RECORD OF DECISION
SR018 Former Recreational Small Arms Use Area

CAPE ROMANZOF LONG-RANGE RADAR SITE, ALASKA

FINAL

RECORD OF DECISION
SR018 Former Recreational Small Arms Use Area

CAPE ROMANZOF LONG-RANGE RADAR SITE, ALASKA

Prepared By

Jacobs Engineering Group Inc.

Prepared for

PACAF Regional Support Center
Joint Base Elmendorf-Richardson, Alaska

FINAL

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APPENDICES

ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
A	applicable
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AFCEC	Air Force Civil Engineer Center
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	chemical of concern
COPC	chemical of potential concern
CSE	Comprehensive Site Evaluation
CSM	conceptual site model
cy	cubic yards
CZOP	Environmental Engineering Directorate, Operations Division, Pacific
Eco-SSL	ecological soil screening level
DERA	Defense Environmental Restoration Account
DERP	Defense Environmental Restoration Program
EPA	U.S. Environmental Protection Agency
ERP	Environmental Restoration Program
FS	Feasibility Study
HHRA	human health risk assessment
IC	institutional control
LRRS	long-range radar site
LTM	long-term monitoring
LUC	land-use control
MC	munitions constituent
MEC	munitions and explosives of concern
mg/kg	milligrams per kilogram
MNA	monitored natural attenuation
NCP	National Contingency Plan

ACRONYMS AND ABBREVIATIONS (Continued)

NFRAP	no further remedial action planned
NWR	National Wildlife Refuge
O&M	operations and maintenance
RA	relevant and appropriate
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RSL	Regional Screening Level
SARA	Superfund Amendments and Reauthorization Act
TCLP	Toxicity Characteristic Leaching Procedure
TSDF	treatment, storage, and disposal facility
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USC	U.S. Code
UU/UE	unlimited use and unrestricted exposure
WACS	White Alice Communications System

PART 1: DECLARATION

1.1 SITE NAME AND LOCATION

SR018 Former Recreational Small Arms Use Area is part of the Cape Romanzof Long-Range Radar Site (LRRS). The LRRS installation is located approximately 560 miles west of Anchorage and 165 miles northwest of Bethel, Alaska. The nearest local communities are Scammon Bay and Hooper Bay, which are located approximately 15 miles east and south of the installation, respectively (Figure 1-1). Cape Romanzof LRRS comprises two distinct areas: the Upper Camp, situated on Towak Mountain, and the Lower Camp, where the main facilities are located. There is a tramway that formerly connected the two camps; the areas are now connected by a road (U.S. Army Corps of Engineers [USACE] 2013).

SR018 is a former recreational small arms use area that is located approximately 300 feet south of the access road between the Lower Camp and the airstrip. The site consists of a man-made clearing covered with native grasses and shrubs. The north end of the clearing nearest the road is the firing point; the south end of the clearing has a large berm/impact area. Features present at the site include a wooden firing pad, an old pistol range, wooden target frames, miscellaneous debris, and the aforementioned earthen berm. Figure 1-2 presents the location of SR018.

Table 1-1
Project Details

Facility Name:	Cape Romanzof LRRS, Alaska
Site Location	165 miles northwest of Bethel, Alaska Section 33; Township 20N, Range 92W Seward Meridian
Latitude and Longitude:	61°47'24.1"N, 165°58'17.8"W
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) ID Number:	Not listed
Alaska Department of Environmental Conservation Contaminated Sites Hazard ID Number	25604
Operable Unit/Site:	SR018

1.2 STATEMENT OF BASIS AND PURPOSE

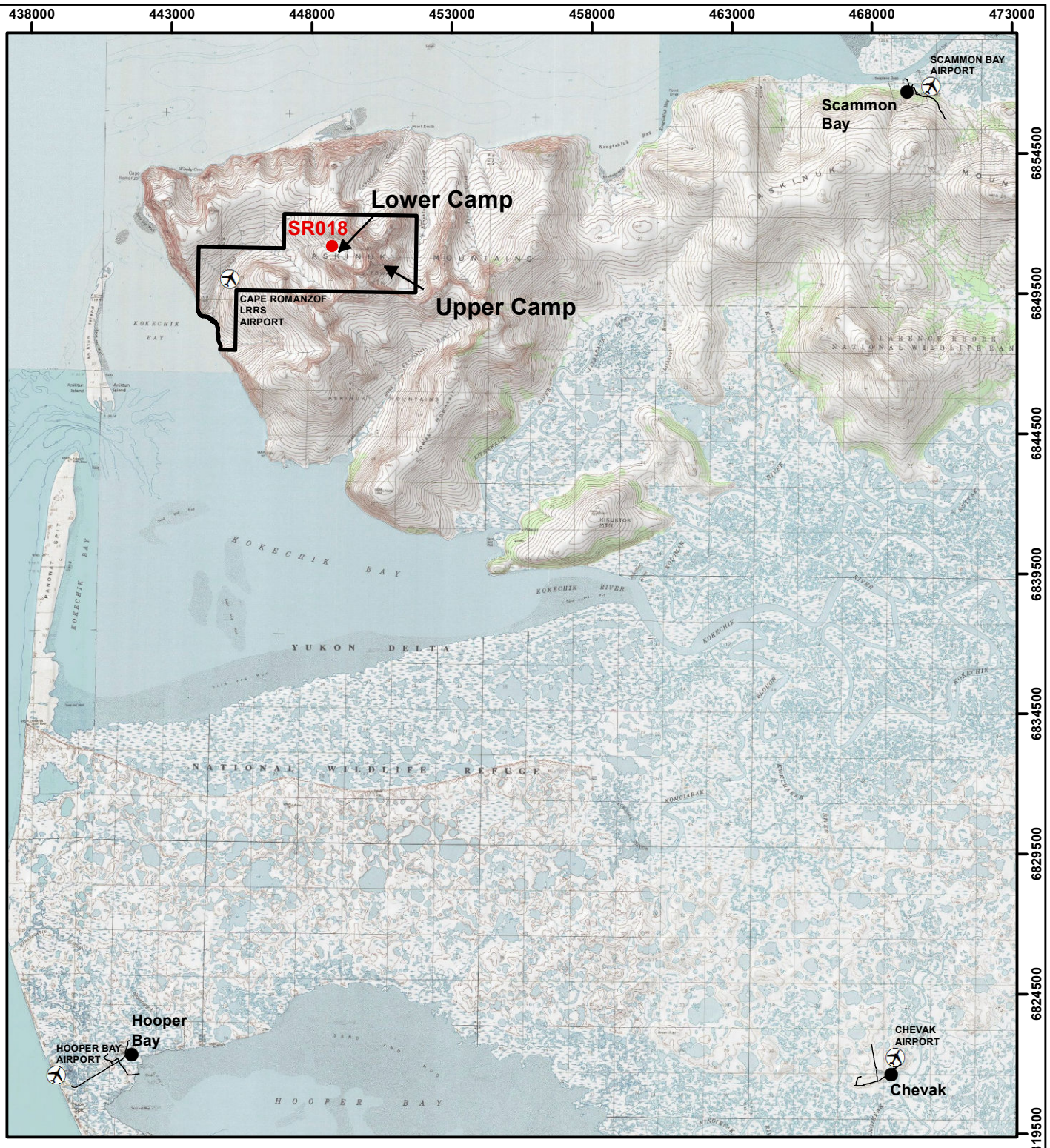
This Record of Decision (ROD) presents the selected remedy for the Environmental Restoration Program (ERP) Site SR018 at the Cape Romanzof LRRS. This remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and, to the extent practicable, with the National Contingency Plan (NCP) (Code of Federal Regulations [CFR] Title 40, Part 300 et seq. [40 CFR 300 et seq.]). This decision is based on the Administrative Record file for this site.

Remedial alternatives were chosen for consideration and are further evaluated in the *Proposed Plan for SR018 Former Recreational Small Arms Use Area* (U.S. Air Force [USAF] 2015b). As the lead agency, the USAF has selected a remedy—Removal and Offsite Disposal—for SR018.

The USAF is issuing this ROD under its lead agency authority and managing remediation at SR018 in accordance with CERCLA, as required by the Defense Environmental Restoration Program (DERP). This ROD is issued in accordance with—and satisfies requirements of—DERP; U.S. Code (USC) Title 10, §2701 et seq. (10 USC 2701 et seq.); CERCLA (42 USC 9601 et seq.); and Executive Order 12580.

Site remediation will be funded under the Defense Environmental Restoration Account (DERA).

The regulatory agency for this project is the Alaska Department of Environmental Conservation (ADEC). ADEC concurs that, if properly implemented, the selected remedy for SR018 will comply with State of Alaska regulatory requirements.



WGS 1984 UTM Zone 3N, meters

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LOCATION AND VICINITY MAP
CAPE ROMANZOF LRRS SR018

CAPE ROMANZOF, ALASKA

JACOBS	DATE:	PROJECT MANAGER:	FIGURE NO:
	6 OCT 2015	D. FLEMING	1-1

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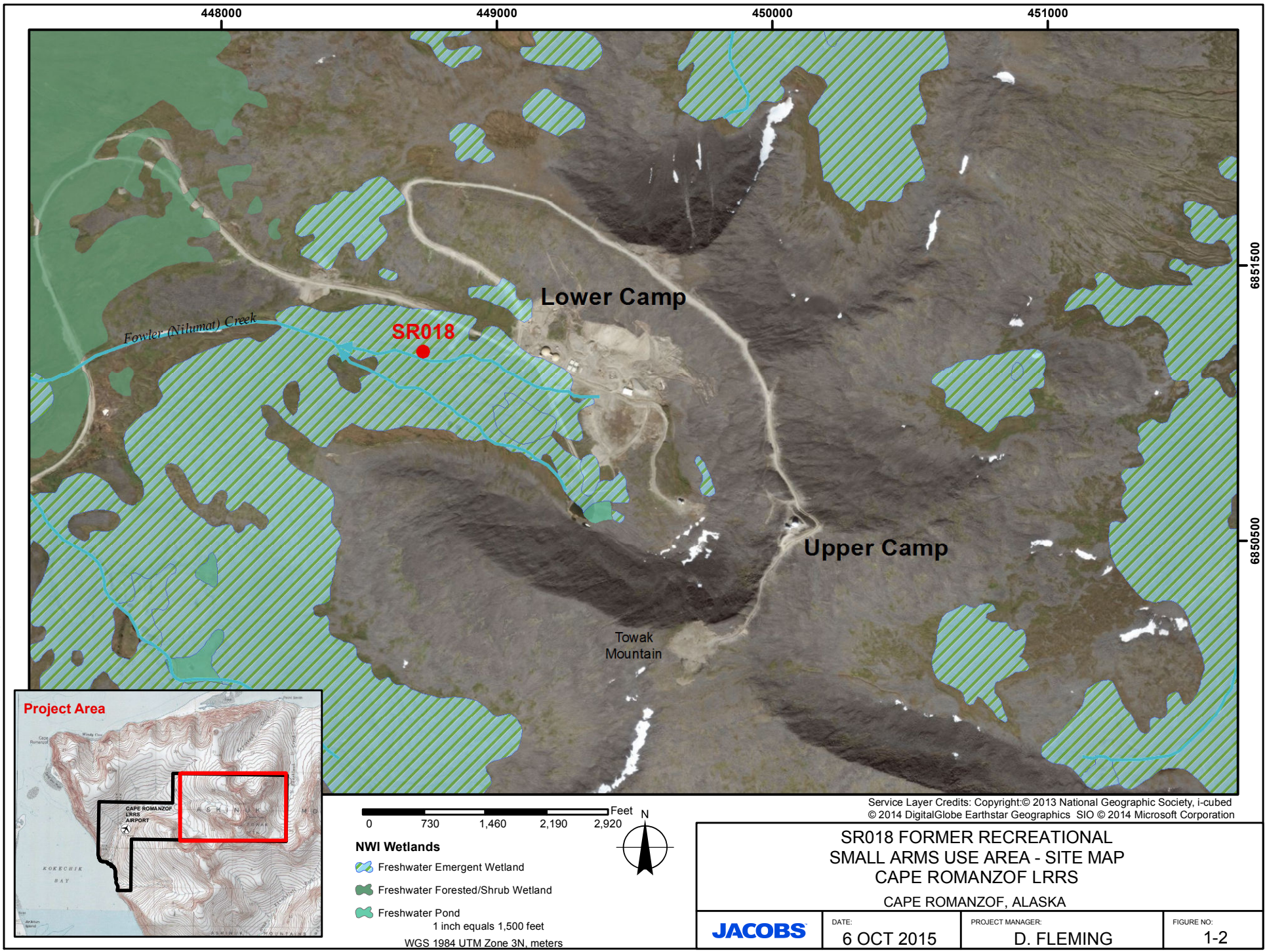
448000
449000
450000
451000
6851500
6850500
Lower Camp
SR018
Fowler (Nilumat) Creek
Upper Camp
Towak
Mountain
Project Area
CAPE ROMANZOF
LRRS
AIRPORT
KOKECHIK
BAY
0
730
1,460
2,190
2,920
Feet
N
NWI Wetlands
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
1 inch equals 1,500 feet
WGS 1984 UTM Zone 3N, meters
Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
© 2014 DigitalGlobe Earthstar Geographics SIO © 2014 Microsoft Corporation
SR018 FORMER RECREATIONAL
SMALL ARMS USE AREA - SITE MAP
CAPE ROMANZOF LRRS
CAPE ROMANZOF, ALASKA
JACOBS
DATE:
6 OCT 2015
PROJECT MANAGER:
D. FLEMING
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1-2
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1.3 ASSESSMENT OF THE SITE

SR018 was identified as a potential munitions response area during a 2011 historical records review. Further records review, field reconnaissance, and visual surveys conducted as part of a Comprehensive Site Evaluation (CSE) Phase I/II identified the nature of SR018 as a recreational small arms use area (USACE 2013). SR018 is, therefore, not eligible for investigation under the USAF Military Munitions Response Program and, instead, falls under the ERP (formerly the Installation Restoration Program [IRP]).

