National Park Service
U.S. Department of the Interior

Katmai National Park and Preserve
Alaska

Brooks Camp Fuel-Contaminated Sand Remediation Environmental Assessment

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Cover Photo: Mt. La Gorce (left background) and Mt. Katolinat (right background) as seen from the shore of Naknek Lake at Brooks Camp on the afternoon of 5 May 2008. Photograph taken by Daniel Noon.

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ABBREVIATIONS AND ACRONYMS

ft	foot
mg/L	milligrams per liter
AAC	Alaska Administrative Code
ACOE	Army Corps of Engineers
ADEC	Alaska Department of Environmental Conservation
ADFG	Alaska Department of Fish and Game
ANILCA	Alaska National Interest Lands Conservation Act
AS	Alaska Statute
BCDA	Brooks Camp Developed Area
BTEX	benzene, toluene, ethylbenzene, and xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DCP	development concept plan
DO	Director's Order
DRO	diesel range organics
EA	environmental assessment
EPA	Environmental Protection Agency
GMP	general management plan
KATM	Katmai National Park and Preserve
L&PB	Lake and Peninsula Borough
MOA	memorandum of agreement
NEPA	National Environmental Policy Act
NPS	National Park Service
OHW	ordinary high water
PAH	polycyclic aromatic hydrocarbon
PID	photoionization detector
PL	Public Law
RCRA	Resource Conservation and Recovery Act
SHPO	State Historic Preservation Office
USC	United States Code
USFWS	United States Fish and Wildlife Service
VTTS	Valley of Ten Thousand Smokes

GLOSSARY OF TERMS

Benzene, Toluene, Ethylbenzene and Xylene (BTEX) – organic chemicals found in fuels that evaporate quickly and can cause cancer (ADEC, 2008).

Bioremediation – a technique that uses bacteria or other organisms to clean up contamination. Bacteria generally break down the contamination into less harmful components, such as carbon dioxide and water. Bioremediation can be used to clean up soil or water. Water and nutrients, such as fertilizer and oxygen, may be added to the contaminated soils to speed up the breakdown process (ADEC, 2008).

Bioventing – a technique to treat soil contaminated with petroleum products or organic chemicals. Air is forced into the soil through specially designed wells. The oxygen enhances growth of naturally occurring bacteria in soils. The bacteria feed on the contaminants in the soils, chemically breaking down the contaminants into non-hazardous components.

Diesel range organics (DRO) – diesel fuel and its by-products (ADEC, 2008).

Lacustrine wetland – a wetland and deepwater habitat classification system that consists of the following characteristics: (1) situated in a topographic depression or a dammed river channel; (2) lacking trees, shrubs, persistent emergent vegetation, emergent mosses or lichens with greater than 30% areal coverage; and (3) total area exceeds 8 ha (20 acres) (USFWS, 1979).

Photoionization detector (PID) – a type of gas detector that measures volatile organic compounds and other gases.

Polycyclic aromatic hydrocarbon (PAH) – a class of carcinogenic organic molecules that are commonly produced by fossil fuel combustion (AHD, 2006).

Soil vapor extraction (SVE) – a remediation technique that removes harmful chemicals, in the form of vapors, from the soil above the water table (EPA, 2001a).

1.0 INTRODUCTION

1.1 Purpose of and Need for Action

The National Park Service (NPS) is proposing to remove and remediate approximately 40 cubic yards of fuel-contaminated sand along the shore of Naknek Lake within Katmai National Park and Preserve (KATM) (Figure 1.1). The contaminated area is located within the Brooks Camp on the north side of the Brooks River adjacent to the trail leading to the ranger station (Figure 1.2). The contaminated site is situated below the ordinary high water (OHW) line of Naknek Lake and is composed of loose gravel and pumice substrate. The proposed project would occur in April and/or early May of 2009 when sediments are exposed during low lake levels.

Brooks Camp is located approximately 30 air miles east of the park headquarters and gateway visitor center in King Salmon, Alaska. Access to Brooks Camp is primarily from King Salmon by either float plane or boat. Most Brooks Camp facilities are located north of the mouth of the Brooks River, near the shore of Naknek Lake (Figure 1.2). Additional facilities are located south of the river, near the shore of Brooks Lake.

The purpose of the proposed project is to remove and remediate fuel-contaminated sand sediments from the shore of Naknek Lake. A small section of the Naknek Lake beach was previously used to fill the Brooks Camp fuel tanks from approximately 1975 to 1993. Fuel was pumped from the NPS fuel barge situated on the lake through a fuel hose to a fill box and connecting underground fiberglass line located adjacent to the beach. The location of the fuel line and fill box (lower elevation) in relation to the tanks (higher elevation) and the fiberglass construction of the line caused numerous fuel leaks along the line and around the fill box over a period of several years. Fueling practices may have also led to sporadic fuel spills over this time period. The fill box was removed and sections of the underground fuel line were either removed or abandoned in-place in 1993 after fueling operations were moved to an aboveground tank system at the current location (Figure 1.3). Sand samples from around the fill box area were collected in 1993 to determine diesel range organic (DRO) concentrations. The 1993 DRO concentrations exceeded Alaska Department of Environmental Conservation (ADEC) regulatory limits for inhalation and ingestion. However, no contamination was located within the area after it was re-sampled. In May of 2007, beach sand was being stockpiled for use in the construction of the new Brooks Camp leach field. After removing approximately 5 cubic yards of sand from an area down-gradient of the former fueling area, NPS maintenance staff noticed the smell of petroleum. The observation was reported to ADEC as required and sand removal operations were relocated to a different portion of the beach (Figure 1.3). The sand from this second area was determined to contain minute levels of xylene below the required ADEC cleanup levels. The sand from this second area was used in the construction of the new Brooks Camp leach field in October of 2007. Removal of the contaminated sediments is needed to meet the requirements of federal, state, and local laws, regulations, and policies (see Section 1.3) and to ensure the natural resources, processes, systems, and values of KATM are preserved and protected.

This environmental assessment (EA) presents and analyzes a “no action” and a proposed action alternative and their associated environmental impacts. It has been prepared in accordance with the National Environmental Policy Act (NEPA) (42 USC 4231-4370d) of 1969 and regulations of the Council on Environmental Quality (40 CFR 1508.9). The two alternatives are described in more detail in Chapter 2.

Figure 1.1. Location of Brooks Camp within Katmai National Park and Preserve.

Figure 1.2. Location of proposed contaminated sand excavation area and Alternative B soil remediation cell area in Brooks Camp.

1.2 Background

1.2.1 Park Purpose and Significance

Katmai National Park and Preserve (KATM), encompassing approximately 4.3 million acres, is located at the head of the Alaska Peninsula, about 290 miles southwest of Anchorage. Established as a National Monument in 1918 to preserve the Valley of Ten Thousand Smokes and the landscape associated with the cataclysmic volcanic eruption of 1912, it was expanded over the years by four presidential proclamations, then enlarged and re-designated a National Park and Preserve by the Alaska National Interest Lands Conservation Act (ANILCA) in 1980 (Public Law (P.L.) 96-487). The implementation language of ANILCA stated that KATM is to be managed for the following purposes, among others: to protect habitats for, and populations of, fish and wildlife, including, but not limited to, high concentrations of brown/grizzly bears and their denning areas; to maintain unimpaired the water habitat for significant salmon populations; and to protect scenic, geological, cultural, and recreational features.

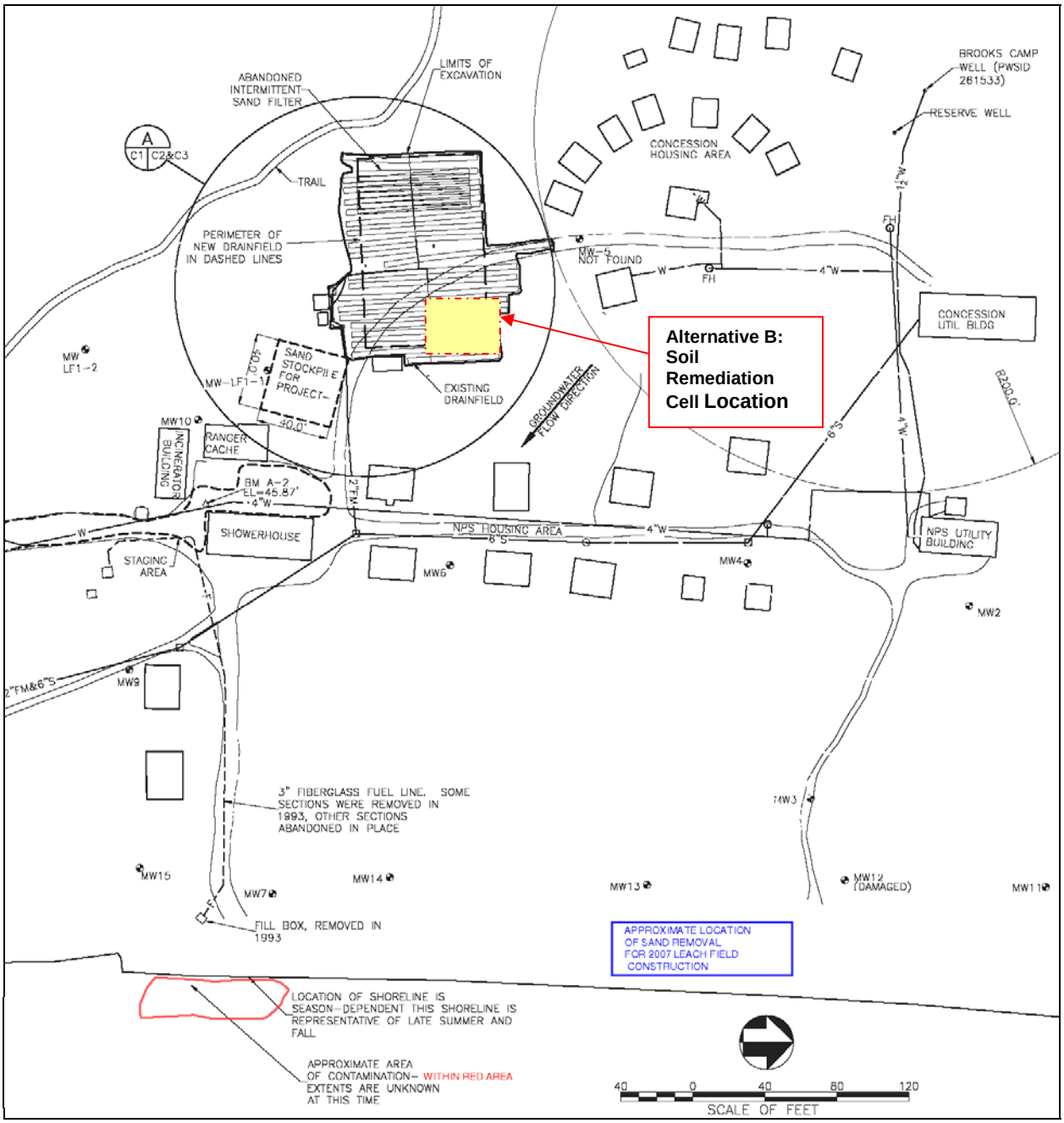

Figure 1.3. Location of proposed contaminated sand excavation and leach field soil cell remediation area.

1.2.2 Brooks River Area Purpose Statements

Stemming from the ANILCA legislation, the NPS identified three primary purposes for the Brooks River area within the 1996 *Brooks River Area Development Concept Plan* (DCP) (NPS, 1996): (1) to protect habitats for, and populations of, fish and wildlife, including, but not limited to, high concentrations of brown bears and their denning areas and maintain the watersheds and habitat vital to red salmon spawning in an unimpaired condition, (2) to provide for the general public resource-based recreation that does not

impair natural and cultural values and (3) to protect and interpret outstanding natural, cultural, geologic and scenic values.

1.3 Laws, Regulations, and Policies

The following laws, regulations, and policies provide guidance for the development of this EA, including design of the alternatives, analysis of impacts, and creation of mitigation measures to be implemented as part of the preferred alternative.

