



New CERCLA Landfill PROPOSED PLAN

Barter Island Long Range Radar Site

February 2021

Introduction

The United States Air Force (USAF) provides this Proposed Plan for the New Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Landfill at Barter Island Long Range Radar Site (LRRS), shown on **Figure 1**. The purposes of this Proposed Plan are to provide background information, identify the preferred alternative for remedial action and explain the reasons for the preference, describe the other remedial options considered, solicit public review of and comment on all alternatives described, and provide information on how the public can be involved in the remedy selection process.

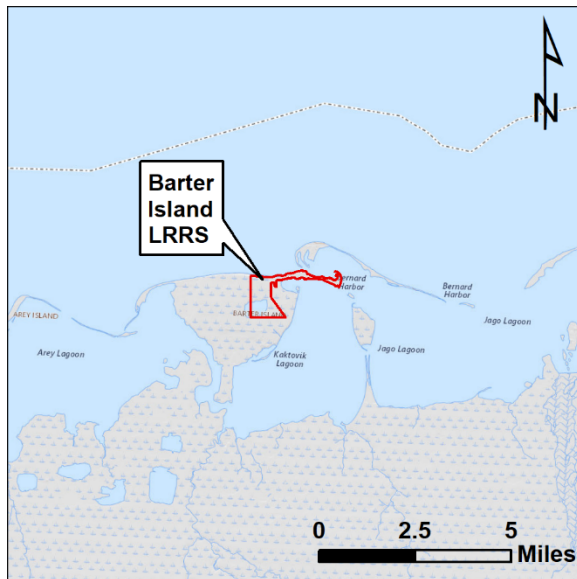


Figure 1 – Barter Island LRRS Location Map

The landfill was constructed in 2008, and contains approximately 7,070 cubic yards (CY) of soil and debris with diesel range organics (DRO), residual range organics (RRO) and polychlorinated biphenyl (PCB) concentrations below applicable cleanup levels, and approximately 20,655 CY of soil and debris with DRO and RRO below

PUBLIC COMMENT

Your comments on this Proposed Plan for the New CERCLA Landfill at Barter Island LRRS are invited during the public comment period that begins March 15, 2021 and ends April 15, 2021. A public meeting where comments can also be received has not yet been scheduled. Upon public interest and request for a public meeting a date, time, and location of the public meeting will be provided.

Please direct written and oral comments to:

Mr. Stephen Krause
U.S. Air Force
Remedial Project Manager
AFCEC/CZOP
10471 20th Street, Suite 348
JBER, Alaska 99506
Phone: (907) 552-1526
USAF Toll Free: 1-800-222-4137
E-Mail: Stephen.Krause.2@us.af.mil

For more information, see one of the project Information Repositories:

Harold Kaveolook School-Community Library
2001 Barter Avenue
Kaktovik, AK 99747
(907) 640-5800

Nuiqsut Trapper School-Community Library
3310 3rd Avenue
Nuiqsut, AK 99789
(907) 480-5800

Tuzzy Consortium Library
5421 North Star Street
Barrow, AK 99723
(907) 852-4050

Administrative Record Website:
<http://ar.afcec-cloud.af.mil/Search.aspx>

Contact Stephen Krause if you would like to visit the Administrative Record located at the Joint Base Elmendorf-Richardson (JBER) located in Anchorage, AK.



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applicable cleanup levels, and PCB concentrations above the applicable cleanup level.

In accordance with CERCLA, the proposed remedy is to leave the landfill contents in place, with measures to ensure continued protection of human health and the environment. These protective Long Term Monitoring (LTM) measures include annual maintenance, inspection and reporting, a Five Year Review (FYR) process, and implementation of land use controls (LUCs), institutional controls (ICs) such as a landfill cap and signage. LUCs have been established under the *Land Use Control Management Plan* (LUCMP) for Barter Island to prevent human and ecological exposure of contaminants within the New CERCLA Landfill.

The New CERCLA Landfill, while not a permitted landfill, was constructed by the USAF to specifics set forth by the Alaska Department of Environmental Conservation (ADEC) Class III standards under 18 Alaska Administrative Code (AAC) 60. Located within an existing gravel pad north of the Module Train area, the landfill was constructed for a one-time disposal of wastes removed from former LF001 and select demolition debris from Clean Sweep activities, designed to contain waste in two distinct Waste Cells, A and B. With proper maintenance, the non-woven geotextile, a minimum of 2 to 3 feet (ft) of gravel fill atop landfill contents, and continuous permafrost beneath, will continue to prevent migration of contaminants and remove the risk of exposure to marine and terrestrial receptors. The preferred alternative for the New CERCLA Landfill is No. 2 - LTM, explained in more detail on page 7.

The USAF is the lead agency and has prepared this Proposed Plan for the New CERCLA Landfill as part of its public participation responsibilities under Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and Section 117(a) of CERCLA. This Proposed Plan summarizes information that can be found in greater detail in the November 2020 Final Feasibility Study (FS) and historical documents contained in the Administrative Record for this site. The USAF encourages the public to review these documents at the Kaktovik, Nuiqsut, Utqiagvik or JBER information repositories to gain a more comprehensive understanding of the site and the restoration activities that have been conducted. Public input on all alternatives and on the rationale for the preferred alternative is important to the remedy selection process.