The primary chemicals of concern (COCs) at SR018 are metals associated with small-caliber ammunition (lead). During the CSE Phase I/II, soil was sampled for lead and antimony. Analytical results indicated that there is lead in concentrations that exceeded the soil cleanup level (400 milligrams per kilogram [mg/kg]) in one location in the berm/impact area at SR018. Although antimony was identified as a chemical of potential concern (COPC) in the CSE Phase I/II, all results for antimony indicated no levels above even the most stringent cleanup criterion; therefore, antimony is not considered a COC. There was no evidence of historical use of explosives and no munitions and explosives of concern (MEC) were observed during the CSE Phase I/II; only small arms debris was observed during the visual survey. This area is further described in Section 2.1.2.

The response action selected in this ROD is necessary to protect human health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

1.4 DESCRIPTION OF THE SELECTED REMEDY

Remedial alternatives for SR018 were developed and evaluated in the *Feasibility Study for SR018 Cape Romanzof Long-Range Radar Site* (USAF 2015c) and presented in the *Proposed Plan for SR018 Former Recreational Small Arms Use Area* (USAF 2015a). Based on the regulator and support agency comments received during the development of the Proposed Plan, the USAF selected Removal and Offsite Disposal as the overall site remedy.

Munitions debris and soil contaminated with lead above the ADEC Method Two cleanup level (400 mg/kg) would be excavated, staged, manifested, and transported for disposal to a Resource Conservation and Recovery Act (RCRA)-permitted chemical waste landfill capable of managing RCRA-regulated lead-contaminated soil. Soil would be excavated and staged onsite prior to transport. Approximately 8.3 cubic yards (cy) (12.5 tons) of lead-contaminated soil remain at the site. Analytical samples would be collected from the staged soil for waste profiling. It is anticipated that excavation activities would focus on surface soil to an 18-inch depth.

Confirmation sampling of the excavation would be required to ensure lead is no longer present at concentrations above the ADEC cleanup level. Once analytical results from confirmation samples indicate that all contaminated soil has been removed, the excavation would be backfilled. If properly implemented at SR018, Removal and Offsite Disposal will then be protective of human health and the environment. The site would be restored for unlimited use and unrestricted exposure (UU/UE). CERCLA five-year reviews would not be required.

Table 1-2 presents the current soil COC at SR018 and its ADEC cleanup level. No source materials constituting principal threat wastes exist at the site.

Table 1-2
Chemical of Concern and Cleanup Level

COC	Maximum Levels Detected	Cleanup Level[1]	Regulatory Source[1]
Lead	2,400 mg/kg	400 mg/kg	18 AAC 75.341(c), Table B1

Notes:
[1] ADEC Method Two Under 40-Inch Zone direct contact soil cleanup criteria (ADEC 2016a)
For definitions, refer to the Acronyms and Abbreviations section.

The major components of the selected remedy for SR018, Removal and Offsite Disposal, are as follows:

- Excavate the area of contaminated soil by hand and load into Super Sacks, segregating excavated soils into RCRA hazardous and non-RCRA hazardous waste streams.

- Collect analytical confirmation samples from the excavation cavity.
- Collect waste samples from the excavated soil to be analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) for lead.
- Once confirmation sample results show that all contaminated soil above 400 mg/kg has been removed, the excavation will be backfilled with local clean fill.
- Excavated soil would be shipped offsite for disposal at a treatment, storage, and disposal facility (TSDF).

Upon completion, SR018 will not require any future work, including CERCLA five-year reviews or any further contamination testing.

1.5 STATUTORY DETERMINATIONS

The selected remedy for SR018—Alternative 5—is protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. The selected remedy for SR018 satisfies the statutory requirements of CERCLA and the NCP. The NCP establishes the expectation that treatment will be used to address the contaminants posed by a site whenever practicable, as specified in 40 CFR 300.430(f)(5)(ii)(F). The selected remedy for SR018 does not satisfy the statutory preference for treatment because it will not permanently or significantly reduce the toxicity, mobility, or volume of COCs at the site. The selected remedy for SR018 was chosen, however, because of the remoteness of the location and unlikely presence of human and ecological receptors, which make the implementation of treatment technologies costly and impractical.

Contaminants will not remain onsite above ADEC regulatory cleanup levels; therefore, no periodic monitoring will be required. SR018 would be restored for UU/UE. CERCLA five-year reviews would not be required.

1.6 DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary located in Section 2.0 of this ROD. Additional information can be found in the Administrative Record file for this site.

- The COC and its respective concentrations (Section 2.7, Table 2-2)
- Baseline human health and ecological risk evaluation represented by the COC (Section 2.7)
- Cleanup level established for COC and the basis for the selection (Section 2.8)
- How source materials constituting principal threat wastes are addressed (Section 2.11)
- Current and reasonably anticipated future land-use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD (Sections 2.6.1 and 2.7)
- Potential land and surface water use that will be available at the site as a result of the selected remedy (Sections 2.6.1 and 2.6.2)
- Estimated capital, annual operations and maintenance (O&M), total costs, and the number of years over which the remedy cost estimates are projected (Sections 2.10.7 and 2.12.5; Tables 2-5, 2-6, and 2-7)
- Key factors that led to selecting the remedy, including a description of how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision (Sections 2.10, 2.12, and 2.13)

1.7 AUTHORIZING SIGNATURES

This signature sheet documents the U.S. Air Force approval of the remedy selected in this Record of Decision for SR018 at the Cape Romanzof LRRS, Alaska.

By signing this declaration, the Alaska Department of Environmental Conservation concur that proper implementation of the selected remedy for SR018 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 potential exposures that present unacceptable risk to human health or the environment.

SUZANNE W. BILBREY, P.E., GS-15
AFCEC/CZ Director, Environmental Management Directorate

Date

KIM DERUYTER, DSMOA Section Manager
Contaminated Sites Program
Alaska Department of Environmental Conservation

Date

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PART 2: DECISION SUMMARY

The Decision Summary identifies the selected remedy, explains how the remedy fulfills statutory and regulatory requirements, and provides a substantive summary of previous investigations that support remedy selection.

2.1 SITE NAME, LOCATION, AND DESCRIPTION

The Cape Romanzof LRRS installation is located approximately 540 miles west of Anchorage on the Bering Sea coast. The nearest local communities are Scammon Bay (Population: 474, from the 2010 census) and Hooper Bay (population: 1,014 from the 2000 census), which are located approximately 15 miles east and south of the installation, respectively (Figure 1-1). Bethel is the closest town, located 165 miles to the southeast. The LRRS consists of 4,900 acres of land on the southwestern coast of Alaska in the Yukon-Kuskokwim Delta region within the Yukon Delta National Wildlife Refuge (NWR). SR018 consists of a single area within the LRRS: Former Recreational Small Arms Use Area; this area is described in greater detail in Section 2.1.2.

Table 2-1
Project Information

Facility:	Cape Romanzof LRRS, Alaska
Site Location:	165 miles northwest of Bethel, Alaska Section 33; Township 20N, Range 92W Seward Meridian
Latitude and Longitude:	61°47'24.1"N, 165°58'17.8"W
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) ID Number:	Not listed
Alaska Department of Environmental Conservation Contaminated Sites Hazard ID Number	25604
Operable Unit/Site:	SR018
Point of Contact:	Mr. Richard J. Mauser – Remedial Project Manager richard.mauser@us.af.mil AFCEC/CZOP 10471 20th Street, Suite 339 Joint Base Elmendorf-Richardson, AK 99506-2201 907-552-0788

The Cape Romanzof LRRS is owned by USAF, which is issuing this ROD under its lead agency authority. As the regulatory agency, ADEC provides primary oversight of the environmental restoration actions in accordance with State of Alaska contaminated sites regulations (Alaska Administrative Code [AAC] Title 18, Chapter 75, Part 3, *Discharge Reporting Cleanup and Disposal of Oil and Other Hazardous Substances* [18 AAC 75.3]) (ADEC 2016a).

The implementation of the selected remedy for SR018 will be funded by DERA, a funding source approved by Congress to clean up contaminated sites on U.S. Department of Defense installations.

2.1.1 Regional Setting

The Cape Romanzof LRRS comprises approximately 4,900 acres of land along the shore of the Bering Sea coast. It is approximately 540 miles west of Anchorage and 165 miles northwest of Bethel. The nearest local communities are Scammon Bay and Hooper Bay, which are located approximately 15 miles east and south of the installation, respectively. No roads connect Scammon Bay or Hooper Bay to the Cape Romanzof LRRS; it is accessible by air, by sea a few months during the summer, or by snowmachine in the winter. USAF owns the Cape Romanzof LRRS and is responsible for environmental cleanup of the site.

The Cape Romanzof LRRS is divided into two areas, the Lower Camp where the main camp facilities (i.e., housing, power plant, and bulk fuel storage area) are located; and the Upper Camp where the long-range radar equipment is located (Figure 1-2). The Upper Camp is located at the top of Towak Mountain at an elevation of approximately 2,300 feet above mean sea level; the two areas are connected by a gravel road and former tramway service. A 1-mile-long gravel runway serving the installation is located near the beach at Kokechik Bay, approximately 4 miles southwest of the Lower Camp by road. Fowler (Nilumat) Creek and its tributaries run through Cape Romanzof LRRS to Kokechik Bay. There is one small lake, which was formed by a small dam at the head of the valley at the Lower Camp (USACE 2013).

2.1.2 Site Description

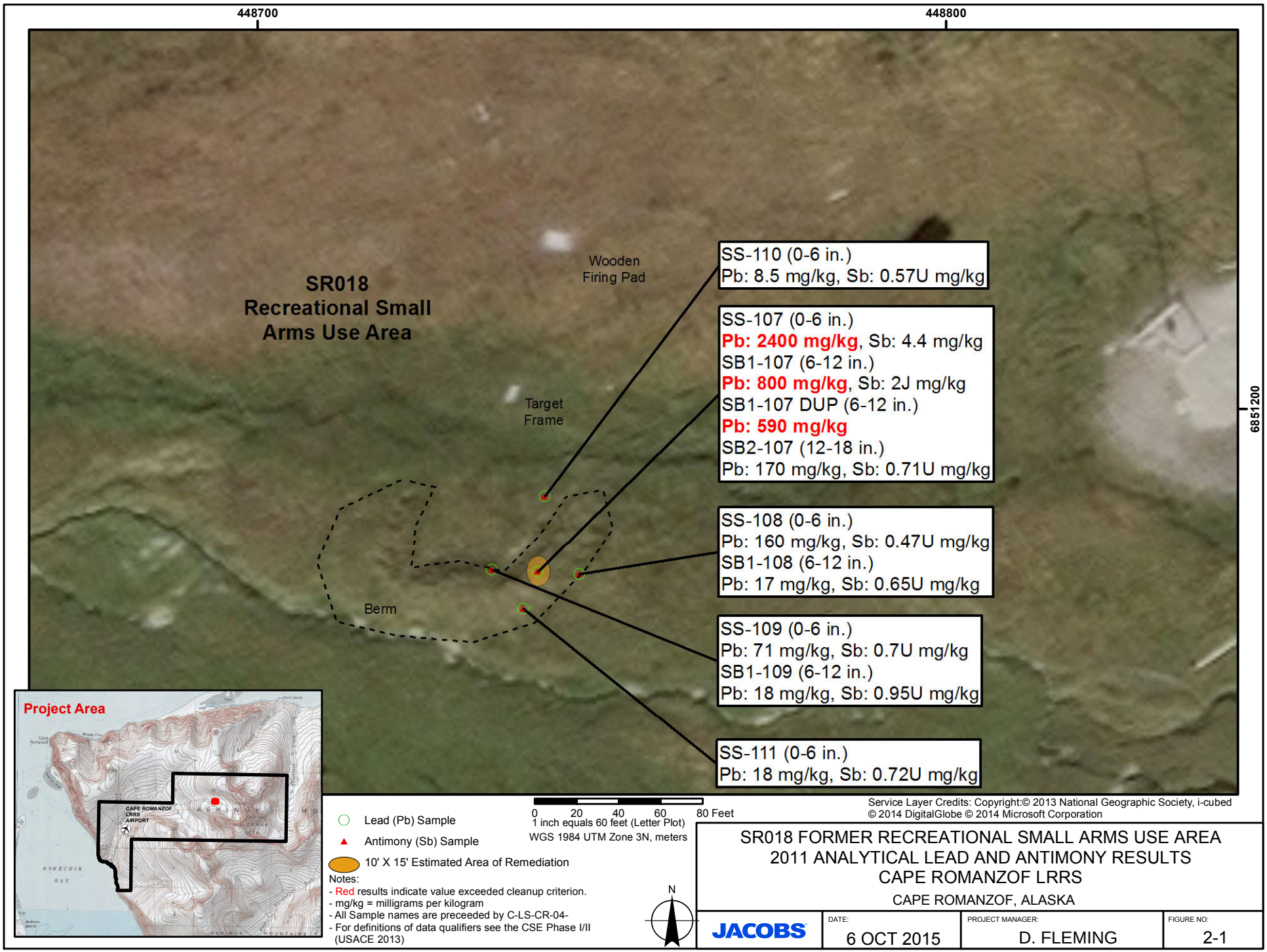
SR018 is located approximately 300 feet south of the access road between the Lower Camp and the airstrip, between the access road and one of the branches of Fowler (Nilumat) Creek. The site consists of a man-made clearing covered with native grasses. The north end of the clearing nearest the road is the firing point and the south end of the clearing has a large berm/impact area. Features present at the site include a wooden firing pad, an old pistol range, wooden target frames, miscellaneous debris, and the earthen berm (USACE 2013).

2.1.3 Facility Environmental Restoration Program History

SR018 is a former recreational small arms use area. The primary COC at this Cape Romanzof LRRS site is lead associated with small-caliber ammunition. A combined CSE Phase I/II was performed at the Cape Romanzof LRRS in 2011. The CSE Phase I included a historical records review, visual reconnaissance, and interviews; the CSE Phase II included a visual survey and environmental sampling.

During the CSE Phase I/II, soil was sampled for lead and antimony. Analytical results indicated that these metals are present in surface and subsurface soil associated with activities conducted at SR018. Samples detected lead in concentrations that exceeded the soil cleanup level for residential areas (400 mg/kg) in three samples at one location in the berm/impact area (Figure 2-1). All results for antimony were less than the most stringent cleanup criterion. Although antimony was identified as a COPC in the CSE Phase I/II and evaluated as a potential contributor to overall risk, site concentrations are well below both state and federal cleanup levels; the antimony results were collocated with lead.

