DEC062

THE PROPOSED PLAN FOR REMEDIAL ACTION

Naknek Recreation Camp 1 (Rapids Camp)

611 CES/CEVR Installation Restoration Program

INTRODUCTION

This proposed plan provides information on the investigation and planned Remedial Action for the Naknek Recreation Camp 1 (Rapids Camp, see Figure 1). Rapids Camp occupies about 12.5 acres of land adjacent to the Naknek River and is located roughly 6 miles southeast of King Salmon Airport. This camp was operated by the Air Force from 1952 to 1977 to support military personnel at King Salmon Airport. The facility included boat docks, fish camps, lodging, and fuel storage for a generator and refueling of boats. A fire occurred near the beach and boat dock area in 1978. All buildings, tanks and other structures have been removed from the entire site.

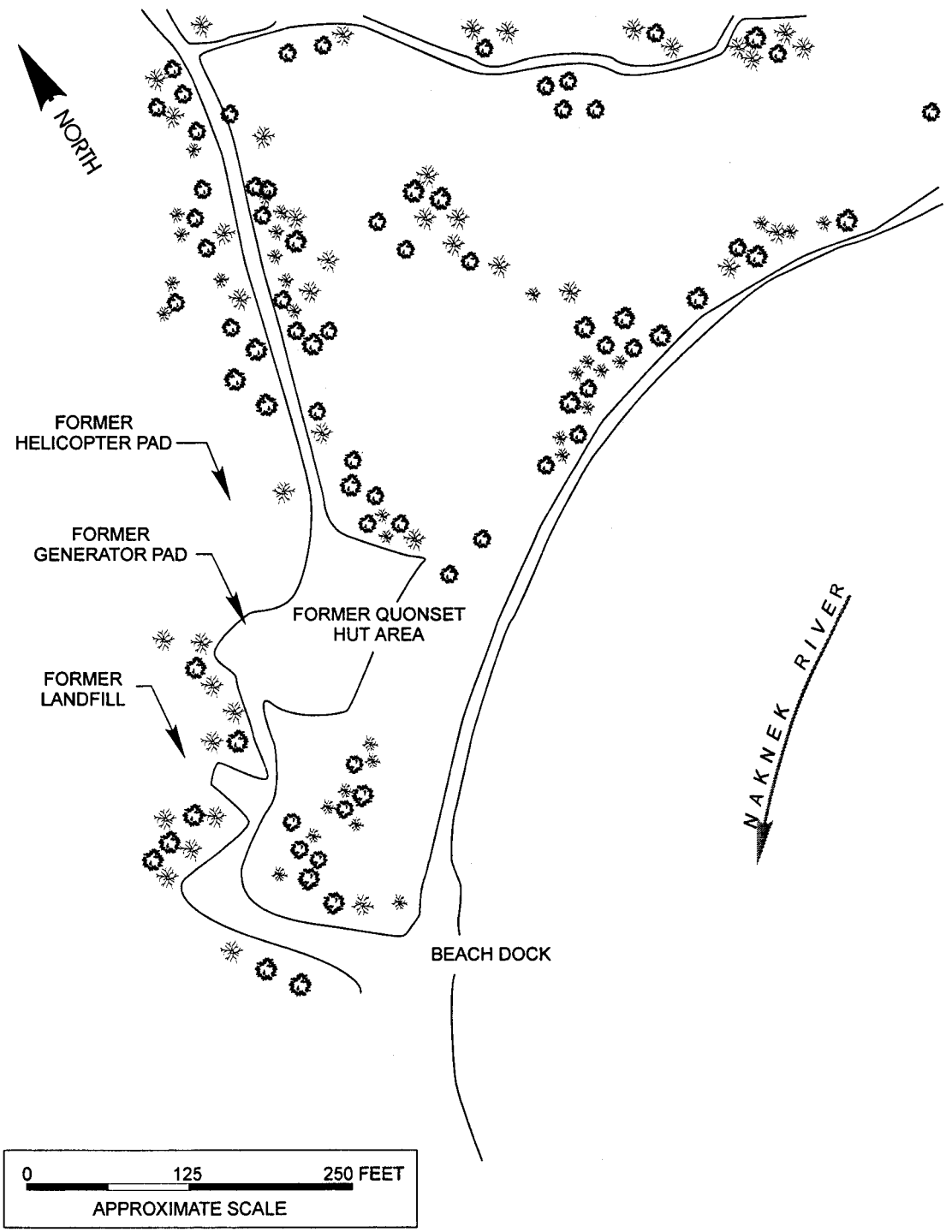
The Air Force, Alaska Department of Environmental Conservation (ADEC), and the U.S. Environmental Protection Agency (EPA) have been involved in the investigation of contamination and development of the cleanup alternatives at this site. Four areas of contamination have been documented at Rapids Camp; the beach/dock area, the generator pad area, the former landfill area, and solid waste throughout the site. Remedial action alternatives were developed and evaluated in a feasibility study. The feasibility study was based on the results of site investigation studies performed at the site.

