Final Site Characterization Report

Former Port Heiden Radio Relay Station
Port Heiden, Alaska

Prepared for

611th Civil Engineer Squadron

July 2012

Prepared by

Native Village of Port Heiden
P.O. Box 49007
Port Heiden, AK 99549
Phone: (907) 837-2225
Fax: (907) 837-2297

Final Site Characterization Report

Former Port Heiden Radio Relay Station
Port Heiden, Alaska

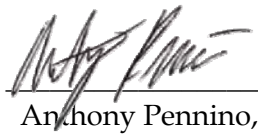
July 2012

The following information is provided in compliance with *Site Characterization Work Plan and Reporting Guidance for Investigation of Contaminated Sites*, prepared by the Alaska Department of Environmental Conservation, September 23, 2009.

Qualified person responsible for sample collection:

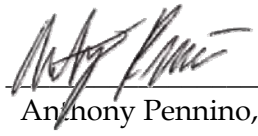
Thor Kallestad, Boretide Consulting

Qualified persons responsible for data interpretation:



Anthony Pennino, AP Consulting

Qualified persons responsible for data reporting:



Anthony Pennino, AP Consulting

Site name: Former Port Heiden Radio Relay Station

ADEC file number: 2637.38.002

Contents

LIST OF FIGURES

LIST OF APPENDICES (delivered as electronic files)

Abbreviations

611 CES	611th Civil Engineer Squadron
AAC	*Alaska Administrative Code*
ACM	asbestos- containing material
ADEC	Alaska Department of Environmental Conservation
Adminrec	Administrative Record
AOC	area of concern
bgs	below ground surface
BLO/SSO	Black Lagoon Outfall/Septic System Outfall
CA	cooperative agreement
CSR1	Contaminated Soil Removal Area 1
CSR2	Contaminated Soil Removal Area 2
DOD	Department of Defense
DRO	diesel-range organic
DSA	Drum Storage Area
°F	degrees Fahrenheit
FCS/PG1	Foundation Cover Soil/Pad Grid 1 Area
GAC	granular activated carbon
GPS	global positioning system
GRO	gasoline-range organic
GWMR	groundwater monitoring report
IDW	investigation-derived waste
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NVPH	Native Village of Port Heiden
NLF	North Landfill
NRD	North of the Road
OTF	on-the-fly
PCB	polychlorinated biphenyl
PCE	tetrachloroethylene
PHAR	Port Heiden Access Road
PID	photoionization detector
POL	petroleum, oil, and lubricants

PVC	polyvinyl chloride
RRO	residual-range organic
RRS	radio relay station
SCR	site characterization report
TAH	total aromatic hydrocarbons
TAqH	total aqueous hydrocarbons
TAT	turnaround time
TCE	trichloroethylene
TSCA	Toxic Substances Control Act
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

1.0 Introduction

The Native Village of Port Heiden (NVPH) and AP Consulting have authored this Final Site Characterization Report (SCR). The document summarizes site characterization and remediation activities that were conducted at the Former Port Heiden Radio Relay Station (RRS) during the 2011 field season. This SCR details remedial activities that relate to site soils; groundwater investigation activities are summarized separately. Groundwater plume delineation and monitoring efforts are presented in the *Final Groundwater Monitoring Report, Former Port Heiden Radio Relay Station, Port Heiden, Alaska* (GWMR; NVPH, 2012). Port Heiden is located 424 miles southwest of Anchorage, Alaska (Figure 1).

These site characterization activities conform to sampling and analysis requirements defined in Chapter 18, Section 75.355 of the *Alaska Administrative Code* (18 AAC 75.355). The contents of this SCR meet applicable reporting requirements identified in 18 AAC 75.335. Field activities were conducted in accordance with the *Final Soil Characterization and Disposal Work Plan, Former Port Heiden Radio Relay Station, Port Heiden, Alaska* (NVPH, 2011a). The 2011 work plan was written to permit flexibility in terms of conducting field activities to accommodate changing field conditions, updated understanding of site characterizations, weather conditions, and other field variables. Qualified persons, as defined in 18 AAC 75.990(100), were responsible for all sampling and reporting summarized in this report.

The site characterization project has its origins in the US Army Engineer Alaska District Cooperative Agreement (CA) "Remediate Former Port Heiden RRS." The scope of work for this project was derived from two CAs, Numbers 11AF-09-0100 and 11AF-10-0100. In keeping with the spirit of the CAs, mentoring has been a large part of this project. AP Consulting has been retained by the NVPH to provide advisory services and empower the local community to perform as much of the project work as possible. It is anticipated that within the next few years, several members of the NVPH will have become proficient with relevant regulations, hazardous material shipments, sampling techniques, surveying, remediation, reporting, and project controls required for similar projects. Thereafter, the NVPH and AP Consulting anticipate that outside contractor involvement will be minimized and the skills required to conduct similar projects will exist locally within the community of Port Heiden.

1.1 Project Objectives

2011 was the second year of a 3-year effort under the CA to delineate, define, and remove hazardous materials from the Former Port Heiden RRS. Several previous investigations (Section 2.1) had been performed at the site. In 2011, the NVPH adopted a three-pronged approach for investigation of the Former RRS. The first strategy was to digest the previous site

fig1_NVPH_SCR_site_r1_5-29-2012

FIGURE 1
Port Heiden Location and Project Site Aerial View

Prepared for 611 CES

Final Site Characterization Report, Former Port Heiden RRS, 2012

work performed, identify existing data gaps, and collect missing site information. This initial effort was successfully accomplished, and a detailed baseline of site conditions now exists. The baseline summary is presented in this SCR.

In its second strategy, the NVPH began excavation, removal, and off-site disposal of known site soils contaminated with polychlorinated biphenyls (PCBs). Additional soil delineation occurred during these 2011 excavation activities. Consequently, the affected soil boundaries have been more tightly defined, which will permit acceleration of excavation and disposal efforts during the 2012 field season.

The third NVPH strategy in 2011 was to define the current nature and extent of groundwater contamination at select locations in the vicinity of the Former Port Heiden RRS. The results of these groundwater delineation efforts and groundwater monitoring activities are summarized in the GWMR (NVPH, 2012).

1.2 Document Organization

This SCR consists of the following seven sections.

- **Section 1** provides the introduction and summarizes the SCR organization.
- **Section 2** provides the project background. A description of the Former Port Heiden RRS and the local environmental setting is also provided.
- **Section 3** describes the field activities. Documentation, screening, sampling, and surveying methodologies are presented.
- **Section 4** presents the sampling and excavation results for all Former RRS sites where activity occurred in 2011.
- **Section 5** provides waste transportation and disposal information. Quantities, transportation, and disposal methods are described.
- **Section 6** provides a summary of the site characterization project. Recommendations for future action are presented.
- **Section 7** provides references for all works cited.

