
# UNITED STATES AIR FORCE
# 611TH AIR SUPPORT GROUP
# 611TH CIVIL ENGINEER SQUADRON

# JOINT BASE ELMENDORF-RICHARDSON, ALASKA

# NIKOLSKI RADIO RELAY STATION
# NIKOLSKI, ALASKA

# CERCLA RECORDS OF DECISION:

- **OT-001 FORMER COMPOSITE BUILDING**
- **ST-018 COMPOSITE BUILDING SEPTIC TANK AND OUTFALL**
- **WP-007 COMPOSITE BUILDING POL OUTFALL**

**FINAL**
**SEPTEMBER 2011**

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## APPENDICES

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AAC | Alaska Administrative Code |
| ADEC | Alaska Department of Environmental Conservation |
| ARAR | applicable or relevant and appropriate requirements |
| AST | aboveground storage tank |
| bgs | below ground surface |
| BRA | baseline risk assessment |
| BTEX | benzene, toluene, ethylbenzene, and xylenes |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CERCLIS | Comprehensive Environmental Response, Compensation, and Liability Information System |
| CFR | Code of Federal Regulations |
| COC | contaminant of concern |
| COPC | contaminant of potential concern |
| DEW | Distant Early Warning |
| DoD | Department of Defense |
| DRO | diesel-range organics |
| EPA | U.S. Environmental Protection Agency |
| ERP | Environmental Restoration Program |
| F | analyte was positively identified but numerical value is below reporting limit |
| FS | feasibility study |
| GAC | granular activated carbon |
| GRO | gasoline-range organics |
| HEAST | Health Effects Assessment Summary Tables |
| IC | institutional controls |
| IRIS | Integrated Risk Information System |
| IRA | Indian Reorganization Act |
| J | analyte was positively identified but quantitation is an estimate |
| LUC | land use controls |
| mg/kg | milligrams per kilogram |

## ACRONYMS AND ABBREVIATIONS (Continued)

| | |
|---|---|
| MoGas | motor vehicle gasoline |
| NA | not applicable |
| NCP | National Contingency Plan |
| ND | not detected above reporting limit |
| NFRAP | no further remedial action planned |
| PA | preliminary assessment |
| PAH | polycyclic aromatic hydrocarbon |
| PCB | polychlorinated biphenyl |
| POL | petroleum, oil, and lubricants |
| RA | removal action |
| RAB | Restoration Advisory Board |
| RAO | remedial action objective |
| ROD | Record of Decision |
| RRO | residual-range organics |
| RRS | Radio Relay Station |
| TRPH | total recoverable petroleum hydrocarbons |
| SARA | Superfund Amendments and Reauthorization Act |
| SI | site investigation |
| SVOC | semivolatile organic compound |
| UCL | upper confidence limit |
| USAF | U.S. Air Force |
| USC | United States Code |
| UST | underground storage tank |
| VOC | volatile organic compound |

# PART 1: THE DECLARATION

## 1.1 NAME AND LOCATION

### 1.1.1 OT-001

*Facility Name:* Former Composite Building and White Alice Arrays, Nikolski Radio Relay Station

*Site Location:* Nikolski, Alaska; Section 25; Township 083 South; Range 136 West; Seward Meridian

*Latitude and Longitude:* 52°56'13"N, 168°52'11"W

*Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) ID Number:* AK4570028684 (archived)

*Alaska Department of Environmental Conservation Contaminated Sites Hazard ID Number:* 133, site status is active

*Operable Unit/Site:* OT-001

### 1.1.2 ST-018

*Facility Name:* Composite Building Septic Tank and Outfall, Nikolski Radio Relay Station

*Site Location:* Nikolski, Alaska; Section 25; Township 083 South; Range 136 West; Seward Meridian

*Latitude and Longitude:* 52°56'13"N, 168°52'11"W

*CERCLIS ID Number:* AK4570028684 (archived)

*Alaska Department of Environmental Conservation Contaminated Sites Hazard ID Number:* 127, site status is active

*Operable Unit/Site:* ST-018 (formerly AOC-08)

### 1.1.3 WP-007

*Facility Name:* Composite Building Petroleum, Oil, and Lubricants (POL) Outfall (WP-007), Nikolski Radio Relay Station

*Site Location:* Nikolski, Alaska; Section 25; Township 083 South; Range 136 West; Seward Meridian

*Latitude and Longitude:* 52°56'13"N, 168°52'11"W

*CERCLIS ID Number:* AK4570028684 (archived)

*Alaska Department of Environmental Conservation Contaminated Sites Hazard ID Number:* 136, site status is active

*Operable Unit/Site:* WP-007

Each of these three sites were part of the Nikolski Radio Relay Station (RRS), located on Umnak Island in the Aleutian Island chain, approximately 900 air miles from Anchorage, Alaska, and 1.7 air miles from the village of Nikolski (Figure 1). These three sites are located on the topographic feature known as High Hill (Figure 2).

## 1.2 STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedies for Environmental Restoration Program (ERP) sites OT-001, ST-018, and WP-007 at the Nikolski RRS in Nikolski, Alaska. The remedies were chosen in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 and to the extent practicable with the National Contingency Plan (NCP); and State of Alaska laws and regulations. This decision document is based on the Administrative Record file for each site, which can be accessed via the Internet at <www.adminrec.com> or at the Information Repository at the Nikolski Indian Reorganization Act (IRA) Council Office in the village of Nikolski.

### 1.2.1 Statement of Basis and Purpose under CERCLA

As the lead agency, the Department of the Air Force issues this document. The U.S. Air Force (USAF) is managing remediation at WP-007 and ST-018 in accordance with CERCLA as required by the Defense Environmental Restoration Program (DERP). This Record of Decision (ROD) is issued in accordance with and satisfies requirements of the DERP, United States Code (USC) Title 10, Section 2701 et seq.; CERCLA 42 USC 9601 et seq.; Executive Order 12580, Federal Register Title 52, Section 2923 (23 January 1987); and the NCP, Code of Federal Regulations Title 40, Chapter 300).

As the lead agency, the USAF has selected the remedies for WP-007 and ST-018. The Alaska Department of Environmental Conservation (ADEC) concurs that the selected remedies for WP-007 and ST-018, if properly implemented, will comply with state law.

The U.S. Environmental Protection Agency (EPA) was consulted regarding these sites and the other Nikolski RRS sites, consistent with the requirements of 10 USC 2705. In 1994, EPA Region 10 reviewed the Preliminary Assessment (PA) Report for the Nikolski RRS sites (USAF 1994). Using the EPA Hazard Ranking System, EPA determined that the Nikolski sites' status was No Further Remedial Action Planned (NFRAP) with respect to National Priorities List listing and response. Subsequently, EPA has deferred to ADEC for regulatory oversight of ERP activities at the Nikolski RRS.

### 1.2.2 Statement of Basis and Purpose under State of Alaska Regulations

Because petroleum compounds and polycyclic aromatic hydrocarbons (PAH) are contaminants of concern (COC) under State of Alaska regulations, the remedy for OT-001 is being addressed consistent with those applicable laws and regulations, including but not limited to Title 46 of the Alaska Statutes promulgated thereunder. The State of Alaska agrees that the selected remedy will meet State of Alaska regulatory requirements.

This document complies with the requirements of the *Alaska Oil and Hazardous Substances Pollution Control Act*, Alaska Administrative Code, Title 18 (18 AAC) 75, revised as of 9 October 2008.

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Figure 1 Location Map

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Figure 2 High Hill Site Map

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## 1.3 ASSESSMENT OF SITES

### 1.3.1 Assessment of Sites under CERCLA

#### 1.3.1.1 OT-001

No response action under CERCLA is necessary at this site to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment. No CERCLA COCs are present at the site above 18 AAC 75 soil cleanup levels.

#### 1.3.1.2 ST-018

No response action under CERCLA is necessary at this site to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment. No CERCLA COCs are present at the site above 18 AAC 75 soil cleanup levels.

#### 1.3.1.3 WP-007

The response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment. The COC is polychlorinated biphenyls (PCB) which has been detected at this site above 18 AAC 75 soil cleanup levels. Due to commingling of PCBs with diesel-range organics (DRO) and residual-range organics (RRO), these petroleum contaminants are included as CERCLA COCs at WP-007 only.

Areas within Site WP-007 cannot support unlimited use and unrestricted exposure due to hazardous substances remaining in place after implementation of the selected remedy. Land use restrictions are required as part of this response action and will be achieved through the establishment of institutional controls (IC) that limit the use of those areas of the site that have contamination remaining in place.

### 1.3.2 Assessment of Sites under State of Alaska Regulations

#### 1.3.2.1 OT-001

The response action selected in this ROD is necessary to prevent exposure to non-CERCLA COCs remaining in place after implementation of the selected remedy. The COCs are benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and RRO which have been detected above 18 AAC 75 soil cleanup levels. Areas within Site OT-001 cannot support unlimited use and unrestricted exposure due to the aforementioned COCs remaining in place after implementation of the selected remedy. Land use restrictions are required as part of this response action and will be achieved through the establishment of ICs that limit the use of those areas of the site that have contamination remaining in place.

The USAF is committed to implementing, monitoring, maintaining, and enforcing all components of the selected remedy to ensure that it remains protective of human health and the environment.

#### 1.3.2.2 ST-018

No response action under State of Alaska regulations is necessary at this site to meet 18 AAC 75 soil cleanup levels.

#### 1.3.2.3 WP-007

No response action under State of Alaska regulations is necessary at this site because commingled CERCLA and non-CERCLA contaminants are being addressed under CERCLA, and the remedy complies with applicable state law. Response actions under CERCLA are being taken at this site as indicated in Section 1.3.1.3 to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

## 1.4 DESCRIPTION OF THE SELECTED REMEDIES

### 1.4.1 OT-001

Remedial alternatives for the Former Composite Building site (OT-001), which includes the adjacent Two 20,000-Gallon USTs site (TU-019, formerly AOC-09), were developed and evaluated during the Feasibility Study (FS) (USAF 2003a). Based on the results of the Feasibility Study, the USAF selected ICs as the preferred alternative for OT-001. The major components of the selected response action are presented in Section 1.4.1.2.

#### 1.4.1.1 CERCLA-Selected Remedy

Releases at the site were found to solely contain petroleum products or petroleum product indicators. Under CERCLA Sections 101(14) and 101(33), petroleum products, to include any fractions or derivatives of crude oil, are excluded from the definitions of hazardous substances, pollutants, or contaminants. Therefore, the USAF is not selecting a CERCLA remedy for OT-001.

#### 1.4.1.2 Remedy Required under State of Alaska Regulations

The Former Composite Building (OT-001), including the adjacent Two 20,000-Gallon USTs site (TU-019), are two of thirteen ERP sites at Nikolski RRS. The TU-019 site is in close proximity to Site OT-001. As documented in the 2004 Baseline Risk Assessment, a high degree of correlation exists between the PAH fingerprints from soil borings at OT-001 and TU-019, which indicates that the source of contamination at OT-001 was from a diesel fuel spill. In addition, the conceptual site model for OT-001 indicates that a likely source of the fuel spill that resulted in PAH contamination at OT-001 was from TU-019. Given the close proximity of the sites and similarity of PAH fingerprints, a technical memorandum discussing the administrative inclusion of TU-019 to OT-001 is included in Appendix C.

The general response actions that can be undertaken to satisfy remedial action objectives for protecting human health and the environment at the installation include limited actions (e.g. ICs), containment, ex situ treatment, in situ treatment, and removal/offsite treatment or

disposal. All of these options were considered as a remedy. The selected remedy is ICs, which is required under State of Alaska regulations, as petroleum contaminants will remain onsite above 18 AAC 75 soil cleanup levels.

ICs were selected as the site remedy given previous discussions between Chaluka Corporation and the USAF which indicated that, other than personnel stationed at Nikolski RRS when it was operational, people have not resided on High Hill in the past and do not intend to reside on High Hill in the future. Chaluka Corporation concurs with the USAF's selection of ICs as a remedy for the High Hill sites. The ICs will reduce human or environmental exposure to contamination, and prevent activities that may result in increased exposure or spread the extent of contamination. The major components of the selected remedy for OT-001 will include:

- ICs to prevent residential use and restrict surface excavation activities at the site. The ICs will be developed to encompass an area described as Tract 37C covering approximately 29.64 acres (Figure B-1 in Appendix B).
- The requirement that all surface excavation or digging activities within Tract 37C be subject to ADEC approval as may be required by State of Alaska regulations [e.g., 18 AAC 75.325(i)].
- USAF will conduct five-year reviews of the remedy since substances will remain onsite at levels above applicable State of Alaska cleanup levels specified in 18 AAC 75. These five-year reviews will also report on the effectiveness of the ICs. Reviews may become more frequent if conditions change.

The ICs established by the State of Alaska regulations will remain in effect indefinitely or until the COCs at OT-001 are below applicable 18 AAC 75 cleanup levels, at which point the ICs can be eliminated with the approval of ADEC in accordance with 18 AAC 75.375(f). USAF, as the responsible entity, will implement, monitor, and maintain the ICs in accordance with State of Alaska regulations. USAF will also provide a monitoring report to ADEC every five years after each monitoring event. If the site remedy is found to be deficient during an inspection, ADEC will be contacted and further corrective action will be planned. ADEC will be notified if the property subject to ICs is transferred or if any significant changes are made to the use and activity restrictions of the ICs. There are currently no tenants, contractors, or

occupants within the property subject to ICs. Table 1-1 presents the State of Alaska COCs present at OT-001.

The USAF will be responsible for implementing the selected remedy.

### 1.4.2 ST-018

The Composite Building Septic Tank and Outfall is one of 13 ERP sites at Nikolski RRS. The recommended action for ST-018 identified in the Feasibility Study (USAF 2003a) was onsite treatment of tank liquids and abandonment of the tank in place in accordance with ADEC guidance. This recommended action was completed at the site in 2007.

#### 1.4.2.1 CERCLA-Selected Remedy

The CERCLA-selected remedy for ST-018 is No Further Action. In 2007, in accordance with ADEC guidance, the tank was closed, and remaining tank liquids were removed and disposed of in accordance with ADEC guidance. There is no contamination remaining onsite above 18 AAC 75 soil cleanup levels. No source materials constituting principal threats exist at ST-018.

#### 1.4.2.2 Remedy Required under State of Alaska Regulations

No remedies are required under State of Alaska regulations. USAF has selected a CERCLA no-action remedy for ST-018 which meets all applicable requirements of the State of Alaska including but not limited to 18 AAC 75.

### 1.4.3 WP-007

Remedial alternatives for the Composite Building POL Outfall (WP-007) were developed and evaluated during the Feasibility Study (USAF 2003a). Based on the results of the Feasibility Study, USAF selected ICs as the preferred alternative for WP-007.

#### 1.4.3.1 CERCLA-Selected Remedy

The Composite Building POL Outfall (WP-007) is one of thirteen ERP sites at Nikolski RRS. The general response actions that can be undertaken to satisfy remedial action objectives for protecting human health and environment at the installation include limited actions (e.g. ICs), containment, ex situ treatment, in situ treatment, and removal/offsite treatment or disposal. The CERCLA-selected remedy for WP-007 is ICs given that hazardous substances (PCBs), commingled with DRO and RRO, will remain onsite above 18 AAC 75 soil cleanup levels. The ICs will reduce human or environmental exposure to contamination, and prevent activities that may result in increased exposure or spread the extent of contamination. Major components of the CERCLA-selected remedy for WP-007 will include:

- ICs to prevent residential use and restrict surface excavation activities at the site. The ICs will be developed to encompass an area described as Tract 37C covering approximately 29.64 acres (Figure B-1 in Appendix B).
- Prohibiting residential use and occupancy within Tract 37C in excess of 33 days per year by any one individual (40 CFR 761.3).
- The requirement that all surface excavation or digging activities within Tract 37C be subject to ADEC approval as required by State of Alaska regulations [e.g., 18 AAC 75.325(i)].
- USAF will conduct five-year reviews of the remedy as required by CERCLA Section 121(c) since hazardous substances will remain onsite at levels above applicable State of Alaska cleanup levels in 18 AAC 75. These five-year reviews will also report on the effectiveness of the ICs. Reviews may become more frequent if conditions change.

The ICs will remain in effect indefinitely or until such time as the COCs at WP-007 are below applicable 18 AAC 75 cleanup levels (Table 1-1). USAF, as the responsible entity, will implement, monitor, and maintain the ICs in accordance with CERCLA and NCP regulations. USAF will also provide periodic monitoring reports to ADEC as part of five-year reviews. If the site remedy is found to be deficient during an inspection, ADEC will be contacted and further corrective action will be planned. ADEC will be notified if the property subject to ICs is transferred or if any significant changes are made to the use and activity restrictions of the ICs. There are currently no tenants, contractors, or occupants within the property subjected to ICs. Table 1-1 presents the CERCLA COCs present at OT-001 and WP-007.

The USAF will be responsible for implementing the selected remedy.

### 1.4.3.2 Remedy Required under State of Alaska Regulations

No additional remedies are required under State of Alaska regulations. The USAF has selected a CERCLA remedy for the site which meets all applicable requirements of the State of Alaska including but not limited to 18 AAC 75.

