Nenana Rail Realignment Project
Nenana, Alaska
Railroad Mile 410.1 to Mile 413.3

NEPA ENVIRONMENTAL ASSESSMENT

Submitted pursuant to 42 USC 4332(2)(c), 23 CFR Part 771.119

by the

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL TRANSIT ADMINISTRATION

and

ALASKA RAILROAD CORPORATION

12 October 2004
Date of Approval

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The Alaska Railroad Corporation proposes to realign its mainline track to bypass the downtown area of Nenana, Alaska. The Proposed Action includes a new embankment (up to approximately 150 feet wide and 25 feet high), a bridge over the George Parks Highway, oversized culvert underpasses (multi-plate tunnels) to maintain access along the airport access road and 9th Street, and an optional rail siding near the airport. The existing track through downtown Nenana and the existing looped approach to the Tanana River bridge would be left in place to maintain freight service to the Port of Nenana. To mitigate impacts on floodwater elevations, a dike would be constructed at the upstream end of the airport runway. This document addresses the potential environmental impacts associated with the proposal.

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Comments on this environmental assessment are requested by November 15, 2004 and should be sent to Greg Lotakis, Project Manager, Alaska Railroad Corporation, P.O. Box 107500, Anchorage, Alaska, 99510, (907) 265-2217.

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ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
AASHTO	American Association of State Highway and Transportation Officials
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
ADOL	Alaska Department of Labor
ADOT&PF	Alaska Department of Transportation and Public Facilities
ANCSA	Alaska Native Claims Settlement Act
APRFC	Alaska Pacific River Forecast Center
ARRC	Alaska Railroad Corporation
ARTA	Alaska Railroad Transfer Act
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	Best Management Practice
CFR	Code of Federal Regulations
cfs	cubic feet per second
CWA	Clean Water Act
dBA	A-weighted sound decibels
DCED	Department of Community and Economic Development
DGC	Division of Governmental Coordination
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
FTA	Federal Transit Administration
GVEA	Golden Valley Electric Association
KV	kilovolt
Mph	miles per hour
MSL	mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGVD29	National Geodetic Vertical Datum of 1929
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
ROW	right-of-way
SHPO	State Historic Preservation Officer
SWPPP	Storm Water Pollution Prevention Plan
TNH	Tryck Nyman and Hayes, Inc.
URS	URS Corporation
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1.0 INTRODUCTION

The Alaska Railroad Corporation (ARRC), in cooperation with the Federal Transit Administration (FTA), proposes to realign its mainline track to bypass the downtown area of Nenana, Alaska, a community on the George Parks Highway approximately 56 miles southwest of Fairbanks (Figure 1). This project has been under consideration for a number of years, and the ARRC has recently received funds from the FTA to further investigate the project. This Environmental Assessment (EA) describes and analyzes the potential environmental impacts of the Proposed Action and reasonable alternatives in accordance with the National Environmental Policy Act (NEPA).

1.1 PURPOSE

The purpose of the Proposed Action is threefold: 1) improve the safety of mainline rail/roadway crossings and railroad operations; 2) reduce rail transportation times; and 3) reduce operation and maintenance costs.

- *At-grade crossing safety*: The new mainline rail alignment would overpass the George Parks Highway, the primary north-south artery between Anchorage and Fairbanks, and would grade-separate secondary road crossings with additional overpasses, greatly reducing the risk of train-vehicle collisions. All or a portion of the existing track in downtown Nenana would be maintained as a siding or spur to provide freight service to the Nenana waterfront. Six existing at-grade crossings in downtown Nenana would receive only intermittent use as opposed to the six to ten trips per day of through-traffic that they presently support. Therefore, the proposed realignment would substantially improve the safety of rail/roadway crossings and railroad operations.
- *Rail transportation times:* The proposed rail alignment would be shorter and have fewer curves than the current alignment, which would substantially reduce derailment risk while increasing train speeds. The proposed mainline realignment would reduce the length of the track by nearly two miles and save an estimated six to eight minutes in through-train running time between Anchorage and Fairbanks.
- *Operation and maintenance costs*: The current alignment has multiple, tight curves that require expensive maintenance. The new track configuration would be substantially less maintenance-intensive than the present configuration, which would reduce operating and maintenance costs for this segment of track.

In addition to continuing rail service to the Port of Nenana, the Proposed Action would provide the opportunity to serve the Nenana Airport with an optional spur or siding generally parallel to the new main track.

1.2 NEED

Built in about 1920, the existing track was installed in a large curve to the east and north of downtown Nenana, passing close to the confluence of the Nenana and Tanana rivers and paralleling the Tanana River waterfront to serve port and downtown commerce. The track then curved southward through undeveloped terrain east of downtown and looped back to the north to gain elevation for the bridge across

the Tanana River. This alignment has not changed since original construction, and issues relating to community growth, public safety, and railroad operational efficiency now need to be addressed.

- *Curvature:* Several railway curves exceed modern design standards, in some places reaching a relatively sharp 12-degree curve. As a result, trains must go slower than required by modern standards, the risk of derailment is higher, and the force of heavy trains on this curved track requires intensive, expensive maintenance.
- *Crossings*: Six at-grade crossings are cause for safety concerns in Nenana. These include the potential for train-vehicle collisions, frequent blockage of these crossings, and delay in timely access to key public facilities, such as the medical clinic.
- *Downtown Impacts*: The existing mainline track running through downtown Nenana passes through the most densely populated part of the community, subjecting homes and businesses to noise, vibration, and risks associated with the transportation of hazardous materials through the community.

1.3 THE NEPA PROCESS

In compliance with NEPA, the FTA must determine if the proposed project would have significant impacts on the environment of the Nenana area, which includes both the natural and manmade environment. NEPA is a national mandate for the protection of the environment and full consideration of reasonable project alternatives that minimize adverse impacts to the human and natural environment. The purpose of NEPA is to provide public disclosure of the environmental impacts associated with federal actions. The NEPA process enables public officials to make decisions that are based on an objective understanding of environmental consequences, and to take actions that protect, restore, and enhance the environment. NEPA mandates that appropriate opportunities be provided for public comment, particularly at the beginning and prior to closure of the process, to ensure that relevant issues and concerns are identified and addressed.

Scoping, the first step in the NEPA process, is designed to meet two objectives. The first is to identify alternatives to the Proposed Action and/or alternative ways to implement the Proposed Action so that the identified purpose and needs are fulfilled. The second is to identify environmental concerns or issues relevant to the Proposed Action and its alternatives that should be addressed in the EA. Scoping for this project was conducted from April through June 2003. Details on the public and agency scoping are provided in the Scoping Summary Report (URS Corporation [URS] 2003a). The Scoping process identified the following issues to be addressed in this EA:

- Impacts of the new alignment on train-related accident rates;
- Potential impacts on local access and emergency response capabilities;
- The George Parks Highway crossing by the new alignment: advantages and disadvantages of a railroad overpass above the highway versus a highway overpass above the railroad, with consideration given to safety and noise;
- Future status of the existing track through downtown Nenana with regard to maintaining local freight and passenger rail service;
- Potential impacts to wetlands, the Nenana City Pond, drainage, and flooding;

INSERT FIGURE 1

- Noise impacts associated with moving the railroad away from the city center and incorporating an overpass at the George Parks Highway;
- Compatibility with Nenana Airport operations, including the desire to maintain two separate access routes to the airport, the potential to support current and future operations, and the ability to support future plans to modify or expand the airport;
- Potential impacts on future community growth and development (i.e., would the new alignment form a physical barrier to future development?);
- Opportunities for enhanced tourism (e.g., develop tourism between Nenana and Denali National Park);
- Future status of the ARRC maintenance crew and facility in Nenana following the realignment;
- Temporary and permanent employment opportunities for local residents associated with track realignment and maintenance activities;
- Potential for tribal land trades associated with the alignment alternatives;
- Need for an agreement between ARRC and property owners regarding a new alignment right-of-way;
- Nenana does not have a local landfill; therefore, construction waste would need to be handled accordingly and possibly transported away from the community.
- Identification of material sources and transport methods associated with track realignment.

In addition, during the course of preparation of the EA, the Bureau of Indian Affairs (BIA) recommended that the EA address the potential for impacts to the railroad embankment as a result of continued erosion of the west bank of the Tanana River at the east end of the project area. River erosion caused by the Tanana River is not a part of the purpose and need for this project, although it is a future maintenance consideration for ARRC regardless of whether the project is constructed. This issue is addressed in the EA with regard to a bank stabilization/road project proposed by BIA. If both projects receive all the necessary approvals and construction is funded, BIA and ARRC will work together to coordinate the two projects. Additionally, although unrelated to the Proposed Action, ARRC is working with the BIA and Nenana Native Council on a cooperative agreement regarding ARRC's participation in the maintenance of bank stabilization structures constructed as part of BIA's project. If no agreement is reached and erosion of the Tanana River continues, ARRC will eventually need to stabilize the bank of the Tanana River to protect its existing embankment and a small section of the embankment associated with the Proposed Action. The Alaska Railroad bridge over the Tanana River has not been affected by the erosion; therefore, it is not addressed in this EA.

This EA evaluates the potential impacts of the proposed alternatives, including No Action, on the physical, biological, and human resources of the Nenana area. If significant impacts are identified in the EA, a more detailed Environmental Impact Statement (EIS) will be prepared. If the FTA determines that no significant adverse impacts would occur, it will issue a Finding of No Significant Impact (FONSI). This finding would allow ARRC to proceed with the proposed project.

1.4 PROJECT AUTHORIZATIONS

Federal, state, and local permits and approvals would be required before construction and operation of the proposed project can proceed. The following is a list of potential permits and other environmental compliance requirements.

- United States Army Corps of Engineers (USACE) Clean Water Act (CWA) Section 404 permit for placement of fill in wetlands;
- Alaska Department of Environmental Conservation (ADEC) CWA Section 401 Water Quality Certification;
- Alaska State Historic Preservation Officer (SHPO) certification of compliance with Section 106 of the National Historic Preservation Act;
- United States Environmental Protection Agency (USEPA) and ADEC National Pollutant Discharge Elimination System (NPDES) general permit for storm water discharges from construction sites;
- ADEC General Wastewater Disposal Permit for excavation dewatering;
- Alaska Department of Natural Resources (ADNR) temporary water use permit for dust control;
- Alaska Department of Transportation and Public Facilities (ADOT&PF) Encroachment Permit for construction across the George Parks Highway right-of-way; and
- City of Nenana agreements and approvals (e.g., flood hazard permit).

2.0 ALTERNATIVES

This section describes the Proposed Action, build alternatives, and the No Action Alternative. Several other alternatives were examined but were not selected for detailed analysis in the EA. These are also discussed, including the reasons why they were eliminated from further consideration. All of the alternatives considered during the scoping process are shown conceptually on Figure 2, and the build alternatives are shown conceptually on Figures 3 and 4.

2.1 PROPOSED ACTION

The Proposed Action (Alternative B-2 High Profile) would realign the mainline track of the Alaska Railroad to bypass downtown Nenana (Figure 3). The estimated construction cost is approximately $23.7 million (Appendix B). About one mile south of the Nenana waterfront, the new alignment would curve to the east from the existing track and begin to gain elevation on an approximately 2,000-foot long fill embankment with a grade of approximately 0.86 percent. The embankment would be wide enough to facilitate construction and to provide access for maintenance vehicles along the new main line. This access road may be converted to a double track in the future, but construction of a double track is not part of this project. The base of the embankment would be a maximum of approximately 150 feet wide. The new alignment would pass below the clear zone of the Nenana Airport approach and beneath the Golden Valley Electric Association (GVEA) 138-kilovolt (kV) main transmission line, which parallels the west side of the George Parks Highway. At the top of the ascending embankment the track would level off and pass over the George Parks Highway at a skew angle of 45 degrees on a through-girder overpass bridge of standard design incorporating two 100-foot spans. The top of the embankment on the overpass would be approximately 25.5 feet above the highway surface.

The railroad crossing over the George Parks Highway would be designed to accommodate the option of a future two-track configuration by providing sufficient embankment width. It would also be designed to facilitate the potential future expansion of the highway to a four-lane configuration in the vicinity of Nenana, as indicated in the ADOT&PF Draft Parks Highway Corridor Management Plan (CH2M Hill 2002, Section 4.11.5.1, p. 4-68). The overpass design would include a highway median separation or median barrier, a clear zone on each side of the highway, provision for pedestrian passage beneath the bridge approach fill, and appropriate lighting and signage. A future railroad realignment concept consistent with the Proposed Action is included as a compatible project in the Draft Parks Highway Corridor Management Plan (CH2M Hill 2002, Section 4.11.2, p. 4-67, and Figures 4-20 and 4-21, pp. 4-69 and 4-71).

From the proposed George Parks Highway railroad crossing, the new alignment would extend towards the northeast on a fill embankment maintained level at a height of approximately 25 feet above the surrounding terrain. The embankment would traverse wetlands north of the Nenana Airport, turning north to match grade with the existing rail loop on the south approach to the Tanana River railroad bridge. The new alignment would cross two existing secondary roads: an unnamed street that extends from 10th Street to 12th Street, providing airport access from the north, and 9th Street. These roads would be maintained by incorporating an oversized culvert underpass (multi-plate tunnel) into the railroad embankment (Figure 3). This would provide a two-lane, separated grade crossing allowing motor vehicles to pass under the track. G Street and 10th Street would be replatted so that they would end in cul-de-sacs, as depicted on Figure 3, or be connected with a road extending parallel to the new tracks, depending on discussions with

the property owner. The total length of the track realignment would be approximately 10,700 feet (2 miles). Equalization culverts would be installed as necessary to maintain natural drainage patterns.

The existing 1920-era railroad track through downtown Nenana and the existing looped approach to the Tanana River bridge would be left in place to maintain freight service to the Port of Nenana. The project requires construction of a short section of track at the south end of the project to maintain access to the existing track during and after construction.

One option for the proposed alternative is to construct a siding or spur from a point near the junction with the loop extending parallel to the new main track to the commercial lease lots on the north side of the airport property. This option would allow for rail service connection to the Nenana Airport. The siding or spur might be constructed at a lower grade than the embankment, as depicted on Figure 3, or it might be constructed at approximately the same grade as the embankment so that at-grade crossings would not be needed. Impacts associated with the optional airport siding are addressed in this EA. However, if the airport siding is not constructed as part of this project or within 3 years of this EA, additional NEPA analysis may be required.

To mitigate impacts on floodwater elevations along the upstream side of the embankment, a dike would be constructed at the upstream end of the airport runway (Figure 2). The dimensions of the dike would be developed during final design and would vary with the topography. At its largest, the dike could be approximately 10 feet high, 10 to 12 feet wide across the top, and 65 feet wide across the base (side slopes of 2.5H:1V) (URS 2004). The location of the dike, which would not interfere with airport clear zones, may be adjusted slightly during final design.

2.1.1 Factors Considered in Selecting the Proposed Action

The Proposed Action (Alternative B-2 High Profile) received substantial study and agency consultation prior to being identified as the Proposed Action. Safety was the main consideration influencing the decision, along with several other factors, including consistency with design requirements for future George Parks Highway improvements and the ability to provide opportunities for future coordination of cargo and passenger service with Nenana Airport. ARRC and the ADOT&PF Northern Region representatives have conferred on a continuing basis, including meetings on June 25, 2003, and October 30, 2003, to ensure that the Proposed Action would be based on optimal safety considerations and be fully consistent with the Draft Parks Highway Corridor Management Plan (CH2M Hill 2002) and American Association of State Highway and Transportation Officials (AASHTO) safety and design criteria (AASHTO 2001). In addition, a safety analysis of the railroad/highway crossing configuration was performed to compare the tradeoffs of a railroad-over-highway (high-profile) versus a highway-over-railroad (low-profile) configuration (Tryck Nyman and Hayes, Inc. [TNH] 2003).

The safety analysis indicated that a design elevating vehicles above ground level would increase the highway accident risk for the George Parks Highway. A railroad-over-highway crossing configuration, would have substantially less accident risk than the highway-over-railroad mode. Using financial cost as an indicator, for example, the safety analysis showed that costs associated with vehicle accidents and guardrail maintenance for a George Parks Highway overpass above the railroad would be an estimated $39,000 per year, in contrast to $6,000 annually for the railroad-over-highway configuration (TNH 2003). The analysis also determined that the railroad-over-highway (high-profile) configuration would avoid interference with a potential future interchange between the George Parks Highway and 10th Street and

Insert Figure 2

Insert Figure 3

Insert Figure 4

blockage of airport access from the George Parks Highway, both potential adverse effects of a highway-over-railroad (low-profile) design. The disadvantages of the low-profile configuration that led to its rejection as a feasible alternative are discussed in greater detail in Section 2.3.2.

Once it was determined that a high-profile configuration would be preferable, the northern Alternative B High Profile alignment was examined in comparison to the southern alignment, Alternative B-2 High Profile (Figure 2). Both had similar advantages with respect to the George Parks Highway crossing. However, on the basis of community preferences expressed during the scoping process (Section 1.3), the southern Alternative B-2 High Profile was selected as the Proposed Action for the following reasons:

- It would better facilitate potential future railroad service to the Nenana Airport;
- It would allow more space for the future southward expansion of community development;
- It would be confined largely to City of Nenana land, thus minimizing impacts to private property; and
- It has fewer constructability issues than Alternative B High Profile, specifically related to continuing rail operations while constructing the new alignment at the location where the new track would cross the existing loop track.

2.1.2 Construction of the Proposed Action

The Proposed Action would require the construction of a ramp to elevate the embankment fill to a height of approximately 25.5 feet above the ground. The ramp would begin at a location where the existing mainline track passes within about 30 feet from the east bank of the Nenana River, an active erosion zone that ARRC has already armored with riprap.

The following items would be considered in the final design of the Proposed Action:

- The elevation of the GVEA transmission line, which currently meets the necessary clearance requirement;
- The approach surface elevations and clear zones for the Nenana Airport;
- The mapped 100-year flood elevations between 355 and 357 feet above mean sea level (MSL) (National Geodetic Vertical Datum of 1929 [NGVD29]; elevations given in the Federal Emergency Management Agency's [FEMA] Flood Insurance Rate Map [FIRM] for the City of Nenana, Alaska, April 7, 1999);
- Minimum clearance above the highway of 18 feet to bottom of structure;
- The elevation of the existing tracks and the need to match at each end of the realignment; and
- The need to maintain rail service during construction.

The proposed alignment would avoid the Nenana City Pond, a water-filled former material site south of the George Parks Highway and 12th Street intersection, which is stocked annually with rainbow trout and used locally for recreational fishing. It would also bypass a church located opposite the pond on the west side of the George Parks Highway (Figure 2).

