UNITED STATES AIR FORCE

611th Civil Engineer Squadron

Record of Decision Amendment for ERP Site SS007

Cape Newenham Long Range Radar Site, Alaska

FINAL

MARCH 2020

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LIST OF ACRONYMS AND ABBREVIATIONS

ACL	alternative cleanup level
ADEC	Alaska Department of Environmental Conservation
ADNR	Alaska Department of Natural Resources
ARARs	applicable or relevant and appropriate requirements
BERA	baseline ecological risk assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
ERA	ecological risk assessment
ERP	Environmental Restoration Program
FS	Feasibility Study
FYR	Five-Year Review
HHRA	human health risk assessment
HQ	hazard quotient
ICs	institutional controls
IRA	interim remedial action
LRRS	Long Range Radar Site
LTM	long-term monitoring
LUCs	land use controls
mg/kg	milligrams per kilogram
NCP	National Contingency Plan
NPV	net present value
O&M	operations and maintenance
PCB	polychlorinated biphenyl
PP	Proposed Plan
PY	Project Year
RAO	remedial action objective
ROD	Record of Decision
SLERA	screening-level ecological risk assessment
TBC	to be considered
TRV	toxicity reference value
UCL	upper confidence limit
UECA	Uniform Environmental Covenants Act
USAF	U.S. Air Force
UU/UE	unlimited use and unrestricted exposure

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PART 1 DECLARATION

1.1 SITE NAME AND LOCATION

Cape Newenham, a small peninsula on the southwest coast of Alaska, is located on the Bering Sea, approximately 462 miles southwest of Anchorage. The installation is the location of a long-range radar dome and associated facilities operated by the U.S. Air Force (USAF). The cape is the southern terminus of the Ahklun Mountains and lies between Bristol Bay and Kuskokwim Bay (**Figure 1**). The nearest community, situated within a major hard rock mining province, is Platinum (population: 48), located 30 miles to the northwest in Goodnews Bay.

The Cape Newenham Long Range Radar Site (LRRS) is remote and can only be accessed by air or sea. The installation includes an Upper Camp, located at an elevation of approximately 2,000 feet, that houses the radar facility, and a Lower Camp, which consists of a runway, living quarters (composite building), and support facilities. The Upper and Lower Camps are connected by a gravel road and tramway. Environmental Restoration Program (ERP) Site SS007 consists of two separate areas of concern: The Upper Camp area and the Upper Mountainside area, downgradient from the Upper Camp.

1.2 STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) Amendment for Cape Newenham Site SS007 includes the original Decision Document (DD) now referred to as the ROD (USAF, 2000). The ROD, prepared in 2000 and signed March 30, 2001, for SS007 presents remedies for polychlorinated biphenyl (PCB)-contaminated soils which remain onsite and are located at: (a) the Upper Camp area beneath an earthen cap constructed in 1996, and (b) on the Upper Mountainside area downgradient of the Upper Camp.

This ROD Amendment for ERP Site SS007 at Cape Newenham LRRS, Alaska, focuses on the Upper Mountainside area and presents changes to the original remedy. The remedy was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and, to the extent practicable, the National Contingency Plan (NCP).

Additional information has emerged since the ROD was signed, and the USAF has identified changes to the original remedy for Site SS007 to address the PCB-contaminated soil remaining at the uncapped Upper Mountainside area at Site SS007. This decision is based on the Administrative Record file for this site, which will include this ROD Amendment. A copy of the Administrative Record is available online (http://afcec.publicadmin-record.us.af.mil/).

The State of Alaska concurs that the new remedy, when properly implemented, will comply with state law.

1.3 ASSESSMENT OF THE SITE

The response action selected in this ROD Amendment for Site SS007 is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

1.4 DESCRIPTION OF AMENDED REMEDY

The original ROD remedy selected for the Upper Mountainside area of Site SS007 was capping the flat area around the radar dome and adjacent parking area, long-term monitoring (LTM) with institutional controls (ICs). The original remedy did not include remedial actions to address PCB-contaminated soils on the mountainside (Upper Mountainside area). It was determined that the conditions at the Upper Mountainside area did not present unacceptable threats to either human health or the environment and because of extreme terrain (30- to 40-degree slope of loose rocks) and climatic conditions (high winds and poor visibility) (USAF, 2000). However, post-ROD investigations and a revised ecological risk assessment (ERA) (USAF, 2014b) determined that, in some locations, PCB concentrations in soil in the Upper Mountainside area presented an unacceptable level of risk to ecological receptors. The elevated PCB concentrations were detected at the Upper Mountainside area as a result of the long-term monitoring and sampling strategy for Site SS007 and are not the result of increased migration of contaminants from the capped area (Upper Camp area) (USAF, 2012). Therefore, the original remedy for Site SS007 is being amended to address the uncapped Upper Mountainside area of the site, the capped Upper Camp area does not require amendment, through the addition of the following response actions:

- **Soil Removal** – Soil removal will be conducted within the target treatment area on the uncapped, upper mountainside where PCB concentrations in soil exceed the site-specific ecological alternative cleanup level (ACL) of 160 milligrams per kilogram (mg/kg) (UASF, 2014a). Due to access and terrain challenges, manual soil removal techniques will be used and only in areas where the work can safely be accomplished. The removal will be limited to the top 2 inches of soil and is expected to be completed in one season (Project Year [PY] 1). PCB concentrations exceed the ACL in an area of approximately 0.07 acres; however, removal is technically practicable in only a portion of the impacted area. Following removal activities, confirmation surface soil sampling for PCBs will be conducted to document conditions.
- **Long-term Monitoring** – LTM sample locations for PCBs will be established in a manner that will allow the USAF to determine whether or not the leading edge of contamination is migrating downgradient (that is, establishment of a monitoring "fence" that defines the downgradient extent of PCB contamination) (USAF, 2014c). LTM will be conducted using a silt fence, in addition to a surface creep/saltation sampling device (or similar), and an airborne dust sampler. (USAF, 2014c). Surface soil sampling will be initiated in PY1 with the installation of the saltation sampler, with subsequent samples collected twice in PY2, and then once annually in PY3, PY4, and PY6 (USAF, 2014c). Additionally, during the first 5 years, to meet the remedial action objective (RAO) to prevent impacts to ecological receptors from PCB-contaminated soils above the proposed site-specific ACL (UASF, 2018), ecological monitoring will be conducted annually to confirm that the Upper Mountainside area is not being used by more sensitive receptors (i.e., Lapland longspurs or Common shrews). If no presence is observed during this 5-year period, then the USAF

will issue a note to the administrative record that documents the findings, and no further explicit monitoring for the Lapland longspur and Common shrew will be performed after consultation and agreement from the Alaska Department of Environmental Conservation (ADEC). If the small home-range receptors are identified onsite during the monitoring period, the ERA will be reviewed in consideration of the Lapland longspur and Common shrew.

- **Land use controls (LUCs)** – Residual soil contamination is not safe for human health because there are areas where the concentrations exceed 1 mg/kg. LUCs are, therefore, necessary to preclude access and to control the disposition and use of any soil excavated from the site. LUCs will be maintained until the concentration of hazardous substances in the soil are at levels that allow for unlimited use and unrestricted exposure (UU/UE). In the vicinity of the Upper Camp capped area, LUCs are currently in place for the protection of human health from concentrations of PCBs above 1 mg/kg. Under this modification, the scope and application of LUCs for SS007 will be modified to include the uncapped mountainside area where PCB concentrations in soil exceed 1 mg/kg. The expanded LUCs will include the following:
    1) Placement of warning and restricted access signs to limit human access.
    2) ICs that: prevent access to soil until soil cleanup levels have been met; maintain the integrity of any current or future remedial or monitoring system; prohibit the development and use of property for residential housing; prevent the use of contaminated soil for restricted uses in the event of excavation by requiring a site dig permit; implement a soils management plan; and conduct LTM at SS007. ICs will be incorporated into the Land Use Control Plan for SS007. These controls are in place to ensure that invasive activities are not taking place within the boundary of the sites where land use is restricted, and that ADEC and USAF approvals are obtained prior to conducting such work.
    3) Annual inspections (with photos and field observations) of the signs and control barriers will be conducted. For each annual inspection, a performance report will be sent to ADEC. At that time, the frequency of inspections and reports may be reduced after consultation with and agreement from ADEC.
    4) LUCs (Notice of Activity and Use Limitations) will be recorded in the appropriate Cape Newenham LRRS land records, including the Base Master Plan and Alaska Department of Natural Resources (ADNR) land records, pursuant to the Alaska Uniform Environmental Covenants Act (UECA). LUC boundaries will encompass all areas where soil contaminant levels pose an unacceptable risk to human health and the environment and a map designating their locations will accompany notations placed on land records.
    5) Cape Newenham LRRS has controlled access and all site visitors cleared for work at SS007 will be made aware of potential contaminant exposure hazards in the Upper Mountainside area during the mandatory visitor safety briefing.

  The USAF will be responsible for implementing, maintaining, monitoring, reporting, and enforcing the LUCs, and the LUCs will be maintained until the site is eligible for UU/UE. The USAF will inform, monitor, enforce, and bind, where appropriate, authorized lessees, tenants, contractors, and other authorized occupants of the site regarding the LUCs

affecting the site. Although the USAF may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the USAF will retain ultimate responsibility for remedy implementation and protectiveness.

The USAF will notify ADEC as soon as practicable, but no longer than 10 days after discovery, of any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the LUCs. The USAF will take prompt measures to correct the violation or deficiency and prevent its recurrence. In this notification, the USAF will identify any corrective measures it has taken or any corrective measures it plans to take and the estimated time frame for completing them. For corrective measures taken after the notification, the USAF will notify ADEC when measures are complete.

The USAF will not modify or terminate LUCs, modify land uses that might impact the effectiveness of the LUCs, take any anticipated action that might disrupt the effectiveness of the LUCs, or take any action that might alter or negate the need for LUCs without 45 days prior to the change seeking and obtaining approval from ADEC of any required ROD modification.

The USAF will monitor and inspect all site areas subject to LUCs annually.

The USAF will report annually, or as determined by the USAF and ADEC, to ADEC on the frequency, scope, and nature of the LUC monitoring activities, the results of such monitoring, and changes to the LUCs, and any corrective measures resulting from monitoring during the time period.

- **Five-Year Reviews (FYRs)** – FYRs are required by CERCLA Section 121(c) and NCP §300.430(f)(4)(ii) if a remedial action results in contaminants remaining onsite above levels that allow for UU/UE. The objective of the FYR is to ensure that remedies are, or will be, protective of human health and the environment. FYRs will be performed until the site is eligible for UU/UE.

  Due to its high toxicity and potential mobility from wind entrainment and surface runoff, the PCB-contaminated source material on the uncapped mountainside constitutes a principal threat waste. The amended remedy includes the removal of PCB-impacted soil to the extent feasible within the target treatment area. Although complete removal of all material with concentrations exceeding the ACL by manual removal is technically impracticable, LTM, periodic inspections, and FYRs will be completed to monitor and/or evaluate whether migration of PCBs from the mountainside is occurring.

1.5 STATUTORY DETERMINATIONS

The amended remedy 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 amended remedy does not satisfy the statutory preference for treatment as a principal element of the remedy because the PCB-contaminated soil will be removed, as feasible, without treatment. Treatment technologies were determined to be unfeasible for large areas at the Upper Mountainside area because of technical implementation challenges

associated with the steep slope, the site geology, and the applicability of available *ex-situ* and *in-situ* treatment options. There are no cost-effective ex-situ treatment facilities to receive excavated material for treatment and disposal.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for UU/UE, a statutory review will be conducted within 5 years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

1.6 ROD DATA CERTIFICATION CHECKLIST

The following information is included in Part 2, the Decision Summary section of this ROD Amendment, starting on Page 2-1:

- Chemicals of concern and their respective concentrations – Section 2.7.1 (Page 2-6).
- Baseline risk represented by the chemicals of concern – Section 2.7 (Page 2-5).
- Cleanup levels established for chemicals of concern and the basis for these levels – Section 2.8 (Page 2-12).
- How source materials constituting principal threats are addressed – Section 2.11 (Page 2-26).
- 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 – Section 2.6 (Page 2-5).
- Potential land and groundwater use controls that will be required as a result of the selected remedy – Section 2.12.2 (Pages 2-27 to 2-29).
- Estimated capital, annual operation and maintenance, and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected – Section 2.12.3 (Pages 2-29 to 2-30).
- Key factors that led to selecting the remedy – Section 2.12.1 (Page 2-27).

Additional information can be found in the Administrative Record file for Site SS007 at Cape Newenham LRRS.

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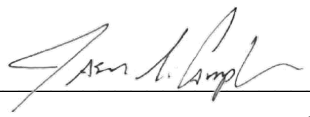
1.7 AUTHORIZING SIGNATURES

Lead Agency Selection

This signature documents the U.S. Air Force's selection of the remedy contained in the Record of Decision Amendment for Site SS007 at Cape Newenham Long Range Radar Site, Alaska.



14 May 20

JASON S. CAMPBELL, Colonel, USAF, P.E. Date

Deputy Director, Environmental Management

Air Force Civil Engineer Center

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Alaska Department of Environmental Conservation Concurrence Page

This signature sheet documents the Alaska Department of Environmental Conservation's concurrence with the selected remedy contained in the Record of Decision Amendment for Site SS007 at Cape Newenham Long Range Radar Site, Alaska; and concurs that this remedy, when properly executed, will comply with State law.

William A. O'Connell 6-18-21

for STEPHANIE BUSS

Date

Environmental Program Manager,
Alaska Department of Environmental Conservation

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PART 2 DECISION SUMMARY

The Decision Summary (Part 2) of the ROD Amendment provides an overview of the site characteristics, alternatives evaluated, and the analysis of those options. This part of the ROD Amendment also identifies the selected remedy and explains how the remedy fulfills statutory and regulatory requirements. Figures are provided at the end of this document, and references cited in this ROD Amendment are listed in **Appendix A**.

2.1 SITE NAME, LOCATION, AND DESCRIPTION

Cape Newenham, a small peninsula on the southwest coast of Alaska, is located on the Bering Sea, approximately 462 miles southwest of Anchorage **(Figure 1**). The installation is the location of a long-range radar dome and associated facilities operated by the USAF (USAF, 2014a). The cape is the southern terminus of the Ahklun Mountains and lies between Bristol Bay and Kuskokwim Bay. The nearest community, situated within a major hard rock mining province, is Platinum (population: 48), located 30 miles to the northwest in Goodnews Bay (USAF, 2014a).

In 1943, the U.S. Department of Defense (DoD) withdrew 14,282 acres at Cape Newenham for military purposes. In 1958, after construction of the LRRS was complete, the USAF relinquished all but a 1.2-mile wide, 2,347-acre strip of land that bisects the peninsula to the U.S. Department of the Interior, Bureau of Land Management (BLM). In 1969, 265,000 acres were designated the Cape Newenham National Wildlife Reserve (NWR), which was incorporated into the Togiak NWR in 1980.