Because of the large amount of data in most of the appendices, they are provided as electronic files in Acrobat (pdf) format. The appendices are as follows:

- Appendix A: Super Sack Waste Disposal Documentation
- Appendix B: Field Notes and Database
- Appendix C: Analytical Data
- Appendix D: ADEC Laboratory Quality Control Forms
- Appendix E: Quality Assurance Summaries

This Final SCR was developed based on comments received from the NVPH, the United States Air Force (USAF) 611th Civil Engineer Squadron (611 CES), United States Army Corps of Engineers (USACE), and Alaska Department of Environmental Conservation (ADEC) on the previous Draft and Draft Final versions of this report.

2.0 Project Background

Ten affected soil areas of concern (AOCs) have been under investigation at the Former Port Heiden RRS:

- The Black Lagoon Outfall/Septic System Outfall (BLO/SSO)
- Contaminated Soil Removal Area 1 (CSR1)
- Contaminated Soil Removal Area 2 (CSR2)
- The Drum Storage Area (DSA)
- The Foundation Cover Soil/Pad Grid 1 Area (FCS/PG1)
- Water Tank Hill
- Location 5
- The North Landfill (NLF)
- The three Petroleum, Oil, and Lubricants (POL) Stockpiles
- The Road between the Former RRS and the Port Heiden Airport

The locations of the soil AOCs investigated in 2011 are shown in Figure 2.

2.1 Previous Investigations

The Department of Defense (DOD) has arranged for an Administrative Record (Adminrec) to be posted online. The Adminrec summarizes various Environmental Restoration projects conducted under DOD oversight. The Adminrec address identifying 611 CES projects in Alaska is listed below:

http://www.adminrec.com/PACAF.asp?Location=Alaska

At this website, the user can select the "Port Heiden" link for access to a list of historical Former Port Heiden RRS documents. Note that not all of the historical Port Heiden RRS documents are available at this link.

During 2009, a prior contractor, Weston Solutions, was in the process of delineating the nature and extent of contamination at the Former Port Heiden RRS. The NVPH picked up where Weston left off. Weston had summarized its very detailed and accurate 2009 fieldwork in the *Draft Final Report, Remedy Selection and Implementation, Demolition and Debris Removal, Port Heiden Radio Relay Station, Port Heiden, Alaska* (Weston, 2010). Additionally, field activities in 2010 were documented in the *Final Site Characterization Report, Former Port Heiden Radio Relay Station, Port Heiden, Alaska* (NVPH, 2011a). These documents were the

starting point for 2011 field activities. Information presented in this SCR includes delineation data from the Weston report and findings from 2010.

This SCR and the GWMR (NVPH, 2012) provide an accurate, current, and complete summary of site conditions at the Former Port Heiden RRS.

2.2 Regional Environmental Setting

The Former Port Heiden RRS is situated on a low glacial moraine at an elevation of 95 feet above mean sea level. The topography of the site slopes gently to the west and southwest. Additional information about the environmental setting at Port Heiden is presented below. Much of this information is excerpted from the State of Alaska, Division of Community and Regional Affairs, on the Port Heiden page at the link below:

http://www.commerce.state.ak.us/dca/commdb/CF_BLOCK.htm

2.2.1 Location

Port Heiden is 424 miles southwest of Anchorage, at the mouth of the Meshik River, on the north side of the Alaska Peninsula. The community lies near the Aniakchak National Preserve and Monument. Its location is approximately 56.948390 North Latitude and -158.629020 West Longitude (Section 27, T037S, R059W, Seward Meridian.) Port Heiden is in the Kvichak Recording District. The area encompasses 50.7 square miles of land and 0.7 square mile of water.

2.2.2 History

The old village of Meshik was located at the current site of Port Heiden. Influenza epidemics during the early 1900s forced residents to relocate to other villages. During World War II, Fort Morrow was built nearby and 5,000 personnel were stationed at the base. The fort was closed after the war. A school established in the early 1950s attracted people from surrounding villages. Port Heiden incorporated as a city in 1972. The community relocated inland, because storm waves had eroded much of the old town site and threatened to destroy community buildings (State of Alaska, 2010).

2.2.3 Culture

Port Heiden is a traditional Alutiiq community, with a commercial fishing and subsistence lifestyle (State of Alaska, 2010).