The embankment would be constructed progressively from south to north by trucking fill material through areas disturbed by construction activities or on local roads, and by using earth-moving equipment to grade the fill. Approximately 900,000 yards of embankment material would be required. Potential haul routes may be local roads, the George Parks Highway, and the Alaska Railroad mainline track. Fill material would be transported with work trains from an existing ARRC material site located approximately 25 miles south of the project (railroad milepost 388) and/or purchased from local Native Corporation material source sites or other commercial sources as needed. Two staging/stockpile areas have been identified for the project: the west staging/stockpile area located between the existing track and the George Parks Highway overpass, and the east staging/stockpile area located south of the existing Nenana railroad loop (Figure 2). These areas would be used to stockpile fill material and stage construction equipment and vehicles. Local roads (probably 10th Street) would be used by trucks to transport fill material from the staging/stockpile area to the embankment work area.

Preliminary geotechnical studies to characterize the study area have been completed, and additional design-level geotechnical studies will be conducted during final design. Shallow, organic soils are reported to be in the study area, often with ponded surface water, underlain by discontinuous permafrost in the form of permanently frozen alluvial deposits (Section 3.1.2). The embankment would be designed and constructed to address impacts from any degradation of permafrost soils, thermal erosion, or subsidence. Construction methods vary widely based on the specific subsurface geology and, depending upon findings from the geotechnical study, may include removing poor substrate or cutting the standing vegetation but leaving it in place and placing geotextile fabric over the surface prior to fill deposition. The latter approach to embankment construction is typical of construction in subarctic interior Alaska. The approach identified during final design would minimize risk to the structural integrity of the new embankment by minimizing adverse effects to the underlying permafrost soils.

2.2 ALTERNATIVES CONSIDERED FOR DETAILED STUDY

One additional build alternative, Alternative B High Profile, was considered for detailed study. This alternative and the No Action Alternative are discussed in the following sections.

2.2.1 Alternative B High Profile

Alternative B High Profile (Figure 4) would be similar to the Proposed Action but located about 500 to 1,000 feet farther north, approximating the northern boundary of the Alternative B Study Area shown in Figure 2. The estimated construction cost is approximately $25.2 million (Appendix B). Like the Proposed Action, this alternative would build an elevated rail crossing approximately 25.5 feet above the George Parks Highway surface, extending to the northeast and traversing wetlands north of the airport. The embankment would be wide enough to facilitate construction and to provide access for maintenance vehicles along the new main line. This access road may be converted to a double track in the future, but construction of a double track is not part of this project. The base of the embankment would be a maximum of approximately 150 feet wide. This alignment would have less curvature than that of the Proposed Action. Three-degree horizontal curves would accommodate train operating speeds of 50 miles per hour (mph). The embankment would cross the southern portion of the loop track and match existing grade on the south approach to the Tanana River railroad bridge. The new mainline railroad embankment would cross the existing track loop by overpass, with an oversized culvert underpass (multi-plate tunnel) incorporated to accommodate rail traffic on the loop to and from the Nenana waterfront. The new alignment would also cross the same two existing secondary roads as the proposed alternative, in slightly

different locations (the unnamed street that extends from 10th Street to 12th Street, and 9th Street), and the unnamed road between 10th Street and the airport would be re-routed (Figure 4). E Street, G Street, and 8th Street would be replatted so that they would end in cul-de-sacs, as depicted on Figure 4, or be connected with a road extending parallel to the new tracks, depending on discussions with the property owner.

Similar to the Proposed Action, the existing alignment through downtown Nenana would be left in place to service the Port of Nenana, and an option would be included for constructing a spur or siding to the airport. The optional airport spur or siding would be constructed from a point near the junction with the loop and would extend southwestward to the commercial lease lots on the north side of the airport property. Impacts associated with the optional airport siding are addressed in this EA. However, if the airport siding is not constructed as part of this project or within 3 years of this EA, additional NEPA analysis may be required.

Alternative B High Profile would include design considerations and construction procedures similar to those described in Section 2.1.2 for the Proposed Action. The realignment would begin on the existing ARRC mainline track south of Nenana adjacent to the Nenana River and approximately 400 feet north of the extension of the centerline of the Nenana Airport Runway. The George Parks Highway crossing would be similar to that described for the Proposed Action, but located farther north. The profile would climb a distance of approximately 3,000 feet at a grade of approximately 0.7 percent to gain the necessary vertical clearance over the highway, then at a 0.03 percent grade for 4,000 feet to the loop overpass, and finally descend at 0.21 percent for 2,500 feet to tie into the existing track on the south approach to the Tanana River railroad bridge. In addition to crossing two secondary roads as noted above, this alternative would cross undeveloped private lands southwest of the track loop. The new alignment would cross over the existing loop by installing an oversized culvert underpass (multi-plate tunnel) to allow traffic on the existing track to operate. At the south end, a new track section would be installed to maintain access to the existing track and the Nenana waterfront. To mitigate impacts on floodwater elevations along the upstream side of the embankment, this alternative would also include construction of a dike at the upstream end of the airport runway (Figure 2).

2.2.2 No Action

Under the No Action Alternative, the George Parks Highway crossing and new mainline track alignment would not be built and railroad operations in the Nenana area would continue as at present. There are currently six at-grade crossings in downtown Nenana, and six to ten trips per day of mainline train traffic traveling through Nenana. The current track configuration requires that trains traverse several sharp curves through the community; in order to negotiate these curves, trains currently move through Nenana at a posted speed of 20 to 25 mph. If the alignment remains unchanged, the purpose and need considerations discussed in Section 1.0 would not be met, and the safety issues, delays, and noise impacts currently experienced in downtown Nenana would continue. Additionally, the number of trains traveling through Nenana is expected to increase in the future; therefore, current impacts would increase to the extent that the number of trains increases. The high maintenance costs and operating constraints on mainline rail traffic imposed by the original 1920-era track alignment through Nenana would increase as trains pass through the Nenana area more frequently.

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

2.3.1 Alternative A: New Tanana River Bridge Crossing

Alternative A would have paralleled the existing railroad alignment and George Parks Highway northward, gaining elevation on a high ramp to a new railroad bridge crossing of the Tanana River west of the existing George Parks Highway bridge (Figure 2). Like the highway bridge, the new railroad bridge would have utilized one or more in-water piers and an island in the Tanana River for the north abutment. A spur would have been built from the new track alignment to the Nenana waterfront to maintain rail service to the community. From an engineering standpoint, this alternative would have been the most complex to design and construct, because of the high bridge crossing of the Tanana River and the need for an elevated southern approach. Following public and agency consultation, Alternative A was eliminated from further consideration because of impacts to the Nenana and Tanana Rivers, disruptions to existing Port of Nenana operations, the high cost of construction, and the cumulative visual, solar shading, and noise impacts of the high approach ramp and new railroad bridge in combination with the existing highway bridge. While this alternative represented the least amount of impacts to floodplains and wetlands, concerns related to the aforementioned consequences outweighed the benefits from the reduced floodplain and wetland impacts.

2.3.2 Alternative B Low Profile Options

Three low-profile variants of Alternative B, shown on Figure 2 within the Alternative B Study Area, were based on a George Parks Highway bridge overpass of the ARRC mainline track as the new alignment curved eastward to cross the wetlands north of the Nenana Airport. Consequently, each of these alternatives would have constructed a low-profile rail embankment, with height dictated by the requirement to stay above the mapped 100-year flood elevations between 355 and 357 feet above MSL (NGVD29). This constraint would have required the new rail embankment to be about 10 feet high, in contrast to the approximately 25.5-foot embankment height for the two B High Profile alternatives (Sections 2.1 and 2.2). The following sections briefly discuss the three B Low Profile alternatives.

2.3.2.1 Alternative B Low Profile

Under this alternative, the George Parks Highway would have been raised approximately 38 feet to clear the proposed ARRC alignment. With a maximum grade of 3 percent to comply with AASHTO design standards (AASHTO 2001, Exhibit 8-1, p. 510), the highway would have had to be redesigned and elevated on an earthen ramp over a distance exceeding 4,000 feet when vertical curves are considered. The new highway bridge would have been built to accommodate potential future widening of the George Parks Highway to four lanes in accordance with the Draft Parks Highway Corridor Management Plan (CH2M Hill 2002, Section 4.11.5.1, p. 4-68). Because the highway ramp would have blocked access to adjacent streets, oversized culvert underpasses (multi-plate tunnels) would have been incorporated to provide access to the Nenana Airport and other properties along the highway. The rail profile would have had a grade of 0.5 percent for the first 600 feet, held level for a distance of 5,500 feet, and finally increased to 0.69 percent for the last 3,000 feet. This alternative would have crossed the existing mainline track in the looped south approach to the Tanana River railroad bridge, but at so low an elevation that an underpass would not have been feasible. A “jump bridge” would have been employed to allow construction traffic to cross the mainline while the new embankment was under construction. This is a short, single-span temporary bridge that is lifted out of the way whenever a train must go through. Under

this alternative, the existing loop would have been removed. A rail spur to the Nenana waterfront would have been retained along the existing railroad alignment paralleling the George Parks Highway. The reasons for eliminating Alternative B Low Profile from further consideration are presented in Section 2.3.2.4.

2.3.2.2 Alternative B-1 Low Profile

This alternative differed from Alternative B Low Profile in that the horizontal alignment was shifted to tie into the 9-degree curve at the bottom of the track loop. The vertical profile would have had a grade of 0.42 percent for the length of the change. This option avoided the need to cross the existing mainline track during construction and would have allowed the existing loop to be retained. The highway overpass configuration would have been the same as with Alternative B Low Profile. A "jump bridge" would not have been needed with this alternative, because the existing track in the south approach to the Tanana River railroad bridge would not have been crossed. The reasons for eliminating Alternative B-1 Low Profile from further consideration are presented in Section 2.3.2.4.

2.3.2.3 Alternative B-2 Low Profile

This alternative would have originated at essentially the same location as the other low-profile options and would have required a similar George Parks Highway bridge over the new railroad alignment. This alternative, however, would have curved far enough south to allow a connection back to the track loop at the north end of the 9-degree curve at the bottom, allowing the new curve to be 5 degrees. This would have improved operating conditions by easing the speed control imposed by the curve. The reasons for eliminating Alternative B-2 Low Profile from further consideration are presented in Section 2.3.2.4.

2.3.2.4 Reasons for Eliminating the B Low Profile Alternatives from Further Consideration

Following consultation between ARRC and ADOT&PF Northern Region representatives, including meetings on June 25, 2003 and October 30, 2003, the B Low Profile alternatives were eliminated from further consideration. The factors determining this decision relate primarily to the George Parks Highway crossing and the advantages of a railroad-over-highway configuration, particularly with respect to safety, consistency with the Draft Parks Highway Corridor Management Plan (CH2M Hill 2002), and AASHTO safety and design criteria (AASHTO 2001):

- For a George Parks Highway bridge over the railroad, AASHTO safety criteria for rural freeways consistent with the ADOT&PF Management Plan (CH2M Hill 2002) would limit the approach grade to a maximum 3 percent slope (AASHTO 2001, Exhibit 8-1, p. 510). Incorporating a 3 percent grade for a George Parks Highway overpass of the railroad would require a very long fill embankment on the north and south highway approaches to the bridge. Such an embankment would extend northward over 2,000 feet and would impact residential and commercial properties in downtown Nenana, possibly including some relocations.
- On the north (Nenana) side, the approach embankment for a George Parks Highway bridge over the railroad would have the potential to interfere with a planned interchange between the George Parks Highway and 10th Street at George Parks Highway MP 304.2 and the associated frontage roads (CH2M Hill 2002, Section 4.11.5.2, p. 4-68; Rafson, J., personal communication, October 30, 2003).

- On the south side, the elevated approach for a George Parks Highway bridge over the railroad would cross the Nenana Airport runway approach line and would have the potential to enter the runway clear zone.
- Because the north side of the ramp would extend over 2,000 feet along the highway and intrude into the developed area of Nenana, the highway-over-railroad configuration would produce an increased highway noise impact on the community.
- The embankment required for a bridge over the railroad would block the existing Nenana Airport access road from the George Parks Highway (12th Street) and make it difficult to provide an alternative access route connecting directly with the highway. The only access to the airport would be from the north through the existing road spur from 10th Street. Eliminating or complicating direct access from the George Parks Highway would impair the airport's ability to provide dual access for emergency medical response and security requirements.
- The embankment necessary to have sufficient freeboard above the 100-year flood event would have impacts on the area floodplain (by blocking floodwater flow) similar to those of the high option configuration carried forward.
- The Alternative B Low Profile alternatives would be located predominantly in wetlands; therefore, all of the alternatives would have impacts to wetlands. Although the low option configurations impact a smaller area of wetlands than the high option configurations (URS 2003b), safety considerations associated with the low embankment options outweighed the benefits of a reduced embankment fill.

2.3.3 Alternative C: East Airport Bypass

Alternative C would have departed from the existing track alignment nearly 5 miles south of the Nenana Airport and extended northward, skirting the east end of the airport runway and crossing the narrow space between the end of the runway and the Tanana River. The alignment would have been graded to match elevation with the existing track loop north of the airport. Where the track would have passed around the east end of the runway, a clearance of 23 feet above ground elevation would have been required for train passage. This clearance was in conflict with the Federal Aviation Administration (FAA)-mandated runway approach clear zone and runway safety area. In addition, the bank of the Tanana River at the east end of the runway is an actively eroding outside bend that has required armoring in the recent past to protect the runway. Alternative C was considered infeasible and eliminated from further consideration because conflict with the runway approach clear zone and runway safety area could not be avoided. The design constraints imposed by the constricted space between the end of the runway and the Tanana River, and particularly the active bank erosion at this location, created additional feasibility problems. This alternative also presented the largest impact to wetlands and floodplains, being built almost exclusively within these areas resulting in more than twice the impact as the Proposed Action.

3.0 AFFECTED ENVIRONMENT AND IMPACTS

This section of the EA discusses the affected environment and the potentially beneficial or adverse social, economic, and environmental impacts of the alternatives described in Section 2.0, including direct, indirect, and cumulative effects. This section also addresses issues identified through early agency coordination and the public scoping process (23 Code of Federal Regulations [CFR] 771.111). The impact analysis is organized by physical, biological, and human components of the environment that are relevant to the alternatives, and identifies measures proposed to mitigate adverse environmental impacts of the alternatives (23 CFR 771.119.b).

3.1 PHYSICAL ENVIRONMENT

Components of the physical environment that are relevant to the alternatives are air quality; soils, geology, and seismic conditions; surface and groundwater hydrology; and water resources. Potential direct and indirect impacts on these physical environmental components are discussed in the following sections. The impact topic considered to be of greatest importance with respect to the physical environment is the impact of the new rail embankment on floodwaters of the Tanana River during a 100-year flood event. This topic is discussed in detail in Section 3.1.3.

3.1.1 Air Quality

Existing Conditions: Under the Clean Air Act of 1970, USEPA has set National Ambient Air Quality Standards (NAAQS) for the six most common air pollutants, or criteria pollutants. These include ozone, particulate matter, carbon monoxide, sulfur dioxide, nitrogen oxides, and airborne lead. A region may be categorized as being in attainment or non-attainment of the standards for each pollutant, or, when insufficient information exists, unclassifiable. Air quality in the Nenana area is categorized as unclassifiable because insufficient information exists to determine ambient air quality. Due to the city's location along the Tanana River Basin, it is likely that there are naturally elevated background levels of particulates from fine, windblown glacial and river sediments (Baumgartner, J., personal communication, November 10, 2003).

Impacts and Mitigation: Under the Proposed Action, emissions from vehicles and heavy equipment during construction would result in short-term increases in criteria pollutants and localized decreases in air quality. Ground-disturbing activities such as vegetation removal, excavation, grading, and fill placement may temporarily generate fugitive dust. Because no burning of vegetation or other material is planned, smoke would not be an issue. Once the project is complete, long-term emissions are expected to be consistent with current emissions from train operations through the area. However, lower emissions concentrations might occur locally at Nenana because most trains would bypass the central developed portion of the community. The proposed project will not increase the number of trains over the no-build (no action) alternative.

An air quality permit for construction activities would not be required from the ADEC under 18 Alaska Administrative Code (AAC) 50. ADEC does not currently require permits for emissions from earthmoving activities associated with transportation projects (Baumgartner, J., personal communication, November 10, 2003). Air quality impacts associated with the project would be short-term, resulting from

construction activities as discussed in Section 3.4, Construction Impacts. No indirect impact to air quality is foreseen.

Alternative B High Profile would have impacts to air quality that are identical to the Proposed Action.

Under the No Action Alternative, present effects of railroad operations on air quality would not change.

3.1.2 Soils, Geology, and Seismic Conditions

Existing Conditions: The City of Nenana is located in the Tanana Lowlands, a broad and relatively flat area between the Alaska Range to the south and the foothills of the White Mountains to the north. Discontinuous permafrost underlies the flood plains in the area. During a site visit on July 20, 2003, average depth to permafrost in wetlands within the study area was approximately 15 inches. According to preliminary geotechnical investigations, the thickness of permafrost in the project area varies from nonexistent to 19 feet thick. Permafrost generally will be thickest in areas furthest from large surface water bodies, and thinnest or nonexistent in areas near large surface water bodies or areas with non-native surface conditions. Based on well logs for the Nenana area, permafrost in some locations relatively distant from surface water bodies may be no more than a few feet thick. Permafrost in the area is considered to be relatively sensitive to disturbance (Bureau of Land Management [BLM] 1997). In areas where permafrost is present, any activity that alters the thermal regime of soil and sediment is likely to result in some change to the underlying permafrost.

The Nenana area is typified by deep, nearly level to gently sloping, poorly drained, silty soils. These silty soils are comprised of three different types of material: Tanana silt loam, Salchaket very fine silt loam, and Goldstream silt loam (United States Department of Agriculture [USDA] 1977).

- Tanana silt loam is a somewhat poorly drained soil that was formed in silty and sandy sediment on flood plains. These soils are perennially frozen at a depth of 30 inches or more, depending on the thickness of the organic mat (decomposed plant material and mosses), the surface cover, and the flooding frequency. This soil type has moderate permeability, and erosion by water presents only a slight hazard.
- Salchaket very fine silt loam consists of deep, well-drained soils that formed in sandy and silty alluvial deposits. This soil type has moderate permeability, and erosion by water presents only a slight hazard, except on stream banks where the hazard is greater.
- Goldstream silt loam consists of poorly drained soils that formed in deep, silty alluvium. These soils are perennially frozen at a shallow to moderate depth and have moderate permeability above the permafrost; erosion by water presents only a slight hazard.

Alaska is one of the most seismically active regions in the world, and interior Alaska can experience major seismic events (BLM 1997). A number of large earthquakes have been centered near Nenana in the relatively recent past. The most significant major active fault in the region, based on recent seismic activity, is the Denali Fault System located approximately 75 miles south of Nenana at its nearest point. The Denali Fault has generated major earthquakes, including a 7.9 magnitude event that occurred on November 3, 2002. That event resulted in minor damage to structures in Nenana, including sewer mains, roads, runways, and several buildings (Mayrand, J., personal communication, February 20, 2004).