**Table 1-1**
**Soil Contaminants of Concern and Cleanup Levels**

| Site | COC | Maximum Detected Concentration (mg/kg) | ADEC Method Two Cleanup Level (mg/kg) | Regulator |
|---|---|---|---|---|
| OT-001 | Benzo(a)anthracene | 20.1 | 9.0 | ADEC[1] |
| OT-001 | Benzo(a)pyrene | 17.6 | 0.9 | ADEC[1] |
| OT-001 | Benzo(b)fluoranthene | 21.8 | 9.0 | ADEC[1] |
| OT-001 | Dibenzo(a,h)anthracene | 2.47 | 0.9 | ADEC[1] |
| OT-001 | RRO | 8,600 | 8,300 | ADEC[1] |
| WP-007 | PCBs | 2.04 | 1.0 | CERCLA |
| WP-007 | DRO | 110,000 | 230 | CERCLA |
| WP-007 | RRO | 54,100 | 8,300 | CERCLA |

**Notes:**
[1] Petroleum products are excluded as CERCLA hazardous substances under the CERCLA petroleum exclusion [42 USC 9601 (14)]. This is an integrated ROD documenting final remedies selected under both the CERCLA and Alaska State laws and regulations.
For definitions, see the Acronyms and Abbreviations section.

## 1.5 STATUTORY DETERMINATIONS

The selected remedies for OT-001, ST-018, and WP-007 are protective of human health and the environment, comply with promulgated requirements that are applicable or relevant and appropriate to the remedial actions, and are cost-effective.

The selected remedies represent the maximum extent to which permanent solutions can be used in a practicable manner at sites OT-001, ST-018, and WP-007. The remedies provide the

best balance of tradeoffs in terms of the balancing criteria while also considering state and community acceptance.

The NCP establishes the expectation that treatment will be used to address the principal threats posed by a site whenever practicable [40 CFR, Section 300.430(a)(1)(iii)(A)]. The selected remedies of ICs at OT-001 and WP-007 do not satisfy the statutory preference for treatment as a principal element of the remedies because ICs will be applied to control exposure pathways and minimize risk without treatment.

The remedies provided in this Final ROD are intended to minimize exposure of receptors to potential contamination. The remedy for WP-007 will result in CERCLA hazardous substances, pollutants, or contaminants and commingled petroleum contamination remaining at the site above levels that allow for unlimited use and unrestricted exposure. Therefore, a statutory review will be required at ERP Site WP-007 every five years after initiation of the remedial action to verify that the remedy is, or will be, protective of human health and the environment.

The remedy for OT-001 will result in petroleum contaminants remaining onsite above State of Alaska regulatory soil cleanup levels in 18 AAC 75 that allow for unlimited use and unrestricted exposure. Therefore, periodic reporting will be required at ERP Site OT-001 for submittal to ADEC to verify that the remedy is, or will be, protective of human health and the environment.

No source materials constituting principal threats exist at OT-001, ST-018, or WP-007.

## 1.6 DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD:

- List of COCs and their respective concentrations (Table 1-1).
- Human health and ecological risk evaluation represented by the COCs (Section 2.7).
- Cleanup levels established for COCs (Table 1-1).

- How source materials constituting principal threat wastes will be addressed (Section 2.11).
- Current and reasonably anticipated future land use assumptions and beneficial uses used in baseline risk calculations and the ROD (Sections 2.6 and 2.7).
- Potential land and groundwater use that will be available at the site as a result of the selected remedy (Section 2.6).
- Estimated capital, annual operations and maintenance (O&M), total costs, and the number of years over which the remedy cost estimates are projected (Section 2.10, Table 2-18, and Table 2-19).
- Key factors that led to selecting the remedies (description of how the selected remedies provide the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) (Section 2.10).

Additional information can be found in the Administrative Record files for ERP sites OT-001, STO-018, and WP-007, Nikolski RRS, Alaska, which can be accessed via the Internet at www.adminrec.com, or at the Information Repository at the Nikolski IRA Council Office in the village of Nikolski.

## 1.7 AUTHORIZING SIGNATURES

This signature sheet documents the USAF approval of the CERCLA remedies selected in this Record of Decision for Site ST-018 (Composite Building Septic Tank and Outfall) and Site WP-007 (Composite Building POL Outfall) at Nikolski RRS, Alaska).

This signature sheet documents the USAF approval of the remedy selected in this Record of Decision for Site OT-001 (Former Composite Building) at Nikolski RRS, Alaska.

By signing this declaration, ADEC concurs that proper implementation of the selected remedies for ST-018, WP-007, and OT-001 will comply with state environmental laws. These decisions will be reviewed and may be modified in the future if information becomes available that indicates the presence of contaminants or exposures that may cause unacceptable risk to human health or the environment.

Robyn M. Burk — 23 Sep '11

ROBYN M. BURK, Colonel, USAF
Commander, 611th Air Support Group

Date

John Halverson — 9/30/2011

JOHN HALVERSON, Environmental Program Manager
Federal Facilities Section, Contaminated Sites Program
Alaska Department of Environmental Conservation

Date

# PART 2: DECISION SUMMARY

The decision summary identifies the selected remedies, explains how the remedies fulfill statutory and regulatory requirements, and provides a substantive summary of the Administrative Record files that support the remedy selection decision.

## 2.1 SITE NAME, LOCATION, AND DESCRIPTION

Sites OT-001 Former Composite Building; ST-018 Composite Building Septic Tank and Outfall; and WP-007 Composite Building POL Outfall are three of thirteen ERP sites at Nikolski RRS, located on Umnak Island in the Aleutian Island chain, approximately 900 air miles from Anchorage, Alaska (Figure 1). The Nikolski RRS encompasses approximately 435 acres on the southwest end of Umnak Island and is located in Section 25, Township 83 South, Range 136 West, Seward Meridian. Nikolski RRS is an inactive USAF installation established on lands withdrawn from public domain by a public land order, and is situated 1.7 air miles from the village of Nikolski at a topographic feature known as High Hill, which is at an elevation of approximately 700 feet above mean sea level.

As the lead agency for CERCLA remedial activities, the USAF has conducted environmental restoration at OT-001, ST-018, and WP-007 in accordance with CERCLA under the Department of Defense (DoD) ERP that was established by Section 211 of SARA of 1986. As the lead regulatory agency, ADEC provides primary oversight of the environmental restoration actions, in accordance with CERCLA and Alaska State laws and regulations.

Funding for remedial activities is provided by the Defense Environmental Restoration Account, a funding source approved by Congress to clean up contaminated sites on DoD installations.

### 2.1.1 Site OT-001

**Site Name**: Former Composite Building (OT-001), Nikolski RRS

**Site Location**: Section 25; Township 083 South; Range 136 West; Seward Meridian

**Latitude and Longitude**: 52°56’13”N, 168°52’11”W

**Point of Contact:** Mr. Steve Hunt, USAF Remedial Project Manager

Steve.Hunt@elmendorf.af.mil
USAF 611 CES/CEAR
10471 20th Street, Suite 302
Joint Base Elmendorf-Richardson, AK 99506

Site OT-001 is located on a flat, graded section at the top of High Hill. The site consisted of the Former Composite Building, two 1,311-gallon aboveground storage tanks (AST) for fuel storage, one 60-gallon motor vehicle gasoline (MoGas) AST for the emergency fire pump, and a 24,000-gallon AST for water storage. Site OT-001 also includes the adjacent Two 20,000-Gallon USTs (Site TU-019, formerly AOC-09) which were closed and removed in 2007 and 2009. Two White Alice Arrays were located north of the Composite Building. Previous environmental investigations at OT-001 and TU-019 identified PAH compounds in soil at concentrations exceeding Method Two soil cleanup levels specified in 18 AAC 75.341. It is believed that PAH contamination at OT-001 is the result of an historic diesel fuel spill and leaks associated with the nearby 20,000-gallon USTs at TU-019. Approximately 20 percent of diesel fuel is comprised of aromatic hydrocarbons, including PAHs. Because PAHs have very low solubility in water and are recalcitrant to biodegradation, the absolute concentration of PAHs in soils decreases very slowly. To confirm that PAH compounds detected at OT-001 and TU-019 were residuals from a previous diesel fuel spill, chemical fingerprints were developed using available soil analytical data from OT-001 and TU-019 (USAF 2004). The chemical fingerprint of each petroleum product is unique. PAHs are present in various petroleum products at different relative concentrations; therefore, when petroleum is remediated due to biodegradation, the remaining PAHs sampled within the same source will have the same relative concentrations. If the two samples are taken from different sources, the relative PAH concentrations would vary widely. As shown in Figure 3, the data contain considerable uniformity in relative PAH concentrations, which indicate that the contamination likely came from the same source, and was likely released at approximately the same time. Therefore, TU-019 has been included with OT-001 in this Record of Decision.

In addition to the PAH contamination, 7.5 cubic yards of RRO-contaminated soil was present inside the concrete vault on top of the northern 20,000-gallon UST. Removal of this soil was proposed under the *Proposed Plan for Nine Sites at the Nikolski RRS* (USAF 2003b) and was removed in 2007 when in-place closure of the two USTs was conducted at TU-019. In response to remaining ADEC concerns with the in-place UST closure completed in 2007, the two USTs were excavated and removed from the site during the 2009 field season in accordance with Alaska UST regulations at 18 AAC 78 (BEM 2009). The two USTs were permanently closed in July 2009 (BEM 2009).

Since non-CERCLA constituents are present above applicable ADEC Method Two regulatory limits, the site poses a current or future unacceptable risk to human health. Land use restrictions are required as part of this response action and will be achieved through the establishment of ICs that limit the use of those areas of the site that have contamination remaining in place.

### 2.1.2 Site ST-018

**Site Name**: Composite Building Septic Tank and Outfall (ST-018), Nikolski RRS

**Site Location**: Section 25; Township 083 South; Range 136 West; Seward Meridian

**Latitude and Longitude**: 52°56’13”N, 168°52’11”W

**Point of Contact:** Mr. Steve Hunt, USAF Remedial Project Manager

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USAF 611 CES/CEAR
10471 20th Street, Suite 302
Joint Base Elmendorf-Richardson, AK 99506

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Figure 3 Fingerprint of PAH Contamination at the OT-001 Site

(Color 11x8.5)

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Site ST-018 includes an 8,000-gallon septic tank and discharge pipe. According to historical drawings, the 8,000-gallon septic tank discharged over the northwest cliff of High Hill (USAF 1963a, 1963b). The only portion of this system currently visible consists of a concrete headwall located at the top of the cliff and penetrated by a 6-inch, cast-iron pipe fitted with a 90-degree elbow that turns downward for discharge over the cliff (Appendix A).

In 2007, USAF completed in-place closure of the septic tank at ST-018 in accordance with ADEC requirements. Closure of the ST-018 septic tank, including draining and treatment of the remaining septic tank liquid and partial demolition and backfilling of the tank, was conducted in accordance with the field activities work plan. Soil was analyzed for gasoline-range organics (GRO), DRO, RRO, VOCs, PCBs, PAHs, and metals. None of the constituents was detected above applicable Method Two regulatory limits; therefore, unacceptable exposure to hazardous substances does not occur and is not expected to occur in the future. The site does not pose a current or future unacceptable risk to humans.

### 2.1.3 Site WP-007

**Site Name:** Composite Building POL Outfall (WP-007), Nikolski RRS
**Site Location:** Section 25; Township 083 South; Range 136 West; Seward Meridian
**Latitude and Longitude:** 52°56’13”N 168°52’11”W
**Point of Contact:** Mr. Steve Hunt, USAF Remedial Project Manager

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Site WP-007 is the outfall for the POL discharge pipeline originating at the Former Composite Building. The available data indicate the outfall area was the discharge point for liquid wastes disposed of in floor drains and industrial sinks in the Composite Building. WP-007 is located near the top of High Hill on a steep, rocky slope. Several phases of investigations at the site have revealed DRO, RRO, and PCBs that are commingled in soil at

concentrations exceeding the Method Two soil cleanup levels specified in 18 AAC 75.341 (Table 1-1).

Areas within Site WP-007 cannot support unlimited use and unrestricted exposure due to hazardous substances remaining onsite above applicable ADEC Method Two regulatory limits. Therefore, land use restrictions are required as part of this response action and will be achieved through the establishment of ICs that will limit use of those areas of the site that have contamination remaining in place.

## 2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

This section provides background information and summarizes the series of previous site activities and investigations that lead to this ROD.

### 2.2.1 Site History

The Nikolski RRS was one of 18 Distant Early Warning (DEW) stations constructed in Alaska between 1950 and 1959 to provide reliable communications for the DEW line. The facility was constructed in 1958 and became operational in 1961. RRS facilities were originally known as White Alice Communications Systems but were redesignated RRS by the USAF Alaskan Air Command in 1969 (USAF 1997a). The original facility consisted of the following:

- Main facility on High Hill
  - Composite Building with dormitories, office space, storage space, and two billboard antennas with feedhorn towers (OT-001)
  - Composite Building septic tank and outfall (ST-018, formerly AOC-08)
  - Composite Building POL outfall (WP-007)
  - Equipment for standby power generation
  - Transformer Building and two billboard antennas with feedhorn towers (OT-010, formerly SS-010)
  - Two 20,000-Gallon USTs site (TU-019) incorporated into OT-001

  - Two 1,311-gallon ASTs for fuel storage, one 60-gallon AST MoGas tank for the emergency fire pump, a 24,000-gallon AST for water storage, and two White Alice Arrays were associated with the Former Composite Building
- Landfill located about 1/4-mile northeast of the main facility (LF-001)
- POL storage and distribution facilities:
  - POL tank area (SS-004) located about 1 mile northeast of the village of Nikolski
  - POL pipeline (SS-003) running about 2.25 miles from the POL tank area to the north-northeast along the coast to the main facility
- Airstrip and runway lighting vault (SS-005)
- Power and control cables between the runway lighting vault and the Composite Building
- Construction camp septic tank (ST-017, formerly AOC-07)
- Dam and pump house (AOC-01) located along a creek to the northeast of the main facility
- Water supply pump house and AST (SS-002) located along the bank of the lake located east-southeast of the main facility
- Drum storage area (SS-006) at the foot of the runway

The Nikolski facility was deactivated in 1977, and most facility buildings and structures were demolished in 1988, including all aboveground structures at the main facility on High Hill. Nonhazardous and asbestos-containing demolition debris, including building debris and empty drums, were placed into the site demolition landfill (LF-001). Hazardous materials generated during the 1988 demolition were transported via barge to the Elmendorf Air Force Base treatment, storage, and disposal facility (USAF 1995).

### 2.2.2 History of Investigations and Removal Actions

The following activities have been performed at Nikolski RRS since the 1977 facility deactivation:

- 1983 PCB removal action (RA)
- 1988 site demolition (USAF 1988)
- 1993 PA (USAF 1994)
- 1995 PA/site investigation (SI), which identified 13 areas where hazardous substances or petroleum products may have been stored, released to the environment, or disposed of onsite (USAF 1995)

- 1996 follow-up PA/SI (USAF 1996)
- 1997 drum RA at the former drum storage area (SS-006) (USAF 1997a, 1997b, 1998)
- 2000 follow-up SI (USAF 2000)
- 2001 Clean Sweep Environmental Survey Report (USAF 2001b)
- 2001 Remedial Investigation (RI), which included the 13 sites identified during the PA/SI (USAF 2002b)
- 2002 supplemental RI at the Construction Camp Septic Tank site (ST-017) and POL Tank Area (SS-004) (USAF 2002a)
- 2003 Feasibility Study that addressed contaminants at the Composite Building and Associated White Alice Arrays (OT-001), POL Tank Area (SS-004), and Construction Cap Septic Tank (ST-017) (USAF 2003a)
- 2004 baseline risk assessment (BRA) that addressed the Composite Building and associated White Alice Arrays (OT-001), POL outfall (WP-007), POL pipeline (SS-003), and POL tank area (SS-004) (USAF 2004)
- 2007 septic tank closure and decommissioning addressed the septic tank at the Composite Building septic tank and outfall (ST-018)
- 2007 in-place closure at the Two 20,000-Gallon USTs site (TU-019) of two USTs consisting of site preparation, soil excavation around the USTs, removal of tank liquids and sludge, UST cleaning, confirmation sampling and analysis, backfilling of the USTs, and site re-grading (USAF 2010a).
- 2009 excavation and removal of two USTs at Site TU-019 to address regulatory deficiencies identified by ADEC regarding the 2007 in-place UST closure (USAF 2010a). Site TU-019 was incorporated into OT-001.

The following activities have been performed at sites OT-001/TU-019, ST-018, and WP-007.

#### 2.2.2.1 1995 Preliminary Assessment/Site Investigation

**OT-001:** During investigations completed as part of the 1995 PA/SI (USAF 1995), Site OT-001 was screened for PCBs. The screening method used gave a high number of false positives and therefore did not conclusively detect or dismiss the presence of PCBs (USAF 2002b). As part of the RI/FS Work Plan (USAF 2001a) ADEC agreed that the 2001 RI (USAF 2002b) data set would be a stand-alone data set used for remedy selection; therefore, the data set from the 1995 PA/SI was not used for remedy selection. Four soil samples were

collected from the sides of the Former Composite Building and one soil sample from each of the former White Alice Arrays.