Site Background

The New CERCLA Landfill was constructed within an existing gravel pad located north of the Module Train area (**Figure 2**). The USAF constructed the landfill across an approximate 2.25-acre area in 2008 in accordance with ADEC Class III standards under 18 AAC 60. The New CERCLA Landfill was constructed for the one-time use of disposing of waste removed from the former LF001 landfill, which included household waste, human and animal waste, and drums and other maintenance waste or excess materials, and select demolition debris from the Barter Island LRRS Clean Sweep activities. Clean Sweep activities conducted in 2008 consisted of the abatement of waste in the former LF001 landfill, and subsequent



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demolition of deactivated buildings and associated infrastructure.

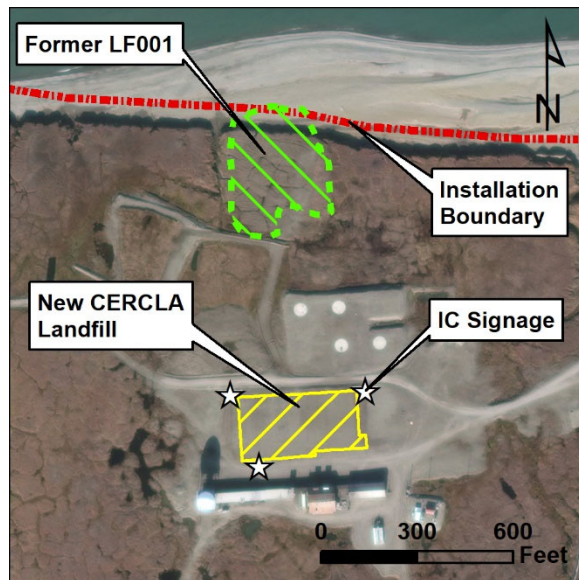


Figure 2 – New CERCLA Landfill Site Map

The former LF001 Landfill was operational between 1956 and 1978, situated immediately adjacent to the Beaufort Sea shoreline. Environmental investigations were conducted at the former LF001 Landfill by the USAF beginning in 1981, only three years following the landfill closure. Despite erosion control efforts between 1990-2000, major storm events over the years compromised the sea wall protection and exposed the northern face of the landfill. In order to prevent further erosion of the landfill material, the USAF conducted a Time-Critical Removal Action in the fall of 2007 to remove the northernmost portion of LF001 landfill material and debris exposed to the Beaufort Sea, and during the following summer of 2008, completed the excavation of LF001 material and debris.

Waste disposal at the New CERCLA Landfill was performed in accordance with the New CERCLA Landfill Operation and

Closure Plan, and was approved by ADEC under 18 AAC 60 and 18 AAC 75. Two separate disposal cells (Waste Cell A & B) were designed and constructed to contain waste within the New CERCLA Landfill (Figure 3).

- **Waste Cell A** contains 7,070 CY that consists of:
 - Excavated material from LF001, as well as
 - Clean Sweep demolition debris with:
 - DRO and RRO-impacted soil at concentrations below Method Two Soil Cleanup Levels for the Arctic Zone of 12,500 milligrams per kilogram (mg/kg) and 13,700 mg/kg, respectively; and
 - PCB-impacted soil with concentrations less than 1.0 mg/kg.
- **Waste Cell B** contains 20,655 CY that consists of:
 - Excavated material from LF001, as well as
 - Clean Sweep demolition debris with:
 - DRO and RRO-impacted soil at concentrations below Method Two Soil Cleanup Levels; and
 - PCB-impacted soil with concentrations above 1.0 mg/kg, but below 10.0 mg/kg.

The area excavated within the existing gravel pad to contain the wastes was approximately 372 ft in length, 180 ft in width on the east edge and 199 ft in width on the west edge, covering roughly 97,900 square ft. The existing raised gravel pad selected for the landfill placement was



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formerly the location of a tank farm that was removed in 2006, and the active A-Train Power Plant facility that was demolished during the 2008 Clean Sweep activities. The excavated gravel pad material removed to create Waste Cells A and B was characterized for potential petroleum, oil and lubricants (POL)-contamination due to suspected historic fuel spills. Analytical results for DRO and RRO within the excavated gravel reported RRO below the Method One Cleanup Level in all samples, and DRO present above the Method One Cleanup Level in 46 percent (%) of all samples, with the highest sample result being 3,100 mg/kg. Only the gravel with DRO and RRO results reported below their respective Method One Cleanup Levels were considered for use as clean gravel cover; all other excavated gravel exceeding the Method One Cleanup Level was disposed in Waste Cell A of the New CERCLA Landfill.

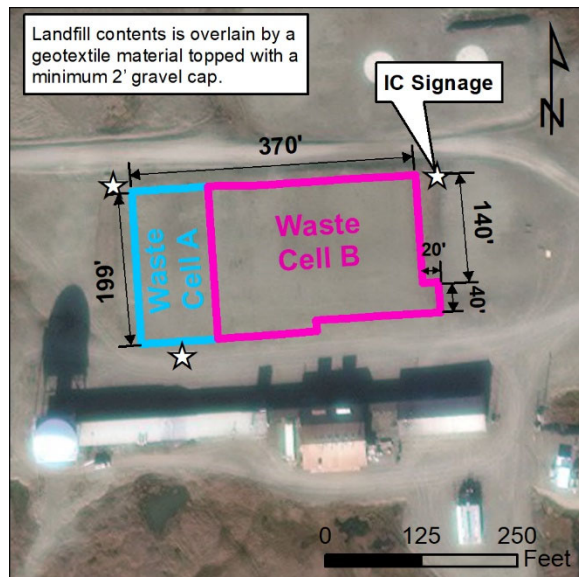


Figure 3 – New CERCLA Landfill Construction Detail

The New CERCLA Landfill was surveyed and capped with approximately 2 to 3 ft of

clean gravel material prior to closure. Per the ADEC-approved closure plan for the New CERCLA landfill, visual inspections were conducted annually from 2010 to 2016 to satisfy ADEC post-closure monitoring requirements. Interim landfill inspections will take place annually until a final remedy is determined for the New CERCLA Landfill.