Impacts and Mitigation: The Proposed Action involves the construction of an approximately two-mile long, 150-foot wide embankment. Important considerations include potential impacts from mining of source material for the embankment, potential effects of the embankment on permafrost and permafrost on the embankment, and the potential for erosion.

The material required to construct the embankment would be obtained from an existing ARRC material site located adjacent to the tracks (near ARRC Mile 388) and south of Nenana, and/or from other private material sources. Because only established material sources would be used, only temporary construction-related impacts on the area due to trucks transporting fill material on local roads and haul roads would occur. Construction impacts are addressed in Section 3.4.

As discussed previously, permafrost in the region is relatively sensitive to disturbance (BLM 1997). The thickest portion of the embankment, near the center, could potentially cause the permafrost line to rise above its current level and extend up into the center of the embankment, creating an impermeable ridge of frozen soil. The thinner edges of the embankment would have less insulating ability and could increase thaw depth along the toe of the embankment, leading to the formation of a depression along each side of the embankment. The depression would likely fill with water, causing additional thermal degradation of the permafrost and possible sloughing of the embankment. Specific geotechnical and thermal studies to characterize permafrost conditions in the study area would be conducted during final design, and the embankment would be designed and constructed to address impacts from any potential for degradation of permafrost, thermal erosion, or subsidence.

Construction could involve removing poor substrate prior to building the embankment, or cutting the standing vegetation but leaving it in place and placing geotextile fabric over the surface prior to fill deposition. The latter approach is typical of construction in sub-arctic interior Alaska. The approach identified during final design would minimize risk to the structural integrity of the rail embankment by addressing adverse effects to the underlying permafrost soils. Additional measures that may be implemented to address impacts to or from permafrost include completing some construction activities in winter, minimizing disturbance to native vegetation outside of the embankment footprint, encouraging re-growth of disturbed areas, or using thermal siphons, which are a series of tubes that extract heat from the ground to prevent the melting of permafrost. Through proper design and construction of the project, impacts to and from permafrost are expected to be minimal.

There would be short-term impacts to soils associated with construction as discussed in Section 3.4, Construction Impacts.

Although the project is in an area of high seismic potential, seismic conditions are not considered a major factor. The potential for earthquake damage to the proposed alignment is generally no greater than in other sections of rail alignment within the state, and probably substantially less than in some areas near active fault zones. The separated grade crossing over the George Parks Highway would be designed according to the latest applicable seismic codes. The most current applicable seismic codes are governed by the American Railway Engineering and Maintenance of Way Association.

Alternative B High Profile would have impacts and mitigation measures similar to those described for the Proposed Action. Construction methods would be identical to those for the Proposed Action.

Under the No Action Alternative, the current alignment would remain in use, and there would be no new impacts related to soils, geology, or seismic stability.

3.1.3 Surface Water and Groundwater Hydrology

Executive Order 11988, Floodplain Management, and United States Department of Transportation (USDOT) Order 5650.2, Floodplain Management and Protection, establish federal policies for the protection of floodplains and floodways. The intention of these regulations is to avoid, to the extent practicable, adverse impacts to floodplains; minimize the impact of floods to human safety, health, and welfare; and avoid supporting land use development that is incompatible with natural and beneficial floodplain values. When avoidance is not possible, these policies require appropriate consideration of methods to minimize adverse impacts. In this EA, the floodplain analysis is based on the FEMA FIRM for Nenana and additional hydrologic and hydraulic analyses completed for the project. The City of Nenana regulates the floodplain management program for their community through the National Flood Insurance Program and uses the FIRM to evaluate and manage flood hazards in the community. The FEMA FIRM is included as Figure 5.

Existing Conditions: Most of the study area consists of wetlands that lie within the 100-year floodplain of the Tanana River (Section 3.2.2). These wetlands exhibit many natural and beneficial floodplain values such as flood peak attenuation, water quality maintenance, groundwater recharge, recreation, wildlife habitat, and nutrient cycling. This broad, flat, alluvial plain stretches for a distance of about 1.4 miles between the Nenana River to the west and the Tanana River to the east, with slightly higher forested upland bordering the west side of the study area along the Nenana River. Nenana is situated on the southeast side of the confluence of the two rivers, which are major regional drainages that control the hydrologic characteristics of the area. Sloughs, ponds, and wetlands also have important roles in the hydrology and ecology of the area. These features are described further in the Preliminary Hydrologic Assessment (URS 2004), which presents the preliminary hydrologic and hydraulic study performed for this project.

The Tanana River dominates the flood history of the Nenana area. Both the Nenana River and the Tanana River are glacial-fed waterways and are most likely to flood because of excessive summer rainfall. Major flood events in the community are generally assumed to be related to the Tanana River, not the Nenana River. At the confluence of the two rivers, however, the Nenana creates a backwater effect on the Tanana, which means that the Tanana River water surface elevation immediately upstream from the Nenana River is affected by discharge in both rivers. Consequently, when high discharge events in the Nenana and Tanana rivers coincide, they are likely to intensify flood conditions. A summary of past flood events on the Tanana River, including flood magnitude and frequency, are presented in the Preliminary Hydrologic Assessment (URS 2004).

According to the FIRM, the majority of the land surface between the Tanana and Nenana Rivers is likely to be inundated to a distance of approximately 3 miles south of the George Parks Highway bridge during a 100-year flood event (i.e., 1 percent chance of occurring in any given year). According to recent survey data, the George Parks Highway, the existing railroad embankment, and the airport runway and taxiway are above the peak water surface elevation of the 100-year flood. Presently, floodwater will flow between the railroad embankment and the runway, and along the south side of the runway. Since floodwater would not overtop the George Parks Highway during a 100-year flood, the highway will cause the water flowing around the runway to flow through town and under the George Parks Highway bridge.

Insert Figure 5

Many of the wetlands in the study area have standing water on a prolonged basis, which moves slowly through the area as sheet flow. To date, no detailed investigations of the water table are available to explain the connections between groundwater, wetlands, and the two rivers located in the vicinity of the study area.

Impacts and Mitigation: Both build alternatives have the potential to affect surface water and groundwater movement in the floodplain and natural and beneficial floodplain values. Complete avoidance of the mapped floodplain through Nenana is not practicable since the entire community is within the 100-year floodplain depicted on the FIRM, and any new alignment would pass through the floodplain (Figure 5).

The primary surface water issue is the impact of the embankment on surface water elevations during flooding and whether the Proposed Action would result in a significant encroachment on the floodplain. The preliminary hydrologic analysis completed for this project identifies the probable magnitude of these impacts based on the preliminary track design. The Proposed Action would at least partially block floodwater from flowing from the airport area towards the George Parks Highway bridge, which would cause increased floodwater elevations on the upstream side (south and east) of the embankment. Without mitigation, such an increase might cause water to flow over the George Parks Highway and would result in a substantial change to the flood risks along at least a portion of the upstream side of the embankment. To mitigate the impact of the Proposed Action on floodwater elevations along the upstream side of the embankment during a 100-year flood, a dike would be constructed at the upstream end of the airport runway (Figure 2). As detailed in the following paragraphs, with this mitigation, the Proposed Action is anticipated to have no significant impact on the City, the highway, the airport, or surrounding areas during a 100-year flood. In order to meet the criteria of the Executive Order and the USDOT Order, the hydrologic and hydraulic analyses defined a significant impact as the occurrence of any of the following during a 100-year flood: (1) an increase of more than 1 foot in the water surface elevation, (2) the overtopping of the George Parks Highway at a location where it would not have been overtopped without the Proposed Action, or the overtopping of the airport at a location where it would not have been overtopped without the Proposed Action (URS 2004).

The dike would prevent floodwater from the Tanana River from flowing around the north and southwest sides of the runway towards the George Parks Highway. The actual dimensions of the dike would be developed during final design and would vary with the topography. At its largest, the dike could be approximately 10 feet high, 10 to 12 feet wide across the top, and 65 feet wide across the base (side slopes of 2.5H:1V) (URS 2004). The location of the dike would not interfere with airport clear zones; the dike location may be adjusted slightly during final design.

The flood control dike would be designed such that floodwater would be diverted from the floodplain back toward the main channel of the Tanana River during the 100-year flood. This would cause an increase of approximately 0.3 feet in the peak 100-year water surface elevation between the George Parks Highway bridge and the railroad bridge, and an increase of less than 1 foot on the upstream side of the railroad bridge (URS 2004). The increase in water surface elevation due to the dike would be less than the increase expected to occur at some locations along the upstream side of the proposed track embankment if the dike were not constructed. An increase in the floodwater elevation of 0.3 feet between the railroad and George Parks Highway bridges is acceptable to the City if the dike is constructed and floodgates are installed on the equalization drainage culverts in the railroad embankment (refer to April

14, 2004 correspondence with the City in Appendix A). A flood hazard permit would be required from the City for the proposed development in the 100-year flood zone.

The dike would benefit the airport and the southern half of Nenana during flood events with a greater frequency of occurrence than the 100-year flood. As described earlier, floodwater presently flows from the Tanana River between the railroad embankment and the runway, and along the south side of the runway. Since the dike would redirect this floodwater back to the channel, the areas immediately downstream of the dike may not be inundated with this floodwater as quickly. Although the area immediately downstream of the dike would still be inundated during the 100-year flood and may still be inundated during floods with a greater frequency of occurrence, it would not be inundated as quickly as without the dike.

The ARRC would place culverts along the railroad embankment to mitigate potential impacts of the proposed project on local drainage. The culverts would allow the shallow surface-water-runoff patterns to remain essentially unchanged, and would maintain floodplain functions and values during low flow stages when the floodgates remain open. The installation of floodgates on the culverts and the use of flood-proof road crossings would allow management of flow during floods. The specific design that would be used to flood-proof the road crossings would be determined during final design, but could consist of raising the road grade to or above the 100-year flood water surface elevation, constructing a ring dike around the road crossing and passing the road over the ring dike, or some other equivalent measure.

The proposed project would result in less total area to provide natural and beneficial floodplain values. However, the majority of the floodplain would not be affected. In addition, the dike would divert the majority of the overland flow back to the main channel of the Tanana River, and installation of floodgates on the culverts would allow management of the remaining flow. Cross culverts in the new rail embankment would allow continued use of floodplain functions and values during low flow stages when the floodgates remain open, and would mitigate potential impacts of the proposed project on local drainage by allowing shallow surface water runoff patterns to remain essentially unchanged. The area impacted by the construction of a new alignment would be small relative to the area of the entire floodplain. Therefore, there would not be a significant loss of natural and beneficial floodplain values.

This project minimizes the impact of floods to human safety, health, and welfare through construction of the dike, installation of culverts with floodgates, use of flood-proof road crossings, and adherence to the stipulations required under the Flood Hazard Permit from the City. There would be no significant impacts on natural and beneficial floodplain values, no significant increase in flood-related risks to human life, and no significant increase in flood-related risks associated with interruption of service or loss of vital transportation facilities. Therefore, the floodplain encroachment resulting from the Proposed Action would comply with Executive Order 11988 and USDOT Order 5650.2.

The new rail embankment has the potential to affect groundwater flow. If the embankment were to cause the permafrost line to rise above its current level and extend up into the center of the embankment, an impermeable ridge of frozen soil could be created that would cause groundwater elevations on the upstream (south) side of the embankment to increase. See Section 3.1.2 for further discussion on the potential impacts to permafrost. A thermal analysis would be conducted during final design to determine the appropriate mitigation measures, which may include but are not limited to the following techniques:

- Use a bedding of thaw-stable material to provide a stable foundation for the culverts
- Over-size the culverts by the expected amount of settlement
- Use seepage rings and heavier pipe to reduce the impact of differential settlement on the culverts
- Install thaw pipes
- Construct drainage channels along each toe of the embankment

Alternative B High Profile would have the same impacts, benefits, and mitigation measures as the Proposed Action. The northern portion of the dike would be slightly longer under Alternative B High Profile due to the more northerly position of the alignment (Figure 2).

Under the No Action Alternative, the current alignment in the floodplain would remain in use, current surface water and groundwater hydrology would remain unchanged, and there would be no change in the water surface elevations of the 100-year floodplain from this project. The No Action Alternative would not realize the benefit of the addition of the dike associated with the build alternative.

3.1.4 Water Resources

Existing Conditions: Water resources in the Nenana area include surface water bodies and groundwater. Three major surface water bodies are located within or near the study area: the Nenana City Pond, the Nenana River, and the Tanana River. The Nenana City Pond is a manmade lake in a former material site at the southeast corner of the George Parks Highway and 12th Street intersection. The Nenana River is located west of the study area, and the Tanana River is located east and north of the study area. In addition, wetlands in the study area have standing water on a prolonged basis.

In locations where significant permafrost is present, which may be the case in the central part of the study area, groundwater can occur as a supra-permafrost aquifer and sub-permafrost aquifer. The supra-permafrost aquifer refers to water above the permafrost, within the active layer. In areas of shallow permafrost, the supra-permafrost aquifer is limited in thickness and often of low quality as a drinking water resource. The sub-permafrost aquifer lies below permafrost and is typically more extensive and of higher quality as a drinking water source. In areas where no permafrost exists, such as around large water bodies, groundwater is controlled by bedrock or shallow impermeable soil horizons, and separate aquifers may not be present. This is likely the case near the southernmost and northernmost portions of the study area.

Groundwater in the Nenana area is currently used as a drinking water source, and drinking water resources may be further developed in the future. Groundwater is used for the existing municipal water supply system, which serves the school and most of the homes in the city, and for private wells (Department of Community and Economic Development [DCED] 2004). The municipal water supply system consists of one primary and one secondary well. A search of the ADNR well log tracking system in February 2004 identified six water supply wells in the Nenana area. The closest known well location is more than 1,000 feet outside of the study area. Additional wells not included in the state database may exist. Based on available well logs, water supply wells in the area are either located in areas with no permafrost, or drilled into a sub-permafrost aquifer. The groundwater in the area is not a USEPA-designated sole source aquifer.

Impacts and Mitigation: The Proposed Action would pass approximately 50 feet east of the Nenana River (at the beginning of the project), immediately north of the Nenana City Pond, and approximately 400 feet west of the Tanana River at the north end of the project.

The proposed alternative would have a negligible increase in the amount of impervious surface, and no reduction of infiltration into the underlying soils. Based on anticipated project activities and the location of the project alignment relative to existing structures and known well locations, the Proposed Action would not impact groundwater quality or the use of groundwater as a water supply resource. The project would not impact a USEPA-designated sole source aquifer. Potential construction-related impacts to water resources from soil erosion, water runoff, and excavation dewatering are addressed in Section 3.4.

Alternative B High Profile would be constructed farther north of the Nenana City Pond than the Proposed Action, and therefore would have less potential to impact water quality of that water body. Other potential impacts to surface and groundwater quality under this alternative would be the same as under the Proposed Action.

Under the No Action Alternative, there would be no changes to existing short- or long-term impacts to surface or groundwater resources.

3.2 BIOLOGICAL ENVIRONMENT

Components of the biological environment that are relevant to the project alternatives are vegetation, wetlands, fish and wildlife, and protected species. Potential impacts on these biological resources are discussed in the following sections.

3.2.1 Upland Vegetation

Existing Conditions: Vegetation in the Nenana area consists predominately of boreal forest communities, black spruce forest, and muskeg habitat common to central Alaska (Viereck et al. 1992). Wetland community types are discussed in more detail in Section 3.2.2. General upland vegetation communities include deciduous forest, upland spruce-hardwood forest, coniferous forest (lowland spruce-hardwood), scattered woodland and dwarf forest (white spruce woodlands), and low and tall shrub thickets (Selkregg 1976). Mixed forest communities are dominated by paper birch and white spruce with smaller amounts of black spruce, balsam poplar, and aspen. Shrub communities primarily consist of American green alder and several species of willow. Riparian shrub communities primarily consist of willow species.

Upland forest communities in the Nenana area are generally located along the Tanana River, in slightly elevated areas around the Nenana Airport, within the existing Nenana railroad loop, and between the George Parks Highway and the Nenana River (includes the existing ARRC right-of-way and the old GVEA transmission line). Upland vegetation has been disturbed in portions of the study area by past activities, such as marking or clearing property boundaries and developing secondary access roads.

Impacts and Mitigation: The Proposed Action would require the clearing of vegetated uplands and removal of mature trees, shrub understory, and/or herbaceous ground cover from approximately 43.9 acres. As indicated on Table 3-1, this includes approximately 24.6 acres within the footprint of the main rail embankment and approximately 15.4 acres at the staging/stockpile areas (Figure 2). It also includes approximately 3.9 acres of upland mixed forest and shrub habitat for the flood control dike that would be constructed under the Proposed Action (described in Section 3.1.3). Cleared trees, brush, and stumps

Table 3-1. Area (in Acres) of Upland Vegetation and Wetlands to be Cleared/Filled[1]

Vegetation/ Wetland Type		Proposed Action		Alternative B High Profile			Staging/ Stockpile Areas		Flood Control Dike[2]
		Rail Embankment	Optional Siding	Rail Embankment	Re-Routed Road	Optional Siding	East	West	
Upland Vegetation		**24.6**	**0.0**	**22.0**	**0.5**	**<0.1**	**<0.1**	**15.3**	**3.9**
Forested Wetlands	PFO1A	1.2	0.5	3.3	0.4	0.2	-	-	1.7
	PFO1/SS1A	-	-	2.1	-	0.8	2.9	-	-
	PFO4/1B	-	0.3	-	-	-	-	-	-
	PFO4/SS1B	-	-	-	-	-	-	-	2.2
	Subtotal	**1.2**	**0.8**	**6.6**	**0.4**	**1.0**	**2.9**	**-**	**3.9**
Scrub Shrub Wetlands	PSS1A	4.5	2.1	2.3	<0.1	1.0	0.9	-	-
	PSS1B	0.6	-	0.6	-	-	-	-	-
	PSS4/1B	1.6	0.6	-	-	-	-	-	-
	PSS1/EM1A	0.8	0.7	-	-	-	1.5	-	-
	Subtotal	**7.5**	**3.4**	**2.9**	**<0.1**	**1.0**	**2.4**	**-**	**0.0**
Emergent Persistent Wetlands	PEM1A	1.6	0.3	1.4	-	0.6	1.0	-	-
	PEM1/SS1A	1.9	0.2	0.9	0.7	0.7	-	-	0.1
	PEM1/SS1B	0.2	-	0.2	-	-	-	-	-
	Subtotal	**3.7**	**0.5**	**1.5**	**0.7**	**1.3**	**1.0**	**-**	**0.1**
Total Wetlands		**12.4**	**4.7**	**11.0**	**1.2**	**3.3**	**6.3**	**0.0**	**4.0**
Total Area of Potentially Affected Vegetation		**37.0**	**4.7**	**33.0**	**1.7**	**3.4**	**6.4**	**15.3**	**7.9**

[1] Area calculated to the nearest 0.1 acre; the acreage calculations include an additional 5 feet on either side of the toe of the embankment that would be impacted by construction equipment and placement of silt fence or similar control for preventing sedimentation of adjoining wetlands.