There was no evidence of historical use of explosives, and no MEC were observed during the CSE Phase I/II; only “small arms debris” was observed during the visual survey (USACE 2013).



Notes:
- Red results indicate value exceeded cleanup criterion.
- mg/kg = milligrams per kilogram
- All Sample names are preceeded by C-LS-CR-04-
- For definitions of data qualifiers see the CSE Phase I/II (USACE 2013)

SR018 FORMER RECREATIONAL SMALL ARMS USE AREA
2011 ANALYTICAL LEAD AND ANTIMONY RESULTS
CAPE ROMANZOF LRRS
CAPE ROMANZOF, ALASKA

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	6 OCT 2015	D. FLEMING	2-1

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The ERP is responsible for cleaning up contamination from past operations by reducing risks to human health and the environment. A total of 17 ERP sites are located at the installation; their statuses are presented in Table 2-2 (USAF 2011; ADEC 2016b).

Table 2-2
Cape Romanzof LRRS ERP Sites

Site	Name	Status
DP011	Debris Area	Final ROD 2008. Cleanup Complete with ICs
LF002	Landfill No. 1	Final ROD 2007. Cleanup Complete
LF003	Landfill No. 2	Final ROD 2013. Offsite Disposal, LTM, and LUCs
LF004	Landfill No. 3	Final Proposed Plan 2000 NFRAP Cleanup Complete determination issued 2000 Active Landfill ICs established in 2004
LF012	611th/Disposal Pit/Debris Landfill	Final ROD 2007. Cleanup Complete
OT005	Road Oiling	Final ROD 2007. Cleanup Complete
OT006	White Alice	Final ROD 2007. Cleanup Complete
SS001	Waste Accumulation Area No. 2	Final ROD 2007. Cleanup Complete
SS007	Waste Accumulation Area No. 1	Final ROD 2008. Cleanup Complete
SS008	Waste Accumulation Area No. 3	Final ROD 2007. Cleanup Complete
SS010	Spill Site 10 (Weather Station Building)	Draft ROD 2012. LUCs, MNA, and LTM
SS013	Seep Area, Spill/Leak No. 5	Final ROD 2011. Cleanup Complete with ICs
SS014	Drum Storage Area	Final ROD 2008. Cleanup Complete with ICs
SS015	Spill Site 15	Final ROD 2011. Cleanup Complete with ICs and MNA
SS016	Upper Tram Area	Draft ROD 2012. Removal and Offsite Disposal; if removal is not feasible, then cap and LUCs
SS017	Lower Tram Area	Draft ROD 2012. Removal and Offsite Disposal; if removal is not feasible, then cap and LUCs
ST009	Former Truck Fueling Station near beach	Final ROD 2008. Cleanup Complete with ICs

Note:
For definitions, refer to the Acronyms and Abbreviations section.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

This section provides background information, summarizes the series of investigations that led to this ROD, and describes the CERCLA response actions previously undertaken at SR018.

Constructed in 1953, the Cape Romanzof LRRS was one of the original 12 Aircraft Control and Warning sites built in the 1950s in Alaska as part of an air defense communications system (USACE 2013). In 1958, a White Alice Communications System (WACS) was activated and operated until 1979. The Cape Romanzof WACS was deactivated and replaced by an Alascom-owned satellite earth terminal in 1979 (USACE 2013). USAF, the lead agency for remedial activities, has performed environmental investigations at the Cape Romanzof LRRS since 1989. These activities were conducted in accordance with CERCLA under DERP (10 USC 2701 et seq.), which was established by Section 120 of SARA.

A CSE Phase I/II was performed at the Cape Romanzof LRRS in 2011. The CSE Phase I included a thorough records review, field reconnaissance, visual surveys, and interviews; the CSE Phase II included a visual survey and environmental sampling. The CSE Phase II concluded that a CERCLA response action is necessary due to the presence of lead in soils at concentrations that create a risk to human health or welfare or the environment.

No Federal Facility Agreements or state agreements for the Cape Romanzof LRRS are in effect. None of the Cape Romanzof LRRS sites are listed on the National Priorities List. To date, there have been no regulatory enforcement activities at SR018, although hazardous substances regulated under CERCLA (lead) have been identified.

2.3 COMMUNITY PARTICIPATION

NCP §300.430(f)(3) establishes a number of public participation activities that the lead agency must conduct following preparation of the Proposed Plan and review by the regulatory agency. In accordance with NCP requirements, USAF distributed the Proposed Plan (USAF 2015a) on 22 September 2015 to the villages of Scammon Bay, Hooper Bay, and

Chevak for public review and to solicit public input. A notice regarding the availability of the Proposed Plan was published in *The Delta Discovery* on 30 September and 7 October 2015. The 30-day public comment period for the Proposed Plan began 23 September 2015 and ended 22 October 2015. No public meeting was requested following distribution of the Proposed Plan, and no comments were received during the 30-day public comment period.

The Proposed Plan (USAF 2015a), and all newsletters, fact sheets, and community relations documents relating to the ERP (formerly IRP) sites at the Cape Romanzof LRRS are located in an Administrative Record and a public information repository at Joint Base Elmendorf-Richardson. Appendix C contains more information regarding efforts to solicit community involvement in the SR018 decision making process.

2.4 SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

Under its lead agency authority, USAF plans to remove and dispose of munitions debris and soil contaminated with lead above the ADEC Method Two cleanup level in order to protect human and ecological receptors from encountering lead-contaminated soil. USAF is responsible for excavating, staging, manifesting, and transporting the soil offsite for disposal to a RCRA-permitted chemical waste landfill that is capable of handling—and certified to manage—RCRA-regulated, lead-contaminated soil. Soil would be excavated and staged onsite prior to transport. Approximately 8.3 cy of lead-contaminated soil will be removed. Analytical samples would be collected from the staged soil for waste profiling. It is anticipated that excavation activities would focus on surface soil to an 18-inch depth. Confirmation sampling of the excavation would be required to ensure lead is no longer present at concentrations above the ADEC cleanup level.

ADEC will provide the primary regulatory oversight. The selected remedy for SR018 is appropriate for reasonably anticipated future land use; satisfies USAF mission requirements; complies with Applicable or Relevant and Appropriate Requirements (ARARs), including but not limited to 18 AAC 75; achieves Remedial Action Objectives (RAOs); and is consistent with other remediation activities that have occurred at the Cape Romanzof LRRS.

2.5 SITE CHARACTERISTICS

The installation is accessible only by air, boat (during summer), and snowmachine (during winter). The Cape Romanzof LRRS is centrally located in the western Askinuk Mountains and is bordered by native corporation lands. It is bordered on the north, south, and west by the Bering Sea, and on the east by rugged terrain (USACE 2013). Natural site features and characteristics are explained below.

2.5.1 Topography

The Cape Romanzof LRRS is located on a mountain mass that rises steeply out of the Yukon-Kuskokwim Delta. The installation lies on a peninsula at the western end of the Askinuk Mountains. The Cape Romanzof LRRS sits in a glacially-carved valley that is encircled by sheer bedrock ridges. The lowland is crossed by wandering creeks and a stream bed that is nearly level, with sluggishly moving water that flows west into the Bering Sea (USAF 2011). Permafrost is not known to exist at the Cape Romanzof LRRS (USAF 2011).

The Upper Camp is situated on Towak Mountain, which drops steeply down into the valley. The valley is characterized by uneven terrain with flat and steep segments.

2.5.2 Climate

Cape Romanzof LRRS has a maritime climate. Temperatures recorded at Cape Romanzof range from 4.6 to 53.0 degrees Fahrenheit (°F). The average wind speed is approximately 12 miles per hour. Average annual precipitation at Cape Romanzof is 25.48 inches, with an average annual snowfall of 68.2 inches (Western Regional Climate Center 2015). Winter snowpack and winds often create severe conditions. The Bering Sea is ice-free from June to October (Wendler, Chen and Moore 2013).

2.5.3 Geology

The Cape Romanzof Upper Camp consists of sand, gravel, and boulders overlying the granite bedrock of Towak Mountain. The Lower Camp is underlain by deposits of talus (coarse-

grained materials) and other colluvial materials (USAF 2011). The U-shaped valley cross-section and the stepped longitudinal profile of Fowler (Nilumat) Creek are typical of glaciated valleys. The Upper Camp is characterized by a thin accumulation of angular sand and residual erosional blocks overlying granitoid bedrock (USACE 2013).

The area is composed dominantly of Cretaceous intrusive rocks of felsic composition, classified as granitoids. The region is described as having been weathered and eroded by ice wedges and underlain by partial or discontinuous permafrost (USACE 2013).

2.5.4 Surface and Subsurface Hydrology

Surface Water: Surface water drainage is accomplished chiefly by overland flow to Fowler (Nilumat) Creek. Numerous ponds exist for short periods of time (usually one to five days) following precipitation events. Kokechik Bay is a major surface water feature of the Yukon Delta NWR (USACE 2013).

Groundwater: Small amounts of groundwater are available on the valley slopes as local perched water. Well No. 1, located at Lower Camp, is the drinking water source at the Cape Romanzof LRRS. During the spring and summer months, groundwater is pumped from the Lower Camp to local storage facilities for later use (USAF 2011). The static water level in this well was measured at 29 feet below grade (Feulner 1966), which suggests that local groundwater occurs under artesian (confined) pressure.

Wetlands: Although there were no surface water features observed within the boundaries of SR018 during the CSE Phase I/II site visit (USACE 2013), SR018 and the surrounding area south of the road, is located in an emergent wetland. An emergent wetland is characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants (Federal Geographic Data Committee 2013).

2.5.5 Ecology

Flora: Vegetation at the Cape Romanzof LRRS is characterized by low-growing plants that can withstand the extreme wind conditions that predominate the area. Marshes, marigold, crowberry, low-growing shrubs, and a few hardy grass species are common vegetation types (USAF 2011).

Fauna: Tomcod, herring, Alaska blackfish, and Dolly Varden inhabit Fowler (Nilumat) Creek, while pink salmon spawn in this creek. Several beaver ponds have been constructed in the creek. Arctic fox, vole, and rock ptarmigan have been seen throughout the Lower Camp (USAF 2011). Many species of bird live in or migrate through the areas around the Cape Romanzof LRRS, including 12 species of duck, rough legged hawk, horned and tufted puffin and others.

2.5.6 Previous Site Characterization Activities

This section describes previous investigations pertaining to SR018. These documents are available in the Administrative Record file for the site.

- A CSE Phase I/II was conducted in 2011 in order to obtain information and evaluate the possible presence of munitions, munitions debris, explosives, and contaminated media at two potential munitions response areas (USACE 2013). The CSE Phase I/II concluded that the small arms use at SR018 was recreational in nature, and the recreational small arms use area is not an "other than operational" military range. Therefore, it is not a munitions response area. Results of the CSE concluded that, although both lead and antimony are present in the soil at SR018, only lead is present at concentrations above the cleanup level, and further CERCLA response action under the ERP was recommended.
- A Feasibility Study (FS) prepared in 2015 evaluated potential response technologies to address metals contamination in soil at SR018 (USAF 2015c). The alternatives presented in the FS were screened based on site-specific effectiveness, implementability, and cost and ranged from land-use controls (LUC) and long-term monitoring (LTM) to complete removal and offsite disposal. The No Action alternative was retained as a baseline against which the other alternatives could be compared. Each alternative was subjected to detailed analysis based on the threshold and primary balancing criteria established under the NCP [40 CFR 300.430(e)] (USAF 2015c).
- A Proposed Plan was developed in 2015 to address the metals contamination in soil at SR018 (USAF 2015a). The preferred remedy called for excavation and offsite disposal of lead-contaminated soil above the ADEC cleanup level and backfilling the excavated areas

to prevent erosion and surface water ponding. ADEC approved the Proposed Plan on 22 September 2015. No comments were received from the community during the 30-day public comment period.

2.5.7 Nature and Extent of Contamination

SR018 is a former recreational small arms use area. The primary COC at this site at the Cape Romanzof LRRS is lead associated with small-caliber ammunition. Analytical results indicate that lead is present in surface and subsurface soil in concentrations that exceed the soil cleanup level for residential areas (400 mg/kg) in three samples at one location in the berm/impact area (Figure 2-1). All results for antimony were less than the most stringent cleanup criterion.

There was no evidence of historical use of explosives, and no munitions or explosives of concern were observed during the CSE Phase I/II; only "small arms debris" was observed during the visual survey conducted as part of the CSE Phase I/II (USACE 2013).

Types of Contamination and Affected Media

The primary COC at SR018 at the Cape Romanzof LRRS is lead. Lead-contaminated soil is located at the firing range berm/impact area and is likely associated with activities at SR018. This area measures approximately 10 feet by 15 feet and extends an estimated 18 inches below ground surface (bgs). It is estimated that approximately 8.3 cy of soil are contaminated with lead. The affected volume of soil was estimated based on the ADEC Method Two cleanup criterion of 400 mg/kg for lead in residential areas (ADEC 2016a).

No surface water, sediment, or groundwater data were collected during the CSE Phase I/II; these are considered potential exposure pathways. Depth to groundwater at the Lower Camp ranges from 1 foot to 60 feet bgs (USAF 2011). Groundwater at LF003, which is upgradient of SR018, was found at 10 to 20 feet bgs. Groundwater is used as the drinking water source for the Cape Romanzof LRRS (USACE 2013).

Lead adsorbs to soil and is not considered highly mobile in the environment. When lead is deposited in soil from anthropogenic sources, it does not biodegrade or decay and is not rapidly absorbed by plants; therefore, it remains in the soil at elevated levels. The maximum concentration found at SR018 was 2,400 mg/kg.

Known or Potential Routes of Migration

Surface water flowing across SR018 provides a mechanism for potential contamination of the wetlands and Fowler (Nilumat) Creek by munitions constituents (MCs). Surface water runoff would probably not carry off significant quantities of contaminated soil. Downward percolation of water through soil and the upper gravelly clay aquitard unit provides a mechanism for potential contamination. The potential also exists for humans to have dermal contact and dust inhalation from surface soil.

Terrestrial and surface water are present, therefore contaminant uptake by terrestrial plants, including rain splash onto plants, is possible, as contamination is present in the root zone (0 to 4 feet bgs). Incidental ingestion/exposure or inhalation of fugitive dust by grubbing, foraging, or burrowing animals is also possible. While several mammalian species are present at Cape Romanzof LRRS, no endangered species or critical habitat areas are known to exist in the vicinity (USACE 2013).