The agencies have identified Alternative E, excavation and bioremediation of contaminated soils, and continued groundwater monitoring, as the remedy that best addresses the contamination issues in the beach/dock and the generator pad areas. As part of this alternative, the landfill will be capped and surface soil sampling will be performed along the former pipeline, in the helicopter pad area, and along the beach.

Final cleanup decisions will not be made until after the community has the opportunity to review this Proposed Plan and make their comments and concerns known to the Air Force. Please review and address your comments to:

Mr. Roger Lucio
611 CES/CEVR
6900 9th Street, Suite 310
Elmendorf AFB, Alaska 99506-2270
(907) 552-4532 or (800) 222-4137

The Air Force will host a public meeting in King Salmon on April 15, 1998 to discuss this Proposed Plan and take your comments. The meeting will held in the base theater from 7:00 to 9:00 p.m. The comment period runs from April 1, 1998 to April 30, 1998.



RAPIDS CAMP PROPOSED PLAN
KING SALMON, ALASKA
RAPIDS CAMP

FIGURE 1

SITE INVESTIGATION

Surface soil, subsurface soil, and groundwater samples were collected throughout the site and analyzed for potential contaminants. In addition, riverbed sediments were collected from the Naknek River along the beach/dock area.

BEACH/DOCK AREA

Petroleum contamination was found in two groundwater monitoring wells and in surface soils at the beach/dock area. Trichloroethene (TCE), which is a solvent or de-greasing agent, was also found in one well at the beach/dock area. The source of contamination in this area is thought to be spills from above ground fuel storage tanks used to refuel boats and solvents used in the maintenance of boat motors and equipment.

Petroleum hydrocarbons were found at low levels in surface and subsurface soil throughout the beach/dock area. The detected concentrations of petroleum hydrocarbons did not exceed the proposed cleanup levels.

Groundwater was found in wells at the beach/dock area at depths of 7 feet or less. During the 1994 site investigation, TCE, diesel, and several other fuel constituents; toluene, ethylbenzene, xylene and trimethylbenzenes, were detected in one well at concentrations that exceeded safe drinking water levels and proposed cleanup levels. Diesel was detected at a concentration of 6.7 mg/L, and TCE was detected at a concentration of 3.7 mg/L in this one well. Another sampling event in 1996 indicated that the petroleum hydrocarbon and TCE levels in this well had decreased to below detectable levels.

Groundwater modeling was performed based on the levels of petroleum hydrocarbons detected in surface soils and the most recent groundwater data. The modeling results indicate petroleum hydrocarbons may continue to leach (move from the soil into the groundwater). However, the maximum diesel concentrations in groundwater are predicted to be 0.02 mg/L, which is two orders of magnitude below the proposed groundwater cleanup standard of 1 mg/L.

GENERATOR PAD/LANDFILL AREA

Surface soils at the generator pad area were contaminated with petroleum hydrocarbons. The source of the contamination is thought to have been diesel spills.

Seven soil borings were completed in the vicinity of the former generator pad to a depth of 60 feet. Surface soil samples were collected from nine additional locations in this area. The soil boring data indicates that petroleum hydrocarbons that exceed cleanup goals are present in this area from the surface to approximately 5 feet below ground surface. Diesel was detected in surface soil at concentrations ranging from 42 milligrams per kilograms (mg/kg) to 280,000 mg/kg. Polychlorinated biphenyls (PCBs) were detected in one surface soil sample at a concentration of 11 mg/kg. The sample containing PCBs was collected in the vicinity of several used drums and visible surface staining. Diesel was also detected in this sample at a concentration of 14,000 mg/kg. PCBs were not detected in any other surface or subsurface soil samples.

Subsurface soil contamination was detected in one boring collected approximately 15 to 35 feet below ground surface. Diesel concentrations in samples collected from this interval ranged from 4,800 mg/kg to 9,300 mg/kg. Diesel was also detected at a concentration of 3,600 mg/kg, 30 to 32 feet below ground surface in one other boring. The two soil borings in which subsurface contamination was detected at concentrations exceeding cleanup goals were located approximately 35 feet apart

and are near the center of the former generator pad area. Subsurface contamination was not detected at concentrations that exceeded cleanup goals in adjacent soil borings (25 to 50 feet away).