At Site TU-019, steel measuring tape was extended down into each of the vent pipes of the 20,000-gallon USTs to measure the depth of the tanks. Upon retrieval of the tape measure from each tank, there was a petroleum-like odor on the tape, but no visible sign of product or other liquid (USAF 1995). No sampling was conducted during the 1995 PA/SI.

**ST-018:** The 1995 PA/SI reported a 6-inch, cast-iron discharge pipe and concrete headwall on the northwest cliff face of High Hill, approximately 120 feet west of the Former Composite Building (USAF 1995). No visible evidence of an associated septic tank in the area was noted. No sampling was conducted during the 1995 PA/SI.

**WP-007:** During investigations completed as part of the 1995 PA/SI, one surface soil sample was collected from the suspected discharge point of the Composite Building POL discharge pipeline (USAF 1995). Several constituents were detected over Method Two soil cleanup levels (18 AAC 75.341).

#### 2.2.2.2 2000 Site Investigation

**OT-001:** During the 2000 SI, an electromagnetic survey was conducted at TU-019 (included in Site OT-001) to verify the location and limits of the USTs and piping (USAF 2000). However, due to scrap metal in the area from site demolition activities, the survey did not provide useful data. Five surface soil samples (0 to 12 inches below ground surface [bgs]) were collected east and southeast of the standpipes at areas of suspected or likely contamination and analyzed for GRO and benzene, toluene, ethylbenzene, and xylenes (BTEX). All results were nondetect. No liquids were encountered in the tanks.

**ST-018:** During the 2000 SI, an electromagnetic survey was conducted at ST-018 to verify the location and limits of the suspected septic tank (USAF 2000). No underground structures were identified during the electromagnetic survey although a visual indication of a buried

structure was noted in an area located approximately 10 feet behind the pipe discharge headwall. Surface soil samples were collected on top of High Hill at areas suspected to have potential for contamination.

No work was done at WP-007 during the 2000 Site Investigation.

#### 2.2.2.3 2001 Remedial Investigation

**OT-001:** 2001 activities at OT-001 included soil sampling from the vicinity of the Former Composite Building, near the Composite Building Arrays, and near TU-019. PAHs were detected in soil samples from both OT-001 and TU-019 above Method Two soil cleanup levels, indicating that both sites contained PAHs. For consistency the associated soil contamination at TU-019 was later administratively transferred to OT-001 and all PAH contamination in the area is considered part of OT-001. Due to the screening in the 1995 PA/SI, the site was sampled for PCBs but all results were below 1.0 mg/kg. The Remedial Investigation concluded that the COCs for this site are limited to PAHs (USAF 2002b).

At Site TU-019, field screening indicated the presence of POL products. As mentioned above, PAHs were detected in soil samples from both OT-001 and TU-019 above Method Two soil cleanup levels. In addition to the PAH contamination, 7.5 cubic yards of RRO-contaminated soil was present inside the concrete vault on top of the northern 20,000-gallon UST. This soil was removed in 2007.

**ST-018:** 2001 RI activities at ST-018 included excavation of test pits to locate the buried septic tank and sampling of tank liquid and surface soil at the base of the cliff, beneath the pipe discharge (USAF 2002b). DRO, RRO, VOCs, PAHs, PCBs, and lead were detected in exceedance of groundwater cleanup levels (18 AAC 75.345, Table C). All detected contaminants in the soil were below site regulatory limits.

**WP-007:** The 2001 RI (USAF 2002b) included extensive sampling of WP-007. Soil borings were advanced to allow subsurface sampling. Test pits were excavated to investigate potential

impact to soil beneath the pipeline between the Composite Building and the outfall location. Four analytes were present at concentrations above Method Two regulatory limits: arsenic, DRO, RRO, and PCBs. Arsenic was detected in concentrations up to 5.91 mg/kg compared to a calculated background level of 28.7 mg/kg. It was believed that the arsenic present at the site is representative of background conditions and is not a result of historic site activities.

#### 2.2.2.4 2004 Baseline Risk Assessment

The 2004 BRA was conducted in accordance with applicable guidance, including the ADEC *Risk Assessment Procedures Manual* (ADEC 2000b), to describe potential human health and ecological risks associated with contaminants at OT-001, WP-007 and two other sites at the Nikolski RRS (USAF 2004). In regard to human health and ecological risks at OT-001 and WP-007, the BRA concluded that:

- The sites receive infrequent human visitation.
- Residential development of these sites is highly unlikely, given prevailing weather conditions, lack of water supply, and difficult access.
- Determination has been made under 18 AAC 75.350 that groundwater is not a current or reasonably expected future drinking water source.
- Based on current land-use assumptions, human health hazard index and estimate of excess lifetime cancer risk are both less than ADEC target risk values.
- Site soil is too rocky to support a layer of vegetation.
- The density of soil invertebrate populations is very low.
- These sites do not provide suitable habitat for terrestrial omnivores; if terrestrial omnivores are not exposed to site contaminants, it is extremely unlikely that contaminants will reach higher-trophic-level organisms or enter the food chain.
- No action is required to address human health and ecological risks, based on current and future land use and site conditions.

The BRA also concluded that PAH at OT-001 and TU-019 are likely residual contaminants from the same source, a past diesel fuel spill (USAF 2004).

#### 2.2.2.5 2007 Septic Tank Closure and Decommissioning

**ST-018:** USAF completed in-place closure of the septic tank at ST-018 in accordance with ADEC requirements. Closure of the ST-018 septic tank, including draining and treatment of the remaining septic tank liquids, and partial demolition and backfilling of the tank, was conducted in accordance with the field activities work plan. Prior to the septic tank closure, the actual size of the tank was determined to be 4,200 gallons, rather than the 8,000 gallon tank as noted in the 2001 RI.

Approximately 1,330 gallons of liquid from the septic tank was pumped through a granular activated carbon (GAC) treatment system and into a temporary holding tank prior to onsite discharge. To confirm that discharge of the GAC-treated water was acceptable, samples were collected and analyzed against applicable discharge permit requirements. An offsite laboratory, Laboratory Data Consultants, analyzed the samples for GRO, DRO, total aromatic hydrocarbons, PCBs, and free chlorine. Field screening was performed for turbidity, dissolved solids, and pH. Comparisons of the analytical and field screening data with wastewater discharge permit requirements, then consultation with ADEC, confirmed that the treated water was suitable for onsite discharge.

#### 2.2.2.6 2007 and 2009 UST Closures at TU-019

**OT-001:** In 2007, in-place closure of the two USTs at TU-019 (included in Site OT-001) consisted of site preparation, soil excavation around the USTs, removal of tank liquids and sludge, UST cleaning, confirmation sampling and analysis, backfilling of USTs, and site re-grading (USAF 2010a). In 2009, the two USTs were excavated and removed to address regulatory deficiencies identified by ADEC regarding 2007 in-place UST closure at TU-019 (USAF 2009).

### 2.2.3 Enforcement History

No enforcement activities, notices of violation, or lawsuits have pertained to Sites OT-001, ST-018, or WP-007; however, the closure actions performed at TU-019 in 2007 were

considered inadequate by ADEC (USAF 2009). Therefore, additional actions were taken in 2009 to correct the deficiencies. The 2009 site activities were successful and the site is now closed.

## 2.3 COMMUNITY PARTICIPATION

NCP Section 300.430(f)(3) establishes requirements for notification and document availability of Proposed Plans for review by the public. USAF has participated in several public meetings in the village of Nikolski, and has met with staff and officers of the tribal government and Chaluka Corporation to discuss issues specifically pertaining to the Nikolski RRS. In 2001, a fact sheet describing the cleanup process was published and provided to the community. The fact sheet sought public input regarding formation of a Restoration Advisory Board (RAB) and discussed ways that the public could provide input and voice concerns. Community members opted not to participate in a formal RAB but indicated that meetings at convenient and appropriate times would be more desirable. In April 2001, a public meeting was conducted to discuss the investigative work that was planned and to exchange information about village resources available to assist USAF. In 2002, a meeting was conducted and a fact sheet provided to summarize the results of the investigations, discuss the decision-making process, and reiterate ways that village residents could participate.

In 2002 and 2003, USAF personnel and environmental staff met with community residents and officers of the tribal government to reinforce USAF's commitment to incorporating community input in the cleanup process. In 2004, the USAF project manager conducted a meeting at the village of Nikolski and provided a fact sheet that discussed the status of the cleanup process. On several occasions, the USAF project manager visited the village of Nikolski and met with members of the community and the tribal government to share information.

The Proposed Plans and supporting documents for the OT-001, ST-018, and WP-007 sites were made available to the public in March 2007. They can be found at the Information Repository located at the Nikolski IRA Council Office in the village of Nikolski. A public

review and comment period was open for the six Proposed Plans from 22 March through 20 April 2007. The public comment period was extended to 21 May at the request of stakeholders. On 13 April 2007, a public meeting was held at Nikolski School.

USAF responses to comments received during the public comment period for the Proposed Plans are included in Section 3 (Responsiveness Summary) of this ROD.

## 2.4 SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

Sites OT-001, ST-018, and WP-007 are three of thirteen sites located at the former Nikolski RRS. Environmental restoration at Nikolski RRS is being conducted under the authority of CERCLA. In addition, certain closure activities (e.g., petroleum sites, UST closures, and septic tank closures) are being conducted in accordance with State of Alaska regulations (18 AAC 75 and 78) or guidance (ADEC 2000a).

The remedial action objectives (RAO) for ERP sites at Nikolski RRS are the protection of human health and the environment. Although land use at the High Hill sites is recreational, ICs are required because contamination will be left in place at OT-001 and WP-007 at levels that do not meet applicable Method Two soil cleanup levels for unlimited and unrestricted use (18 AAC 75.341 Table B1). Site-specific RAOs are:

**OT-001**

- Prevent ingestion of soil containing benzo(a)pyrene in excess of 0.4 mg/kg.
- Prevent human contact with underground utilities containing asbestos.
- (TU-019) Prevent ingestion of soil containing RRO in excess of 8,300 mg/kg, benzo(a)anthracene in excess of 4.0 mg/kg, benzo(a)pyrene in excess of 0.4 mg/kg, benzo(b)fluoranthene in excess of 4.0 mg/kg, and dibenzo(a,h)anthracene in excess of 0.4 mg/kg.

**WP-007**

- Prevent ingestion, inhalation, and migration to groundwater of soil containing DRO in excess of 230 mg/kg.

- Prevent ingestion or inhalation of soil containing RRO in excess of 8,300 mg/kg.
- Prevent exposure to surface soil containing PCBs in excess of 1.0 mg/kg.
- Prevent offsite migration of PCBs in excess of 1.0 mg/kg.

**ST-018**

ST-018 does not have site-specific RAOs. The site has no residual contamination above applicable cleanup levels, the septic tank is closed, and tank liquids have been removed and disposed. Therefore, no further action is necessary.

## 2.5 SITE CHARACTERISTICS

The OT-001 site is located on a flat, graded section at the top of High Hill. The two White Alice Arrays were located north of the Composite Building. Two 1,311-gallon ASTs for fuel storage, one 60-gallon AST tank for MoGas for the emergency fire pump, and a 24,000-gallon AST for water storage, were previously located at OT-001. The Two 20,000-Gallon USTs site (TU-019) is adjacent to OT-001 and included under OT-001. The 20,000-gallon USTs at TU-019 were located north of the Former Composite Building along the west edge of High Hill. These USTs received diesel fuel pumped via the Fuel Pipeline (SS-003) from the Petroleum, Oil, and Lubricants (POL) Storage Tanks (SS-004). The two USTs were addressed and closed in 2009 in accordance with the State of Alaska UST program.

The 4,200-gallon septic tank and discharge pipe at ST-018 are located on High Hill, approximately 120 feet west of the Former Composite Building. This septic tank discharged down the northwest cliff face of High Hill, where the only visible portion of this system is a concrete headwall penetrated by a 6-inch, cast-iron pipe extending over the cliff edge. The pipe is fitted with a 90-degree elbow that turns downward for discharge over the cliff. The septic tank, concrete headwall, and discharge pipe remain at the site.

The Composite Building POL Outfall area (WP-007) is located on a bluff of High Hill to the east of the Former Composite Building. The site is the outfall for the discharge pipe connected to floor drains and industrial sinks in the Former Composite Building.

### 2.5.1 Physiography and Climate

The Nikolski RRS is located on Umnak Island in the Aleutian Island chain, approximately 900 air miles from Anchorage, Alaska, and 1.7 air miles from the village of Nikolski. The main facility overlooks the Bering Sea from the top of a local topographic high known as High Hill. The main facility is at an elevation of approximately 700 feet above mean sea level.

Nikolski has a cold maritime climate characterized by high humidity, considerable cloudiness, frequent fog, and abundant rain and snow. The wet weather in the area is caused by a number of factors, including the Aleutian low-pressure cell, the impacts of the Pacific Ocean and Bering Sea, and orthographic precipitation.

### 2.5.2 Geology

The geologic material at sites OT-001, ST-018, and WP-007 consists of volcanic (andesite) rubble and silty gravel overlying andesite bedrock (USAF 2000a).

### 2.5.3 Hydrogeology

The localized geology at each site controls the distribution of subsurface water. For the sites located on High Hill, the grain-size distribution of the fill material is large enough that vertical migration of precipitation is quite significant on top of the bedrock surface. Shallow groundwater (two inches to three inches in depth) travels downgradient, along the bedrock surface, until it encounters a topographical low area. Therefore, in areas where a depression exists on the bedrock surface, as was created when the pad for the 20,000-gallon USTs was constructed, isolated volumes of groundwater (or perched water) are typically encountered.

### 2.5.4 Surface Water Hydrology

Surface water drains from High Hill in all directions: into Sheep Creek to the south and east, and into the Bering Sea to the north and west. Surface water from the Nikolski RRS travels

over a drainage area of about 100 acres to the point of probable entry into Nikolski Bay, or over a drainage area of roughly 250 acres to the point of probable entry into Sheep Creek.

Drinking water for the facility during its years of operation was obtained from a lake about half of a mile southeast of the main facility (USAF 1995). This lake, about 300 feet above sea level (USAF 1994), is the headwater of Sheep Creek, which flows westward into Nikolski Bay and discharges about 800 feet north of the POL tank area (USAF 1997a).

The village of Nikolski is not in the same watershed as the former Nikolski RRS facility (USAF 1994). A community water supply currently supplies the village of Nikolski with its water. The water comes from a seep located approximately one mile southwest of the airstrip.

### 2.5.5 Ecology

Umnak Island provides habitat for diverse marine mammals and fish species and, therefore, could be classified as a sensitive aquatic environment. These areas also provide spawning habitat for coho, sockeye, and pink salmon (USAF 1994).

Several sea bird colonies have been identified within the Umnak Island area, and various duck and goose species are known to inhabit this area. In addition, bald eagles have been known to inhabit areas around Cape Udak. Three pairs of bald eagles were observed near the facility during the RI (USAF 2002b). Sea lions have been documented in the nearby Aleutian Islands Wilderness (USAF 1994). The only endangered species on or around Umnak Island are the Steller's Eider and the Northern Sea Otter, which live in the marine environment. Contamination on High Hill at Nikolski RRS is assumed to be too far away from the marine environment to have any effect on this environment.

### 2.5.6 Previous Site Characterization Activities

#### 2.5.6.1 Sampling Strategy at OT-001

During the 1995 PA/SI (USAF 1995) and 2001 RI (USAF 2002b), environmental samples associated with Site OT-001 (including those from Site TU-019) were collected and analyzed. Environmental media sampled included surface and subsurface soil. Samples were analyzed for a wide variety of constituents, including lead, GRO, DRO, RRO, PCBs, volatile organic compounds (VOC), and PAHs. Surface water and sediment were not identified on High Hill. The only groundwater encountered at the top of High Hill was a thin layer perched at the bedrock surface, which is not considered an exposure pathway (USAF 2002b).

##### *2.5.6.1.1 1995 Preliminary Assessment/Site Investigation*

During the 1995 PA/SI (USAF 1995), four surface soil samples (95NIK015SO, 95NIK016SO, 95NIK017SO, and 95NIK018SO) were collected from the sides of the Former Composite Building, and two surface soil samples (95NIK019SO and 95NIK020SO) were collected in the vicinity of the former White Alice Arrays. The soil samples were analyzed for PCBs and results are presented in Table 2-1. The screening method used during the 1995 PA/SI resulted in a high percentage of false positives; therefore, the nature and extent of PCB contamination at the site was not determined.

**Table 2-1**
**OT-001 Soil Analytical Results for Total Polychlorinated Biphenyls, 1995 Preliminary Assessment/Site Investigation**

| 95NIK 015SO | 95NIK 016SO | 95NIK 017SO | 95NIK 018SO | 95NIK 019SO | 95NIK 020SO | PCB Method Two Soil Cleanup Level, 18 AAC 75.341 |
|---|---|---|---|---|---|---|
| 1.4 | ND | 0.2 | 0.1 | ND | ND | 1.0 |

**Notes**:
All results in mg/kg
For definitions, see the Acronyms and Abbreviations section.

#### *2.5.6.1.2 2000 Site Investigation*

Five surface soil samples (0 to 12 inches bgs) were collected at TU-019 east and southeast of the standpipes and analyzed for GRO and BTEX, but all results were nondetect (USAF 2000).