1.3.1 NPS Organic Act and General Authorities Act

The NPS 1916 Organic Act (39 Stat. 535) and the 1970 General Authorities Act (P.L. 91-383) prohibit impairment of park resources and values. The NPS 2006 *Management Policies* (NPS, 2006) uses the terms "resources and values" to mean the full spectrum of tangible and intangible attributes for which the park was established and is managed, including the Organic Act's fundamental purpose and any additional purposes as stated in the park's establishing legislation. The impairment of park resources and values may not be allowed unless directly and specifically provided by statute. The primary responsibility of the NPS is to ensure that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities to enjoy them.

1.3.2 NPS Management Policies and Pollution Control Laws

NPS activities pertaining to contaminants, including response actions or handling, acquisition, storage, transportation, and disposal of such substances, will comply with federal, state, and local laws and regulations (NPS, 2006). These laws and regulations include the:

(1) Solid Waste Disposal Act (42 USC 6901-6992k) including the Resource Conservation and Recovery Act of 1976 (RCRA) and the Hazardous and Solid Waste Amendments of 1984,
(2) Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) (42 USC 9601-9675),
(3) Oil Pollution Act of 1990 (33 USC 2701-2761),
(4) Federal Water Pollution Control Act (Clean Water Act) (33 USC 1251-1387),
(5) Hazardous Materials Transportation Act (49 USC 5101-5127),
(6) Toxic Substances Control Act (15 USC 2601-2692), and
(7) Alaska Oil and Hazardous Substances Pollution Statutes (AS 46.03.740-AS 46.03.826 and AS 46.04.010-AS 46.04.900).

The NPS will identify, assess, and take response actions as promptly as possible to address releases and threatened releases of contaminants into the environment (NPS, 2006).

1.4 Relationship of the Proposal to Other Park Planning

1.4.1 KATM General Management Plan

The KATM General Management Plan (GMP) (NPS, 1986) establishes goals for resource preservation and visitor use, along with management strategies for achieving those goals. These goals are based on the park's purpose and significance, the laws and policies that guide management of the national park system, and the issues and concerns expressed by NPS staff, park visitors, neighbors and the general public. The GMP provides the following guidance and objectives related to the protection and management of water quality within KATM.

The lakes and rivers of KATM are the basis for a significant part of the commercial salmon fishery that is vital to the regional economy. Most access to the park is water-based, and developments such as Brooks Camp are generally situated adjacent to water bodies. Water quality within KATM will be maintained in a manner consistent with and under the regulatory programs of the ADEC and the Environmental Protection Agency (EPA). A systematic program of water-quality monitoring adjacent to developed areas will be developed in cooperation with ADEC to ensure that any effects of human activities on the water environment are detected and minimized. The NPS, EPA, and ADEC will enforce water quality regulations within KATM.

The NPS recognizes the potential for fuel and oil spills in inland lakes and rivers and the Shelikof Strait. The sensitive nature of KATM resources and the difficulty of containing spills on water make oil and fuel spills of special concern. The NPS will work with other federal and state agencies to prepare for the possibility of spills. NPS personnel will receive training in spill reporting and treatment, and the NPS will acquire at least minimal equipment for spill containment and treatment.

1.4.2 Brooks Camp Area Development Concept Plan

The 1996 *Brooks River Area DCP* (NPS, 1996) describes desired future conditions for natural resources, cultural resources, and visitor experience/interpretation. Future conditions that are especially relevant to this project include protecting and maintaining habitat vital to red salmon and rainbow trout spawning and juvenile development cycles; remediating and mitigating damage to the water table, soils, vegetation, and cultural resources caused by leaks in the fuel oil delivery system at Brooks Camp; and protecting ecosystem functions.

The DCP describes remediation efforts related to fuel oil spills that have occurred in the past within the Brooks Camp area. The Brooks Camp underground fuel system was replaced in 1993 with a complete aboveground system that can be readily dismantled and relocated to the south side of the Brooks River at the appropriate time. Fuel spill remediation efforts are described in all of the DCP alternatives, including the no-action alternative and the preferred alternative. The proposed project would not preempt the DCP, nor preclude the full implementation of the DCP Record of Decision.

1.4.3 Brooks Camp Fueling Operations

The proposed project is related to past, present, and future Brooks Camp fueling operations. The Brooks Camp area of KATM requires routine shipments of diesel fuel and gasoline for the successful operation of the camp during the summer months. Electricity is provided by diesel-powered generators. Diesel fuel and gasoline power the camp's vehicles and motorized equipment. Several times each year between July and September, fuel is transported from King Salmon to Lake Camp by a tanker truck. The fuel is then transported approximately 25 miles by boat on Naknek Lake from Lake Camp to Brooks Camp (Figure 1.1).

Before the NPS modified the Brooks Camp fuel delivery operations in 2008, fuel was transported on Naknek Lake using a fuel barge with a 3,500-gallon internal fuel tank capacity. Between 1975 and 1993, fuel was pumped from the fuel barge to underground storage tanks via fiberglass fuel lines. From 1993 to 2007 the fuel was pumped from the fuel barge to the existing generator fuel tanks through an above-ground steel fuel pipe (Figure 1.3). From 1975 to 2007, fuel was also pumped into smaller tanks or containers at the Brooks River spit area (Figure 1.2). These smaller fuel tanks and containers were then transported by vehicle to provide generator and vehicle fuel to park operations on the south side of the Brooks River.

Currently, the NPS transports fuel from Lake Camp to Brooks Camp using a new 65-foot long landing craft, the *Qit'rwik*. The landing craft is capable of transporting one or two fuel trucks with a total fuel capacity of 3,000 gallons. Once at Brooks Camp, the *Qit'rwik* is anchored ashore and the fuel truck(s) are off-loaded and driven directly to the fuel tanks on each side of the Brooks River. Modifying the way fuel is transported eliminates the need of pumping fuel adjacent to the Naknek Lake shoreline. This will also reduce the occurrence of future fuel spills adjacent to the lake.

Future projects involving Brooks Camp fueling operations will include the proposed installation of gravel-filled geotextile boat ramps within Naknek Lake adjacent to the Brooks Camp generator trail and Brooks River spit area in 2009, the proposed removal of the existing above-ground Brooks Camp generator fuel tank fuel line in 2009, and the approved relocation of fuel tanks from Lake Brooks to the new facility maintenance and employee housing area between 2009 and 2011 (NPS, 2007).

1.4.4 KATM Contaminated Site Remediation Projects

Brooks Camp Developed Area

In the spring of 1991, an underground fuel distribution line at Brooks Camp ruptured during fuel transfer operations. Although the fuel spill was contained, approximately 50 gallons of fuel oil leaked into the ground. In 1992, an environmental engineering company was contracted to accurately define the extent of soil and groundwater contamination at several locations within the BCDA. Additional sites contaminated with hydrocarbons (gasoline and fuel oil) were identified and mapped. A tank tightness test was also conducted on all six underground storage tanks (four diesel tanks and two gasoline tanks) within the Brooks River area. All six tanks and associated fuel lines failed to meet ADEC regulatory requirements for tank leakage rates. The six tanks and most of the associated fill boxes and lines were removed in 1993 and were replaced with aboveground tanks and fuel lines. Contaminated soils were also removed adjacent to the storage tanks and fuel lines. Some of the underground fuel lines were abandoned in place due to the archeological sensitivity of the area. Sand and soil samples were collected and sent to Anchorage for analysis. The analysis concluded that the diesel range organic concentrations within the samples exceeded ADEC regulatory limits (NPS, 1996).

In 1997 the NPS completed an EA that evaluated corrective actions to remediate underground fuel contamination in the Brooks Camp area. The EA proposed action consisted of using a combination of corrective action techniques. A Finding of No Significant Impact (FONSI) was approved and the proposed action was implemented. The highly contaminated soils beneath the former fuel tank sites on the south side of the Brooks River were excavated, cleaned, and placed back into the excavated areas. Bioventing and soil vapor extraction techniques were used to remediate the soils adjacent to the fuel tanks on the north side of the Brooks River. Enhanced bioremediation techniques were used within existing and newly installed monitoring wells on both sides of the river. Contaminated sites occurring within archeological sensitive areas were not disturbed (NPS, 1997).

Contaminated soil remediation activities began in the fall of 1997. Several additional wells were installed on the north and south side of the Brooks River and a soil vapor extraction system was installed near the Brooks Camp generator building. To monitor contamination levels, the NPS contracted annual soil and groundwater sampling within three areas of the BCDA: Brooks Camp, Brooks Lake maintenance and housing area, and the former vehicle refueling area located on the south side of the Brooks River between the river mouth and the VTTS Road. Most of the monitoring wells sampled had petroleum hydrocarbon concentrations below ADEC cleanup levels. However, the wells positioned along the Naknek lakeshore adjacent to the Brooks Camp generator building, visitor center, and ranger station had DRO concentration values of 4.3 milligrams per liter (mg/L). A DRO concentration value of 8.9 mg/L was detected in the monitoring well adjacent to the Brooks Lake generator building. These values were above the ADEC

cleanup level of 1.5 mg/L. Benzene, toluene, ethylbenzene, and xylene (BTEX) concentration values within all of the monitoring wells were lower than ADEC cleanup level requirements. Some of the wells in Brooks Camp had DRO concentrations above the required ADEC cleanup level as recently as 2005, which was the first time Hart Crowser (NPS contractor) conducted annual contamination monitoring at Brooks Camp. The air sparging system was shut down after Hart Crowser demonstrated that the elevated contamination at the generator building was too far upgradient of the air sparging system's capability. In August of 2005, Hart Crowser sampled six representative monitoring wells at Brooks Camp. Of these wells, only one had contamination levels above ADEC cleanup requirements for DRO (Heubner, 2008).

In April of 2005, ADEC requested the discontinuation of sampling near the existing Brooks Lake maintenance and housing area as long as the NPS monitors the shoreline for petroleum sheens entering the lake. One monitoring well was left in place near the site. In March of 2006, ADEC recommended the suspension of sampling at Brooks Camp and the former vehicle fueling area in order to assemble a historic perspective of the contamination at the two sites. Contamination sampling is scheduled to resume at Brooks Camp and the former vehicle fueling area in 2009 (Heubner, 2008).

Pfaff Mine

In addition to the Brooks Camp area remediation projects, the NPS has conducted remediation activities at Pfaff Mine, an abandoned gold mine located in the northeast portion of KATM within the drainages of Battle Lake and Moraine Creek. During the summer of 2008, 36 drums containing diesel fuel, lubricating oil, and fuel contaminated water were removed and transported to a fuel and oil recovery and recycling facility in Anchorage. Remediation of fuel contaminated soils is scheduled to occur during 2009.

1.5 Issues

To focus the content of the EA, the NPS selected specific issues and eliminated others from further analysis. Subsequent discussions of the affected environment and environmental impacts related to each alternative focus on these selected issues. A brief rationale for the selection or dismissal of each topic is given below.

1.5.1 Issues Selected for Detailed Analysis

Air Resources

The Clean Air Act (P.L. 88-206), NEPA, and NPS 2006 *Management Policies* require consideration of impacts on air resources. Brooks Camp is located within a designated Class II attainment area (KATM) under the Clean Air Act. Emissions from the use of diesel-powered excavation equipment and from dust generated during the removal and transport of the contaminated sand would have negligible to minor adverse effects on air resources. Remediation activities using biological, chemical, or thermal methods would have negligible to minor adverse effects on air quality depending on the extent of fuel contamination within the sand and the method of remediation used.

Water Resources

The Clean Water Act, NEPA, and *NPS Management Policies 2006* require consideration of impacts to water quality. The removal and remediation of fuel-contaminated sand could affect water quality within Naknek Lake and the selected remediation area.

Fish and Fish Habitat

Legislation creating KATM requires the protection of sockeye (red) salmon and their habitat. *NPS Management Policies 2006* direct the NPS to maintain all the components and processes of naturally-evolving park ecosystems, including the natural abundance, diversity, and ecological integrity of fisheries.