Groundwater was found at a depth of approximately 80 feet near the generator pad. No contamination was detected in site groundwater and the deepest penetration of contamination into the soil is nearly 50 feet above the groundwater. Soils from approximately 15 to 30 feet below ground surface contain diesel contamination that exceeds the 3,000-mg/kg cleanup level.

SUMMARY OF SITE RISKS

The Air Force conducted a human health risk assessment and an ecological risk assessment for the Rapids Camp area. The human health risk assessment looked at whether or not the contaminants could increase the risk of a person living or working at the site for contracting cancer or other adverse health affects. Exposure to contaminated soil and groundwater at the sites may pose a risk to future residents. Skin contact or accidental ingestion may increase the potential for noncarcinogenic health affects. The state and Air Force agreed that a cleanup goal of 3,000 mg/kg for diesel range organics in soil was protective of both human health and the environment. Only those soils in the upper 5 feet require remediation to protect human health and the environment. Based on modeling data, the deeper contaminated soil is unlikely to affect groundwater; consequently, the soil poses little, if any, risk. No remediation of this deeper contamination is planned.

The most recent groundwater quality data indicates that the groundwater does not currently pose a risk. Residential wells in the vicinity of Rapids Camp have been sampled for potential contaminants three times during the previous 2 years. No contaminants have been found in any of the residential wells at levels that might pose a risk to human health. The Air Force has agreed to prohibit installation of any drinking water wells within 200 feet of the generator pad or landfill until long-term groundwater monitoring supports the conclusion that groundwater continues to meet applicable drinking water standards.

The ecological risk assessment indicated that exposure to petroleum products in the soil could cause potential risks to small-sized wildlife species living at the site.

SUMMARY OF ALTERNATIVES

Initially a wide range of alternatives was considered to address contamination at the site. After further screening, five alternatives were carried forward for final analysis against the nine criteria described in the national contingency plan and listed in Table 1.

Table 1: Evaluation Criteria	
1	Protective Human Health and the Environment
2	Compliance with ARARs
3	Long-Term Effectiveness and Permanence
4	Reduction in Toxicity, Mobility, or Volume Through Treatment
5	Short-Term Effectiveness
6	Implementability
7	Cost
8	State Acceptance
9	Community Acceptance

The application of each of the criteria to Rapids Camp is discussed in the following section. The feasibility study for Rapids Camp contains more information about all of the alternatives and details their evaluation.

The several elements described in the following paragraphs are common to all the alternatives.

Surface debris should be removed from each area. The removal will focus on debris visible on the surface, not buried debris. Debris removal was added as a component of this project because the community, through the Restoration Advisory Board, requested that the Air Force address the solid waste littering the site.

Surface debris should be removed for the former landfill area. After debris removal, the area should be capped with a two-foot thick layer of clean soil and re-vegetated with native plant species. An inspection and maintenance program should be developed and implemented for the landfill cap.

Two additional monitoring wells should be installed to monitor groundwater quality; one in the vicinity of the generator pad and one in the landfill area.

Surface soil samples should be collected at the former helicopter pad, along the former pipeline corridor, and along the beach. A maximum of 20 soil samples should be collected and analyzed for DRO, VOCs, and PCBs.

Existing monitoring wells should be monitored once during construction and once every 5 years for a minimum duration of 25 years.

A volume of contaminated soil, present between 15 and 30 feet below ground surface, at the generator pad will not be remediated. This soil exceeds the 3,000 mg/kg cleanup level. Remediation will not be performed because cleanup of this soil would have no tangible benefit in terms of decreased risk or protection of groundwater.

Alternative A: No Action

- Cost: none
- O & M (operation and maintenance): none
- Total present worth: none
- Estimated time to implement: none

This alternative is required to establish a baseline that reflects current conditions at the site without any further cleanup being conducted. This alternative does not meet any of the nine criteria.

Alternative B: Capping of soil at generator pad, intrinsic remediation, and long-term monitoring of ground water.

- Cost: $583,142 to $1,249,591
- O & M (operation and maintenance): $90,238 to $193,366
- Total present worth: $673,380 to $1,442,957
- Estimated time to implement: 25 years

This alternative includes capping or covering the contaminated soil with a low permeability asphalt layer. The soil will then be allowed to intrinsically remediate or cleanup naturally beneath the cap. Intrinsic remediation is the process of using the natural bacteria present in the soil to break down the contamination.