Site Characteristics

Barter Island is located in an area of low, flat topography, with continuous permafrost that is present approximately 3 to 6 ft below ground surface (bgs), which remains frozen year round. The New CERCLA Landfill is located on a raised gravel pad approximately 20 ft above mean sea level, with surface drainage toward the Beaufort Sea approximately 750 ft to the north. Runoff in the area occurs as supra-permafrost sheet flow and small streams near the shoreline during spring snow melt, although the topographical high of the raised gravel pad leads to dryer conditions. The largest lake on the island, Fresh Water Lake, is approximately 0.8 miles south of the site. It is used as a year-round potable water source for the village of Kaktovik and the radar site but has no direct or indirect contact with the New CERCLA Landfill. The Beaufort Sea is the only other permanent surface water body located near the site.

The New CERCLA Landfill is located on property owned by the United States Government, managed by the USAF. Land uses include industrial activities associated with the operation and maintenance of the radar site. There are no buildings or paved roads present at the New CERCLA Landfill, although gravel roads border the site to the north and south. Fishing occurs along the coastline, but the land immediately



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surrounding the installation where the landfill is located is not utilized for subsistence hunting or fishing.

The contamination source area at the New CERCLA Landfill consists of 7,070 CY of buried soil and construction debris in Waste Cell A with low-level POL (< Method Two) and PCB (<Method Two) concentrations, and 20,655 CY of buried soil and construction debris in Waste Cell B with low-level POL (< Method Two) concentrations and PCB concentrations greater than 1.0 mg/kg but below 10.0 mg/kg.

Risk Evaluation Results

PCBs remain the only contaminant of concern onsite with concentrations above ADEC Method Two Soil Cleanup Levels, and the primary focus for evaluation of risk.

The contaminated soil and debris that was removed from the former LF001 and Clean Sweep demolition activities was placed within the New CERCLA Landfill and is contained between the continuously frozen ground beneath, and a non-woven geotextile cover and 2 to 3 ft of clean gravel fill. Vertical migration, up or down, of the contaminants is controlled/prevented in this manner. The landfill design and engineering controls maintained by the USAF prevent receptor exposure to potential contaminants placed within Disposal Cells A and B.

For the purposes of evaluating exposure pathways, it is anticipated there are no current or future site residents. Future exposure pathways consider that the facility will remain inactive and LUCs are in place within the LUCMP to prevent human and ecological exposure to contaminants within the New CERCLA Landfill. Notice of activity and use limitation (NAUL) will be

developed in a Record of Decision, and recorded in the Alaska land records at the appropriate Alaska Department of Natural Resources recording district to prevent residential land use and redevelopment. Based upon site observations and historic information prepared by the USAF there is no potential for occupants to become exposed to contaminants through the consumption of local plants or animals. The landfill is also removed from the shoreline by approximately 750 ft and is therefore not currently susceptible to potential erosional impacts from the Beaufort Sea, and is not located in an area used by village residents for subsistence activities.

The potential exposure pathways for the New CERCLA Landfill are limited due to the presence of a non-woven geotextile and 2 to 3 ft of clean gravel fill that limits the direct exposure and the potential for migration due to shallow permafrost and the absence of groundwater. However, some risk of potential surface erosion over time exists, and could result in multiple potentially complete pathways of exposure if the landfill contents were exposed. In this case, seasonal surface water runoff and limited porewater transport would have the potential to allow offsite migration of exposed soil and sediment contaminated with PCBs.

Assuming no remedial action is taken, and landfill erosion is allowed to occur, complete human health and ecological exposure routes include ingestion and direct contact/dermal absorption of subsurface soil, sediment, pore water, and surface water, and inhalation of fugitive dust. The human receptors include potential USAF staff visiting the site or assigned to maintain the site, civilians engaging in subsistence



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activities in the marine environment downgradient of the landfill, or trespassers using the landfill for a short duration of time.

Ecological receptors consist primarily of terrestrial mammals and invertebrates that burrow and have the opportunity for direct contact with the buried contaminated soil and debris, such as lemmings, voles, ground squirrels, and arctic foxes. Plants are also a limited potential ecological receptor, as they have the ability to uptake contaminated porewater or surface water through direct contact absorption, although the landfill's gravel cap prevents vegetation, and the downgradient and surrounding vegetation is limited to sparse tundra grasses and lichens. Birds and terrestrial mammals are also able to ingest smaller terrestrial invertebrates and mammals, completing the pathway for biota through bioaccumulation of PCBs. Other potential ecological receptors, although less likely due to the distance (approximately 750 ft) downgradient from the landfill, include marine animals, some of which are threatened or endangered, such as polar bear (*Ursus maritimus*), Pacific walrus, bowhead, or beluga whales, and ringed or bearded seals, or fish and marine invertebrates which inhabit the Beaufort Sea.