The Cape Newenham LRRS is remote and can only be accessed by air or sea. The installation includes an Upper Camp, located at an elevation of approximately 2,000 feet, that houses the radar facility, and a Lower Camp, which consists of a runway, living quarters (composite building), and support facilities (**Figure 2**). The Upper and Lower Camps are connected by a gravel road and tramway. ERP Site SS007 consists of two separate areas of concern: the Upper Camp area and the Upper Mountainside area to the northwest of, and downgradient from the Upper Camp (**Figure 3**). Due to past practices, PCBs that constitute a principal threat waste remain in soils on the Upper Camp area, under the PCB cap (**Figure 4**). This ROD Amendment focuses on the Upper Mountainside area, downgradient from the Upper Camp area (**Figure 5**).

The USAF is the CERCLA lead agency, and ADEC is the lead regulatory agency for cleanup activities at Cape Newenham LRRS.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Cape Newenham LRRS was one of the first Aircraft Control and Warning sites, constructed to establish a permanent air defense system and radar coverage for Alaska's west coast. The installation was constructed in the early 1950s and became operational in 1954 (USAF, 2014a). The installation is currently active, with four on-site personnel operating and maintaining the LRRS. The current military mission of the LRRS is peacetime air surveillance as part of the Alaska Radar System of the overall North American Air Defense Mission (USAF, 2018).

From the 1950s to the 1970s, the Site SS007 Upper Camp area was used for disposal of waste oil, scrap metal, ethylene glycol, water waste from the radar units, and miscellaneous wastes. The radar dome was powered through an electrical substation approximately 20 feet to the northeast of the facility, which housed PCB-containing electrical equipment (USAF, 2014a). Environmental investigations of Site SS007 identified surface and subsurface soil contaminated with PCBs, primarily Aroclor 1260 (USAF, 2018). The contamination originates near the electrical substation and spreads out northward (Figure 3). Detailed information on the site history and environmental investigations is provided in the Site SS007 ROD (USAF, 2000). A summary of the circumstances that led to the need for this ROD Amendment is provided below.

In 1996, an interim remedial action (IRA) was completed by the USAF at Site SS007. Accessible soil on the Upper Camp plateau with PCB concentrations greater than 10 mg/kg was capped. A permeable geotextile liner was placed over the PCB-contaminated soil and then earthen material was placed on top of the liner and compacted to create the cap. The capped area includes the flat area surrounding the radar dome, the former electrical substation foundation, and the adjacent parking lot (USAF, 2014a). Human health risk assessment (HHRA) and ERA conducted after construction of the remedial cap concluded that the IRA had sufficiently reduced human health and ecological risks to acceptable levels (USAF, 2018).

After completion of the soil cap in 1996, and as part of the LTM effort, surface soil samples have been collected downslope (to the northwest of the mountainside) outside the soil cap since 1997. (USAF, 2018). Other than LTM and LUCs defined for SS007, no IRA was recommended for the mountainside area of SS007 when the Upper Camp plateau was capped in 1996 (USAF, 2000). PCB-contaminated soil located on the upper mountainside downslope from the plateau was not capped due to the extreme terrain and the fact that a cap would be difficult or impossible to maintain due to erosion processes (USAF, 2000).

The SS007 ROD, executed March 30, 2001, concludes that the remedy for Site SS007 was protective of human health and the environment (USAF, 2000). The USAF remedy for Site SS007 at Cape Newenham LRRS is the result of selection in accordance with Alaska State laws and regulations and in accordance with CERCLA, as amended by the Superfund Amendment and Reauthorization Act of 1986 (SARA) and, to the extent practicable, the NCP, where applicable (USAF, 2018). The remedy documented for the PCB-contaminated soils that remain beneath the existing earthen cap that was constructed in 1996 at the Upper Camp area is LTM with ICs. The major components of the remedy for Site SS007 are as follows:

- Annual inspection and maintenance of the existing PCB cap.
- Annual inspections of signage.
- LTM at established down-gradient locations.
- Implementation of ICs to prevent exposure to the remaining PCB-contaminated soil.

The remedy selected in the SS007 ROD did not include removal or treatment actions to address PCB-contaminated soils on the upper mountainside where PCBs exceeded the site-wide cleanup level of 1 mg/kg because of the extreme terrain (30- to 40-degree slope of loose rocks) and climatic conditions (high winds and poor visibility), which made use of machinery and work in that area unsafe (USAF, 2014a).

LTM activities have been conducted and ICs implemented at SS007 as required by the ROD. This includes monitoring of the surface soil at the established downgradient locations (UASF, 2018). Elevated PCB concentrations in soil at the Upper Mountainside area of SS007 were identified due to a change to the LTM sampling strategy; these detections are not the result of increased migration of contaminants from the capped area, but the result of changed sampling locations (USAF, 2014a). Post-ROD LTM identified PCBs in the uncapped, Upper Mountainside area soil at a maximum concentration of 308,000 mg/kg. As a result, the 2011 FYR concluded that a revised ERA was warranted to evaluate potential effects of PCBs in the uncapped mountainside soil on ecological receptors (USAF, 2012 and 2014a). The results of the revised ERA, completed in 2014, indicated that the PCB concentrations in soil in the uncapped, Upper Mountainside area posed an unacceptable risk to terrestrial carnivorous mammalian populations, represented by the least weasel, that may forage in the area (USAF, 2014b).

Based upon the revised ERA, to address ecological risks from potential exposure to PCBs in soils on the uncapped mountainside at Site SS007, additional remedial action is necessary (USAF, 2018).

2.3 COMMUNITY PARTICIPATION

In October 2018, the Proposed Plan (PP) for remedial action on the Upper Mountainside area at Site SS007 was released for public comment (USAF, 2018). The PP can be found in the Administrative Record file for Cape Newenham LRRS. The public comment period extended from 15 October 2018 to 15 November 2018. A notice was placed in *The Delta Discovery* newspaper on 17 October 2018 and 24 October 2018 inviting public comment on the PP and announcing a public meeting (**Appendix B**). No written comments were received in response to the newspaper notice.

The public meeting to discuss the PP was held in the community of Togiak on 14 November 2018, and comments received during the November 2018 public meeting were recorded. The USAF's responses to comments received at the public meeting are included in the *Responsiveness Summary*, which is Part 3 of this ROD Amendment.

2.4 SCOPE AND ROLE OF THE RESPONSE ACTION

As noted, post-ROD investigations in accordance with the established LTM for Site SS007 revealed that PCB concentrations in soil in the Upper Mountainside area present an unacceptable level of ecological risk. This ROD amendment addresses the additional information relative to conditions on the Upper Mountainside area of Site SS007 (Figures 4 and 5), where uncapped, PCB-contaminated soil poses an unacceptable risk to foraging populations of terrestrial carnivorous mammals in the area. This ROD Amendment presents the final response action for SS007 Upper Mountainside area and addresses a principal threat at the site through the manual removal of PCB-contaminated source material in the soil at specific locations.

2.5 SITE CHARACTERISTICS

The following subsections provide an overview of the Cape Newenham LRRS, including the current understanding of the nature and extent of contamination.

2.5.1 Environmental Setting

The land surface at Cape Newenham slopes steeply to the south and more gently to the north. Areas where bedrock is not present at the surface are covered in mosses or grasses, except for lower-lying regions that are protected from strong winds, which have taller bushes. The Upper Camp area at Site SS007 sits on a mountaintop at approximately a 2,000-foot elevation. The southern tip of the mountaintop consists of steep cliffs and rocky outcroppings. The north side of Upper Camp consists of a 30-degree slope of loose rock debris for approximately one-quarter mile.

Surface water from the Upper Camp drains downslope to available receiving drainages, including several small ponds. All streams that develop at the lower elevations of the LRRS drain approximately northward. The upper valley at the LRRS is the principal groundwater recharge zone, and the valley near the Lower Camp normally contains groundwater at shallow depths (3-7 feet). Two springs were previously documented approximately 2 miles north of the Upper Camp near the northwest end of the runway on roughly the east and west sides of the former drum disposal site (USAF, 1996). Drinking water at the LRRS is obtained from willow groundwater via a buried gallery system located near the south end of the runway (USAF, 2000).

Cape Newenham falls within the maritime continental climate zone, characterized by weather patterns of long, cold winters and shorter, warm summers. Summer temperatures are moderated by maritime influence from the Bering Sea, but winter temperatures are more continental in nature due to the presence of sea ice during the coldest months of the year (WRCC, 2017). Average temperatures range between 44.6 and 51.9 degrees Fahrenheit (°F) in the summer season (June through August) and between 13.6 and 23.2°F in the winter season (December through February). Extreme temperatures recorded between 1953 and 1984 at Cape Newenham were 75°F (July 1960) and -28°F (February 1954). Mean annual precipitation is 36.59 inches, which includes 76.9 inches of snow. Average monthly precipitation ranges from 1.09 to 5.88 inches, with rainfall generally highest in August and September.

2.5.2 Nature and Extent of Contamination

Previous environmental investigations conducted at Site SS007 in 1991 and 1995 identified surface and subsurface soil contaminated primarily by the PCB Aroclor 1260. The main area originates near the electrical substation and migrates northward (**Figure 4**). The uncapped PCB-contaminated soil downslope from the Upper Camp area is spread variably below the slope break across an area of approximately 0.75 acres. After completion of the soil cap in 1996, LTM was initiated and includes surface soil samples downslope outside of the cap to monitor for potential PCB migration outside of known areas of contamination. Analytical results of the surface soil samples collected at the Upper Camp have exceeded 10 mg/kg for PCBs, with the highest concentrations located downslope of the soil cap. Maximum historic concentrations have been reported at 02-UC-05 (308,000 mg/kg), 02-UC-06 (248,000 mg/kg), and 07-UC-08 (165,000 mg/kg).

While PCB concentrations in these areas vary over time, the general inability to consistently collect samples from the same locations over time precludes the ability to perform trend evaluations of the PCB contamination (USAF, 2014a). PCBs are recalcitrant compounds in the environment and are difficult to biodegrade under natural conditions. They also have a high soil sorption coefficient

(generally above 5,000), resulting in highly sorptive behavior and low mobility in soil. These qualities make PCBs persistent in the environment (USAF, 2014a). Reductions in PCB concentrations observed over time are probably more likely to be caused by physical mechanisms of natural attenuation such as dilution and photolysis as opposed to biological processes. The higher soil concentrations found in areas outside the cap reflect previously existing contamination that was detected more recently because of the randomized sampling strategy that was employed, and do not reflect increasing migration and contamination.

2.6 CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

2.6.1 Land Use

Site SS007 sits atop a plateau of one of the Ahklun Mountains. No other developed areas (residential, commercial, or recreational) exist within 1 mile of the mountaintop, except for a gravel roadway providing limited access to the composite facility and the runway. The USAF does not plan to make any changes to use of the land at ERP Site SS007 within the foreseeable future and understands that as long as contamination remains in place with ICs, the land use cannot be changed (USAF, 2014a).

2.6.2 Ground and Surface Water Uses

Groundwater recharge is assumed to occur at higher elevation areas, but groundwater has not been reported at ERP Site SS007. Drinking water for the USAF facility is collected in a gallery system along the southern end of the Runway (USAF, 2014a).

2.7 SUMMARY OF SITE RISKS

A baseline HHRA and ERA were conducted in conjunction with the 1995 Remedial Investigation (RI) (USAF, 2018). The HHRA was performed to evaluate potential health effects associated with exposure of workers, via ingestion or dermal contact, to PCBs in soils at the Upper Camp. The HHRA concluded there was no unacceptable risk to human health at that time (USAF, 1997). Potential human health risks have not been re-evaluated since the ROD and, therefore, are not described in this ROD Amendment. Details on the baseline HHRA are provided in the ROD (USAF, 2000).

The 1995 ERA evaluated risks to the least weasel and the Peale's peregrine falcon, and risk to these selected receptors was determined to be highly unlikely (USAF, 2018). Details on the baseline ERA are provided in the ROD (USAF, 2000). Subsequent LTM sampling on the uncapped mountainside identified substantially higher PCB concentrations in soil than had been previously detected; therefore, a revised ERA was conducted in 2014. The revised ERA incorporated PCB soil concentration data collected after the completion of the 2000 ROD, updated toxicity data, and changes to the exposure assumptions (USAF, 2017). The revised ERA evaluated those areas not currently under the remedial cap, which included the terrestrial area down-slope of the soil cap (the Upper Mountainside area) and aquatic areas associated with ponds and beaches farther downgradient from Site SS007 (USAF, 2014b). The revised ERA included a screening-level ERA (SLERA) and a baseline ERA (BERA), as detailed in the following sections.

2.7.1 Identification of Chemicals of Concern

The revised ERA included surface soil and sediment data collected from 1995 through 2012 (USAF, 2014b). Aroclor-1260 was the only detected constituent in most of the surface soil samples from the uncapped area; however, Aroclor-1254 was also detected in a limited number of samples. Therefore, PCBs were selected as the contaminants of concern (COCs) in surface soil at Site SS007, and all detected Aroclor results for each sample were summed and evaluated as total PCBs (USAF, 2014b). **Table 2-1** presents the occurrence and distribution of PCBs in the uncapped surface soil at the Upper Mountainside area of Site SS007.

Table 2-1 Occurrence and Distribution of Total PCBs in Uncapped Areas of Site SS007 and Downgradient Locations

Investigation Area and Matrix	Number of Detects	Number of Samples	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	Mean (mg/kg)	EPC (mg/kg)
Upper Mountainside Area Surface Soil	113	118	0.14	308,000	9,648	35,392
Ponds Sediment	2	32	0.15	2.33	0.31	0.081
Beach 1 Sediment	2	34	0.067	0.077	0.037	0.069

Key:
EPC – exposure point concentration
mg/kg – milligrams per kilogram
PCB – polychlorinated biphenyl

Source: USAF, 2014b

The results of the pond and beach sediment samples were also incorporated in the revised ERA (Table 2-1; Figure 2). Aroclor-1260 was detected in sediment samples from the ponds; therefore, PCBs were selected as the COCs for the ponds downgradient of Site SS007. Aroclor-1260 was also detected in sediment samples collected from the beach northwest of the USAF runway (Beach 1), which was sampled as part of the LTM program. Therefore, PCBs were identified as the only COCs for Beach 1. No analytes were detected in the sediment samples collected from the northwest coast of the Cape of Bird Cove, near Bird Rock, downgradient of the three ponds (Beach 2); therefore, no COCs were identified for Beach 2 and the associated data were not included in the revised ERA (USAF, 2014b).

Exposure point concentrations (EPCs) are estimated chemical concentrations that a receptor may contact and are specific to each exposure medium. The EPCs used for this ERA were dependent on the assessment being performed. For the SLERA, the maximum detected concentration was used, while the BERA used the 95 percent upper confidence limit (UCL) on the mean as the EPC (USAF, 2014b). The U.S. Environmental Protection Agency (EPA) and ADEC consider the 95 percent UCL on the mean concentration as a conservative upper-bound estimate that is not likely to underestimate the mean concentration. EPCs were calculated for each analyte using the EPA's

statistical program ProUCL, Version 4.1.01. This procedure identifies the statistical distribution type (that is, normal, lognormal, or nonparametric) for each constituent within the defined exposure area (the area of interest) and computes the corresponding 95 percent UCL for the identified distribution type (USAF, 2014b).

2.7.2 Exposure Assessment

The ecological endpoints and measures of exposure and effects identified in the revised ERA are summarized in **Table 2-2**. Detailed information on the ecology of the Upper Mountainside area, the ponds, and the beaches is provided in the revised ERA (USAF, 2014b).