fig2_NVPH_SCR_AOC_soil_r1_5-29-2012

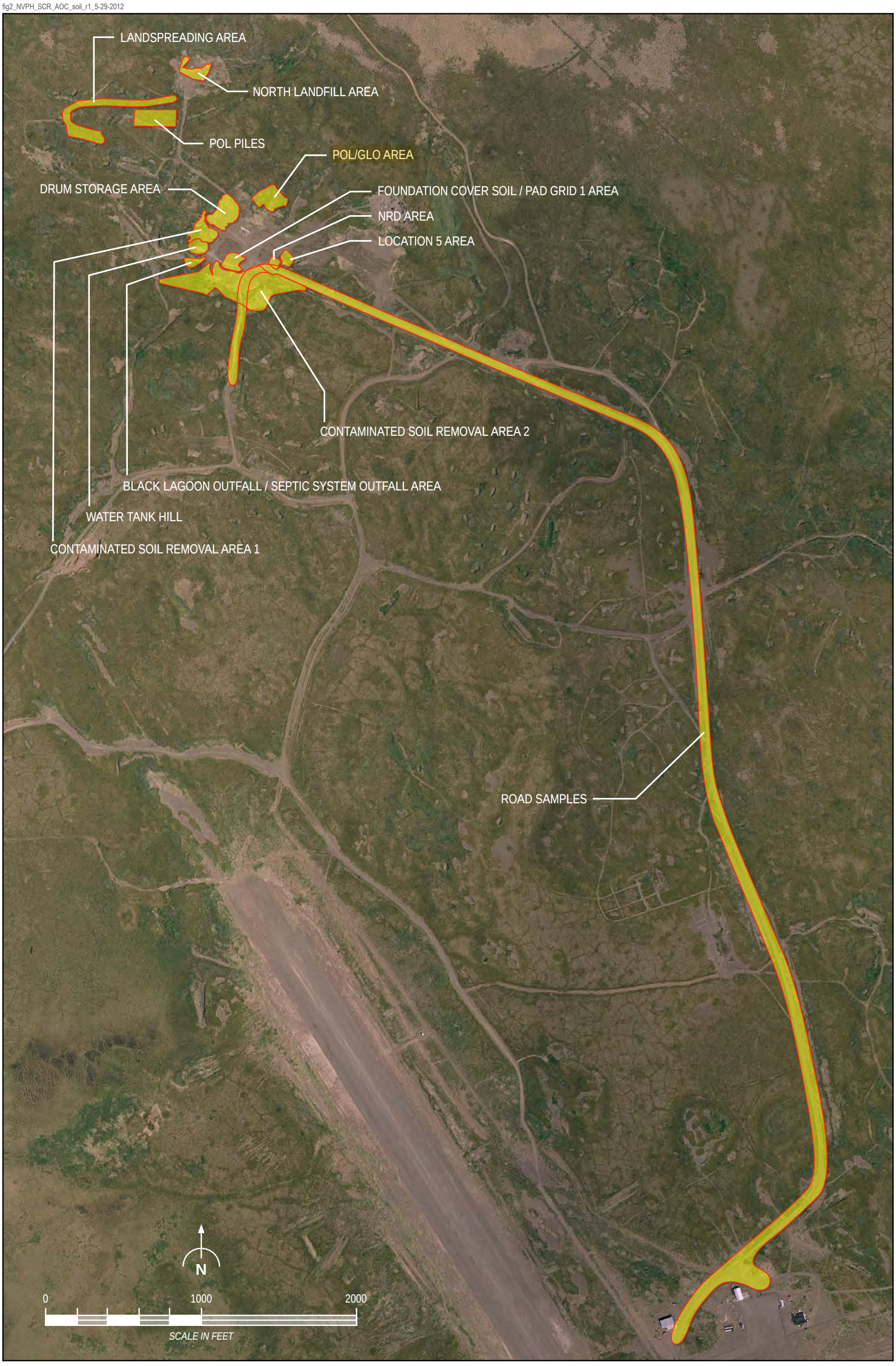


FIGURE 2
Former Port Heiden RRS Areas of Concern, Soil

Prepared for 611 CES

Final Site Characterization Report, Former Port Heiden RRS, 2012

2.2.4 Economy

Commercial fishing and government jobs provide the majority of cash income. In 2009, 12 residents held commercial fishing permits. Subsistence harvests of salmon, other fish, and marine mammals average 109 pounds per person. Game, birds, plants, and berries are also an important part of villagers' diets (State of Alaska, 2010).

2.2.5 Facilities

Individual wells and septic tank systems are used by most homes in Port Heiden. The school operates its own domestic well and treatment system. Thirty-one of 37 occupied households are fully plumbed. The city provides septic pumping services and collects refuse three times a week. The permitted Class III Landfill is located 6.5 miles northeast of the community (State of Alaska, 2010).

2.2.6 Transportation

The state-owned airport consists of a 5,000-foot-long by 100-foot-wide, lighted, gravel runway and a 4,000-foot-long by 100-foot-wide, lighted, gravel crosswind runway. The airport can accommodate aircraft as large as a Boeing 737 aircraft, and regular air services are provided. The airstrip serves as a point of transfer for flights to the Pacific Ocean side of the Alaska Peninsula. There is a natural boat harbor but no dock. A boat haul-out, a beach off-loading area, and marine storage facilities are available. Cargo from Seattle is periodically delivered by chartered barge and is lightered and offloaded on the beach. Automobiles, all-terrain vehicles, and snow machines are the local means of transportation (State of Alaska, 2010).

2.2.7 Climate

Port Heiden has a maritime climate, with cool summers, relatively warm winters, and rain. Snowfall averages 58 inches per year. January temperatures average 25 degrees Fahrenheit (°F), and July temperatures average 50°F (State of Alaska, 2010). According to ADEC regulations in 18 AAC 75.990, the Former Port Heiden RRS falls under the over-40-inch zone (site receives annual precipitation of 40 or more inches each year).

3.0 Field Activities

Six of the soil AOCs under investigation at the Former Port Heiden RRS were surveyed extensively during the 2011 field season. Soil sampling activities were performed at the following seven AOCs during 2011:

- BLO/SSO
- CSR1
- CSR2
- Three POL Stockpiles
- Two AOCs on the road between the Former Port Heiden RRS and the airport
  - Port Heiden Access Road (PHAR)]
  - Area just north of the road, called North of the Road (NRD)
- POL1/POL2/POL3 Area

Because of time constraints, no sampling activities were conducted at the following three AOCs:

- FCS/PG1
- Location 5
- NLF

Additional field activities included clearing brush, constructing staging areas, and filling, transporting, and weighing Super Sacks. Associated results and detailed descriptions of field activities conducted at each AOC are presented in Section 4.

3.1 Field Documentation

All notes collected during field activities were entered in the project logbook. The project logbook is provided in Appendix B.

3.2 Soil Field Screening

In general, two categories of soil contaminants were encountered during the 2011 fieldwork. Soil was affected with PCBs, or in the case of the BLO/SSO, the landspreading area for treatment of the three POL Stockpiles, and the POL1/POL2/POL3 Area, various POL contaminants were also suspected.

For PCB-contaminated soil, field screening was not used. Because the use of various field screening kits available to evaluate the presence or absence of PCBs gains little favor with most regulatory agencies, the alternative of employing a 3-day turnaround time (TAT) with the laboratory was chosen. This approach enabled the field team to quickly achieve certainty about whether a particular sample was above or below the PCB cleanup level of 1 milligram per kilogram (mg/kg). It also saved a considerable amount of labor hours required for the use of field screening kits. Additionally, the cost savings gained from not purchasing the screening kits was roughly equal to the additional expenditure required for the rapid TAT.

Suspected POL-contaminated soil was field screened with a photoionization detector (PID) during excavation of the septic tank and pipeline areas of the BLO/SSO AOC. The headspace screening technique, which is described in the Quality Assurance Project Plan (QAPP), Appendix A, of the *Final Soil Characterization and Disposal Work Plan, Former Port Heiden Radio Relay Station, Port Heiden, Alaska* (NVPH, 2011b), was used for all PID soil field screening.

3.3 Soil Sampling

PCB confirmation samples were collected based on the Unites States Environmental Protection Agency (USEPA) hexagonal grid sampling methodology (USEPA, 1986). Specifically, an excavated area was subdivided into 15-foot squares. A 10-foot square polyvinyl chloride (PVC) template, subdivided into four 5-foot squares, was then centered within each 15-foot square grid (Figure 3). Composite samples were collected from the nine points of intersection created by these four 5-foot grids. One dedicated steel sampling spoon was used to scoop soil from each of the nine locations. The nine soil scoops were then composited in a dedicated steel sampling bowl. An 8-ounce sample container was then filled with soil from this mixing bowl and prepared for shipment to the analytical laboratory.

Duplicate samples were collected at a 1-to-10 ratio against soil field samples. All soil samples were collected in accordance with protocol presented in the *Draft Field Sampling Guidance* (ADEC, 2010).