Because the landfill contents is contained within the landfill's subsurface, between a non-woven geotextile and gravel cap, and continuous permafrost, the most-likely exposure would be associated with any future excavation and removal of landfill contents if a removal action alternative was the selected remedy. There is potential risk of some surface erosion of the New CERCLA Landfill cap to occur if unchecked over time, which could lead to a compromised non-woven geotextile,

exposed landfill contents, and a surface release into the environment. The basis of action for the New CERCLA Landfill is the potential risk that exists to the health of human (USAF staff, contractors, site visitors) and ecological (small mammals, invertebrates, birds, and to a lesser extent large terrestrial and marine mammals) receptors of exposure to known-carcinogen PCBs, following a potential breach from an un-maintained landfill cap. The Preferred Alternative of long-term cap inspection, maintenance, reporting, continued property use restrictions, and a thorough FYR process to confirm continued protection by the remedy is considered the appropriate response.

It is the lead agency's current judgement that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in this Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of a hazardous substance into the environment.

Remedial Action Objectives and Cleanup Level

Remedial Action Objectives (RAOs) for the New CERCLA Landfill are to protect human health and the environment from exposure to PCB concentrations above 1.0 mg/kg and below 10.0 mg/kg (contained within Waste Cell B) under current and future conditions, and ensure compliance with applicable or relevant and appropriate requirements (ARARs) until the PCB Method Two Cleanup Level of 1.0 mg/kg is achieved. These objectives include the reduction of COCs to the extent that the human health risk does not exceed the cancer risk management standard of 1 in



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100,000 (1×10^{-5}) and non-carcinogenic risk standard or hazard index of 1.0, set forth in 18 AAC 75.325(h). The overall risk may be reduced by lowering the contaminant levels through excavation or treatment processes and/or eliminating the exposure routes such as with the proposed LTM alternative through maintenance of a cap to ensure remaining contamination is contained.

Although Alternative 2 – LTM is the proposed remedy for the site, the cleanup level for PCBs that would pertain to a future removal action of the contaminated soil and materials present within the New CERCLA Landfill, if implemented as a cleanup goal for the site, is provided in **Table 1**. Action levels are conservatively based upon criteria deemed safe for residential conditions, although current and future land use is limited to industrial/non-residential purposes based upon the LUCs recorded in the LUCMP for Barter Island LRRS New CERCLA Landfill, and the NAUL that will be recorded on the deed following completion of the Record of Decision. ARAR goals for the contaminated soils and materials are established by ADEC's 18 AAC 75.

Table 1 – New CERCLA Landfill Cleanup Level

Cleanup Level	Cleanup Level Source
PCBs - 1 mg/kg	ADEC Method Two Soil Cleanup Level in the Arctic Zone, Table B1 (AAC, as amended October 2018)

Groundwater is not present at the site, and the landfill's comparatively dry site conditions and topographical high locale lead to very little active zone water or flow and therefore 18 AAC 75 Table C groundwater quality standards were not included as an ARAR goal for the New CERCLA Landfill.

Summary of Remedial Alternatives

The objective of the remedial alternatives is to provide protection to human health and the environment based upon the different restoration goals for each alternative and the future land use of the site. Five remedial alternatives for the New CERCLA Landfill were considered and are described below. The preferred alternative is Remedial Alternative 2, Long Term Monitoring.

Remedial Alternative 1: No Action

Under this remedial alternative, the USAF would take no action to prevent potential receptor exposure to PCB-contaminated soil and debris in the subsurface at the New CERCLA Landfill. A no action alternative is required under the NCP and establishes a baseline for comparison of the alternative remedies.

Remedial Alternative 2: Long Term Monitoring (LTM)

Under this remedial alternative, the USAF would avoid all barge travel and corresponding risk to the marine environment, and leave all PCB-contaminated soil and debris with concentrations above 1.0 mg/kg but below 10.0 mg/kg in place. Although soil and debris with PCB concentrations above the ADEC Method Two Cleanup Level of 1 mg/kg would remain, this alternative is considered given the remote nature of the site, the lack of available local resources, and ongoing natural attenuation of PCB contamination occurring slowly over time by biological processes and weathering. This alternative includes LTM through:



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- Re-implementation of an annual landfill cap inspection and reporting requirement;
- Enforcement of LUCs by maintaining the current dig restrictions and use limitations already in place;
- Recording of NAUL in the Alaska land records at the appropriate Alaska Department of Natural Resources recording district;
- Maintenance of implemented ICs which include notification signage and gravel landfill cap; and
- A FYR process to evaluate the protectiveness and applicability of the remedial alternative.

Although supra-permafrost (active zone) water is seasonally present in historically limited quantity, and not hydraulically connected with other area surface water bodies including the Beaufort Sea, to ensure future protectiveness, and provide a monitored point of compliance, porewater monitoring would be conducted immediately downgradient of the landfill perimeter in areas of natural drainage, once every 5 years. This active zone monitoring would be implemented the year before each FYR to evaluate the protectiveness of the alternative and ensure no offsite migration is occurring. LTM, cap maintenance and a FYR would continue until PCB concentrations are determined to be below the ADEC Method Two Cleanup Level of 1.0 mg/kg. These protective Long Term Monitoring (LTM) measures include annual maintenance, inspection and reporting, a Five Year Review (FYR) process, and implementation of land use controls (LUCs): 1) recording a NAUL in the Alaska land records at the appropriate Alaska Department of Natural Resources recording district, 2) installation

of warning signs, and 3) inspection and maintenance of the landfill cap.