2.7.3 Ecological Effects Assessment

The revised ERA considered the site-specific ecological characteristics and included use of receptor-specific assumptions to provide realistic estimates of exposure and risk (USAF, 2014b). Ecological risks were estimated for plants, invertebrates, birds, and mammals that are known to be occasionally present at or near the site.

The assumed points of surface soil exposure to terrestrial plants and invertebrates are in the Upper Mountainside area, and the assumed points of sediment exposure to aquatic plants and benthic invertebrates (collectively known as aquatic resources) are in the area of the three ponds and Beach 1 (USAF, 2014b). Aquatic plant sediment screening values are not readily available; therefore, the terrestrial plant screening value was used as a surrogate. For wildlife (birds and mammals) assumed to be exposed through the food chain, maximum surface soil and sediment samples were compared directly with a concentration-based value. The BERA refined the intentionally conservative assumptions used in the SLERA, and less conservative exposure assumptions were used to provide added reality to the exposure and risk estimates for ecological receptors (USAF, 2014b). The screening values and sources used in the BERA are provided in **Table 2-3**.

Site-specific toxicity studies or quantitative field surveys were not conducted for the BERA. Therefore, single-chemical toxicity data found in the literature were used to as the basis for the toxicity reference values (TRVs) used in the BERA (USAF, 2014b). Detailed descriptions of the selected literature and the process for identifying TRVs and other criteria used in the BERA are provided in the revised ERA (USAF, 2014b).

2.7.4 Ecological Risk Characterization

Table 2-4 provides a summary of the exposure estimates and results derived in the revised ERA. For the representative receptors using the Upper Mountainside area and potentially exposed to PCBs detected in soil, a hazard quotient (HQ) of 181 was derived for estimated exposures to terrestrial carnivorous mammalian receptors, represented by the least weasel. The calculated HQ substantially exceeds the acceptable threshold criterion of 1 (USAF, 2014b). No unacceptable ecological risks were identified for the ponds or the Beach 1 area (USAF, 2014b).

Table 2-2 Ecological Exposure Pathways of Concern

Functional Group	Assessment Endpoint	Representative Endpoints	Measure of Exposure	Measure of Effect
Upper Mountainside Area				
Terrestrial Vegetation	Survival and health of plants at the site, and potentially exposed to constituents in soil.	Various plants	Measured constituent levels in soil.	Available plant benchmarks from literature sources.
Terrestrial Invertebrates	Survival and health of terrestrial invertebrates at the site, and potentially exposed to constituents in soil.	Various terrestrial invertebrates	Measured constituent levels in soil.	Available terrestrial invertebrate benchmarks from literature sources.
Upland Raptors	Survival and health of raptors using onsite areas with suitable habitat, and potentially exposed to constituents in soil and prey items.	Rough-legged hawk	Measured constituent levels in soil; modeled constituent levels in food items.	Literature-based chronic LOAEL for bird populations.
Cliff-nesting Seabirds	Survival and health of cliff nesting seabirds using onsite areas with suitable habitat, and potentially exposed to constituents in soil.	Kittlitz's murrelet	Measured constituent levels in soil; modeled constituent levels in food items.	Literature-based chronic LOAEL for avian populations.
Carnivorous Mammals	Survival and health of carnivorous mammals using onsite areas with suitable habitat, and potentially exposed to constituents in soil and prey items.	Least weasel	Measured constituent levels in soil; modeled constituent levels in food items.	Literature-based chronic LOAEL for mammalian populations.
Ponds				
Aquatic Plants and Benthic Invertebrates	Survival and health of aquatic plants and benthic invertebrates within the ponds, and potentially exposed to constituents in sediment.	Various aquatic plants and benthic invertebrates.	Measured constituent levels in sediment.	Available sediment quality benchmarks from literature sources.

Table 2-2 (Cont.) Ecological Exposure Pathways of Concern

Functional Group	Assessment Endpoint	Representative Endpoints	Measure of Exposure	Measure of Effect
Ponds (Cont.)				
Migratory Birds	Survival and health of migratory birds using pond areas with suitable habitat, and potentially exposed to constituents in sediment and prey items.	Mallard	Measured constituent levels in sediment; modeled constituent levels in food items.	Literature-based chronic LOAEL for avian populations.
Semi-aquatic Insectivorous Mammals	Survival and health of carnivorous mammals using pond areas with suitable habitat, and potentially exposed to constituents in sediment and prey items.	Least weasel	Measured constituent levels in sediment; modeled constituent levels in food items.	Literature-based chronic LOAEL for mammalian populations.
Beach 1				
Aquatic Plants and Benthic Invertebrates	Survival and health of aquatic plants and benthic invertebrates within the beach and potentially exposed to constituents in sediment.	Various aquatic plants and benthic invertebrates	Measured constituent levels in sediment.	Available sediment quality benchmarks from literature sources.
Semi-aquatic Insectivorous Birds	Survival and health of carnivorous birds using beach with suitable habitat, and potentially exposed to constituents in sediment and prey items.	Rock sandpiper	Measured constituent levels in sediment; modeled constituent levels in food items.	Literature-based chronic LOAEL for avian populations.
Semi-aquatic Insectivorous Mammals	Survival and health of carnivorous mammals using beach with suitable habitat, and potentially exposed to constituents in sediment and prey items.	Least weasel	Measured constituent levels in sediment; modeled constituent levels in food items.	Literature-based chronic LOAEL for mammalian populations.

Key:
LOAEL – lowest observed adverse effects level

Source: USAF, 2014b

Table 2-3 Ecological Risk Screening Evaluation for Plants, Benthic Invertebrates, and Wildlife Exposed to PCBs

Investigation Area and Matrix	EPC (mg/kg)	Screening Level for Plants[1] (mg/kg)	Plant HQ	Screening Level for Terrestrial Invertebrates[2] (mg/kg)	Terrestrial Invertebrate HQ	Screening Level for Benthic Invertebrates[3] (mg/kg)	Benthic Invertebrate HQ
Upper Mountainside Area Surface Soil	35,392	40	885	500	71	NA	NA
Ponds Sediment	0.081	40	0.002	NA	NA	0.277	0.3
Beach 1 Sediment	0.069	40	0.002	NA	NA	0.189	0.4

Key:
1 – Screening level source: Efroymson et al., 1997a
2 – Screening level source: Parmelee et al., 1997b
3 – Screening level source: Freshwater (for Ponds) or marine (for Beach 1) PEL; Buchman, 2008
EPC – exposure point concentration
HQ – hazard quotient
mg/kg – milligrams per kilogram
NA – not applicable
PEL – probable effect level; the concentration above which adverse effects are expected.
PCB – polychlorinated biphenyl

Source: USAF, 2014b

Table 2-4 Hazard Quotient Summary for Wildlife Exposed to PCBs

Investigation Area and Matrix	Endpoint Representative Species	Intake (mg/kgbw-d)	NOAEL TRV-based		LOAEL TRV-based	
			NOAEL TRV (mg/kgbw-d)	HQ	LOAEL TRV (mg/kgbw-d)	HQ
Upper Mountainside Area Surface Soil	Rough-legged hawk	9.94E-02	0.09	1	1.27	0.08
	Kittlitz's murrelet	3.77E-02	0.09	0.4	1.27	0.03
	Least weasel	1.25E+02	0.14	**892**	0.69	**181**
Ponds Sediment	Mallard	1.30E-06	0.09	0.00001	1.27	0.000001
	Least weasel	1.53E-03	0.14	0.01	0.69	0.002
Beach 1 Sediment	Rock sandpiper	4.34E-02	0.09	0.5	1.27	0.03
	Least weasel	4.92E-03	0.14	0.04	0.69	0.007

Key:
HQ – hazard quotient
mg/kgbw-d – milligrams per kilogram body weight per day
NOAEL – no observed adverse effect level
LOAEL – lowest observed adverse effect level
PCB – polychlorinated biphenyl
TRV – toxicity reference value

Bold – HQ exceeds the screening criterion of 1.

Source: USAF, 2014b

In the 2014 Feasibility Study (FS), a site-specific ACL was derived using the same ecological exposure and toxicity assumptions and food web model as the revised ERA, ADEC 18 Alaska Administrative Code (AAC) 75.340(f) method four (USAF, 2018). The ACL is intended to be protective of mammalian ecological receptors, as represented by the least weasel. Potential ACLs ranging from 160 mg/kg to 2,040 mg/kg were calculated to correspond to a HQ of 1 when using either low (no observed adverse effect levels [NOAEL]-based) TRVs or high (lowest observed adverse effect levels-based [LOAEL]) TRVs. The lower end of this range (160 mg/kg for total PCBs) was identified as the recommended ACL for the Upper Mountainside area of Site SS007. Addressing concentrations greater than 160 mg/kg will attain residual site soil concentrations indicative of acceptable risk levels (NOAEL-based HQ less than or equal to the criterion of 1) (USAF, 2014a).

2.7.5 Basis for Action

The response action selected in this ROD Amendment is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment. Residual PCB concentrations in soil in the Upper Mountainside area of Site SS007 pose an unacceptable risk to terrestrial carnivorous mammalian populations that may forage in this area (USAF, 2014b).

2.8 REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) provide a general description of what the cleanup will accomplish and serve as the design basis for the remedial alternatives evaluated in this ROD Amendment. RAOs are media-specific or site-specific goals for protecting human health and the environment that are established based on the nature and extent of the contamination, the resources that are currently and potentially threatened, and the potential for human and environmental exposure. The RAOs developed for the uncapped, Upper Mountainside area of Site SS007 are as follows:

1. Protect site workers from direct contact, ingestion, and inhalation of PCB-contaminated soils.
2. Prevent impacts to ecological receptors from ingestion or direct contact with PCB-contaminated soils above the site-specific ACL of 160 mg/kg.
3. Prevent migration of PCB contamination that would result in downgradient soil, surface water, or groundwater contamination.

The SS007 ROD provides the results of a baseline HHRA to evaluate the effects of exposure of contract workers to PCBs at the site. Human health exposure pathways are reduced for Site SS007 through site-wide LUCs that include placement of warning signs and restricted access signs, soil excavation, use, and transport restrictions, and annual LUC inspections. The basis for taking additional action on the uncapped mountainside at Site SS007 is to ensure the protection of ecological receptors, represented by the least weasel (USAF, 2018).

2.9 DESCRIPTION OF ALTERNATIVES

In 2000, a decision document (ROD) was completed to identify the remedy for Site SS007 (USAF, 2000). The remedy selected under CERCLA was LTM with ICs. The major components of the original Site SS007 remedy are as follows:

- Annual inspection and maintenance of the existing PCB cap.
- Annual inspections of signage.
- LTM at established down-gradient locations.
- Implementation of ICs to prevent exposure to the remaining PCB-contaminated soil.

LTM of soil and sediment at down-gradient locations was to be performed to ensure that PCB-contaminated soils were not migrating offsite. The ICs were to include the following: placement of warning and restricted access signs to limit human access; establishment of restrictions on land use to prevent excavation and maintain the integrity of the cap; and a notation of the land use restrictions on land records and in the facility master plan (USAF, 2000).

The remedy selected in 2000 did not include actions to address PCB-contaminated soils on the upper mountainside because of extreme terrain (30- to 40-degree slope of loose rocks) and climatic conditions (high winds and poor visibility). However, post-ROD investigations identified that PCB concentrations in soil in the Upper Mountainside area present an unacceptable level of risk to ecological receptors (USAF, 2014b). In 2014, a FS was conducted to identify remedial alternatives to address the PCB-contaminated soil in the Upper Mountainside area of Site SS007 (USAF, 2014a). The FS evaluated four remedial alternatives designed to address risks to ecological receptors from the PCB-contaminated soil in the Upper Mountainside area. The remedial alternatives are listed in **Table 2-5** and are described below.

Table 2-5 Summary of Remedial Alternatives (Upper Mountainside Area)

Alternative	Name	Description
1	No Action	The remedy selected in the 2000 Record of Decision (LTM with ICs) would remain unchanged. No further action would be taken on the uncapped, Upper Mountainside area.
2	Removal, LTM, and LUCs	Soil removal where PCB concentrations exceed the proposed site-specific ecological ACL of 160 mg/kg within the target treatment area; LTM; LUCs; and FYRs.
3	Capping, LTM, and LUCs	Installation of a gravel cap where PCB concentrations exceed the proposed site-specific ecological ACL of 160 mg/kg within the target treatment area; LTM; LUCs; and FYRs.
4	Removal, Capping, LTM, and LUCs	A combined approach of removal (Alternative 2) and capping (Alternative 3) within the target treatment area; LTM; LUCs; and FYRs.

Key:
ACL – alternative cleanup level
ICs – institutional controls
FYRs – Five-Year Reviews
LTM – long-term monitoring
LUCs – land use controls
mg/kg – milligrams per kilogram
PCB – polychlorinated biphenyl

2.9.1 Description of Remedy Components

This section describes the major components of each of the four alternatives evaluated in the FS.

Alternative 1: No Action – Alternative 1 consists of taking no further action on the uncapped, Upper Mountainside area. This alternative serves as a baseline for evaluating the other project alternatives, as required by the NCP. No additional actions would be taken to address the ecological risks posed by the uncapped, PCB-contaminated soil at the Upper Mountainside area. The major components of Alternative 1 are as follows:

- Annual inspection and maintenance of the existing PCB cap.
- Annual inspections of signage.
- LTM at established down-gradient locations.
- Implementation of ICs on the capped area of the Upper Camp plateau.

Alternative 2: Removal, LTM, and LUCs – Alternative 2 consists of removing soil from the Upper Mountainside area where PCB concentrations exceed the site-specific ACL of 160 mg/kg. The major components of Alternative 2 are as follows:

- **Soil Removal** – Soil removal will be conducted within the target treatment area on the uncapped, upper mountainside where PCB concentrations in soil exceed the site-specific ecological ACL of 160 mg/kg (UASF, 2014a). Due to access and terrain challenges, manual soil removal techniques will be used and only in areas where the work can safely be accomplished because bedrock is willow and medium-to-large sized boulders dominate the uncapped mountainside area. The removal will be limited to the top 2 inches of soil and is expected to be completed in one season (PY 1). PCB concentrations exceed the ACL in an area of approximately 0.07 acres; however, removal is technically practicable in only a portion of the impacted area. Excavated soil will be properly containerized and disposed of offsite at an appropriate landfill.
- **LTM** – LTM sample locations for PCBs will be established in a manner that will allow the USAF to determine whether or not the leading edge of contamination is migrating downgradient (that is, establishment of a monitoring "fence" that defines the downgradient extent of PCB contamination) (USAF, 2014c). LTM will be conducted using a silt fence, in addition to a surface creep/saltation sampling device (or similar), and an airborne dust sampler. (USAF, 2014c). Surface soil sampling will be initiated in PY1 with the installation of the saltation sampler, with subsequent samples collected twice in PY2, and then once annually in PY3, PY4 and PY6 (USAF, 2014c). Additionally, during the first 5 years, to meet the RAO to prevent impacts to ecological receptors from PCB-contaminated soils above the proposed site-specific ACL (UASF, 2018), ecological monitoring will be conducted annually to confirm that the Upper Mountainside area is not being used by more sensitive receptors (i.e., Lapland longspurs or Common shrews). If no presence is observed during this 5-year period, then the USAF will issue a note to the administrative record that documents the findings, and no further explicit monitoring for the Lapland longspur and Common shrew will be performed after consultation and agreement from ADEC. If the

small home-range receptors are identified onsite during the monitoring period, the ERA will be reviewed in consideration of the Lapland longspur and Common shrew.