Conceptual Site Model

A conceptual site model (CSM) was developed to depict the potential relationship or exposure pathway between chemical sources and receptors under current site conditions per ADEC guidance (Appendix B). An exposure pathway describes the means by which a potential receptor can be exposed to contaminants in environmental media.

No MEC were anticipated or found at the SR018. Exposure pathway analysis for exposure to MCs in soil to human and non-human receptors was addressed. In the absence of surface water and sediment data, the proximity to various surface water channels adjacent to SR018,

the surface water, sediment, and groundwater pathways are potentially complete. MCs were limited to lead and antimony from small arms activities (USACE 2013).

Surface soil, subsurface soil, surface water, and groundwater are directly affected by contamination at SR018. Soil, surface water, and groundwater are considered potential exposure media. Incidental soil ingestion and dermal absorption of contaminants from the soil, surface water, or groundwater are considered the most likely current exposure pathways. Inhalation of outdoor air contaminated with volatiles is possible, though unlikely. Dermal contact with surface water is possible but unlikely during site work or recreational/subsistence activities in the area. Surface water is considered a minor pathway because of the dispersion of contaminants within the water.

The most likely receptors in these areas include site workers and visitors, but due to its remote location, subsistence harvesters or consumers are not considered likely receptors. Four contract personnel currently live at the Cape Romanzof LRRS. Because known lead contamination will be excavated offsite, this site will be eligible for a UU/UE determination. Human health exposure pathways are presented in Appendix B.

Potential ecological receptors include invertebrates and seabirds. Marine mammals are not likely to be affected, as contaminants do not appear to be migrating from SR018. Potential pathways for ecological receptors are presented in Appendix B.

2.6 CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

2.6.1 Land Use

Current land use of the Cape Romanzof LRRS includes industrial activities associated with O&M of the radar installation and runway. Current use of nearby lands is minimal. There are currently no plans that will significantly change existing land use at the site.

As the lead agency, USAF has the authority to determine the future land use of SR018. After considering input from the State of Alaska and the local community, USAF has determined that land use is expected to remain the same.

2.6.2 Groundwater and Surface Water Uses

Groundwater is used as the drinking water source for the Cape Romanzof LRRS (USACE 2013). Water supply for the installation is obtained from groundwater in an area that is upgradient of—and not affected by—site contamination. It is unknown to what extent installation personnel use the resources in Fowler (Nilumat) Creek, but with only a few contract personnel occupying the site, use is likely infrequent. Fowler (Nilumat) Creek empties into Kokechik Bay, an important resource for subsistence gathering of shellfish and herring spawn.

2.7 SUMMARY OF SITE RISKS

The RAOs for SR018 consist of site-specific goals for protecting human health and the environment. Implementation of the RAOs, as described in Section 2.8, will minimize human and ecological exposure risks. 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.

A screening-level human health risk assessment (HHRA) and ecological risk assessment were conducted as part of the CSE Phase I/II investigation and were limited to the soil sample data collected in 2011. Lead and antimony were identified as COPCs. The exposure assumptions used to develop the HHRA included both current exposures to the Cape Romanzof LRRS staff, construction workers, and visitors, as well as potential future exposures to residents (USACE 2013).

2.7.1 Human Health Risks

Of the original list of COCs, only lead has been detected at concentrations above the ADEC cleanup level at SR018. Therefore, lead was the only COC identified in the Proposed Plan.

Identification of Chemicals of Concern

The only COC at SR018 is lead associated with small-caliber ammunition. Analytical results indicated that there is lead in surface soil (0 to 12 inches bgs) associated with activities conducted at SR018. Two out of the nine primary samples detected lead in one location of the berm/impact area in concentrations that exceeded the ADEC Method Two cleanup criterion of 400 mg/kg (ADEC 2016a). Lead at 2,400 mg/kg was detected in a sample collected at 0 to 6 inches bgs and lead at 800 mg/kg was detected in a sample collected at 6 to 12 inches bgs (USACE 2013).

Toxicity Assessment

The U.S. Environmental Protection Agency (EPA) guidance set residential and industrial screening levels for lead at 400 mg/kg and 1,000 mg/kg, respectively. The screening level serves as an indicator that additional study may be appropriate. Based on the levels of lead found in soil at SR018 over the screening level of 400 mg/kg, a response action is necessary.

In general, non-cancer risk is expressed as a hazard quotient; however, hazard quotients cannot be calculated for lead. The HHRA conducted during the CSE Phase I/II evaluated the ratios of the detected exceedance concentrations (2,400, 800, and 590 mg/kg) to the EPA Regional Screening Level (RSL) for residential soil (400 mg/kg), which is the same as the ADEC Method Two cleanup level for residential soil (EPA 2015). The HHRA concluded that lead in soil at SR018 may result in risk to human receptors, as all three exceedances resulted in ratios greater than 1 (6, 2, and 1.5, respectively) (USACE 2013).

Exposure to inorganic lead is treated separately from other contaminants for purposes of determining protective levels. The Integrated Exposure Uptake Biokinetic Model and the Adult Lead Methodology are recommended by ADEC and EPA for the evaluation of potential

exposures to lead in environmental media for children and adults, respectively. The EPA developed the Adult Lead Methodology for evaluating the potential risks from exposure to lead to pregnant females in nonresidential settings, that is, under industrial exposures.

The primary target organs of lead toxicity include the cardiovascular/renal, hematological, and neurological systems (Agency for Toxic Substances and Disease Registry [ATSDR] 2007). Health effects associated with exposure to inorganic lead include, but are not limited to, neurotoxicity, developmental delays, hypertension, impaired hearing acuity, impaired hemoglobin synthesis, and male reproductive impairment (EPA 2004). Additional side effects of lead exposure include blood anemia, colic (severe stomachache), kidney damage, muscle weakness, brain damage, and could possibly result in death.

Human Exposure Assessment

The Human Health CSM, presented as Appendix B, describes the potential relationship or exposure pathway for lead at SR018 and both potential current and potential future human receptors. The CSM Graphic and Scoping Forms presented in Appendix B provide an overview of contaminated media at SR018, as well as potential exposure pathways for human receptors. If achieved, the RAOs (Section 2.8) developed for SR018 will adequately mitigate future human health risks. Under the preferred alternative, munitions debris and soil contaminated with lead would be removed and disposed of offsite, and the site would be restored for UU/UE. CERCLA five-year reviews would not be required.

At the Cape Romanzof LRRS, populations may be exposed to the COC during recreational land use or during site work; subsistence harvesting activities are limited due to the inaccessibility of the site and the distance from the nearest populated areas, Scammon Bay and Hooper Bay. However, Fowler (Nilumat) Creek empties into Kokechik Bay, which is an important resource for subsistence gathering of shellfish and herring spawn. Complete pathways include incidental ingestion or dermal absorption of soil, and direct contact with groundwater and surface water by site workers or visitors (Appendix B).

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.

Risk Characterization

The risk-based cleanup levels listed under 18 AAC 75 are based upon a lifetime cancer risk threshold of 1×10^{-5} and a non-cancer hazard index of 1. Since concentrations of contamination are above risk-based levels at SR018, action is required under CERCLA to protect human health and the environment.

The range of exceedances representative of contaminated soil that remains at SR018 are shown in Table 2-3.

Table 2-3
Summary of Medium-Specific Primary Exposure Concentrations

Exposure Point	COC	Range of Exceedances (mg/kg)	Cleanup Level (mg/kg)[1]	Ratio of Exceedances to the RSL[2]	Location
Soil – Direct Contact/Ingestion	Lead	2,400	400	6	Berm/Impact Area
		800		2	
		590		1.5	

Notes:
[1] Cleanup Levels based on 18 AAC 75.341(c) Method Two, Table B2 soil cleanup levels for the Under 40-Inch Zone, ingestion exposure pathway (ADEC 2016a).
[2] EPA RSL for residential soil of 400 mg/kg for lead (EPA 2015).
Scenario Timeframe: Current
Media: soil
Exposure Media: soil, surface water, outdoor air
For definitions, refer to the Acronyms and Abbreviations section.

Lead-contaminated soil is located at the firing range berm/impact area. This area measures approximately 10 feet by 15 feet and extends an estimated 18 inches bgs; it is estimated that approximately 8.3 cy of soil are contaminated with lead. There was no evidence of historical use of explosives, and no MEC were observed during the CSE Phase I/II; only small arms debris was observed during the visual survey.

Groundwater at LF003, which is upgradient of SR018, was found at 10 to 20 feet bgs. Due to the low mobility of lead in soil, a lack of receptors, and a small source volume, groundwater pathways are likely negligible, but remain potentially complete in the absence of information to the contrary.

There were no surface water features observed within the boundaries of SR018 during the CSE Phase I/II site visit (USACE 2013); however, SR018 appears to be within a wetland and its close proximity of Fowler (Nilumat) Creek and its drainage channels suggest that the surface water pathway may be complete. Surface water flowing across SR018 provides a mechanism for potential contamination of the wetlands and Fowler (Nilumat) Creek by MCs. Surface water runoff would likely not carry off significant quantities of contaminated soil.

2.7.2 Ecological Risks

The ecological risk assessment conducted during the CSE Phase I/II investigation concluded that both lead and antimony in soils may result in unacceptable risks to ecological receptors at SR018 (USACE 2013). All of the lead sample results exceeded the EPA ecological soil screening level (Eco-SSL) value for lead (11 mg/kg). Three out of 10 of the antimony sample results exceeded the Eco-SSL value for antimony (0.27 mg/kg). These screening concentrations for lead and antimony are less than background concentrations for many states; however, the levels indicate the contamination present is potentially harmful to terrestrial plants and animals (USACE 2013).

Contamination present in surface soils has the potential to bioaccumulate and to be taken up into biota through the root zone for plants or by burrowing animals. Complete pathways include direct contact with or uptake of surface soil; incidental ingestion of surface or subsurface soil; and direct contact, absorption, or ingestion of groundwater (see Appendix B). The assessment applies in particular to invertebrates and ground-feeding birds that are prevalent at SR018. If achieved, the RAOs (Section 2.8) developed for SR018 will adequately mitigate future ecological risks.

2.7.3 Basis for Action

The response action selected in this ROD is necessary to protect the public health/welfare or the environment from actual or threatened releases of hazardous substances into the environment.

2.8 REMEDIAL ACTION OBJECTIVES

RAOs for SR018 are intended to protect human health and the environment from unacceptable exposure to contamination in soil and groundwater, as well as to prevent potential contact with debris remaining onsite (USAF 2015c). The following RAOs were identified for SR018:

- Prevent direct contact of humans to soil containing lead in excess of 400 mg/kg.
- Minimize or eliminate direct ecological exposure to lead and antimony.
- Reduce the potential for lead to migrate from site soil to any groundwater, surface water, and/or sediments where human receptors could be exposed.

Achievement of these RAOs is necessary to be protective of human health and the environment while also allowing continued site use for the USAF mission at the Cape Romanzof LRRS and protecting the sensitive tundra environment from disruption.

2.9 DESCRIPTION OF ALTERNATIVES

Remedial alternatives for lead-contaminated soil at SR018 have been developed. The alternatives were developed based on the RAOs and general response actions identified for SR018, as well as on the screening of potential remedial technologies. To develop a response strategy for lead-contaminated soil at SR018, a conceptual understanding of the volume and location of the contamination is needed. Approximately 8.3 cy of lead-contaminated soil remain at SR018 (USAF 2015c).

The following alternatives were evaluated for treatment of lead-contaminated soil at SR018:

- Alternative 1: No Action
- Alternative 2: LUCs and LTM
- Alternative 3: Capping, LUCs, and LTM
- Alternative 4: Debris Removal, In Situ Soil Treatment, Capping, and LUCs
- Alternative 5: Removal and Offsite Disposal

In accordance with CERCLA guidance, the No Action alternative was retained for comparison. The feasibility of other alternatives initially considered was generally limited by the remoteness of the site location and sensitivity of the tundra environment. An FS was conducted for SR018 and a preferred alternative was selected; Alternative 5 is protective of human health and the environment and complies with the ARARs applicable to SR018. ARARs are discussed in Section 2.10.2, and a complete list is provided in Appendix A. Table 2-4 presents the listed alternatives and the associated advantages and disadvantages of each.

Table 2-4
Summary of Remedial Alternatives Evaluated for SR018

Alternative	Description	Key Assumptions	Advantages	Disadvantages	Cost Estimate[1] (millions)
Alternative 1	No Action	• No action planned.	• Easy to Implement. • No cost. • No CERCLA five-year reviews.	• Not protective. • Does not comply with ARARs.	$0
Alternative 2	LUCs and LTM	• LUCs are effective in preventing exposure. • LTM inspections no less than once every five years.	• Easy to implement. • Low cost.	• Contamination will remain onsite; CERCLA five-year reviews would be required to ensure that the site remedy remains protective.	$0.32
Alternative 3	Capping, LUCs, and LTM	• Containment is successful; no contamination leaches or migrates beyond site boundaries. • LUCs are effective in preventing exposure. • LTM inspections once a year for the first five years, every five years thereafter, indefinitely.	• Minimizes the potential for exposure to contaminants.	• Contamination will remain onsite; CERCLA five-year reviews would be required to ensure that the site remedy remains protective.	$0.89
Alternative 4	Debris Removal, In Situ Soil Treatment, Capping, and LUCs	• Surficial munitions debris would be removed and disposed of offsite. • Containment is successful; no contamination leaches or migrates beyond site boundaries. • LUCs are effective in preventing exposure. • LTM inspections once a year for the first five years, every five years thereafter, indefinitely.	• All surficial debris would be removed. • Satisfies the CERCLA statutory preference for the treatment of contamination. • Minimizes the potential for exposure to contaminants.	• Highest cost. • Contamination will remain onsite; CERCLA five-year reviews would be required to ensure that the site remedy remains protective.	$1.08

Table 2-4
Summary of Remedial Alternatives Evaluated for SR018 (Continued)

Alternative	Description	Key Assumptions	Advantages	Disadvantages	Cost Estimate[1] (millions)
Alternative 5*	Excavation and Offsite Disposal	• Volume estimates are accurate. • Lead concentrations will be below the cleanup level or nondetect.	• Highly effective. • All contamination and debris above the approved cleanup level would be removed. • No LUCs or CERCLA five-year reviews will be required; SR018 would be available for UU/UE.	• Difficult to implement because it requires that large amounts of soil be shipped offsite for disposal. • Disruptive to the environment. • Does not satisfy the CERCLA statutory preference for the treatment of contamination.	$0.92

Notes:
[1] Costs are estimated with +50/-30% accuracy based on subcontractor quotes, construction drawings, and engineering estimates
* = Selected Remedy
For definitions, refer to the Acronyms and Abbreviations section.