The removal of fuel-contaminated sand from the shore of Naknek Lake could potentially affect fish and fish habitat.

Wildlife and Wildlife Habitat

The proposed project has the potential to affect wildlife or wildlife habitat. Although the contaminated sand removal activities would occur during a one week period in April or early May before brown bears and other wildlife arrive at the Brooks Camp area, the covered remediation soil cell and electrified perimeter fence may be in place for one or more years until the contaminants in the sand are reduced to a level meeting ADEC requirements.

Wetlands

Consideration of impacts on wetlands is required by Executive Order 11990 *Protection of Wetlands*. The proposed action would occur within a lacustrine wetland, as defined by the U.S. Fish and Wildlife Service's *Classification of Wetlands and Deepwater Habitats of the United States* (USFWS, 1979). All NPS actions with the potential to have adverse impacts on wetlands must comply with NPS Director's Order (DO) 77-1, *Wetlands Protection*.

Cultural Resources

The proposed project area is located within the Brooks River Archeological District National Historic Landmark. The NPS is responsible for protecting cultural resources from physical damage. The National Historic Preservation Act (P.L. 89-665), National Environmental Policy Act (NEPA) (P.L. 91-190), the NPS Organic Act (39 Stat. 535), NPS 2006 *Management Policies*, and NPS 28 – Cultural Resource Management Guideline, require the NPS to consider effects of its actions on cultural resources.

Soundscape

Section 4.9 of NPS 2006 *Management Policies* directs the NPS to take action to prevent or minimize all noise that through frequency, magnitude, or duration adversely affects the natural soundscape or other park resources or values. The proposed project would be accomplished through the use of motorized excavation equipment. Sound created by the excavation equipment would affect the natural soundscape within the Brooks River area.

1.5.2 Issues Dismissed from Detailed Analysis

Floodplains

Executive Order 11988 – *Floodplain Management*, requires the NPS and other federal agencies to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. The proposed project is considered as an excepted action under Executive Order 11988 and NPS Procedural Manual 77-2: *Floodplain Management Guidelines*. Although the proposed project would occur within the Naknek Lake floodplain, which is inundated throughout most of the year, the project would not involve the modification or direct or indirect development of the floodplain.

Section 4.8.1.1 of 2006 *Management Policies* requires the NPS to allow natural shoreline processes, such as erosion, deposition, dune formation, overwash, inlet formation, and shoreline migration to continue without interference. After the contaminated sand is removed from the Naknek Lake shoreline, the project area would be re-graded to its pre-excavated appearance and would not have an effect on shoreline functions.

Soils and Vegetation

Section 9.1.3.1of 2006 *Management Policies* directs the NPS to carefully control ground disturbance and site management to prevent undue damage to vegetation and soils (NPS, 2006a). The removal of contaminated sand from the Naknek lake shore would not adversely affect soils and vegetation. Remediation activities would take place within a heavy-duty plastic soil remediation cell. At the conclusion of remediation activities, uncontaminated sand meeting federal and state requirements would be reused or discarded in an approved area.

Threatened, Endangered, and Other Special Status Species

The NPS has obtained concurrence with the USFWS that sand excavation activities along Naknek Lake would have no effect on federal endangered, threatened or candidate species. Steller's eider (*Polysticta stelleri*) is the only listed species with the potential to occur in the project area. The USFWS has evidence indicating that Steller's eiders, listed as threatened under the Endangered Species Act in 1997, migrate through the region, as some have collided with a road power line off the west end of Naknek Lake. They are thought to migrate through the region, probably flying at night. The USFWS has requested that mitigations be followed so that if Steller's eiders are seen in the project areas, the project would not proceed while they are present.

The proposed project would not adversely affect three species of passerine birds listed as Alaska Species of Special Concern. Although these bird species (olive-sided flycatcher – *Contopus borealis*, blackpoll warbler – *Dendroica straita*, and gray-cheeked thrush – *Catharus minimus*) have been observed on at least one occasion within the Valley of Ten Thousand Smokes (VTTS) area of KATM, they have not been previously observed inhabiting the Brooks Camp area.

Visual Quality

The removal of contaminated sand would not affect the visual quality of the Naknek Lake shore or Brooks Camp area. The area affected by the sand removal would be re-graded to its pre-excavated appearance. The excavated area would eventually be inundated by Naknek Lake during mid-summer.

Wilderness

The proposed action would not occur within a wilderness area and, therefore, would not impact wilderness characteristics or values.

Socioeconomics

The proposed project would not affect Brooks Camp concessioner operations. Sand excavation activities would occur in April or early May before concessioner operations begin at Brooks Camp. Remediation activities would take place away from concessioner facilities and would not affect Brooks Lodge guests and staff.

Any related impacts on the local economies of King Salmon and Naknek would likely be short-term, negligible, and beneficial due to the small size and duration of the project. NPS maintenance staff would excavate the contaminated sand and complete remediation activities. Local materials may be purchased to assist in excavation and remediation tasks. Laboratory testing of contaminated sand would occur in a facility capable of performing such responsibilities. This would occur in Anchorage or a similar sized city within or outside of Alaska.

Land Use and Access

A NPS conservation easement and private allotment parcel are located south of the Brooks River, outside of the immediate project area (USA, 1998). The project would not increase visitor use nor would it interfere with the provisions of the 1998 Conservation Easement Agreement. As part of the normal NEPA public review process, all parties of the Agreement would be welcome to express their views on this

proposal. The proposed sand removal area is located on federal land, below the OHW mark. The Agreement does not apply to federal lands below the OHW line. Furthermore, excavation, transport, and remediation of the sand would not occur on or adjacent to the private property.

The proposed project would not limit or restrict public land use and access to the Naknek lakeshore. Contaminated sand excavation and transport activities would occur in April or early May before the lake is free of ice and Brooks Camp is open for public use.

Subsistence

ANILCA requires the NPS to evaluate the effect of the proposed project on subsistence uses and needs. The effects of the proposed action on subsistence uses and needs were dismissed from further analysis because (1) Katmai National Park (including the project areas) is closed to subsistence uses and (2) the proposed project would not affect regional subsistence resources or activities outside of the park. Thus, there would be no potential for significant subsistence restrictions. An ANILCA Section 810(a) summary evaluation and analysis is located in Appendix A

ANILCA Section 1306

ANILCA requires the NPS to evaluate the effect of the proposed actions on Federal Subsistence users and needs. An ANILCA Section 810 Subsistence Evaluation is located in Appendix A of the EA. Federal Subsistence uses are allowed in Katmai National Preserve in accordance with ANILCA Section 202(2), 203, and 816(a) and NPS regulations.

Minority and Low-Income Populations

Executive Order 12898 – *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations* requires all federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low income populations and communities. This project would not be expected to result in significant changes in the environment of the project area, and therefore would not be expected to have any direct or indirect impacts to minority or low-income populations or communities.

1.6 Permits and Approvals Needed to Implement the Project

U.S. Army Corps of Engineers

The NPS would submit a request for a U.S. Army Corps of Engineers (ACOE) jurisdictional determination to determine whether a Department of the Army permit authorization under Section 404 of the Clean Water Act is necessary. If the proposed project falls under ACOE jurisdiction and a Section 404 permit is required, the NPS would obtain the permit before the proposed project occurs.

Alaska Coastal Management Program

The NPS would submit a Negative Determination Letter to the State of Alaska, Department of Natural Resources, Office of Project Management and Permitting, to request concurrence that this project is consistent with the standards of the Alaska Coastal Management Program and would have no effects on the uses or resources of the coastal zone (Appendix B). This project would also be reviewed by the Lake and Peninsula Borough (L&PB) for provisions under the borough coastal management plan. The NPS would apply for appropriate authorizations and permits identified during the review process.

Alaska Department of Fish and Game

Alaska Statute 16.05.871 (Anadromous Fish Act) requires that an individual or government agency provide prior notification and obtain permit approval from the Alaska Department of Fish and Game (ADFG), Division of Habitat to construct a hydraulic project or use, divert, obstruct, pollute, or change

the natural flow or bed of a specified waterbody. All activities within or across a specified anadromous waterbody and all instream activities affecting a specified anadromous waterbody require approval from the Division of Habitat. Since the proposed project would occur within Naknek Lake, an anadromous waterbody, the NPS would submit a fish habitat permit application to the Division of Habitat for review and approval and obtain a fish habitat permit before sand removal activities take place.

Alaska Department of Environmental Conservation

18 Alaska Administrative Code (AAC) 75, *Oil and Hazardous Substances Pollution Control Regulations, Discharge Reporting, Cleanup, and Disposal of Oil and Other Hazardous Substances* establishes petroleum-related contaminated site cleanup rules to protect human health, safety, and welfare and the environment. The NPS would coordinate with the ADEC to ensure all remediation and monitoring activities comply with these regulations and would obtain all necessary approvals and permits before commencing with the proposed project.

2.0 ALTERNATIVES

2.1 Introduction

This chapter describes two alternatives, a No Action alternative and Proposed Action alternative. Table 2.1 provides a summary and comparison of the alternatives and their environmental impacts. The NPS considered the alternatives based on federal and state regulatory requirements, previous NEPA decisions, logistics, and impacts the alternatives would have on air and water resources, fish and fish habitat, wetlands, cultural resources, and soundscape.

2.2 Alternative A: No-Action

Under the No-Action Alternative, contaminated sand located on the Naknek Lake shoreline adjacent to Brooks Camp would not be removed and remediated. Contaminated sand would remain in place and would not be disturbed. This alternative represents a continuation of the existing situation and provides a baseline for evaluating the changes and impacts of the Proposed Action on the affected environment (Chapter 3).

2.3 Alternative B: Proposed Action and Environmentally Preferred Alternative – Remove Contaminated Sand from Naknek Lake Shoreline and Remediate within Brooks Camp Area of KATM

Under the Proposed Action, sand within an estimated 50 ft by 50 ft area on the Naknek lakeshore would be removed by using a wheeled and/or tracked excavator equipped with a backhoe (Figure 1.3). Several equally spaced 3-foot deep trenches would be excavated parallel to the shoreline. An environmental consultant would field test the excavated sand using a photoionization detector (PID) and a hydrocarbon test kit. Only contaminated “hot spots” would be removed from the lakeshore and remediated. It is estimated that up to 40 cubic yards of sand may require remediation.

Contaminated sand requiring ADEC cleanup level conditions would be transported by a dump truck approximately 400 feet to a soil remediation cell constructed within the Brooks Camp leach field (Figures 1.3 and 3.2). Sand samples would be collected and transported to an ADEC certified laboratory for polycyclic aromatic hydrocarbon (PAH); diesel range organics (DRO); and benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations analysis. Sand not meeting ADEC cleanup conditions would be returned to the excavated area. The lakeshore would be leveled and re-graded as close as possible to its pre-excavated condition.

The soil remediation cell would be approximately 40 ft by 40 ft in size and would consist of a heavy-duty 20 mil or greater plastic impervious liner surrounded by a timber or elevated soil berm (Figure 2.1). The soil cell would be located a minimum of 200 feet away from drinking water wells. To reduce fuel-contaminant concentrations, a NPS and ADEC approved chemical oxidation solution would be applied and mixed at a rate of 20 pounds of solution per 1 cubic yard of contaminated sand. The solution is commonly used throughout the United States to safely remediate highly concentrated contaminated sites. The solution consists of two parts, an oxidizer and an activator, which are mixed together at the remediation site. The solution destroys the contaminants at the molecular level through chemical oxidation. The by-products of the chemical reaction are carbon dioxide and water.

A reinforced impervious polyethylene cover would be placed over the cell to mitigate possible human and wildlife exposure. An electrified fence would be installed around the soil cell to prevent brown bears and other wildlife from coming into contact with the contaminants and chemical oxidation solution. Sand meeting ADEC minimum contaminant concentration levels would either be reused or placed in an approved disposal site located within the Brooks River area of KATM. The length of time required for the sand to be remediated in the soil cell is uncertain and would depend on the level of contamination. Contamination levels would be monitored using routine field and laboratory testing. Sand meeting ADEC minimum contaminant concentration levels would either be reused or placed in an approved disposal site located within the Brooks River area of KATM.