Remedial Alternative 3: Onsite Treatment through Solvent Extraction

Under this remedial alternative, the USAF would excavate the contents of New CERCLA Landfill Waste Cells A and B. Wastes would be segregated into stockpiles of large metal or concrete debris (> 1 cubic foot), small metal or concrete debris (< 1 cubic foot), and soil. Waste Cell A soil and debris, and Waste Cell B debris would be transferred to shipping containers and barged offsite for disposal in a permitted treatment, storage, disposal facility (TSDF) landfill in the contiguous United States (US) as non-hazardous waste.

Onsite treatment of the estimated 12,400 CY of Waste Cell B soil with PCB concentrations above 1.0 mg/kg but below 10.0 mg/kg would be conducted by an experienced soil extraction treatment vendor/contractor, and include:

- Construction of lined soil treatment cells with associated piping and pumps, for confined storage of clean and contaminated soil, and secure transport of solvent;
- Active soil treatment where soil, in 100 CY batches, is exposed to a series of solvent baths, drained, mixed, and re-rinsed with solvent, until field screening and confirmatory laboratory analysis shows that concentrations have been reduced as intended;
- Use of clean and contaminated solvent storage and recycling cells to recycle solvent onsite through a purification system consisting of settling, 10-micron bag filter, and molecular sieve



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purification stations to treat the solvent for reuse.

The proprietary non-hazardous and non-toxic solvent has been field-tested and proven successful in remote Alaskan environments at the destruction of PCBs in soil by 96%. With a maximum initial PCB concentration of 10 mg/kg, a reduction to 0.4 mg/kg is achievable if 96% reduction is achieved, as proven in past applications, effectively meeting the ADEC Method Two Soil Cleanup Level of 1.0 mg/kg. Following treatment, if the used and recycled solvent is shown to contain less than 2.0 milligrams per liter PCBs, it would be incinerated onsite as opposed to being shipped offsite for disposal.

Once all soils had achieved cleanup and were confirmed clean by laboratory analysis, they could be utilized as backfill for the closure of the New CERCLA Landfill. All contaminated soil leaving the facility would be in compliance with the CERCLA Offsite Rule (Section 121(d)(3)) and NCP 40 Code of Federal Regulations (CFR) 300.440.

Remedial Alternative 4: Disposal in Offsite Permitted Landfill

Under this remedial alternative, the USAF would excavate the contents of New CERCLA Landfill Waste Cells A and B, and segregate wastes as described under Alternative 3.

- An estimated:
 - 7,070 CY of Waste Cell A soil and debris with PCB concentrations below ADEC Method Two Cleanup Levels, and
 - 20,655 CY of Waste Cell B soil and debris above ADEC Method Two Cleanup Levels

- would be transferred to shipping containers and barged offsite for disposal to a permitted TSDF landfill in the contiguous US as non-hazardous waste.

Following excavation and confirmation sampling, the New CERCLA Landfill disposal trenches would be backfilled and capped. All contaminated soil leaving the facility would be in compliance with the CERCLA Offsite Rule (Section 121(d)(3)) and NCP 40 CFR 300.440.

Remedial Alternative 5: Offsite Treatment through Thermal Desorption

Under this remedial alternative, the USAF would excavate the contents of New CERCLA Landfill Waste Cells A and B, and segregate wastes as described under Alternatives 3 and 4.

- Waste Cell A soil and debris with PCBs below 1.0 mg/kg, and Waste Cell B debris with PCBs ranging from 1.0 to 10.0 mg/kg would be transferred to shipping containers and barged offsite for disposal in a permitted TSDF.
- Waste Cell B soil with PCBs ranging from 1.0 to 10.0 mg/kg would be transferred to shipping containers and barged offsite to a thermal desorption facility in the contiguous US.
- Here soils would be incinerated in a controlled US Environmental Protection Agency (EPA)-approved facility at moderately high temperatures with air quality pollution prevention systems in place (EPA, 2012), until they reach acceptable levels to be used as daily cover at a permitted landfill.

All contaminated soil leaving the facility would be in compliance with the CERCLA



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Offsite Rule (Section 121(d)(3)) and NCP 40 CFR 300.440.

Comparing Remedial Alternatives

The objective (i.e., RAOs) of the five remedial alternatives evaluated for the New CERCLA Landfill is to provide protection to human health and the environment based upon the different restoration goals for each alternative, the future land use of the site (industrial), and the site's remote geographic location. A comparison of the five remedial alternatives is provided in the following sections, and in **Table 2**. The nine criteria used in the evaluation of the remedial alternatives for the landfill, in accordance with CERCLA:

- (1) **Protection of human health and the environment:** How well does the alternative provide protection to human health and the environment?
- (2) **Compliance with ARARs:** Does the alternative meet applicable state and federal laws?
- (3) **Long-term effectiveness and permanence of the alternative:** What is the long-term risk after implementation of the RA is complete? Are the COCs permanently removed or destroyed?
- (4) **Toxicity, mobility, or volume reduction through treatment:** How well does the treatment reduce toxicity, mobility, or volume of the contaminants?
- (5) **Short-term effectiveness:** Could the health and safety of human and ecological receptors be impacted during the implementation of the alternative?
- (6) **Implementability:** Is the alternative available and able to be constructed,

maintained, and/or enforced? What is the technical and administrative feasibility of this alternative and availability of the required goods and services?

- (7) **Cost:** Is the alternative cost-effective in terms of both capital and operational and maintenance costs?
- (8) **State agency acceptance:** What are the State's (or supporting agency's) comments or concerns pertaining to the alternatives considered and the selection of the preferred alternative?
- (9) **Community acceptance:** What are the community's comments or concerns regarding the alternatives considered and the selection of the preferred alternative?