#### *2.5.6.1.3 2001 Remedial Investigation*

The 2001 Remedial Investigation results were used to define the nature and extent of contamination at the site, due to the unreliable screening method used for PCB screening during the 1995 PA/SI.

Subsurface Soil. Using a hollow-stem auger, 14 soil borings (OT1-SB62, OT1-SB63, OT1-SB64, OT1-SB65, OT1-SB66, AC9-SB12, AC9-SB13, AC9-SB14, AC9-SB15, AC9-SB25, AC9-SB26, AC9-SB27, AC9-SB28, and AC9-SB29) were advanced at OT-001 (including TU-019). Subsurface soil samples were collected from 11 of the 14 soil borings and tested for lead, GRO, DRO, RRO, VOCs, PCBs, and PAHs. Soil samples were also collected from four hand-auger borings samples (OT1-HA01, OTHA02, AC9-HA5, and AC9-HA6) and tested for lead, GRO, DRO, RRO, VOCs, and PCBs. In addition, two soil samples were collected from the soil at TU-019 in the vault on the northeastern UST (AC9-TP01) and from a test pit beneath the end of the pipe that exited the tanks (AC9-TP02). These samples were tested for lead, GRO, DRO, RRO, and VOCs. Analytical results (Table 2-2; Figure 4) indicated that PAHs were the only COCs exceeding the Method Two soil cleanup levels specified in 18 AAC 75.341.

Asbestos Sampling. During the 2001 RI, bulk samples were collected from underground utilities near the Former Composite Building and analyzed for asbestos (USAF 2002b). The analytical results indicated that asbestos was present in one sample (Table 2-3).

PCB Sampling. A sample of the tar coating on the outside of both tanks at TU-019 was sampled for PCBs. PCB-1254 (Aroclor 1254) was detected at 4.28 mg/kg, well below the 50 mg/kg screening level (USAF 2002). No other PCBs were detected.

## Table 2-2
## OT-001 Soil Sampling Analytical Results, 2001 Remedial Investigation

| Sample ID/ Depth (feet bgs) | Lead | Benzene | Toluene | Ethylbenzene | Xylenes | GRO | DRO | RRO | Total PCBs | PAHs | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Acenaphthene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(k)fluoranthene | Chrysene | Dibenzo(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-c,d)pyrene | Naphthalene | Pyrene |
| OT1-SB62 (6.5-7) | -- | ND | 0.0091 JF | ND | ND | ND | 112 | 266 | 0.323 | 0.484 | 0.691 | 1.180 | **1.220** | 1.000 | 0.204 JF | 1.320 | ND | 2.320 | 0.303 JF | 0.543 | 0.113JF | 2.690 |
| OT1-SB63 (4-5.5) | 7.08 | ND | ND | ND | ND | ND | ND | 23.2 JF | ND | 0.0198 | 0.032 | 0.0597 | 0.0501 | 0.0492 | 0.0201 | 0.0621 | 0.00755 | 0.0689 | 0.0162 | 0.0247 | 0.0167 | 0.0799 |
| OT1-SB64 (5-6.5) | 8.32 | ND | ND | ND | ND | ND | 36.3 JF | 167 | 0.0457 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| OT1-SB65 (0-2) | 13.2 | ND | ND | ND | ND | ND | 102 | 207 | 0.280 | 1.980 | 3.760 | **4.890** | **5.090** | **4.350** | 2.620 | 5.480 | ND | 9.070 | 1.520 | 2.560 | 0.707 | 8.790 |
| OT1-SB66 (6-8) | 4.74 | ND | ND | ND | ND | 98.7 J | 4,760 | 242 | ND | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| AC9-SB12 (0-2) | -- | ND | ND | 0.0147 J | 0.0345 J | 1.03 JF | 173 | 370 | -- | 3.610 | 5.540 | **10.400** | **8.400** | **6.810** | 1.340 | 12.600 | **1.330** | 18.900 | 3.500 | **4.040** | 5.170 | 25.100 |
| AC9-SB13 (0-2) | -- | ND | ND | ND | ND | 0.535 JF | 108 | 255 | -- | 1.200 | 2.040 | 3.690 | **3.500** | 2.920 | 0.564 JF | 4.230 | **0.419 JF** | 7.820 | 0.996 | 1.520 | 0.613 JF | 9.040 |
| AC9-SB13 (14.5-16.5) | -- | -- | -- | -- | -- | -- | 393 | 10.1 JF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| AC9-SB14 (10.5-12.5) | -- | ND | ND | ND | ND | -- | 1,910 | 263 | ND | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

## Table 2-2
## OT-001 Soil Sampling Analytical Results, 2001 Remedial Investigation (Continued)

| Sample ID/ Depth (feet bgs) | Lead | Benzene | Toluene | Ethylbenzene | Xylenes | GRO | DRO | RRO | Total PCBs | PAHs | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Acenaphthene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(k)fluoranthene | Chrysene | Dibenzo(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-c,d)pyrene | Naphthalene | Pyrene |
| AC9-SB15 (0-2) | -- | ND | 0.00767 JF | 0.0114 JF | 0.0284 | -- | 133 J | 243 J | -- | 4.370 | 7.840 | **20.100** | **17.600** | **21.800** | 2.260 | 19.700 | **2.470** | 29.800 | 3.670 | **7.990** | 3.000 | 35.800 |
| AC9-SB15 (4.5-6.5) | -- | ND | ND | 0.0644 J | 0.102 J | -- | 285 J | 494 J | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| AC9-SB25 (2-4) | -- | ND | ND | 0.0049 JF | 0.0565 | 0.546 JF | ND | 23.1 JF | ND | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| AC9-SB27 (2-4) | -- | ND | ND | ND | ND | 0.736 J:F | 110 | 304 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| OT1-HA01 (2-3.5) | -- | ND | ND | ND | ND | ND | ND | 25.2 JF | ND | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| OT1-HA02 (6-7.5 in. bgs) | -- | ND | ND | ND | ND | ND | ND | 9.85 JF | ND | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| AC9-HA05 (9.5-11.5 in. bgs) | -- | ND | ND | ND | ND | 3.9 | 1,850 | 52.3 JF | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| AC9-HA06 (8-9.5 in. bgs) | -- | ND | ND | ND | ND | 0.523 JF | 659 | 71 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

## Table 2-2
## OT-001 Soil Sampling Analytical Results, 2001 Remedial Investigation (Continued)

| Sample ID/ Depth (feet bgs) | Lead | Benzene | Toluene | Ethylbenzene | Xylenes | GRO | DRO | RRO | Total PCBs | PAHs | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Acenaphthene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(k)fluoranthene | Chrysene | Dibenzo(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-c,d)pyrene | Naphthalene | Pyrene |
| AC9-TP01 (0-1 in. bgs) | 65.3 M | ND | 0.0142F | ND | ND | 1.4 F | 8,050 | **8,600 F** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| AC9-TP02 (1-1.5 in. bgs) | -- | ND | ND | ND | 0.0452 F | 2.41 F | 274 | 167 | ND | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Method 2 Soil Cleanup Level* | 400 | 120 | 6,600 | 8,300 | 16,600 | 1,400 | 8,250 | 8,300 | 1 | 2,300 | 16,800 | 4 | 0.4 | 4 | 40 | 400 | 0.4 | 1,500 | 1,900 | 4 | 1,100 | 1,100 |

**Notes:**

*Method Two Soil Cleanup Level, 18 AAC 75.341 and 40 CFR 761.61(4) (i)(B) by reference

All results in mg/kg

"--" = Not Analyzed

**Bold** = value above Method Two Soil Cleanup Levels

Sample IDs beginning with OT1 were from Site OT-001 and sample IDs beginning with AC9 were from Site TU-019

For definitions, see the Acronyms and Abbreviations section

Figure 4 Former Composite Building Area (OT-001/AOC-09) Data Summary

(B&W 11 x 17)

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**Table 2-3**
**OT-001 Asbestos Analytical Results, 2001 Remedial Investigation**

| Sample ID | Asbestos | Other Fibrous Material Cellulose | Nonfibrous Material Unknown |
|---|---|---|---|
| AC9-SN01 | Chrysotile 55-60%<br>Crocidolite 1-15% | 5 to 10% | 15 to 30% |

**Note:** For definitions, see the Acronyms and Abbreviations section.

#### *2.5.6.1.4 2007 UST Closure Activities at TU-019*

Confirmation samples were collected at TU-019 during 2007 field activities. Soil samples were collected from the UST excavation and were analyzed for GRO, DRO, BTEX, PAHs, and lead. Water samples were collected from the perched groundwater within the UST excavation and were analyzed for DRO and PAHs. Analytical results indicated that DRO, Benzene, and PAHs were the only COCs exceeding the Method Two soil and groundwater cleanup levels specified in 18 AAC 75.341 and 18 AAC 75.345, respectively (Table 2-4 and Table 2-5).

### 2.5.6.2 Sampling Strategy at ST-018

Tank liquid and soil samples associated with ST-018 were collected and analyzed during the 2000 SI (USAF 2000) and 2001 RI (USAF 2002b). Samples were analyzed for a wide variety of constituents including GRO, DRO, RRO, PCBs, PAHs, VOCs (including BTEX), and metals.

#### *2.5.6.2.1 2000 Site Investigation*

During the 2000 SI, four surface soil samples (013 to 016) were collected east and southeast of the suspected location of the septic tank, at areas suspected to have potential for contamination (USAF 2000). The soil samples were analyzed for GRO and BTEX; none of the constituents were detected.

## Table 2-4
## TU-019 Soil Sample Analytical Results, 2007 Closure Activities

| Analyte | Cleanup Level[1] | Cleanup Level[2] | TU019-001 | TU019-001-Dup | TU-019-002 | TU-019-003 | TU-019-004 | TU-019-005 | TU-019-006 | TU-019-007 | TU-019-008 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Results in mg/kg | | | | | | | | | | |
| **Alaska Method AK 101/102** | | | | | | | | | | | |
| GRO | **260** | ***1,400*** | ND[3.43] | ND[3.61] | ND[3.78] | 11.8 | 0.530 F | ND[2.68] | ND[3.51] | ND[3.59] | 9.05 |
| DRO | **230** | ***8,250*** | 63.3 F | 62.7 F | **1,090** | **2,310** | 223 F | 155 F | 56.8 F | 132 | **5,790** |
| **EPA Method 8260B** | | | | | | | | | | | |
| Benzene | **0.02** | ***6.4*** | **ND[0.357]** | **ND[0.376]** | **ND[0.401]** | **ND[0.301]** | **ND[0.263]** | **ND[0.279]** | **ND[0.365]** | **ND[0.373]** | **ND[0.519]** |
| Toluene | **4.8** | ***180*** | ND[1.37] | ND[1.44] | ND[1.54] | ND[1.16] | ND[1.01] | ND[1.07] | ND[1.4] | ND[1.44] | ND[2.0] |
| Ethylbenzene | **5** | ***89*** | ND[0.686] | ND[0.722] | ND[0.771] | ND[0.578] | ND[0.505] | ND[0.536] | ND[0.701] | ND[0.718] | ND[0.998] |
| Xylenes (total) | **69** | ***81*** | ND[2.056] | ND[2.162] | ND[2.311] | ND[1.738] | ND[1.515] | ND[1.606] | ND[2.101] | ND[2.158] | ND[2.998] |
| **EPA Method 8270C** | | | | | | | | | | | |
| Acenaphthylene | **190** | ***5,000*** | 0.051 F | ND[0.561] | ND[0.131] | ND[0.641] | ND[0.584] | 0.233F | ND[0.031] | ND[0.123] | 0.177 F |
| Acenaphthene | **190** | ***5,000*** | 0.254 | 0.645 | 0.137 | 1.03 | 1.35 | 1.24 | ND[0.031] | ND[0.123] | ND[0.177] |
| Fluorene | **240** | ***3,300*** | 0.246 | 0.621 | 0.167 | 0.917 | 1.15 | 1.22 | ND[0.031] | ND[0.123] | 0.218 |
| Phenanthrene | **3,900** | ***24,900*** | 1.62 | 4.27 | 1.03 | 6.17 | 8.39 | 8.07 | 0.031 | 0.195 | 0.175 F |
| Anthracene | **3,900** | ***24,900*** | 0.457 | 1.19 | 0.343 | 1.52 | 2.21 | 2.26 | 0.009 F | 0.067 F | ND[0.177] |
| Fluoranthene | **1,900** | ***3,300*** | 1.4 | 3.41 | 1.12 | 5.06 | 7.64 | 7.7 | 0.0368 | 0.305 | 0.478 |
| Pyrene | **1,400** | ***2,500*** | 1.75 | 4.44 | 1.28 | 6.23 | 8.89 | 8.95 | 0.047 | 0.363 | 0.825 |
| Benzo(a)Anthracene | **5.5** | ***9*** | 0.879 | 2.23 | 0.636 | 2.76 | 4.57 | 4.74 | 0.025 F | 0.184 | 0.189 |
| Chrysene | **550** | ***930*** | 0.977 | 2.48 | 0.643 | 3.03 | 4.94 | 4.99 | 0.027 F | 0.194 | 0.13 F |
| Benzo[b]Fluoranthene | **17** | ***9*** | 0.833 | 2.1 | 0.565 | 2.72 | 4.93 | 4.73 | 0.0348 | 0.198 | 0.164 F |
| Benzo[k]Fluoranthene | **170** | ***93*** | 0.228 | 0.291 F | 0.14 | 0.779 | 0.656 | 1.95 | ND[0.031] | 0.053 F | ND[0.177] |
| Benzo[a]pyrene | **2.4** | ***0.9*** | 0.863 | ***2.17*** | 0.509 | **2.62** | **4.95** | **4.63** | 0.0335 | 0.175 | 0.129 F |
| Indeno[1,2,3-c,d]pyrene | **50** | ***9*** | 0.359 | 0.885 | 0.192 | 1.17 | 2.14 | 1.91 | 0.026 F | 0.083 F | ND[0.177] |
| Dibenzo[a,h]anthracene | **5** | ***0.9*** | 0.117 | 0.298 F | 0.061 F | 0.346 F | 0.674 | 0.628 | ND[0.031] | ND[0.123] | ND[0.177] |
| Benzo[g,h,i]perylene | **1,400** | ***2,500*** | 0.458 | 1.16 | 0.207 | 1.35 | 2.73 | 2.35 | 0.0538 | 0.096 F | ND[0.177] |
| Naphthalene | **19** | ***92*** | 0.24 | 0.596 | 0.109 F | 0.715 | 0.709 | 0.942 | ND[0.031] | ND[0.123] | 0.086 F |
| 1-Methyl-naphthalene | **38** | ***3,300*** | 0.198 | 0.697 | 0.129 F | 0.714 | 0.737 | 1.04 | ND[0.031] | ND[0.123] | ND[0.177] |
| 2-Methyl-naphthalene | **54.5** | ***1,660*** | 0.188 | 0.712 | 0.109 F | 0.681 | 0.714 | 1.02 | ND[0.031] | ND[0.123] | ND[0.177] |
| **EPA Method 6020** | | | | | | | | | | | |
| Lead | **--** | ***400*** | 7.3 | 5.26 | 6.03 | 8.06 | 17.3 | 21.4 | 5.21 | 5.68 | 4.79 |

**Notes:**

[1] ADEC Method Two Soil Cleanup Level for Migration to Groundwater for the Over 40-Inch Zone; [2] for Inhalation/Ingestion for the Over 40-Inch Zone

ND – Analyte analyzed for but undetected at the corresponding method detection or quantitation limit

F – The analyte is positively identified but the associated numerical value is below the PQL

**Table 2-5**
**TU-019 Groundwater Sample Analytical Results, 2007 Closure Activities**

| Analyte | Groundwater Cleanup Level[1] | TU019GW |
|---|---|---|
| | Results in mg/L | |
| **Alaska Method AK102** | | |
| DRO | 1.5 | **4,480** |
| **EPA Method 8270C** | | |
| Acenaphthylene | -- | 0.0272 F |
| Acenaphthene | 2.2 | 0.18 |
| Fluorene | 1.46 | 0.161 |
| Phenanthrene | -- | 0.702 |
| Anthracene | 11 | 0.154 |
| Fluoranthene | 1.46 | 1.43 |
| Pyrene | 1.1 | **1.79** |
| Benzo(a)anthracene | 0.001 | **0.534** |
| Chrysene | 0.1 | **0.222** |
| Benzo(b)fluoranthene | 0.001 | **0.3** |
| Benzo(k)fluoranthene | 0.1 | **0.165** |
| Benzo(a)pyrene | 0.0002 | **0.296** |
| Indeno(1,2,3-c,d)pyrene | 0.001 | **0.0682 F** |
| Dibenzo(a,h)anthracene | -- | ND [0.0767] |
| Benzo(g,h,l)perylene | -- | 0.0784 |
| Naphthalene | 0.7 | 0.175 |
| 1-Methyl-naphthalene | -- | 0.256 |
| 2-Methyl-naphthalene | -- | 0.108 |

**Notes:**
[1] Exceedances of the ADEC Groundwater Cleanup Level are in bold.
ND – Analyte analyzed for but undetected at the corresponding method detection or quantitation limit.
F – The analyte is positively identified but the associated numerical value is below the PQL.