- **LUCs** – Residual soil contamination is not safe for human health. LUCs are therefore necessary to preclude access and to control the disposition and use of any soil excavated from the site. In the vicinity of the capped area, LUCs are currently in place for the protection of human health from concentrations of PCBs above 1 mg/kg. Under this modification, the scope and application of LUCs for SS007 will be modified to include the uncapped mountainside area where PCB concentrations in soil exceed 1 mg/kg. The expanded LUCs will include the following:
    1) Placement of warning and restricted access signs to limit human access.
    2) ICs that: prevent access to soil until soil cleanup levels have been met; maintain the integrity of any current or future remedial or monitoring system; prohibit the development and use of property for residential housing; prevent the use of contaminated soil for restricted uses in the event of excavation by requiring a site dig permit; implement a soils management plan; and conduct LTM at SS007. ICs will be incorporated into the Land Use Control Plan for SS007. These controls are in place to ensure that invasive activities are not taking place within the boundary of the sites where land use is restricted, and that ADEC and USAF approvals are obtained prior to conducting such work.
    3) Annual inspections (with photos and field observations) of the signs and control barriers will be conducted. When available, performance reports would be submitted to ADEC for the first 5 years, followed by a FYR. At that time, the frequency of inspections and reports may be reduced after consultation with and agreement from ADEC.
    4) LUCs (Notice of Activity and Use Limitations) will be recorded in the appropriate Cape Newenham LRRS land records, including the Base Master Plan and ADNR land records, pursuant to the AK UECA. LUC boundaries will encompass all areas where soil contaminant levels pose an unacceptable risk to human health and the environment and a map designating their locations will accompany notations placed on land records.
    5) Cape Newenham LRRS has controlled access and all site visitors cleared for work at SS007 will be made aware of potential contaminant exposure hazards in the Upper Mountainside area during the mandatory visitor safety briefing.

  The USAF will be responsible for implementing, maintaining, monitoring, reporting, and enforcing the LUCs, and the LUCs will be maintained until the site is eligible for UU/UE. The USAF will inform, monitor, enforce, and bind, where appropriate, authorized lessees, tenants, contractors, and other authorized occupants of the site regarding the LUCs affecting the site. Although the USAF may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the USAF will retain ultimate responsibility for remedy implementation and protectiveness.

  The USAF will notify ADEC as soon as practicable, but no longer than 10 days after discovery, of any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the LUCs. The USAF will

take prompt measures to correct the violation or deficiency and prevent its recurrence. In this notification, the USAF will identify any corrective measures it has taken or any corrective measures it plans to take and the estimated time frame for completing them. For corrective measures taken after the notification, the USAF will notify ADEC when measures are complete.

The USAF will not modify or terminate LUCs, modify land uses that might impact the effectiveness of the LUCs, take any anticipated action that might disrupt the effectiveness of the LUCs, or take any action that might alter or negate the need for LUCs without 45 days prior to the change seeking and obtaining approval from ADEC of any require ROD modification.

The USAF will monitor and inspect all site areas subject to LUCs annually.

The USAF will report annually, or as determined by the USAF and ADEC, to ADEC on the frequency, scope, and nature of the LUC monitoring activities, the results of such monitoring, and changes to the LUCs, and any corrective measures resulting from monitoring during the time period.

- **FYRs** – FYRs are required by CERCLA Section 121(c) and NCP §300.430(f)(4)(ii) if a remedial action results in contaminants remaining onsite above levels that allow for UU/UE. The objective of the FYR is to ensure that remedies are, or will be, protective of human health and the environment. FYRs will be performed until the site is eligible for UU/UE.

Alternative 3: Capping, LTM, and LUCs – Alternative 3 includes the installation of a gravel cap over soil where PCB concentrations exceed the site-specific ecological ACL of 160 mg/kg. The major components of Alternative 3 are as follows:

- **Capping** – Approximately 6 inches of gravel would be installed over the target treatment area (approximately 0.07 acres) using small construction equipment and manual tools, totaling approximately 52.8 cubic yards of material. Since mobility to groundwater and leaching are not concerns to be addressed by the surface cap, an impermeable membrane would not be installed. Coarse gravel was selected as an appropriate material to prevent exposure to contaminated soil and to prevent migration of contaminated soil away from the mountainside. For cost estimating purposes, gravel replacement is assumed to be required every 5 years. If cap erosion is observed during LTM events or periodic inspections, actions would be taken to repair it. The time required to complete capping activities is one season (PY1). Cap replacement is assumed to occur every 5 years, beginning in PY5.
- **LUCs** – LUCs currently in place for SS007 would be expanded to include the Upper Mountainside area where PCB concentrations in soil exceed 1 mg/kg. The expanded LUCs would include warning and restricted access signage, soil disturbance restrictions, and annual LUC inspections, as detailed in Alternative 2. The USAF would be responsible for implementing and enforcing the LUCs, and the LUCs would be maintained until the site is eligible for UU/UE.
- **LTM** – LTM, including surface soil sampling, would be performed to understand contaminant behavior and to evaluate potential migration and ecological monitoring would

be conducted to determine if the Upper Mountainside area is being used by more sensitive receptors (i.e., Lapland longspurs and Common shrews). Details on the LTM and ecological monitoring are provided under Alternative 2.

- **FYRs** – FYRs are required by CERCLA Section 121(c) and NCP §300.430(f)(4)(ii) if a remedial action results in contaminants remaining onsite above levels that allow for UU/UE. The objective of the FYR is to ensure that remedies are, or will be, protective of human health and the environment. FYRs would be performed until the site is eligible for UU/UE.

Alternative 4: Removal, Capping, LTM, and LUCs – Alternative 4 proposes a combined approach of removal (Alternative 2) and capping (Alternative 3). The major components of Alternative 4 are as follows:

- **Soil Removal** – Soil removal would be conducted within the target treatment area on the uncapped, upper mountainside where PCB concentrations exceed the site-specific ecological ACL of 160 mg/kg (Figure 5). Manual soil removal techniques would be used. The removal would be limited to the top 2 inches of soil and is expected to be completed in one season (PY 1). PCB concentrations exceed the ACL in an area of approximately 0.07 acres; however, removal is technically practicable in only a portion of the impacted area.
- **Capping** – Approximately 6 inches of gravel would be installed over the target treatment area (approximately 0.07 acres) using small construction equipment and manual tools, totaling approximately 52.8 cubic yards of material. Since mobility to groundwater and leaching are not concerns to be addressed by the surface cap, an impermeable membrane will not be installed. Coarse gravel was selected as an appropriate material to prevent exposure to contaminated soil and to prevent migration of contaminated soil away from the mountainside. For cost estimating purposes, gravel replacement is assumed to be required every 5 years. If cap erosion is observed during LTM events or periodic inspections, actions would be taken to repair it. The time required to complete capping activities is one season (PY1). Cap replacement is assumed to occur every 5 years, beginning in PY5.
- **LUCs** – LUCs currently in place for SS007 would be expanded to include the Upper Mountainside area where PCB concentrations in soil exceed 1 mg/kg. The expanded LUCs will include warning and restricted access signage, soil disturbance restrictions, and annual LUC inspections, as detailed in Alternative 2. The USAF would be responsible for implementing and enforcing the LUCs, and the LUCs would be maintained until the site is eligible for UU/UE.
- **LTM** – LTM, including surface soil sampling, would be performed to understand contaminant behavior and to evaluate potential migration and ecological monitoring would be conducted to determine if the Upper Mountainside area is being used by more sensitive receptors (i.e., Lapland longspurs and Common shrews). Details on the LTM and ecological monitoring are provided under Alternative 2.
- **FYRs** – FYRs are required by CERCLA Section 121(c) and NCP §300.430(f)(4)(ii) if a remedial action results in contaminants remaining onsite above levels that allow for

UU/UE. The objective of the FYR is to ensure that remedies are, or will be, protective of human health and the environment. FYRs would be performed until the site is eligible for UU/UE.

2.9.2 Common Elements and Distinguishing Features of Each Alternative

There are several common elements among the identified alternatives. The following elements are included in all identified alternatives except as noted below:

- LTM to understand contaminant behavior and evaluate potential migration. This element is included in the No Action Alternative (Alternative 1); however, Alternatives 2, 3, and 4 include ecological monitoring to determine if the Upper Mountainside area is being used by more sensitive receptors in addition to surface soil sampling.
- Expansion of LUCs to include the Upper Mountainside area of Site SS007 under Alternatives 2, 3, and 4. The No Action Alternative (Alternative 1) includes ICs on the Upper Camp plateau area only, but does not include the expansion of the LUCs to the Upper Mountainside area.
- FYRs to evaluate remedy protectiveness.

In addition, all alternatives except the No Action alternative would comply with Federal and State requirements that are applicable or relevant and appropriate. The identified alternatives also have the following distinguishing features:

- Alternative 1 requires cap inspection, maintenance, repair, and possible replacement of the existing cap and does not address ecological risks identified by the 2014 revised ERA.
- Alternatives 3 and 4 require ongoing cap inspections, cap maintenance/repair, and cap replacement for the Upper Mountainside area, in addition to the existing cap.

2.9.3 Expected Outcomes of Each Alternative

The expected outcome of all alternatives except Alternative 1 (no action) would be achievement of RAOs, which would protect site workers and ecological receptors from unacceptable risk from exposure to PCB-contaminated soils, as well as prevent surface water or groundwater impacts from downgradient migration of PCB contamination.

2.10 COMPARATIVE ANALYSIS OF ALTERNATIVES

This section of the ROD Amendment summarizes the comparative analysis of alternatives that was presented in the detailed analysis section of the FS (USAF, 2014a). The four alternatives were evaluated individually and against each other based on nine criteria identified in CERCLA Section 121(b) and the NCP Section 300.430(f)(5)(i). These criteria provide grounds for comparison of the relative performance of the alternatives and identify their advantages and disadvantages. Evaluating against the nine criteria provides sufficient information to adequately compare the alternatives and to eventually select the most appropriate approach for a site.

The nine criteria are divided into three groups: threshold criteria, balancing criteria, and modifying criteria. *Threshold* criteria must be achieved by an alternative for it to be eligible for further

consideration and analyses. *Balancing* and *modifying* criteria are then used to establish the rationale for choosing the most appropriate alternative. The results of this evaluation are used to identify a selected remedy. The relative performance of each alternative, when compared to the nine criteria, and how it compares to the other alternatives under consideration, are discussed in the following subsections and summarized in **Table 2-6**.

Table 2-6 Remedial Alternatives Comparative Evaluation

Criteria	Alternative			
	1	2	3	4
	No Action	Removal, LTM, and LUCs	Capping, LTM, and LUCs	Removal, Capping, LTM, and LUCs
Threshold Criteria				
Protection of Human Health & Environment	No	Yes	Yes	Yes
Compliance with ARARs	No	Yes	Yes	Yes
Primary Balancing Criteria				
Long-term Effectiveness & Permanence	None	Medium	High	High
Reduction in Toxicity, Mobility, or Volume through Treatment	N/A	N/A	N/A	N/A
Short-term Effectiveness	High	Medium	Medium	Medium
Implementability	High	Medium	Medium	Medium
Estimated Costs[1] ($ Million)				
Capital Costs	$0	$1.62	$1.11	$2.02
Operations and Maintenance Costs	$0	$0.37	$3.59	$3.59
Total Costs (30 Years)	$0	$1.99	$4.71	$5.61
Modifying Criteria				
State/Support Agency Acceptance	Unacceptable	Acceptable	Acceptable	Acceptable
Community Acceptance	Unacceptable	Acceptable	Acceptable	Acceptable

Key:
1 – Present value costs (USAF, 2014a)
ARARs – applicable or relevant and appropriate requirements
LTM – long-term monitoring
LUC – LUC
N/A – not applicable

2.10.1 Overall Protection of Human Health and the Environment

Overall protection of human health and the environment is the first threshold criterion. This criterion addresses whether each alternative provides adequate protection of human health and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or ICs.

Alternative 1 is not considered protective of the environment because no action would be taken to minimize risks to ecological receptors. Alternatives 2, 3, and 4 are protective of human health and the environment because all known soil exposure pathways would be restricted by existing LUCs, the implementation of expanded LUCs, and the existing soil cap. In addition, ecological monitoring would be performed to evaluate potential impacts to sensitive receptors. Alternatives 2 and 4 include removal, to the extent practicable, of PCB-contaminated soil from the Upper Mountainside area; however, complete removal of the impacted soil is not feasible. Alternatives 3 and 4 would provide protection from exposure because the cap would minimize direct contact with PCB-contaminated soil; however, perpetual cap maintenance and replacement would be required to ensure total protectiveness. Alternative 4 would provide the greatest degree of protection because this alternative includes both removal and capping of PCB-contaminated soil.

2.10.2 Compliance with Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA and NCP §300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations, which are collectively referred to as "applicable or relevant and appropriate requirements (ARARs)," unless such ARARs are waived under CERCLA section 121(d)(4). Criteria to be considered (TBC) are non-promulgated advisories or guidance issued by Federal or State government that are not legally binding and do not have the status of potential ARARs. However, in many circumstances, TBCs are considered along with ARARs.

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

Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting 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 that their use is well suited to the particular site. Only those state standards that are identified in a timely manner and are more stringent than federal requirements may be relevant and appropriate.

ARARs fall into three categories: chemical-specific, location-specific, and action-specific. *Chemical-specific* ARARs are health-based or risk-management-based numbers that provide concentration limits for the occurrence of a chemical in the environment at agreed-upon points of compliance. *Location-specific* ARARs restrict activities in certain sensitive environments. *Action-specific* ARARs are activity-based or technology-based, and typically control remedial activities that generate hazardous wastes (such as with those covered under Resource Conservation and Recovery Act [RCRA]). Offsite shipment, treatment, and disposal of excavated contaminated soil invoke action-specific ARARs. **Table 2-7** summarizes the ARARs for the remedial alternatives, as defined in the FS (USAF, 2014a).

Compliance with ARARs addresses whether an alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the site. Compliance with ARARs is the second threshold criterion. This criterion identifies whether a remedy will meet all the ARARs or provide the basis for invoking a waiver.

Alternative 1 (No Action) would not be compliant with ARARs, as no action would be taken to address ecological risks associated with soil at the Upper Mountainside area. Remedial actions under Alternatives 2, 3, and 4 would be designed and implemented to be compliant with location- and action-specific ARARs. A site-specific ACL is proposed for the uncapped mountainside to be protective of ecological receptors and would be compliant with chemical-specific ARARs.

2.10.3 Long-Term Effectiveness and Permanence

The long-term effectiveness and permanence criterion is one of the primary balancing criteria. This criterion refers to the expected residual risk and evaluates the ability of a remedy to maintain reliable protection of human health and the environment over time, once RAOs have been met. This criterion also includes the consideration of residual risk that will remain onsite following remediation and the adequacy and reliability of controls.

PCBs are recalcitrant compounds in the environment and are difficult to biodegrade under natural conditions. Given that natural attenuation is not a mechanism for PCBs in soil, Alternative 1 has no long-term effectiveness, and is rated **None**. Alternatives 2, 3, and 4 are considered to have moderate to good long-term effectiveness because the adequacy and reliability of LUCs, soil removal, and engineered caps are proven to prevent exposure to contaminated soil. Manual techniques and the prevalence of large boulders may limit complete removal of residual PCBs, and some inaccessible small amounts may remain in place; therefore, Alternative 2 is considered to have moderate long-term effectiveness and is rated **Medium**. The surface cap installed as part of Alternatives 3 and 4 would further prevent exposure and would mitigate any potential for offsite migration of residual PCBs; therefore, these alternatives are rated **High**.