[2] The flood control dike for Alternative B High Profile would be approximately 300 feet longer than the dike for the Proposed Action. The additional length of the dike would be located in the east staging/stockpile area (Figure 2); therefore, the area of impact for the extra dike section was included in the east staging/stockpile area.

P = Palustrine
EM1 = Emergent, persistent
FO1 = Forested, broad-leaved deciduous
FO4 = Forested, needle-leaved evergreen
SS1 = Scrub shrub, broad-leaved deciduous
SS4 = Scrub shrub, needle-leaved evergreen
A = temporarily flooded
B = saturated

would be either used in the embankment as discussed earlier or disposed at a site or sites approved by the City of Nenana. Firewood would be made available to local residents if the community were to express interest.

Upland vegetation that would be impacted is common to the region. Extensive areas with similar vegetation would remain undisturbed near the alignment; therefore, the impacts of vegetation removal would not affect availability of these habitats in the surrounding area. The amount of clearing has been minimized to the extent possible. It is limited to the staging/stockpile area, the dike area, the embankment footprint, and an additional 5 feet on either side of the toe of the embankment that would be impacted by construction equipment and placement of erosion controls. Native vegetation would be reestablished on the embankment and dike slopes to stabilize the slopes prior to completing the project. The staging/stockpile areas (approximately 15 acres) would eventually naturally revegetate with common native upland species that invade disturbed areas, such as birch, alder, and willow.

Alternative B High Profile would have impacts on upland vegetation similar to the Proposed Action. Approximately 41.8 acres would be affected, including approximately 22 acres of vegetated uplands for the embankment, 15.4 acres for the staging/stockpile areas, 3.9 acres for the flood control dike, and 0.5 acres to re-route the unnamed road between 10th Street and the airport. An additional 0.1 acres of upland vegetation would be affected for the optional siding.

The No Action Alternative would not affect upland vegetation, with the exception of continued routine maintenance clearing of brush along the existing railroad tracks and upper embankment

3.2.2 Wetlands

Existing Conditions: Extensive areas of wetland habitat within the Nenana area are a result of low relief, poor drainage, proximity to the Tanana and Nenana rivers, and underlying permafrost. A large portion of wetlands in the area is subject to periodic flooding from the Tanana River and, to a lesser extent, from the Nenana River. Wetland communities consist of three main types of palustrine wetlands: forested, scrub shrub, and emergent persistent wetlands (Cowardin et al. 1979). Wetlands in or near the study area are mapped on Figure 6.

Portions of wetland communities in the study area have been disturbed by past activities such as blazing of property boundaries and the development of secondary access roads. Wetland areas around the Nenana Airport were filled to create the runway, taxiway, and airport facilities. In several areas, past activities have substantially modified existing wetlands by removing the insulating vegetation, thereby degrading the permafrost layer and creating trenches of standing water with emergent vegetation.

Open water areas within the study area consist primarily of flooded gravel pits. The Nenana City Pond, a small open water body with limited emergent vegetation along the perimeter, is located at the southeast corner of the George Parks Highway and 12th Street intersection. The pond was originally created as a material site for construction of the George Parks Highway through Nenana. Another flooded gravel pit is located at the southernmost portion of the study area, on the east side of the existing ARRC alignment.

Insert Figure 6

Wetlands within the study area were surveyed in July 2003 and are described in detail in the Environmental Field Survey and Preliminary Jurisdictional Determination of Wetlands (Wetlands Report) (URS 2003b). Since that report was prepared, additional design elements have been added to the project based on new engineering considerations; therefore, the study area was expanded to accommodate these new features. Mapping of wetlands in the expansion areas was accomplished by interpretation of recent aerial photograph coverage and examination of existing National Wetland Inventory (NWI) wetland maps (no ground verification). As a result, areas of wetland impact discussed in this EA are greater than those discussed in the Wetlands Report (URS 2003b).

The ecological functions and social values associated with wetlands in the study area are described in detail in the Wetlands Report (URS 2003b). Wetland functions are the natural processes that occur in a wetland, grouped broadly as habitat, hydrologic, or water quality, which make the wetlands useful or valuable. Wetland values are social benefits or opportunities wetlands provide for people. The primary functions of wetlands in the study area include recharge and discharge of groundwater, control or moderation of flood intensity, production and export of biomass, and wildlife habitat. The primary values of wetlands in the study area include recreation, subsistence hunting and gathering, nature appreciation, wildlife viewing, and aesthetic opportunities.

Impacts and Mitigation: The Proposed Action would impact approximately 22.7 acres of wetlands, predominantly forested and scrub shrub wetlands (shrub bogs), including approximately 12.4 acres for the rail embankment, 6.3 acres for the staging/stockpile areas, and 4.0 acres for the flood control dike. The optional siding for the Proposed Action would require an additional 4.7 acres of wetland fill that would affect primarily scrub shrub wetlands. Table 3-1 lists the wetland types and areas that would be filled under the Proposed Action. Although the exact alignment and dimensions of the selected alternative could change slightly during final design, the wetland fill areas presented in Table 3-1 provide conservative estimates of wetlands that would be affected under the build alternatives. Wetlands that would be impacted by the Proposed Action are common to the region. No unique or rare wetlands would be affected.

Avoidance: The study area for this project is limited to the area between the Tanana and Nenana rivers and to a location that could support future rail operations to the Port of Nenana and the Nenana Airport. Continuation of rail service to the port and the airport was an important concern expressed during public scoping. Since a large portion of the study area contains wetlands, the realignment of the railroad could not avoid disturbance of wetlands. Other alternatives that would impact a smaller area of wetlands than the proposed alternative were considered, but these alternatives were determined not to be practicable because of safety considerations, routing restrictions (e.g., airport clear zone), and other factors, as discussed in Section 2.0.

Minimization: Impacts to wetlands would be minimized by limiting earth-moving equipment and fill-hauling trucks to disturbed areas (e.g., within the footprint of the embankment) and local roads whenever possible. To avoid blocking the slowly moving sheet flow of surface water within wetlands areas, transverse equalization culverts would be installed at the base of the embankment, allowing cross-drainage of surface water to accommodate natural drainage patterns and minimizing impacts to existing wetlands adjacent to the embankment.

The proposed alternative would require an individual USACE Section 404 Permit for placement of fill in jurisdictional wetlands. ARRC would comply with the associated terms and conditions of that permit, including any mitigation that may be required. Impacts to wetlands would be further minimized by the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) outlining Best Management Practices (BMPs) to minimize storm water run-off impacts, including placement of silt fence or similar control for preventing sedimentation of adjoining wetlands. Environmental compliance will be monitored by a qualified environmental inspector as described in the SWPPP to ensure the embankment is maintained within the fill limits and pollution sources are prevented from entering surrounding wetlands. Based on comparison of the project-induced potential loss of wetlands to the extensive similar, nearby wetland areas present in the broader Tanana floodplain, impacts to wetlands are considered minor.

Alternative B High Profile would impact approximately 22.5 acres of wetlands as opposed to the 22.7 acres impacted by the Proposed Action. Approximately 3.3 additional acres would be filled within the footprint of the optional siding embankment for Alternative B High Profile (Table 3-1). Alternative B High Profile would affect mostly forested wetland types, whereas the Proposed Action would predominately affect scrub shrub bog. Mitigation measures for Alternative B High Profile would be similar to those implemented for the Proposed Action. Alternative B High Profile would similarly require an individual USACE Section 404 Permit.

The No Action Alternative would have no affect on wetlands.

3.2.3 Fish and Wildlife

The Nenana area, including the study area, supports an abundance of fish and wildlife species in a variety of habitats. The following sections discuss fish, birds, and mammals likely to use the habitats in or near the study area. Section 3.2.3.4 discusses the impacts of the project alternatives on the fish and wildlife resources described.

3.2.3.1 Fish

Two major rivers in the Nenana area support fish: the Tanana River and the Nenana River. The Nenana River parallels the west side of the study area, and the Tanana River forms the boundary along the east and north sides of the study area. The Tanana River is the largest river in the region and supports anadromous and resident fish species (Table 3-2). The Nenana River, the second largest river in the region, provides habitat to generally the same species of fish in the vicinity of its confluence with the Tanana River. Due to high sediment loads and turbidity, conditions are not favorable for fish spawning in the main channels of these rivers, although spawning can occur in associated side channels, sloughs, and tributary streams. No anadromous streams or tributaries to those streams are located inside the study area.

The Nenana City Pond, located at the southeast corner of the George Parks Highway and 12th Street intersection, also supports fish. The Nenana City Pond was created when material was removed from an excavated pit during construction of the George Parks Highway. The Alaska Department of Fish and Game (ADF&G) stocks the pond annually with rainbow trout (ADF&G 2001). Although the pond freezes sufficiently deep to kill introduced trout, a resident pike population appears to successfully over winter in the pond (URS 2003b).

Table 3-2. Common Fish Species in the Vicinity of the Nenana Rail Realignment

Species Type	Common Name	Scientific Name
Anadromous Fish Species[1]	chum salmon	*Oncorhynchus keta*
	coho salmon	*Oncorhynchus kisutch*
	chinook salmon	*Oncorhynchus tshawytscha*
Resident Fish Species[2]	sheefish	*Stenodus leucichthys*
	whitefish species	*Coregonus spp., Prosopium spp.*
	rainbow trout (introduced)	*Oncorhynchus mykiss*
	Arctic grayling	*Thymallus arcticus*
	longnose sucker	*Catosomus catasomus*
	burbot	*Lota lota*
	northern pike	*Esox lucius*
	slimy sculpin	*Cottus cognatus*

[1] Alaska Department of Fish and Game (ADF&G) 1996
[2] Selkregg 1976

3.2.3.2 Birds

Approximately 150 bird species inhabit the Tanana and Nenana River Valleys, many of which are commonly found in similar habitats throughout the interior region of Alaska (ADF&G 1985). The most common species that could be present in the study area are listed in Table 3-3.

Forty-two passerine bird species, including 37 songbird species and five woodpecker species, have been documented in the upper Tanana River Valley terrestrial habitats (Spindler and Kessel 1980). These bird species are associated with major habitat types in the upper Tanana Valley taiga, many of which occur in the study area. These habitats include low and medium shrub thickets, tall shrub thickets, deciduous forest, mixed deciduous-coniferous forest, coniferous forest, and scattered woodland and dwarf forest (Spindler and Kessel 1980). Birds include both resident species, which are present year-round, and summer resident/migrants that could be present in the area to nest and rear young during the summer months.

Parts of the Tanana and Nenana River valleys support waterfowl nesting and migration staging areas for diving and dabbling ducks, swans, and cranes. Both rivers serve as major migration corridors for waterfowl migrating seasonally to and from breeding areas in western and northern Alaska. Lack of open water areas likely limits use of the study area by waterfowl, especially as nesting habitat.

Twelve species of shorebirds are regular spring migrants through the region. Shorebirds congregate on small ponds, sloughs, and mud flats during spring and fall migration, and flocks numbering in the hundreds can be seen foraging in those habitats during the peak of migration in the latter half of May. The degree to which migrating shorebirds occur in the study area is unknown, but the Tanana River and adjacent wetlands provide a concentration of favorable foraging habitats suitable as migration stopovers.

Several raptor species may pass through or reside in the general area, but have not been documented as nesting in the study area.

Table 3-3. Common Bird Species in the Vicinity of the Nenana Rail Realignment

Species Type	Common Name	Scientific Name
Passerine Species[1]	downy woodpecker	*Picoides pubescens*
	three-toed woodpecker	*Picoides tridactylus*
	hairy woodpecker	*Picoides villosus*
	black-backed woodpecker	*Picoides arcticus*
	common raven	*Corvus corax*
	gray jay	*Perisoreus canadensis*
	black-capped chickadee	*Poecile atricapillus*
	boreal chickadee	*Poecile. hudsonicus*
	bohemian waxwing	*Bombycilla garrulus*
	northern shrike	*Lanius excubitor*
	pine grosbeak	*Pinicola enucleator*
	white-winged crossbill	*Loxia leucoptera*
	common redpoll	*Carduelis flammea*
	hoary redpoll	*Carduelis hornemanni*
	American robin	*Turdus migratorius*
	Swainson's thrush	*Catharus ustulatus*
	orange-crowned warbler	*Vermivora celata*
	yellow warbler	*Dendroica petechia*
	yellow-rumped warbler	*Dendroica coronata*
	American tree sparrow	*Spizella arborea*
	white-crowned sparrow	*Zonotrichia leucophrys*
	fox sparrow	*Passerella iliaca*
Waterfowl Species[2, 3]	trumpeter swan	*Cygnus buccinator*
	tundra swan	*Cygnus columbianus*
	black scoter	*Melanitta nigra*
	white-winged scoter	*Melanitta fusca*
	surf scoter	*Melanitta perspicillata*
	greater scaup	*Aythya marila*
	lesser scaup	*Aythya affinis*
	Canvasback	*Aythya valisineria*
	common goldeneye	*Bucephala clangula*
	Barrow's goldeneye	*Bucephala islandica*
	northern pintail	*Anas acuta*
	northern shoveler	*Anas clypeata*
	green-winged teal	*Anas crecca*
	American wigeon	*Anas americana*
	Mallard	*Anas platyrhynchos*
	lesser sandhill crane	*Grus canadensis*
Shorebird Species	semipalmated plover	*Charadrius semipalmatus*
	killdeer	*Charadrius vociferous*
	lesser yellowleg	*Tringia flavipes*
	solitary sandpiper	*Charadrius solitaria*
	spotted sandpiper	*Actitis macularia*
	Wilson's snipe	*Gallinago gallinago*
	red-necked phalarope	*Phalaropus lobatus*
	upland sandpiper	*Bartramia longcauda*
	least sandpiper	*Charadrius minutilla*
	semipalmated sandpiper	*Charadris pusilla*
	pectoral sandpiper	*Charadrius melanotos*
	long-billed dowitcher	*Limnodromus scolopaceus*

Table 3-3 (Continued)

Species Type	Common Name	Scientific Name
Raptor Species[4]	bald eagle	*Haliaeetus leucocephalus*
	golden eagle	*Aquila chrysaetos*
	sharp-shinned hawk	*Accipiter striatus*
	northern goshawk	*Accipiter gentilis*
	boreal owl	*Aegolius funereus*
	northern hawk owl	*Surnia ulula*

[1] Spindler and Kessel 1980
[2] Selkregg 1976
[3] United States Fish and Wildlife Service (USFWS) 1994
[4] Alaska Department of Fish and Game (ADF&G) 1994

3.2.3.3 Mammals

Several mammal species potentially occur in the vicinity of the study area (Table 3-4). Of these common species, six are of particular importance because of their subsistence value to local residents and recreational values for hunting and trapping. These include large game such as black bear and moose, and furbearers such as wolf, lynx, marten, and beaver.

Black bears are present in forested habitats in the Nenana area. During 2003 field studies, bear scat and tracks were observed, and individual bears were sighted within the study area. Black bears are adaptable to a range of habitat types and would use all of the habitats in the area, to some extent. Black bears in the Tanana Flats prefer to den in willow-alder habitat and black spruce habitats; they avoid denning in marshland and heath meadow habitats (Smith et al. 1994).

Brown bears could also occur in small numbers in the study area, but they generally occupy areas farther from humans than black bears. Brown bears are relatively common in the northern foothills of the Alaska Range. Habitat within the study area does not likely support regular presence of brown bears.

Moose are widespread throughout the Tanana and Nenana River drainages, with the highest concentrations occurring in the Tanana Flats region. The Tanana Flats are seasonally important to all sex and age groups due to the availability and high quality of preferred browse and suitable cover. Evidence of moose browse on willow shrubs within the study area indicates moderate use of the area for feeding. During spring and summer, densities of moose increase on the Tanana Flats when moose migrate from adjacent watersheds (ADF&G 1995). Cows from surrounding hills and drainages migrate to the Tanana Flats to calve in the spring, returning to higher elevations in the fall. Lower densities of moose remain on the Tanana Flats in the winter. Some moose calving may occur in the study area in suitable habitat.

Furbearers common to interior Alaska would be expected to occur to some extent in the study area. Wolves, coyotes, red fox, lynx, river otter, marten, ermine, muskrats, and beaver range throughout the Tanana Valley lowlands and are commercially trapped (ADF&G 1987). The occurrence of these species within the study area is not known.

Other common small mammals likely to occur in the general vicinity of the study area include shrews, northern red-backed voles, tundra voles, and red squirrel.

Table 3-4. Common Mammal Species in the Vicinity of the Nenana Rail Realignment

Species Type	Common Name	Scientific Name
Large Mammal Species	black bear	*Ursus americanus*
	brown bear	*Ursus arctos*
	moose	*Alces alces*
Furbearer Species	wolf	*Canus lupus*
	coyote	*Canus latrans*
	red fox	*Vulpes vulpes*
	lynx	*Lynx canadensis*
	river otter	*Lutra canadensis*
	marten	*Martes americana*
	ermine	*Mustela erminea*
	muskrat	*Ondontra zibethica*
	beaver	*Castor canadensis*
Small Mammal Species	shrews	*Sorex spp.*
	red squirrel	*Tamiasciurus hudsonicus*
	northern red-backed vole	*Clethrionomys rutilus*
	microtine voles	*Microtus spp.*
	porcupine	*Erethizon dorsatum*
	snowshoe hare	*Lepus americanus*

3.2.3.4 Effects of Alternatives on Fish and Wildlife

The Proposed Action would result in the direct loss of approximately 66.6 acres of terrestrial habitat (approximately 43.9 acres of upland habitat and 22.7 acres of wetland habitat). These acreages include the embankment, staging/stockpile areas, and flood control dike. An additional 4.7 acres of wetland habitat would be used for the optional siding. Upland vegetation would become established on the embankment and dike slopes and may provide limited additional habitat for some species. The staging/stockpile areas would also naturally revegetate with upland vegetation and provide habitat for wildlife.

Mobile species such as small mammals, waterfowl, shorebirds, and songbirds that presently use habitat affected by the project would be displaced to similar habitat in adjacent areas. Large mammals have greater home ranges than other wildlife species; therefore, large mammals would not likely be adversely affected by the amount of habitat loss anticipated under the Proposed Action.

ARRC's Nenana Foreman reported that historical moose kill numbers are low in the Nenana area. Typically, trains kill about one moose per month starting in November and through the winter months. Almost all moose kill in this area occurs north or south of the proposed realignment location. The proposed alternative may result in a slight increase in the collision mortality of moose and other mammals that cross the new embankments when trains are approaching. Field experiments undertaken by the ARRC and ADF&G in 1990 did not demonstrate a significant correlation between increased train speed and moose strikes. To the extent that the number of trains increases, there could be an increase in the number of moose strikes. ARRC would continue to mitigate potential impacts to moose by complying with the 1991 Cooperative Agreement between ARRC and the ADF&G (ADF&G and ARRC 1991). This agreement established a plan of action to limit the number of moose killed by trains. Overall, wildlife habitat and populations in the study area are not expected to be adversely affected by the project.

