4, 5, and 6 where mercury was found at 1.43, 1.75, and 2.97 mg/kg respectively. The ADEC method two migration to ground water cleanup level for mercury is 1.4 mg/kg.

One sample from Stockpiles 5 yielded an arsenic concentration of 373 mg/kg, exceeding the proposed site specific cleanup level of 50 mg/kg for this constituent. NRC is currently proposing an alternative cleanup level for this COC due to elevated background concentrations. ADEC tentatively approved a “to be considered background level” per email correspondence with NRC (Appendix F).

**Table 13 AOC 8 Utica Mine Site Stockpile Analytical Results**

| Location | Sample Number | As | Ba | Cd | Cr | Pb | Hg | Se | Ag |
|---|---|---|---|---|---|---|---|---|---|
| Stockpile 1 | 1209UTI00801 | 18.2 | 30.3 | 0.351 | 6.79 | 18.8 | 0.16 | 0.457J | 0.0567J |
| | 1209UTI00802 | 26.5 | 84.7 | 0.459 | 8.93 | 14.3 | 0.0999 | 0.779 | 0.0477J |
| | 1209UTI00803 | 34.4 | 59.7 | 0.365 | 9.67 | 16.3 | 0.0623 | 0.642 | 0.0547J |
| | 1209UTI00804 | 14.3 | 44.3 | 0.200J | 10.9 | 7.05 | 0.0258J | 0.414J | 0.0474J |
| Stockpile 2 | 1209UTI00805 | 40.6 | 44.1 | 0.41 | 8.46 | 203 | 0.258 | 0.463J | 0.171 |
| | 1209UTI00806 | 19.3 | 42.7 | 0.365 | 8.26 | 243 | 0.345 | 0.487J | 0.0326J |
| | 1209UTI00807 | 22.6 | 72.7 | 0.682 | 9.9 | 144 | 0.0981 | 0.516 | 0.0768 |
| | 1209UTI00808 | 15.9 | 20.5 | 0.346 | 7.59 | 12.8 | 0.0535 | 0.366J | 0.0399J |
| Stockpile 3 | 1209UTI00809 | 20.8 | 41.4 | 0.396 | 8.02 | 28.4 | 0.224 | 0.557 | 0.0650U |
| | 1209UTI00810 | 25.7 | 39.5 | 0.386 | 9.52 | 19.7 | 0.0809 | 0.404J | 0.0587J |
| | 1209UTI00811 | 21.1 | 44.9 | 0.408 | 11.4 | 20.3 | 0.171 | 0.420J | 0.0400J |
| | 1209UTI00812 | 29.9 | 26.8 | 0.337 | 7.41 | 25.6 | 0.146 | 0.517 | 0.0871J |
| | 1209UTI00813 | 22.9 | 35 | 0.31 | 8.02 | 46.8 | 0.095 | 0.541 | 0.0777J |
| | 1209UTI00823 | 43 | 23.7 | 0.269 | 5.18 | 12.6 | 0.0544 | 0.367J | 0.0624U |
| Stockpile 4 | 1209UTI00814 | 16.3 | 34.2 | 0.333 | 7.17 | 15.3 | 1.43 | 0.339J | 0.0318J |
| | 1209UTI00815 | 25.7 | 38.9 | 0.392 | 7.79 | 19.5 | 0.0736 | 0.509 | 0.0474J |
| | 1209UTI00816 | 24.9 | 36 | 0.362 | 8.84 | 22.7 | 0.0601 | 0.475J | 0.0458J |
| Stockpile 5 | 1209UTI00817 | 16.4 | 36.4 | 0.261 | 7.04 | 26.9 | 0.071 | 0.370J | 0.0354J |
| | 1209UTI00818 | 373 | 40.9 | 0.375 | 8.89 | 16.4 | 0.0712 | 0.594 | 0.0490J |
| | 1209UTI00819 | 14.1 | 28 | 0.203J | 6.04 | 12.4 | 1.75 | 0.287J | 0.0650U |
| Stockpile 6 | 1209UTI00820 | 18.4 | 24.2 | 0.367 | 10.5 | 17.2 | 2.97 | 0.276J | 0.0666U |
| | 1209UTI00821 | 21.7 | 29.8 | 0.419 | 14.1 | 18.9 | 0.129 | 0.442J | 0.0403J |
| | 1209UTI00822 | 24.7 | 20.9 | 0.301 | 5.77 | 9.79 | 0.0808 | 0.0894 | 0.0320J |