### *2.5.6.2.2 2001 Remedial Investigation*

Tank Liquid Sampling: A sample taken from the liquid present in the septic tank was tested for GRO, DRO, RRO, VOCs, PCBs, PAHs, and metals. Analytical results were compared to the Alaska groundwater cleanup levels in 18 AAC 75.345, Table C. Several analytes were detected at concentrations exceeding their respective groundwater cleanup levels (Table 2-6). Tank contents never came in contact with groundwater; all tank contents were properly disposed of when the tank was closed in 2007. No contamination remains onsite above Method Two cleanup criteria.

Surface Soil: One surface soil sample (AC8-SS01) was collected at the base of the cliff directly below the septic tank discharge. The sample was analyzed for GRO, DRO, RRO,

VOCs, PCBs, PAHs, and metals; none of the constituents was detected above applicable Method Two regulatory limits (Figure 5).

**Table 2-6**
**ST-018 Tank Liquid Analytical Results, 2001 Remedial Investigation/2007 Water Removal and Treatment**

| Constituent | | Cleanup Criteria | Sample No. AC8-WW02[1] |
|---|---|---|---|
| GRO | | 2,200 | 1,830 |
| DRO | | 1,500 | **16,400 J** |
| RRO | | 1,100 | **13,300 J** |
| VOCs | 1,1-Dichloroethene | 7,300 | 9.25 |
| | Benzene | 5 | ND |
| | Ethylbenzene | 700 | 9.15 |
| | Total Xylenes | 10,000 | 40.35 |
| | Toluene | 1,000 | 27.7 |
| | Trichloroethene (TCE) | 5 | **167** |
| | Vinyl Chloride | 2 | **13.4** |
| | cis-1,2-Dichloroethylene | 70 | **2,690** |
| PAHs | Benzo(a)anthracene | 1.2 | **2.35 J** |
| | Benzo(a)pyrene | 0.2 | **1.43 J** |
| | Benzo(b)fluoranthene | 1.2 | **1.7 J** |
| | Dibenzo(a,h)anthracene | 0.12 | **0.259** |
| PCBs-1260 | | 1.0 | **4.34** |
| Lead | | 15 | **26.2** |

**Notes:**
[1] Exceedances of the ADEC Groundwater Cleanup Levels are in bold.
All results in micrograms per liter
J = Estimated value
For definitions, see the Acronyms and Abbreviations section.

Figure 5 Composite Building Septic Tank and Outfall (AOC-08) Data Summary

(B&W 8.5 x 11)

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### 2.5.6.3 Sampling Strategy at WP-007

During the 1995 PA/SI and 2001 RI, surface and subsurface soil samples associated with WP-007 were collected and analyzed. Samples were analyzed for a wide variety of constituents, including GRO, DRO, RRO, PCBs, semivolatile organic compounds (SVOC), total recoverable petroleum hydrocarbons (TRPH), VOCs, PAHs, and metals. Figure 6 presents the RI soil sampling data summary for WP-007 including analytical results exceeding the Method Two soil cleanup levels.

#### *2.5.6.3.1 1995 Preliminary Assessment/Site Investigation*

During the 1995 PA/SI, one surface soil sample from 6 to 12 inches below ground surface was collected at the suspected discharge point of the outfall pipe and was analyzed for GRO, DRO, TRPH, VOCs, SVOCs, PCBs, and metals. Analytical results (Table 2-8) indicated DRO, SVOCs, arsenic, and lead were present above the Method Two soil cleanup levels in 18 AAC 75.341. Arsenic was deemed to be naturally occurring and not site related.

**Table 2-7**
**WP-007 Surface Soil Analytical Results, 1995 Preliminary Assessment/ Site Investigation**

| Constituent | | Sample No. 95NIK021SO | Sample No. 95NIK022SO (split) | Sample No. 95NIK023SO (duplicate) | Method Two Soil Cleanup Level 18 AAC 75.341 Direct Contact or Outdoor Inhalation |
|---|---|---|---|---|---|
| GRO | | 12.8 | ND | 13.8 | 1,400 |
| DRO | | **100,000** | **110,000** | **95,000** | 8,250 |
| TRPH | | 170,000 | 170,000 | 170,000 | NA |
| VOCs | Benzene | -- | -- | 0.03 J | 8.5 |
| | Toluene | 0.12 JB | -- | 0.74 JB | 220 |
| | Ethylbenzene | 0.71 J | -- | -- | 81 |
| | Total Xylenes | 0.17 J | -- | 0.31 J | 63 |
| | Acetone | 4.19 JB | -- | 5.19 JB | 51,100 |
| | Methylene Chloride | 0.77 J | -- | 1.02 J | 120 |
| | Trichloroethene | 0.05 J | -- | 0.11 J | 0.42 |
| | n-Butylbenzene | 0.54 JB | 0.067 | -- | 42 |

**Table 2-7**
**WP-007 Surface Soil Analytical Results, 1995 Preliminary Assessment/ Site Investigation (Continued)**

| Constituent | | Sample No. 95NIK021SO | Sample No. 95NIK022SO (split) | Sample No. 95NIK023SO (duplicate) | Method Two Soil Cleanup Level 18 AAC 75.341 Direct Contact or Outdoor Inhalation |
|---|---|---|---|---|---|
| | t-Butylbenzene | -- | 0.019 | -- | 70 |
| | 1,3,5-Trimethylbenzene | -- | 0.38 | 0.92 JB | 32 |
| | 1,2,4-Trimethylbenzene | -- | -- | 0.27 JB | 37 |
| | 4-Isopropyltoluene | -- | -- | 0.77 JB | NA |
| SVOCs | Fluoranthene | 140 | 730 | 180 | 1,500 |
| | Pyrene | 190 | -- | 270 | 1,100 |
| | 2-Methyl-naphthalene | -- | **430** | -- | 230 |
| | Acenaphthene | -- | 420 | -- | 2,300 |
| | Benzo(a)anthracene | -- | **1,400** | -- | 4 |
| | Benzo(a)pyrene | -- | **69** | -- | 0.4 |
| | Benzo(b)fluoranthene | -- | **1,400** | -- | 4 |
| | Benzo(g,h,I)perylene | -- | 980 | -- | 1,100 |
| | Benzo(k)fluoranthene | -- | **1,200** | -- | 40 |
| | Chrysene | -- | **1,400** | -- | 400 |
| | Fluoranthene | -- | 730 | -- | 1,500 |
| | Indeno(1,2,3-c,d)pyrene | -- | **880** | -- | 4 |
| | Phenanthrene | -- | 820 | -- | 16,800 |
| PCBs | | ND | ND | ND | 1.0 |
| Metals | Arsenic | **13** | **9.2** | **28** | 3.7 |
| | Barium | 2,560 | 3,300 | 2,619 | 16,600 |
| | Cadmium | 11 | 12 | 16 | 65 |
| | Chromium | 117 | 120 | 154 | 250 |
| | Lead | **700** | **1,200** | **1,010** | 400 |
| | Mercury | 0.4 | 0.77 | 0.5 | 13 |
| | Selenium | -- | 1.0 | -- | 410 |
| | Silver | 17 | 29 | 27 | 410 |

**Notes:**
All results in mg/kg
**Bold** = above the lowest ADEC Method Two soil cleanup level between direct contact and outdoor inhalation (18 AAC 75.341)
For definitions, see the Acronyms and Abbreviations section

Figure 6 Composite Building POL Outfall Area (WP-007) Data Summary

(B&W 11x17)

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### *2.5.6.3.2 2001 Remedial Investigation*

During the 2001 RI, both surface and subsurface soils were investigated, and several test pits were excavated in an effort to determine the origin of the outfall pipeline at WP-007.

Surface Soil: Surface soil samples were collected and analyzed for GRO, DRO, RRO, PCBs, and metals. DRO, RRO, and PCBs were detected at concentrations exceeding Method Two soil cleanup levels (Table 2-8; Figure 6).

**Table 2-8**
**WP-007 Surface Soil Analytical Results, 2001 Remedial Investigation**

| Sample ID | GRO | DRO | RRO | Total PCBs |
|---|---|---|---|---|
| WP7-SS01 (SO0-0.5) | 1.83 F | **80,000** | **54,100** | **2.043** |
| WP7-SS02 (SO0-0.5) | ND | **25,300** | **44,800** | **1.016** |
| WP7-SS03 (SO0-0.5) | 14.9 J | **60,300** | **31,700** | 0.55 |
| WP7-SS04 (SO0-0.5) | ND | 2,570 | 8,000 | 0.19 |
| WP7-SS05 (SO0-0.5) | ND | ND | 40.0 F | ND |
| Method Two Soil Cleanup Level 18 AAC 75.341 Direct Contact or Outdoor Inhalation | 1,400 | 8,250 | 8,300 | 1.0 |

**Notes:**
All results in mg/kg
Bold = above the lowest ADEC Method Two soil cleanup level between direct contact and outdoor inhalation (18 AAC 75.341)
For definitions, see the Acronyms and Abbreviations section.

Subsurface Soil: Subsurface samples were collected from borings advanced on the hillside. Results of the sampling indicated that POL contamination is largely limited to the area of visible surface staining. In two of the samples, DRO was detected at concentrations exceeding the Method Two soil cleanup levels specified in 18 AAC 75.341 (Table 2-9; Figure 6).

## Table 2-9
## WP-007 Subsurface Soil Analytical Results, 2001 Remedial Investigation

| Sample ID | GRO | DRO | RRO | PCBs |
|---|---|---|---|---|
| WP7-HA01 (SO0-3) | ND | ND | 42.4 | ND |
| WP7-HA02 (SO0-2.5) | ND | ND | 46.6 | ND |
| WP7-HA03 (SO0-3) | ND | ND | 40.8 | ND |
| WP7-HA04 (SO0-2) | ND | ND | 41.3 | ND |
| WP7-HA05 (SO0-0.5) | -- | 44.4 | 338 | ND |
| WP7-HA06 (SO1-1.5) | -- | 16.4 FJ | 140 | ND |
| WP7-SB07 (SO0-2) | 20.8 | **3,070** | 1,440 | ND |
| WP7-SB09 (SO4.5-6.5) | 2.53 | 52 | 71 | ND |
| WP7-SB10 (SO2.5-4.5) | 0.580 FJ | 16.4 | 86.5 | ND |
| WP7-SB17 (SO0-1) | ND | -- | -- | -- |
| WP7-SB31 (SO2-4) | ND | 13.9 FJ | 54.7 | ND |
| WP7-SB31 (SO6-7) | -- | **3,330** | 721 | ND |
| WP7-SB32 (SO0-5) | -- | ND | 41 | ND |
| WP7-SB33 (SO2-4) | -- | ND | 21.2 FJ | ND |
| WP7-SB33 (SO6-8) | ND | ND | 20.7 FJ | ND |
| WP7-SB57 (SO2-3.5) | 2.09 | 1,350 | 1,540 | ND |
| WP7-SB58 (SO0-2.5) | ND | ND | 21.2 JF | ND |
| WP7-SB59 (SO0-2) | ND | 44.0 J | 116 J | ND |
| Method Two Soil Cleanup Level 18 AAC 75.341 Direct Contact or Outdoor Inhalation | 1,400 | 8,250 | 8,300 | 1.0 |

**Notes:**

All results in mg/kg

Bold = above the lowest ADEC Method Two soil cleanup level between direct contact and outdoor inhalation (18 AAC 75.341)

"--" = not analyzed

For definitions, see the Acronyms and Abbreviations section.

### 2.5.7 Nature and Extent of Contamination

Environmental media affected by contamination on High Hill are surface and subsurface soil. Potential receptors at sites OT-001 and WP-007 are current and future human recreational visitors. Potential exposure pathways for humans are limited to soil ingestion and dermal exposure. The rocky nature of the sites, which are exposed to cold and high winds, do not provide suitable habitat for ecological receptors.

Consumption of subsistence resources poses minimal risk to human health, as soils on High Hill are too rocky to support substantive vegetative cover or optimal habitat for terrestrial omnivores. Surface water and sediment were not found on High Hill or at the base of the cliff below ST-018 and OT-001; therefore, those media were not considered when evaluating the nature and extent of contamination. Groundwater was not encountered in borings or test pits at High Hill; however, a thin perched groundwater layer was encountered at the bedrock surface (USAF 2002b). Based on this perched groundwater layer, a groundwater use determination, in accordance with 18 AAC 75.350, was performed. The findings of the groundwater use determination indicate that groundwater is not currently or reasonably expected to be a future source of drinking water, or an exposure pathway.

**OT-001:** This ERP site is at the top of High Hill and has contaminated or stained soil. Results from previous environmental investigations at OT-001 showed subsurface soil contamination above applicable Method Two State of Alaska soil cleanup levels specified in 18 AAC 75.341, that are primarily associated with petroleum products from a previous diesel spill, at several sampling locations around the former composite building and UST footprints (Figure 4). The maximum concentrations of benzo(a)anthracene (20.1 mg/kg), benzo(a)pyrene (17.6 mg/kg), benzo(b)fluoranthene (21.8 mg/kg), and dibenzo(a,h)anthracene (2.47 mg/kg) were detected at soil boring AC9-SB15 about 10 feet from the southwest corner of the Composite Building footprint. The maximum concentration of RRO (8600 mg/kg) was detected at test pit AC9-TP01 about 15 feet southwest of the southernmost UST. The State of Alaska soil cleanup levels are applicable for sites addressed under the State of Alaska Regulations, such as OT-001.

**ST-018:** This ERP site is about 100 feet west of OT-001 on High Hill. The septic tank had a capacity of 4,200 gallons of wastewater in which the RI documented levels of petroleum, VOCs, PAHs, PCBs, and lead contaminants above groundwater cleanup levels in 18 AAC 75.345, Table C (Table 2-6; Figure 5). Affected site soils at ST-018 at the base of the cliff beneath the discharge pipe; no contaminants were detected in site soils at concentrations exceeding applicable Method Two soil cleanup levels. The septic tank was closed in place, and tank fluids and sludge were removed and disposed in 2007.

**WP-007:** This ERP site is on the east side of High Hill upslope and adjacent to the access road and has heavy iron staining of soil within an area less than 0.1 acre in size (Figure 6) having a 60-foot vertical drop and a lower section in the drainage ditch along the road. Results from previous environmental investigations at WP-007 showed soil contamination above applicable Method Two soil cleanup levels specified in 18 AAC 75.341 for DRO, RRO, and PCBs. The maximum concentrations of DRO (80,000 mg/kg), RRO (54,100 mg/kg), and PCBs (2.043 mg/kg) were detected at surface soil sample WP7-SS01. The State of Alaska soil cleanup levels are the soil ARARs for the High Hill ERP sites.

### 2.5.8 Conceptual Site Model

A conceptual site model was developed for sites OT-001 and WP-007 to depict the potential relationship or exposure pathway between chemical sources and receptors. An exposure pathway describes the means by which a receptor can be exposed to contaminants in environmental media. Those pathways are presented in Figure 7 and are based upon current and reasonably likely future land uses.

Since future residential land use is considered unlikely, it is not included in Figure 7. However, residential land use has been considered in the human health risk assessment to show that the site is unsuitable for unrestricted use or unlimited exposure, and to establish requirements for land use controls, as described in this ROD.

Figure 7 Conceptual Site Model

(11x17)

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## 2.6 CURRENT AND POTENTIAL FUTURE LAND AND WATER USES

### 2.6.1 Land Use

When the installation was active, the land at the former Nikolski RRS was used for military purposes. Current land use of the Nikolski RRS land, including the top of High Hill, appears to be primarily for recreational purposes. After considering public comment on the Proposed Plans, and based on subsequent discussions between Chaluka Corporation and the USAF, it is unlikely that future residential land use of High Hill, including sites OT-001, ST-018, and WP-007, will occur.

Public Land Order 2374, issued in 1961 by the U.S. Department of the Interior, withdrew public domain lands in the vicinity of the Native Village of Nikolski on Umnak Island, Alaska, for use by the Department of the Air Force as the Nikolski Radio Relay Station. Subtitle D of Public Law 108-136 dated 24 November 2003 contains provisions for land conveyance between the Air Force and Native corporations established under the Alaska Native Claims Settlement Act. Specifically, Section 2862 of Public Law 108-136 contains an offer of conveyance of the surface and subsurface estates in the former Nikolski RRS to the Chaluka Corporation and Aleut Corporation, respectively, by the Secretary of the Interior. Environmental restoration of specific parcels of lands defined as Phase II lands in Public Law 108-136 are the responsibility of the Department of the Air Force; upon completion of environmental restoration of parcels of Phase II lands by the Air Force, the lands are to be conveyed to the Native corporations in accordance with applicable law. Upon conveyance of a parcel of land under Section 2862 of Public Law 108-136, the Secretary of the Interior shall terminate the corresponding portion of Public Land Order 2374 relating to the parcel conveyed. Upon conveyance of all lands subject to conveyance under Section 2862 of Public Law 108-136, the Secretary of the Interior will terminate all remaining portions of Public Land Order 2374 as it pertains to Umnak Island, Alaska.