The new embankment could serve as an obstacle to normal travel and could alter movement patterns of local animals, since the top of the embankment would be higher than the surrounding area. However, the embankment would be unlikely to create a barrier to wildlife movement, due to the gentle 2:1 slope animals could easily climb. An existing cyclone fence encircling most of the Nenana Airport property serves as a physical barrier to wildlife movement. Both moose and black bear would be able to access habitat on either side of the new embankment.

The Proposed Action avoids the Nenana City Pond; therefore, fish habitat in the pond would not be impacted. The alignment would tie into the existing mainline rail loop on the south approach to the Tanana River railroad bridge. The proposed alternative would not impact the Tanana River or the Nenana River. Consequently, there would be no impact to Essential Fish Habitat (EFH).

Alternative B High Profile would result in the loss of approximately 64.3 acres of habitat (approximately 41.8 acres of upland habitat and 22.5 acres of wetland habitat). These acreages include the embankment, staging/stockpile areas, flood control dike, and re-routed road between 10th Street and the airport. An additional 3.4 acres of habitat would be used for the optional siding. Alternative B High Profile would have impacts to fish and wildlife similar to the Proposed Action. Alternative B High Profile also would have no impact to the Nenana City Pond, Nenana River, Tanana River fish populations, or EFH.

Under the No Action Alternative, there would be no changes to the existing environment, and fish and wildlife habitats and populations would not be impacted.

3.2.4 Protected Species

Existing Conditions: In a March 8, 2004 letter, USFWS stated that no known federally listed or proposed species, or proposed or designated critical habitat exists in the study area. Larry Peltz of National Marine Fisheries Service stated in an April 26, 2004 telephone conversation that there are no threatened, endangered, or candidate species located in the study area under National Marine Fisheries Service jurisdiction.

Both bald and golden eagles and their nests are protected under the Bald Eagle Protection Act (16 United States Code [USC] 668 et seq.). ARRC conducted a survey of the entire rail alignment with USFWS in 2002, and no eagle nests were observed within the Nenana study area. No bald or golden eagles were observed in the study area during the URS 2003 field studies.

Impacts and Mitigation: No endangered, threatened, or other federally protected species would be affected by either build alternative or the No Action Alternative.

3.3 HUMAN ENVIRONMENT

The City of Nenana (City) is located on the south bank of the Tanana River, east of the confluence with the Nenana River. Nenana is 56 miles southwest of Fairbanks on the George Parks Highway. Nenana is accessible by the Nenana River (during ice-free months), the George Parks Highway, the Alaska Railroad, and the Nenana Municipal Airport, which has a 5,000-foot airstrip. Components of the human environment that are relevant to the alternatives under consideration are land use, socioeconomics, environmental justice, tribal consultation, transportation, noise, utilities, archaeological and historic sites, recreation, Section 4(f)/6(f) property, contaminated sites, and visual impacts. Potential direct and indirect impacts on these human environmental components are discussed in the following sections.

3.3.1 Land Status and Land Use

In the following discussions of land status and land use, land status addresses the ownership of land within the study area, and land use covers actual land and water uses and management of uses in the area affected by the proposed project.

Land Status

Existing Conditions: The federal government constructed the Alaska Railroad between 1914 and 1923, and operated the railroad until 1985, when it was sold to the State of Alaska. The Alaska Railroad Transfer Act (ARTA) generally transferred lands to the ARRC for a 200-foot wide corridor centered on the main track, along with various depots and terminals. The ARRC has exclusive use of the corridor, which is loosely referred to as the ARRC right-of-way (ROW). ARTA also guarantees perpetual use of the corridor as long as it is used for transportation, communication, or transmission purposes. In Nenana, the ARRC also owns 264 acres of land reserves, including land along the Port of Nenana.

There are three general categories of land ownership in the vicinity of the proposed track realignment: lands owned by the City, primarily around the airport; privately owned lands, including those owned by the Nenana Native Council; and restricted Native Townsite lots. Figure 7 shows general land ownership in relation to the build alternatives. In addition, the State of Alaska owns a 300-foot wide ROW associated with the George Parks Highway.

The City of Nenana is a home rule city that is not in an organized borough. Platting authority rests with the City's Planning and Zoning Commission; there is currently no zoning within the City. The City owns several blocks of land adjacent to the proposed alignment, and a large section of land that includes the Nenana airport and surrounding lands. Some of the land near the airport is leased for aircraft parking/storage and for commercial purposes.

Several dedicated road easements and rights-of-way in the study area have been platted and are the ownership responsibility of the City, or, in the case of the George Parks Highway, the State of Alaska. Some of these have been constructed, and others have been dedicated but not developed.

No federal, Native Corporation, Alaska Mental Health Trust, University of Alaska, or Alaska Native lands or allotments are located within the study area. Two restricted Native townsite lots are near the study area, and one townsite lot abuts the northern part of the study area near where the realignment would tie back into the existing track (Figure 7). Seven other restricted townsite lots are located further north, between the Tanana River and First Street. Any activities that would affect Native allotments or restricted townsite lands would require consultation with the Tanana Chiefs Conference and the BIA regarding those lands.

Impacts and Mitigation: Under the Proposed Action, land transactions would be required between ARRC and the City of Nenana. Much of the proposed alignment would pass through City-owned land surrounding the Nenana Airport. The Proposed Action would also pass through City-owned lot number 67, which already contains a portion of the curve of the old alignment. The purchase of City land would have a minor effect on the availability of City lands for municipal purposes.

Insert Figure 7

In addition, the ARRC would need to obtain approval from ADOT&PF to construct an elevated crossing over the George Parks Highway. Constructed road access would likely require some form of separated grade crossing. Platted ROW that has not been constructed can be vacated through a replat procedure that would require the cooperation of the property owner and likely the City, but adequate alternative access to blocks and lots must also be considered. Specific property lots and platted easements/ROW are identified and discussed in the Evaluation of Land Status and Related Issues (URS 2003c).

Several private land parcels are located in or near the study area and would be directly impacted by the proposed alternative (Figure 7). Depending on the exact final alignment, three to five privately owned lots could be impacted. ARRC would acquire the land needed for track realignment as appraised at fair market value and in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act. Although no acquisition of restricted native lands (Native allotments or restricted townsite lands) is anticipated, if such lands must be acquired, additional BIA requirements may apply. Based on the preliminary design, no residences or other structures would be affected.

Alternative B High Profile would cross less City-owned land near the Nenana Airport than the Proposed Action, but Alternative B High Profile would impact nine to ten privately-owned lots, as opposed to three to five private land lots affected under the Proposed Action. Based on the preliminary design, no residences or other structures would be affected. Landowners would be compensated at appraised fair market value for their property.

Land status would not change from existing conditions under the No Action Alternative.

Land Use

Existing Conditions: The City of Nenana is located on low elevation land along the south bank of the Tanana River, just upstream from the confluence of the Tanana and Nenana Rivers. The City is concentrated within a small area between 9th Street and the Tanana River, and is bounded by the George Parks Highway on the west and the Alaska Railroad bridge embankment on the east. The principal area of residential development is on the south bank of the Tanana River. A number of commercial developments are located in the same area, but they are generally grouped near the center of town. Industrial areas are located near the Port of Nenana along the railroad track alignment west of the George Parks Highway.

Most of the outlying area within City limits, including the study area, is undeveloped woodland, except for the airstrip and dispersed buildings along the highway and near the central part of the City. The area through which the proposed track alignment would be routed has been subdivided but is generally undeveloped. Land owned by various private landowners is used for rural residential purposes and associated uses. Land uses adjacent to the study area include open space and recreational activities, such as fishing for stocked rainbow trout at the Nenana City Pond.

The City is in the process of preparing a Comprehensive Plan. The Comprehensive Plan would likely identify lands in the vicinity of the airport for industrial use, with undeveloped lands north of the airport identified for future residential use (Mayrand, J., personal communication, February 20, 2004). ADOT&PF recently prepared a Draft Parks Highway Corridor Management Plan, which presents recommendations for management and improvements to the George Parks Highway Corridor (CH2M Hill

2002). Recommendations in this draft plan are discussed in detail under Section 3.3.4. State lands in the general area are managed under the Tanana Basin Area Plan (ADNR 1991). No federal land management plans apply to the study area.

Impacts and Mitigation: Under the Proposed Action, vehicular access to the Nenana Airport would be maintained through two routes. The current track would be left in place as a spur or siding to maintain existing service to the Port of Nenana and other commercial and industrial businesses in the City. In addition, the project may include a siding to the Nenana Airport, which would facilitate additional commercial and industrial uses of that area. Because the airport already limits expansion of the City to the south, and the Tanana River limits expansion to the east, the proposed railroad corridor would have minimal impact on opportunities for community growth and development.

The Alternative B High Profile alignment would be situated further north than the Proposed Action. The presence of a track alignment in this location could have a slightly greater affect on future expansion of the City than the Proposed Action since it could potentially segregate residential properties along the north and south sides of the new embankment. Other potential land use impacts would be identical to those discussed for the Proposed Action.

The No Action alternative would not impact or change land use within the Nenana area.

3.3.2 Socioeconomics

This socioeconomics discussion addresses basic characteristics and resources associated with the human environment, particularly population, demographics, housing, and economic activity. Population characteristics and potential effects from track realignment can influence the need for housing and public services such as education, public safety, and health care. Housing characteristics, particularly housing availability and prices, could be affected by an increase in the construction and operations workforce associated with the proposed project. The discussion of economic activity includes employment, wages and personal income, public finance characteristics, and commercial and industrial growth.

3.3.2.1 Population, Demographics, and Housing

Existing Conditions: The Nenana population has fluctuated in the past, in part due to large construction projects, including the Alaska Railroad, Clear Air Force Base, the George Parks Highway, and cleanup after the devastating 1967 flood. For example, construction of the Alaska Railroad doubled Nenana's population to 634 residents, according to the 1920 U.S. Census. Since 1980, Nenana's population has fluctuated from a high of 592 residents in 1981 to a low of 348 residents in 1999 (Alaska Department of Labor [ADOL] 2000). The current population of the city is approximately 500 (DCED 2004). Based on regional population projections, a modest increase in population is likely in upcoming years.

As indicated in Table 3-5, about 51% of the population of Nenana is white and 41 % is Alaska Native or American Indian, primarily Athabascan. The remaining population is listed as other races or two or more races.

Nenana has a lower owner occupancy rate than the statewide average. In 2000, about 56 % of the 171 occupied houses were owner-occupied, and the remaining houses were renter-occupied (U.S. Census 2000). The average number of persons per household in 2000 was 2.4 individuals. The majority of the 39 unoccupied housing units in Nenana (66 %) are considered seasonal, recreational, or occasional use units.

Impacts and Mitigation: The Proposed Action is not likely to generate long-term population growth in the community or change area demographics, primarily because the proposed project would not create any new requirements for support of railroad operations in the community or affect current levels of ARRC operations employment. In the short term, some local residents may be hired for construction, and workforce employees from outside Nenana may commute from Fairbanks or stay temporarily in the community during the period of construction. However, construction employees would not likely bring their families to Nenana for the relatively limited period of construction.

The Proposed Action would involve property acquisition of three to five lots. However, a substantial amount of vacant land that could be developed to meet future housing needs is available in Nenana, and this alternative is not anticipated to limit expansion of the community. This alternative would not displace any existing residences or cause any disruptions in established neighborhoods or to community cohesion. If relocation were necessary, it would be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

Similar to the Proposed Action, Alternative B High Profile would not have a long-term impact to the community population, demographics, or housing in the Nenana area. Alternative B High Profile would require the acquisition of nine to ten lots, approximately twice as many lots as would be acquired under the Proposed Action. As with the Proposed Action, a substantial amount of vacant land to meet future housing needs is available in Nenana. Existing residences would not be displaced, and there would be no disruptions in established neighborhoods or impact to community cohesion.

The No Action Alternative would not affect community population, demographics, or housing.

3.3.2.2 Economy

Existing Conditions: Historically, Nenana's economy has centered on its physical proximity to two major rivers and its ability to serve as a hub for road, rail, and water access to interior Alaska. Nenana's economy is driven by a mix of private and public sector activity. Over 40 percent of all employment in the community is associated with local, state, or federal governments and other regional organizations (DCED 2004), which include the following:

- City of Nenana,
- Nenana Native Council (a BIA-recognized Traditional Council),
- Toghotthele Corporation (ANCSA Village Corporation),
- Nenana School District,
- Yukon-Koyukuk School District, and
- Alaska Department of Transportation and Public Facilities (highway maintenance).

Much of the seasonal private sector economy in Nenana is a result of the community's ability to serve as a hub for rail and river barge transportation for interior Alaska. Yutana Barge Lines, a major private employer operating in Alaska since 1916, is headquartered in Nenana and is a significant source of seasonal employment for the community. Yutana Barge Lines delivers bulk fuel, construction materials, vehicles, and freight to villages along the Tanana and Yukon Rivers. Other sources of short-term and seasonal employment include the Nenana Ice Classic and commercial fishing. Forestry and mining

contribute minimally to Nenana's economy. The city is also developing a tourist economy with various historical sites, museums, and other attractions, including:

- Nenana Railroad Depot – Built in 1922, this is one of the few remaining original railroad depots, which is now a railroad museum owned and operated by the City of Nenana and is on the National Register of Historic Places.
- Alfred Starr Cultural Center – This new log museum provides information about the Natives who made their camps near Nenana, how the Nenana Ice Classic got its start, and how the railroad was built.
- Nenana Ice Classic – This three-day festival held in March marks the beginning of the contest for guessing the date of spring breakup of the Nenana River and for awarding the jackpot.
- St. Mark's Episcopal Church – This log chapel was built in 1905 and is listed on the National Register of Historic Places.
- Iditarod dog kennels.
- A replica of the sternwheeler Nenana.
- Tanana River – The Tanana River is a major transportation corridor and is used extensively for boating, fishing, and sightseeing, as well as for snowmobiling and skiing in the winter.
- Nenana River – The Nenana River is an important recreation area due to its close proximity to Denali National Park and Preserve.

At the time of the U.S. Census, 170 jobs were held in Nenana. The official unemployment rate at that time was nearly 24 percent, and around 53 percent of adults in the community were not in the work force. About 18 percent of residents were reported as living below the poverty level. A comparison of key demographic and economic data for the City of Nenana with statewide and national averages is provided in Table 3-5.

Table 3-5. Key 2000 Demographic and Economic Data

		Nation	State of Alaska	City of Nenana
Race (%)	White	75.1	69.3	50.7
	Black	12.3	3.5	0.2
	Alaskan Native and American Indian	0.9	15.6	41.0
	Asian	3.6	5.2	0.5
	Other [1]	8.1	6.4	7.6
Economic Data	Average per capita income (in 1999)	$21,857	$22,660	$17,334
	% Civilian Labor Force Unemployed	5.8	6.1	14.9
	% Below Poverty Level (Individuals)	12.4	9.4	17.8
	% Unemployed (Total)	5.6[2]	7.8[2]	23.8

Source: U.S. Census Bureau, Census 2000 (unless indicated otherwise)
[1] Includes races that are a combination of two or more of the other races listed.
[2] U.S. Department of Labor, 2004.

Impacts and Mitigation: The Proposed Action would have a short-term beneficial economic impact in the community during construction, and potential for a long-term beneficial impact based on additional opportunities provided at the Nenana airport. See Section 3.4 for a discussion of economic impacts related to construction.

As an option for both build alternatives, construction of a siding or spur to the airport could potentially facilitate further economic development at the Nenana Airport by improving air/rail transportation links. ARRC would retain all or part of the existing 1920-era loop track alignment along the Nenana waterfront to provide continued service to the Port of Nenana and other commercial businesses, and avoid potential adverse economic effects to those businesses. No businesses would be displaced by the proposed alternative. If relocation of any businesses were necessary, it would be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

The Proposed Action would have a long-term beneficial impact on health and social services by reducing the amount of rail traffic at the at-grade crossings in the City, which would enhance safety and reduce delays in access to health facilities.

Alternative B High Profile would have the same economic benefits and potential public service effects on the community as described for the Proposed Action.

Under the No Action Alternative, the short-term economic benefits associated with a large construction project would not be realized. Additionally, a siding to the airport would not be constructed and the opportunity to improve air/rail transportation links would remain unrealized. At-grade crossings through the City would continue to be used at increasing frequency, and timely access to health facilities would suffer potential delays due to blocked crossings.

Existing Conditions: The City of Nenana receives revenues to operate and provide public services from the transfer of revenues from federal and state government, a local sales tax, and a property tax. The sales tax in Nenana in 2000 was 4 percent, and the property tax was 12.0 mills (DCED 2004). Property taxes are determined by multiplying the millage rate by every $1,000 of the assessed value of the property. The millage rate is based on the amount of mills necessary to meet the budget of the community.

Impacts and Mitigation: Construction of the Proposed Action could generate some additional public revenue for the City of Nenana. While the City does not maintain a dedicated bed or room tax, the City does charge a 4 percent sales tax on a number of sales transactions, including the purchase of temporary accommodations at a bed and breakfast or hotel/motel. For the period of construction of the track realignment, some workers may require temporary accommodations, generating sales tax revenue. Sales tax revenue would also be generated by other purchases of goods and services within the city during construction, and expenditures by the construction workforce over the construction period. On a long-term basis, construction of a rail spur to the airport could facilitate economic activity and generate additional municipal revenue through property and sales taxes.

Alternative B High Profile would generate public revenue for the City of Nenana identical to the Proposed Action.

Under the No Action Alternative, additional public revenue associated with a large construction project would not be realized.

3.3.2.3 Subsistence

Existing Conditions: Subsistence refers to the customary and traditional non-commercial use of wild resources. Both federal and state subsistence programs limit subsistence hunting and fishing to rural areas of Alaska, which includes the Nenana area. The collection of wild resources as a means of subsistence is important to many people living in Nenana. At least one-fourth of the households surveyed in 1982 were multiple-resource harvesters, and at least one-half of the households in Nenana harvested salmon and moose, although this number was likely an underestimate (Shinkwin and Case 1984). The majority of Native households in Nenana rely on subsistence foods such as fish, moose, bear, waterfowl, and berries.

Locally, lands along the west bank of the Tanana River are used by residents of Nenana for salmon harvest during summer, and likely for berry picking and other traditional subsistence harvest activities. No specific data are available for subsistence harvest activities within the study area.

Subsistence fishing occurs throughout the year, although it primarily takes place during the open water season (spring through fall). Fish commonly harvested for subsistence include chinook, chum, and coho salmon; broad, humpback, and round whitefish; least cisco; sheefish; burbot; grayling; and northern pike. Most subsistence fishing efforts focus on Tanana River salmon to harvest the early run of chinook salmon in late June/early July, chum salmon in July, and coho and chum salmon in late August/early September (Shinkwin and Case 1984).