Yellow shaded cells indicate the exceedance of ADEC clean up levels




WHPacific

**Stockpile (AOC 8) Samples**
**2012 Former Utica Mine**
**Charaterization and Remediation Report**
**April, 2013**

Figure
**12**
Stockpiles
AOC 8

## Remediation Efforts

Stockpile 6 and its bottom liner were placed in six Super Sack™ brand 1 CY bags for transportation offsite to a facility licensed to receive materials contaminated with metals. Approximately half of the soils in Stockpiles 4 and 5 were placed into the last 14 Super Sacks™. Additional remedial efforts were hampered by supplies and weather. The filled Super Sacks™ and the remaining stockpiles (including the remainders of Stockpiles 4 and 5) were covered with 6 mil reinforced polyethylene liner material, which was weighed down with large rocks and heavy metal debris to prevent wind from blowing the covers away.

## Deviations from the Work Plan

Heavy equipment availability prohibited WHPacific from transporting any soils for disposal.

## Discussion

The AOC 8 stockpiles are characterized, staged, and ready to be either transported for disposal or moved to a landfarm for remedial action. The AOC 4 South Dump Site is a potential location to build a landfarm as the site is accessible, clear of debris, obstructions and vegetation.

## Remaining Work

The remainder of stockpiles 4 and 5 will need to be placed in Super Sacks for transport. Stockpiles 4, 5, and 6 packaged in Super Sacks will then need to be transported as metals (arsenic and mercury) contaminated soil to a facility out of state. Stockpiles 1, 2, and 3 require land farming to remediate the DRO concentrations.

## AOC 9- Possible Settling Pond

WHPacific noted the light blue color of the suspected settling pond discussed in the SLR ESA (SLR, 2007) during the June 2012 site visit. When WHPacific returned in September, the water level was higher and the pond showed coloration more typical of the other ponds in the area.

### Field Work

On September 9, 2012 WHPacific advanced four test pits by hand in the soils surrounding the pond to a depth of one foot bgs where water saturation began. Archaeological monitoring was conducted at this site during excavation. Samples were field screened by PID. An analytical sample was collected at one foot bgs in each of the test pits (4 primary; table 5), and the pits were backfilled using the removed soils. A field duplicate and MS/MSD pair were not included.

WHPacific deployed two small inflatable rafts to collect water and sediment samples from the pond surface and bottom respectively. Field parameters and water samples were collected from just below the surface of the water at four different locations in the pond. A spring loaded Ekman dredge was deployed from the rafts at each sampling location to collect bottom sediment samples. However, the copious pond flora fouled the dredge jaws, keeping the jaws from completely closing and allowing sediments to drain from the dredge as it was being pulled to the surface. Sediment samples were collected from the shallower west end of the pond where WHPacific field scientists could wade and collect samples by hand shovel. A field duplicate and MS/MSD were not included.

### Laboratory Analyses Results

Sample results are summarized in Table 14 and plotted on Figure 11. There were no detectable concentrations of POL products, VOC or PAH constituents in the sediments and water of the AOC 9 pond. Metal concentrations were below the ADEC cleanup levels for soils, except arsenic. Arsenic concentrations of the shore sediment and pond bottoms were above the ADEC soil action limit of 3.9 mg/kg. Arsenic levels were comparable to the natural level found from the AOC 10 background studies. DRO, arsenic and barium were the only COPC detected in the pond water at levels above the Table C ground water criteria.