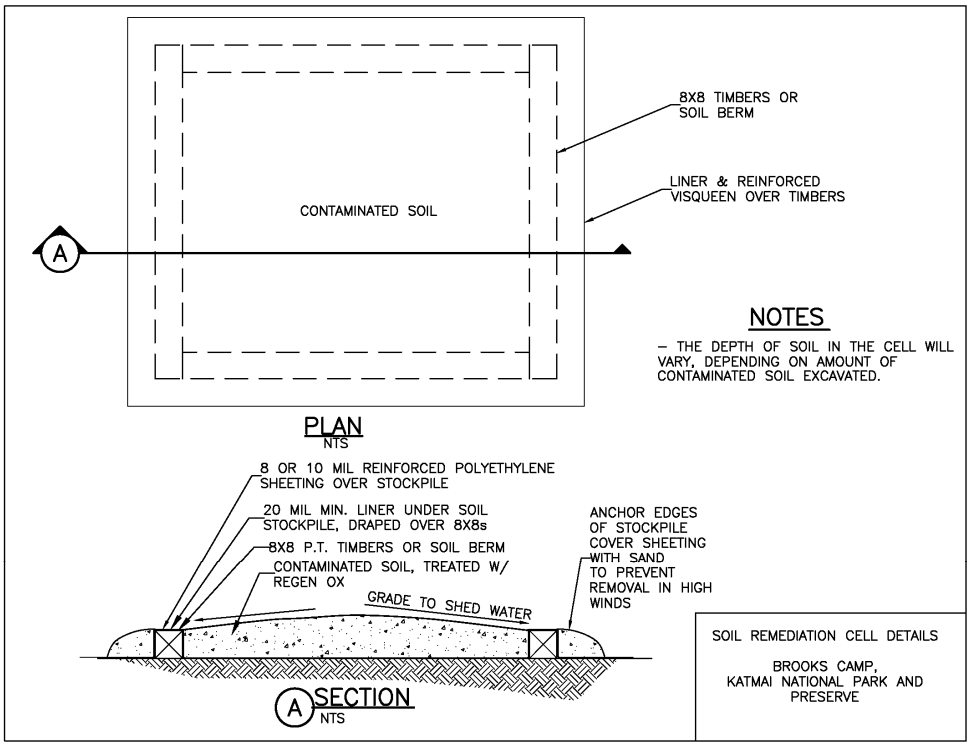

Figure 2.1. Soil remediation cell diagram.

2.5 Mitigations Associated with Alternative B

Employee and Visitor Safety

All excavation and remediation activities would be conducted by NPS staff and contractors in a safe manner. Excavation and transport equipment would be operated only by qualified personnel. Contaminated sand would be excavated, contained, transported, treated, and disposed safely under applicable federal, state, and local laws, regulations, and policies. Contaminated sand would be stored and secured away from visitor areas.

Threatened, Endangered, and Species of Special Concern

Sand excavation activities would not take place if Steller's eiders (*Polysticta stelleri*) are present within the project areas. Contaminated sand storage and/or soil cell remediation activities would not occur within active olive-sided flycatcher (*Contopus borealis*), blackpoll warbler (*Dendroica straita*), or gray-cheeked thrush (*Catharus minimus*) nesting sites.

Water Quality

To protect the surface water and groundwater quality within and adjacent to the soil remediation area, excavation activities would occur while the Naknek lakeshore is dewatered during April and/or early May of 2009. The remediation cell would be lined with an impermeable polyethylene plastic liner and surrounded by a timber or soil berm. Reinforced plastic sheeting would be placed over the treatment cell to prevent precipitation from affecting the remediation process and preventing runoff from entering surface and groundwater sources.

Fish and Fish Habitat

Sand excavation activities would occur below OHW in April and/or early May of 2009 while the Naknek lakeshore is exposed. The lakeshore would be leveled and re-graded as close as possible to its pre-excavated condition to ensure spawning habitat is not adversely impacted.

Wildlife and Wildlife Habitat

Excavation activities would occur in April and/or early May of 2009 before brown bears and other primary wildlife species inhabit the project area. All sand not removed for remediation would be returned to the lakeshore. The lakeshore would be leveled and re-graded as close as possible to its pre-excavated condition. The sand remediation area would be enclosed by an electrified perimeter fence to prevent brown bears and other wildlife from coming into contact with the contaminants.

Wetlands

The proposed project site is located within a lacustrine wetland system which is normally inundated by Naknek Lake during the summer and fall months. Excavation activities would be limited to approximately 100 cubic yards of sand within an estimated 50 ft by 50 ft area adjacent to the Brooks Camp ranger station access trail. Excavation activities would occur while the site is dewatered during April and/or early May of 2009. After the contaminated sand is removed, the lakeshore would be leveled and re-graded as close as possible to its pre-excavated condition. No new fill materials would be placed within the project site. Contaminated sand remediation activities would occur within the Brooks Camp leach field, a previously disturbed upland area.

Cultural Resources

Should previously unknown cultural resources be identified during project implementation, work would be stopped in the discovery area and the NPS would perform consultations in accordance with federal regulations (36 CFR 800). NPS would abide by provisions of the Native American Graves Protection and Repatriation Act of 1992. Any artifacts recovered during the implementation of the project at any of the project sites would be accessioned, cataloged, preserved, and stored in compliance with the *NPS Cultural Resources Management Guidelines*.

2.6 Environmentally Preferred Alternative

Alternative B is the environmentally preferred alternative. This proposed alternative would improve the natural environment within the BCDA by removing and treating contaminants onsite through the least amount (distance and time) of handling and transport. Under the No-Action alternative, contaminants would continue to be present within the Naknek lakeshore, which would have an adverse effect on the environment.

2.7 Alternatives Considered but Eliminated from Detailed Analysis

Three alternatives were considered but dismissed from further analysis due to the unnecessary risk of adversely affecting the environment and the feasibility of implementing the alternatives.

2.7.1 Remove Contaminated Sand from Naknek Lake Shoreline and Remediate within a Former KATM Valley of Ten Thousand Smokes Road Gravel Pit

An alternative was considered to remove and remediate the contaminated sand within a former Valley of Ten Thousand Smokes (VTTS) Road gravel pit located approximately 3 miles from Brooks Camp on the south side of the Brooks River. Access to the south side of the Brooks River can only be achieved by fording the river during the spring low water period. Due to this limitation, the transport of multiple dump truck loads of contaminated sand across the river would increase the risk of adversely affecting the river's water quality. In addition, the time and costs required to transport the contaminated sand to the alternative remediation site would substantially increase.

This alternative was dismissed from further environmental analysis due to the environmental risk of transporting the contaminated sand across Brooks River, an ecologically important water body vital to the health and survival of anadromous salmon and brown bears, to conduct identical remediation methods. The NPS determined that the Brooks Camp leach field area (Alternative B) would provide a suitable remediation site.

2.7.2 Removal of Contaminated Sand from Naknek Lake Shoreline and Remediate at an Approved King Salmon Site Outside of KATM

An alternative was considered to remove and remediate the contaminated sand at a site outside of KATM near King Salmon. Under this alternative, the sand would be placed into one or more one cubic yard capacity sacks constructed of woven polypropylene fabric, sealed, and temporarily stored approximately 400 feet from the contaminated site near the Brooks Camp leach field. The temporary storage area would be enclosed by an electrified perimeter fence to prevent brown bears and other wildlife from coming into contact with the contaminants. Sand samples would be collected and transported to an ADEC certified laboratory for PAH, DRO, and BTEX concentrations analysis. Sand not meeting ADEC cleanup conditions would be returned to the excavated area. The lakeshore would be leveled and re-graded as close as possible to its pre-excavated condition.

Between July and September of 2009 when the lake level of Naknek Lake permits boats to access Brooks Camp, the sacks would be transported by barge or landing craft to the Lake Camp area of KATM. Once at Lake Camp, the sacks would be transported to an approved King Salmon remediation site by dump truck or other large motor vehicle. The remediation cell, covering, and electric fence would be of identical size and construction as was previously described in Alternatives B. Sand meeting ADEC minimum contaminant concentration levels would either be reused or placed in an approved King Salmon area disposal site. The length of time required for the sand to be remediated in the treatment cell would depend on the level of contamination. This level would be determined during field and laboratory testing.

This alternative was dismissed from further environmental analysis due to the possible risk of transporting the sand off-site approximately 35 miles over Naknek Lake, a pristine water resource, via boat to conduct identical remediation methods. The NPS determined that the Brooks Camp leach field area (Alternative B) would provide a suitable remediation site.

2.7.3 Remove Contaminated Sand from Naknek Lake Shoreline and Remediate at an Approved Thermal Desorption Treatment Facility Outside of KATM

An alternative was considered to remove and remediate the contaminated sand at an ADEC approved thermal treatment facility within or near Anchorage. Under this alternative, the sand would be placed into one or more one cubic yard capacity sacks constructed of woven polypropylene fabric, sealed, and temporarily stored approximately 400 feet from the contaminated site near the Brooks Camp leach field. The temporary storage area would be enclosed by an electrified perimeter fence to prevent brown bears and other wildlife from coming into contact with the contaminants. Sand samples would be collected and transported to an ADEC certified laboratory for PAH, DRO, and BTEX concentrations analysis. Sand not meeting ADEC cleanup conditions would be returned to the excavated area. The lakeshore would be leveled and re-graded as close as possible to its pre-excavated condition.

Between July and September of 2009 when the lake level of Naknek Lake permits boats to access Brooks Camp, the sacks would be transported by barge or landing craft to the Lake Camp area of KATM. Once at Lake Camp, the sacks would be transported to Naknek by dump truck or other large motor vehicle and loaded onto an overseas barge for transport to an approved thermal treatment facility.

Thermal desorption is a pollution remediation technology that uses heat to physically separate petroleum hydrocarbons from excavated soils. Thermal desorbers are designed to heat soils to temperatures sufficient to cause constituents to volatilize and desorb (physically separate) from the soil. After leaving the desorber, the soils would be cooled, re-moistened to control dust, and stabilized (if necessary) for disposal or reuse. The contaminants extracted from the soils would be safely disposed in an approved facility (EPA, 2001b).

This alternative was dismissed from further environmental analysis due to the possible risk of transporting the sand off-site approximately 35 miles over Naknek Lake, a pristine water resource, via the NPS landing craft and an additional 500+ miles over the ocean from Bristol Bay via barge to an approved thermal treatment facility. Although this method would remove the contaminants from the sand in a fraction of the time compared to the soil cell remediation method, the overall cost and risk of transporting the contaminated sand over large water bodies would not be beneficial. The NPS determined that the Brooks Camp leach field area (Alternative B) would provide a suitable remediation site.

2.8 Summary and Comparison of Alternatives

Table 2.1 presents a summary and comparison of the potential effects of the No-Action Alternative and Alternative B. The environments within which the alternatives would be implemented are discussed in detail in Chapter 3, "Affected Environment" and the potential impacts to the environment are discussed in detail in Chapter 4, "Environmental Effects."

Table 2.1. Summary and Comparison of Alternatives

Impact Topics	Alternative A: No Action	Alternative B: Remove Contaminated Sand from Naknek Lake Shoreline and Remediate within Brooks Camp Area of KATM
Air Resources	**Short-term** and **Long-term** – negative, negligible to minor impact if contaminants are disturbed and become airborne.	**Short-term** – negative, negligible to minor impact from use of heavy equipment to excavate and transport contaminated sand. **Long-term** – positive, negligible to minor impact resulting from remediation achievement.
Water Resources	**Short-term** and **Long-term** – negative, minor impact if contaminants interact with surface water and groundwater sources.	**Short-term** – no impact. **Long-term** – positive, minor impact resulting from remediation achievement.
Wildlife and Wildlife Habitat	**Short-term** and **Long-term** – negative, minor impact if wildlife encounter contaminated sand.	**Short-term** – no impact. **Long-term** – positive, minor impact resulting from remediation achievement.
Fish and Fish Habitat	**Short-term** and **Long-term** – negative, minor impact if contaminants interact with surface water sources.	**Short-term** – no impact. **Long-term** – positive, minor impact resulting from remediation achievement.
Wetlands	**Short-term** and **Long-term** – negative, negligible impact if contaminants interact with lacustrine wetland functions.	**Short-Term** – negative, minor impact from contaminated sand excavation activities. **Long-Term** – no impact.
Cultural Resources	**Short-term** and **Long-term** – no impact.	**Short-term** – no to negligible impact if mitigation measures are followed to protect cultural resources (See Section 2.7). **Long-term** – no to negligible impact if mitigation measures are followed to protect cultural resources (See Section 2.7).
Soundscape	**Short-term** and **Long-term** – no impact.	**Short-Term** – negative, negligible impact from use of heavy equipment to excavate and transport contaminated sand. **Long-Term** – no impact.