fig3_NVPH_SCR_grid_r1_5-29-2012

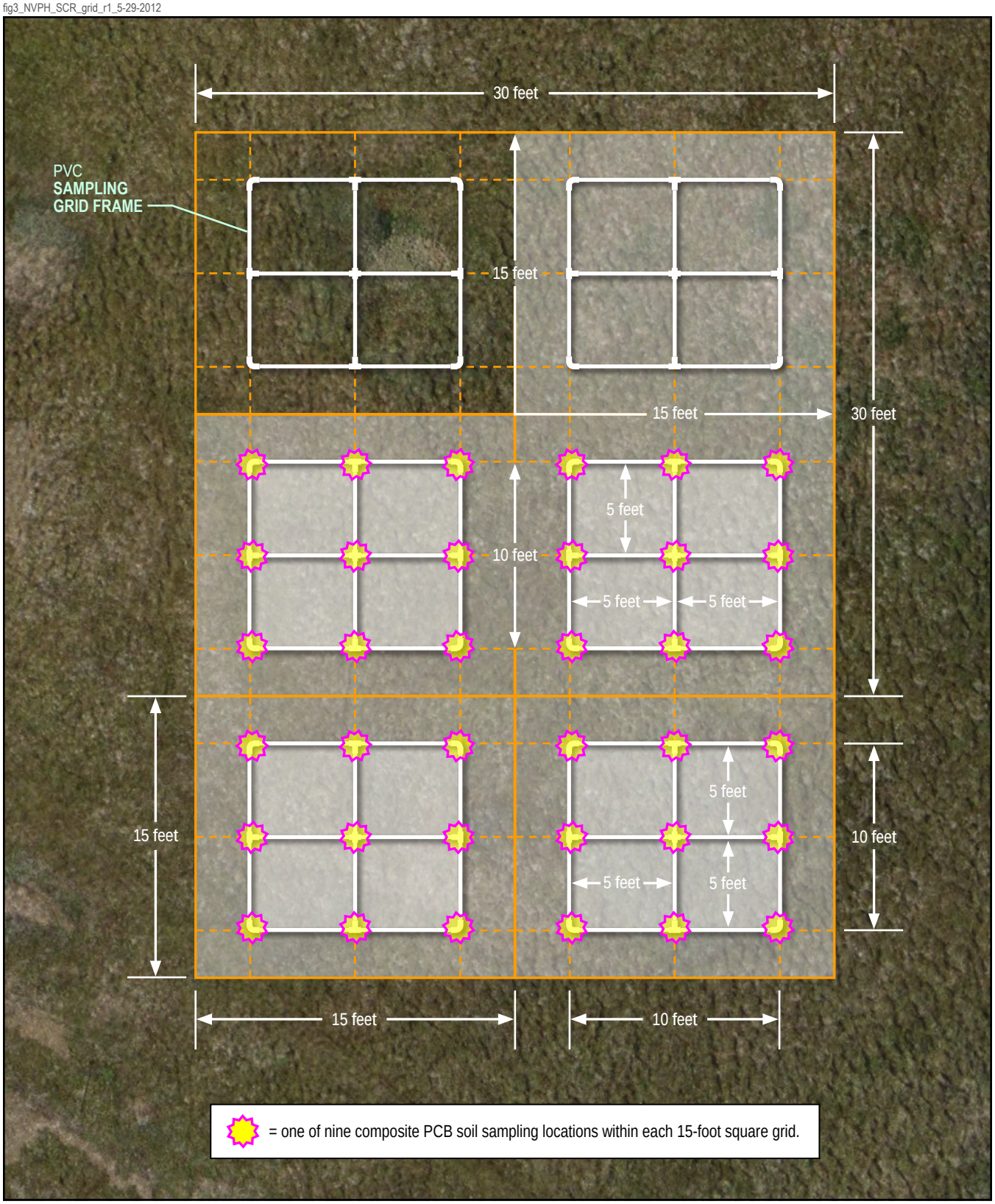


FIGURE 3
Former Port Heiden RRS PCB Confirmation Sampling Grid

3.4 Surveying

Horizontal and vertical positions of various points of concern were established through global positioning system (GPS) survey techniques. Additional permanent and recognizable site features were also surveyed to facilitate quick generation of local swing-tie measurements if required at a later date.

The surveying requirements of these groundwater monitoring efforts were met by using a Trimble R8 receiver and a Trimble R8 rover. Instrument positioning was determined in World Geodetic System 1984 geographic coordinates (latitude/longitude) and converted internally for output as Alaska State Plane Coordinate System, North American Datum 1983, Zone 6, U.S. Survey feet.

Points were surveyed by using kinematic (stop and go) survey methods. Kinematic surveying involves the establishment of "base" and "rover" units that are used in conjunction to acquire survey points. Survey control was established from a National Geodetic Survey monument, and the rover unit was then used to collect the desired points.

Kinematic surveying uses GPS phase measurements from five or more satellites common to both the base receiver and the rover. To achieve centimeter-level precision, the surveys were first initialized. On-the-fly (OTF) surveying was the method chosen to survey points for the Former Port Heiden RRS. OTF surveying is a precise form of kinematic surveying that allows for the rapid collection of survey coordinates in the field.

All survey points collected were initialized, and the instruments were properly calibrated. The vertical accuracy for all GPS survey points is within 0.09 foot, and the horizontal accuracy is within 0.04 foot.

4.0 Sampling and Excavation Results

Sampling and excavation results for the six AOCs where fieldwork was conducted at the Former Port Heiden RRS in 2011 are summarized below. SGS Analytical performed all laboratory analyses referenced in this SCR. Note that only the results for Aroclor 1260 are presented in the text and figures for the report from the PCB analysis. The complete analytical data are presented in Appendix C and include data for the other Aroclor.

4.1 Port Heiden Access Road

The PHAR was the first area of concern for PCB removal to meet the deadline of June 17, 2011, that was ordered by the USACE on the Weston removal action in the DMC Wash Area. The sample results are shown in Figure 4 and were collected at a depth of 2 to 4 inches below ground surface (bgs). The areas where PCB levels were higher than cleanup levels were removed at 6-inch lifts and subsequently sampled until cleanup levels were achieved. All contaminated soils encountered at the PHAR were removed and placed in Super Sacks for transport and disposal.

4.2 CSR2

While sampling the southwest side of the Former RRS Pad perimeter for windblown PCBs in 2010, several results in excess of 1 mg/kg were received from the location that would ultimately become CSR2. This area proved to be quite large. Although an extensive sampling effort was conducted in 2010, soil removal activities did not occur at that time. Samples in these locations were from an approximate depth of 2 to 4 inches bgs.

In 2011, the CSR2 area between the PHAR and the RRS Site Road was the focus of both soil sampling and soil excavation. Figure 5 shows the locations of samples collected at the CSR2 area and identifies locations from which sample results were higher than 1.0 mg/kg for PCBs. In these locations at CSR2 where PCB concentrations had been identified, soil was excavated at 1-foot lifts until sample results from the excavated material reported concentrations below cleanup levels. Some of the removed soils from the CSR2 area were transported by covered dump trucks to the landfill, and the rest were stockpiled at the Former Port Heiden RRS. Because of concerns about the characterization methodology, the soil placed in the landfill and the stockpiles from CSR2 at the RRS near the Site Road were sampled with multi-incremental (MI) methods by Jacobs Engineering. The results of sampling in the landfill indicated PCBs above 1 part per million (ppm) (between 13 and 25 ppm). This material had to be completely removed from the landfill, as requested by ADEC, and was placed in Super Sacks numbered from 123 to 249. These Super Sacks were

staged as approved by the USEPA, USAF, USACE, and ADEC at the Landing area during the winter. They were transported by barge on the first seasonal haul available back to the certified landfill. The remaining soil from the landfill, as had been approved, was stockpiled and covered with 20-mil liner at the Former Port Heiden RRS in the fenced CSR2 area. The landfill stockpile at the RRS has an estimated area of 70 by 40 by 10 feet.