**Table 14 AOC 9 Possible Settling Pond Analytical Results**

**SHORE AND POND BOTTOM**

| ANALYTE | 1209UTIP00901SD | 1209UTIP00902SD | 1209UTIP00903SD | 1209UTIP00904SD | 1209UTIP0B0901SD | 1209UTIP0B0902SD |
|---|---|---|---|---|---|---|
| Gasoline Range Organics | ND | ND | ND | ND | 1.47 J | ND |
| Diesel Range Organics | 12 J | 9.85 J | ND | ND | 42.2 J | ND |
| Residual Range Organics | 131 | 123 | 23.7 | 97.5 | 441 | 337 |
| Benzene | ND | ND | ND | ND | ND | ND |
| Ethylbenzene | ND | ND | ND | ND | ND | ND |
| o-Xylene | ND | ND | ND | ND | ND | ND |
| P & M -Xylene | ND | ND | ND | ND | ND | ND |
| Toluene | ND | ND | ND | ND | ND | ND |
| 1-Methylnaphthalene | ND | ND | ND | ND | ND | ND |
| 2-Methylnaphthalene | ND | ND | ND | ND | ND | ND |
| Acenaphthene | ND | ND | ND | ND | ND | ND |
| Acenaphthylene | ND | ND | ND | ND | ND | ND |
| Anthracene | ND | 0.00371 J | ND | ND | ND | ND |
| Benzo(a)Anthracene | ND | 0.017 | ND | ND | ND | ND |
| Benzo[a]pyrene | ND | 0.0143 | ND | ND | ND | ND |
| Benzo[b]Fluoranthene | ND | 0.0176 | ND | ND | ND | ND |
| Benzo[g,h,i]perylene | ND | 0.00746 | ND | ND | ND | ND |
| Benzo[k]fluoranthene | ND | ND | ND | ND | ND | ND |
| Chrysene | ND | 0.0154 | ND | ND | ND | ND |

| ANALYTE | 1209UTIP00901SD | 1209UTIP00902SD | 1209UTIP00903SD | 1209UTIP00904SD | 1209UTIP0B0901SD | 1209UTIP0B0902SD |
|---|---|---|---|---|---|---|
| Dibenzo[a,h]anthracene | ND | ND | ND | ND | ND | ND |
| Fluoranthene | 0.00255 J | 0.0309 | ND | ND | ND | ND |
| Fluorene | ND | ND | ND | ND | ND | ND |
| Indeno[1,2,3-c,d] pyrene | ND | 0.00663 J | ND | ND | ND | ND |
| Naphthalene | ND | ND | ND | ND | ND | ND |
| Phenanthrene | ND | 0.0134 | ND | ND | ND | ND |
| Pyrene | ND | 0.0388 | ND | ND | ND | ND |
| Arsenic | 27.1 | 25.6 | 28 | 30.8 | 38.2 | 95.3 |
| Barium | 57.3 | 49.4 | 28.8 | 49.9 | 61 | 79.6 |
| Cadmium | 0.393 | 0.373 | 0.303 | 0.433 | 0.489 | 0.564 |
| Chromium | 12.5 | 9.73 | 5 | 11.8 | 11.6 | 12.8 |
| Lead | 18.7 | 12.8 | 18 | 17.8 | 16.6 | 19.4 |
| Mercury | 0.0704 | 0.0532 J | 0.0198 J | 0.0588 | 0.0718 | 0.0863 J |
| Selenium | 0.756 | 0.624 J | 0.658 | 0.418 J | 0.716 J | 0.482 J |
| Silver | 0.0614 J | 0.0491 J | 0.0579 J | 0.0617 J | 0.0741 J | 0.095 J |

Yellow shaded cells indicate the exceedance of ADEC clean up level

**SURFACE WATER**

| ANALYTE | 1209UTIP00901SW | 1209UTIP00902SW | 1209UTIP00903SW | 1209UTIP00904SW | 1209UTIRI0901SW | 1209UTIRI0902SW |
|---|---|---|---|---|---|---|
| Gasoline Range Organics | ND | ND | ND | ND | | |
| Diesel Range Organics | 0.185 J | 0.18 J | 0.183 J | 0.198 J | | |
| Residual Range Organics | ND | ND | ND | ND | | |
| | | | | | | |
| Benzene | ND | ND | ND | ND | | |
| Ethylbenzene | ND | ND | ND | ND | | |
| Toluene | ND | ND | ND | ND | | |
| o-Xylene | ND | ND | ND | ND | | |
| P & M -Xylene | ND | ND | ND | ND | | |
| 1-Methylnaphthalene | ND | ND | ND | ND | | |
| 2-Methylnaphthalene | ND | ND | ND | ND | | |
| Acenaphthene | ND | ND | ND | ND | | |
| Acenaphthylene | ND | ND | ND | ND | | |
| Anthracene | ND | ND | ND | ND | | |
| Benzo(a)Anthracene | ND | ND | ND | ND | | |
| Benzo[a]pyrene | ND | ND | ND | ND | | |
| Benzo[b]Fluoranthene | ND | ND | ND | ND | | |
| Benzo[g,h,i]perylene | ND | ND | ND | ND | | |
| Benzo[k]fluoranthene | ND | ND | ND | ND | | |
| Chrysene | ND | ND | ND | ND | | |