Criteria 1 and 2 are *threshold* criteria that must be met by statute for a proposed alternative to be considered for implementation. Criteria 3 to 7 are the primary balancing factors on which each alternative is evaluated to identify the selection of the preferred alternative. Criteria 8 and 9 are *modifying* criteria that will be evaluated upon obtaining regulatory and community comments on this Proposed Plan, and will be used to help develop the ROD.

Overall Protection of Human Health, Welfare and the Environment

Remedial Alternative No.1 (No Action) is neither protective of human health or the environment, and would allow eventual release of contaminants through an unmaintained landfill cap and sediment runoff. Alternative 2 (LTM) provides protection of human health and the environment if the landfill cap is well maintained, although risk remains for the potential of a release of PCB to the environment in the event of erosion or



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failure of the cap. Almost all risk is eliminated through the implementation of Alternatives 3, 4 and 5, while concurrently providing a high level of protection to human health and the environment. With these alternatives, the New CERCLA Landfill waste would be removed, alleviating the risk for erosion.

Compliance with ARARs

Chemical-specific ARAR goals for the contaminated soils and materials confined within the New CERCLA Landfill are ADEC Soil Cleanup Levels per 18 AAC 75, which for this site include:

- Table A2, Method One— Petroleum Hydrocarbon Soil Cleanup Levels for the Arctic Zone; and
- Table B1, Method Two – PCB Soil Cleanup Level for the Arctic Zone.

Evaluation of the proposed alternatives indicates that all alternatives, except the No Action Alternative 1, meet ARARs.

Chemical-specific ARARs for soil are met with the implementation of Alternatives 3, 4, and 5 with the removal and treatment or offsite disposal of the New CERCLA Landfill contents, and Alternative 2 with continued landfill monitoring and maintenance to ensure no risk of exposure to receptors exists. Alternative 1 does not comply with chemical-specific ARARs.

Location-specific ARARs are based upon the concentrations of hazardous substances and/or the occurrence of activities or sensitive species at a location, which for this site include:

- Marine Mammal Protection Act (MMPA) of 1972 which regulates human interaction with marine mammals;

- Endangered Species Act (ESA) of 1973 which is designed to protect species at risk of extinction; and
- National Historic Preservation Act (NHPA) of 1966 which is intended to preserve historical and archaeological sites in the United States.

These types of ARARs would only apply to work being performed onsite, such as cap maintenance or landfill remediation. The coastal regions of Barter Island are known threatened or endangered species habitat for polar bears, ringed seals and bearded seals, Pacific walrus, and bowhead whale. Spectacled and Steller's eider, as well as the yellow-billed loon, are also known to be possible transient visitors to the area, although it is not likely a suitable nesting location based upon site reconnaissance. Portions of the island are also listed on the National Register of Historic Places, although not in the immediate area of the New CERCLA Landfill.

Location-specific ARARs are met by each of the alternatives other than the No Action Alternative 1. During implementation of the removal and disposal or treatment alternatives, no sensitive or rare plants, threatened or endangered species are expected to be disturbed. Removal and disposal of the New CERCLA Landfill contents would occur only during daylight hours, during the summer and early fall months, avoiding mid to late fall months when polar bear tend to frequent the area. Alternative 2 avoids any added risk to the environment during field implementation, as all PCB soil and debris would remain in place, secured beneath the non-woven geotextile and clean gravel fill material. Compliance with the 611th Air Support



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Group's Polar Bear Interaction Management and Pacific Walrus Haulout Avoidance Plan and the 611th Air Support Group's Integrated Cultural Resources Management Plan for the Distant Early Warning System in Alaska ensures USAF contractors compliance with the MMPA and NHPA.

Similar to location-specific ARARs, action-specific ARARs would become applicable upon excavation and disposal of buried debris and contaminated soil, under one of the non-preferred Alternatives 3, 4 or 5. These requirements include:

- Resource, Conservation and Recovery Act of 1976,
- Toxic Substances Control Act of 1976,
- Clean Water Act of 1972, stormwater management,
- Alaska Solid Waste Management Regulations (18 AAC 60), and
- Alaska Oil Pollution Regulations (18 AAC 75).

As no excavation or disposal of contaminated debris and soil is included in the proposed Alternative 2, and contamination would remain in place, an additional ARAR specific to Alternative 2 would be:

- Uniform Environmental Covenants Act (AK Statute § 46.04.300).

Long-Term Effectiveness and Permanence

Remedial Alternative 2 provides long-term effectiveness for as long as annual inspection and cap maintenance continue, or until a FYR has shown PCB concentrations have achieved their ADEC Method Two Cleanup Level by natural attenuation. Monitoring and maintenance of the offsite

landfill by trained landfill operators is included as a component of Alternative 4, therefore securing the permanence and long-term effectiveness of that option. Remedial Alternatives 3 and 5 include permanent treatment of PCB-contaminated soil to regulatory acceptable safe levels, leaving no long-term risks to human health and the environment. Alternative 1 No Action is neither permanent nor considered effective for long-term protection of the environment.

Reduction of Toxicity, Mobility or Volume of Contaminants through Treatment

Both Remedial Alternatives 3 and 5 involving treatment of the New CERCLA Landfill contents are effective at eliminating mobility of PCB-contaminated soils and PCB-paint. Remedial Alternatives 3 and 5 would result in reduction of toxicity and volume, as they would not only remove the contents from the site but would also treat the estimated 12,400 CY of Waste Cell B PCB-contaminated soil to reduce contaminant concentrations to within environmentally acceptable Federal, State and/or permit requirements. Alternatives 1 and 2 have no impact on contaminant toxicity, mobility or volume.