Moose is the primary large mammal taken by subsistence hunters in the Nenana area; the most heavily used area is south of the Tanana River between the Wood and Totatlanika Rivers, just east of Nenana (Shinkwin and Case 1984). Black bear are hunted in the spring throughout the Tanana Flats and in the foothills west of Tatlanika Creek from Nenana to Healy. Small game such as snowshoe hare, spruce grouse, ptarmigan, and porcupine are also harvested for subsistence use, although no high subsistence use areas have been identified for these species. Furbearing animals (beaver, muskrat, mink, marten, river otter, lynx, and red fox) are commonly trapped by Nenana area residents for subsistence and commercial uses in the vicinity of the George Parks Highway and near the Totatlanika River, although trapping occurs throughout the Nenana area. Limited trapping and hunting may occur in the study area. Waterfowl are harvested near Nenana, to the east and south of the Tanana River.

Subsistence use of vegetation includes the harvest of many types of berries, and the harvest of trees for fuel and timber for building materials. Seasonal collection of subsistence vegetation occurs primarily along the George Parks Highway corridor.

Impacts and Mitigation: The Proposed Action would not likely reduce subsistence opportunities in the vicinity of the study area. Considering the proximity of the City of Nenana to the north, the Nenana Airport to the south, and the Tanana River to the east, subsistence activities are likely limited in the study area to harvesting of vegetation (berries, roots, and firewood) and some small game hunting. Subsistence fishing activities along the Tanana River would not be affected by project activities. Because the greater Nenana region supports an abundance of fish, wildlife, and subsistence vegetation in areas used more traditionally for subsistence harvests, any displacement of subsistence activities caused by the proposed project would be negligible. Mr. Bear Ketzler, Nenana Native Council, confirmed that the proposed railroad alignment between the city and the airport would not impact subsistence activities. Although ducks used to be taken in that area, since the early 1980s the area has been drying out and is no longer a good place to hunt ducks.

Alternative B High Profile would have the same impacts on subsistence resources and uses as discussed for the Proposed Action.

Under the No Action Alternative, subsistence resources and uses would not change.

3.3.3 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, directs Federal agencies to identify and address disproportionately high and adverse effects of Federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law.

Existing Conditions: Data used to assess environmental justice considerations were obtained from several sources. The U.S. Census Bureau, Census 2000, is the most complete and accurate source of demographic data and economic/income data available for the Nenana area. The Nenana Community Profile from the Alaska DCED website was also used as a supplemental source of information (DCED 2004). Table 3-5 summarizes race and income data for Nenana, which are compared to state and national data. Based on Federal policy, Nenana is a minority or low-income community.

In November 2003, FTA initiated government-to-government coordination with the Nenana Native Council, a federally recognized tribal government, to solicit comments and concerns regarding the proposed project and potential impacts to cultural resources (Appendix A). FTA also sent letters to other Alaska Native entities in the area (Toghotthele Corporation, Tanana Chiefs Conference, and Doyon Corporation). Additional information on public outreach is provided in Section 3.3.8. No responses were received.

Impacts and Mitigation: Construction of the Proposed Action may create a minor beneficial effect to the community through local employment and business revenue opportunities for local residents, including the Tribal government and Alaska Natives. Private property required by ARRC for the ROW could be owned by Alaska Native residents, but would be acquired at fair market value and in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act and, if applicable, with BIA policies and procedures. The proposed project would provide beneficial effects to all residents by reducing noise impacts from trains traveling through downtown Nenana and improving safety at crossings by decreasing the amount of through-train traffic (existing at-grade crossings would be used intermittently during service to the Port of Nenana). Access to Tribal offices and the health clinic would be faster and safer. The option of adding a siding to the airport with potential for a dual-use terminal in the future, as well as maintaining the rail spur to the Port of Nenana and existing downtown businesses, would maintain or increase economic development activities within the community. Impacts to subsistence activities would be negligible from the proposed alternative. Therefore, the Proposed Action would have no disproportionate adverse impacts to minority or low-income populations.

Construction and operation of Alternative B High Profile would have impacts similar to the Proposed Action. Alternative B High Profile would have no disproportionate adverse impacts to minority or low-income populations.

There would be no change in existing conditions under the No Action Alternative; therefore, this alternative would have no effect on environmental justice.

3.3.4 Transportation Systems and Facilities

In addition to the Alaska Railroad, there are three modes of public transportation that serve the Nenana area: highways, river transportation, and general aviation. These three transportation modes, plus the Alaska Railroad, are discussed in the following sections.

3.3.4.1 Highways and Roads

Existing Conditions: The George Parks Highway, a paved, two-lane thoroughfare completed in 1970, traverses the west side of the study area in a north-south direction. This is the highway linking Nenana with Anchorage and Fairbanks, and it is the only paved road in the study area. Secondary roads in the study area are constructed on fill. The ADOT&PF Parks Highway Corridor Management Plan identifies a year 2000 traffic volume of 2,000 vehicles per day along the George Parks Highway near Nenana (CH2M Hill 2002). This daily average traffic volume is expected to grow to 2,700 by the year 2030 (CH2M Hill 2002). Planned improvements to the George Parks Highway are described in the Draft Parks Highway Corridor Management Plan, including resurfacing, potential widening of the highway to four lanes in select locations (including Nenana), and interchange improvements (CH2M Hill 2002).

Impacts and Mitigation: During the preliminary evaluation of potential alternatives for this project and a thorough review of safety considerations and accident statistics, the railroad-over-highway crossing configuration was selected jointly by ARRC and ADOT&PF in preference to a highway-over-railroad configuration (Section 2.0). The Proposed Action would cross above the George Parks Highway on an overpass bridge. The priority for this crossing is to ensure a safe, grade-separated configuration that would accommodate projected future traffic increases and planned improvements to the George Parks Highway, possibly including widening to four lanes as described in the Draft Parks Highway Corridor Management Plan (CH2M Hill 2002, Section 4.11.5.1, p. 4-68). The Proposed Action would be consistent with this objective. Additionally, the proposed realignment would reduce the amount of train traffic at the other at-grade road crossings in Nenana, thereby increasing safety, while allowing for higher operating speeds for trains and the associated operational benefits.

The Proposed Action would cross two secondary roads: an unnamed road that extends in a southeast direction from 10th Street to provide access to the Nenana Airport from the north, and 9th Street (Figure 3). The grade-separated crossing of these roads by the railroad embankment would be constructed as a reinforced two-lane oversized culvert underpass (multi-plate tunnel). This alternative would maintain two separate access routes to the Nenana Airport, which addresses an important safety concern for the community identified in the public scoping comments.

Land that has been designated by the City as future roads, but not yet constructed, can be re-designated for use by ARRC through cooperation with the property owners and the City. However, adequate alternative access to blocks and lots in the Nenana area would still exist after remapping the roads. G Street and 10th Street would end in cul-de-sacs, as depicted on Figure 3, or would be connected with a road extending parallel to the new tracks, depending on discussions with the property owner.

Construction related impacts on local roads and haul roads are addressed in Section 3.4.

Alternative B High Profile would have impacts to highways and roads that are similar to the Proposed Action. Alternative B High Profile would require the unnamed road between 10th Street and the airport to

be re-routed (Figure 4). G Street, E Street, and 8th Street would end in cul-de-sacs, as depicted on Figure 4, or would be connected with a road extending parallel to the new tracks, depending on discussions with the property owner.

Under the No Action Alternative, railroad crossings of the secondary roads along the existing route within Nenana would remain at-grade. The potential for train-vehicle collisions would not be reduced, and would increase as future train traffic increases. Additionally, at-grade crossings would continue to be blocked as trains pass, delaying access to key public facilities including the medical clinic.

3.3.4.2 River Transportation

Existing Conditions: Riverboat and barge activities based along the Port of Nenana waterfront have traditionally been a mainstay of the local economy. Comments from Nenana residents during public scoping emphasized the importance of ensuring that future rail service continues to support Port of Nenana freight transshipment enterprises.

Impacts and Mitigation: Under the Proposed Action, all or part of the existing 1920-era loop track alignment south of the Tanana River bridge and along the Nenana waterfront would be retained as a siding or spur to ensure continued access to the port during and after the new mainline realignment. If the optional siding to the Nenana Airport is constructed, it would provide a rail connection between the port area and airport, potentially resulting in economic benefits for both entities.

Construction and operation of Alternative B High Profile would have impacts on river transportation similar to the Proposed Action.

Under the No Action Alternative, access to the Port of Nenana waterfront would remain the same.

3.3.4.3 Aviation

Existing Conditions: The Nenana Municipal Airport has a 5,000-foot paved and lighted runway, a 2,000-foot lighted ski plane runway, and a 4,000-foot float plane runway. There were 66 enplanements at the Nenana Airport in 2000 (FAA 2000). In 2003, the city was awarded a grant to implement a runway rehabilitation project, which is currently underway.

Impacts and Mitigation: The relationship between the Nenana Airport and the Alaska Railroad was a topic of considerable discussion at the May 7, 2003 public scoping meeting in Nenana. Residents expressed a desire to maintain the opportunity for expanding future tourism and passenger service through both rail service and aviation. One topic discussed at the meeting was the selection of a rail alignment that would approach close to the airport, providing an opportunity for potential future development of a dual use rail-aviation terminal that could facilitate productive coordination of freight and passenger operations between the Alaska Railroad and the Nenana Airport. This consideration was a factor for incorporating a rail spur to the Nenana Airport into the project design as an option. The Proposed Action would not extend into the airport clear zone, would not restrict access to the airport, and would not have any adverse effects on airport operations. (A dual use rail-aviation terminal is not part of this project. It would require a separate NEPA evaluation if federal funding or permits are required.)

Alternative B High Profile would be located about 750 to 1,000 feet farther north than the Proposed Action, placing the alignment further from the Nenana Airport. Alternative B High Profile would provide

access to the airport via an optional rail spur. The alignment would not extend into the airport clear zone, would not restrict access to the airport, and would not have any adverse effects on airport operations.

Under the No Action Alternative, there would continue to be no access via rail to the Nenana Airport. A dual use rail-aviation terminal envisioned by the City could not be accommodated without constructing a new rail spur.

3.3.4.4 Alaska Railroad

Existing Conditions: The Alaska Railroad currently passes through the City of Nenana, close to the confluence of the Nenana and Tanana Rivers, and parallel to the Tanana River waterfront to serve the Port of Nenana and downtown commerce. The track then curves south through undeveloped terrain east of the downtown area and loops back to the north to gain elevation to the bridge across the Tanana River. This alignment has not changed since its original construction in 1920. The current alignment requires trains to slow substantially while passing through Nenana, increasing operating time, creating noise, increasing wear on tracks, and increasing the potential for a derailment. In addition, there are six at-grade highway crossings within the City that create safety concerns.

Impacts and Mitigation: The Proposed Action would improve travel time by 6 to 8 minutes between Anchorage and Fairbanks while improving safety by bypassing at-grade road crossings through town and reducing the risk of derailment on sharp curves. Reduced curves and use of continuously welded rail would also decrease operations and maintenance costs. These improvements would result in a long-term economic and public safety benefit to both the ARRC and the general public.

Alternative B High Profile would also improve safety, reduce transportation times, and reduce operating and maintenance costs, similar to the Proposed Action. However, the alignment would have more constructability issues related to maintenance of ongoing rail operations during construction, in comparison to the Proposed Action.

The No Action Alternative would leave rail operations in Nenana unchanged, and the risk of derailment and train/vehicle collisions at at-grade road crossings would be unchanged. Under the No Action Alternative, the costs of operation and maintenance would increase to the extent that future train traffic increases through the Nenana area.

3.3.5 Noise and Vibration

A noise and vibration assessment was completed for the Nenana area to assess potential impacts associated with the rail realignment alternatives (Mullins 2003). The study was conducted in accordance with the *Transit Noise and Vibration Impact Assessment (DOT-T-95-16)* guidance manual developed for the FTA in 1995. The study focused on a church and residence south of the Proposed Action (Alternative B-2 High Profile), and the residences located near the track loop at the northern end of the Alternative B Study Area (Figure 2). The following discussions summarize the results of the noise and vibration assessment.

3.3.5.1 Noise

Existing Conditions: Current noise levels in the Nenana area are heavily influenced by traffic from the railroad, the George Parks Highway, and the Nenana Airport. Although ambient noise levels were

relatively loud for the existing alignment, train noise was clearly the loudest measured. At-grade crossings require that the engineer blow the signal horn at each crossing, and U.S. Department of Transportation regulations require that the train's warning signal produce a minimum level of 98 A-weighted sound decibels (dBA) when measured from a distance of 100 feet. The signal horn is the loudest and probably the most objectionable aspect of train noise, creating the loudest momentary noise event observed around most trains. Any reduction of signal horn use has a positive effect for the local noise environment. Train horns are sounded when approaching each at-grade crossing in downtown Nenana and at the Tanana River railroad bridge.

For the current track configuration, a train must traverse several sharp curves through the community; in order to negotiate these curves, trains currently move through Nenana at a posted speed of 20 to 25 mph. Traveling at a slower speed subjects the community to a lengthier noise impact. The track also loops around some residential properties between downtown Nenana and the Tanana River bridge. Certain residential areas are exposed to sound from two noise events as each train travels through this loop. In addition, existing rail is jointed as opposed to welded, accounting for approximately 5 dBA of overall train noise.

FTA noise impact criteria group noise-sensitive land uses into the following three categories: Category 1 – buildings or parks where quiet is an essential element of their purpose; Category 2 – residences and buildings where people normally sleep, including residences, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance; and Category 3 – institutional land uses with primarily daytime and evening use, including schools, libraries, churches and active parks.

Ldn and Leq are noise measurements typically used in environmental noise analysis. Ldn is a 24-hour average noise level used to describe environmental noise that is adjusted to account for increased sensitivity to nighttime noise. Leq can be described as the "average" sound level that occurs during a one-hour measurement period. Ldn is used to characterize noise exposure for residential areas (Land Use Category 2). For other noise-sensitive land uses, such as outdoor churches and school buildings (Land Use Categories 1 and 3), the maximum one-hour Leq during the facility's operating period is used.

Table 3-6 presents the measured and modeled noise levels for the closest receptors to either alternative alignment. The apparent discrepancy between the present year sound level data as measured and the modeled level results from the way in which the different values are calculated. The measured noise level includes all of the noise present in the area including highway, airplane, and train traffic. However, the model noise level only takes into account train noise. For the church and the church residence, the

Table 3-6. Present and Future Noise Levels

Monitor Site	Land Use Category	Sound Level	Measured level	Modeled level	
			Existing (2003)	Existing (2003)	Future (2025) (with the project)
Church	3	Leq	61	51	52
Church residence	2	Ldn	61	55	53
Loop Homes	2	Ldn	53	57	55

George Parks Highway heavily influenced the existing noise values. The decrease from the measured level to the modeled level for the loop homes was a result of fewer actual train pass-bys than expected.

Impacts and Mitigation: The Proposed Action would realign the rail north of the Nenana Airport and as far south of the City center as possible, improving noise conditions in town and near existing residences. The proposed track realignment would have the following effects on noise:

- Benefit the existing residences along the track. While future trains would be slightly noisier because they are traveling faster (50 mph versus 20 to 25 mph), the noise events would last fewer total minutes per day and would be located farther from most of the community.
- Reduce the predicted noise level in the immediate area of the new alignment due to the use of continuously welded track to build the new alignment.
- Reduce train traffic on the large loop between the downtown area and the Tanana River bridge, which would reduce repeated exposure to noise from the same train for those residences located within the loop.
- Eliminate most train trips through downtown Nenana. Trains would typically bypass town at cruising speed, placing trains further from most residences and businesses and minimizing the noise exposure to current developed areas.
- Reduce use of at-grade crossings in or near residential areas, thereby decreasing how often the engineer must blow the required signal horn and the associated noise impacts.

For the year 2025, predicted train noise for the Proposed Action is expected to decrease by 2 dBA at the nearest homes and increase by 1 dBA at the church (Table 3-6). The FTA noise impact criteria and the existing predicted noise levels are plotted on Figure 8.

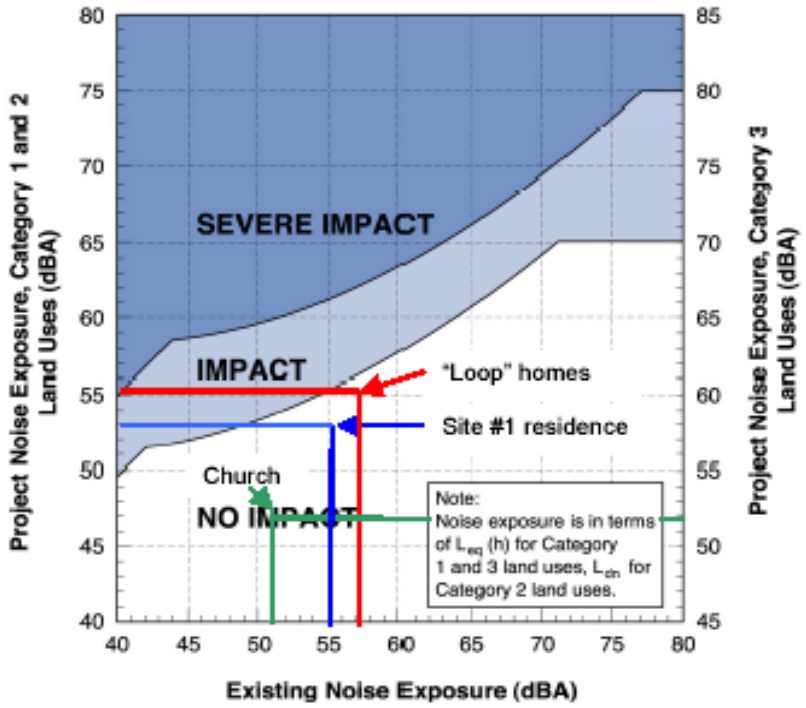

Figure 8. Evaluation of Existing Noise and Predicted Noise Change

The existing predicted noise levels are well inside the region of "No Impact." Since future noise levels are expected to decrease, it is reasonable to conclude that there would be no noise impact from the Proposed Action, which would result in an overall beneficial noise impact to area residents. The cumulative noise exposure between modeled existing and future noise levels would result in no impact to the church or residences from the Proposed Action (Mullins 2003). Therefore, no mitigation is required

Alternative B High Profile is not expected to change noise levels at either the church or the residence on the southern end of the study area, as the relative position to the church and residence would remain greater than 300 feet from the track centerline. Analysis shows that sites greater than 300 feet from the track centerline result in no cumulative noise impact (Mullins 2003). Alternative B High Profile is expected to decrease noise levels by 2 dBA at the nearest homes in the track loop area in the northern portion of the study area. Therefore, Alternative B High Profile also would not require mitigation.

Under the No Action Alternative, the community would continue to receive noise impacts from train traffic as trains pass along the Port of Nenana waterfront and through downtown Nenana. Residents along the loop area would continue to experience train noise levels twice by passing trains. Trains would continue to sound their horns near at-grade crossings at their current frequency and proximity to residents. Use of the existing jointed track would continue. As train traffic and length increase in the future, noise levels associated with the No Action Alternative would be expected to increase.