| ANALYTE | 1209UTIP00901SW | 1209UTIP00902SW | 1209UTIP00903SW | 1209UTIP00904SW | 1209UTIRI0901SW | 1209UTIRI0902SW |
|---|---|---|---|---|---|---|
| Dibenzo[a,h]anthracene | ND | ND | ND | ND | | |
| Fluoranthene | ND | ND | ND | ND | | |
| Fluorene | ND | ND | ND | ND | | |
| Indeno[1,2,3-c,d] pyrene | ND | ND | ND | ND | | |
| Naphthalene | ND | ND | ND | ND | | |
| Phenanthrene | ND | ND | ND | ND | | |
| Pyrene | ND | ND | ND | ND | | |
| | | | | | | |
| Arsenic | 6.07 | 4.74 J | 4.25 J | 4.02 J | ND | ND |
| Barium | 50.3 | 45.5 | 39.9 | 41.6 | 16.2 | 16.6 |
| Cadmium | ND | ND | ND | ND | ND | ND |
| Chromium | ND | ND | ND | ND | ND | ND |
| Lead | ND | ND | ND | ND | ND | ND |
| Mercury | ND | ND | ND | ND | ND | ND |
| Selenium | ND | ND | ND | ND | ND | ND |
| Silver | ND | ND | ND | ND | ND | ND |