3.0 AFFECTED ENVIRONMENT

This chapter provides a description of each project area, presents the relevant resource components of the existing environment, and provides a baseline for the alternative comparisons in Chapter 4, "Environmental Effects." The relevant resource components discussed in this chapter are air resources, water resources, fish and fish habitat, wetlands, cultural resources, and soundscape.

3.1 Project Areas

The Brooks River area is located approximately 30 air miles east of KATM park headquarters and gateway visitor center in King Salmon, Alaska. Park staff and visitors travel to the Brooks River area from King Salmon by floatplane or boat. The Brooks River area is divided into two primary developments: Brooks Camp located north of the river and the Lake Brooks development located south of the river approximately 1.5 miles from Brooks Camp. These two areas are linked by an access road and floating bridge across the Brooks River. Brooks Camp consists of a visitor and staff facilities, park

employee housing, maintenance infrastructure, concessioner facilities, and a campground connected by a series of foot paths. A 26-mile one-lane road provides staff and visitors access to the VTTS from the Brooks River area. The project areas involving the contaminated sand excavation site and construction of a remediation cell are described in detail below.

Contaminated Sand Excavation Site

The proposed sand excavation activities would occur within an approximate 50 ft by 50 ft area of the Naknek lakeshore located adjacent to the Brooks Camp ranger station access trail. The contaminated site is located below the ordinary high water (OHW) line at an approximate elevation of 93 feet above mean sea level (AMSL). The lakeshore is composed of coarse sand and various sizes of small volcanic tephra stones and is fringed by upland vegetation consisting of an overstory of white spruce and birch and an understory of alder, willow, grasses, and sedges (Figure 3.1).

Proposed Brooks Camp Area Sand Remediation Site

The proposed 40 ft by 40 ft remediation cell would be located in a previously disturbed area approximately 400 feet north of the Naknek lakeshore excavation site near the Brooks Camp leach field (Figures 1.3 and 3.2). The site is currently used as a leach field and a temporary equipment and materials storage area. The upland site is located at an approximate elevation of 100 feet AMSL and is surrounded by vegetation consisting of a white spruce and birch and an understory of alder, willow, grasses, and sedges.

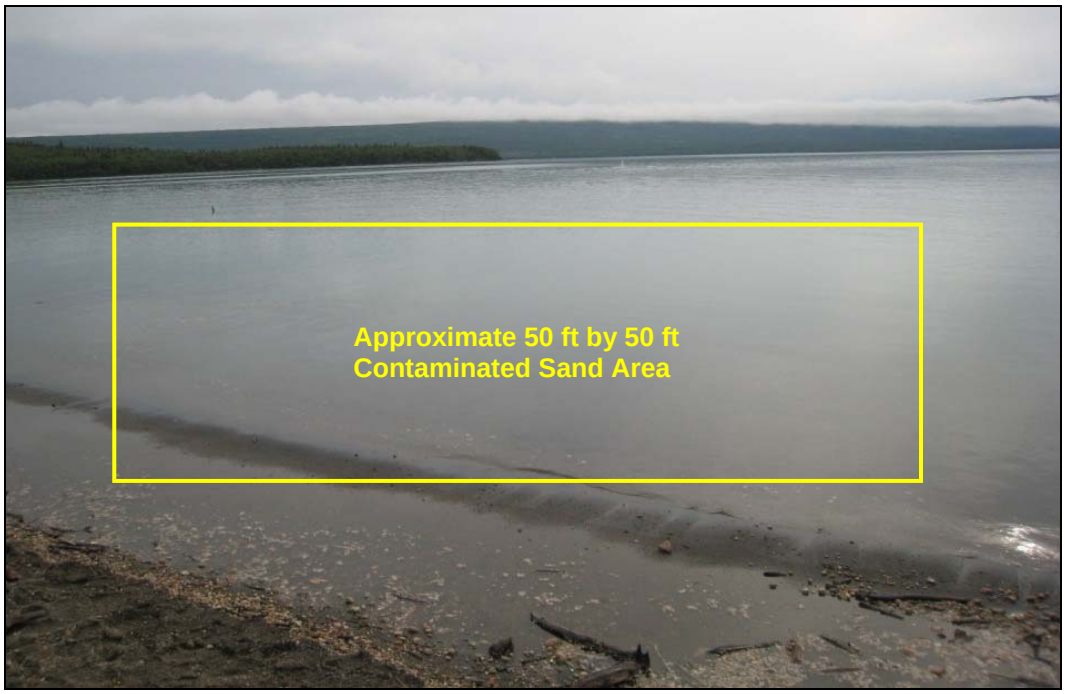

Figure 3.1. Approximate location of contaminated sand within Naknek Lake. Lower lake levels during the spring months would expose the contaminated area and allow for excavation. (Photograph recorded 23 July 2008)

Figure 3.2. Proposed Brooks Camp leach field area soil remediation site as described in Alternative B.

3.2 Resource Impact Topics

3.2.1 Air Resources

KATM has been designated as a Class II air quality area under the Clean Air Act (42 USC 7401 to 7671q). The air over KATM is essentially unaffected by human activity. Visibility and air quality are considered pristine, except for the small developed areas such as Brooks Camp where smoke from the incinerator, campground, lodge fireplace, and occasional open burning practices is created and the use of gasoline and diesel-powered transportation vehicles and equipment are in frequent operation. Air quality and visibility may be temporarily impacted by these activities as well as by infrequent natural events, such as local volcanic activity and dust storms (NPS, 1986).

3.2.2 Water Resources

Naknek Lake is the largest freshwater lake in KATM as well as in the National Park System (235 square miles). The lake is exceptionally clear, has a high oxygen concentration, and is supported by a relative abundance of blue-green algae, diatoms, and protozoa. Total phosphorus appears to be a key nutrient within the lake system while nitrogen concentrations are limited. Total dissolved solids are generally higher in Naknek Lake in comparison to the other large KATM lakes due to nearby glacial and volcanic inputs. Summer water temperature stratification between the surface and deepest portions of the lake does not fully develop; instead, the lake circulates through the summer due to coastal winds (Kozlowski, 2007).

The lake levels are generally much lower during the late winter and spring months and increase by as much as nine vertical feet during the summer and fall months. Lake levels increase due to receding glaciers, melting snow pack, and frequent precipitation events.

Naknek Lake is routinely used by floatplanes and boats during the summer months. In addition to fuel spills caused from past NPS fueling activities, a limited amount of diesel and gasoline fuels are inadvertently introduced into Naknek Lake by leakage from the engines of small boats and aircraft anchored or beached adjacent to Brooks Camp.

Brooks Camp obtains drinking water through a nearby groundwater well located approximately 500 feet west of Naknek Lake (Figure 1.2). Drinking water meets EPA and ADEC standards and is routinely treated and tested.

3.2.3 Fish and Fish Habitat

Naknek Lake is formally recognized by the State of Alaska as important for anadromous fishes, including sockeye salmon (*Onchorhynchus nerka*) and coho salmon (*Oncorhynchus kisutch*) (Johnson and Weiss, 2007). Salmon migrate to spawning areas in the lake and its tributaries in the spring and summer, but none are known to spawn along the lake shore in the project area (Troy Hamon, KATM Chief of Natural Resources, personal communication). Nonanadromous fish such as rainbow trout (*Salmo gairdneri*), dolly varden (*Salvelinus malma*), and Arctic grayling (*Thymallus arcticus*) also inhabit Naknek Lake.

3.2.4 Wildlife and Wildlife Habitat

The Brooks River and Naknek lakeshore areas are noted for its outstanding wildlife resources. The salmon runs attract more than 65 brown bears to the area annually. The bears typically remain on the Brooks River through the later part of July, and then disperse to other salmon streams. Bears return to the river in September to catch spawning salmon, particularly in the lower section of the river and along the Naknek lakeshore adjacent to Brooks Camp.

Other wildlife species that utilize the Naknek lakeshore area and adjacent Brooks Camp woodland include foxes, hares, red squirrels, voles, shrews, and bats. Bird species previously observed near the project areas include bald eagle, northern boreal and northern saw-whet owls, common merganser, Arctic tern, and a variety of migratory passerine birds.

3.2.5 Wetlands

The shore of Naknek Lake is classified as a lacustrine wetland using the U.S. Fish and Wildlife Service's *Classification of Wetlands and Deepwater Habitats of the United States* (USFWS, 1979). Under this classification system, lacustrine wetlands: (1) are situated in a topographic depression or a dammed river channel; (2) lack trees, shrubs, persistent emergents, emergent mosses or lichens with greater than 30% area coverage; and (3) have a total area that exceeds 8 ha (20 acres) (Figure 3.1).

3.2.6 Cultural Resources

Brooks Camp is located within the Brooks River Archeological District National Historical Landmark, established because of the quantity and quality of prehistoric remains. Brooks Camp proper, occupying the point of a terrace which overlooks both lake and river, is situated on a prehistorically heavily occupied section of the landmark. Here the land is comprised of a series of sequential beach ridges and river terraces which intersect at the mouth of the river. It is primarily on these ridges and terraces that

prehistoric dwellings were constructed, with activities taking place all around. Occupation of the beach ridges along the Naknek Lake began as early as 4,500 years ago and has been found to extend from near the mouth of Brooks River to the campground.

The ethnographic importance of the Brooks River corridor has not been afforded the same level of recognition as the archeological values. The ethnographic resources overlap many of the archeological deposits, but the heart of the ethnographic resources is located near the Brooks River mouth and immediate shoreline on the north side of the river and the shoreline south of the river mouth to a point beyond which the "Beaver Pond" comes closest to Naknek Lake. The ethnographic resources associated with Brooks Camp are rich, varied and include the traditional harvest of redfish or the taking of spawned out red salmon in the Naknek drainage by those Alaska Natives traditionally associated with the area. Other ethnographic resources are largely undocumented and poorly understood. The Brooks River corridor contains numerous burials that are of extreme ethnographic importance to contemporary peopled traditionally associated with this site. The preliminary information that has been recorded suggests that Qit'rwik, or Brooks Camp, is a potential candidate for the National Register of Historic Places as a Traditional Cultural Property.

3.2.7 Soundscape

Natural sounds occurring along the Naknek shoreline and within the Brooks Camp area include waves from the lake, wind, and vocalizations from birds and other wildlife. Common human created sounds heard along the Naknek Lake area include float planes, small transport vehicles, and motor boat engines. Human voices and occasional shouts are heard in areas receiving higher visitation levels, particularly where park and concessioner staff and visitors are located within the Brooks Camp area.

Natural sounds occurring along the VTTS Road include sound from wind and precipitation events and wildlife vocalizations. Human-induced sounds include the occasional vehicle traveling on the VTTS Road and aircraft flying overhead.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

For each issue selected for detailed analysis (see section 1.5.1) and for which the subject resources are described in chapter 3, the direct, indirect, and cumulative effects are analyzed. The effects to the subject resources are analyzed on the basis of the duration, context, and intensity of the impacts. Summary impact levels (characterized as negligible, minor, moderate, or major) are given for each issue topic in the analyses. Definitions of impact terms are provided below. Table 4-1 presents a summary of impact level thresholds.