3.3.5.2 Vibration

Existing Conditions: There is no known history of complaints from area residents regarding vibration associated with the current track location and operating conditions. The FTA has developed screening distances to identify structures for further study of potential vibration impacts. Structures falling outside of the screening area are generally considered to be outside of the impact range for vibration. The appropriate screening distance is 200 feet for residences and 120 feet for non-residences. The closest sensitive receptor is the church located approximately 240 feet from proposed action. No existing or known future residence is located within the vibration screening distance from the proposed track. Furthermore, a review of vibration data from other recent studies undertaken for ARRC shows that the expected level of ground vibration would be well within the range acceptable to humans.

Impacts and Mitigation: The Proposed Action would move the alignment away from existing residences. The proposed alignment would not substantially change vibration impacts from existing conditions; therefore, there is no reason to expect a vibration impact that would require mitigation.

Alternative B High Profile would also move the alignment away from existing residences; therefore, the alignment would not have a vibration impact that would require mitigation.

Under the No Action Alternative, there is no existing vibration impact and no expectation of increased train vibration with future train activity.

3.3.6 Utilities

Existing Conditions: There are two main electrical utilities in or near the study area: the existing 138-kV GVEA transmission line which conveys electrical power to Fairbanks along with the Northern Intertie, and the secondary 12.5-kV transmission line located on the east side of the George Parks Highway. The secondary transmission line supplies main power to downtown Nenana and runs generally in a north-

south direction from the airport to downtown. GVEA plans to increase the 138-kV transmission line to 230-kV in about 10 years. The ARRC requires 30.5 feet of clearance for a power line carrying up to 50 kV, and an additional 0.5 inches of clearance for every 1-kV above 50-kV. No water, sewer, or natural gas utilities are present in or near the study area.

Impacts and Mitigation: The Proposed Action would not impact the 138-kV transmission line, but would intersect with the secondary transmission line. A new line would be built under or through the new embankment fill or new longer power poles would be installed to carry power over the embankment. During construction, efforts would be made to maintain power to the city by use of detour lines as the new line is spliced to the existing power poles on the north and south sides of the new alignment embankment (Koshak, S., personal communication, February 20, 2004). In the chance a short outage is necessary, the outage would be coordinated with the City of Nenana to ensure that no vital services are interrupted and a time of day is selected that causes the least impact to residences. The city currently experiences periodic power outages that can last up to several hours (Mayrand, J. personal communication, February 20, 2004), and with advanced planning and notice to electric utility customers, adverse effects of a short outage associated with alignment construction would be minimized.

Alternative B High Profile would similarly intersect the secondary transmission line and would not impact the 138-kV transmission line. Construction and mitigation measures would be the same as for the Proposed Action.

Under the No Action Alternative, no impacts to utilities would occur.

3.3.7 Cultural, Archaeological, and Historic Sites

The National Historic Preservation Act of 1966 and its implementing regulation (36 CFR 800) require that federally assisted projects take into account possible effects on resources that are listed, or are eligible for listing, on the National Register of Historic Places (NRHP).

Existing Conditions: A cultural resources survey of the Nenana area was conducted by professional archaeologists in July 2003 (Northern Land Use Research, Inc. 2003). The report discusses the field survey methods and results, and identifies 15 previously recorded archaeological and historic sites within a 5-mile radius of the study area. None of these sites are located within the study area, and no cultural resources were identified within the study area during the field survey.

Impacts and Mitigation: Based on the results of the field survey and previously recorded information available at the time of the survey, no impact to cultural resources (including both archaeological and historic sites) is anticipated by either the Proposed Action or Alternative B High Profile. On November 24, 2003, SHPO concurred that there would be no impacts to historic resources (Appendix A). Should construction activities unearth any archaeological or cultural resources, construction would be halted in the immediate area, and SHPO and local tribes would be contacted.

On November 4, 2003, FTA initiated government-to-government coordination by sending a letter to the Nenana Native Council, a federally recognized tribal government, to solicit comments and concerns regarding the proposed project and potential impacts to cultural resources (Appendix A). FTA also sent letters to other Alaska Native entities in the area (Toghotthele Corporation, Tanana Chiefs Conference, and Doyon Corporation). In addition, during the scoping process, notices and newsletters were mailed to

Native groups. A public scoping meeting was held on May 7, 2003, in Nenana. Comments made during the scoping process are outlined in Section 1.3 and in the Scoping Summary Report (URS 2003a). No adverse impacts that significantly or uniquely affect these groups or associated cultural resources, including traditional and cultural properties, have been identified for either of the build alternatives.

Under the No Action Alternative, the alignment would not change and no cultural resources would be affected.

3.3.8 Recreation

Existing Conditions: Recreation activities in Nenana are important to local residents and visitors to the area. Tourist activities based on recreational opportunities provide income to the local economy. Both local residents and tourists enjoy a variety of activities including sport fishing, hunting, water-based recreation, camping, picnicking, hiking, berry picking, cross-country skiing, sightseeing, wildlife observation, flying, dog mushing, snowmobiling, and off-road vehicle use. Recreational activities or recreational use areas near the study area are as follows:

- Sport hunting occurs on public lands or, with permission from landowners, on privately owned lands. Moose and black bear are the primary game for hunting.
- The Nenana City Pond, a popular fishing location south of the City and adjacent to 12th Street, is open year-round and stocked with rainbow trout by ADF&G. This pond is not a designated Section 4(f) property.
- Boating, fishing, and sightseeing in the summer and snowmobiling and skiing in the winter occur on the Tanana and Nenana rivers. Sport fishing opportunities are limited on the main stem of these glacial-fed rivers because of naturally high sediment loads. However, many people fish for burbot on the Tanana River in the winter, and in the summer anglers target the clear water tributaries and sloughs of both rivers.
- The Nenana Valley RV Park and Campground, located at 4th and C Streets, provides camping opportunities in town.
- Boating opportunities exist throughout the area, and currently two local river guides utilize the surrounding waters.
- Trails and roads in various locations in the city and surrounding area can be accessed for snowmobiling, cross-country skiing, hiking, and off-road vehicle use. Trails near Nenana include the Nenana-Kantishna Trail, the Nenana-Minto Trail (Old Mail Trail), and trails associated with the Golden Spike Interpretive Park; however, there are no trails located within the study area.
- Local dog sled tours operate from Nenana.

Lands surrounding Nenana are used for hunting and trapping game, but there are no established hunting/trapping areas within the study area. The study area may be used informally by snowmobiles or dogsled teams in the winter and all-terrain vehicles in the summer.

Impacts and Mitigation: The Proposed Action would have minimal impact on recreational activities in the vicinity of the study area. The proposed alternative would not impact use of the Tanana or Nenana Rivers or any tributaries, or disrupt established snowmobile, dogsled, or all-terrain vehicle use. Ample, undisturbed areas for recreation would remain near the City. The proposed alternative would pass near

the northern end of the Nenana City Pond. Although it would not affect fishing success, the presence of nearby train operations could result in a minor increase in noise and visual impacts around the Nenana City Pond. Since the west side of the pond is already adjacent to the George Parks Highway, any change to the quality of the fishing experience would be minimal. Indirect impacts, such as an increase in the number of people accessing the area, are not expected since the proposed realignment is not expected to increase recreation access. There is some potential for non-resident construction workers to use local RV parks during project construction. Such arrangements are dependent on the construction contractors and RV park operators. The availability of RV space for visitors could be decreased on a short-term basis for the duration of construction.

Alternative B High Profile would have minimal impacts on recreational activities, similar to the Proposed Action. This alternative may have less of a visual or noise impact on the Nenana City Pond because the alignment passes 400 to 500 feet farther north than the Proposed Action.

Under the No Action Alternative, there would be no changes to recreation opportunities within the Nenana area.

3.3.9 Section 4(f)/Section 6(f) Property

Section 4(f) of the Department of Transportation Act of 1966, as amended by 49 USC 303, was created to protect public parks and recreation lands, wildlife and waterfowl refuges, and historic sites. Federally funded transportation programs and projects requiring the use of any of these lands are allowed only if there is no other prudent and feasible alternative. If avoidance is not feasible and prudent, the project must include all possible planning to minimize harm to these areas.

The Land and Water Conservation Fund (LWCF) Act of 1965, as amended, was established to provide funds to develop outdoor recreation resources. Section 6(f)(3) of the act requires lands that have been developed using LWCF monies not be converted to a land use other than public outdoor recreation, unless lands of equal value or usefulness are exchanged for the converted lands.

Existing Conditions: There are two NRHP-listed sites, but no designated federal or state parks or refuges located within 5 miles of the study area. The two NRHP-listed sites are the original Nenana railroad depot and the St. Marks Episcopal Mission. A local park (Golden Spike Interpretive Park) is located north and west of the study area; it consists of a trail with interpretive signs, benches, and a pavilion. In addition, a multiple-use hard court, ball field, and playground, with a well and parking area, were developed in the City using LWCF monies. According to the City of Nenana mayor, the Nenana City Pond is used locally for recreational purposes, but is not currently, nor is it intended to become, a formally designated parkland subject to Section 4(f) (Mayrand, J., Personal Communication, February 20, 2004).

Impacts and Mitigation: Neither build alternative would impact any Section 4(f)/6(f) properties. The sites listed on the NRHP, the Golden Spike Interpretive Park, and the recreation areas created under LWCF are not located near the proposed new embankment locations and therefore would not be affected. The potential for impacts to the Nenana Depot, which is now a museum owned and operated by the City of Nenana, was addressed because of its former association with the Alaska Railroad. Passenger trains have not stopped at the depot for many years, and the existing railroad tracks adjacent to the depot would remain in place under both build alternatives for use as a siding or spur. Therefore, the historic character of the Nenana Depot would not be affected.

Under the No Action Alternative, there would not be any changes to existing conditions; therefore, Section 4(f)/6(f) properties would not be impacted.

3.3.10 Contaminated Sites

Existing Conditions: A limited investigation of contaminated sites was conducted as part of the environmental review for this project. An environmental database review was completed, and a site reconnaissance was conducted July 15 through July 17, 2003, in conjunction with the Environmental Field Survey to identify potential contaminated sites in the study area (URS 2003b).

Impacts and Mitigation: The ADEC Contaminated Sites database listed four contaminated sites within the City of Nenana. None of the listed sites were located within or would potentially affect the study area. The site reconnaissance identified some structures near the study area that could serve as sources of contamination. However, no evidence of contamination was observed or reported within the study area. The study area was relatively free of discarded material of any type, although small quantities of domestic garbage were noted. No abandoned automobiles or other abandoned motorized equipment were observed, and there were no signs of disposal of oily waste or old drums in the area. Further investigation into possible contamination will be conducted prior to property acquisition for either build alternative. In the event contamination is encountered during construction, it would be addressed in accordance with applicable state and federal regulations. BIA would be contacted if contamination is encountered adjacent to restricted lots (Native allotments or restricted townsite lands).

3.3.11 Visual Impacts

Existing Conditions: The City of Nenana is located on low elevation lands concentrated in a small area between 9th Street and the south bank of the Tanana River. It is bounded on the east by the Alaska Railroad embankment and on the west by the George Parks Highway. Most of the outlying area is undeveloped woodland, except for the airstrip and dispersed buildings along the highway and near the central part of the City. The area where the majority of people live and work and might be subject to visual impacts is downtown Nenana.

The visual characteristics from downtown Nenana are strongly influenced by the existing elevated portion of the railroad embankment, which loops through town. The existing bridges over the Tanana River (both the railroad and the highway bridges) and views of the mountains to the north and south are important visual resources to the community. The Alaska Range begins approximately 25 miles south of Nenana, and Mt. McKinley is located approximately 65 miles south.

Impacts and Mitigation: Visual impacts occur when changes in the landscape are noticeable to viewers looking at the landscape from homes, preservation areas, highways and travel routes, and important cultural features and historic sites.

The new, approximately 25.5-foot high embankment associated with both build alternatives would result in minor long-term effects on visual characteristics from downtown Nenana. The embankment would be most visible to people driving on the George Parks Highway who would view the new railroad bridge over the highway and its gently meandering approach to the south side of the existing Nenana River railroad bridge. Downtown Nenana residents and workers would be less likely to experience visual impacts. The new embankment would not be visible from most areas in downtown Nenana, as existing

vegetation and structures would fully or partially obstruct views. Given the relative height of the ascending-grade embankment and the treeline, views of the Alaska Range and Mt. McKinley to the south would not be significantly affected. The new feature that would be most visible to both travelers and Nenana residents is the railroad bridge crossing over the George Parks Highway. Planned revegetation of the embankment would mitigate the visual impact as it blends in color and texture with the adjacent shrub and forested areas. Construction-related impacts for both build alternatives are addressed in Section 3.4.

The Alternative B High Profile alignment would be closer to the community than the Proposed Action, and would have a narrower barrier of trees and brush between it and the main area of the city. Therefore, it would have a slightly greater but still minor impact on visual resources than the proposed alternative.

The No Action Alternative would not change visual resources from existing conditions.

3.4 CONSTRUCTION IMPACTS

Construction activities associated with both build alternatives could have short-term impacts on noise levels, air and water quality, traffic congestion and detours, safety, local housing and economy, visual resources, borrow sources, and disposal areas. These impacts would be temporary, existing only for the duration of construction (currently anticipated to last for two years, 2006-2007). This section describes the construction impacts and identifies appropriate mitigation measures specific to these impacts.

- Air quality impacts would be temporary and would come primarily from emissions from diesel-powered construction equipment and dust from embankment construction, haul road and local road use, and staging/stockpile areas. Airborne particles would be controlled as necessary by the application of water or other controlled materials for dust suppression in accordance with established BMPs employed by the ARRC.
- Noise and vibration impacts would result from heavy equipment movement (including trucks transporting embankment fill material on local roads and haul roads) and construction activities, such as pile driving and vibratory compaction of the embankments. The Contractor would use standard equipment with mufflers and would make certain that equipment is in good operating condition.
- Water quality impacts resulting from erosion and sedimentation would be controlled in accordance with established BMPs. A SWPPP would be prepared and implemented for the project to obtain coverage under the NPDES General Permit for Storm Water Discharges from Construction Activities. No significant impacts to water quality are expected to result during construction activities. An ADEC Section 401 Water Quality Certification (Certificate of Reasonable Assurance) would be required for the project, and ARRC and its contractors would abide by stipulations included in that certification.
- Excavation dewatering may be performed during construction activities, which could require an ADEC General Wastewater Disposal Permit for excavation dewatering. Appropriate BMPs would be implemented to prevent scour erosion and sediment transport and to protect surface water quality during dewatering.
- Trucks transporting embankment fill material from the stockpile area would use local roads as well as haul roads within the project area. The local roads have adequate capacity for the anticipated truck traffic, but may need to be upgraded by the construction contractor for use by

trucks and other heavy equipment. Associated air, noise and water quality impacts are described above. In addition, traffic flow would be temporarily impacted during truck crossings (such as at 10th Street), construction of the bridge over the George Parks Highway, and construction of the oversized culvert underpasses. Traffic flow would be controlled by planning and scheduling construction activities to minimize traffic delays within the Nenana area. Signs would be used as appropriate to provide notice of road closures and other pertinent information to the traveling public. The public would be notified in advance of road closings and other construction-related activities so that motorists, residents, and business people could plan travel routes in advance. Access to the community, the airport, and emergency facilities would be maintained, although some delays in non-emergency situations may be expected. A sign providing the name, address, and telephone of an ARRC contact person would be displayed on-site to assist the public in obtaining immediate responses to questions and concerns about project activities.

- Local housing could be affected by a short-term increased demand to accommodate the construction workforce. Construction crews from outside Nenana would likely lodge in existing commercial facilities, available rental housing, or RV sites; live in a temporary camp/RV sites (with adequate facilities for disposal of wastewater, including sanitary wastes) provided by the ARRC or the construction contractor; or commute from Fairbanks or other close communities. The availability of local housing and rental prices could be temporarily affected during the period of construction. Because there is no additional ARRC operations employment associated with the track realignment project, there would be no long-term impact on housing.
- Depending on arrangements made by construction contractors, construction crews could use existing facilities for food and lodging during construction periods, which would have a positive, short-term economic benefit to the area.
- Depending on the skills needed for construction and availability in the local Nenana labor force, construction could increase local and regional employment and wage income. The number of positions and length of employment would vary depending on the construction schedule and the contractors selected. There may also be opportunities for local provision of construction materials, such as fill material, and other services related to construction, which could result in increased earnings for suppliers of materials and services locally and in the region. During the public scoping process, community members and local organizations expressed interest in providing construction labor, materials, and services.
- Construction of a new alignment would have some minor impacts on public services provided by the City of Nenana and other local organizations. The non-resident construction workforce could create extra demand on health and social services temporarily. It is unlikely that there would be additional demand for education services, because families of non-resident construction workers would not likely relocate to Nenana for the relatively brief period of construction.
- Visual impacts related to construction would include material storage and construction equipment. For residents of Nenana, these may be visually displeasing; however, this would be a temporary condition and should pose no substantial long-term impacts. Fugitive dust would be mitigated by use of dust suppression BMPs.

In addition to the above impacts and mitigation measures, construction of the roadway underpasses and George Parks Highway crossing would require placement of embankments, use of synthetic stabilization materials, and possible excavation of unsuitable material. Excavation of unsuitable material may be

required at the wetland sites. Nenana does not have a landfill; unsuitable material would be disposed in an approved location either on- or off-site. The removal of debris and disposal of waste materials from the project would be performed in accordance with local and state requirements.

Alternative B High Profile would have similar construction impacts, and would require the same mitigation measures, as the Proposed Action. Construction impacts related to Alternative B High Profile are also expected to be minor. The No Action Alternative would not have any construction impacts.

3.5 CUMULATIVE EFFECTS

Federal regulations implementing NEPA (40 CFR 1508.7) define a cumulative effect (cumulative impact) as "the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." The following sections identify and describe potential cumulative effects that could result from the Proposed Action (Alternative B-2 High Profile) or its build alternative (Alternative B High Profile) in combination with other persistent past, present, or reasonably foreseeable future human actions or natural events in or near the Nenana area. These other actions and events are called *external actions* because they take place independently from the Proposed Action or its build alternative. By considering external actions that could interact with the alternatives, the cumulative effects analysis allows potential unintended consequences of the alternatives to be perceived.

The cumulative effect analysis for the proposed project alternatives includes:

- Definition of the spatial (geographic) and temporal (time frame) boundaries of the analysis.
- Identification of past, present, and reasonably foreseeable future actions that could produce additive or synergistic environmental effects when combined with potential direct or indirect impacts of the alternatives described in Sections 2.0 and 3.0.
- Description and discussion of potential cumulative effects of project alternatives on the physical, biological, and human environments.