Analytical results above cleanup levels for PCBs at CSR2 at have also been reported for the following additional locations:

- CSR2-G88 and CSR2-G90
- CSR2-G72 and CSR2-G73
- CSR2-G91 to CSR2-G113

Areas in CSR2 that were found to have PCB soils with concentrations above cleanup levels during 2010 field investigations are also shown in Figure 5.

4.3 North of the Road Area

PCB samples were collected from an area just north of where the main site road enters the RRS area—NRD (Figure 5). The parties that developed the CA had proposed cutting this area down to improve transportation safety and decided it would be prudent to collect soil samples before removal of the NRD based on the findings of the contamination on Site Road directly adjacent to the area. Sample results showed that several locations contain PCB concentrations higher than cleanup levels. However, no soils were excavated from this area in 2011.

4.4 Three POL Stockpiles

The POL-contaminated soils from Weston's three biopiles created in 2009 and CA excavated soils from the POL2/POL3/GOL area in 2011 are located within this area as five landspread areas that are rototilled to enhance biodegradation. Before placing the soil in the landspreading areas, samples were collected and analyzed to determine the background levels of potential contaminants of concern. Some of the samples were analyzed with a silica gel cleanup to determine whether biogenic rather than petrogenic petroleum hydrocarbons are present. Figure 6 identifies results from the samples and shows that concentrations from some samples are above cleanup levels for diesel-range organics (DRO) only. No soils were excavated from this area in 2011. The three biopiles Weston placed were taken down and flattened with a bulldozer, and the lining was removed by an excavator and was disposed of. The edges of the former biopile areas and the landspread areas have berms created by the bulldozer. The rocks and debris were removed from the landspread area in preparation for rototilling. Rototilling treatment will continue in 2012.

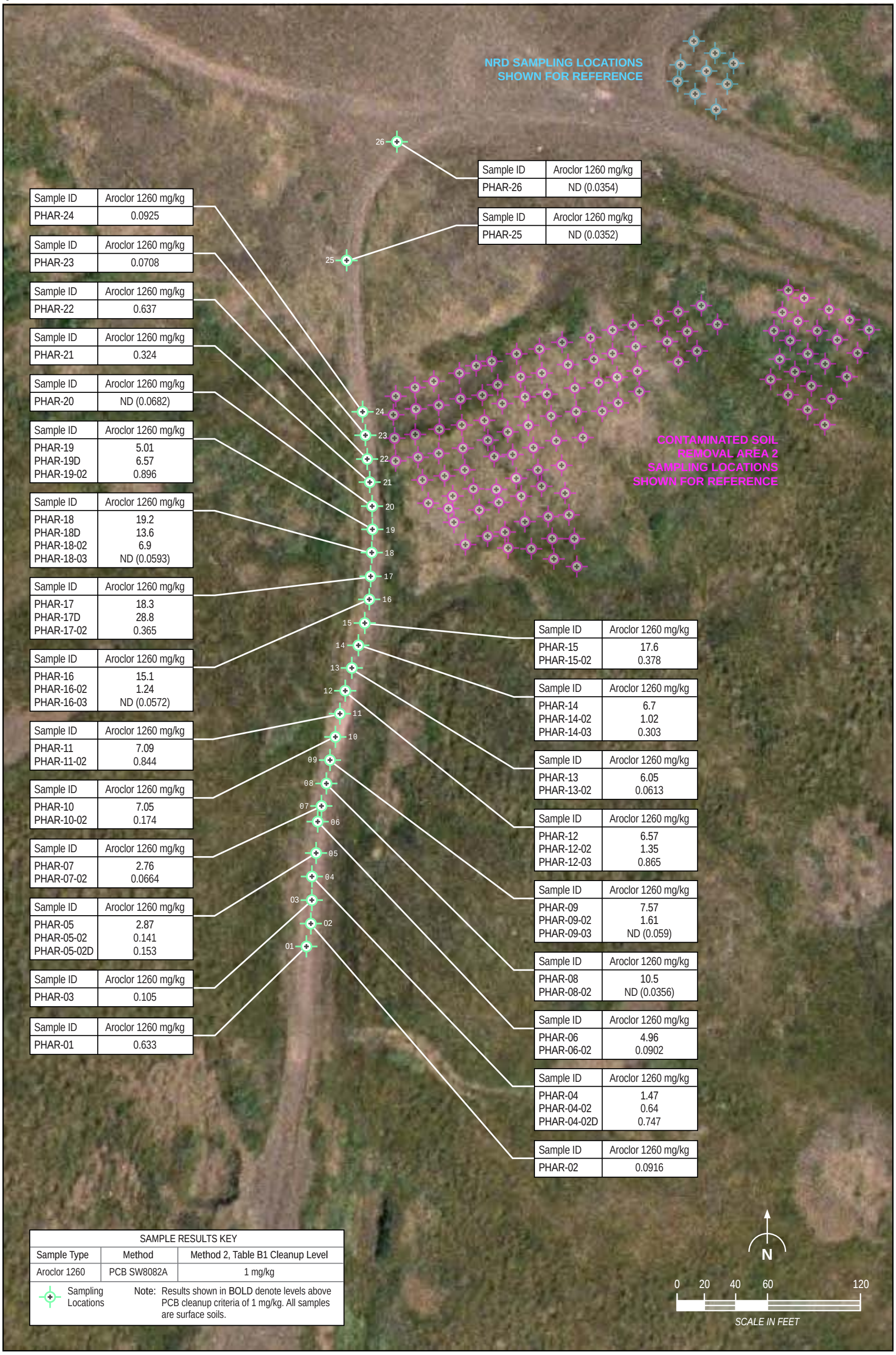


FIGURE 4
Port Heiden Access Road PCB Sampling Locations and Results

Prepared for 611 CES

Final Site Characterization Report, Former Port Heiden RRS, 2012

fig5_NVPH_SCR_CSR2_data_r3_5-29-2012

Sample ID	Aroclor 1260 mg/kg
NRD-01	1.21
NRD-02	0.409
NRD-03	1.21
NRD-04	3.35
NRD-05	1.42
NRD-06	0.785
NRD-07	1.86
NRD-08	0.716
NRD-09	1.84
NRD-10 (duplicate location of NRD-09)	1.75

Sample ID	Aroclor 1260 mg/kg
CSR2-G91	4.63
CSR2-G92	5.19
CSR2-G93	5.97
CSR2-G94	5.09
CSR2-G95	4.68
CSR2-G96	3.15
CSR2-G97	4.04
CSR2-G98	5.42
CSR2-G99	3.34
CSR2-G100	6.26
CSR2-G101 CSR2-G101D	7.33 7.31
CSR2-G102	3.61
CSR2-G103	5.23
CSR2-G104	3.66
CSR2-G105	2.57
CSR2-G106	2.54
CSR2-G107	2.59
CSR2-G108	6.15
CSR2-G109	6.89
CSR2-G110	8.55
CSR2-G111 CSR2-G111D	2.57 2.14
CSR2-G113	1.14

Sample ID	Aroclor 1260 mg/kg
CSR2-G72	1.66
CSR2-G73	3.84

Sample ID	Aroclor 1260 mg/kg
CSR2-G88	6
CSR2-G90	7.05

N

0 10 40 50 60 100

SCALE IN FEET

SAMPLE RESULTS KEY		
Sample Type	Method	Method 2, Table B1 Cleanup Level
Aroclor 1260	PCB SW8082A	1 mg/kg

Contaminated Soil Removal Area 2 Sampling Locations

NRD Sampling Locations

Areas to be further investigated based on 2010 sample results

Notes: Results shown in BOLD denote sampling locations where levels exceed PCB cleanup criteria of 1.0 ppm. Results from all other sampling locations are below cleanup levels.