2.9.1 Description of Remedy Components

As mentioned above, five alternatives were developed to address contamination at SR018. This section provides a summary overview of the components of those alternatives.

Alternative 1: No Action

- No response action would be taken. This alternative is a baseline for comparison as required under the NCP [40 CFR 300.430(e)(6)].
- Exposure risks to human health and the environment would persist. Administrative approval would be unlikely.

Alternative 2: LUCs and LTM

- LUCs would be used to restrict land use and prevent the removal and transportation of potentially contaminated soil and/or hazardous waste. Signage would be installed to prevent unauthorized access and maintain the integrity of the cap. USAF dig permitting system would be utilized to avoid activities that could breach the cap. No unauthorized transport or disposal of soil or unauthorized digging/excavation would occur without ADEC notification and approval. The LUCs at SR018 would be incorporated into the USAF LUC Management Plan.
- The approximate cost for this alternative is $0.32 million.
- Periodic maintenance, monitoring, and reviews would be required under this alternative, as contamination would remain onsite.

Alternative 3: Capping, LUCs, and LTM

- Munitions debris at the site and soil contaminated with lead in concentrations greater than 400 mg/kg would be capped with a minimum 2-foot soil cap. The cap would be used to prevent direct contact with lead contamination, minimize infiltration and resulting contaminant leaching, and control surface water runoff and erosion. Regularly scheduled inspections and maintenance would be performed to ensure cap integrity.
- LUCs would be used to restrict land use and to prevent the removal and transportation of potentially contaminated and/or hazardous waste. Signage would be installed to prevent unauthorized access and maintain the integrity of the cap. USAF dig permitting system would be utilized to avoid activities that could breach the cap. No unauthorized transport or disposal of soil or unauthorized digging/excavation would occur without ADEC notification and approval. The LUCs at SR018 would be incorporated into the USAF LUC Management Plan.

- The approximate cost for this alternative is $0.89 million; the estimated project duration would be five days.
- Periodic maintenance, monitoring, and reviews would be required under this alternative, as contamination would remain onsite.

Alternative 4: Debris Removal, In Situ Soil Treatment, Capping, and LUCs

- Munitions debris at the site and soil contaminated with lead greater than 400 mg/kg would be capped with a minimum 2-foot soil cap.
- Following collection of pre-treatment soil samples, calcium hydroxyapatite (or equivalent stabilizer) would be placed on the soil in situ using water and a sprayer to increase stabilization and prevent leaching of lead. The stabilizer would soak into the soil just past the estimated depth of contamination at 18 inches bgs. This action would limit the migration of lead from the site. Post-application samples would be collected after stabilization and analyzed for total lead and lead after performing the TCLP.
- The cap would be used to prevent direct contact with lead contamination, minimize infiltration and resulting contaminant leaching, and control surface water runoff and erosion. Regularly scheduled inspections and maintenance would be performed to ensure cap integrity.
- LUCs would be used to restrict land use and prevent the removal and transportation of potentially contaminated and/or hazardous waste. Signage would be installed to prevent unauthorized access and maintain the integrity of the cap. The USAF dig permitting system would be utilized to avoid activities that could breach the cap. No unauthorized transport or disposal of soil or unauthorized digging/excavation would occur without ADEC notification and approval. The LUCs at SR018 would be incorporated into the USAF LUC Management Plan.
- The approximate cost for this alternative is $1.08 million; the estimated project duration would be 12 days.
- Periodic maintenance, monitoring, and reviews would be required under this alternative, as contamination would remain onsite.

Alternative 5: Removal and Offsite Disposal

- Munitions debris and soil contaminated with lead above the ADEC Method Two cleanup level (400 mg/kg) would be excavated, staged, manifested, and transported for disposal to a RCRA-permitted chemical waste landfill capable of managing RCRA-regulated lead-contaminated soil. Soil would be excavated and staged onsite prior to transport. Approximately 8.3 cy (approximately 12.5 tons) of lead-contaminated soil remain at the site; when excavated, the amount of soil to be disposed of equates to approximately 10 cy (approximately 15 tons) when adjusting for bulk factor.

- Analytical samples would be collected from the staged soil for waste profiling. It is anticipated that excavation activities would focus on surface soil to an 18-inch depth. Confirmation soil samples would be collected from the excavations to confirm clean boundaries, and the site would be backfilled with locally available clean fill.
- Segregating excavated soil into RCRA hazardous and nonhazardous waste streams and containing lead-contaminated soils in stockpiles. Collecting and analyzing confirmation samples to ensure the cleanup level has been met. Loading lead-contaminated soil into Super Sacks for transport from Lower Camp to the airstrip.
- Chartering an aircraft from the Cape Romanzof LRRS to Anchorage. Staging Super Sacks in containers in Anchorage for transport to the TSDF. Barging and trucking containers from Anchorage to the TSDF in the contiguous United States.
- At the conclusion of site work, SR018 would be available for UU/UE. No periodic or CERCLA five-year reviews would be required, as any remaining contaminants would be at concentrations below ADEC cleanup levels.
- The approximate cost for this alternative is $0.92 million; the estimated project duration would be 13 days. However, the cost and amount are likely to vary because the weather patterns have the potential to affect project duration.

2.10 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In accordance with the NCP, the remedial alternatives were evaluated against the nine criteria described in CERCLA §21(b) and NCP §300.430(e)(9)(iii), which are described below. These alternatives were evaluated using site-specific information and sampling data, as well as professional and scientific judgment, and compiled in *Feasibility Study for SR018, Cape Romanzof Long-Range Radar Site, Alaska* (USAF 2015c). This section of the ROD profiles the relative performance of each alternative against the nine criteria, which fall into three groups—threshold, primary balancing, and modifying—and notes how each alternative compares to the other options under consideration.

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 ARARs

Balancing criteria weigh the tradeoffs between alternatives. These criteria represent the standards upon which detailed evaluation and comparative analysis of alternatives are based. In general, a high rating on one criterion can offset a low rating on another. 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 indicate whether technical and administrative issues have been met by the alternative and address the public concerns in the decision making process. Modifying criteria are listed below:

- Community acceptance
- State/support agency acceptance

Table 2-5 and the following sections summarize how well each alternative satisfies the evaluation criteria and provides a basis for comparison to the other alternatives under consideration.

Table 2-5
Screening of Alternatives for SR018

Alternative	Threshold Criteria		Primary Balancing Criteria					Modifying Criteria	
	Overall Protection of Human Health and the Environment	Compliance with ARARs	Long-Term Effectiveness and Permanence	Reduction of Toxicity, Mobility, or Volume through Treatment	Short-Term Effectiveness	Implementability	Cost (millions)	State Acceptance	Community Acceptance
Alternative 1: No Action	○	○	0	0	0	5	$0	No	No
Alternative 2: LUCs and LTM	●	●	2	0	2	4	$0.32	Yes	Yes
Alternative 3: Capping, LUCs, and LTM	●	●	3	0	2	4	$0.89	Yes	Yes
Alternative 4: Debris Removal, In Situ Soil Treatment, Capping, and LUCs	●	●	4	2	2	3	$1.08	Yes	Yes
Alternative 5: Removal and Offsite Disposal	●	●	5	0	2	3	$0.92	Yes	Yes

Notes:

● or 5 = Fully meets criterion

◐ or 1 to 4 = Somewhat meets criterion

○ or 0 = Does not meet criterion

For additional definitions, refer to the Acronyms and Abbreviations section.

2.10.1 Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether each alternative provides adequate protection and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, and/or LUCs. All of the alternatives, except the No Action alternative, are protective of human health and the environment by eliminating, reducing, or controlling risks posed by contamination at SR018. The No Action alternative does not include provisions for environmental monitoring, controlling the migration of contaminants, reducing contaminant concentrations, or preventing human or ecological exposure and therefore fails to meet the criterion. Alternatives 2 through 5 would be effective.

2.10.2 Compliance with Applicable or Relevant and Appropriate Requirements

Under CERCLA §121(d) and NCP §300.430(f)(1)(ii)(B) remedial actions at CERCLA sites are required to legally satisfy ARARs on federal and state levels unless waived under CERCLA §121(d)(4).

ARARs are divided into three categories. Chemical-specific ARARs are used to set cleanup levels that are both protective of human health and ecological receptors (18 AAC 75) during site work. Location-specific ARARs require that potential wildlife habitat, migration patterns, and negative effects on the ecosystem be considered as part of project design. Action-specific ARARs are included to highlight proper waste management procedures and provide pollution control and notification procedures in the event of a spill. ARARs, once identified, are then further classified as applicable, relevant, and appropriate, or to be considered. The ARARs for SR018 are presented in Appendix A.

Applicable requirements are cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal or state environmental regulations 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 may be applicable provided they are at least as stringent as federal requirements and are identified in a timely manner.

Relevant and appropriate requirements are cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal or state environmental regulations 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. State standards may only be relevant and appropriate if they are identified in a timely manner and are more stringent than federal requirements.

Compliance with ARARs addresses whether a remedy will meet all federal and state environmental regulations, or provides a basis for invoking a waiver. No waiver for SR018 is anticipated to be necessary; Alternatives 2, 3, 4, and 5 meet the provisions of the ARARs as shown in Appendix A, so long as they are implemented as designed (Alternatives 2, 3, and 4) and all waste streams are handled, manifested, transported, and disposed of in accordance with applicable federal and state regulations including, but not limited to RCRA, Toxic Substances Control Act, and 18 AAC 75 (Alternative 5).

The No Action alternative would result in contaminated soil remaining onsite in an uncontrolled manner. This would not be protective of human health or the environment and would not comply with ARARs.

2.10.3 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 after the selected alternative has been implemented. This criterion includes the consideration of residual risk that will remain onsite and the adequacy and reliability of controls.

The No Action alternative did not meet the two threshold criteria; therefore, it is not a viable alternative and further evaluation under this criterion is not applicable. Alternatives 2, 3, and 4 rely on the adequate implementation of LUCs, and regular maintenance and monitoring, to remain effective over the long-term. Alternatives 3 and 4 rely on the adequate implementation and regular maintenance of the cap to remain effective over the long-term. Alternative 5, once executed, would render the site immediately available for UU/UE. Thus, the long-term permanence of Alternative 5 is preferred but must be weighed against the negative implications of disrupting the environment at SR018, which would also be long-term.

2.10.4 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. Under CERCLA, there is a preference for alternatives that reduce the toxicity, mobility, and/or volume of contaminated media through treatment.

For this site, only one alternative meets the statutory preference for treatment; Alternative 4 satisfies the statutory preference for a reduction in toxicity, mobility, or volume through treatment. Under Alternative 4, a chemical stabilizer would be applied to limit the mobility and leachability of residual lead contamination in soil. The lead would remain in the soil, though it would be less bioavailable and, thus, less hazardous. Reduction in toxicity would be confirmed with post-treatment analytical laboratory testing.

2.10.5 Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the alternative and any potential adverse impacts on workers, the community, and the environment during construction and operation of the alternative.

The No Action alternative did not meet the two threshold criteria; therefore, it is not a viable alternative and further evaluation under this criterion is not applicable. Under Alternative 2, LUCs would provide moderate short-term effectiveness by eliminating the potential for

exposure to contaminants. Because of surface contamination, there is a possibility of short-term exposure risk to workers associated with construction of the soil cap as part of Alternatives 3 and 4. Short-term risks associated with cap maintenance may also present an exposure concern for future site workers. However, natural processes would not reduce lead to concentrations below the RAOs; the lead would remain indefinitely. An increased volume of fossil fuels would be necessary, which would then be released into the environment as a result of both the heavy machinery to used construct the cap and the airplane/vehicles for transportation offsite. Alternative 5 poses greater risk of exposure or potential release through the long and complex transportation chain from the Cape Romanzof LRRS to an appropriately permitted TSDF in the contiguous United States. Removal of lead-contaminated soil would be highly effective in a short timeframe. The removal of contaminated soil will be conducted by hand-shoveling, which would mitigate any negative environmental impacts. Because much of the site has previously been developed, anticipated impacts are not considered significant. The estimated two round trips between the Lower Camp and the airstrip required to implement this alternative pose a moderate risk to workers due to dangers associated with the condition of the road between the Lower Camp and the airstrip at the Cape Romanzof LRRS. Soil removal and containerization would expose site workers to lead contamination, as well as to hazards associated with shoveling. These hazards would be addressed by instituting Occupational Safety and Health Administration/Hazardous Waste Operations and Emergency Response requirements (USAF 2015c).

2.10.6 Implementability

Implementability addresses the technical and administrative feasibility of the alternative 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 did not meet the two threshold criteria; therefore, it is not a viable alternative and further evaluation under this criterion is not applicable.

The remote location of the Cape Romanzof LRRS raises the importance of this criterion. Alternatives 3 and 4 would require the mobilization of heavy equipment and personnel to the site. Alternatives 4 and 5 would require long-distance barge transportation of contaminated waste to an appropriately licensed disposal facility, which creates the potential for improper handling and spills; this risk is not present under Alternative 2. Alternative 5 is perhaps more likely to achieve the modifying criteria (state and community acceptance) because no contamination would be left onsite (USAF 2015c).

Because SR018 is within a wetland and Alternatives 3, 4, and 5 include dredging and filling of a wetland, coordination with USACE will need to be conducted, along with potentially utilizing a Nationwide Permit. Best management practices, such as silt fences and polyethylene plastic sheeting, should also be utilized to limit damage to surrounding wetlands.

2.10.7 Relative Cost

Due to the remoteness of the Cape Romanzof LRRS, the primary cost factor for any remedial action is the quantity of material that needs to be capped or the waste that needs to be transported. Alternative 2 has the lowest cost, but does not significantly lower the risk. Cost estimates for Alternatives 3 and 4 are based on the assumption that 11.1 cy (16.65 tons) of soil would be required to cap the munitions debris and lead-contaminated soil with a 10-foot by 15-foot soil cover and the maintenance of LUCs at the site. Alternative 4 has the highest cost and is difficult to implement. The cost for Alternative 5 includes shoveling, containerization, shipment, and disposal of lead-contaminated soil (USAF 2015c).