Groundwater monitoring wells would be sampled periodically to document groundwater quality and detect if residual contaminants at the beach/dock area or contaminants in the capped soil at the generator pad have migrated from the soil into the groundwater.

Alternative C: Excavation and thermal treatment of soil and long-term monitoring of groundwater.

- Cost: $692,301 to $1,483,502
- O & M (operation and maintenance): $90,238 to $193,366
- Total present worth: $782,538 to $1,676,868
- Estimated time to implement: 1 year for soil cleanup, 25 years for groundwater monitoring

Approximately 1,000 cubic yards of soil to an average depth of five feet below ground surface would be excavated and transported to a thermal treatment facility located on-site (soil burner) for incineration. The thermal treatment process uses heat to separate petroleum hydrocarbons from the soil. Excavated soil will be screened for the presence of PCBs using an on-site field analytical method. The excavation would be backfilled with clean soil and re-vegetated with native plant species.

Groundwater monitoring wells would be sampled periodically to document groundwater quality and detect if residual contaminants at the beach/dock area or contaminants at 15 to 30 feet below ground surface at the generator pad have migrated from the soil into the groundwater.

Alternative D: *In situ* bioventing of soil and long-term monitoring of groundwater.

- Cost: $531,847 to $1,139,672
- & M (operation and maintenance): $115,722 to $247,977
- Total present worth: $647,569 to $1,387,648
- Estimated time to implement: 15 to 25 years

This alternative uses bioventing to treat the soil in place by blowing air into the contaminated soil zone. This movement of air helps to volatilize or evaporate the contaminants in the soil by supplying oxygen to naturally occurring organisms that break down the contaminants. The rate that naturally occurring bacteria are able to breakdown the contamination is increased because of the extra air available.

Groundwater monitoring wells would be sampled periodically to document groundwater quality and detect if residual contaminants at the beach/dock area or at the generator pad have migrated from the soil into the groundwater.

Alternative E: Excavation and bioremediation of soil and long-term monitoring of groundwater,

- Cost: $450,238 to $964,797
- O & M: $281,610 to $603,450
- Total Present Worth: $731,849 to $1,568,247
- Estimated time to achieve cleanup: 5 years for soil cleanup, 25 years for groundwater monitoring

Approximately 1,000 cubic yards of soil, to an average depth of five feet below ground surface, would be excavated and transported to a bioremediation treatment cell at King Salmon Airport. The soil would be placed in a lined treatment cell and air would be injected into the soil with piping to increase the rate of natural biological breakdown of the contaminants. Excavated soil will be screened for the presence of PCBs using a field analytical method. The excavation would be backfilled with clean soil and re-vegetated with native plant species.

Groundwater monitoring wells would be sampled periodically to document groundwater quality. The monitoring data will verify that residual contaminants at the beach/dock area or at 15 to 30 feet below ground surface at the generator pad area have not migrated from the soil into the groundwater.

EVALUATION OF ALTERNATIVES

These alternatives were weighed against seven of the nine evaluation criteria (See

Table 1). ADEC and EPA have been involved throughout the process, so state acceptance (the eighth criteria) has already been achieved. Community acceptance (the ninth criterion) of the preferred alternative can not be determined until after the public comment period and all comments received have been reviewed and considered.

Alternative A does not meet the first two criteria of overall protection of human health and the environment or compliance with state or federal regulations. Consequently, Alternative A will not be considered further.

Criterion 1 - Overall Protection of Human Health and the Environment

Alternatives B through E provide protection in this area. However, Alternative B could result in potential impacts to human health and the environment, because the contamination remains in place. If the cap proves ineffective at stopping contaminant migration, contaminants in the soil could migrate to the groundwater.

Criterion 2 – Compliance with ARARs

Alternatives B through E would all meet applicable or relevant and appropriate requirements (ARARs). The difference is how quickly each alternative can achieve these requirements. Alternatives C and E will meet this requirement more quickly because contaminants above cleanup levels will be removed from the site within one year. Thermal treatment (Alternative C) would be completed within one year as well, while bioremediation (Alternative E) would require at least three years. The other alternatives will require at least 5 years.

Criterion 3 – Long-term Effectiveness and Permanence

All of the alternatives provide long-term effectiveness and permanence because soil is both excavated and treated in place and groundwater monitoring is implemented to ensure that humans and animals are not exposed to contaminated water.

Alternatives C and E involve excavation and treatment of soil. The most highly contaminated soil is permanently removed from the site. Alternative D involves *in situ* treatment of the soil. Soil contaminants will eventually achieve treatment goals, but not as quickly as in alternatives C and E. Treatment is the least comprehensive in alternative B where contaminated soil is capped with asphalt to prevent direct exposure with contamination. All contaminated soil would remain on site in Alternative B.