LTM would assist in evaluating the reliability of controls and whether PCBs are migrating downgradient of the mountainside. Periodic inspections would also evaluate the condition of the cap, and gravel replacement would be completed to make sure the cap is protective. FYRs, as required under Alternatives 2, 3, and 4, would be necessary to evaluate the effectiveness of the selected alternative because hazardous substances will remain onsite in concentrations above concentrations that allow for UU/UE.

Table 2-7 Description of ARARs

Source	Standard, Requirement, Criterion, Limitation	Description of Standard	Status	Comment
Chemical-Specific ARAR				
ADEC, Oil and Other Hazardous Substances Pollution Control	18 AAC 75.340 and 75.341, Soil Cleanup Levels; General Requirements and Tables	This regulation provides PCB soil cleanup levels and a process to develop alternative PCB soil cleanup levels, if appropriate. The applicable EPA rule governing disposal and cleanup of PCB contaminated facilities under 40 CFR Part 761.61 (PCB remediation waste) may apply to PCB cleanup at a contaminated site. The PCB cleanup levels listed in Table B-1 are based on cleanup levels referred to in 40 CFR 761.61 for high occupancy areas with no cap. PCBs in soil may be cleaned up to between 1 and 10 mg/kg if the responsible person: (i) caps the area containing PCBs in soil at levels between 1 and 10 mg/kg and (ii) provides documentation that a deed notation or other appropriate instrument has been recorded.	Applicable	Applicable regarding the cleanup and disposal of contaminated materials, including PCBs.
ADEC, Water Quality Standards	18 AAC 70.020	There may be no concentrations of toxic substances in water or in shoreline or bottom sediments, that, singly or in combination, cause, or reasonably can be expected to cause, adverse effects on aquatic life or produce undesirable or nuisance aquatic life, except as authorized by this chapter.	Applicable	Federally promulgated water quality standards for the State of Alaska regarding toxic substances, including human health criteria and aquatic life criteria, are found at 40 CFR 131.36, which are incorporated by reference in this section. 18 AAC 70.020 includes PCBs in the definition of "toxic substances".
Location-Specific ARAR				
Endangered Species Action of 1973	16 USC 1536(1)(2) and (c); 16 USC 1538(a)(1)	Prohibits actions that jeopardize the continued existence of any listed species, results in the destruction or adverse modification of designated habitat of such species (1536) or results in a "taking" of any list species (1538).	Applicable if listed species or critical habitat is identified.	Site SS007 is adjacent to the habitat of several endangered species (spectacled and Stellar's eiders, short-tailed albatross, and Stellar sea lion). Section 7 of this act requires consultation with the USFWS and/or National Marine Fisheries Service. Though on-site actions are not required to meet the administrative or procedural requirements of the Act (e.g., consultation), consultation will be completed, as needed, to verify compliance with substantive requirements if listed or critical habitat is identified.
Migratory Bird Treaty Act	16 USC 703-712	Prohibits the taking, possessing, buying, selling, or bartering of any migratory bird, including feathers, or other parts, nest, eggs, or products, except as allowed by regulations. This includes disturbing nesting birds.	Applicable if migratory birds are identified during the action.	Migratory birds are known to pass over the area, although no nesting habitats are believed to exist on site.

Table 2-7 (Cont.) Description of ARARs

Source	Standard, Requirement, Criterion, Limitation	Description of Standard	Status	Comment
Action-Specific ARAR				
TSCA	40 CFR 761.61	Regulates the cleanup and disposal of PCB remediation waste.	Applicable	Because contamination at the site was pre-1987, there are no established cleanup levels for the site under TSCA, Subpart G. Alaska PCB soil cleanup levels are in 18 AAC 75.
ADEC, Oil and Other Hazardous Substances Pollution Control	18 AAC 75.375, ICs	Regulates when ICs are needed and identifies what types of institutional controls may be used.	Applicable	Alternatives that implement ICs will consider this guidance. ICs are in place as part of the current remedy.
ADEC, Final Guidance on Using ICs in Oil and Other Hazardous Substance Cleanups	February 2011	Provides guidance on various types of ICs that may be used and the basic steps in creating, tracking and removing them.	Applicable	Alternatives that implement ICs will consider this guidance. ICs are in place as part of the current remedy.
Oil Pollution Prevention	40 CFR 112	Governs management of oil or fuels greater than 1,320 gallons, if held in containers 55 gallons or larger. Requirements include implementation of spill prevention procedures and spill response procedures.	Applicable, if >1,320 gallons of oil are managed; relevant and appropriate if <1,320 gallons of oil are managed.	If oil or oil-based compounds are managed during the remediation (e.g. for fueling of excavation equipment), then the design and management requirements of this rule would apply.
Offsite Disposal of Wastes from Site Remediation, CERCLA Off-Site Rule	40 CFR 300.440	Any waste from a CERCLA site that is disposed of off-site must be sent to a facility reviewed by the EPA under the Off-Site Rule, once a decision document is signed for the waste (e.g., ROD, Action Memo). The concentrations in the waste may be extremely low, but the waste must still go to an Off-Site Rule EPA-approved facility.	Applicable if wastes are disposed of off-site.	Applicable to alternatives that implement removal of PCB-contaminated soil and subsequent disposal at an offsite landfill.

Table 2-7 (Cont.) Description of ARARs

Source	Standard, Requirement, Criterion, Limitation	Description of Standard	Status	Comment
Action-Specific ARAR (Cont.)				
ADEC Hazardous Waste Regulations	18 AAC 62	Regulations of the federal government for identification and listing of hazardous wastes, promulgated and published as 40 CFR Part 261, as revised as of 1 July 2002, are adopted by reference. This part identifies those solid wastes which are subject to regulation as hazardous wastes under parts 40 CFR Parts 262 through 265. Sets Toxicity Characteristic Leaching Procedure concentrations above which generated wastes must be managed as hazardous waste. Soil is generated when it is removed from the ground and taken outside the area of contamination.	Applicable if hazardous wastes are generated.	No listed hazardous wastes are believed to be present at Site SS007.
Clean Air Act and ADEC Air Quality Control Regulations	18 AAC 50	Regulate the control of air emissions, which may be applicable to some remedies, including capping	Applicable if fugitive dust, from remediation or remediation related activities, vehicle traffic over dirt roads, etc. could reach ambient air.	Depending on the chosen remedy, state and federal air quality regulations may be an ARAR. The control of emissions, if necessary, will be addressed in the site work plan.
Alaska Uniform Environmental Covenants Act	AS 46.04.300 – 46.04.390	Requires filing of a Notice of Activity and Use Limitation.	Applicable	Applicable where a remedial decision results in (1) contamination remaining in the environment in concentrations that are safe for some, but not all, uses: or (2) an engineered feature or structure that requires monitoring, maintenance, or operation, or that will not function as intended if disturbed.

Key:

> – greater than
< – less than
AAC – Alaska Administrative Code
ADEC – Alaska Department of Environmental Conservation
ARAR – applicable or relevant and appropriate requirements
AS – Alaska Statute
CFR – Code of Federal Regulations
EPA – U.S. Environmental Protection Agency
IC – institutional control
mg/kg – milligrams per kilogram
PCB – polychlorinated biphenyl
ROD – Record of Decision
TSCA – Toxic Substances Control Act
USC – United States Code
USFWS – U.S. Fish & Wildlife Service

2.10.4 Reduction of Toxicity, Mobility, or Volume through Treatment

The reduction of toxicity, mobility, or volume (TMV) of contaminants through treatment criterion is one of the primary balancing criteria. This criterion refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

No treatment technologies are included as part of any of the alternatives; therefore, this criterion is not applicable.

2.10.5 Short-Term Effectiveness

The short-term effectiveness criterion is one of the primary balancing criteria. This criterion addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community, and the environment during construction and operation of the remedy until RAOs are achieved. For Alternatives 2, 3, and 4, RAOs are achieved when the remedies are in place. Alternatives 2, 3, and 4 would be in place at the end of PY1.

Risks to the community for all alternatives from implementing the remedy are considered limited because of the remote site location. Environmental impacts from implementing the site remedy would be limited to emissions from onsite construction equipment, potential spills from PCB-contaminated soil removed from the site (Alternatives 2 and 4), and erosion from implementing removal and capping actions (Alternatives 3 and 4). The potential for emissions and erosion would be proportional to the extent of use of construction equipment. Environmental management plans could be implemented to reduce potential environmental impacts by providing guidance and protocols on the safe handling of contaminated media and erosion control.

Risks to workers increase with the complexity of construction equipment and the scale of the treatment area over the mountainside. A cap to address PCB-contaminated soils above 10 mg/kg downslope of the Upper Camp was not originally implemented because the extreme terrain (30- to 40-degree slopes of loose rocks) and climatic conditions (high winds and poor visibility) made this work unsafe (USAF, 2012). Implementation of proper safety precautions would be mandatory for Alternatives 2, 3, and 4. Because Alternative 2 can be completed using smaller equipment as compared to Alternatives 3 and 4, risks to workers should be comparatively lower. Based on these evaluations, Alternatives 2, 3, and 4 are rated **Medium**. For Alternative 1, since actions are limited to the current LTM, there are limited risks from remedy implementation as compared to the other alternatives, and this alternative is rated **High**.

2.10.6 Implementability

The implementability criterion is one of the primary balancing criteria. This criterion addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

No administrative challenges are associated with implementation of the proposed alternatives. Due to the remote site location, mobilization of construction equipment over long distances and narrow roads is challenging, but implementable. Alternative 1 is easily implementable and is currently done at the site; therefore, it is rated **High**. Technical implementability challenges increase with

the complexity of construction equipment and the scale of the gravel cap. Mobilization and handling of construction equipment to the site may be challenging. Alternatives 2, 3 and 4 are considered moderately implementable as compared to Alternative 1 given the equipment used to implement the remedies. As a result, these alternatives are rated **Medium**.

2.10.7 Cost

The cost criterion is one of the primary balancing criteria. This criterion includes an evaluation of estimated capital and annual operations and maintenance (O&M) costs, as well as net present value (NPV). NPV is the total cost of an alternative over time in terms of today's dollar value. The costs are rough order-of-magnitude estimates and, as such, are suitable only for the purpose of budget development/planning. Actual costs will depend on the final scope and design of the selected remedial action, the implementation schedule, competitive market conditions, and other variables.

A summary of the estimated cost for each alternative is presented in Table 2-6. The estimated total NPV for the alternatives evaluated ranges from $0 for Alternative 1 (No Action) to $5.61 million for Alternative 4 (Removal, Capping, LTM, and LUCs). Since LTM and LUCs are common to Alternatives 2, 3, and 4, the cost differences are based on the actions proposed to address the PCB-contaminated soil: removal (Alternative 2), capping (Alternative 3), or a combination of the two (Alternative 4). The O&M costs associated with long-term maintenance of a cap (Alternatives 3 and 4) are nearly two orders of magnitude greater than those associated with removal alone (Alternative 2).

2.10.8 State/Support Agency Acceptance

The ADEC find Alternative 1 (no action) **Unacceptable**, as it is not protective of ecological receptors. All other alternatives are rated **Acceptable**.

2.10.9 Community Acceptance

During the public comment period, no written responses were received from the community or other interested parties. During the public meeting, the community members in attendance stated that they were happy the USAF was acting at Site SS007, but they did not identify a preferred alternative. As a result, all alternatives but the No Action alternative (Alternative 1) were rated **Acceptable**. The No Action alternative (Alternative 1) was rated **Unacceptable**.

2.11 PRINCIPAL THREAT WASTE

The NCP establishes an expectation that treatment will be used to address the principal threats posed by a site wherever practicable (NCP §300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a site; a principal threat waste is normally defined as material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to ground water. This requirement will not be met due to the site-specific complexities associated with this removal action: mobilization of appropriate equipment to site; technical challenges of soil removal (access to surface soil, presence of bedrock, steep terrain, topology and the presence of boulders); and the relatively low volume of soil to be removed.

2.12 SELECTED REMEDY

The selected remedy is **Alternative 2** (**Removal, LTM, and LUCs**). This alternative includes the removal, to the extent practicable, of soil with PCB concentrations exceeding the site-specific ecological ACL of 160 mg/kg. LTM and LUCs are also required elements of the selected remedy.

2.12.1 Rationale for the Selected Remedy

Alternative 2 (Removal, LTM, and LUCs) was selected over the other alternatives because it provides the optimal balance of fulfilling the evaluation criteria to an acceptable level and lifetime project costs. Based on currently available information, the USAF believes the selected remedy meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria.

2.12.2 Description of the Selected Remedy

The selected remedy amends the original remedy through the addition of the following response actions:

- **Soil Removal** – Soil removal will be conducted within the target treatment area on the uncapped, upper mountainside where PCB concentrations in soil exceed the site-specific ecological ACL of 160 mg/kg (UASF, 2014a). Due to access and terrain challenges, manual soil removal techniques will be used and only in areas where the work can safely be accomplished because bedrock is willow and medium-to-large sized boulders dominate the uncapped mountainside area. The removal will be limited to the top 2 inches of soil and is expected to be completed in one season (PY 1). PCB concentrations exceed the ACL in an area of approximately 0.07 acres; however, removal is technically practicable in only a portion of the impacted area. Excavated soil will be properly containerized and disposed of offsite at an appropriate landfill.
- **LTM** –LTM sample locations for PCBs will be established in a manner that will allow the USAF to determine whether or not the leading edge of contamination is migrating downgradient (that is, establishment of a monitoring "fence" that defines the downgradient extent of PCB contamination) (USAF, 2014c). LTM will be conducted using a silt fence, in addition to a surface creep/saltation sampling device (or similar), and an airborne dust sampler. (USAF, 2014c). Surface soil sampling will be initiated in PY1 with the installation of the saltation sampler, with subsequent samples collected twice in PY2, and then once annually in PY3, PY4, and PY6 (USAF, 2014c). Additionally, during the first 5 years, to meet the RAO to prevent impacts to ecological receptors from PCB-contaminated soils above the proposed site-specific ACL (UASF, 2018), ecological monitoring will be conducted annually to confirm that the Upper Mountainside area is not being used by more sensitive receptors (i.e., Lapland longspurs or Common shrews). If no presence is observed during this 5-year period, then the USAF will issue a note to the administrative record that documents the findings, and no further explicit monitoring for the Lapland longspur and Common shrew will be performed after consultation and agreement from ADEC. If the small home-range receptors are identified onsite during the monitoring period, the ERA will be reviewed in consideration of the Lapland longspur and Common shrew.

- **LUCs** – Residual soil contamination is not safe for human health. LUCs are therefore necessary to preclude access and to control the disposition and use of any soil excavated from the site. In the vicinity of the capped area, LUCs are currently in place for the protection of human health from concentrations of PCBs above 1 mg/kg. Under this modification, the scope and application of LUCs for SS007 will be modified to include the uncapped mountainside area where PCB concentrations in soil exceed 1 mg/kg. The expanded LUCs will include the following:

    1) Placement of warning and restricted access signs to limit human access.