The estimated costs for each alternative are presented in Table 2-6. These estimates include labor, equipment, waste transport and disposal, laboratory analysis, sampling, re-seeding, and five-year monitoring where applicable for a period of 30 years.

Table 2-6
SR018 Alternatives Cost Summary

Alternative	Capital[1] (millions)	Present Worth Operations & Maintenance[2] (millions)	Total Present Worth Cost[3] (millions)
Alternative 1: No Action	$0	$0	$0
Alternative 2: LUCs and LTM	$0.24	$0.08	$0.32
Alternative 3: Capping, LUCs, and LTM	$0.70	$0.19	$0.89
Alternative 4: Debris Removal, In Situ Soil Treatment, Capping, and LUCs	$0.89	$0.19	$1.08
Alternative 5: Removal and Offsite Disposal	$0.92	$0	$0.92

Notes:
[1] The costs for five-year reviews conducted every five years for 30 years are incorporated into the capital cost for alternatives 2, 3, and 4. Five-year review costs were estimated at $47,428.
[2] The costs for five-year reviews are included under capital costs. O&M costs include tasks such as site inspections (Alternatives 2, 3, and 4), cap inspections, and cap maintenance (Alternatives 3 and 4) using 5% rate of return over 30 years.
[3] Costs estimated with +50%/-30% accuracy based on subcontractor quotes, construction drawings, and engineering estimates. Values include total capital costs, total annual costs, and present worth of annual costs (5 percent rate of return).
For definitions, refer to the Acronyms and Abbreviations section.

2.10.8 State/Support Agency and Land Manager Acceptance

The No Action alternative is not viable because it is not protective of human health and the environment, nor does it comply with the ARARs.

Administrative concurrence for Alternatives 2, 3, 4, and 5 is possible because the land is owned and operated by USAF; no plans exist to transfer the land, and land use is unlikely to change. Under Alternative 5, SR018 would be restored for UU/UE. CERCLA five-year reviews would not be required. ADEC concurs that, if implemented correctly, Alternatives 2, 3, 4, and 5 are protective of human health, safety, and welfare, as well as the environment and would, therefore, be eligible for approval. Alternative 5 was selected as the preferred alternative because it satisfies this criterion while more fully satisfying the short and long-term goals for SR018.

2.10.9 Community Acceptance

No comments were received from the community on the Proposed Plan (USAF 2015a). Based on the lack of response locally, it is assumed that the community accepts the selection of Alternative 5 for SR018, as presented in the Proposed Plan (USAF 2015a).

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, which are 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 contains hazardous substances, pollutants, or contaminants (typically with a potential cancer risk of 10^{-3} or greater) that act as a reservoir for migration of contamination to groundwater or air, or that act as a source for direct exposure (EPA 1991). No principal threat wastes have been identified at SR018.

2.12 SELECTED REMEDY

The remedy selected in this ROD is Alternative 5, which includes removal and offsite disposal. This remedy satisfies overall protectiveness, complies with ARAR criteria, and was the most favorable alternative with respect to short-term and long-term effectiveness. The selected remedy meets the RAOs for site SR018 as presented in Section 2.8 of this ROD.

The primary indicator of remedial action performance will be satisfying the RAOs for SR018 (see Section 2.8) and protecting human health and the environment. Performance measures are defined herein as the required actions to achieve RAOs. It is anticipated that successful implementation, O&M, and completion of the performance measures will achieve a protective and legally compliant remedy for SR018.

2.12.1 Remedy Implementation

The selected remedy under Alternative 5: Removal and Offsite Disposal is designed to (1) prevent direct contact with humans to soil containing lead in excess of 400 mg/kg, (2) minimize or eliminate direct ecological exposure to lead, and (3) reduce the potential for the lead to migrate from site soil to any groundwater, surface water, and/or sediments where human receptors could be exposed.

The following logistical coordination and manifesting activities would be required for excavation, staging, transport, and disposal of lead-contaminated soil at a licensed TSDF:

- Segregating excavated soils into RCRA hazardous and RCRA nonhazardous waste streams and containing lead-contaminated soils in stockpiles
- Collecting and analyzing confirmation samples to ensure the cleanup level has been met
- Loading lead-contaminated soil into Super Sacks for transport from Lower Camp to the airstrip
- Chartering an aircraft from the Cape Romanzof LRRS to Anchorage
- Staging Super Sacks in containers in Anchorage for transport to the TSDF
- Barging and trucking containers in Anchorage to the TSDF in the contiguous United States

2.12.2 Summary of the Rationale for the Selected Remedy

The selected remedy presented herein is to remove lead contamination and munitions debris and dispose of it offsite. The removal action will eliminate the potential for human/ecological exposure and future contaminant migration through removal and offsite disposal, remain protective of human health and the environment, and continue to achieve RAOs for SR018. This alternative passes threshold criteria, is protective of human health and the environment long-term, and is more implementable and less costly than capping, LUCs, and LTM, which would leave contamination onsite at SR018 and could cause increased erosion.

2.12.3 Description of the Selected Remedy

As the lead agency, USAF is responsible for implementing and enforcing the remedy selected herein for SR018. The Air Force Civil Engineer Center (AFCEC)/Operations Division (CZOP) remedial project manager is the point of contact.

Munitions debris and soil contaminated with lead above the ADEC Method Two cleanup level (400 mg/kg) would be excavated, staged, manifested, and transported for disposal to a RCRA-permitted chemical waste landfill capable of managing RCRA-regulated lead-contaminated soil. Soil would be excavated and staged onsite prior to transport. Approximately 8.3 cy (12.5 tons) of lead-contaminated soil remain at the site; when excavated, the amount of soil to be disposed of equates to approximately 10 cy (15 tons), adjusting for bulk factor. Analytical samples would be collected from the staged soil for waste profiling. It is anticipated that excavation activities would focus on surface soil to an 18-inch depth.

Confirmation sampling of the excavation would be required to ensure lead is no longer present at concentrations above the ADEC cleanup level. Once analytical results from confirmation samples indicate that all contaminated soil has been removed, the excavation would be backfilled.

2.12.4 Summary of Estimated Remedy Costs

The information in the cost estimate summary is based on the best available information regarding the anticipated scope of the remedial alternative. Major changes to the estimated costs are not anticipated. If changes to the estimated costs occur, they will be documented in the form of a technical memorandum made available in the Administrative Record, an Explanation of Significant Differences document, and/or a ROD amendment. Table 2-7 presents an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

Table 2-7
Cost Estimate Summary – Capital and Operation and Maintenance Costs for the Selected Remedy

Remedy	Description	Cost
Soil Removal and Offsite Disposal	Capital Cost	$917,871
	Estimated Annual Overhead and Maintenance	$0
	Estimated Present Worth Costs	$917,871

Notes:
Costs estimated with +50% / -30% accuracy based on subcontractor quotes, construction drawings, and engineering estimates.
Cost estimates for the alternative are based on site-specific conceptual designs and are expressed in 2014 dollars.
Time to achieve RAOs:13 Days

2.12.5 Expected Outcomes of the Selected Remedy

Under this alternative, the site would be restored for UU/UE. CERCLA five-year reviews would not be required with this remedy and the USAF would petition ADEC to issue a cleanup complete determination. The cleanup level for SR018, ADEC Method Two criterion (400 mg/kg for lead), is protective for residential use. Land use at the site is not anticipated to change. The time estimated for cleanup goals is 13 days from the initiation of fieldwork, which can only be performed during the summer months when snow cover has melted. Removal of the collocated lead and antimony in soils would remove the potential for lead to bioaccumulate and to be taken up into biota through the root zone for plants or by burrowing animals.

2.13 STATUTORY DETERMINATIONS

Under CERCLA §121, as required by NCP §300.430(f)(5)(ii), the lead agency must select a remedy that is protective of human health and the environment, complies with ARARs, is cost-effective, and uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes (1) a statutory preference for remedies that employ a treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes as a principal element; and (2) a bias against offsite disposal of untreated wastes.

The selected remedy for SR018 does not comply with the statutory preference for treatment as a principal element. No reduction of toxicity, mobility, or volume of waste through treatment would occur under Alternative 5.

2.13.1 Protection of Human Health and the Environment

The selected remedy, Alternative 5, will protect human health and the environment by permanently removing source contamination. RAOs will be achieved through removal and offsite disposal.

2.13.2 Compliance with Applicable or Relevant and Appropriate Requirements

Remedial actions must comply with both the federal and state ARARs presented and described in Appendix A. The selected remedy, Alternative 5, complies with the chemical-specific, location-specific, and action-specific ARARs, including RCRA (42 USC 6901), the Alaska Oil and Other Hazardous Substances Pollution Control Regulations (18 AAC 75), Alaska Air Quality Control Regulations (18 AAC 50, 15), Alaska Solid Waste Management Regulations (18 AAC 60), Alaska Hazardous Waste Regulations (18 AAC 62), Clean Water Act (33 USC 1344; 40 CFR 230), Clean Air Act (42 USC 7401, 40 CFR 230), Migratory Bird Treaty Act (50 CFR Parts 10, 20, 21), and U.S. Department of Transportation Regulations (49 CFR 170-199; 40 CFR 263). No waivers are required for the SR018 project site.

2.13.3 Cost Effectiveness

In USAF's judgment, the selected remedy is cost-effective and represents a reasonable value for the money that is to be spent. In making this determination, the following definition from 40 CFR 300.430(f)(1)(ii)(D) was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness." This determination was accomplished by evaluating the "overall effectiveness" of those alternatives that satisfy the threshold criteria, meaning that they are protective of human health and the environment and compliant with the ARARs identified for SR018. The overall effectiveness of the selected remedy for SR018 was demonstrated in the comparative analysis of alternatives (Section 2.10) and is summarized in

Table 2-8. The estimated present worth cost of the selected remedy is $917,871 (in 2014 U.S. dollars). This cost includes provisions for munitions debris and lead-contaminated soil removal and offsite disposal.

2.13.4 Utilization of Permanent Solutions and Alternative Treatment Technologies

The selected remedy, Alternative 5, provides an effective long-term solution in consideration of the type of contamination present onsite and the remote location of the Cape Romanzof LRRS. Removal and Offsite Disposal, if implemented as intended, presents an overall site remedy that protects human health, is readily implementable, and provides cost effectiveness in comparison to other alternatives.

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 based on 40 CFR 300.430(a)(1)(iii)(A). The selected remedy for SR018 does not satisfy the statutory preference for treatment of all waste streams as a principal element of remediation. No lead-contaminated soil in excess of RAOs would remain at the site, but the excavated soil would not be treated. Instead, excavated soil and munitions debris would be sent to a licensed TSDF (RCRA-regulated, when necessary) for disposal. Lead in soils would be removed from the site, but not treated because the costs would be substantially higher without a significant reduction in risk at this remote site.

Table 2-8
Cost and Effectiveness Summary

Remedy	Present Worth Cost (millions)	Long-Term Effectiveness and Permanence	Reduction of Toxicity, Mobility, or Volume Through Treatment	Short-Term Effectiveness
Removal and Offsite Disposal	$0.92	Long-term risk to human health and the environment through permanently removing source contamination.	No reduction in toxicity, mobility, or volume through treatment will occur under this alternative. Treatment technologies would be difficult to identify and costly to implement at this remote site.	During site work, exposure risks would be minimized with proper training beforehand and the use of appropriate personal protective equipment.

2.13.6 Five-Year Review Requirements

Pursuant to CERCLA §121(c) and NCP §300.430(f)(4)(ii), because the selected remedy will result in no hazardous substances, pollutants, or contaminants remaining onsite above levels that allow for UU/UE, no five-year reviews will be required.

2.14 DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for SR018 (USAF 2015c) was released for public comment in September 2015. The Proposed Plan identified Removal and Offsite Disposal as the proposed remedial action. No written or verbal comments were submitted during the public comment period. It was determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate.

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PART 3: RESPONSIVENESS SUMMARY

This section provides a summary of the public comments regarding the *Proposed Plan for Final Remedial Action for ERP SR018* (USAF 2015c). At the time of the public review period, USAF proposed Alternative 5, Removal and Offsite Disposal, to address munitions debris and lead-contaminated soil at SR018.

The state regulatory agency, ADEC, was invited to comment on the draft of the Proposed Plan, prior to the public comment period. All regulator comments on the Proposed Plan were addressed and integrated into the final version. All regulator comments on the draft ROD will also be addressed and integrated into the final version.

NCP 300.430(f)(3) establishes a number of public participation activities that the lead agency must conduct as part of the CERCLA process; these are discussed in detail in Section 2.3. The Proposed Plan (USAF 2015c) was made available to the public for public review during a 30-day public comment period that began on 23 September 2015 and lasted through 22 October 2015. Notices regarding the availability of the Proposed Plan were published in *The Delta Discovery* on 30 September and 7 October 2015. Copies of the Proposed Plan were distributed for public review and comment to several local agencies in Scammon Bay, Hooper Bay, and Chevak, Alaska. No comments were received during the public comment period. A public meeting was not requested by the community to discuss the Proposed Plan for SR018.

3.1 ORAL AND WRITTEN COMMENTS AND RESPONSES

No public comments on the SR018 2015 Proposed Plan were received.

3.2 TECHNICAL / LEGAL ISSUES

No additional technical or legal issues were identified.

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PART 4: REFERENCES

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APPENDIX A

Applicable or Relevant and Appropriate Requirements

APPENDIX A

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS SITE SR018 CAPE ROMANZOF LRRS, ALASKA

This appendix reviews potential Applicable or Relevant and Appropriate Requirements (ARARs) for SR018 at the Cape Romanzof Long-Range Radar Site (LRRS), Alaska. Under the Comprehensive Environmental Response, Compensation, and Liability Act, three types of ARARs are considered:

- Chemical-specific
- Location-specific
- Action-specific

Each ARAR has been assessed based on its applicability to the site, and categorized as applicable or relevant and appropriate. In addition, U.S. Environmental Protection Agency guidance documents identify items to be considered (TBC). TBCs are not considered legally enforceable but are evaluated along with ARARs as part of the risk assessment to set protective cleanup level targets. Table A-1 presents chemical-specific ARARs. These standards have been used to select cleanup levels appropriate to the site. Table A-2 presents location-specific ARARs and Table A-3 presents action-specific ARARs.