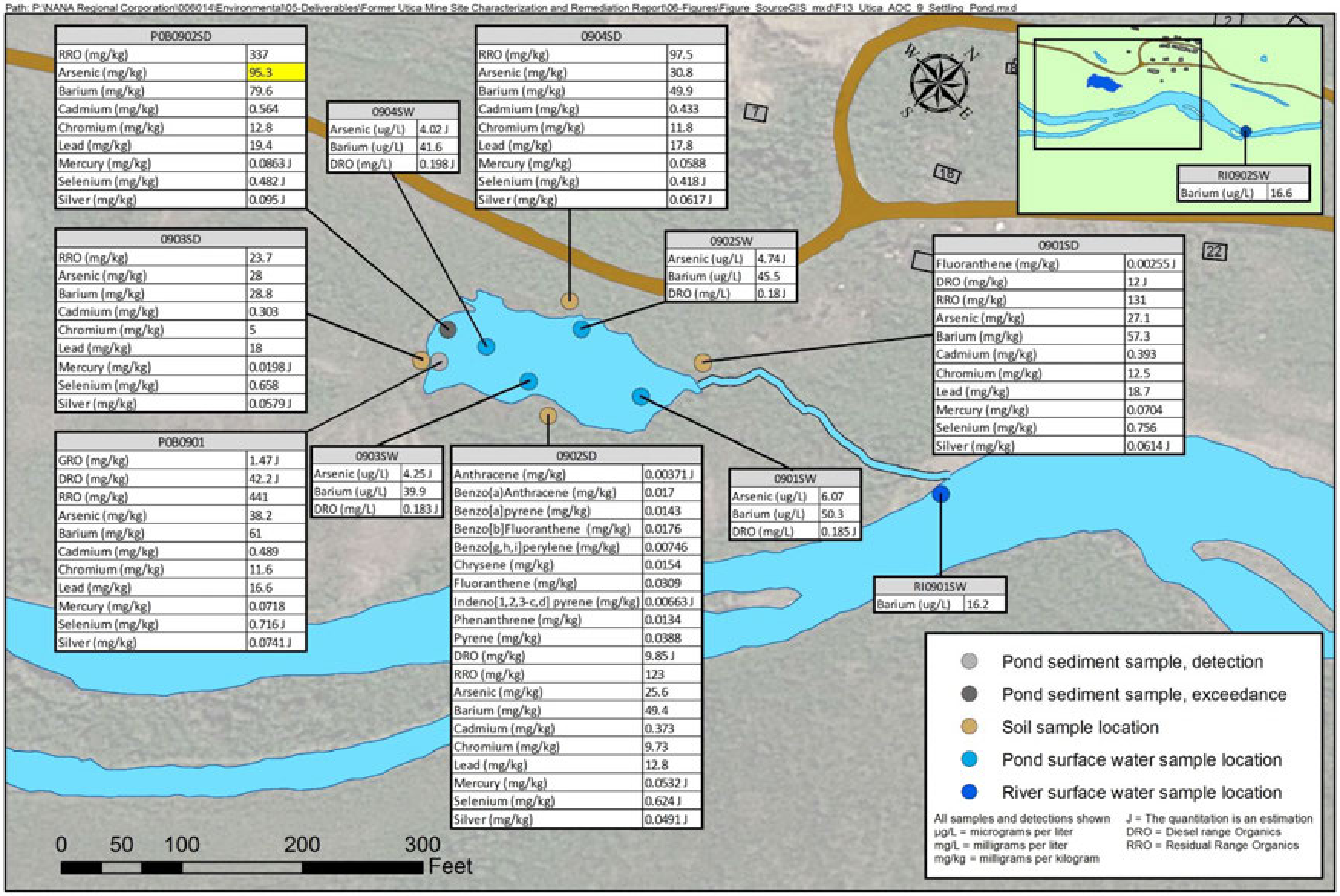



Figure 13 Settling Pond AOC 9

**Settling Pond (AOC 9) Samples**
**2012 Former Utica Mine**
**Charaterization and Remediation Report**
**November, 2012**

WHPacific

**Deviation from Work Plan**

There were two deviations from the work plan at AOC 9; one was the omission of collecting field duplicate and MS/MSD samples. Field screening was also omitted due to field oversight. However, all samples from the pond were submitted to the lab; field screening was not driving their collection locations.

**Discussion**

The analytical results indicate the settling pond is comparable to the surrounding conditions of the site. POL contamination in shore sediment and the water column was not present. Metals analyses of the near shore sediment and water column were consistent with concentrations found at the rest of the site.

**Remaining Work**

The analytical results have provided a characterization of the potential settling pond as being below the state regulatory limits. No further action is proposed for the AOC 9.

## AOC 10 Background Metals

Levels of arsenic above the ADEC cleanup level of 3.9 mg/kg, designated for sites receiving less than 40 inches of precipitation per year, were detected throughout the site during previous investigations, prompting WHPacific to believe that significantly higher concentrations of non-anthropogenic sources of arsenic may naturally exists at the site.

### Field Work

The AOC 10 – Background Metals sampling work plan was separately approved by ADEC on June 28, 2012. On the second site reconnaissance eight test pits were advanced by hand at undisturbed areas uphill from the mining site, on July 12th. The selected sample collection areas had a similar geology and elevation to the mining site. Archaeological monitoring was conducted at this AOC during excavation. Nine samples were submitted for analysis (table 5).

### Laboratory Analyses Results

The results from these samples show arsenic levels ranging from 5.86 to 17.1 mg/kg, demonstrating naturally elevated arsenic levels in the local soils. Locations and a summary of metals detections are presented in Table 15 and Figure 12.

### Discussion

Further research into the geology of the Former Utica Mine Camp Site and general area has led to the following description and history.

### Geologic Setting

The bulk of the bedrock in the region is mapped by the USGS (Till and others, 2010) as unit DOx, the “mixed unit” of the Nome Complex. These rocks are interlayered carbonaceous schist, biotite schist and marble units which have undergone greenschist facies metamorphism during the Mesozoic. In the Inmachuk River area, these rocks are overlain in places by younger basalt flows (QTv) which flowed north from the Umuruk Lake volcanic center between 2 and 5 million years ago.