Prepared for 611 CES

FIGURE 5

CSR2 and NRD PCB Sampling Locations Where Results Exceed Cleanup Levels

Final Site Characterization Report, Former Port Heiden RRS, 2012

fig6_NVPH_SCR_LSA_data_r2_5-29-2012

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA3-05W	ND	ND(9.40)	80.2	711

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA3-04W	0.495	ND(12.5)	278	2660

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA3-03W	0.199	ND(10.4)	133	1240

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA1-01W	0.188	ND(11.3)	154	1840

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA1-02W	0.573	ND(11.9)	199	1660

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA1-03W	0.18	ND(8.28)	110	1270

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA3-02S	ND	ND(9.81)	42.7	449

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA3-01S	ND	ND(12.4)	195	1140

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA4-04	ND	ND(5.61)	166	1730

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA4-03 LSA4-03(1)	ND --	ND(8.18) --	413 264	3510 1990

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA4-02	ND	ND(5.48)	203	2660

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA4-05	ND	ND(6.00)	ND(67.2)	902

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA4-06	ND	ND(6.01)	217	2270

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA4-07 LSA4-07(1)	ND --	ND(7.56) --	283 42.4	2580 417

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA4-08	0.0896	ND(6.31)	ND(147)	2040

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA4-09	ND	ND(3.24)	ND(41.8)	565

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA4-01 LSA4-01(2)	0.499 0.18	ND(14.0) ND(8.28)	590 284	7090 2710

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
LSA4-10	0.203	ND(10.0)	146	2090
LSA4-11	0.224	ND(10.3)	177	2580

LSA3-03W
LSA3-04W
LSA3-05W
LSA1-01W
LSA1-02W
LSA1-03W
LSA3-02S
LSA3-01S
LSA4-05
LSA4-04
LSA4-03
LSA4-02
LSA4-01
LSA4-06
LSA4-07
LSA4-08
LSA4-09
LSA4-10/-11

N

0 25 50 100 200

SCALE IN FEET

SAMPLE RESULTS KEY		
Sample Type	Method	Method 2, Table B1 Cleanup Levels
Aroclor 1260	PCB SW8082	1 mg/kg
GRO (Gasoline Range Organics)	AK101	300 mg/kg (migration to groundwater)
DRO (Diesel Range Organics)	AK102	250 mg/kg (migration to groundwater)
RRO (Residual Range Organics)	AK103	10,000 mg/kg (ingestion)

Landspreading Area Sampling Locations

Notes: Results shown in BOLD denote levels above cleanup criteria. All VOC, PAH, SVOC, and pesticide concentrations are below cleanup levels.

Prepared for 611 CES

FIGURE 6

Landspreading Area PCB, GRO, DRO, and RRO Sampling Locations and Results

Final Site Characterization Report, Former Port Heiden RRS, 2012

4.5 BLO/SSO

In 2005, test pits were excavated and sampled at depths of 19 to 21 feet bgs. The location and results of these samples helped guide the location in 2011 of the test pits, which are shown in Figure 7. The test pits in 2011 were sampled for PCBs, gasoline-range organics (GRO), DRO, residual-range organics (RRO), and volatile organic compounds (VOCs). Results showed samples above cleanup levels for DRO, trichloroethylene (TCE), and tetrachloroethylene (PCE). Results for the PCE and TCE soil levels that reported concentrations above cleanup levels are shown in Figure 7. For several samples, the reporting limits for these two analytes were higher than the cleanup levels (identified in the "Sample Results Key" in Figure 7). The reporting limits for PCBs in this AOC were all below the cleanup level of 1.0 mg/kg. No soils were excavated from this area in 2011.

4.6 POL1/POL2/POL3 Area

The POL1/POL2/POL3 area was blended into one giant POL excavation called the "Pit." The excavation was started near POL2 and headed toward POL3 and the GLO area. When the GLO MW03 well was reached, the excavation was curved to the right of the well, possibly extending farther toward the Borrow Pit, as excavated by Weston in 2009. The excavation reached a depth of 60 feet bgs, and POL contamination was still present. Because of depth and related safety issues, the excavation was not advanced. The sidewalls were sampled. After one sample was collected from the bottom of the excavation where contamination remained, the Pit was closed. Geotex fabric was placed on the exposed area of the excavation, and the excavation was sampled and surveyed. The sample results are shown in Figure 8. The POL Pit was backfilled with clean stockpile soil that had been dug from the Pit and segregated during excavation. The clean stockpile sample results are identified as SP-1 through SP-50 (Stockpile 1 to 50). Additional grading, backfilling, or both will occur in 2012.

4.6 Other Areas of Investigation

In addition to the areas of investigation described above, additional minor sampling and excavations were conducted at the following locations:

- CSR1, where two samples were collected and PCB-contaminated soils were removed
- DSA, where eight samples were collected and PCB-contaminated soils were removed

fig7_NVPH_SCR_BLO_data_r2_5-29-2012

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg	PCE µg/kg	TCE µg/kg
SB13-TP09	ND	196	3750	1880	622	3830

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg	PCE µg/kg	TCE µg/kg
BLOSSO-SS01-05	ND	ND(6.20)	ND(24.1)	ND(24.1)	ND(31.0)	ND(31.0)

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg	PCE µg/kg	TCE µg/kg
BLOSSO-SS01-01	--	--	--	--	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg	PCE µg/kg	TCE µg/kg
SB13-TP11	ND	ND(4.29)	ND(22.6)	ND(22.6)	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg	PCE µg/kg	TCE µg/kg
BLOSSO-SS01-02	ND	ND(6.59)	ND(26.9)	ND(26.9)	ND(32.9)	ND(32.9)

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg	PCE µg/kg	TCE µg/kg
SB13-TP08	ND	ND(5.50)	ND(22.8)	ND(22.8)	ND(27.5)	ND(27.5)

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg	PCE µg/kg	TCE µg/kg
BLOSSO-SB13-03	ND	65.1	3470	856	ND(240)	ND(240)

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg	PCE µg/kg	TCE µg/kg
BLOSSO-SB13-04	ND	ND(3.82)	ND(22.5)	ND(22.5)	--	--

SB13-TP09
BLOSSO-SS01-05
BLOSSO-SS01-04
SB13-TP11
BLOSSO-SS01-01
BLOSSO-SS01-02
BLOSSO-SS01-03
SB13-TP07
SB13-TP12
SB13-TP13
SB13-TP08
BLOSSO-SB13-03
BLOSSO-SB13-04

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg	PCE µg/kg	TCE µg/kg
BLOSSO-SS01-04	ND	ND(5.38)	42.6	33.5	ND(26.9)	ND(26.9)