Duration

Temporary: Impacts would last no more than a season, or for the duration of the discreet activity, such as maintenance of a road or trail segment.

Long-Term: Impacts would extend for several years up to the life of the project.

Permanent: Impacts are a permanent change to the resource that would last beyond the life of the project even if the actions causing the impacts were to cease.

Context

Common: The affected resource is widespread, and is not identified in enabling legislation as important to the park, nor is it rare within or outside the park. The portion of the affected resource impacted by the action does not fill a unique role within the park or its region of the park.

Important: The affected resource is identified by enabling legislation, or is rare either within or outside the park. The portion of the affected resource does not fill a unique role within the park or its region of the park.

Unique: The affected resource is identified by enabling legislation, and the portion of the affected resource uniquely fills a role within the park and its region of the park.

Intensity

Low: A change in resource condition is perceptible, but does not measurably alter the resource function in the park ecosystem, cultural context, or visitor opportunity.

Medium: A change in a resource condition is measurable or observable, and an alteration is detectable to the resource function in the park ecosystem, cultural context, or visitor opportunity.

High: A change in a resource condition is measurable or observable, and an alteration to the resource function in the park ecosystem, cultural context, or visitor opportunity is clearly and consistently observable.

Table 4-1. Summary Impact Levels

Negligible	Minor	Moderate	Major	Impairment
Effects would generally be low intensity, temporary, and would not affect unique resources.	Effects would tend to be low intensity and short duration, but common resources may sustain medium intensity and long-term effects.	Common resources would be affected by higher intensity and longer term impacts while important and unique resources are affected by medium to low intensity and shorter-term to temporary impacts, respectively.	Effects are generally medium to high intensity, long-term to permanent and affect important to unique resources.	Impairment occurs when a resource no longer fulfills the specific purposes in the enabling legislation or its role in maintaining the Park's natural integrity.

4.2 Cumulative Impacts Analysis Information

Cumulative impacts are defined as the incremental impacts to the environment resulting from adding the proposed action to other past, present, and reasonably foreseeable future actions (also referred to as regional actions), regardless of what agency (federal or non-federal) or person undertakes those actions. Cumulative impacts may result from singularly minor but collectively significant actions taking place over a period of time (CEQ Sec 1508.7).

Cumulative impacts are analyzed by considering the past, present, and reasonable foreseeable future actions taken by the NPS, other agencies, private organizations and individuals in the Brooks River area. These include the following:

- Brooks Camp area fueling operations (See Section 1.4.3).
- Past KATM contaminated sites remediation projects (See Section 1.4.4).
- Past construction, conversion and expansion of numerous NPS and private structures within the Brooks River area of KATM, including offices, storage facilities, maintenance facilities, a visitor center, commercial lodge, employee and concessions residences, a campground, utilities, roads, elevated bear viewing platforms, and trails.
- Past, present, and future operation of the above facilities and infrastructures.
- Proposed future actions such as (1) implementing projects related to housing, visitor services, sanitation and utility services described and analyzed in the 2006 *Rehabilitation and Replacement of Brooks Camp Facilities Environmental Assessment* (NPS, 2006b); (2) construction of NPS facilities (e.g., Brooks Lake maintenance facility replacement (NPS, 2007) and proposed Naknek lake fuel transport boat ramp installations); (3) moving the bulk fuel storage facility inland away from the shore of Brooks Lake; (4) concessioner facility repairs and improvements associated with a new 2008 Katmailand concessions contract; and (5) implementing the Brooks Camp move as specified in Alternative 5 of the 1996 DCP (NPS, 1996).

4.3 Alternative A: No-Action

4.3.1 Air Resources

Under the No-Action alternative, if the contaminated sand located within the Naknek lakeshore and adjacent to the Brooks Camp ranger station access trail is disturbed naturally or by human activities, Diesel-range organic (DRO) contaminants may become airborne and adversely impact air resources.
Cumulative Impacts. Brooks River area fueling operations; soil remediation projects; diesel and gasoline powered motorboats, aircraft, land vehicles, and equipment use; garbage incineration; and other park and concession management activities have caused cumulative minor impacts to air resources in the past and will continue to have cumulative minor impacts on air resources in the future.

Conclusion. Under the No-Action alternative, air resources would be adversely impacted if the contaminated sand is inadvertently disturbed. This impact would be negligible to minor, depending on the amount of contaminants in the sand and the level of disturbance. Minor air resource impacts would continue to occur from other park uses and activities.

The level of impacts on air resources anticipated from the No-Action alternative would not result in impairment of park resources that fulfill specific purposes identified in the Park's enabling legislation or that are crucial to the natural and cultural integrity of the park and preserve.

4.3.2 Water Resources

Under the No-Action alternative, if the contaminated sand located within the Naknek lakeshore and adjacent to the Brooks Camp ranger station access trail is disturbed naturally or by human activities, DRO contaminants may be released into Naknek Lake and adversely impact water resources.

Cumulative Impacts. Future ground disturbance activities occurring within the contaminated area along the Naknek lakeshore and fuel and petroleum leaks from the use of diesel and gasoline powered motorboats, aircraft, land vehicles, and equipment within the Brooks River area would continue to have a negative cumulative impact on water resources.

Past, present and future park management actions would continue to affect the water resources of the Brooks River area. Past Brooks Camp fueling operations have adversely affected surface and ground water quality. Fueling operations near the Brooks Lake facilities have caused similar adverse effects to surface and ground water quality. The replacement of underground storage tanks and fuel lines with above ground tanks and lines throughout the Brooks River area in 1993 and the planned relocation of the fuel tanks away from the Brooks Lake facilities in 2009-2010 would provide future protection of water resources within the area and improve overall water quality.

Conclusion. Under the No-Action alternative, water resources would be adversely impacted if the contaminated sand is inadvertently disturbed. This impact would be minor in intensity and long-term in duration, depending on the amount of contaminants in the sand and the level of disturbance. Minor, long-term water quality impacts would continue to occur from park management activities and public use. However, these impacts are steadily improving from the enhancement of fuel storage methods and fueling practices.

The level of impacts on water resources anticipated from the No-Action alternative would not result in impairment of park resources that fulfill specific purposes identified in the Park's enabling legislation or that are crucial to the natural and cultural integrity of the park and preserve.

4.3.3 Fish and Fish Habitat

Under the No-Action alternative, if the contaminated sand located within the Naknek lakeshore and adjacent to the Brooks Camp ranger station access trail is disturbed naturally or by human activities, DRO contaminants may be released into Naknek Lake and adversely impact fish populations and habitat.

Cumulative Impacts. Future ground disturbance activities occurring within the contaminated area along the Naknek lakeshore and fuel and petroleum leaks from the use of diesel and gasoline powered motorboats, aircraft, land vehicles, and equipment within the Brooks River area would continue to have a negative cumulative impact on fish populations and habitat.

Past, present and future park management actions would continue to affect fish populations and habitat within the Brooks River area. Past Brooks Camp fueling operations may have temporarily affected fish populations and habitat. Fueling operations near the Brooks Lake facilities may have caused similar adverse effects to fish populations and habitat. The replacement of underground storage tanks and fuel lines with above ground tanks and lines throughout the Brooks River area in 1993 and the planned relocation of the fuel tanks away from the Brooks Lake facilities in 2009-2010 would provide future protection of fish populations and habitat within Naknek Lake and Brooks Lake.

Conclusion. Under the No-Action alternative, fish populations and habitat would be adversely impacted if the contaminated sand is inadvertently disturbed. This impact would be minor in intensity and long-term in duration, depending on the amount of contaminants in the sand and the level of disturbance. Minor, long-term fish populations and habitat impacts would continue to occur from park management activities and public use. However, these impacts are steadily improving from the enhancement of fuel storage methods and fueling practices.

The level of impacts on fish populations and habitat anticipated from the No-Action alternative would not result in impairment of park resources that fulfill specific purposes identified in the Park's enabling legislation or that are crucial to the natural and cultural integrity of the park and preserve.

4.3.4 Wildlife and Wildlife Habitat

Under the No-Action alternative, the NPS would not disturb the contaminated site. However, brown bears and other wildlife inhabiting the area may come into contact with the contaminated sand if it is exposed through natural processes (ex. beach erosion) or if one or more animals excavate the area in search of food (ex. fish remains).

Cumulative Impacts. Future ground disturbance activities occurring within the contaminated area along the Naknek lakeshore and fuel and petroleum leaks from the use of diesel and gasoline powered motorboats, aircraft, land vehicles, and equipment within the Brooks River area would continue to have a negative cumulative impact on wildlife and wildlife habitat.

Conclusion. Under the No-Action alternative, wildlife and wildlife habitat would continue to be impacted by the presence of the contaminated sand along the Naknek lakeshore. This impact would be minor in intensity and long-term in duration, depending on the amount of contaminants in the sand and the level of future disturbance.

The level of impacts on wildlife and wildlife habitat anticipated from the No-Action alternative would not result in impairment of park resources that fulfill specific purposes identified in the Park's enabling legislation or that are crucial to the natural and cultural integrity of the park and preserve.

4.3.5 Wetlands

Under the No-Action alternative, the contaminated area would not be disturbed and no physical impacts would occur to the Naknek shoreline lacustrine wetland. However, the presence of contaminants in the sand may have an adverse impact on wetland functions.

Cumulative Impacts. Future ground disturbance activities occurring within the contaminated area along the Naknek lakeshore and fuel and petroleum leaks from the use of diesel and gasoline powered motorboats, aircraft, land vehicles, and equipment within the Brooks River area would continue to have a negative cumulative impact on wetlands.

Past, present and future park management actions would continue to affect wetland functions within the Brooks River area. Past Brooks Camp fueling operations may have temporarily affected wetland functions along the Naknek lakeshore. Fueling operations near the Brooks Lake facilities may have caused similar adverse effects to lacustrine wetland functions. The replacement of underground storage tanks and fuel lines with above ground tanks and lines throughout the Brooks River area in 1993 and the planned relocation of the fuel tanks away from the Brooks Lake facilities in 2009-2010 would provide future protection of wetlands within and adjacent to Naknek Lake and Brooks Lake.

Conclusion. Under the No-Action alternative, the Naknek lakeshore lacustrine wetland would not be physically impacted. However, wetland functions may be adversely impacted due to the presence of contaminants in the sand. This impact would be minor in intensity and long-term in duration, depending on the amount of contaminants in the sand and the level of future disturbance. Minor, long-term wetland impacts would continue to occur along the Naknek shoreline from park management activities and public

use. However, these impacts are steadily improving from the enhancement of fuel storage methods and fueling practices.

The level of impacts on wetlands anticipated from the No-Action alternative would not result in impairment of park resources that fulfill specific purposes identified in the Park's enabling legislation or that are crucial to the natural and cultural integrity of the park and preserve.

4.3.6 Cultural Resources

Under the No-Action alternative, the contaminated area would not be disturbed and no impacts would occur to cultural resources within the contaminated area.

Cumulative Impacts. No impacts would be expected from future actions occurring within the project area. Existing and future projects would be regulated under state and federal requirements for cultural resource protection. Any impacts to cultural resources in un-surveyed areas would be evaluated on a site and project-specific basis by cultural resource professionals.

Conclusion. No impacts to cultural resources would occur within the project area. The level of impacts on cultural resources anticipated from the No-Action alternative would not result in impairment of park resources that fulfill specific purposes identified in the Park's enabling legislation or that are crucial to the natural and cultural integrity of the park and preserve.

4.3.7 Soundscape

No impacts to the soundscape would occur under the No-Action alternative.

Cumulative Effects. Past, present and future park management actions would continue to affect the soundscape within the Brooks River area. These adverse impacts would be negligible to minor in intensity and short-term in duration depending on the scale of the park management action (ex. routine park operations, construction projects).

Conclusion. No impacts to the soundscape would occur. The level of impacts on the soundscape anticipated from the No-Action alternative would not result in impairment of park resources that fulfill specific purposes identified in the Park's enabling legislation or that are crucial to the natural and cultural integrity of the park and preserve.