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CHEMICAL-SPECIFIC ARARS

Chemical-specific ARARs provide numerical cleanup values that establish acceptable contaminant concentrations that may remain following a remedial response (Table A-1). The Alaska Administrative Code (AAC), Title 18, Chapter 75, Article 3, *Oil and Hazardous Substances Pollution Control Regulations - Discharge Reporting, Cleanup, and Disposal of Oil and Other Hazardous Substances,* Method Two soil cleanup criteria (18 AAC 75.341[c] and [d]) – Tables B1 and B2) establish the applicable chemical-specific soil cleanup values (Alaska Department of Environmental Conservation [ADEC] 2016). The regulation tabulates soil cleanup criteria for lead and antimony. The standards applicable at the Cape Romanzof LRRS are for sites located in a non-arctic zone with annual precipitation of less than or equal to 40 inches.

Table A-1
Chemical-Specific ARARs

Regulation	Description	A or RA	Rationale
The Resource Conservation and Recovery Act (RCRA) of 1976 as amended by the hazardous and solid waste amendments of 1984, Subtitles C and D, other than corrective action requirements (U.S. Code, Title 42, Section 6901 [42 USC 6901])	Establishes protections and protocols for the creation and recycling of waste, including cradle to grave manifesting.	A	Excavated materials designated as waste (e.g., contaminated soils) are subject to the requirements of RCRA.
Toxic Substances Control Act, Section 403 (Code of Federal Regulations, Title 40, Section 761 [40 CFR 761])	Regulates storage and disposal requirements, including onsite storage limitations for lead wastes. Specifies notification and recordkeeping requirements for lead disposal.	A	Concentrations of lead greater than 1,200 milligrams per kilogram (mg/kg) (the residential threshold) exist at SR018. The maximum detected concentration of lead was 2,400 mg/kg (surface soil sample C-LS-CR-04-SS-107).
Alaska Oil and Other Hazardous Substance Pollution Control regulations (18 AAC 75.300 et al.)	Governs discharge of oil and hazardous substances and state cleanup requirements. Also establishes soil cleanup levels.	A	Cleanup levels for soil (18 AAC 75.340-341); methods for determination and application of cleanup levels. The site is known to be affected by a release of metals constituents. Alternative soil cleanup levels may be applied.

Notes:
A = applicable
RA = relevant and appropriate
For definitions, see the Acronyms and Abbreviations section.

LOCATION-SPECIFIC ARARS

Location-specific ARARs are restrictions developed on the conduct of activities at specific locations (Table A-2). These ARARs may restrict or preclude certain remedial actions, or they may apply only to certain portions of an installation. Location-specific factors that may require the identification of ARARs include sensitive habitats, floodplains, wetlands, endangered species habitat, fault locations, and historic or archeological resources.

Table A-2
Location-Specific ARARs

Regulation	Description	A or RA	Rationale
Bald and Golden Eagle Protection Act (16 USC 668-668c) Migratory Bird Act of 1972 (50 CFR Title Sections 10, 20 and 21)	Protects bald and golden eagles/habitat in the area and provides for permitted activities.	A	Bald or golden eagles have not been identified in the project area, but the possibility for their presence exists.
Endangered Species Act of 1973 (16 USC 1531. et seq.: 50 CFR 200; 50 CFR 402)	Provides for the protection of endangered and threatened species.	RA	Considered for possible impacts to the Spectacled eider (threatened), which may occur in this location.
Migratory Bird Treaty Act (37 Stat. 878, Ch. 45; 16 USC 703-712 (§709 has been omitted); 50 CFR Parts 10, 20, 21)	Prohibits taking or possession of any migratory bird listed, including parts, nests, or products.	A	Considered for possible impacts to birds at Cape Romanzof LRRS.
Clean Water Act – Section 404 (33 USC 1344; 40 CFR 230: Section 404(b)(1))	Establishes a program to regulate the discharge or dredged and fill material into waters of the United States, including wetlands.	A	Considered for possible impacts to wetlands at Cape Romanzof LRRS. According to the National Wetlands Inventory Wetlands Mapper, SR018 is within a freshwater emergent/scrub-shrub wetland. Several wetland areas are also located along the road from Lower Camp to the airstrip.
Alaska Solid Waste Management Regulations (18 AAC 60)	Lists the requirements for location standards of storage of solid wastes.	A	Applicable if excavation options require solid waste storage locations onsite.

Notes:
A = applicable
RA = relevant and appropriate
For definitions, see the Acronyms and Abbreviations section.

ACTION-SPECIFIC ARARS

Action-specific ARARs are requirements that apply to specific investigative or remedial actions (Table A-3). Action-specific requirements do not in themselves determine remedial alternatives; they indicate how a selected alternative must be achieved. Action-specific ARARs are refined during remedial design as specific information becomes available.

Table A-3
Action-Specific ARARs

Regulation	Description	A or RA	Rationale
Alaska Spill Reporting and Notification (18 AAC 75)	ADEC has authority for specifying sampling and analysis of soil, surface water, and groundwater resulting from the discharge of oil or a hazardous substance. ADEC has authority for specifying soil, surface water, and groundwater cleanup levels resulting from the discharge of oil or a hazardous substance.	A	18 AAC 75.355 lists requirements for sampling and analysis. 18 AAC 75.360 lists requirements for cleanup work plans.
Alaska Air Quality Control Regulations (18 AAC 50, 15) and Clean Air Act (42 USC 7401, 40 CFR 230, 33 CFR 320-330)	Regulations governing identification, prevention, abatement, and control of air pollution.	A	Cleanup methods will require the use of heavy machinery and trucks for transporting soil.
U.S. Department of Transportation Regulations (49 CFR 170-199; 40 CFR 263) Alaska Hazardous Waste Regulations (18 AAC 62)	Governs the packaging, marking, labeling, recordkeeping, transportation, and transporters of hazardous materials.	A	Monitoring and/or confirmation samples and requirements for excavated soils and wastes to be transported from the project area.
Solid Waste Management Regulations (40 CFR 257, 40 CFR 264, 49 CFR 265, 40 CFR 266, 40 CFR268, 40 CFR 270, 40 CFR 261, 40 CFR 262) Alaska Solid Waste Management Regulations (18 AAC 60)	Governs the management and transport of solid wastes generated during remedial activity. Specifies restrictions on land disposal of specific types of hazardous waste based on levels achievable by current technology.	A	Excavated soils and monitoring samples may be generated from the project area. Remedial alternatives may create contaminated media to be removed from the site. 18 AAC 60.010 lists requirements for accumulation, storage, and treatment of solid wastes. 18 AAC 60.015 lists requirements for transport of solid wastes.

Notes:
A = applicable
RA = relevant and appropriate
For definitions, see the Acronyms and Abbreviations section.

APPENDIX B

Conceptual Site Model

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Cape Romanzof LRRS SR018

Completed By: K. Daniel

Date Completed: 9/24/2015

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

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

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

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

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

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

Media	Transport Mechanisms	Exposure Media	Exposure Pathway/Route	Current & Future Receptors: Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☑ Surface Soil (0-2 ft bgs)	☑ Direct release to surface soil → check soil									
	☑ Migration to subsurface → check soil									
	☑ Migration to groundwater → check groundwater									
	☐ Volatilization → check air									
	☑ Runoff or erosion → check surface water									
	☑ Uptake by plants or animals → check biota									
	☐ Other (list):	☑ soil	☑ Incidental Soil Ingestion	C/F	C/F	C/F	C/F	C/F	C/F	
☐ Subsurface Soil (2-15 ft bgs)	☐ Direct release to subsurface soil → check soil		☐ Dermal Absorption of Contaminants from Soil							
	☐ Migration to groundwater → check groundwater		☐ Inhalation of Fugitive Dust							
	☐ Volatilization → check air									
	☐ Uptake by plants or animals → check biota									
	☐ Other (list):	☑ groundwater	☑ Ingestion of Groundwater							
☑ Ground-water	☑ Direct release to groundwater → check groundwater		☑ Dermal Absorption of Contaminants in Groundwater							
	☐ Volatilization → check air		☐ Inhalation of Volatile Compounds in Tap Water							
	☑ Flow to surface water body → check surface water	☐ air	☐ Inhalation of Outdoor Air							
	☐ Flow to sediment → check sediment		☐ Inhalation of Indoor Air							
	☑ Uptake by plants or animals → check biota		☐ Inhalation of Fugitive Dust							
	☐ Other (list):	☑ surface water	☑ Ingestion of Surface Water							
☑ Surface Water	☑ Direct release to surface water → check surface water		☐ Dermal Absorption of Contaminants in Surface Water							
	☐ Volatilization → check air		☐ Inhalation of Volatile Compounds in Tap Water							
	☑ Sedimentation → check sediment	☑ sediment	☑ Direct Contact with Sediment							
	☑ Uptake by plants or animals → check biota	☑ biota	☑ Ingestion of Wild or Farmed Foods							
	☐ Other (list):									
☐ Sediment	☐ Direct release to sediment → check sediment									
	☐ Resuspension, runoff, or erosion → check surface water									
	☑ Uptake by plants or animals → check biota									
	☐ Other (list):									

Revised, 10/01/2010

Human Health Conceptual Site Model
Scoping Form

Site Name: Cape Romanzof LRRS SR018 Former Recreational Small Arms Use Area

File Number: 2526.38.020

Completed by: E. McDonald, Jacobs Engineering

Introduction

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

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

1. General Information:

Sources *(check potential sources at the site)*

- ☐ USTs
- ☐ ASTs
- ☐ Dispensers/fuel loading racks
- ☐ Drums
- ☐ Vehicles
- ☐ Landfills
- ☐ Transformers
- ☒ Other: Expended ammunition

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

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

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

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

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

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

* bgs - below ground surface

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

a) Direct Contact -

1. Incidental Soil Ingestion

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

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

Comments:

Lead concentrations in surface soil up to 2,400 mg/kg.

2. Dermal Absorption of Contaminants from Soil

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

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

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

Comments:

b) Ingestion -

1. Ingestion of Groundwater

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

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

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

Comments:

Lead contamination is limited to surface soil up to 18 inches bgs. Nearby groundwater was found at approximately 10-20 feet bgs. Lead is unlikely to migrate to groundwater; however, the groundwater pathway remains potentially complete in the absence of information to the contrary.

2. Ingestion of Surface Water

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

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

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

Comments:

No surface water was observed at SR018; however, North Fowler (Nilumat) Creek is present downgradient and south of SR018. Although no surface water samples have been collected at SR018, the pathway remains potentially complete.

3. Ingestion of Wild and Farmed Foods

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

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

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

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

Comments:

Lead can bioaccumulate and is present within the root zone of plants and could conceivably be ingested by burrowing animals.

c) Inhalation-

1. Inhalation of Outdoor Air

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

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

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

Comments:

2. Inhalation of Indoor Air

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

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

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

Comments:

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

Dermal Exposure to Contaminants in Groundwater and Surface Water

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

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

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

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

Comments:

Inhalation of Volatile Compounds in Tap Water

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

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

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

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

Comments:

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

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

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

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

Comments:

Direct Contact with Sediment

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

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

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

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

Comments:

Fowler (Nilumat) Creek and its tributaries run through Cape Romanzof LRRS to Kokechik Bay, which is an important resource for subsistence gathering of shellfish.

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

APPENDIX C

Community Participation

Wood Bison *from page 15*

beyond. One cow has swum the Yukon and is north of Russian Mission. A few bulls also crossed the big river and almost made it to Unalakleet on the Bering Sea coast.

Seaton is pleased to see most of the bison circling back to near their introduction points near the village of Shageluk.

"One of my biggest worries was they'd go away to where they couldn't find each other again," he said. He got a bit nervous when he watched some of the collared animals dispersing as far south as the Kuskokwim River.

"But then they did a big loop back," he said. "They were just exploring. Now they know the hills, the flats, where the good vegetation is."

The quiet country where the Innoko runs next to the Yukon is now home to bulls the weight of 10 men, smaller but more numerous cows, and a few calves born on the muskeg this summer. This modest population is the only group of wood bison in the United States (plains bison that live in other areas of Alaska, the Lower 48 and Canada are a different, smaller species). Seaton expects the herd will grow to somewhere between hundreds to several thousand animals.

Wood bison were in Alaska before. Adapted to low, wet areas, wood bison lived in Yukon Flats and other areas of Alaska from about 10,000 years ago until they disappeared.

In 1991, a Fort Yukon resident told now-retired Fish and Game biologist Bob Stephenson his mother had stories about bison living near the village. Elders interviewed from 1991 - 2000 in Beaver, Birch Creek, Chalkyitsik, Fort Yukon, Venetie, Minto and Nenana shared stories of bison or at least knowledge of them. Some mentioned seeing herds of bison near Eagle, Circle and Fort Yukon in 1916 or 1917.

Stephenson knew the rare creatures existed in Canada, so he proposed re-introducing wood bison to Yukon Flats. Yukon Flats is one of three areas — along with Yukon/Innoko and Minto Flats — with ample grasses, sedges and forbs for bison.

Twenty years after Stephenson's suggestion, Seaton took over the program. Amid a blur of activity, he remembers a lot of meetings bringing people together from the three potential areas. Of the three largest habitats, Seaton focused on the Innoko River area even though it was farthest from the road system.

"Even the barge trip is 1,000 miles to get to the Innoko," he said. "But Innoko people consistently supported the project."

While people in other areas thought the introduction of bison might interfere with potential oil and gas development, Shageluk and lower Yukon residents always said yes when asked about the return of wood bison.

Seaton found that others liked the idea too. With a budget too small to get 130 animals from south of Anchorage to the middle of western Alaska, he begged for help.

Safari Club International donated $100,000 biologists used as matching funds added to federal grants for wildlife restoration. Lynden Transport discounted their C-130 bison-airlift flights by $100,000. Steelfab of Anchorage donated more than $30,000 in modifying connex containers to hold bison. Inland Barge of Nenana discounted their bison-moving odyssey on the Tanana, Yukon and Innoko rivers by $13,000.

"People stepped up in every way," Seaton said.

Why?