    2) ICs that: prevent access to soil until soil cleanup levels have been met; maintain the integrity of any current or future remedial or monitoring system; prohibit the development and use of property for residential housing; prevent the use of contaminated soil for restricted uses in the event of excavation by requiring a site dig permit; implement a soils management plan; and conduct LTM at SS007. ICs will be incorporated into the Land Use Control Plan for SS007. These controls are in place to ensure that invasive activities are not taking place within the boundary of the sites where land use is restricted, and that ADEC and USAF approvals are obtained prior to conducting such work.

    3) Annual inspections (with photos and field observations) of the signs and control barriers will be conducted. When available, performance reports would be submitted to ADEC for the first 5 years, followed by a FYR. At that time, the frequency of inspections and reports may be reduced after consultation with and agreement from ADEC.

    4) LUCs (Notice of Activity and Use Limitations) will be recorded in the appropriate Cape Newenham LRRS land records, including the Base Master Plan and ADNR land records pursuant to the AK UECA. LUC boundaries will encompass all areas where soil contaminant levels pose an unacceptable risk to human health and the environment and a map designating their locations will accompany notations placed on land records.

    5) Cape Newenham LRRS has controlled access and all site visitors cleared for work at SS007 will be made aware of potential contaminant exposure hazards in the Upper Mountainside area during the mandatory visitor safety briefing.

    The USAF will be responsible for implementing, maintaining, monitoring, reporting, and enforcing the LUCs, and the LUCs will be maintained until the site is eligible for unlimited use and unrestricted exposure (UU/UE). The USAF will inform, monitor, enforce, and bind, where appropriate, authorized lessees, tenants, contractors and other authorized occupants of the site regarding the LUCs affecting the site. Although the USAF may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the USAF will retain ultimate responsibility for remedy implementation and protectiveness.

    The USAF will notify ADEC as soon as practicable, but no longer than 10 days after discovery, of any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the LUCs. The USAF will take prompt measures to correct the violation or deficiency and prevent its recurrence. In

this notification, the USAF will identify any corrective measures it has taken or any corrective measures it plans to take and the estimated time frame for completing them. For corrective measures taken after the notification, the USAF will notify ADEC when measures are complete.

The USAF will not modify or terminate LUCs, modify land uses that might impact the effectiveness of the LUCs, take any anticipated action that might disrupt the effectiveness of the LUCs, or take any action that might alter or negate the need for LUCs without 45 days prior to the change seeking and obtaining approval from the ADEC of any require ROD modification.

The USAF will monitor and inspect all site areas subject to LUCs annually.

The USAF will report annually, or as determined by the USAF and ADEC, to ADEC on the frequency, scope, and nature of the LUC monitoring activities, the results of such monitoring, and changes to the LUCs, and any corrective measures resulting from monitoring during the time period.

- **FYRs** – FYRs are required by CERCLA Section 121(c) and NCP §300.430(f)(4)(ii) if a remedial action results in contaminants remaining onsite above levels that allow for UU/UE. The objective of the FYR is to ensure that remedies are, or will be, protective of human health and the environment. FYRs will be performed until the site is eligible for UU/UE.

  Due to its high toxicity and potential mobility from wind entrainment and surface runoff, the PCB-contaminated source material on the uncapped mountainside constitutes a principal threat waste. The amended remedy includes the removal of PCB-impacted soil to the extent feasible within the target treatment area. Although complete removal of all material with concentrations exceeding the ACL by manual removal is technically impracticable, LTM, periodic inspections, and FYRs will be completed to monitor and/or evaluate whether migration of PCBs from the mountainside area is occurring and to evaluate impacts to potential ecological receptors.

2.12.3 Summary of the Estimated Remedy Costs

Cost estimates account for engineering, construction, and O&M costs incurred over 30 years. The estimated costs for the selected remedy (Alternative 2) are detailed in the 2014 FS and summarized in **Table 2-8**. Costs are based on the best available information regarding the anticipated scope of the selected remedial alternative. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. Major changes may be documented in the form of a memorandum in the Administrative Record file, an Explanation of Significant Differences (ESD), or another ROD amendment. This estimate is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

Table 2-8 Cost Estimate Summary for the Selected Remedy

Remedy Component	Unit Cost	Units	Quantity	Discount Factor (2.3%)	Cost
Capital Costs					
Soil removal	$1,593,630	lump sum	1	0.98	$1,557,801
Pilot study device installation	$64,705	lump sum	1	0.98	$63,250
CAPITAL TOTAL					**$1,621,051**
Operations and Maintenance (O&M)					
Soil sampling (PY2)	$79,272	lump sum	2	0.96	$151,495
Soil sampling (PY3)	$79,272	lump sum	1	0.93	$74,045
Soil sampling (PY4)	$79,272	lump sum	1	0.91	$72,380
Soil sampling (PY6)	$79,272	lump sum	1	0.87	$69,162
O&M TOTAL					**$367,081**
Summary					
Capital	Total				**$1,621,051**
O&M	Total				**$367,081**
PROJECT TOTAL					**$1,988,132**

Key:
% – percent

PY – Project Year

2.12.4 Expected Outcomes of the Selected Remedy

The expected outcome of the selected remedy (Alternative 2 – Removal, LTM, and LUCs) is achievement of RAOs, which would protect site workers and ecological receptors from unacceptable risk from exposure to PCB-contaminated soils, as well as prevent surface water or groundwater impacts from downgradient migration of PCB contamination. The CERCLA action will remove, to the extent practicable, soil from the target treatment area with concentrations above the 160 mg/kg site-specific ACL.

2.13 STATUTORY DETERMINATIONS

The amended remedy is protective of human health and the environment, complies with those federal and state requirements that are applicable or relevant and appropriate for the remedial action, is cost-effective, and utilizes permanent solutions and technologies to the maximum extent practicable. The amended remedy does not satisfy the statutory preference for treatment as a principal element of the remedy because the PCB-contaminated soil will be removed, as feasible, without treatment. Treatment technologies were determined to be unfeasible at the Upper Mountainside area because of technical implementation challenges associated with the steep slope, the site geology, and the available *ex-situ* and *in-situ* treatment options.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for UU/UE, a statutory review will be conducted within 5 years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

2.14 DOCUMENTATION OF SIGNIFICANT CHANGES

There were no significant changes from the PP (USAF, 2018).

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PART 3 RESPONSIVENESS SUMMARY

This section provides a summary of the public participation activities and comments received following the publication of the PP for the Upper Mountainside area of Site SS007 at Cape Newenham LRRS, Alaska, and the USAF response to comments received.

3.1 BACKGROUND AND COMMUNITY INVOLVEMENT

In October 2018, the PP for remedial action on the Upper Mountainside area at Site SS007 was released for public comment (USAF, 2018). No written comments were received on the PP.

On 14 November 2018, the USAF held a public meeting in the community of Togiak. This meeting was used to present the preferred alternative for remedial action, as detailed in the PP, to discuss any community concerns, and to answer questions about the USAF's planned actions to address the PCB-contaminated soil at the Upper Mountainside area of Site SS007. The meeting was recorded and transcribed, and questions raised during the meeting are summarized below.

3.2 STAKEHOLDER ISSUES AND LEAD AGENCY RESPONSES

There were no major issues identified during the November 2018 public meeting. The public comments supported the USAF acting to remediate the PCB-contaminated soil on the Upper Mountainside area of Site SS007; however, a preferred alternative was not identified by any members of the public. Following is a summary of the general topic areas on which questions focused and the USAF's responses to these questions.

1. **Public comment – Impacts to marmots and other species from PCB contamination:** Members of the public discussed historical hunting of marmot that occurred near Cape Newenham LRRS. Have animals such as fish, seals, walruses, and herons been tested to determine if they have PCB contamination in their systems?

   USAF response: No, samples have not been collected from animals as part of the Cape Newenham LRRS cleanup activities. The ERA evaluated risks to the most sensitive receptor – the least weasel – to provide a conservative evaluation of risks. Marmots are unlikely to experience greater impacts as they are less sensitive than least weasels. Marine species, including fish, seals, walruses, and herons have not been sampled because they are transient species. The least weasel was identified as the most sensitive resident species, so it was determined to be the best indicator of potential ecological risks.

2. **Public comment – PCB migration:** The winds are very strong on the mountainside at Cape Newenham LRRS and it is likely that PCB-contaminated soil was blown out into the ocean or distributed elsewhere and is not just lodged between the rocks and gravel on the mountainside. Have you investigated other areas for PCBs?

   USAF response: Yes, grid sampling has been performed at Site SS007 to investigate the extent of the PCB contamination. The results have shown that the uncapped, PCB-contaminated soil is relatively confined to the target treatment area. Sampling has also been conducted at the ponds at the bottom of the slope, downgradient of Site SS007, and the data

indicate that PCBs have not migrated down to the ponds. The proposed remedy will help ensure that the contaminants do not migrate offsite.

3. **Public comment – Use of local businesses and contracting:** If a cap is employed, will you use a local source for the gravel? Also, will local businesses be used to perform the work, and will it be issued as an 8(a) contract?

   USAF response: Yes, local gravel sources will be considered as part of the cost evaluation process if a gravel cap is a component of the selected remedy. Contracting is handled separately, and it is unknown at this time what contract vehicle would be used to solicit bids for remedy implementation. The USAF encourages hiring of local community members, as feasible.

4. **Public comment – Schedule:** When will the project (remedy implementation) start?

   USAF response: The cleanup response at the Upper Mountainside area of Site SS007 is programmed in the USAF's budget for 2020. However, we will not know until 2020 if funding will be allocated for this work.

5. **Public comment – Schedule:** Will you hold another meeting in the community?

   USAF response: Yes, the USAF would consider another meeting if there was a community request for one.

FIGURES

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SCALE IN MILES
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UNITED STATES AIR FORCE
611TH CIVIL ENGINEER SQUADRON
RECORD OF DECISION AMENDMENT
FOR ERP SITE SS007 AT
CAPE NEWENHAM LONG RANGE RADAR SITE, ALASKA

SITE LOCATION MAP

FIGURE
1

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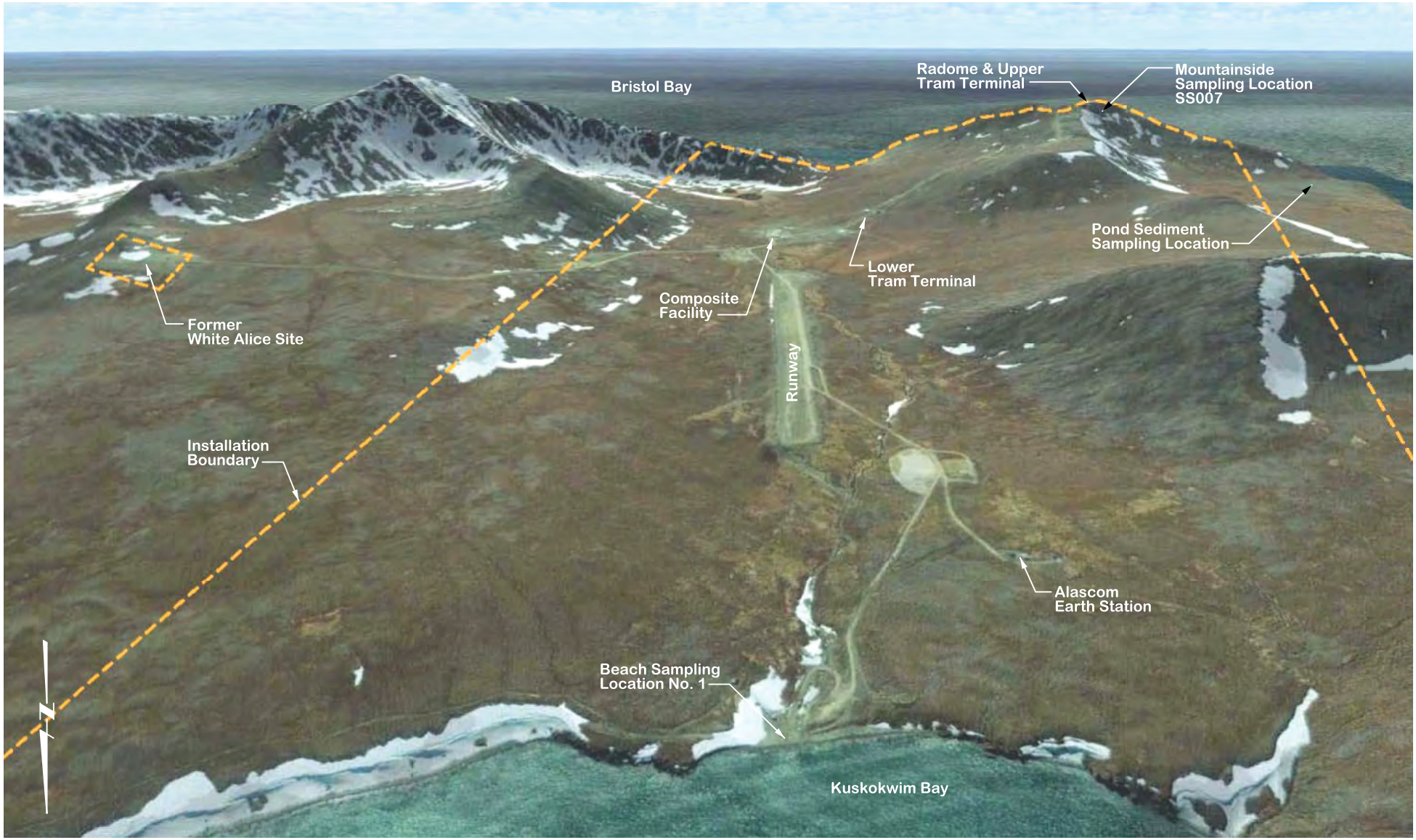

NO SCALE	UNITED STATES AIR FORCE 611TH CIVIL ENGINEER SQUADRON RECORD OF DECISION AMENDMENT FOR ERP SITE SS007 AT CAPE NEWENHAM LONG RANGE RADAR SITE, ALASKA	SITE LAYOUT	FIGURE 2 185750836. 100.69110403