4.4 Alternative B: Proposed Action and Environmentally Preferred Alternative – Remove Contaminated Sand from Naknek Lake Shoreline and Remediate within Brooks Camp Area of KATM

4.4.1 Air Resources

Under Alternative B, air resources would be adversely affected during the excavation and transport of the contaminated sand. This minor adverse impact would occur from disturbing contaminants in the sand and using diesel powered equipment. The use of fertilizer would provide bacteria the ability to break down the contaminants in the sand. This break down would produce small concentrations of carbon dioxide over a period of several years. Carbon dioxide concentrations would slowly decrease as harmful contaminants are reduced to safer levels. Air quality impacts from the release of carbon dioxide would be negligible. The removal of the contaminated sand would provide a negligible to minor long-term improvement in air quality within the Brooks Camp area of KATM.

Cumulative Impacts. Brooks River area fueling operations; soil remediation projects; diesel and gasoline powered motorboats, aircraft, land vehicles, and equipment use; garbage incineration; and other park and concession management activities have caused cumulative minor impacts to air resources in the past and will continue to have cumulative minor impacts on air resources in the future. The implementation of Alternative B would not substantially increase the cumulative impacts to air quality within the Brooks River area or other areas of KATM.

Conclusion. Under Alternative B, air resources would be adversely impacted during the excavation, transport, and remediation of the contaminated sand. This impact would be negligible to minor, depending on the amount of contaminants in the sand and the level of disturbance. Minor air resource impacts would continue to occur from other park uses and activities.

The level of impacts on air resources anticipated from the No-Action alternative would not result in impairment of park resources that fulfill specific purposes identified in the Park's enabling legislation or that are crucial to the natural and cultural integrity of the park and preserve.

4.4.2 Water Resources

Under Alternative B, the water quality of Naknek Lake and adjacent groundwater sources would improve from the removal of contaminated sand. To ensure water quality is not adversely impacted from the excavation and transport of the contaminated sand, Alternative B would occur in April and/or early May of 2009 when lake water levels are low enough to expose the contaminated area and the lakeshore is free of ice. The contaminated sand would be contained in a polypropylene-lined remediation cell which would be surrounded by an elevated berm. The remediation cell would provide sufficient volume to contain precipitation and prevent contaminated water from entering surface and ground waters. The remediation cell would meet or exceed EPA and ADEC standards.

Cumulative Impacts. Fuel and petroleum leaks from the use of diesel and gasoline powered motorboats, aircraft, land vehicles, and equipment within the Brooks River area would continue to have a negative cumulative impact on water resources. The implementation of Alternative B would provide a minor positive cumulative impact to water quality within the Brooks River area of KATM.

Conclusion. Under Alternative B, the water resources of the Brooks River area would experience a negligible to minor long-term improvement, depending on the amount of contaminants excavated and remediated. However, minor, long-term water quality impacts would continue to occur from park management activities and public use. However, these impacts are steadily improving from the enhancement of fuel storage methods and fueling practices.

The level of impacts on water resources anticipated from Alternative B would not result in impairment of park resources that fulfill specific purposes identified in the Park's enabling legislation or that are crucial to the natural and cultural integrity of the park and preserve.

4.4.3 Fish and Fish Habitat

Under Alternative B, fish and fish habitat adjacent to the excavation area and other water bodies within KATM would not be impacted from contaminated sand removal, transport, and remediation activities. Alternative B would occur before fish populations utilize the area in April and/or early May of 2009. During this period lake water levels are low enough to expose the contaminated area and the lakeshore is free of ice. Sand excavation activities on the Naknek lakeshore would be conducted in accordance with an

approved Alaska Fish Habitat Permit and would follow all specific conditions stated on the permit. The lakeshore would be leveled and re-graded as close as possible to its pre-excavated condition. Remediation activities would occur in an upland area away from Naknek Lake within a polypropylene lined treatment cell. The cell would meet or exceed EPA and ADEC standards.

Cumulative Impacts. Fuel and petroleum leaks from the use of diesel and gasoline powered motorboats, aircraft, land vehicles, and equipment within the Brooks River area would continue to have a negative cumulative impact on fish and fish habitat. The implementation of Alternative B would provide a minor positive cumulative impact to fish and fish habitat within the Brooks River area of KATM.

Conclusion. Under Alternative B, fish and fish habitat would not be impacted during the removal, transport, and remediation of contaminated sand within the project area. Although the removal of the contaminated sand would provide a minor positive, long-term impact to fish and fish habitat, negative long-term water quality impacts would continue to occur from other park management activities and public use. However, these impacts are steadily improving from the enhancement of fuel storage methods and fueling practices.

The level of impacts on fish and fish habitat anticipated from Alternative B would not result in impairment of park resources that fulfill specific purposes identified in the Park's enabling legislation or that are crucial to the natural and cultural integrity of the park and preserve.

4.4.4 Wildlife and Wildlife Habitat

Under Alternative B, wildlife and wildlife habitat adjacent to the excavation area and the sand remediation area would not be impacted from contaminated sand removal, transport, and remediation activities. Excavation activities would occur in April and/or early May of 2009 before brown bears and other primary wildlife species inhabit the project area. All sand not removed for remediation would be returned to the lakeshore. The lakeshore would be leveled and re-graded as close as possible to its pre-excavated condition. The sand remediation area would be covered by an impermeable plastic liner and enclosed by an electrified perimeter fence to prevent brown bears and other wildlife from coming into contact with the contaminants.

Cumulative Impacts. Fuel and petroleum leaks from the use of diesel and gasoline powered motorboats, aircraft, land vehicles, and equipment within the Brooks River area would continue to have a negative cumulative impact on wildlife and wildlife habitat. The implementation of Alternative B would provide a minor positive cumulative impact to wildlife and wildlife habitat within the Brooks River area of KATM.

Conclusion. Under Alternative B, wildlife and wildlife habitat would not be impacted during the removal, transport, and remediation of contaminated sand within the project area. The removal and remediation of the contaminated sand would provide a minor positive, long-term impact to wildlife and wildlife habitat. Other minor, long-term impacts to wildlife and wildlife habitat would continue to occur within the Brooks River area from park management activities and public use involving fuel use. However, these impacts are steadily improving from the enhancement of fuel storage methods and fueling practices.

The level of impacts on wildlife and wildlife habitat anticipated from Alternative B would not result in impairment of park resources that fulfill specific purposes identified in the Park's enabling legislation or that are crucial to the natural and cultural integrity of the park and preserve.

4.4.5 Wetlands

Under Alternative B, the Naknek lakeshore lacustrine wetland would be adversely impacted from the removal of contaminated sand. This adverse impact would be minor in intensity and short-term in duration (approximate one-week period). Excavation activities would be limited to approximately 100 cubic yards of sand within an estimated 50 ft by 50 ft area adjacent to the Brooks Camp ranger station access trail. Excavation activities would occur while the site is dewatered during April and/or early May of 2009. After the contaminated sand is removed, the lakeshore would be leveled and re-graded as close as possible to its pre-excavated condition. No new fill materials would be placed within the project site. Contaminated sand remediation activities would occur only within previously disturbed upland areas and would not impact adjacent wetlands. No long-term impacts to wetlands are expected from the implementation of Alternative B.

Cumulative Impacts. Future ground disturbance activities occurring along the Naknek lakeshore and fuel and petroleum leaks from the use of diesel and gasoline powered motorboats, aircraft, land vehicles, and equipment within the Brooks River area would continue to have a negative cumulative impact on the wetlands.

Past, present and future park management actions would continue to affect wetland functions within the Brooks River area. Past Brooks Camp fueling operations may have temporarily affected wetland functions along the Naknek lakeshore. Fueling operations near the Brooks Lake facilities may have caused similar adverse effects to lacustrine wetland functions. The replacement of underground storage tanks and fuel lines with above ground tanks and lines throughout the Brooks River area in 1993 and the planned relocation of the fuel tanks away from the Brooks Lake facilities in 2009-2010 would provide future protection of wetlands within and adjacent to Naknek Lake and Brooks Lake.

Conclusion. Under Alternative B, the lacustrine wetland within the Naknek lakeshore project area would be temporarily impacted from the excavation of contaminated sand. This temporary adverse impact would be minor in intensity. Other minor, long-term wetland impacts would continue to occur within the Brooks River area from park management activities and public use. However, these impacts are steadily improving from the enhancement of fuel storage methods and fueling practices.

The level of impacts on wetlands anticipated from Alternative B would not result in impairment of park resources that fulfill specific purposes identified in the Park's enabling legislation or that are crucial to the natural and cultural integrity of the park and preserve.

4.4.6 Cultural Resources

The proposed project site is within the boundaries of the Brooks River Archeological District National Historic Landmark. The NPS is in the process of assessing the potential effects of the contaminated sand removal and remediation on cultural resources, as per Section 106 of the National Historic Preservation Act of 1966. Through this process, a determination of effect will be made and concurrence sought from the State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation previous to any action taking place.

Should any unknown cultural resources be uncovered during project implementation, work would be stopped in the discovery area. The NPS would perform consultations according to 36 CFR 800 and, as appropriate, provisions of the Native American Graves Protection and Repatriation Act of 1992. A Determination of Eligibility would be conducted. If adjustments could not be made to the project to avoid cultural resource disturbance, a Memorandum of Agreement (MOA) with the Advisory Council on

Historic Preservation and the Alaska State Historic Preservation Office that incorporates comments from consulting parties would be executed. The MOA would specify measures to mitigate adverse effects. Any artifacts recovered from park property at the project site would be accessioned, cataloged, preserved and stored in compliance with NPS Cultural Resource Management Guidelines.

Cumulative Impacts. No impacts would be expected to cultural resources from other future construction projects. For future projects, construction activities on un-surveyed sites would be regulated by State and federal requirements for cultural resource protection. Any impacts to un-surveyed areas would need to be evaluated on a site and project-specific basis by cultural resources experts.

Conclusion. No to negligible impacts to cultural resources are expected to occur within the project area. Should any unknown cultural resources be uncovered during project implementation, work would be stopped in the discovery area. The NPS would consult with the SHPO, Advisory Council of Historic Preservation, and affected Native communities.

The level of impacts on cultural resources anticipated from Alternative B would not result in impairment of park resources that fulfill specific purposes identified in the Park's enabling legislation or that are crucial to the natural and cultural integrity of the park and preserve.

4.4.7 Soundscape

Under Alternative B, minor short-term (approximately one week) adverse impacts would occur to the soundscape within the Brooks River area during the use of heavy equipment to excavate and transport the contaminated sand.

Cumulative Effects. Past, present and future park management actions would continue to affect the soundscape within the Brooks River area. These adverse impacts would be negligible to minor in intensity and short-term in duration depending on the scale of the park management action (ex. routine park operations, construction projects).

Conclusion. Minor short-term adverse impacts would occur on the soundscape. The level of impacts on the soundscape from implementing Alternative B would not result in impairment of park resources that fulfill specific purposes identified in the Park's enabling legislation or that are crucial to the natural and cultural integrity of the park and preserve.

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APPENDIX

Alaska National Interest Lands Conservation Act (ANILCA)

Section 810 Summary Evaluation and Findings

BACKGROUND

Subsistence uses, as defined by the Alaska National Interest Land Conservation Act (ANILCA), section 803, means "the customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools or transportation; for the making and selling of handicraft articles out of non-edible byproducts of fish and wildlife resources taken for personal or family consumption; for barter, or sharing for personal or family consumption; and for customary trade." Subsistence activities include hunting, fishing, trapping, and collection of berries, edible plants, and wood or other materials.

I. INTRODUCTION

This section was prepared to comply with Title VIII, Section 810 of the ANILCA. It summarizes the evaluation of potential restrictions to Title VIII Federal Subsistence uses that could result from the NPS proposed actions to excavate contaminated sand from the shoreline of Naknek Lake and remediate the contaminated sand onsite near the Brooks River in Katmai National Park and Preserve (KATM). The *Brooks Camp Beach Area Fuel Spill Remediation Environmental Assessment* (EA) describes a no-action and proposed action for consideration.