"I think everybody likes wood bison," he said. "People like the idea of restoring a native species to Alaska, filling that hole in the ecosystem. It's the last big animal to come back to the U.S."

Things haven't been perfect for Alaska's newest wild bison. A few animals died after relocation: some from stress, others fell through rotten spring ice. Big snowfalls or ice storms in the area could make it hard on animals that reach their food by sweeping away snow with their woolly faces. But the stately beasts are back on the landscape, in one of the few places on the globe that could accommodate them.

Since the late 1970s, the University of Alaska Fairbanks' Geophysical Institute has provided this column free in cooperation with the UAF research community. Ned Rozell is a science writer for the Geophysical Institute.

Public Comment Period
Cape Romanzof LRRS SR018 Proposed Plan

The U.S. Air Force announces the availability of the Proposed Plan for Site SR018 at the Cape Romanzof Long-Range Radar Site (LRRS). The Proposed Plan describes the site history, nature and extent of contamination, and the remedial alternatives considered as well as the preferred alternative for lead- and antimony-contaminated soil at SR018. These chemicals of concern are primarily associated with small-caliber ammunition.

The public comment period for the Proposed Plan begins 22 September 2015 and ends 21 October 2015. The U.S. Air Force encourages interested individuals to provide feedback, comments, and suggestions regarding the proposed remedies. The U.S. Air Force will accept verbal and written comments on the Proposed Plan during the 30-day public comment period, and a public meeting will be held if one is requested during the public comment period.

Copies of the Proposed Plan have been distributed to the Scammon Bay, Hooper Bay, Chevak, and Paimuit communities. Copies can also be obtained from the Air Force Restoration Project Manager, Keith Barnack, who can be reached via email at keith.barnack@us.af.mil or by telephone at 1-800-222-4137.

Chasing the Ambulance

Bethel Fire Department Calls for week ending September 25

• On 9-18-15 at 3:40 p.m. Medics responded to Standard Oil road for an intoxicated person lying in a puddle of water. On arrival medics assessed and transported the patient to the hospital.

• On 9-19-15 at 3:15 a.m. Medics responded to the area of second road housing for the report of a person bleeding from the cheek. On arrival medics assessed and transported the patient to the hospital.

• On 09-22-15 at 10:45 a.m. medics responded to Trailer Court for a report of a person who was having hard time walking. Medic assessed patient and patient transported to hospital.

• On 09-22-15 at 10:58 a.m. medics responded to Atsaq Road for the report of a person who was fallen down and was bleeding. The patient was assessed and transported to the hospital.

• On 09-23-15 at 11:40 a.m. Firefighters responded to the area of Standard road for the report of black smoke. On arrival firefighters found a pile of pallets on fire. Firefighters advised person involved that outdoor burning is closed and to get a permit.

• On 9-23-15 at 3:23 p.m. Firefighters responded to the area of City Subdivision for the report of a building fire on arrival firefighters extinguished the fire and then cleared.

• On 09-23-15 at 8:37p.m. medics responded to Sobering Center for a report of a person who was having mental health issues. Medic assessed patient and police transported to the hospital.

• On 09-24-15 at 2:06 pm medics responded to Grant Aviation for a report of a person who was unresponsive. Medic assessed patient and transported to the hospital.

• On 09-24-15 at 7:00 p.m. medics responded to the TWC for a report of a person who was huffing. Medic assessed patient and patient transported to hospital.

• On 09-25-15 at 7:18 a.m. Firefighter responded to Kilbuck School for a report of a fire alarm system activated. Firefighter investigated the report and found no signs of the smoke or fire. Firefighter returned to quarters.

The Cop Shop

Guilty in the courts

State of Alaska District Court in Bethel
September 4 - 27

Judgments

Jesse Pavilla, 21	Reckless Endangerment	90 Days
Thomas T. Andrew Jr., 40	Felony Driving Under the Influence	$10,000; 2 Yrs.
Storm Lake, 19	Coercion	2 Yrs.
William Pete, 28	4th Degree Assault	1 Yr.
Benjamin Teddy Kusaiak, 27	2nd Degree Harassment	2 Yrs. Prob.
Sherilyn Martha Gregory, 30	Driving Under the Influence, Reckless Endangerment	$1500, 10 Days, 2 Yrs. Prob.
Jeffrey Barrett Allain, 39	4th Degree Assault	310 Days, 3 Yrs. Prob.
Theodore Tinker, 44	4th Degree Assault	10 Days, 2 Yrs. Prob.
Kelsey Nayamin, 21	Disorderly Conduct	2 Days
Rose M. Olson, 52	Importing Alcohol – Dry Area	$1500,6 Days,18 Mos. Prob.
Lyle Thompson, 24	Reckless Driving	45 Days, 1 Yr. Prob.
Terrence Motgin, 26	4th Degree Misconduct Involving Weapon	5 Days, 2 Yrs. Prob.

Probation violations

Jesse Pavilla, 21	Violated Conditions of Probation	30 Days
William Pete, 28	Violated Conditions of Probation	120 Days
Peter Berlin Sr., 56	Violated Conditions of Probation	30 Days
Marlene April Bell, 28	Violated Conditions of Probation	30 Days
Kenneth Dostert, 20	Violated Conditions of Probation	

Jury Line 543-5879
Or 1-800-543-5879

Bethel DMV 543-2771

THE DELTA DISCOVERY NEWSPAPER
P.O. BOX 1028
BETHEL, AK 99559

AO/PO#_____
CASE NO. _____

Jacobs Engineering
NAME OF PETITIONER
1300 B Street, Suite 600
Anchorage, AK 99503
ADDRESS OF PETITIONER

AFFIDAVIT OF PUBLICATION

UNITED STATES OF AMERICA, STATE OF ALASKA, 4th DIVISION, BEFORE ME, THE UNDERSIGNED, A NOTARY PUBLIC THIS DAY PERSONALLY APPEARED, Kelly J. Lincoln, WHO, BEING FIRST DULY SWORN, ACCORDING TO LAW, SAYS THAT SHE IS THE Office Manager OF THE DELTA DISCOVERY NEWSPAPER, PUBLISHED IN BETHEL IN SAID DIVISION 4th AND STATE OF ALASKA AND THAT THE ADVERTISEMENT, OF WHICH THE ANNEXED IS A TRUE COPY, WAS PUBLISHED IN SAID PUBLICATION ON 9/30/15 AND THEREFORE FOR A TOTAL OF 1 CONSECUTIVE ISSUE(S). THE LAST PUBLICATION APPEARING ON 9/30/15 AND THAT THE RATE CHARGED THEREON IS NOT IN EXCESS OF THE RATE CHARGED TO PRIVATE INDIVIDUALS.

Kelly J. Lincoln
KELLY JEAN LINCOLN
OFFICE MANAGER,
THE DELTA DISCOVERY NEWSPAPER

SWORN TO ME BEFORE ON this 25th day of Sept. 2015

Notary Public
EIRLEEN R. LEE
State of Alaska
My Commission Expires July 18, 2018

Eirleen R Lee
SIGNATURE OF NOTARY

Eirleen R Lee
PRINTED NAME OF NOTARY

MY COMMISSION EXPIRES ON July 18, 2018

APPENDIX D

Responses to Comments

REVIEW COMMENTS

PROJECT: RECORD OF DECISION FOR SR018 DRAFT

LOCATION: CAPE ROMANZOF LRRS, ALASKA

ADEC		**DATE: 18 May 2016** **REVIEWER: Louis Howard** **PHONE: 907-269-7552**	**ACTION TAKEN ON COMMENT BY: Jacobs Engineering Group Inc.**	
Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	CONTRACTOR RESPONSE	ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
1.	Section 1.7, page 1-11	**Authorizing Signatures** Delete text for Kim DeRuyter referring to "Federal Facilities Section". Signature block should look similar to this: KIM DERUYTER, DSMOA Section Manager Contaminated Sites Program Alaska Department of Environmental Conservation	Agreed. "Federal Facilities Section" will be removed from the signature block.	A
2.	Section 2.7.1, page 2-17	**Human Health Risks** **Toxicity Assessment** The text states: "…detected exceedance concentrations (2,400, 800, and 590 mg/kg) to the EPA Regional Screening Level (RSL) for residential soil (400 mg/kg), which is the same as the ADEC Method Two cleanup level for residential soil." The text should state: "…detected exceedance concentrations (2,400, 800, and 590 mg/kg) to the EPA Regional Screening Level (RSL) for residential soil (400 mg/kg), which is the same as the ADEC Method Two cleanup level for residential soil (EPA 2015)." This is the first mention of RSLs in the text and should refer to the 2015 EPA reference in Part 4: References.	Agreed. The text will be changed to "…detected exceedance concentrations (2,400, 800, and 590 mg/kg) to the EPA Regional Screening Level (RSL) for residential soil (400 mg/kg), which is the same as the ADEC Method Two cleanup level for residential soil (EPA 2015)." The 'EPA 2015' reference will also be added to the reference list in Section 4.	A

ADEC		**DATE: 18 May 2016** **REVIEWER: Louis Howard** **PHONE: 907-269-7552**	**ACTION TAKEN ON COMMENT BY: Jacobs Engineering Group Inc.**	
Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	CONTRACTOR RESPONSE	ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
3.	Table 2-3, page 2-19	**Summary of Medium-Specific Primary Exposure Concentrations** **Footnote #2** The footnote states: "EPA RSL for residential soil of 400 mg/kg for lead." The footnote should state: "EPA RSL for residential soil of 400 mg/kg for lead (EPA 2015)."	Agreed. The 'EPA 2015' reference will be added. The footnote will be changed to "EPA RSL for residential soil of 400 mg/kg for lead (EPA 2015)."	A
4.	Section 2.10.1, page 2-30	**Overall Protection of Human Health and the Environment** The text states: "The No Action alternative does not include provisions for environmental monitoring, controlling the migration of contaminants, reducing contaminant concentrations, or preventing human or ecological exposure." The text should state: "The No Action alternative does not include provisions for environmental monitoring, controlling the migration of contaminants, reducing contaminant concentrations, or preventing human or ecological exposure and therefore fails to meet the criterion."	Agreed. "and therefore fails to meet the criterion" will be added to the end of the sentence. The text will be changed to: "The No Action alternative does not include provisions for environmental monitoring, controlling the migration of contaminants, reducing contaminant concentrations, or preventing human or ecological exposure and therefore fails to meet the criterion."	A

REVIEW COMMENTS

PROJECT: RECORD OF DECISION FOR SR018 DRAFT

LOCATION: CAPE ROMANZOF LRRS, ALASKA

ADEC		**DATE: 18 May 2016** **REVIEWER: Louis Howard** **PHONE: 907-269-7552**	**ACTION TAKEN ON COMMENT BY: Jacobs Engineering Group Inc.**	
Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	CONTRACTOR RESPONSE	ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
5.	Section 2.10.3, page 2-31	**Long-Term Effectiveness and Permanence** **2nd Paragraph** The first sentence prior to the discussion of alternatives 2, 3, and 4 should be as follows: "The No Action alternative did not meet the two threshold criteria; therefore, it is not a viable alternative and further evaluation under this criterion is not applicable."	Agreed. The following sentence will be added to the first paragraph on page 2-32: "The No Action alternative did not meet the two threshold criteria; therefore, it is not a viable alternative and further evaluation under this criterion is not applicable."	A
6.	Section 2.10.5, page 2-32	**Short-Term Effectiveness** The text states: "Under the No Action alternative, site contaminant levels would remain the same, site controls would not be implemented to protect potential human and ecological receptors from exposure, and the potential for contaminant migration from SR018 would continue. Therefore, the No Action alternative does not provide short-term effectiveness." The text should state: "The No Action alternative did not meet the two threshold criteria; therefore, it is not a viable alternative and further evaluation under this criterion is not applicable."	Agreed. Text will be changed to state: "The No Action alternative did not meet the two threshold criteria; therefore, it is not a viable alternative and further evaluation under this criterion is not applicable."	A

ADEC		**DATE: 18 May 2016** **REVIEWER: Louis Howard** **PHONE: 907-269-7552**	**ACTION TAKEN ON COMMENT BY: Jacobs Engineering Group Inc.**	
Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	CONTRACTOR RESPONSE	ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
7.	Section 2.10.6, page 2-33	**Implementability** The text states: "The No Action alternative is technically very easy to implement, but administrative approval is unlikely because it is not protective of human health and the environment and does not comply with ARARs or achieve RAOs." The text should state: "The No Action alternative did not meet the two threshold criteria; therefore, it is not a viable alternative and further evaluation under this criterion is not applicable."	Agreed. Text will be changed to state: "The No Action alternative did not meet the two threshold criteria; therefore, it is not a viable alternative and further evaluation under this criterion is not applicable."	A
8.	Section 2.11, page 2-36	**Principal Threat Wastes** The first sentence should state: "The NCP expects that treatment that reduces the toxicity, mobility, or volume of the principal threat wastes will be used to the extent practicable."	Agreed. The sentence "The NCP expects that treatment that reduces the toxicity, mobility, or volume of the principal threat wastes will be used to the extent practicable" will replace the sentence "No principal threat wastes have been identified at SR018" as the first paragraph of Section 2.11.	A
9.	Part 4, page 4-1	**References** Update reference to 18 AAC 75 as follows: ADEC. 2016b (April). *Oil and Other Hazardous Substances Pollution Control. Division of Spill Prevention and Response*. 18 AAC 75. Add reference to EPA RSLs: EPA Regions 3, 6, and 9. 2015 (November). *Regional Screening Levels for Chemical Contaminants at Superfund Sites.* http://www.epa.gov/risk/regional-screening-table	Agreed. References for ADEC 2016 and EPA 2015 will be updated as requested.	A

ADEC		**DATE: 18 May 2016** **REVIEWER: Louis Howard** **PHONE: 907-269-7552**	**ACTION TAKEN ON COMMENT BY: Jacobs Engineering Group Inc.**	
Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	CONTRACTOR RESPONSE	ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
10.	Appendix A, page A-1	Chemical Specific ARARs The text states: "…establish the applicable chemical-specific soil cleanup values (Alaska Department of Environmental Conservation [ADEC] 2015)." The text should state: "establish the applicable chemical-specific soil cleanup values (Alaska Department of Environmental Conservation [ADEC] 2016)." NOTE: 18 AAC 75 has been revised as of April 6, 2016.	Agreed. Reference will be updated to ADEC 2016.	A