### 2.6.2 Ground and Surface Water Uses

The only groundwater encountered at the top of High Hill was a thin layer perched at the bedrock surface. A groundwater use determination, in accordance with 18 AAC 75.350, was performed. The findings of the groundwater use determination indicate that the thin layer of groundwater perched on the bedrock is not currently being used, is not reasonably expected to be used as a future source of drinking water, and is not an exposure pathway. No major permanent surface water features exist on or in the immediate vicinity of OT-001, ST-018, or WP-007.

## 2.7 SUMMARY OF SITE RISKS

This section summarizes the human health and ecological risk evaluations that have been performed for the OT-001, ST-018, and WP-007 sites. The COCs associated with unacceptable site risk are identified, as well as the potentially exposed populations and exposure pathways of primary concern. A summary of the findings of the ecological risks are also presented. Based on the presence of unacceptable risk to residents, ICs are being recommended to reduce risk.

### 2.7.1 OT-001

The BRA conducted for OT-001 estimated potential risks posed by the site if no action was taken (USAF 2004). The BRA did not include Site TU-019 but soil boring data from TU-019 was used to develop the fingerprint of PAH contamination (Figure 3). This section of the ROD summarizes the results of the BRA.

#### 2.7.1.1 Summary of Human Health Risk Assessment

The 2004 BRA considered the cancer and non-cancer risks to human health at Site OT-001, based on current and anticipated future site use and a recreational land use scenario. Table 2-11 presents the human health contaminants of potential concern (COPC) that were addressed in the BRA for OT-001, as well as ranges of detected concentrations and the exposure point concentrations that were used in the assessment.

The BRA exposure pathways included inhalation, ingestion, and dermal contact to surface and subsurface soil, as well as ingestion of plants and animals for human receptors (USAF 2004). Potentially exposed human populations assessed current or future recreational visitors and current and future site workers.

Appendix A of the BRA presents OT-001 toxicity data for the COPCs included in the risk assessment (USAF 2004). Toxicity data were obtained from the EPA Health Effects Assessment Summary Tables (HEAST) and the EPA Integrated Risk Information System (IRIS) Database. These data were selected in accordance with the ADEC *Risk Assessment Procedures Manual* (ADEC 2000b).

Table 2-11 presents the total non-cancer hazard index or the total cancer risk for COPCs at OT-001. The total non-cancer human health index was less than 1.0. The total cancer risk was less than $1 \times 10^{-5}$. Therefore, unacceptable exposure to hazardous substances does not occur and will not occur in the future. The site does not pose a current or future unacceptable risk to humans.

**Table 2-10**
**Summary of Human Health COPCs and Exposure- Point Concentrations for Soil**

| COPC | Concentration Detected (mg/kg) | | Frequency of Detection | Exposure Point Concentration (mg/kg) | Statistical Measure |
|---|---|---|---|---|---|
| | Min | Max | | | |
| Lead | 4.7 | 13.2 | 2/5 | 12.14 | 95% UCL |
| DRO | 36.3 | 4,760 | 7/19 | 909.73 | 95% UCL |
| Total PCBs | 0.0326 | 0.323 | 3/10 | 0.32 | Max Conc. |
| Benzo(a)anthracene | 59.7 | 20,100 | 4/6 | 12,877.50 | 95% UCL |
| Benzo(a)pyrene | 50.1 | 17,600 | 4/6 | 11,252.30 | 95% UCL |
| Benzo(b)fluoranthene | 49.2 | 21,800 | 4/6 | 21,800.00 | Max Conc. |
| Dibenzo(a,h)anthracene | 7.55 | 2,470 | 3/6 | 1,566.02 | 95% UCL |
| Indeno(1,2,3-c,d)pyrene | 24.7 | 7,990 | 4/6 | 5,190.99 | 95% UCL |

**Notes:**
UCL = upper confidence limit
For definitions, see the Acronyms and Abbreviations section.

**Table 2-11**
**Summary of Human Health Risks Associated with OT-001**

| COPC | Non-Cancer Hazard index | Cancer Risk |
|---|---|---|
| Lead | NA | NA |
| DRO | 1.07 x 10-2 | NA |
| Total PCBs | 7.79 x 10-3 | 4.53x x 10-8 |
| Benzo(a)anthracene | NA | 5.54x x 10-7 |
| Benzo(a)pyrene | NA | 4.84x x 10-6 |
| Benzo(b)fluoranthene | NA | 9.37x x 10-7 |
| Dibenzo(a,h)anthracene | NA | 6.73x x 10-7 |
| Indeno(1,2,3-c,d)pyrene | NA | 2.23x x 10-7 |
| Total Hazard Index (without DRO) | 7.79 x 10-3 | -- |
| Total Cancer Risk | -- | 7.27x10-6 |

**Notes:**
NA = Not Applicable
For definitions, see the Acronyms and Abbreviations section.

### 2.7.1.2 Summary of Ecological Risk Assessment

The 2004 BRA considered risks to ecological receptors at Site OT-001. Table 2-12 presents the ecological COPCs included in the BRA for OT-001. The exposure pathways included inhalation, ingestion, and dermal contact to surface and subsurface soil, and ingestion of plants and animals for terrestrial receptors (USAF 2004).

Appendix A of the BRA presents OT-001 toxicity data for COPCs. Toxicity data were obtained from the EPA HEAST and the EPA IRIS Database. These data were selected in accordance with the ADEC *Risk Assessment Procedures Manual* (ADEC 2000b).

Several of the PAHs at OT-001 result in present ecological hazard quotients greater than 1.0; however, the rocky nature of the site, which is exposed to cold and high winds, renders the site unsuitable for supporting a significant vegetation layer. Thus, the density of soil invertebrates is very low. The site does not provide habitat suitable to terrestrial omnivores or higher-trophic-level organisms. For this reason, current site conditions do not represent a significant ecological risk.

#### 2.7.1.3 Basis for Action

The site does not pose an unacceptable risk to human health or the environment, based on a BRA for recreational human and ecological exposure. Therefore, unacceptable exposure to site contaminants does not currently occur, and will not occur in the future.

**Table 2-12**
**Summary of Ecological COPCs and Exposure Point Concentrations in Soil**

| COPC | Concentration Detected (mg/kg) | | Frequency of Detection | Exposure Point Concentration (mg/kg) | Statistical Measure |
|---|---|---|---|---|---|
| | Min | Max | | | |
| Lead | 4.7 | 13.2 | 2/5 | 12.14 | 95% UCL |
| GRO | 0.523 | 98.7 | 9/19 | 98.7 | Max Conc. |
| DRO | 36.3 | 4,760 | 7/19 | 909.73 | 95% UCL |
| RRO | 9.85 | 494 | 19/19 | 235.807 | 95% UCL |
| Toluene | 0.00595 | 0.0845 | 3/18 | 0.0845 | Max Conc. |
| Ethylbenzene | 0.0049 | 0.0644 | 4/18 | 0.0644 | Max Conc. |
| M,P-Xylene | 0.00595 | 0.11765 | 5/18 | 0.11765 | Max Conc. |
| Total PCBs | 0.0326 | 0.323 | 3/10 | 0.32 | Max Conc. |
| Acenaphthene | 19.8 | 4,370 | 6/6 | 3,371.16 | 95% UCL |
| Acenaphthylene | 28.3 | 443 | 4/6 | 345.64 | 95% UCL |
| Anthracene | 30.2 | 7840 | 6/6 | 5,782.67 | 95% UCL |
| Benzo(a)anthracene | 59.7 | 20,100 | 4/6 | 12,877.50 | 95% UCL |
| Benzo(a)pyrene | 50.1 | 17,600 | 4/6 | 11,252.30 | 95% UCL |
| Benzo(b)fluoranthene | 49.2 | 21,800 | 4/6 | 21,800.00 | Max Conc. |
| Benzo(g,h,I)perylene | 29.2 | 9,900 | 6/6 | 6,354.99 | 95% UCL |
| Benzo(k)fluoranthene | 20.1 | 2,620 | 6/6 | 2,064.80 | 95% UCL |
| Chrysene | 62.1 | 19,700 | 6/6 | 13,417.63 | 95% UCL |
| Dibenzo(a,h)anthracene | 7.55 | 2,470 | 3/6 | 1,566.02 | 95% UCL |
| Fluoranthene | 68.9 | 29,800 | 6/6 | 20,518.64 | 95% UCL |
| Fluorene | 16.2 | 3,670 | 6/6 | 2,964.53 | 95% UCL |
| Indeno(1,2,3-c,d)pyrene | 24.7 | 7,990 | 4/6 | 5,190.99 | 95% UCL |
| Naphthalene | 16.7 | 5,170 | 6/6 | 3,296.94 | 95% UCL |
| Phenanthrene | 94.8 | 25,900 | 6/6 | 20,627.64 | 95% UCL |
| Pyrene | 79.9 | 35,800 | 6/6 | 25,046.05 | 95% UCL |

**Notes:**
UCL = upper confidence limit
For definitions, see the Acronyms and Abbreviations section.

### 2.7.2 ST-018

This site was not included in the BRA. Site risks from contaminants in soil at ST-018 were evaluated by comparing contaminant concentrations in soil to applicable Method Two soil cleanup levels in 18 AAC 75.341.

#### 2.7.2.1 Summary of Human Health Risk Assessment

Contaminant concentrations in potentially affected soil at the site were compared to applicable Method Two cleanup levels (18 AAC 75.341, Tables B1 and B2) to assess potential health risks to humans. The more conservative value of the ingestion, inhalation, or

migration-to-groundwater criteria was used. Method Two cleanup levels are risk based and represent an excess lifetime cancer risk at or less than $1 \times 10^{-5}$ and a hazard index at or less than 1.0. The 2007 and 2009 closure of the two USTs included the draining and treatment of the remaining septic tank liquid and removal of the tanks. Soil was analyzed for GRO, DRO, RRO, VOCs, PCBs, PAHs, and metals. No constituents in soil exceeded the applicable Method Two cleanup levels; therefore, unacceptable exposure to hazardous substances does not occur and will not occur in the future. The site does not pose a current or future unacceptable risk to humans.

#### 2.7.2.2 Summary of Ecological Risk Assessment

The rocky nature of Site ST-018, which is exposed to cold and high winds, is not suitable for supporting a significant vegetation layer. Thus, the density of soil invertebrates is very low. The site does not provide habitat suitable to terrestrial omnivores or to higher-trophic-level organisms. Given the physical characteristics of the site, exposure of ecological organisms to contamination is likely to be minimal. No response action is necessary because the site will not have soil or wastewater contaminants remaining in place above applicable cleanup levels that would pose unacceptable levels of ecological risk.

#### 2.7.2.3 Basis for Action

Contaminant concentrations did not exceed applicable Method Two soil cleanup levels specified in 18 AAC 75.341. Therefore, unacceptable exposure to hazardous substances does not occur and will not occur in the future. The site does not pose a current or future unacceptable risk, and no response action is necessary.

### 2.7.3 WP-007

The BRA conducted for WP-007 estimated potential risks posed by the site if no action is taken (USAF 2004). This section of the ROD summarizes the results of the BRA.

### 2.7.3.1 Summary of Human Health Risk Assessment

The 2004 BRA considered the cancer and non-cancer risks to human health at Site WP-007 based on current and anticipated future site use for recreational purposes. Table 2-13 presents the human health COPCs that were addressed in the BRA for WP-007, as well as ranges of detected concentrations and the exposure point concentrations that were used in the assessment.

**Table 2-13**
**Summary of Human Health COPCs and Exposure Point Concentrations for Soil**

| COPC | Concentration Detected (mg/kg) | | Frequency of Detection | Exposure Point Concentration (mg/kg) | Statistical Measure |
|---|---|---|---|---|---|
| | Minimum | Maximum | | | |
| Chromium, total | 5.81 | 28.3 | 13/13 | 19.71 | 95% UCL |
| DRO | 13.9 | 80,000 | 13/22 | 80,000 | Max Conc. |
| RRO | 20.7 | 54,100 | 22/22 | 54,100 | Max Conc. |
| PCB-1254 | 0.088 | 1.24 | 4/22 | 2.043 (total PCBs) | Sum of Max Conc. |
| PCB-1260 | 0.102 | 0.803 | 4/22 | | |
| Benzo(a)pyrene | 0.157 | 0.462 | 4/4 | 0.429 | 95% UCL |
| p-Cymene | 0.00552 | 0.0409 | 2/15 | 0.0409 | Max Conc. |

**Notes:**
Per the ADEC-approved Nikolski Risk Assessment Work Plan, only data from the RI were included in the Risk Assessment.
For definitions, see the Acronyms and Abbreviations section.

The BRA exposure pathways included inhalation, ingestion, and dermal contact to surface and subsurface soil and ingestion of plants and animals for human receptors (USAF 2004). Potentially exposed human populations included current and future recreational visitors and current and future site workers.

Appendix A of the BRA presents toxicity data for the COPCs included in the WP-007 risk assessment. These data were obtained from the EPA HEAST and the EPA IRIS Database and were selected in accordance with the ADEC *Risk Assessment Procedures Manual* (ADEC 2000b).

Table 2-14 presents the total non-cancer hazard index, total cancer risk by COPCs, and cumulative risks. The total non-cancer human health index was 1.2, above the ADEC target

level; however, hazard indices for all target organs were less than 1.0. The total cancer risk was less than ADEC's target level of $1 \times 10^{-5}$. Therefore, unacceptable exposure to hazardous substances is not expected to occur and will not occur in the future, provided land use does not change.

**Table 2-14**
**Summary of Human Health Risks Associated with WP-007**

| COPC | Non-Cancer Hazard Index | Cancer Risk |
|---|---|---|
| Chromium, total | $3.17 \times 10^{-3}$ | NA |
| DRO | $9.43 \times 10^{-1}$ | NA |
| RRO | $2.73 \times 10^{-1}$ | NA |
| Total PCBs | $4.93 \times 10^{-2}$ | $1.84 \times 10^{-7}$ |
| Benzo(a)pyrene | NA | $1.84 \times 10^{-7}$ |
| p-Cymene[1] | NA | NA |
| Total Hazard Index (without DRO and RRO) | $5.24 \times 10^{-2}$ | -- |
| DRO and RRO Hazard Index | **1.22** | -- |
| Total Cancer Risk | -- | $4.71 \times 10^{-7}$ |

**Notes:**
[1] No available reference dose or slope factor
**Bold** = above ADEC target level
For definitions, see the Acronyms and Abbreviations section.

The BRA recommends that no further action be taken at OT-001 based on a number of site-specific factors, including the sampling methodology, the level of conservatism inherent in the ecological risk assessment, and habitat suitability (USAF 2004). The PAHs present at OT-001 are believed to be the result of historic fuel contamination. During the BRA, a chemical fingerprint was calculated based on the available PAH analytical data (USAF 2004). This analysis provided an additional indication that the source of the PAH contamination at Site OT-001 was a historical diesel fuel spill.

### 2.7.3.2 Summary of Ecological Risk Assessment

The 2004 BRA considered risks to ecological receptors at Site WP-007. Table 2-15 presents ecological COPCs included in the BRA for WP-007. Exposure pathways included inhalation, ingestion, and dermal contact to surface and subsurface soil and ingestion of plants and animals for terrestrial receptors.

Appendix A of the BRA presents toxicity data for the COPCs included in the risk assessment for WP-007. These data were obtained from the EPA HEAST Tables and the EPA IRIS Database and were selected in accordance with the ADEC *Risk Assessment Procedures Manual* (ADEC 2000b).

**Table 2-15**
**Summary of Ecological COPCs and Exposure Point Concentrations for Soil**

| COPC | Concentration Detected (mg/kg) | | Frequency of Detection | Exposure Point Concentration (mg/kg) | Statistical Measure |
|---|---|---|---|---|---|
| | Minimum | Maximum | | | |
| Mercury | 0.0493 | 0.221 | 13/13 | 0.1957 | 95% UCL |
| Chromium, total | 5.81 | 28.3 | 13/13 | 19.71 | 95% UCL |
| GRO | 0.58 | 20.8 | 6/18 | 20.8 | Max Conc. |
| DRO | 13.9 | 80,000 | 13/22 | 80,000 | Max Conc. |
| RRO | 20.7 | 54,100 | 22/22 | 54,100 | Max Conc. |
| 1,2,4-Trimethylbenzene | 0.00566 | 0.114 | 5/15 | 0.114 | Max Conc. |
| PCB-1254 | 0.088 | 1.24 | 4/22 | 2.043 (total PCBs) | Sum of Max Conc. |
| PCB-1260 | 0.102 | 0.803 | 4/22 | | |
| Cumene | 0.012 | 0.012 | 1/15 | 0.012 | Max Conc. |
| p-Cymene | 0.00552 | 0.0409 | 2/15 | 0.0409 | Max Conc. |
| sec-Butylbenzene | 0.0211 | 0.0271 | 2/15 | 0.0271 | Max Conc. |
| Trichlorofluoromethane | 0.00911 | 0.00911 | 1/15 | 0.00911 | Max Conc. |
| n-Butylbenzene | 0.048 | 0.048 | 1/15 | 0.048 | Max Conc. |
| n-Propylbenzene | 0.0154 | 0.0154 | 1/15 | 0.0154 | Max Conc. |

**Note:** For definitions, see the Acronyms and Abbreviations section.

The ecological COPCs identified for WP-007 are sec-butyl benzene and n-butyl benzene. The rocky nature of the site, which is exposed to cold and high winds, renders the site unsuitable for supporting a significant vegetation layer. Thus, the density of soil invertebrates is very low. The site does not provide habitat suitable to terrestrial omnivores, such as the masked shrew, or to higher-trophic-level organisms, such as the northern shrike. Additionally, the BRA concluded that both of the ecological COPCs are essentially immobile in the environment. For all of these reasons, current site conditions do not represent a significant ecological risk.