II. EVALUATION PROCESS

Section 810(a) of ANILCA states:

> "In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands...the head of the federal agency...over such lands...shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for the purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy or disposition of public lands needed for subsistence purposes. No such withdrawal, reservation, lease, permit or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be affected until the head of such Federal agency–
>
> (1) gives notice to the appropriate State agency and the appropriate local committees and regional councils established pursuant to Section 805;
>
> (2) gives notice of, and holds, a hearing in the vicinity of the area involved; and determines that (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands, (B) the proposed activity will involve the minimal amount of public lands necessary…and

(C) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions."

A proclamation by President Woodrow Wilson in 1918 created Katmai National Monument from a reservation of approximately 1,700 square miles. Three major purposes of the monument designation were 1) to preserve an area important to the study of volcanism, 2) to preserve the Valley of Ten Thousand Smokes and 3) to conserve an area potentially popular with persons seeking unique scenery and for those with scientific interest. Increased in 1931 to include Brooks Lake, Grosvenor Lake, Lake Colville and part of Naknek Lake; again in 1942 to include offshore islands within five miles of the monument coastline; and again in 1969 to include the remainder of Naknek Lake, the monument grew to contain 4,361 square miles.

With the passage of the ANILCA in 1980 the designation of 3.7 million acres of the monument was changed to a national park, and an additional 308,000 acres was included as a national preserve. Furthermore, 3.4 million acres of the park and preserve were designated as wilderness. The Katmai Preserve was created by the ANILCA Section 202(2) for the following purposes (among others) "to protect habitats for, and populations of, fish and wildlife including, but not limited to, high concentrations of brown/grizzly bears and their denning areas; to maintain unimpaired the water habitat for significant salmon populations; and to protect scenic, geological, cultural and recreational features." The taking of fish and wildlife for subsistence uses is allowed by the ANILCA within Katmai National Preserve pursuant to Section 203, however, subsistence activities are not authorized within Katmai National Park.

III. PROPOSED ACTION ON FEDERAL PUBLIC LANDS

Under the Proposed Action, sand within an estimated 50 ft by 50 ft area on the Naknek lakeshore would be removed by using a wheeled and/or tracked excavator equipped with a backhoe (EA Figure 1.3). Several equally spaced 3-foot deep trenches would be excavated parallel to the shoreline. An environmental consultant would field test the excavated sand using a photoionization detector (PID) and a hydrocarbon test kit. Only contaminated "hot spots" would be removed from the lakeshore and remediated. It is estimated that up to 40 cubic yards of sand may require remediation.

Contaminated sand requiring ADEC cleanup level conditions would be transported by a dump truck approximately 400 feet to a soil remediation cell constructed within the Brooks Camp leach field (EA Figures 1.3 and 3.2). Sand samples would be collected and transported to an ADEC certified laboratory for polycyclic aromatic hydrocarbon (PAH); diesel range organics (DRO); and benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations analysis. Sand not meeting ADEC cleanup conditions would be returned to the excavated area. The lakeshore would be leveled and re-graded as close as possible to its pre-excavated condition.

The soil remediation cell would be approximately 40 ft by 40 ft in size and would consist of a heavy-duty 20 mil or greater plastic impervious liner surrounded by a timber or elevated soil berm (EA Figure 2.1). The soil cell would be located a minimum of 200 feet away from drinking water wells. To reduce fuel-contaminant concentrations, a NPS and ADEC approved chemical oxidation solution would be applied and mixed at a rate of 20 pounds of solution per 1 cubic yard of contaminated sand. The solution is commonly used throughout the United States to safely remediate highly concentrated contaminated sites. The solution consists of two parts, an oxidizer and an activator, which are mixed together at the remediation site. The solution destroys the contaminants at the molecular level through chemical oxidation. The by-products of the chemical reaction are carbon dioxide and water.

A reinforced impervious polyethylene cover would be placed over the cell to mitigate possible human and wildlife exposure. An electrified fence would be installed around the soil cell to prevent brown bears and

other wildlife from coming into contact with the contaminants and chemical oxidation solution. Sand meeting ADEC minimum contaminant concentration levels would either be reused or placed in an approved disposal site located within the Brooks River area of KATM. The length of time required for the sand to be remediated in the soil cell is uncertain and would depend on the level of contamination. Contamination levels would be monitored using routine field and laboratory testing. Sand meeting ADEC minimum contaminant concentration levels would either be reused or placed in an approved disposal site located within the Brooks River area of KATM.

IV. AFFECTED ENVIRONMENT

Water quality and fish habitat adjacent to the excavation area and other water bodies within KATM would not be impacted from contaminated sand removal, transport, and remediation activities. Contaminated sand excavation activities would occur before fish populations utilize the area in April and/or early May of 2009. During this period lake water levels are low enough to expose the contaminated area and the lakeshore is free of ice. Sand excavation activities on the Naknek lakeshore would be conducted in accordance with an approved Alaska Fish Habitat Permit and would follow all specific conditions stated on the permit. The excavation of the contaminated sand within Naknek Lake adjacent to Brooks Camp (EA Figure 1.2) would temporarily affect approximately 2,500 square feet of lakeshore. After the sand is excavated, the lakeshore would be leveled and re-graded as close as possible to its pre-excavated condition to ensure spawning habitat is not adversely impacted. Remediation activities would occur in a previously disturbed upland area (EA Alternative B: Brooks Camp leach field) away from fish habitat within a polypropylene lined and covered treatment cell. The remediation cell would meet or exceed EPA and ADEC standards. Water quality and fish habitat would improve as a result of removing the contaminated sand.

The Brooks River provides spawning habitat for primarily sockeye salmon which migrate from Bristol Bay to Naknek Lake and the Brooks River. Most of the salmon harvested in the Naknek River system have been produced within Katmai National Park and many have been produced in the Brooks River/Brooks Lake section of this system. Harvest of salmon generally occurs in the Naknek River downstream of the park boundary; however, a limited fishery for "red fish", or spawned-out sockeye salmon, is permitted. This activity is authorized under separate legislation, subsequent to ANILCA, at 36 CFR 13.1204 to local residents who are descendants of Katmai residents who lived in the Naknek Lake and River drainage. Other subsistence activities are not permitted in Katmai National Park in accordance with the ANILCA Title II Section 203; Title VIII Section 816(a); and Title XIII Section 1314(c).

Subsistence uses are allowed within Katmai National Preserve in accordance with the ANILCA Title II Section 203 and provisions of Title VIII. Katmai National Preserve, encompassing 308,000 acres, is located on the northern end of the Alaska Peninsula in Game Management Unit 9C and contains geologic features, scenery, wildlife and cultural resources of national significance. The ANILCA also authorized subsistence uses on adjacent federal public lands managed by the Bureau of Land Management (BLM) and the US Fish and Wildlife Service (USFWS).

Subsistence activities in Katmai National Preserve include hunting, trapping, fishing, gathering firewood, picking berries and wild plants, and gathering bird eggs. The area is used for subsistence by residents of Kokhanok, Igiugig, Levelock, Naknek and King Salmon to harvest caribou, brown bear, moose, beaver, snowshoe hare, fox, lynx, mink, wolf, wolverine, ptarmigan, waterfowl, salmon, trout, berries, wild edible plants and other wood resources.

Regional subsistence activities include seasonal gathering of wild edible plants and berries, hunting, trapping, and fishing. The main subsistence species are moose, caribou, furbearers, and fish. Subsistence

fish include Coho salmon, king salmon, sockeye salmon, northern pike, burbot, Dolly Varden, arctic grayling, lake trout, rainbow trout, and whitefish. Beaver, coyote, red fox, gray wolf, wolverine, river otter, weasel, lynx, marten, mink, and muskrat are important furbearer resources. Subsistence birds include rock and willow ptarmigan, grouse, ducks, and geese.

The NPS recognizes that patterns of subsistence use vary from time to time and from place to place depending on the availability of wildlife and other renewable natural resources. A subsistence harvest in a given year may vary considerably from previous years because of weather, migration patterns, and natural population cycles.

V. SUBSISTENCE USES AND NEEDS EVALUATION

To determine the potential impact on subsistence activities by the proposed installation, upgrade, and maintenance of the web camera and communication stations within Katmai National Park, three evaluation criteria were analyzed relative to current subsistence resources that could be impacted.

The evaluation criteria are:

1. The potential to reduce important subsistence fish and wildlife populations by (a) reductions in abundance; (b) redistribution of subsistence resources; or (c) loss of habitat.
2. Potential impacts the action may have on access for subsistence hunters and fishermen.
3. The potential for the action to increase competition among hunters and fishermen for subsistence resources.

1. The Potential to Reduce Populations:

(a) Reduction in Numbers

The proposed project occurring within Katmai National Park is not expected to reduce wildlife species populations. The sand would be excavated between late April and early May before brown bears and other wildlife and anadromous fish species inhabit or migrate to the area. The remediation cell would be surrounded by an electrified fence to prevent larger wildlife species from coming in contact with the sand. Natural wildlife population and migratory cycles would continue and the ongoing regional subsistence pattern would remain unchanged.

(b) Redistribution of Resources

The proposed action is not expected to redistribute, displace, or stress subsistence wildlife resources. To avoid disturbing wildlife populations within the project areas, the sand would be excavated between late April and early May before brown bears and other wildlife and anadromous fish species inhabit or migrate to the area. Sand excavation and remediation activities would utilize a small footprint (40 ft by 40 ft) within a previously disturbed area (Brooks Camp leach field) and would not cause wildlife populations to become redistributed, displaced, or stressed.

(c) Habitat Loss

The proposed action is not expected to cause the loss of beneficial or critical habitat for subsistence species such as salmon, caribou, moose, furbearers, grouse, and waterfowl. The contaminated sand area is approximately 50 ft by 50 ft in size. This area would be leveled and re-graded as close as possible to its pre-excavated condition immediately after the contaminated sand is removed and before the lake level rises and inundates the area. Contaminated sand remediation would take place in a previously disturbed

40 ft by 40 ft upland area and would be protected by a lined treatment cell and enclosed by an electrified fence. The proposed activities would not manipulate subsistence habitats or have any measurable impacts on subsistence resources.

Provisions of ANILCA, the Federal Subsistence Board, and NPS and Alaska Department of Fish and Game (ADF&G) regulations and policies provide for the adequate protection of fish and wildlife populations within Katmai National Preserve while ensuring a subsistence priority for local rural residents.

2. Restriction of Access:

Under all alternatives, access to subsistence uses in the Katmai National Preserve is not expected to be limited or restricted. None of the alternatives propose changes to access regulations.

3. Increase in Competition

The proposed action is not anticipated to result in increased competition for fish, wildlife, and other subsistence resources on Federal public lands. Provisions of ANILCA, the Federal Subsistence Board, and NPS and ADF&G regulations provide the tools for adequate protection of fish and wildlife populations while ensuring a subsistence priority for local rural residents.

VI. AVAILABILITY OF OTHER LANDS

The contaminated sand is located within the Brooks Camp area of Katmai National Park. Remediating the sand outside of KATM in King Salmon would require the transport of the contaminated sand over Naknek Lake via boat to King Salmon. If the sand is treated in an approved ADEC thermal treatment facility, a 500+ miles overseas barge transport from Bristol Bay to the facility would be needed. These two alternatives were dismissed from further analysis in the EA due to the additional costs and preventable risk of transporting the contaminated sand over significant water resources vital to subsistence uses.

VII. ALTERNATIVES CONSIDERED

Two alternatives were considered and analyzed in the EA. Under the No-Action Alternative (Alternative A), contaminated sand located on the Naknek Lake shoreline adjacent to Brooks Camp would not be removed and remediated. Contaminated sand would remain in place and would not be disturbed.

Under Alternative B (proposed action), the contaminated sand would be excavated from the Naknek Lake shoreline and remediated within a treatment cell located within the Brooks Camp leach field.

VIII. FINDINGS

This analysis concludes that the Alternative B (proposed action) would not result in a significant restriction of subsistence uses.