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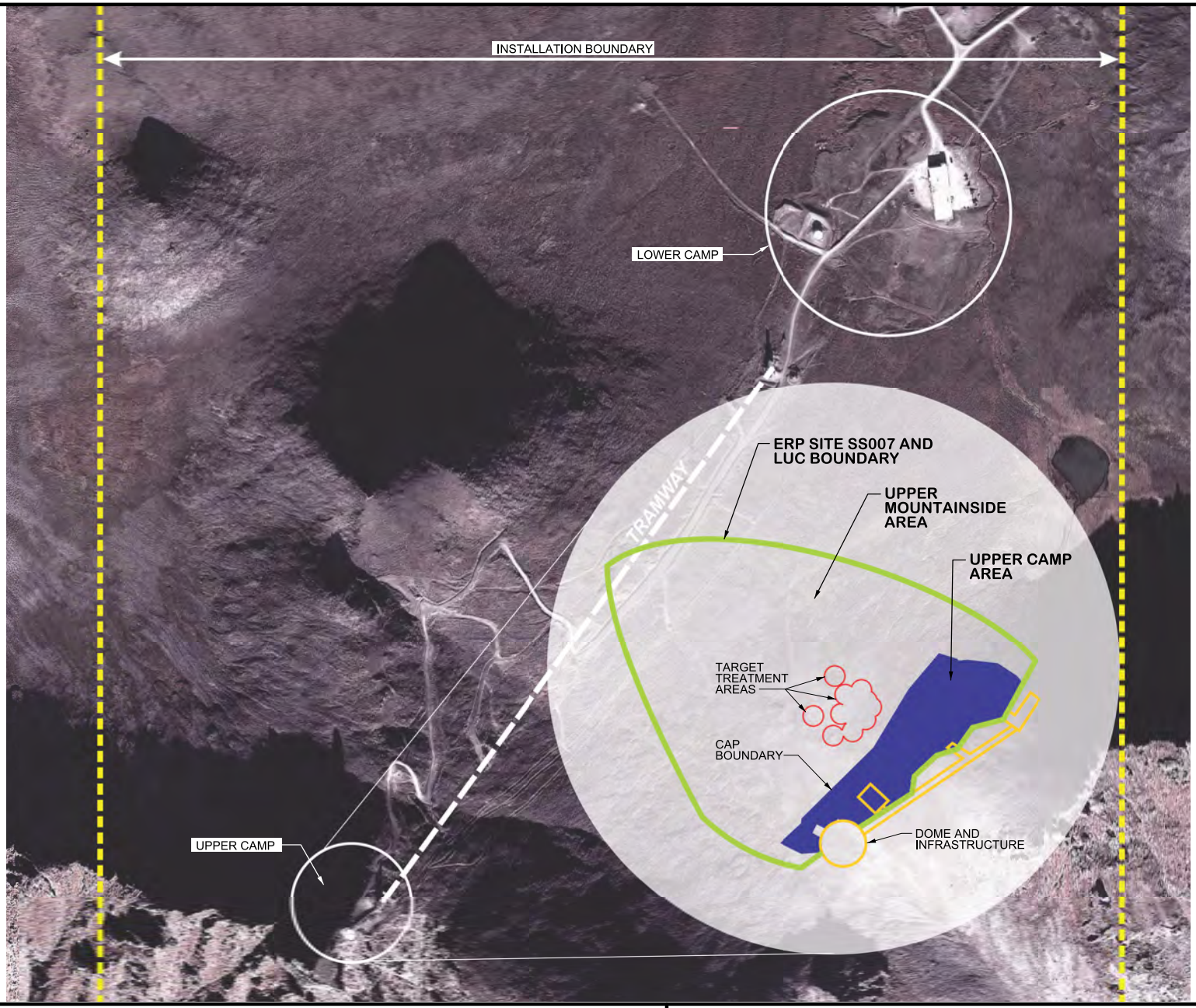

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UNITED STATES AIR FORCE
611TH CIVIL ENGINEER SQUADRON
RECORD OF DECISION AMENDMENT
FOR ERP SITE SS007 AT
CAPE NEWENHAM LONG RANGE RADAR SITE, ALASKA

ERP SITE - SS007
SITE AND LAND USE CONTROL BOUNDARY

FIGURE
3

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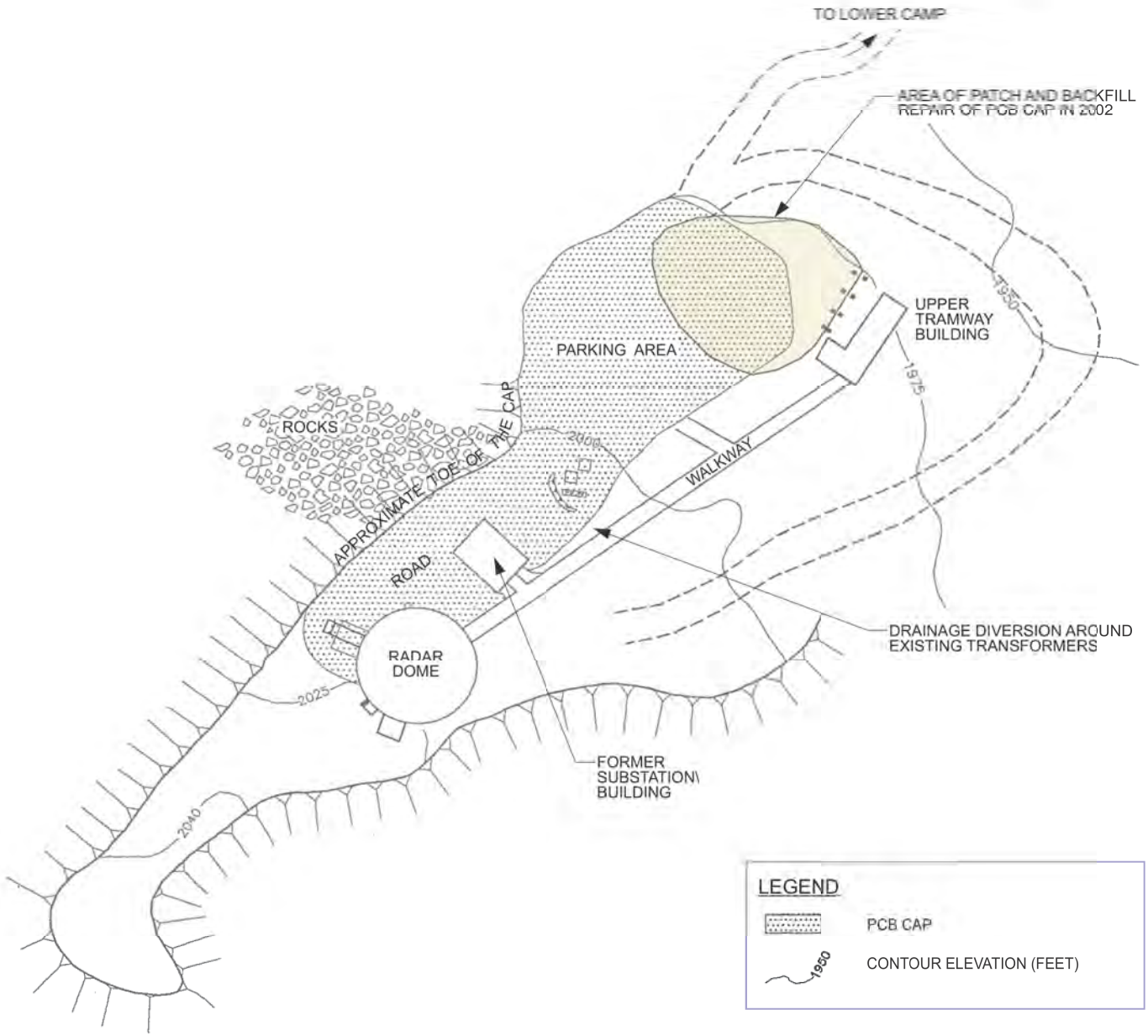
TIME: 02-JUL-2019 11:57 FILE: C:\D\CAD\Proj\Stantec Cardno Baker JV\2019 Cape Newenham_ROD_SS007_185750836\June 2019\fig04_SS007 upper camp.dgn



SCALE IN FEET
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UNITED STATES AIR FORCE
611TH CIVIL ENGINEER SQUADRON
RECORD OF DECISION AMENDMENT
FOR ERP SITE SS007 AT
CAPE NEWENHAM LONG RANGE RADAR SITE, ALASKA

ERP SITE - SS007
UPPER CAMP AREA

FIGURE
4
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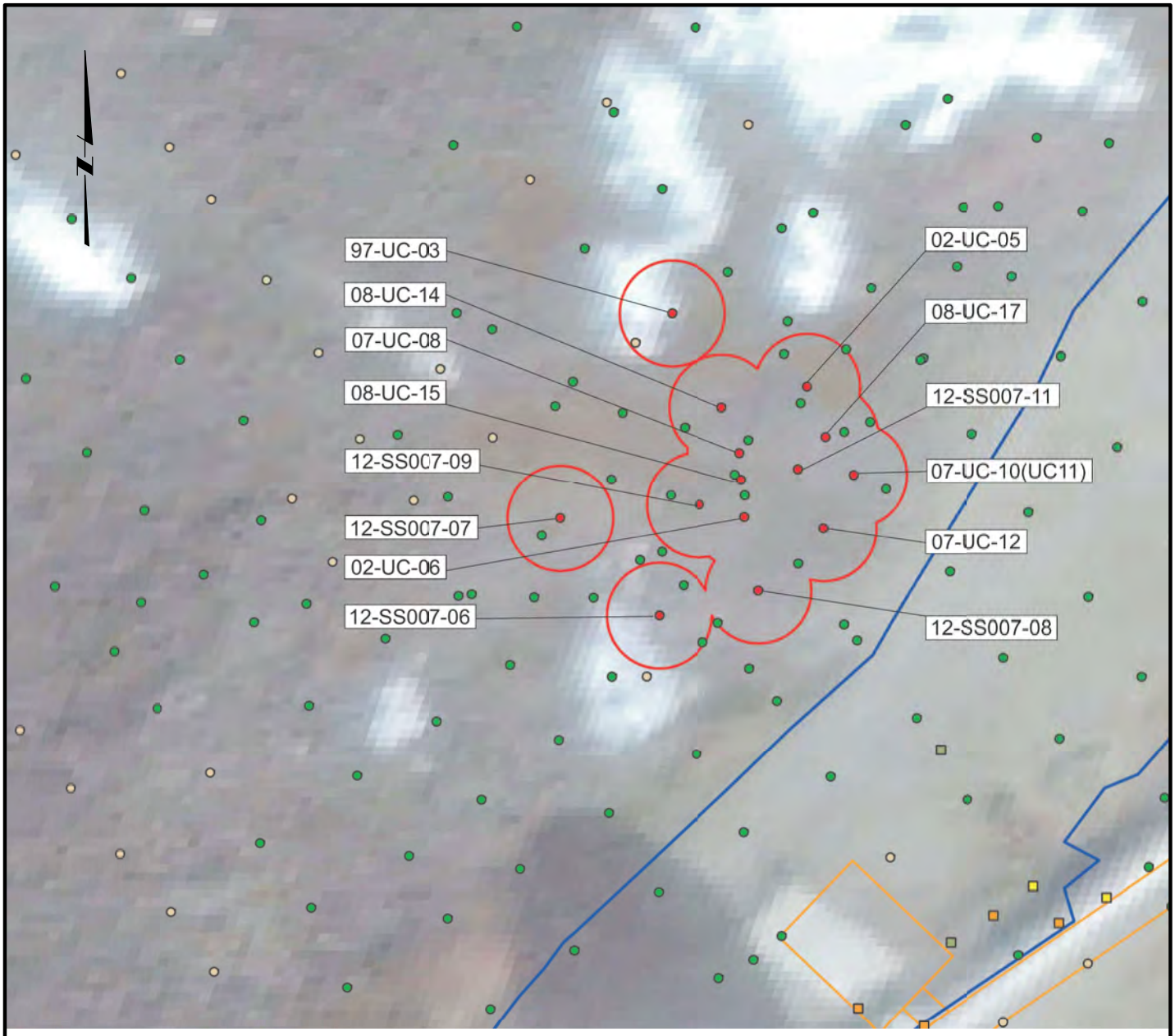

LEGEND

- Target Treatment Area

INFRASTRUCTURE

- Cap Boundary
- Infrastructure and Dome

PCB LAB RESULTS (in ppm)

- PCB ≥ 160 ppm
- PCB < 160 ppm
- ND for PCB, with the RL not specified (1995)

PCB FIELD SCREENING ADJUSTED RESULTS, 1995 (in ppm)

- 1 ≤ PCB < 10
- 10 ≤ PCB < 1,000
- ND (0.5) for Adjusted Field Screening PCB

Note:
1. Sampling locations labeled in this figure as target treatment areas correspond to locations where PCBs ≥ 160 PPM.
2. Infrastructure data is courtesy of Woodward Clyde (2002)
3. ND = analyte not detected
   ND (0.5) = analyte not detected (RL)
   ppm = part per million
   RL = reporting limit
4. The RL for ND results was either 1 or less than 1 for 1995 samples sent to the lab. For 1995 field screening samples, the RL was 0.5, i.e. ND (0.5)
5. Imagery: 31 May, 2010, 0.5-meter resolution
6. Samples shown within cap boundary are results for soil sampled below the cap

SCALE IN FEET
0 15

UNITED STATES AIR FORCE
611TH CIVIL ENGINEER SQUADRON
RECORD OF DECISION AMENDMENT
FOR ERP SITE SS007 AT
CAPE NEWENHAM LONG RANGE RADAR SITE, ALASKA

ERP SITE - SSOO7
UPPER MOUNTAINSIDE AREA
SAMPLING LOCATIONS

FIGURE
5

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FILE: C:\D\CAD\Proj\Stantec Cardno Baker JV\2019 Cape Newenham_ROD_SS007_185750836\June 2019\fig05_upper mountainside.dgn
TIME: 02-JUL-2019 13:33

APPENDIX A

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APPENDIX B

Public Notice of Availability

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

AO/PO#_____
CASE NO. _____

Stantec Consulting Services, Inc.
Attn: Michael Stantec
NAME OF PETITIONER
725 East Fireweed Lane, Suite 200
Anchorage, AK 99503
ADDRESS OF PETITIONER

For: Cape Newenham Public Notice

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 10/17/18 AND THEREFORE FOR A TOTAL OF 2 CONSECUTIVE ISSUE(S). THE LAST PUBLICATION APPEARING ON 10/24/18 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 10.31.18

Notary Public
ELENA HICKS
State of Alaska
My Commission Expires Dec. 12, 2020

SIGNATURE OF NOTARY

Elena Hicks
PRINTED NAME OF NOTARY

MY COMMISSION EXPIRES ON 12/12/20

Inside Bethel news

THE UNITED STATES AIR FORCE
INVITES PUBLIC COMMENT
AND ANNOUNCES A PUBLIC MEETING

For the Proposed Plan for Remedial Action at the
Cape Newenham Long Range Radar Site, Alaska
Togiak, Alaska

The US Air Force (USAF) invites public comment on the Proposed Plan (PP) for remedial action at the Cape Newenham Long Range Radar Site (LRRS), Alaska (Site SS007). Contamination occurred from historic waste disposal practices at Site SS007. A remedy was selected for the site in 2000, but additional information has emerged since that time, and remedial options are being considered to address polychlorinated biphenyl (PCB)-contaminated soils remaining at the uncapped mountainside portion of the site.

The US Air Force, US Environmental Protection Agency, and Alaska Department of Environmental Conservation (the Agencies) considered four remedial alternatives. Each of the four alternatives include long-term monitoring, land use controls and Five-Year Reviews. The distinguishing components of the alternatives are based on actions to physically address the PCB-contaminated soil at the site, as follows:

- Alternative 1 would take no further action on the uncapped mountainside other than what is currently implemented at the site.
- Alternative 2 (preferred alternative) includes removing soil where PCB concentrations exceed cleanup levels within the target treatment area.
- Alternative 3 includes capping the soil where PCB concentrations exceed cleanup levels within the target treatment area.
- Alternative 4 includes a combined approach of removal (Alternative 2) and capping (Alternative 3) within the target treatment area.

The Agencies have identified Alternative 2, removal of soil where PCB-contamination exceeds cleanup levels, as the preferred alternative that will protect human health and the environment. The preferred alternative is a preliminary determination; other alternatives could be selected based upon public comment, new information, or a reevaluation of existing information. The public is encouraged to comment on all the alternatives described in the PP. The Agencies will not select the final action until all public comments obtained during the public comment period have been evaluated.