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg	PCE µg/kg	TCE µg/kg
BLOSSO-SS01-03	0.0698	ND(6.05)	4250	4940	309	ND(30.2)

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg	PCE µg/kg	TCE µg/kg
SB13-TP07	ND	135	6940	1440	216	ND(150)

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg	PCE µg/kg	TCE µg/kg
SB13-TP13	ND	ND(4.66)	ND(23.5)	ND(23.5)	ND(23.3)	ND(23.3)

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg	PCE µg/kg	TCE µg/kg
SB13-TP12	ND	ND(4.15)	ND(21.5)	ND(21.5)	ND(20.8)	ND(20.8)

N

0 25 50 100 200

SCALE IN FEET

SAMPLE RESULTS KEY		
Sample Type	Method	Method 2, Table B1 Cleanup Levels
Aroclor 1260	PCB SW8082	1 mg/kg
GRO (Gasoline Range Organics)	AK101	300 mg/kg (migration to groundwater)
DRO (Diesel Range Organics)	AK102	250 mg/kg (migration to groundwater)
RRO (Residual Range Organics)	AK103	10,000 mg/kg (ingestion)
PCE (Tetrachloroethene)	8260B	24 µg/kg
TCE (Trichloroethene)	8260B	20 µg/kg

Black Lagoon Outfall and Septic System Outfall Sampling Locations

Notes: Results shown in BOLD denote levels above cleanup criteria. All VOC and PAH concentrations are below cleanup levels. Note that several ND results for TCE and PCE have reporting limits above their respective cleanup levels.

FIGURE 7

Black Lagoon Outfall and Septic System Outfall Area PCB, GRO, DRO, and RRO Sampling Locations and Results

Final Site Characterization Report, Former Port Heiden RRS, 2012

Prepared for 611 CES

fig8_NVPH_SCR_POL_data_r2_5-29-2012

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL2-01S(5)	ND	--	--	--
POL2-01SE(5)	--	52.0	2340	77.1
POL2-017S(5)	ND	--	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL2-02S(5)	ND	--	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL2-08S(5)	ND	--	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL2-07S(5)	ND	--	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL2-09S(4)	ND	--	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL2-016S(3)	ND	--	--	--
POL2-018S(3)	ND	--	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL2-10S(4)	ND	--	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL2-15S(3)	ND	--	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL2-11S(4)	ND	--	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL2-14S(3)	ND	--	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL2-06S(5)	ND	--	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL2-13S(3)	ND	--	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL2-12S(4)	ND	--	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL2-05S(5)	ND	--	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL3-01-WSW(15')	--	7.28	104	ND(22.5)

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL3-04-ESW(5')	--	ND(3.11)	ND(25.2)	ND(25.2)

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL3-03-Base(20')	--	3.95	152	ND(22.6)

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL2-03S(5)	ND	--	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL3-02-ESW(18')	--	16.8	1570	ND(119)

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL2-04S(5)	ND	--	--	--

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
GLO-SW-02	--	ND(3.95)	ND(21.2)	26.0

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
GLO-SW-03	--	ND(3.66)	ND(21.3)	26.0

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
GLO-SW-01	--	ND(5.10)	ND(22.4)	53.2
GLO-SW-01D	--	ND(6.58)	ND(23.6)	121

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL3-01NE(2)	ND	NA	ND(5.00)	288

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL3-02NE(2)	ND	2.4	ND(5.76)	62.8

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
GLO-SW-05	--	ND(5.45)	ND(23.2)	33.2

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
POL2-02SE(6)	ND	ND(6.60)	90.2	ND(29.4)

Sample ID	Aroclor 1260 mg/kg	GRO mg/kg	DRO mg/kg	RRO mg/kg
GLO-SW-04	--	ND(5.34)	ND(25.4)	109

POL3-04-ESW(5')
POL3-01-WSW(15')
POL2-01S(5) / POL2-01SE(5) / POL2-17S(5)
POL3-03-Base(20')
POL3-02-ESW(18')
POL2-08S(5)
POL2-02S(5)
POL2-09S(4)
POL2-07S(5)
POL2-16S(3) / POL2-18S(3)
POL2-10S(4)
POL2-03S(5)
POL2-06S(5)
POL2-11S(4)
GLO-SW-02
POL2-04S(5)
POL2-15S(3)
POL2-05S(5)
POL3-01NE(2)
POL2-14S(3)
POL2-12S(4)
GLO-SW-03
POL3-02NE(2)
GLO-SW-05
GLO-SW-01/-01D
POL2-13S(3)
GLO-SW-04
POL2-02SE(6)

SAMPLE RESULTS KEY

Sample Type	Method	Method 2, Table B1 Cleanup Levels
Aroclor 1260	PCB SW8082	1 mg/kg
GRO (Gasoline Range Organics)	AK101	300 mg/kg (migration to groundwater)
DRO (Diesel Range Organics)	AK102	250 mg/kg (migration to groundwater)
RRO (Residual Range Organics)	AK103	10,000 mg/kg (ingestion)

POL/GLO Sampling Locations

Notes: **BOLD** results denote levels above cleanup criteria.
POL samples: All VOC, PAH, SVOC and pesticide concentrations are below cleanup levels.
GLO samples: All BTEX concentrations are below cleanup levels.

N

0 20 40 50 60 100

SCALE IN FEET

Prepared for 611 CES

FIGURE 8
POL**1**/POL**2**/**POL3** Area PCB, GRO, DRO, and RRO Sampling Locations and Results

Final Site Characterization Report, Former Port Heiden RRS, 2012

5.0 Transportation and Disposal

A total of 923.14 tons of PCB-contaminated soil was removed from the Former Port Heiden RRS in 2011. The material was placed in Super Sacks and stored in stockpile areas within the RRS. The material was moved in a total of 173 Super Sacks. The average weight of each Super Sack was approximately 10,672 pounds.

Because contaminated waste exceeded 50 mg/kg of PCB in 32 of the 173 Super Sacks, these sacks were subject to regulations under the Toxic Substances Control Act (TSCA). The total weight of these 32 Super Sacks was 85.94 tons.

The remaining 687 Super Sacks were not regulated under TSCA because the concentrations of contaminated waste were found to have less than 50 mg/kg of PCB. The total weight of these 141 Super Sacks was 837.20 tons.

5.1 Investigation-Derived Waste

All PCB-contaminated soil removed from the Former Port Heiden RRS in 2010 came from the CSR2, PHAR, CSR1, and DSA AOCs. The Super Sacks containing the contaminated soil were filled by pouring dirt from an excavator bucket through a steel hopper and into a Super Sack. The hopper/Super Sack apparatus was at all times used on top of a 20-mil liner underlain by geotextile fabric. The edges of this liner were bermed, and field personnel working in the hopper maintained a designated location for entry/egress. Investigation-derived waste (IDW) was generated during the waste-handling activities of the 2011 fieldwork. Management of applicable IDW streams is described in the following subsections.