Short-Term Effectiveness

The five alternatives differ greatly in their short-term effectiveness, as Alternatives 2, 4 and 5 could be completed and considered effective within a single summer/fall season, while Alternative 3 is estimated to take two seasons to complete both the excavation/segregation of soil and debris, offsite disposal of debris, and onsite treatment of soils. Remedial Alternatives 3, 4 and 5 require transport of large pieces of machinery via barge, which can cause



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substantial schedule delays given the remote location and susceptibility to the presence of seasonal ice-pack. Remedial Alternatives 4 and 5 also each require removal of contaminated soil by barge, which increases the risk of a potential release to the environment should an accident occur that would disperse the material into the ocean during transit.

While Remedial Alternatives 4 and 5 include the most risk to the marine ecosystem with barge transportation between Kaktovik, Alaska and the Port of Seattle, Washington, for both the soil and debris, Remedial Alternative 2 poses no risk to the marine ecosystem with no barging of soil, debris or equipment necessary. Remedial Alternative 3 poses only minimal risk to the marine ecosystem because Waste Cell B soil with PCB concentrations above 1.0 mg/kg would be treated onsite by solvent extraction, with only Waste Cell B debris, and Waste Cell A soil and debris to be shipped offsite. The No Action Alternative 1 lacks short-term effectiveness because it includes no measures to protect human health and the environment at the site.

Implementability

Each of the alternatives can be implemented both technically and administratively. Given the remote nature of Barter Island, which is accessible only by air or barge, resources are limited and pose challenging logistics to acquire, if not local. Implementability is therefore an important evaluation criterion for the alternatives considered for the New CERCLA Landfill. Critical construction components such as heavy equipment and materials are either being sourced locally or will be mobilized in a timely manner for implementation and execution of Remedial Alternatives 3, 4 or

5. With equipment mobilization there is potential for weather delays, particularly with fog and ice in the vicinity of Barter Island during barging season. Specific to the relatively large volume of material that must be transported offsite under Remedial Alternatives 4 and 5, weather delays have the potential to affect these alternatives more than Remedial Alternatives 2 or 3. A major advantage of the proposed LTM Alternative 2 is the implementability of annual inspection and maintenance, requiring mobilization of a single field personnel once a year, and the ability to rely on local heavy equipment capable of minor cap repair and addition of clean material, as needed.

Cost

Alternative 1 is the least expensive to implement because no action would occur to address contaminated soil and debris at the New CERCLA Landfill, but the result would not be protective of human health and the environment. Remedial Alternative 5 is the most expensive alternative due to the barge, trucking and railway transportation and fuel demands from the transport of all soil offsite to an incineration and TSDF facility in the contiguous US for treatment, while the debris remains are barged offsite to a permitted landfill in the contiguous US for disposal. Below are the costs estimated to perform each of the alternatives considered:

- Remedial Alternative No. 1 – \$0
- Remedial Alternative No. 2 – \$891,768 (estimated 30-year monitoring period)
- Remedial Alternative No. 3 – \$41,241,131
- Remedial Alternative No. 4 – \$33,973,510
- Remedial Alternative No. 5 – \$44,911,266



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State/Support Agency Acceptance

ADEC has had the opportunity to review and provide comments on this proposed remedy prior to the public comment period mentioned on the front page of this Proposed Plan and agrees this remedy would be in compliance with state law.

Community Acceptance

Community acceptance of the preferred remedy would be fully evaluated in the Record of Decision based on comments received during the public comment period mentioned on the front page of this Proposed Plan.

Preferred Alternative

This Proposed Plan proposes selection and implementation of Remedial Alternative No. 2, through implementation of an LTM program. Remedial Alternative No. 2 includes allowing all buried New CERCLA Landfill waste, approximately 27,725 CY of PCB-contaminated soil and debris with concentrations ranging from 0-10 mg/kg, to remain in place. The preferred remedy includes:

- Re-implementation of an annual landfill cap inspection and reporting requirement;
- Enforcement of LUCs by maintaining the current dig restrictions already in place;
- Recording of NAUL in the Alaska land records at the appropriate Alaska Department of Natural Resources recording district;
- Maintenance of implemented ICs which include notification signage and gravel landfill cap; and

- A FYR process that includes active zone porewater monitoring (or confirmation of a lack of available porewater to monitor) to evaluate the protectiveness and applicability of the remedial alternative every five years until it is determined that PCB concentrations have met the ADEC Method Two Cleanup Level of 1.0 mg/kg.

The preferred alternative (Remedial Alternative No. 2) meets the RAOs developed for the New CERCLA Landfill by being protective of human health and the environment, and compliant with state and federal laws as detailed within the Compliance with ARARs section of this Proposed Plan. The preferred alternative can change in response to public comment or new information. Based upon the results of the 2008 Clean Sweep field activities, as documented in the *Building Demolition, Concrete Removal, Contaminated Soil Remediation, and Landfill Relocation Report*, the disposal criteria for former LF001 soil and debris and Clean Sweep construction debris was adhered to during the creation of the New CERCLA Landfill. Waste Cell A received soils with PCBs below 1.0 mg/kg which meet the applicable soil cleanup level, and Waste Cell B received soils with PCBs above 1.0 mg/kg but below 10.0 mg/kg, as designed.