The Cape Newenham LRRS PP has been mailed to all known interested parties. The public comment period will begin October 15**,** 2018 and end on November 15, 2018. Written comments regarding alternatives presented in the PP should be sent to the Remedial Project Manager (address provided below), postmarked by November 15, 2018. These will be included in the Amended Record of Decision for Site SS007 that will also be placed in the information repository at completion of the decision process.

An open house with a public comment session will be held on November 14, 2018**,** from 6:00 pm to 8:00 pm at the Traditional Council of Togiak building, 310 Main Street, Togiak, Alaska 99678.

All information pertaining to the site is accessible on the Administrative Record online at:
http://afcec.publicadmin-record.us.af.mil/

Please send comments to:
Richard Mauser
Remedial Project Manager
AFCEC/CZOP
10471 20th Street, Room 339
JBER, AK 99506-2201

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JBER, AK 99506-2201

APPENDIX C

Response to Comments on the Site SS007 Record of Decision Amendment

ADEC Responses

Alaska Department of Environmental Conservation (ADEC) Contaminated Sites Program
Document Reviewed: Draft ROD Amendment: *Record of Decision Amendment for ERP Site SS007 Cape Newenham Long Range Radar Station Site, Alaska* which is dated July 2019
Date Submitted: August 30, 2019

No.	Page	Section	¶	Sentence	Comment	Response
1.	1-1	1.2	1	1	Please correct the reference to the 2000 ROD.	Agreed – Reference changed to USAF, 2000. *ADEC Response: Accepted*
2.	1-1	1.2	4	--	Change to "The State of Alaska concurs that the new remedy, when properly implemented, will comply with state law."	Agreed – Text added as requested. *ADEC Response: Accepted*
3.	1-2	1.4	General	General	Revise the text to be clear with regard to what the site remedy in the 2000 ROD included for each the Upper Camp and the Upper Camp Mountainside, and that the response actions are specific to the Upper Camp Mountainside such that the remedy for Upper Camp would remain the same.	Agreed – Section 1.4, Paragraph 1 revised to read as follows: *"The original ROD remedy selected for the upper mountainside area of Site SS007 was long-term monitoring (LTM) with institutional controls (ICs). The original remedy did not include removal actions to address PCB-contaminated soils at that location (upper mountainside area). It was determined that the conditions at the upper mountainside area did not present unacceptable threats to either human health or the environment and because of extreme terrain (30- to 40-degree slope of loose rocks) and climatic conditions (high winds and poor visibility).(USAF, 2000). However, post-ROD investigations and a revised ecological risk assessment (ERA) (USAF, 2014b) determined that, in some locations, PCB concentrations in soil in the upper mountainside area presented an*

No.	Page	Section	¶	Sentence	Comment	Response
						unacceptable level of risk to ecological receptors. The elevated PCB concentrations were detected at the upper mountainside area as a result of the long-term monitoring and sampling strategy for site SS007 and are not the result of increased migration of contaminants from the capped area (upper camp area) (USAF, 2012). Therefore, the original remedy for Site SS007 is being amended to address the uncapped upper mountainside area of the site, the capped upper camp area does not require amendment, through the addition of the following response actions:" *ADEC Response: The text is confusing as written because it suggests a separate original remedy at Site SS007 for the mountainside area and is inconsistent with other documents. Elsewhere in this document (and in the Proposed Plan and Feasibility Study) it is stated that LUCs are being modified/expanded to include the uncapped mountainside. Recommend the first sentence be modified to read: "The original ROD remedy selected for Site SS007 was capping the flat area around the radar dome and adjacent parking area, Long Term Monitoring (LTM) and Institutional Controls (ICs)" and the second sentence be changed to: The original remedy did not include* ***remedial*** *actions to address PCB-contaminated soils* ***on the mountainside*** *(upper mountainside area). This language is more consistent with the 2000 ROD, and other documents.* **AF Response:** Agree, changes made as suggested.

No.	Page	Section	⁋	Sentence	Comment	Response
						ADEC Response: Accepted
4.	1-2	1.4	Soil Removal	General	It is understood that the top two inches of soil is to be removed by manual removal techniques within the target treatment area(s) with concentrations identified above 160 mg/kg, in areas where work can be accomplished safely. Please confirm that confirmation sampling will be performed following removal activities. Request clarification in the text that the objective is to remove soil at targeted areas above 160 mg/kg to 1 mg/kg.	Agreed – The following text has been added as the last sentence to this paragraph. *"Following removal activities, confirmation surface soil sampling for PCBs will be conducted to document conditions."* *ADEC Response: Accepted*
5.	1-2	1.4	LTM	General	Modify language in ROD to be clear regarding what sampling will be performed and at what frequency, consistent with the 2014 FS and RPO Reports. These comments also applies to other sections (e.g., Table 2-8; Section 2.9.1 Page 2-15 bullet 3; Section 2.12.2 Page 2-29 Bullet 3).	Agree – Language modified to that "soil sampling for PCBs…" and "If no presence of PCBs…." Frequency has already been stated as PY1 through PY4 and PY6. *ADEC Response: The response does not make sense for "If no presence of PCBs" since the text was discussing monitoring for larks and shrew.* *The Remedial Process Optimization (December 2014) for site SS007 recommended a monitoring fence be established at the downgradient extent of PCB contamination and that biennial sampling continue along this fence using a silt fence, surface creep/saltation and airborne dust sampling which would be implemented after a pilot study. Most recent sampling (2016 and 2019)*

No.	Page	Section	¶	Sentence	Comment	Response
						involved soil sample collection from the area immediately downgradient of the cap. The text should be modified to be clear as to the path forward for SS007 LTM sampling. *The frequency for soil sampling is not clearly consistent with the 2014 FS which indicates pilot study installation in PY1, 2 sampling events in PY2, and 1 sampling event in each PY3, PY4, and PY6. This should be presented more clearly in the text and in Table 2-8.* **AF Response:** First three sentences in LTM bullet rewritten to agree with recommendation from RPO Report. *ADEC Response:* *The text in Section 1.4 still refers to presence of PCBs. Please revise it for consistency with the other sections.* *The "either" in "LTM will be conducted using either a silt fence in addition to a surface creep/saltation sampling device (or similar) and an airborne dust sampler. (USAF, 2014c)." does not make sense. Please revise the sentence to be clear.* *Section 1.4 and 2.9.1 were not updated with the edited LTM language.* **AF Response:** Agreed, language in Sections 1.4 and 2.9.1 updated as requested.

No.	Page	Section	⁋	Sentence	Comment	Response
6.	1-2	1.4	LTM	3	Modify the text to include frequency for ecological monitoring.	*ADEC Response: Ecological monitoring annually as currently presented in the text is accepted. Please clarify what the response is, given the highlighted response.* **AF Response:** Agree changed to annual sampling, as previously submitted. *ADEC Response: Accepted* **Note:** "Lark" has been changed to "Lapland longspur" and "shrew" has been clarified to be "Common shrew" as these were the species noted in the Revised Ecological Risk Assessment (USAF, 2014b). The previous reference to the "lark" was from the Technical Feasibility Study (USAF, 2014a), which erroneously identified the lark rather than the Lapland longspur.
7.	1-2	1.4	LTM	5	Revise text to "If no presence,….no further explicit monitoring for the lark and shrew will be performed after consultation and with agreement from ADEC."	Agreed – Last sentence revised to read as follows: *"If no presence of PCBs is observed after this 5-year period, no o further explicit monitoring for the lark and shrew will be performed after consultation and agreement from ADEC."* *ADEC Response: The test is repeated (but different). In addition, the text "If no presence of PCBs" does not make sense since the subject was monitoring for larks and shrew.* *Please clarify. For revisions, correct "no o further" to "no further."* *Explain why "If the small home range receptors are identified onsite during the monitoring period,*

No.	Page	Section	⁋	Sentence	Comment	Response
						the ERA will be reviewed in consideration of the lark and shrew." was deleted. It seems this language is appropriate. **AF Response:** Agree, the deleted sentence was reinstated. *ADEC Response: The first portion of the follow on comment was not addressed. The intent was for it to say "The text is repeated (but different)…"* **AF Response:** "Lark" has been changed to "Lapland longspur" and "shrew" has been clarified to be "Common shrew" as these were the species noted in the Revised Ecological Risk Assessment (USAF, 2014b). The previous reference to the "lark" was from the Technical Feasibility Study (USAF, 2014a), which erroneously identified the lark rather than the Lapland longspur.
8.	1-2	1.4	LUC Bullet 3	General	Replace "ppm" with mg/kg.	Agreed. *ADEC Response: Please define mg/kg and be consistent throughout the document. Both mg/kg and ppm are used in the draft final version of the document.* **AF Response :** ppm replaced with mg/kg (six occurrences), defined in Section 1-4. *ADEC Response: Accepted*
9.	1-3	1.4	LUC Bullet 3	1	The 2000 ROD requires annual inspections of the cap and signage. The inspection schedule for the mountainside should be the same.	Agreed. – The statements "The USAF will monitor and inspect all site areas subject to LUCs at least

No.	Page	Section	⁋	Sentence	Comment	Response
					This text conflicts with the next page which states "The USAF will monitor and inspect all site areas subject to LUCs at least annually…" Please reconcile to include annual inspections throughout. These comments also applies to other sections (e.g., Section 2.8 Page 2-12; Section 2.9.1 Page 2-15 bullet 3; Section 2.12.2 Page 2-29 Bullet 3).	annually, or as determined by the USAF and the ADEC." have been changed to read as follows: *"The USAF will monitor and inspect all site areas subject to LUCs annually."* *ADEC Response: Remove references to biennial inspections, and replace with annual.* **AF Response:** Agree all biennial references changes to annual (seven instances) *ADEC Response: Accepted*
10.	1-3	1.4	LUC Bullet 3	2	Revise text to "At that time, the frequency of inspections and reports may be reduced after consultation and with agreement from ADEC." This comment applies to multiple sections of the document (e.g., 2.9.1; 2.12.2).	Agreed. – change made to 1.4.1, 2.9.1, 2.12.2 *ADEC Response: Accepted. However, please correct "sent to **ADEC At** that time**,** the frequency." to "sent to ADEC. At that time the frequency" in the final document.* **AF response:** Agree, the "," removed from the three locations. *ADEC Response: Accepted*
11.	1-3	1.4	LUC Bullet 4	1	Specifying that LUCs will be recorded in ADNR land records is repetitive, as it is covered by #6. This comment also applies to other sections of the text (e.g., Page 2-15 2.9.1; Page 2-29 2.12.2).	Agreed – The content of Bullet #6 has been incorporated into Bullet #4, and Bullet#6 deleted. Bullet #4 reads as follows: *"LUCs (Notice of Activity and Use Limitations) will be recorded in the appropriate Cape Newenham LRRS land records, including the Base Master Plan and Alaska Department of Natural Resources' (ADNR) land records, pursuant to the AK Uniform Environmental Covenants Act (UECA).*

No.	Page	Section	¶	Sentence	Comment	Response
						Engineering controls, such as LUC boundaries, will encompass all areas where soil contaminant levels pose an unacceptable risk to human health and the environment and a map designating their locations will accompany notations placed on land records. " *ADEC Response: Accepted.*
12.	1-3	1.4	LUC Bullet 4	2	This text is confusing because LUC boundaries are not engineering controls. Delete "Engineering controls, such as" here as well as in other sections of the ROD (e.g., 2.9.1; 2.12.2).	Agreed- "Engineering controls, such as" has been deleted from the three sections. *ADEC Response: Accepted. However, please revise to "LUC boundaries", removing the comma.* **AF Response:** Agree, comma removed (only applied to 2.12.2). *ADEC Response: Please ensure the change is made in the final document. There is no need to re-submit another track change version for this purpose.* **AF Response:** Agree, changes made.
13.	1-3	1.4	2	3	In "Although to another part by contract…", correct "part" to "party" assuming that was the intent.	Agreed – Part corrected to party. *ADEC Response: Accepted.*
14.	1-4	1.4	1	Last	Correct "require" to "required."	Agreed – Last sentence of Section 1.4, ¶ 4 changed require to required.

No.	Page	Section	¶	Sentence	Comment	Response
						ADEC Response: Accepted.
15.	1-5	1.6	-	-	Please check the references in this section, and correct. For example, chemicals of concern appear to be presented in Section 2.7.1. All references were not reviewed.	Agreed – References revised. *ADEC Response: Please also update the associated page numbers. Bullet 5: Correct "2.10.3" to "1.12.3"* **AF Response**: Change made as suggested *ADEC Response: Accepted. Suggest double checking final document prior to submittal. There is no need to re-submit another track change version for this purpose.* **AF Response:** Referenced sections verified.
16.	2-2	2.2	4	3	Please revise the text to clarify that the remedy documented in the November 2000 ROD was for the Upper Camp area beneath the earthen cap constructed in 1996.	Agreed – Sentence revised to read. *"The remedy documented for the PCB-contaminated soils that remain beneath the existing earthen cap that was constructed in 1996at the Upper Camp area is LTM with ICs."* *ADEC Response: Accepted*
17.	2-2	2.2	4	Bullets	Please clarify in the text that the remedy for SS007 also included annual inspections of signage. This comment applies to other sections of the document (e.g., 2.9).	Agreed – *"Annual inspections of signage."* added between first and second bullets throughout document. *ADEC Response: Accepted.*
18.	2-3	2.4	1	3	Please clarify in the text that the ROD Amendment is presenting the response action for SS007 Upper Camp Mountainside.	Agreed – *"Mountainside"* added to end of sentence. *ADEC Response: Accepted.*

No.	Page	Section	¶	Sentence	Comment	Response
19.	2-4	2.5.1	2	4	Please confirm location of springs, and clarify they run along the sides of the runway from south to north into Kuskokwim Bay, and update the text accordingly.	Agreed – Text changed to read as follows: *"Two springs were previously documented approximately 2 miles north of the Upper Camp near the north west end of the runway on roughly the east and west sides of the former drum disposal site (USAF, 1996)."* Reference for USAF, 1996 also added to Appendix A. *ADEC Response: Accepted.*
20.	2-12	2.8	1	Bullet 3	Please insert "soil" so the text reads: "downgradient soil, surface water or groundwater contamination"	Agreed – *"soil,"* inserted *ADEC Response: Accepted.*
21.	2-18	2.9.2	General		Further detail is needed to clarify differences from Alternative 1 (maintaining remedy for Upper Camp cap) and the other alternatives. Are there differences in the LTM and/or IC inspections? Alternative 1 also requires cap inspection, maintenance, repair, and possible replacement.	Agreed – Bullet 4 changed to read as follows: • *"Alternative 1 requires cap inspection, maintenance, repair and possible replacement and does not address ecological risks identified by the 2014 revised ERA."* *ADEC Response: For Bullet 4, add text so that reads: "requires cap inspection, maintenance, repair, and possible replacement o* ***f the existing cap*** *and". Edit Bullet 5 to read: "require ongoing cap inspections, cap maintenance/repair, and cap replacement for the upper mountainside area* ***in addition to existing cap****".* **AF Response**: Agree changes made as suggested *ADEC Response: Accepted.*

No.	Page	Section	¶	Sentence	Comment	Response
22.	2-28	2.12.2	Bullet 3	4	Correct “LUCsforSS007” to “LUCs for SS007”	Agreed *ADEC Response: Accepted.*
23.					**End of ADEC Comments**	