#### 2.7.3.3 Basis for Action

Although current and future land use is limited to recreation, Site WP-007 poses an unacceptable risk to human health based on DRO, RRO, and PCBs present in the soil above Method Two cleanup levels. The CERCLA response action of ICs selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of site contaminants into the environment.

## 2.8 REMEDIAL ACTION OBJECTIVES

RAOs provide a general description of what remedial action will accomplish. These goals typically serve as the design basis for the remedial alternatives, which will be presented in the next section. The RAOs for ERP sites at Nikolski RRS are for protection of human health and the environment. Although land use at the High Hill sites is recreational, ICs are required because contamination left in place at OT-001 and WP-007 are at levels that do not meet applicable Method Two soil cleanup levels for unlimited and unrestricted use (18 AAC 75.341 Table B1). Site-specific RAOs are:

**OT-001**

- Prevent ingestion of soil containing benzo(a)pyrene in excess of 0.4 mg/kg.
- Prevent human contact with underground utilities containing asbestos.
- (TU-019) Prevent ingestion of soil containing RRO in excess of 8300 mg/kg, benzo(a)anthracene in excess of 4.0 mg/kg, benzo(a)pyrene in excess of 0.4 mg/kg, benzo(b)fluoranthene in excess of 4.0 mg/kg, and dibenzo(a,h)anthracene in excess of 0.4 mg/kg.

**WP-007**

- Prevent ingestion, inhalation, and migration to groundwater of soil containing DRO in excess of 230 mg/kg.
- Prevent ingestion or inhalation of soil containing RRO in excess of 8,300 mg/kg.
- Prevent exposure to surface soil containing PCBs in excess of 1.0 mg/kg.
- Prevent offsite migration of PCBs in excess of 1.0 mg/kg.

**ST-018**

ST-018 does not have site-specific RAOs. The site has no residual contamination above applicable cleanup levels, the septic tank is closed, and tank liquids have been removed and disposed. Therefore, no further action is necessary.

The site-specific RAOs for OT-001 and WP-007 were developed based on the current and reasonably anticipated future land use of recreational as described in Section 2.6. These RAOs address the risks identified in the BRA by applying limited actions that will reduce human or environmental exposure to contamination, and prevent activities that may result in increased exposure or spread the extent of contamination.

## 2.9 DESCRIPTION OF ALTERNATIVES

The Feasibility Study (USAF 2003a) describes the evaluation of remedial technologies and the alternatives to address environmental contamination at Nikolski RRS ERP sites. The Remedial Investigation (RI) (USAF 2002b) and Supplemental RI (USAF 2002a) concluded that environmental contaminants at Nikolski RRS are present at concentrations above applicable regulatory levels at several ERP sites. The remedial alternatives for sites OT-001 and WP-007 are summarized in Tables 2-16 and 2-17 below. Since Site ST-018 does not have contamination above cleanup criteria, no alternatives are listed.

The remedial alternatives and the selected alternative for sites OT-001 and WP-007 summarized below are based on the findings of the BRA (USAF 2004); review of comments received during the public comment period of the 2007 Proposed Plans for OT-001 and WP-007; and subsequent discussions between USAF and Chaluka Corporation.

## OT-001

The remedial alternatives considered for soils contaminated with PAH at Site OT-001 are summarized in Table 2-16 below.

**Table 2-16**
**Summary Remedial Alternatives Evaluated for OT-001**

| Assigned Designation | Alternative Description |
|---|---|
| Alternative 1 | No Action |
| Alternative 2 | Institutional Controls |
| Alternative 3 | Thermal Treatment |

- ***No Action***: With the No Action alternative, no remedial activities would be undertaken to treat PAH-contaminated soils, or to prevent exposure to PAH soil concentrations above 18 AAC 75 cleanup levels. The No Action alternative is required for consideration by the NCP, and provides a baseline against which the other alternatives can be compared.
- ***Institutional Controls***: With the ICs alternative, PAH-contaminated soil would remain onsite above 18 AAC 75 soil cleanup levels. The ICs would reduce human or environmental exposure to contamination, and prevent activities that could result in increased exposure or spread the extent of contamination.
- ***Thermal Treatment***: With the Thermal Treatment alternative, PAH- and RRO-contaminated soil would be excavated and thermally treated onsite. High temperature thermal desorption or incineration would be required because low-temperature thermal desorption is not capable of treating soil contaminated with PAHs. Along with the fuel requirements for the thermal treatment process, rainy weather is typical for Nikolski and it may be necessary to dry soils prior to treatment. The treated soil would be periodically analyzed to ensure treatment efficiency, and samples would be collected from the treated off-gas to ensure regulatory compliance.

## ST-018

The Composite Building Septic Tank and Outfall is one of thirteen ERP sites at Nikolski RRS. The recommended action for ST-018 identified in the Feasibility Study (USAF 2003a) was onsite treatment of tank liquids and abandonment of the tank in place in accordance with ADEC guidance. This recommended action was completed at the site in 2007.

The CERCLA-selected remedy for ST-018 is No Further Action. In 2007, in accordance with ADEC guidance, the tank was closed, and remaining tank liquids were removed and disposed of in accordance with ADEC guidance. There is no contamination remaining onsite above 18 AAC 75 soil cleanup levels. No source materials constituting principal threats exist at ST-018. No remedies are required under State of Alaska Regulations. The USAF has selected a CERCLA no-action remedy for ST-018 which meets all applicable requirements of the State of Alaska including but not limited to 18 AAC 75.

**WP-007**

The remedial alternatives considered for Nikolski RRS Site WP-007 are summarized in Table 2-17 below.

**Table 2-17**
**Summary of Alternatives Evaluated for WP-007**

| Alternative | Alternative Description |
|---|---|
| Alternative 1 | No Action |
| Alternative 2 | Onsite Thermal Treatment |
| Alternative 3 | Excavation and Offsite Land Disposal at Permitted Facility |
| Alternative 4 | Institutional Controls |

- ***No Action***: With the No Action alternative, no remedial activities would be undertaken to treat soils contaminated with PCBs, DRO, or RRO, or to prevent exposure to PCB soil concentrations above 1 mg/kg. The No Action alternative is required for consideration by the NCP, and provides a baseline against which the other alternatives can be compared.
- ***Thermal Treatment***: With the Thermal Treatment alternative, soils contaminated with PCBs, DRO, or RRO would be excavated and thermally treated onsite with a high-temperature incinerator such as a rotary kiln. Auxiliary fuels would be required to initiate and sustain combustion of contaminants. The destruction and removal efficiency of the incinerator would be required to meet the 99.9999 percent requirement applicable for incineration of bulk PCB remediation waste. The incinerator would be equipped with an air pollution control system for treatment and removal of off-gases and particulate emissions to meet applicable air pollution control requirements.
- ***Excavation and Offsite Land Disposal***: With the Excavation and Offsite Land Disposal alternative, soils with PCB contamination above 1 mg/kg, DRO above 230 mg/kg, and RRO above 8,300 mg/kg would be excavated, containerized, and shipped offsite to a permitted facility for land disposal. The quantity of contaminated soils excavated is

expected to be in the range of 50 to 70 cubic yards. The soil would be placed in containers meeting the requirements of the DOT Hazardous Materials Regulations at 49 CFR parts 171 through 180. No PCBs would remain onsite above 18 AAC 75 soil cleanup levels. Upon excavation, soil would initially be staged in stockpiles and profiled. If found to contain PCB levels equal to or greater than 50 parts per million (ppm), the excavated soils (or bulk remediation waste) would be shipped offsite to a hazardous waste landfill permitted by the EPA for land disposal. Otherwise, excavated soils with PCB levels below 50 ppm would be shipped offsite to a landfill permitted to manage nonhazardous waste. No source materials constituting principal threats exist at WP-007. Clean fill would be used for site backfill.

- ***Institutional Controls***: With the ICs alternative, PCBs, DRO, and RRO would remain onsite above 18 AAC 75 soil cleanup levels. The ICs would reduce human or environmental exposure to contamination, and prevent activities that may result in increased exposure or spread the extent of contamination.

## 2.10 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In accordance with the NCP, the alternatives for Nikolski RRS were evaluated using the nine criteria described in Section 121(a) and (b) of CERCLA and 40 CFR Section 300.430 (e)(9)(i) as cited in NCP §300.430(f)(5)(i). These criteria are classified as threshold criteria, balancing criteria, and modifying criteria.

**Threshold criteria** are standards that an alternative must meet to be eligible for selection as a remedial action. There is little flexibility in meeting the threshold criteria—the alternative must meet them or it is unacceptable. The following are classified as threshold criteria:

- Overall protection of human health and the environment
- Compliance with, or an applicable waiver of ARARs

**Balancing criteria** weigh the tradeoffs between alternatives. These criteria represent the standards upon which the detailed evaluation and comparative analysis of alternatives are based. In general, a high rating on one balancing criterion can offset a low rating on another balancing criterion. Five of the nine criteria are considered balancing criteria:

- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, and volume through treatment
- Short-term effectiveness

- Implementability
- Cost

**Modifying criteria**, which may be considered to the extent that information is available during the Feasibility Study, but can be fully considered only after public and regulator comments, are as follows:

- Community acceptance
- State/support agency acceptance

This section summarizes how well each alternative satisfies each evaluation criterion and indicates how each alternative compares to the other alternatives under consideration. Tables 2-18 and 2-19 provide a summary of the alternatives comparison for sites OT-001 and WP-007, respectively.

### 2.10.1 Comparison of Remedial Alternatives for OT-001

The three alternatives to deal with PAH contamination at Site OT-001 are summarized in Table 2-18 and the following sections.

**Table 2-18**
**Comparison of Alternatives for PAH-Contaminated Soil at Site OT-001**

| Evaluation Criteria | No Action | Institutional Controls | Thermal Treatment |
|---|---|---|---|
| Overall Protection of Human Health and the Environment | Fail | Pass | Pass |
| Compliance with applicable laws and regulations (including State of Alaska laws and regulation) | Fail | Pass | Pass |
| Long-Term Effectiveness and Permanence | Low | Moderate | High |
| Reduction in Toxicity, Mobility, and Volume Through Treatment | Low | Low | High |
| Short-Term Effectiveness | Low | Moderate | Low |
| Implementability | High | Moderate | Low |
| Cost (in millions)[1] | $0 | $0.1 | $6.0 |
| State Acceptance | No | Yes | Yes |
| Community Acceptance | No | Yes | Yes |

**Notes:**
[1] Cost estimates are based on the 2003 Nikolski Feasibility Study.
For definitions, see the Acronyms and Abbreviations section.

#### 2.10.1.1 Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, and ICs. The concentrations of PAHs at Site OT-001 are above ADEC soil cleanup levels, indicating a potential threat to human health.

With exception to the No Action alternative, the alternatives are considered protective of human health and the environment. The ICs alternative would limit contact with PAH contamination. The Thermal Treatment alternative would reduce levels of PAH contamination.

#### 2.10.1.2 Compliance with Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA and NCP §300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites must, at a minimum, meet legally applicable or relevant and appropriate federal and state requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA Section 121(d)(4). Although Site OT-001 is not regulated under CERCLA, ARARs have been developed and were used when comparing the alternatives for OT-001. These ARARs meet the applicable Alaska State law requirements.

**Applicable requirements** refer to the cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility citing laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. State standards that are identified by the State in a timely manner and that are more stringent than federal requirements may be applicable.

**Relevant and appropriate requirements** are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal

environmental or state environmental or facility citing laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site (relevant) that their use is well-suited (appropriate) to the particular site. Only those state standards that are identified in a timely manner and are more stringent than federal requirements may be relevant and appropriate.

**Compliance with ARARs** addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes or provides a basis for invoking a waiver.

The ICs and Thermal Treatment alternatives are compliant with ARARs and Alaska State laws. The No Action alternative is not compliant with ARARs or Alaska State laws.

#### 2.10.1.3 Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met. This criterion includes the consideration of residual risk that will remain onsite following remediation and the adequacy and reliability of controls.

The No Action alternative would have no long-term effectiveness or permanence. The ICs alternative would leave contaminants onsite above applicable ADEC soil cleanup levels. However, ICs would limit residential land use and impose restrictions on surface excavations that could increase human exposure to contaminants. In addition, the low mobility of PAHs in the subsurface environment will prevent migration offsite and minimize the possibility of exposure.

The Thermal Treatment alternative is a proven technology that effectively and permanently destroys PAH contamination.

#### 2.10.1.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy. The No Action alternative would not treat, remove, or immobilize contamination. Consequently, this alternative does not reduce the toxicity, mobility, or volume of contamination through treatment. The ICs alternative does not have any treatment component that would prevent human exposure to contaminants; instead, this alternative relies on administrative requirements to prevent exposure. This alternative does not include a treatment component. The Thermal Treatment alternative would use a treatment technology to reduce contaminant levels in soils to the appropriate ADEC soil cleanup level.

#### 2.10.1.5 Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community, or the environment during construction, and operation of the remedy until cleanup levels are achieved.

Although the No Action alternative would not achieve the remedial action objectives, it would not expose workers to adverse impacts. The ICs alternative would not require soil excavation and handling operations using heavy machinery; personnel implementing the alternative would conduct a site survey that would entail only limited exposure to contaminants, if any. The Thermal Treatment alternative has higher potential for human exposure as it entails intensive soil excavation and incineration operations. Both of the action alternatives would accomplish remedial action objectives in a single field season.

#### 2.10.1.6 Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

The No Action alternative has no technical or logistical constraints, but does have considerable administrative constraints that would affect implementability. The ICs alternative requires air travel, lodging, and subsistence of personnel at a remote site for approximately a week. The Thermal Treatment alternative would require deploying a thermal treatment unit to a remote island and equipping the incinerator with air pollution control equipment to treat a relatively low volume of contaminated soils.

#### 2.10.1.7 Cost

There are no costs associated with the No Action alternative, but this alternative would not achieve site remedial action objectives. The cost of the ICs alternative would be moderate due to the low intensity aspects of conducting site visits and surveys versus conducting soil excavation and incineration operations. Cost estimates associated with the Thermal Treatment alternative are high given the relatively low levels of PCB contamination, volume of contaminated soil, and expense of mobilizing a thermal treatment unit to a remote site in the Aleutian Islands.

#### 2.10.1.8 State/Support Agency Acceptance

ADEC has expressed its support for the ICs alternative, for the Thermal Treatment alternative, and the Excavation and Offsite Disposal alternative. ADEC does not support the No Action alternative.

#### 2.10.1.9 Community Acceptance

During the public comment period, the community expressed its support both the ICs and the Thermal Treatment alternatives. During subsequent discussions between the USAF and Chaluka Corporation, the corporation expressed its support for the ICs alternative.

### 2.10.2 Comparison of Remedial Alternatives for WP-007

The Nikolski RRS Feasibility Study (USAF 2003a) developed and screened several remedial alternatives for Site WP-007 with DRO, RRO, and PCB contamination. Four of these were selected for analysis in this Record of Decision (Table 2-19).

**Table 2-19**
**Comparison of Alternatives for WP-007**

| Evaluation Criteria | No Action | Onsite Thermal Treatment | Excavation and Disposal at an Offsite Facility | Institutional Controls |
|---|---|---|---|---|
| Overall Protection of Human Health and the Environment | Fail | Pass | Pass | Pass |
| Compliance with ARARs | Fail | Pass | Pass | Pass |
| Long-Term Effectiveness and Permanence | Low | High | High | Moderate |
| Reduction in Toxicity, Mobility, and Volume Through Treatment | Low | High | Low | Low |
| Short-Term Effectiveness | Low | Moderate | Moderate | Moderate |
| Implementability | High | Low | Low | High |
| Cost (in millions)[1] | $0 | $3.18 | $1.15 | $0.1 |
| State Acceptance | No | Yes | Yes | Yes |
| Community Acceptance | No | Yes | Yes | Yes |

**Notes:**
[1] Cost estimates are based on the 2003 Nikolski Feasibility Study.
For definitions, see the Acronyms and Abbreviations section.

### 2.10.2.1 Overall Protection of Human Health and the Environment

The concentrations of DRO, RRO, and PCBs at Site WP-007 are above State of Alaska standards and pose a potential threat to human health. This section describes how each alternative would protect human health and the environment and describes how risks posed through each exposure pathway would be eliminated, reduced, or controlled.