Because of the remote nature of the installation, the limited modes of access and local resources due to this remoteness, and the increased risk of exposure to the marine ecosystem during offsite transport of contaminated material by barge, the preferred alternative does not satisfy the statutory preference for treatment as a principal element; however, implementation



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of the preferred alternative consisting of LTM of the continued onsite containment of the soil and debris with PCB concentrations above 1.0 mg/kg but below 10.0 mg/kg, meets the threshold criteria and provides the best balance and tradeoffs among other alternatives with respect to the balancing and modifying criteria and is expected to be protective of human health and the environment, achieve the applicable cleanup level for PCBs over time through natural attenuation and be cost-effective.



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Table 2 - Comparison of Remedial Alternatives for Addressing the New CERCLA Landfill

Remedial Alternative	Threshold Criteria		Balancing Criteria					Modifying Criteria
	Protection of Human Health and the Environment	Compliance with ARARs	Long-Term Effectiveness and Permanence	Reduction in Toxicity, Mobility, and Volume through Treatment	Short-term Effectiveness (Impacts, Times to Achieve Remedial Action Objectives)	Implementability	Cost	State Acceptance
No. 1 - No Action	Fail	Fail	0	0	0	0	0	Fail
No. 2 - Long Term Monitoring	Pass	Pass	2	1	2	4	4	Pass
No. 3 - Onsite Treatment through Solvent Extraction	Pass	Pass	5	5	3	2	2	Pass
No. 4 - Disposal in Offsite Permitted Landfill	Pass	Pass	3	1	4	3	3	Pass
No. 5 - Offsite Treatment through Thermal Desorption	Pass	Pass	5	5	4	2	1	Pass

Key: 5 = Best 4 = Better than Average 3 = Average 2 = Worse than Average 1 = Worst 0 = Not Applicable



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Public Participation

You are encouraged to provide comments on any of the alternatives presented in this Proposed Plan for Barter Island LRRS New CERCLA Landfill. Use the comment form provided at the end of this plan to document your comments or concerns. A final decision document on the alternatives for the New CERCLA Landfill would not be prepared until public comments are considered. Your comments can be provided to the USAF by the following two methods:

- Mailing the completed Comment Form to the provided address; and
- Discussing your comments or questions over the phone with USAF Project Manager – Mr. Stephen Krause at (907) 552-1526.

A copy of the Proposed Plan would be provided at the Information Repository at the Harold Kaveolook School-Community Library located in the city of Kaktovik, the Nuiqsut Trapper School-Community Library located in the village of Nuiqsut, and the Tuzzy Consortium Library located in Utqiagvik, for review and public comment:

Harold Kaveolook School-Community Library
2001 Barter Avenue
Kaktovik, AK 99747
(907) 640-5800

Nuiqsut Trapper School-Community Library
3310 3rd Avenue
Nuiqsut, AK 99789
(907) 480-5800

Tuzzy Consortium Library
5421 North Start Street
Utqiagvik, AK 99723
(907) 852-4050

Administrative Record Website:
<http://ar.afcec-cloud.af.mil/Search.aspx>

USAF Toll Free:
1-800-222-4137

The public comment period would end **April 15, 2020**.

A public meeting to discuss this project would be held if there is public interest to warrant further discussion of the proposed remedy for the New CERCLA Landfill. If you have an interest in attending a public meeting, please contact Stephen Krause at the telephone number listed above and a public meeting would be scheduled along with an announcement of the meeting location, date and time.

Involving the public in the environmental restoration program (ERP) decision-making process is required by 40 Code of Federal Regulation 300.430(f)(3). The USAF is committed to keeping the community informed of activities, investigations, and cleanup schedules at the site.

Additional information can be found in the information repository located at JBER. The information repository contains newspaper clippings and community relations documents relating to Proposed Plans and response actions for the ERP sites as maintained by the Site Project Manager (Stephen Krause).



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For More Information

To obtain additional information pertaining to the proposed remedy for Barter Island LRRS New CERCLA Landfill or to leave a message of questions or comments associated with this Proposed Plan, please contact:

Mr. Stephen Krause
U.S. Air Force
Restoration Project Manager
AFCEC/CZOP
10471 20th Street, Suite 348
JBER, Alaska 99506
Phone: (907) 552-1526
E-Mail: Stephen.Krause.2@us.af.mil

Glossary of Terms

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AFCEC	Air Force Civil Engineer Center
ARARs	Applicable or Relevant and Appropriate Requirements
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CY	cubic yard
DRO	diesel range organics
EPA	US Environmental Protection Agency
ERP	Environmental Restoration Program
FS	Feasibility Study
ft	feet
FYR	Five Year Review
ICs	Institutional Controls
JBER	Joint Base Elmendorf-Richardson
LRRS	Long Range Radar Site
LTM	Long Term Monitoring
LUCs	Land Use Controls
mg/kg	milligrams per kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
%	percent
PCBs	polychlorinated biphenyls
POL	petroleum, oil and lubricants
RRO	residual range organics
TSDF	treatment, storage, disposal facility
US	United States
USAF	United States Air Force



You may use the space below to write your comments and detach, fold and mail to Stephen Krause (USAF) at the address on the front page. Comments must be postmarked no later than April 15, 2020. If you have any questions, please contact Stephen Krause at (907) 552-1526 or Stephen.Krause.2@us.af.mil.

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Name	
Affiliation	
Address	
City	State and Zip

Place
Stamp
Here

**Mr. Stephen Krause
U.S. Air Force Remedial Project Manager
AFCEC/CZOP
10471 20th Street, Suite #348
JBER, AK 99506**