Most of the Inmachuk River valley was placer mined intermittently from near Deering, south to the confluence of Hannum Creek. Placer tailings and pond remnants occur throughout the valley. Fluvial benches were also mined up to 20-30 feet above stream level and beneath the capping basaltic volcanics.

### Geochemistry of Bedrock

The source of the placer gold in the Fairhaven District appears to have come mainly from eroded quartz-arsenopyrite-gold veins within the carbonaceous schists of unit DOx. This unit is exposed throughout the headwaters of the Inmachuk and Kugruk Rivers. Gold and arsenic are liberated during the weathering and transport of the bedrock. Soil and rock sampling (>3000 samples) in this unit indicates that mean background values are expected to be roughly 25 ppm As in unmineralized bedrock and in areas of naturally occurring mineralization values are expected to be >150-2000 ppm As.

In addition, there are several zones in the headwaters of the Inmachuk River where highly elevated Pb, Zn and Ag occur in the soil and water. These zones trend northwest, across the Harry and Hannum Creek areas. Similar zones occur throughout the Kugruk River valley and some have been explored by core drilling.

NRC is proposing an alternative site specific soil cleanup level based on background arsenic that has no anthropogenic source. ADEC tentatively approved a "to be considered background level" per email correspondence with NRC (Appendix F). ADEC has not yet defined nor approved of the site-specific cleanup/background level proposed (40-50 mg/kg).