With exception to the No Action alternative, the alternatives are considered protective of human health and the environment. The Thermal Treatment alternative would reduce PCB, RRO, and DRO levels by using a high-efficiency incinerator to remediate these contaminants. The Excavation and Offsite Disposal alternative would remove contaminated soils and ship them offsite to a permitted facility for land disposal. The ICs alternative would prevent contact with the contaminants.

### 2.10.2.2 Compliance with Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA and NCP §300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites must, at a minimum, meet legally applicable or relevant and appropriate federal and state requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA Section 121(d)(4).

**Applicable requirements** refer to the cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility citing laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. State standards that are identified by the State in a timely manner and that are more stringent than federal requirements may be applicable.

**Relevant and appropriate requirements** are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility citing laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance

at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site (relevant) that their use is well-suited (appropriate) to the particular site. Only those state standards that are identified in a timely manner and are more stringent than federal requirements may be relevant and appropriate.

**Compliance with ARARs** addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes or provides a basis for invoking a waiver.

The No Action alternative is not compliant with ARARs. The Onsite Thermal Treatment alternative, Excavation and Offsite Disposal alternative, and IC alternative are compliant with ARARs.

#### 2.10.2.3 Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met. This criterion includes the consideration of residual risk that will remain onsite following remediation and the adequacy and reliability of controls.

With the Onsite Thermal Treatment alternative and Excavation and Offsite Disposal alternative, no contamination would remain onsite above applicable PCB, DRO, and RRO soil cleanup levels of 1, 230, and 8,300 mg/kg, respectively. The ICs alternative has moderate long-term effectiveness and permanence since contamination would remain onsite but pathways would be curtailed. The No Action alternative would have no long-term effectiveness or permanence.

#### 2.10.2.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy. Only the Thermal Treatment alternative would reduce toxicity, mobility, and volume of contamination

through treatment. The No Action, Excavation and Offsite Disposal, and Institutional Controls alternatives would not meet this criterion.

#### 2.10.2.5 Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community, or the environment during construction, and execution of the remedy until cleanup levels are achieved.

Although the No Action alternative would not achieve a site remedy, it would not expose workers to adverse impacts. The Thermal Treatment alternative has potential for human exposure during soil excavation and incineration operations, although exposure during excavation and/or incineration would be minimized by compliance with state and federal health and safety laws and regulations. The Excavation and Offsite Disposal alternative poses short-term concerns regarding the potential for human exposure during excavation and onsite management of excavated soils, and the potential environmental impact from shipping contaminated soils offsite. Both of the action alternatives would achieve the site RAO in a single field season. The ICs alternative would have high short-term effectiveness since no risk would be posed to workers and they would be in place upon the signing of the ROD.

#### 2.10.2.6 Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

Because of the remote location of Site WP-007, the logistical constraints involved with implementing removal and offsite disposal include shipping contaminated soils from an island to a permitted facility for land disposal in the contiguous United States. In addition, the contaminated soils at WP-007 are on a slope with a 33 percent to 43 percent grade. These slopes will sharply limit mechanized access to the site.

The Onsite Thermal Treatment alternative would require deployment of a thermal treatment unit equipped with air pollution control equipment to a remote island. If treated onsite, a permit would not be required. The treatment unit would be exempt under CERCLA, but would be required to meet applicable regulatory requirements. The ICs alternative has no technical obstacles but will require periodic monitoring. The No Action Alternative also has no technical obstacles, but administrative constraints would affect implementability.

#### 2.10.2.7 Cost

The cost estimates presented in Tables 2-18 and 2-19 assume using the same alternative to address all contaminated sites across the facility. The ICs alternative is the least expensive alternative that meets the threshold criteria.

#### 2.10.2.8 State Acceptance

ADEC has expressed its support for the ICs alternative. It does not support the No Action alternative, and likely would not require the Excavation and Offsite Disposal or Thermal Treatment alternatives.

#### 2.10.2.9 Community Acceptance

During the public comment period, the community expressed its support for all alternatives except for the No Action alternative. During subsequent discussions between the USAF and Chaluka Corporation, the corporation expressed its support for the ICs alternative.

## 2.11 PRINCIPAL THREAT WASTES

The NCP expects that treatment that reduces the toxicity, mobility, or volume of the principal threat wastes will be used to the extent practicable. The principal threat concept refers to the source materials at a CERCLA site considered highly toxic or highly mobile that generally cannot be reliably controlled in place or present a significant risk to human health or the environment should exposure occur. A source material is material that contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to

groundwater, surface water, or air, or that acts as a source for direct exposure. No principal threat wastes are present at sites OT-001, ST-018, or WP-007.

## 2.12 SELECTED REMEDIES

The primary indicator of remedial action performance will be satisfying the site RAOs and protecting human health and the environment. Remedy selections are based on detailed evaluation of remedial alternatives proposed in the Feasibility Study (USAF 2003a). It is expected that those remedies will remain in effect for as long as site contaminants pose an unacceptable risk to residents by exposure to contaminants above Method Two cleanup levels.

USAF selected the ICs alternative as the preferred alternative for sites OT-001 and WP-007 and the No Action alternative as the preferred alternative for ST-018.

USAF determined that Site OT-001 does not require remedial action under CERCLA authority since contamination at the site is comprised of petroleum products or petroleum product indicators. Under CERCLA Sections 101(14) and 101(33), petroleum products are excluded from the definitions of hazardous substances, pollutants, or contaminants in order to avoid reporting any fractions or derivatives of crude oil. Therefore, USAF is not selecting a CERCLA remedy for OT-001. The ICs alternative will satisfy State of Alaska regulations, as petroleum contaminants will remain onsite above 18 AAC 75 soil cleanup levels. This does not affect the ICs at WP-007, which will be administered under CERCLA including the required five-year reviews.

The ICs alternative will reduce risks and provide overall protection of human health and the environment at levels comparable to the other alternatives, and it is cost-effective. This remedy also has state and community acceptance.

CERCLA Section 121 states: “Remedial actions in which treatment that permanently and significantly reduces the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants as a principal element, are to be preferred over remedial actions not involving such treatment. The offsite transport and disposal of hazardous substances or

contaminated materials without such treatment should be the least-favored alternative remedial action where practicable treatment technologies are available."

While onsite thermal treatment would comply with the statutory preference for remedial actions that employ treatment as their principal element, it was rejected because of its greater constraints to implementability and elevated costs relative to those of the selected alternative, ICs.

There is no contamination remaining onsite at ST-018 above 18 AAC 75 soil cleanup levels. No source materials constituting principal threats exist at ST-018, and no remedies are required under State of Alaska Regulations. The USAF has selected a CERCLA no-action remedy for ST-018 which meets all applicable requirements of the State of Alaska including but not limited to 18 AAC 75.

### 2.12.1 Summary of the Rationale for the Selected Remedies

The selected remedial alternatives for OT-001, ST018, and WP-007 are as follows:

- OT-001 – ICs under the State of Alaska regulations with No Action under CERCLA
- ST-018 – No Action
- WP-007 – ICs under CERCLA with five-year reviews

The USAF has determined that the selected remedies meet the threshold criteria and provide the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria:

- Threshold criteria
  - Protection of human health and environment
  - Compliance with ARARs
- Balancing criteria
  - Long-term effectiveness and permanence
  - Toxicity, mobility, or volume reduction through treatment
  - Short-term effectiveness
  - Implementability
  - Cost

- Modifying criteria
  - State agency acceptance
  - Community acceptance

A comparative analysis among alternatives for OT-001 and WP-007 found the alternatives described in Sections 2.10.1 and 2.10.2, respectively, to be the best options for addressing any contaminant present. ST-018 did not require comparative analysis since no contamination exists at the site above action levels.

The selected remedial alternative of ICs is the most readily implementable approach to reduce the risk posed by contaminated soils, and therefore, provides the best balance of tradeoffs with respect to balancing and modifying criteria. The No Action alternative was rejected because it failed to meet the threshold criteria of protection of human health and the environment, and compliance with ARARs. The Thermal Treatment alternative is expensive and difficult to implement, made more difficult by the steep slopes near sites OT-001 and WP-007. The Excavation and Offsite Disposal alternative is also hampered by operating on the steep slopes of these sites. The costs associated with the IC alternative would be a significantly lower than either the onsite Thermal Treatment or Excavation and Offsite Disposal alternatives, with approximately the same short-term effectiveness. Long-term effectiveness is slightly lower for ICs than the competing alternatives; however, it still meets the baseline protectiveness required under CERCLA and the State of Alaska. Noting that there is both state and community acceptance for the IC alternative, the USAF has determined that this is the best option for sites OT-001 and WP-007.

### 2.12.2 Description of the Selected Remedies

The ICs at OT-001 and WP-007 will reduce human or environmental exposure to contamination, and prevent activities that may result in increased exposure or spread the extent of contamination. No source materials constituting principal threats exist at OT-001, ST-018, or WP-007. The USAF will establish the ICs for sites OT-001 and WP-007 in coordination with Chaluka Corporation and in accordance with State of Alaska contaminated site regulations (18 AAC 75). The major components of the ICs include:

- Prepare a property description for the ICs suitable for recording purposes, based on the area described as Tract 37C covering approximately 29.64 acres (Figure B-1, Appendix B).
- Document the ICs at the District Recorder's office, including a location map and property description.
- Prohibit residential use and occupancy within Tract 37C in excess of 33 days per year by any single individual (40 CFR 761.3).
- Require notification to ADEC for approval prior to commencing any surface excavation or digging activities within the boundaries of Tract 37C as required by State of Alaska regulations at 18 AAC 75.325(i).
- Conduct five-year reviews of the remedy for site WP-007 as required by CERCLA Section 121(c) since hazardous substances will remain onsite at levels above applicable State of Alaska Method Two soil cleanup levels at 18 AAC 75.341 Table B1; and report on the effectiveness of the institutional controls.
- Conduct periodic inspections, monitoring, and reporting of Tract 37C to ensure that the remedy remains protective of human health and the environment, in association with the CERCLA five-year reviews for WP-007,. Submit IC monitoring reports to ADEC. The USAF will promptly notify ADEC if any condition, change of land use, or activity that is inconsistent with the institutional controls is detected during an inspection, and take action as appropriate.

In summary, the USAF is responsible for implementing, maintaining, monitoring, and reporting on the ICs. In the future, while the USAF may transfer these procedural responsibilities to the landowner or another party by contract, agreement, or through other means, the USAF shall retain ultimate responsibility for remedy implementation and protectiveness.

The ICs established in accordance with the State of Alaska regulations at OT-001 will remain in effect until the COCs at OT-001 are below applicable 18 AAC 75 cleanup levels, at which point the ICs at OT-001 can be eliminated with ADEC approval in accordance with 18 AAC 75.375(f). Five-year reviews will also be conducted as long as hazardous substances are present onsite in concentrations exceeding cleanup levels.

The ICs established by CERCLA at WP-007 will remain in effect until the COCs at WP-007 are below applicable 18 AAC 75 cleanup levels and ADEC approval. In addition, it is anticipated that CERCLA will require five-year reviews as long as hazardous substances

remain in place above levels allowing for unlimited use and unrestricted exposure. A report will be provided every five years, after each monitoring event.

USAF will be responsible for implementing, monitoring, and maintaining the ICs in accordance with State of Alaska regulations. USAF will also provide periodic monitoring reports to ADEC. If the remedies at the sites are found to be deficient during an inspection, ADEC will be contacted and further corrective action will be planned. ADEC will be notified if the property subject to ICs is transferred or if any significant changes are made to the use and activity restrictions of the ICs. There are currently no tenants, contractors, or occupants within the property subject to ICs. Table 1-1 presents the State of Alaska COCs present at OT-001 and WP-007.

### 2.12.3 Summary of Estimated Remedy Costs

No costs are associated with the No Action alternative under CERCLA remedies for ST-018. The cost for ICs at both sites OT-001 and WP-007 is estimated at $0.1 million dollars.

The estimated cost elements of the remedy are:

- Three CERCLA site visits through 2027 (in 2003 dollars) $56,046.21
- Institutional controls (in 2003 dollars) $10,000.00
- Total costs (in 2003 dollars) $66,046.21
- Total costs (in 2011 dollars) **$96,991.09**

The information in this cost estimate summary is based on the best available information regarding the anticipated scope of the remedial alternative. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. Major changes may be documented using a technical memorandum in the Administrative Record, an ESD, or ROD amendment. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

### 2.12.4 Expected Outcomes of Selected Remedy

Upon completion of the selected remedy, Nikolski RRS sites OT-001, ST-018 and WP-007 will be in compliance with CERCLA and the State of Alaska environmental statues. No contamination above ADEC Method Two soil cleanup levels identified in 18 AAC 75.341, Table B1, for the over 40-inch zone, will remain at ST-018. Contamination above ADEC Method Two soil cleanup levels at Sites OT-001 and WP-007 will remain onsite. Refer to Table 1-1 for COCs and concentrations. However, the selected remedy of ICs will limit human exposure to contaminants at sites OT-001 and WP-007 and promote the safety of human health and the environment. The remedy of ICs for these sites will be effective immediately upon implementation of the ICs, which will require surveying and recording as a legal document. The survey will document the location of the ICs and will be recorded in the Anchorage Recorder's office under the Aleutian Islands Recording District.

## 2.13 STATUTORY DETERMINATIONS

WP-007 is the only site in this document with a selected remedy under CERCLA. CERCLA-selected remedies must meet the following requirements:

- Be protective of human health and the environment
- Comply with ARARs unless a waiver is provided
- Be cost-effective
- Use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable

In addition, CERCLA five-year reviews are required at Site WP-007 following completion of the remedy if hazardous substances remain in place above levels allowing for unlimited use and unrestricted exposure.

Preference is given to remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of contaminants as a principal element. Sections 2.13.1 through 2.13.4 discuss how the selected remedies meet these statutory requirements and describe regulatory input during the cleanup process.

### 2.13.1 Protection of Human Health and the Environment

Current contaminant concentrations at Site WP-007 pose a potential risk to human health due to the potential contact with DRO-, RRO-, and PCB- contaminated soil. Under the selected remedy, ICs will be used to protect human health and the environment. Implementation of the selected remedy will not pose unacceptable short-term risks or cross-media impacts.

### 2.13.2 Compliance with Applicable or Relevant and Appropriate Requirements

Remedial actions must comply with both federal and state ARARs. ARARs are legally applicable or relevant and appropriate requirements, standards, criteria, or limitations of federal and state environmental laws and regulations.

ARARs fall into three categories: chemical-specific, location-specific, and action-specific. Chemical-specific ARARs are health-based or risk management-based numbers that provide concentration limits for the occurrence of a chemical in the environment at agreed-upon points of compliance. Location-specific ARARs restrict activities in certain sensitive environments. Action-specific ARARs are activity-based or technology-based, and typically control remedial activities that generate hazardous wastes (such as with those covered under the RCRA). Offsite shipment, treatment, and disposal of excavated contaminated soil invoke action-specific ARARs. Criteria to be considered (TBC), are non-promulgated advisories or guidance issued by federal or state government that are not legally binding and do not have the status of potential ARARs. However, in many circumstances, TBCs are considered along with ARARs. Table 2-20 summarizes the ARARs for the selected remedy at WP-007 and describes how the selected remedy addresses each one at agreed-upon points of compliance.

The selected remedy for WP-007 complies with the chemical-specific, location-specific, and action-specific ARARs. The selected remedy does not require waivers for any ARARs. The implementation of the remedy is required to meet the substantive portions of these requirements at agreed-upon points of compliance and is exempt from administrative requirements such as permitting and notifications.

### 2.13.3 Cost Effectiveness

In the judgment of USAF, the selected remedy is cost-effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness" [40 CFR 300.430(f)(1)(ii)(D)]. Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). The relationship of the overall effectiveness of the selected remedies was determined proportional to their costs and, hence, represents a reasonable value for the money to be spent.

### 2.13.4 Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The proposed remedy represents a permanent solution to address contamination at WP-007. Once the criteria listed in the RAOs are attained, no additional actions will be required. In development of the Nikolski Feasibility Study, use of alternative treatment technologies was evaluated. Technologies considered included landfarming, thermal treatment, and bioventing. Due to the remote nature and prevailing site conditions, the use of alternative treatment technologies was not considered practical.

### 2.13.5 Preference for Treatment as a Principal Element

The NCP establishes the expectation that treatment will be used to address the principal threats posed by a site wherever practicable (40 CFR 300.430[a][1][iii][A]). Both the selected remedy and the remedial process at this site were focused on treatment of principal site threats. The selected remedy for Site WP-007 does not satisfy the statutory preference for treatment as a principal element of the remedy, but is preferred because of the greater constraints to implementability and higher disproportionate costs associated with the other treatment alternative considered.

### 2.13.6 Five-Year Review Requirements

CERCLA five-year reviews will be conducted for WP-007 until concentrations of contaminants remaining onsite are reduced to levels that allow for unlimited use and unrestricted exposure.

## 2.14 DOCUMENTATION OF SIGNIFICANT CHANGES

No significant changes have occurred in the final determination of the proposed action specified in the Proposed Plan for sites OT-001, ST-018, and WP-007. One minor change for OT-001 is that the ICs will be implemented under State of Alaska regulations rather than CERCLA authority.