5.1.1 PPE Disposal

Personnel entering the exclusion zone while working on the liner around the hopper wore personal protective equipment (PPE) such as Tyvek suits, protective gloves, boot covers, and, when windy, dust masks. The rare exception to this rule was when excessive rainfall necessitated the use of reinforced PVC raingear.

The suits, gloves, boot covers, and dust masks were all disposable. Upon leaving an exclusion zone, these items was discarded into a trash bag and ultimately disposed of in a Super Sack. When reentering an exclusion zone, a new set of Tyvek suits, gloves, and boot covers was used.

5.1.2 Decontamination Water Disposal

Water used to decontaminate rubber boots when personnel left an exclusion zone was stored on site and circulated through a granular activated carbon (GAC) filter. Before disposal of this decontamination water, it was sampled for the following analytes:

- Total aromatic hydrocarbons (TAH) by Method 8260B
- Total aqueous hydrocarbons (TAqH) by Method 8270 SIM
- PCBs by Method 8082

Approximately 2,000 gallons of decontamination water were generated, less than the 10,000-gallon volume that would require sampling. Therefore, one sample suite was collected upon conclusion of the 2011 field activities. All TAH/TAqH analytes were found to be beneath 18 AAC 70 cleanup levels after the initial GAC filtration. However, the PCB result in GAC-01 exceeded the applicable cleanup level of 0.0005 milligrams per liter (mg/L), identified in Table C, 18 AAC 75.345. Therefore, this water was staged at the Landfill during the winter. GAC-02 is the discharged water of a volume of 1,400 gallons under Notice of Intent Permit 2009DB0004, which was discharged at the site. The results for total PCBs from these IDW samples are presented below:

- October 23, 2011 (GAC-01): 0.00365 mg/L
- October 23, 2011 (GAC-02): 0.000378 mg/L

The remaining water at the site will be retreated and tested during 2012 field activities before it is discharged at the site.

6.0 Summary

The NVPH field crew succeeded in conducting a successful field season. No significant injuries were sustained and 923.14 tons of PCB-contaminated soil were removed from the Former Port Heiden RRS and were safely transported to the US Ecology landfill. 2011 was the second year of a 3-year plan to (1) remove all PCB waste from the site, (2) excavate all POL-contaminated soil, and (3) initiate on-site treatment of the POL contaminated soil. If the same level of productivity achieved in 2011 can be accomplished during the 2012 field seasons with early start dates, these three goals should be achievable under the CA.

6.1 Recommendations

Recognizing that site conditions at the Former Port Heiden RRS are now sufficiently understood and delineation efforts have largely been concluded, recommendations for future actions at each of the nine soil AOCs are presented below. These recommendations will be refined as input is received from project stakeholders during the Final SCR review process.

6.1.1 BLO/SSO Recommendations

The septic pipeline was successfully removed from the BLO/SSO and was disposed of in 2010. Additionally, it was verified that residual contamination does not exist in the pipeline trench or tank/vault excavation. However, historical data indicate an area of POL contamination remains west of the pipeline excavation. Further, a significant area of PCB-contaminated soil has been identified south of the pipeline excavation.

In 2011, additional test pits and soil samples were collected from this area to further delineate and characterize any PCB and petroleum-related contamination. Results from these samples showed DRO, TCE, and PCE above cleanup levels in soil. It is recommended that all BLO/SSO soils in this area with concentrations above cleanup levels be placed in a biopile. Confirmation soil samples from the excavation area should be collected, and it will still be important to achieve confirmation soil sample results with reporting limits below the cleanup levels for PCE/TCE to close out the excavation.

The BLO/SSO soil that has PCB contamination should be sampled and stockpiled based on use of the PCB sampling method.

6.1.2 CSR1 Recommendations

Excavation/removal of PCB-contaminated soils at CSR1 largely concluded in 2010. Concentrations of soil in one grid square remain above 1 mg/kg. The analytical result for PCBs at this location was 1.3 mg/kg before it was covered for the winter. The remaining soil with contamination in excess of the cleanup level at one grid square was removed in 2011 until analytical results confirmed a PCB result of less than 1 mg/kg. It is recommended that this AOC be considered closed.

6.1.3 CSR2 Recommendations

Excavation activities did not occur at CSR2 in 2010; delineation of this AOC consumed much of the short work season. But with the boundary of the overall CSR2 area established in the 2010 season, additionally sampling and soil removal was conducted here in 2011. Analytical results from the excavation showed that site soils with PCB concentrations above cleanup levels remain in the following areas:

- CSR2-G88 and CSR2-G90
- CSR2-G72 and CSR2-G73
- CSR2-G91 through CSR2-G113

It is recommended that these areas be excavated eventually for off-site treatment. Additionally, it is recommended that the areas to the north and west of the CSR2 be further characterized during the 2012 field effort. These areas were identified in the 2010 field activities as having soil with concentrations above the cleanup level of 1.0 mg/kg for PCBs.

6.1.4 POL Stockpile Recommendations

Historical data have identified three areas of POL-contaminated soil that remain buried in the ground at the Former Port Heiden RRS. One is near the BLO/SSO; the second is located directly off the northeast side of the Former RRS Pad; and the third is located north and east of the POL3 area. In 2011 the POL-contaminated soils from these two locations were excavated and added to the three existing POL Stockpiles. The recommended remedial option for future remediation of the POL-contaminated soil at the Former RRS is landfarming/landspreading and monitoring of soil concentrations to confirm bioremediation is occurring.

6.1.5 Recommendations for the Port Heiden Access Road and North of the Road Area

Some of the contaminated soil from the PHAR was removed; however, in other locations, a 1-foot layer of clean soil was placed to prevent contact and spreading of the contamination. For the NRD area, it is recommended that only the soils with contaminant concentrations

above cleanup levels be excavated and removed for treatment in 2012 to accommodate the widening of the site access road.

7.0 Works Cited

ADEC. Division of Spill Prevention and Response Contaminated Sites Program. *Draft Field Sampling Guidance.* May 2010.

ADEC. *Alaska Administrative Code.* Title 18, Chapter 70, Water Quality Standards. April 2012.

ADEC. *Alaska Administrative Code.* Title 18, Chapter 75, Oil and Other Hazardous Substances Pollution Control. April 2012.

NVPH. *Final Site Characterization Report, Former Port Heiden Radio Relay Station, Port Heiden, Alaska.* May 2011a.

NVPH. *Final Soil Characterization and Disposal Work Plan, Former Port Heiden Radio Relay Station, Port Heiden, Alaska.* May 2011b.

NVPH. *Final Groundwater Monitoring Report, Former Port Heiden Radio Relay Station Port Heiden, Alaska.* March 2012.

State of Alaska. Division of Community and Regional Affairs. Alaska Community Database: Port Heiden. http://www.commerce.state.ak.us/dca/commdb/CF_BLOCK.cfm. Accessed June 2010.

USEPA. *Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup. EPA-560/5-86-017.* May 1986.

Weston Solutions. *Draft Final Report, Remedy Selection and Implementation, Demolition and Debris Removal, Port Heiden Radio Relay Station, Port Heiden, Alaska.* March 2010.