Criterion 4 – Reduction in Toxicity, Mobility, and Volume through Treatment

Alternatives C, D, and E would provide reduction in toxicity, mobility, and volume. The difference is how quickly each alternative can achieve these reductions. Alternative C meets this requirement the quickest, followed by Alternative E, because the most highly contaminated soil is removed and treated. Alternative D does not involve excavation and would require 10 to 15 years to achieve the desired reduction in contamination concentrations. Alternative B does not reduce volume or toxicity, but capping does reduce mobility. Low mobility combined with the reduced potential for exposure indirectly decreases toxicity, e.g. a compound can be very toxic but if it is sealed away in a capped area nothing can be affected by that toxicity.

Criterion 5 – Short-term Effectiveness

All of the alternatives would pose some short-term risk to the community, environment, and on-site workers during construction. Alternative B provides the greatest short-term effectiveness for treatment of soil because the contaminated soil is capped and the inherent risks associated with excavating and moving soil are avoided. Alternatives C and E both involve excavation and transportation of

contaminated soil. However, the excavation effort would only take a few days so the short-term risk is of limited duration. Alternative D would have little short term affect. Actual treatment would take several years.

Alternatives B through E rely on monitoring to verify that contamination is not posing an unacceptable risk. All monitoring wells would be sampled twice in 1998, once during construction activities and again in the fall.

Criterion 6 – Implementability

Alternatives B and E are easy to implement, because materials and workers could be obtained locally, for both soil and groundwater. Alternatives C and D are more difficult to implement because both alternatives require construction of some type of facility, (e.g. a treatment building) and electrical power would need to be extended to the site. Alternative C is the most difficult to implement because an incinerator would need to be mobilized, probably by barge, to the site.

Criterion 7 – Cost

The estimated costs are:

B	$673,380 to $1,442,957
C	$782,538 to $1,676,868
D	$647,569 to $1,387,648
E	$731,849 to $1,568,247

Criterion 8 – State Acceptance

The state of Alaska concurs with the preferred alternative, but will make its final remedy selection after reviewing and evaluating public comments.

Criterion 9 – Community Acceptance of the Preferred Alternative

This ninth criterion, community acceptance, will be evaluated after the public comment period is closed.

THE PREFERRED ALTERNATIVE

The Air Force, EPA, and ADEC consider Alternative E, excavation and bioremediation of contaminated soil and long-term groundwater monitoring, as the preferred alternative for contaminated soil at Rapids Camp. This alternative provides effective protection of public health and the environment. Alternative E removes the most highly contaminated soil from the site and reduces the potential for migration of contaminants into the groundwater. It has a reasonable cost and does not have some of the technical difficulties associated with thermal treatment or bioventing.

Alternative E was considered superior to Alternative C, which also involves removal, because biological treatment cells are more cost effective than thermal treatment. The Air Force is currently operating bioremediation treatment cells at King Salmon and has demonstrated the effectiveness of this methodology. None of the other alternatives offered the advantage of immediate removal of contaminated soils.

Groundwater at the site does not currently pose any risk. Contaminants have not been found in groundwater monitoring wells located at the generator pad. The most recent groundwater sample collected from the beach/dock area did not identify any contaminants at levels that exceed cleanup goals. Only residual amounts of contamination remain in soils at the beach dock area. Groundwater modeling indicates that residual soil contamination should not adversely affect the groundwater at this site. Surface water samples will be collected along the beach/dock area to confirm that the residual soil contamination is not adversely impacting surface waters. Site monitoring wells will be sampled twice in 1998 and once every 5 years thereafter for a minimum duration of 25 years.

NEXT STEPS

The Air Force, EPA, ADEC would like you to review this plan, and the associated documents (Remedial Investigation and Feasibility Study) if you wish, and provide us with your comments on these alternatives, particularly the preferred alternative. After the comment period, the agencies will read and consider your comments before making a final decision. Your comments can change or modify the preferred alternative or give the agencies sufficient information to choose another alternative.

All comments received during the comment period and public meeting will be responded to in a document called a Responsiveness Summary. This document becomes part of the final decision. The final cleanup decision on this area is expected in 1998. This decision will be explained in a document called a Record of Decision. You will be notified when this document is signed by the agencies and made available to the public.

The Air Force will host a public meeting in King Salmon to discuss this Proposed Plan and take your comments. **The comment period runs from April 1, 1998 to April 30, 1998.**