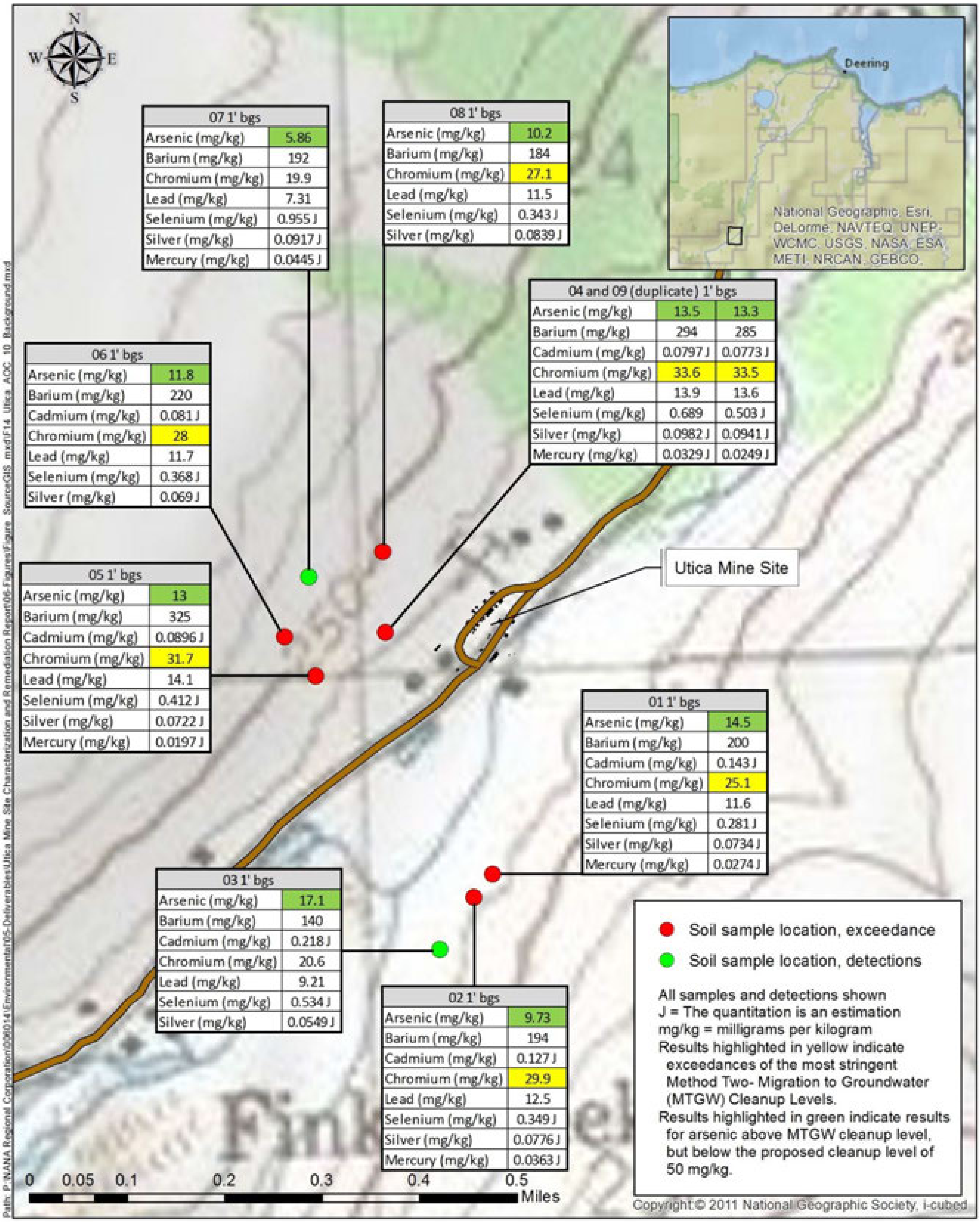
## Deviation from Work Plan

The WHPacific field crew noted the sample collection locations stated in the work plan were in a heavy equipment and motor vehicle laydown yard. To avoid potential contamination the WHPacific field crew stepped out and away from the obvious signs of disturbance.

**Table 15 AOC 10 Background Analytical Results**

| ANALYTE | Units | ADEC Cleanup level | 0712 UTI01 | 071 UTI02 | 0712 UTI03 | 0712 UTI04 | 0712 UTI05 | 0712 UTI06 | 0712 UTI07 | 0712 UTI08 | 0712 UTI09 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | mg/Kg | 3.9 | 14.5 | 9.73 | 17.1 | 13.5 | 13 | 11.8 | 5.86 | 10.2 | 13.3 |
| Barium | mg/Kg | 1100 | 200 | 194 | 140 | 294 | 325 | 220 | 192 | 184 | 285 |
| Cadmium | mg/Kg | 5 | 0.143 J | 0.127 J | 0.218 J | 0.0797 J | 0.0896 J | 0.081 J | ND | ND | 0.0773 J |
| Chromium | mg/Kg | 25 | 25.1 | 29.9 | 20.6 | 33.6 | 31.7 | 28 | 19.9 | 27.1 | 33.5 |
| Lead | mg/Kg | 400 | 11.6 | 12.5 | 9.21 | 13.9 | 14.1 | 11.7 | 7.31 | 11.5 | 13.6 |
| Selenium | mg/Kg | 3.4 | 0.281 J | 0.349 J | 0.534 J | 0.689 | 0.412 J | 0.368 J | 0.955 J | 0.343 J | 0.503 J |
| Silver | mg/Kg | 11.2 | 0.0734 J | 0.0776 J | 0.0549 J | 0.0982 J | 0.0722 J | 0.069 J | 0.0917 J | 0.0839 J | 0.0941 J |
| Mercury | mg/kg * | 1.4 | 0.0274 J | 0.0363 J | ND | 0.0329 J | 0.0197 J | ND | 0.0445 J | ND | 0.0249 J |

Yellow shaded cells indicate the exceedance of ADEC clean up levels




WHPacific

**Back Ground Samples (AOC 10)**
**2012 Former Former Utica Mine**
**Charaterization and Remediation Report**
**April, 2013**

Figure
**14**
Background Samples AOC10

## Conclusions and Recommendations

The completion of this work leaves the site well characterized. The remaining work described for each AOC above generally falls into three categories of action: no further action proposed, establish cleanup levels, and establish cleanup methods. The recommended next steps for this project are to write a comprehensive letter for each of these categories and submit them to DEC for concurrence. Each letter should include the historic sample locations and results and supporting discussion of why the action is proposed for each AOC.

In the interim and until further remediation action is taken at the site, an annual site visit and public meeting should be conducted (in Deering) and road repairs need to be implemented. After the road is repaired and the course of action is agreed upon, the reclamation can be implemented and the site can move into a reuse phase.

## References

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# Appendix A

# Archeology Submittal

# Appendix B

# Photo Log

Appendix C

Laboratory Reports

# Appendix D

# Field Log

Appendix E

Bevill Amendment

# Appendix F

# Correspondence