For the purposes of this Cumulative Effects analysis, the geographic area is defined as the city limits of Nenana and the immediately adjacent area. The time frame for consideration of future cumulative impacts is 10 years. Ten years was chosen to reasonably reflect projects that could be in the planning stages, are likely to occur, but perhaps not yet funded. Projects that may occur beyond 10 years are highly speculative in nature and are not reasonably foreseeable.

3.5.1 Past, Present, and Reasonably Foreseeable Future External Actions

Past and present external actions include past expansion of the City of Nenana and its airport. Past actions such as resurfacing and widening of the George Parks Highway in the vicinity of the study area have also occurred. Due to the location of the study area within the floodplain of the Tanana River, impacts on the biological and physical environment from flood episodes have occurred.

Reasonably foreseeable future external human actions and natural events that have been identified within the temporal and geographic boundaries of the project analysis include the following:

- George Parks Highway Improvements. ADOT&PF has planned several improvements projects for the George Parks Highway near the City of Nenana. These include highway resurfacing scheduled for 2006, improving the truck route that services the Port of Nenana area, and potentially redesigning an interchange at 10th Avenue. Potential effects of these improvements are primarily socioeconomic in nature because they would affect transportation, commerce, and tourism and would occur mostly in previously disturbed areas.

- Tanana River Bank Erosion. The Tanana River has been eroding its western bank, from the airport runway north for a distance of approximately 4,000 feet, for more than 25 years. The Alaska Railroad bridge crosses the Tanana River more than 6,000 feet from the end of the airport runway and has not been affected by this erosion. Based on a review of aerial photographs between 1979 and 2002, a 2,500-foot section of riverbank, immediately north of the airport riprap revetment, has been eroding at a rate of 12 to 28 feet per year, as shown in Table 3-7. This aerial photo review showed that the airport riprap revetment was installed sometime between 1979 and 1989. Based on the erosion rates shown in Table 3-7, the Tanana River would be against the Alaska Railroad embankment sometime approximately 15 to 35 years from now. This is a natural process related to the channel morphology and is outside the timeframe of the 10-year cumulative impact. Nevertheless, the erosion has the potential to be a threat to the embankment if it continues at its current rate. However, it is unknown whether the erosion will continue at its current rate, increase or decrease in erosion rate, or stop altogether on its own. Neither of the proposed build alternatives nor the No Build Alternative would have a measurable impact on the Tanana River bank erosion rates.

Table 3-7. Bank Erosion Along the Tanana River

Aerial Year	Approximate Distance[1]	Amount of Bank Lost	Number of Years	Erosion Rate
1979	945 feet	--	--	--
1989	670 feet	275 feet	10	27.5 feet/year
1998	485 feet	185 feet	9	20.6 feet/year
2002	435 feet	50 feet	4	12.5 feet/year

[1]Distance measured from the centerline of the railroad along the centerline of Sixth Street at a 65-degree angle from the railroad.

- BIA Nenana Roads and River Erosion Project. The BIA proposes to improve approximately one mile of roadway on 9th and K Streets and create about ½-mile of new roadway. The proposed new road will parallel the railroad tracks from the end of K Street to Front Street, just east of the railroad bridge. This project also includes construction and installation of erosion control structures along the Tanana River to prevent continued bank erosion along the eastern border of Nenana, as discussed above, to impact their proposed road within the 25-year design life of the road. The stream barb portion of the project is expected to commence in 2004 and road work is expected to commence in 2005; the estimated cost of the project is $3 million. This project has already been funded, and preparation of an EA and final design are underway. While most of the area for this work is already developed, there are possible impacts to the Tanana River and associated floodplain areas. The BIA project and ARRC's proposed project could affect one another with overlapping alignments, and therefore, BIA and ARRC have been working together to coordinate these efforts. If the BIA project is constructed first, the ARRC project may require

relocation of a portion of the newly constructed road and acquisition of additional land for that relocation. If the design and/or construction phases of the two projects overlap, close coordination with BIA may help minimize impacts associated with the overlapping alignments and associated costs.

- Clear Air Force Base Transfer. Operation of Clear Air Force Base, located approximately 3 miles south of Nenana, will be transferred to the Alaska Air National Guard. The Air National Guard will bring in 180 staff, some of whom may also bring families into the area. Potential effects of these improvements are primarily socioeconomic in nature. Construction/expansion at Clear would not biologically or physically affect the region. Although this external action occurs outside of the defined geographic boundary of the proposed railroad realignment project, new staff at the Air Force Base could result in an increase in the City of Nenana population.
- Expansion of the City of Nenana. During the 2004-2114 period, it is likely that residential and commercial buildings and infrastructure will be developed beyond the existing built area of the City of Nenana. Because of constraints imposed by the City's location at the confluence of the Nenana and Tanana rivers and the presence of high bluffs on the north side of the Tanana River, it is likely that most of the expansion will be southward, toward the proposed railroad embankment and Nenana Airport. There is also a potential for future construction of a bridge to the west across the Nenana River, as discussed in the Draft Parks Highway Corridor Management Plan (CH2M Hill 2002, Section 4.11.3, p. 4-67), with associated road extension; industrial, commercial, and residential development; and enhanced recreational and subsistence opportunities on presently undeveloped lands west of the Nenana River.

3.5.2 Cumulative Effects on the Physical Environment

The primary cumulative effect of either build alternative on the physical environment would involve the interaction of the new railroad embankment and other future improvements with floodwaters, altering water surface elevations within the Tanana River floodplain. Development within the floodplain will cause water surface elevations to increase during large over-bank floods. It is reasonably foreseeable that major flooding will occur in the study area and that the new embankment, if built, would come into contact with floodwater. The timing and magnitude of future flood events are unknown, but hydrologic data collected at Nenana in the past suggest that a future major flood of the Tanana River could inundate the portion of floodplain that would be crossed by either build alternative (Section 3.1.3). The BIA Nenana Roads and River Erosion Project, George Parks Highway improvements, and future expansion of the City of Nenana southward all have the potential to incrementally increase water surface elevations in combination with either of the build alternatives during a large flood event.

According to the preliminary hydraulics and hydrology study, the proposed railroad embankment and dike would cause the water surface elevation in the City of Nenana to increase by approximately 0.3 feet during the peak discharge of the 100-year flood. On the upstream side of the ARRC Tanana River bridge, the increase is estimated to be less than one foot. Although the construction of the erosion control structures proposed by the BIA might further increase water surface elevations upstream of the ARRC bridge, it is anticipated that the cumulative impact of the BIA erosion control structures and the ARRC embankment would still be less than one foot. The BIA erosion control structures would not likely increase water surface elevations downstream of the ARRC bridge. The BIA erosion control structures were designed for the 1.7-year flood (National Resources Conservation Service 2003). At the 1.7-year flood, the ARRC proposed dike would not be affecting flow in the Tanana River. At the 100-year flood,

it is anticipated that the ARRC dike would divert about 2,500 cfs from the floodplain back toward the main channel. This represents an increase in flow of about 1.6 percent at the ARRC bridge. Because the BIA erosion control structures are designed for a 1.7-year flood, and may sustain substantial damage during a 100-year flood, the added impact of the additional flow resulting from the ARRC dike is not anticipated to significantly affect the BIA structures. The roads associated with the BIA project are currently designed to be built at an elevation approximately four to five feet above the existing grade and have incorporated culverts into their design to allow cross drainage. The City of Nenana has verbally approved their preliminary design for construction in the floodplain. A flood hazard permit would be required from the City for their proposed development in the 100-year flood zone.

Further encroachment of the City of Nenana south of the currently developed area due to construction of city and private structures within the 100-year floodplain may also increase water surface elevations during flooding. Because the proposed ARRC dike would divert water away from the south side of the railroad embankment, and the railroad embankment would contain floodgates and other measures to divert flow, there would be no increase in water surface elevations that would affect new structures built south of the currently developed area of the City.

No cumulative effects are anticipated for air quality, geology and soils, seismic conditions, or water resources.

3.5.3 Cumulative Effects on the Biological Environment

The primary cumulative effect either build alternative would have on the biological environment would be the incremental loss of habitat in combination with past losses and reasonably foreseeable future losses of habitat. Growth and development in Nenana has required that structures be built in an alluvial floodplain environment. Fill material obtained from abundant, local river sources has been used to fill wetlands south of Nenana, allowing the community to expand southward and progressively cover wetlands. Fill was also used to build the ARRC alignment through the City of Nenana, the George Parks Highway and secondary roads, and the Nenana airport runway and taxiway.

The Proposed Action or its build alternative would fill approximately 22.7 or 22.5 acres of wetlands, respectively, adding to wetlands already lost in the Nenana area (Section 3.2.2). The potential to build a future rail spur to the airport could fill additional wetland areas of approximately 4.7 and 3.3 acres, respectively, for the Proposed Action or its build alternative. Secondary development to the future rail spur, including roads to the airport and airport parcel development, would result in additional wetland fill.

In the reasonably foreseeable future, it is likely that some privately owned tracts located immediately southeast of the presently developed area of the City of Nenana could be subdivided and developed (Figure 7). This future development would have the potential to cover substantial additional wetland acreage, contributing further to the cumulative loss of wetlands. Because there are extensive areas of similar wetland habitat in the Tanana River floodplain to the south, west, and east of the City of Nenana, loss of wetlands immediately surrounding the community should not impair the region's ability to provide habitat to support existing fish and wildlife populations. In addition, these wetlands do not represent high value fish and wildlife habitat. However, construction of a bridge to the west across the Nenana River, as proposed in the George Parks Highway Improvement Plan, and future road extension and development to the west would have the potential to incrementally increase this cumulative effect, which is currently confined to the immediate vicinity of the City of Nenana.

A second cumulative effect to the biological environment is the gradual fragmentation of wildlife habitat by linear structures such as the George Parks Highway, ARRC embankments, bridge approaches, secondary roads, and the airport runway and security fencing. Such linear structures can impose physical and visual obstacles that may impede wildlife movement through the area. Although the cyclone fence surrounding the Nenana Airport already impedes wildlife movement, the additional fill area would increase the obstacles to wildlife movement through the study area.

The approximately 25-foot embankment combined with existing linear structures and linear structures that would be built in the reasonably foreseeable future in the City of Nenana area could affect normal travel and alter movements of moose and black bear through the study area (Section 3.2.3). However, due to its gentle 2:1 slope, the embankment would be unlikely to create a barrier to wildlife movement. An existing cyclone fence encircling most of the Nenana Airport property currently serves as a physical barrier to wildlife movement. Despite future plans for City growth, extensive areas of undeveloped, unfragmented habitat remain adjacent to the study area. Therefore, cumulative impacts to wildlife migration are not expected to adversely impact wildlife on a local or regional population level.

No cumulative effects are anticipated to threatened or endangered species from implementation of either build alternative. Since no past, present, or future impacts to threatened or endangered species have been identified, and no other foreseeable impacts from construction were identified, no cumulative effects are expected.

3.5.4 Cumulative Effects on the Human Environment

Reasonably foreseeable future actions that could interact with the Proposed Action or with Alternative B High Profile to affect the human environment, and the potential cumulative effects of such interactions, are briefly discussed below.

Socioeconomics: Both build alternatives may result in a short-term increase in employment and income in the Nenana area during construction. If the design and/or construction phases of the BIA project and ARRC's proposed project overlap, close coordination with BIA may help minimize impacts associated with the overlapping alignments and associated costs.

Improvements to the George Parks Highway, BIA Road Improvements, and the transfer of Clear Air Force Base would have the potential to increase local employment and economic activity through expenditures by the construction workforce for local goods and services. Either build alternative would contribute to these short-term, beneficial cumulative effects. Also in the short-term, an increase in local residencies from these external actions would make available housing in Nenana scarcer. Any long-term increase in local residents (most likely associated with activities at Clear Air Force Base) would produce beneficial effects on Nenana's economy by increasing demand for local goods and services.

Under either build alternative, possible construction of a railway spur from the new embankment to the airport would create the potential for increased economic activity, tourism, and recreational use of the Nenana area. In combination with a potential increase in local population due to transfer of the Clear Air Force Base, these activities would bring more people to Nenana over the long term. Although this cumulative effect would have beneficial consequences for the local economy, moderate adverse effects are also likely. The overall level of human activity at Nenana would increase incrementally in the future, bringing higher ambient noise levels, higher demand for local health care and child care services, and

higher traffic levels. Considered together, these future changes have the potential to alter the present rural character of the community, although only to a moderate degree.

Land Use/Land Status: The Proposed Action would have a minor cumulative impact on land use by removing some lots that could be used for future expansion south and east of the existing community. Alternative B High Profile would have more of an impact on land use because of its more northerly location (Figure 7). Activities associated with both George Parks Highway Improvements, the BIA Road Improvement, and Tanana River erosion could remove an additional incremental amount of residential land. The BIA Road Improvements project would provide access to lots that are not currently accessible, adding an incremental amount of residential land. That project is also designed to slow the Tanana River erosion east of the ARRC loop, thereby protecting existing land from being lost to the Tanana River erosion forces. However, there are no foreseeable large-scale economic activities that would stimulate a substantial amount of expansion of the community; therefore, adequate vacant land is available, and potential adverse cumulative impacts to land use would be minimal. If this project cannot be coordinated with the BIA project, and the BIA project is constructed first, this project may require relocation of a portion of the newly constructed road and acquisition of additional land for that relocation.

Transportation Systems and Facilities: Both build alternatives would have a long-term beneficial cumulative effect on traffic safety by decreasing the risk of derailments through reduction in curves and decreasing the risk of train-vehicle collisions by reducing train traffic at the at-grade crossings. The alternatives would also improve railroad efficiency and travel time. In conjunction with airport improvements currently underway, construction of the optional rail spur to the airport would allow future coordination of rail and air transportation links.

Visual Impacts: A future bridge across the Nenana River, in combination with the profile of the new railroad embankment, would produce a cumulative effect on visual resources. Rather than increasing the intensity of the visual impact produced by the new embankment, a Nenana River bridge would increase the general visibility of built structures in the Nenana area, contributing incrementally to a change in the local visual character of the community. This is considered to be a minor cumulative effect, but the addition of other commercial and industrial development along the Parks Highway, in combination with the railroad embankment and the Nenana River bridge, could eventually alter the visual character of the community as experienced by travelers on the Parks Highway and by visitors to Nenana.

No cumulative impacts are anticipated to cultural resources, Section 4(f)/6(f) resources, environmental justice, and contaminated sites. Since no past, present, or future impacts have been identified, and no other foreseeable impacts from construction were identified, no cumulative effects are expected for these issues.

3.6 IRREVERSABLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

NEPA requires a review of significant irreversible and irretrievable effects that occur from development of the Proposed Action (40 CFR 1502.16). An irreversible commitment of resources is defined as the loss of future options, and applies primarily to non-renewable resources, such as minerals or cultural resources, and to those factors that are renewable only over long time spans, such as soil productivity. Irretrievable commitments represent the loss of production, use, or commitment of renewable natural resources for the period of the proposed action (e.g., timber loss or forest productivity). These decisions are reversible, but the foregone utilization opportunities are irretrievable.

Under development of the Proposed Action and Alternative B High Profile, irreversible and irretrievable commitments of resources would occur from the use of land, fill, electrical energy, fuel, and manpower. Land that would lie beneath the railroad tracks along the proposed realignment route represents the greatest irretrievable resource associated with the build alternatives. The No Action Alternative would have no change from the current commitment of resources.

3.7 LOCAL SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

NEPA requires a review of the balance between short-term uses and long-term productivity of resources within the vicinity of the study area (40 CFR 1502.16). The definitions of short-term and long-term are specific to each project. Generally, short-term refers to the useful life of the project. Long-term refers to the period beyond the lifetime of the project.

Those impacts that narrow the range of beneficial uses to the environment are of primary concern. Potential impacts include selecting a development option that reduces the ability to pursue other possibilities, or committing a piece of land or other resource to a particular use that eliminates possibilities of additional uses being performed on the site.

Of some concern between short-term and long-term productivity for the Proposed Action is the resource utilization associated with the build alternatives. The amount of land required for the proposed ROW is approximately 41 acres for the Proposed Action; 71 acres would be disturbed during construction. Alternative B High Profile would disturb 68 acres of land during construction. Long-term productivity of the resources would be preserved by revegetation and avoidance of sensitive areas to the maximum extent practicable. Development of either the Proposed Action or Alternative B High Profile would represent a very small portion of land in the surrounding region.

Implementation of the build alternatives would not limit beneficial uses of the environment. The build alternatives would, however, increase operational safety and efficiency, reduce travel times, reduce operational costs, and make the future development at the airport more feasible.

3.8 MITIGATION

This section provides a summary of mitigation measures that would be implemented as necessary under either build alternative. The mitigation measures are also discussed in the Affected Environment and Impacts section (Section 3.0).

- Air Quality: BMPs, such as watering for dust suppression, would be implemented as needed during construction activities to mitigate fugitive dust emissions.
- Permafrost: Based on geotechnical and thermal studies conducted during final design to characterize permafrost conditions, the embankment would be designed and constructed to address impacts from any degradation of permafrost, thermal erosion, or subsidence. Mitigation measures may include removing unacceptable substrate prior to building the embankment, cutting the standing vegetation but leaving it in place and placing geotextile fabric over the surface prior to fill deposition, completing some construction activities in winter, minimizing disturbance to native vegetation outside of the embankment footprint, encouraging re-growth of disturbed areas, or using thermal siphons, which prevent the melting of permafrost.

- Soil Erosion: A SWPPP would be prepared and implemented as part of the NPDES General Permit for Storm Water Discharges from Construction Activities, and BMPs would be employed to minimize the potential for erosion and sedimentation during construction. The embankment slopes would be stabilized upon completion of the project.

- Water Resources/Hydrology: Existing surface water runoff patterns would be maintained by placing culverts through the embankment when necessary to maintain existing drainage patterns. If permafrost is present, a bedding of thaw-stable material would be incorporated into the culvert design to provide a stable foundation. To mitigate the impact of a new rail embankment on the floodwater elevation during a 100-year flood, a dike would be constructed at the upstream end of the airport runway (Figure 2), and floodgates would be installed on culverts through the embankment to manage floodwater.

- Water Quality: A SWPPP would be prepared and implemented for the project to obtain coverage under the NPDES General Permit for Storm Water Discharges from Construction Activities. Water quality impacts would be mitigated through application of established BMPs to control soil erosion during ground-disturbing activities.

- Wetlands: During construction, appropriate BMPs for preventing sedimentation of adjoining wetlands would be employed, and on-site environmental compliance monitoring by a qualified environmental inspector would be performed to ensure that the embankment is maintained within the fill limits and pollution sources are prevented from entering the surrounding wetlands. Compensatory mitigation could be required as part of the USACE Section 404 Permit for placement of fill in jurisdictional wetlands.

- Vegetation/Habitat: Disturbance to native vegetation outside of the embankment footprint would be minimized by limiting earth-moving equipment and fill-hauling trucks to areas within the footprint of the embankment or local roads whenever possible. Vegetation would be reestablished on the embankment and dike slopes.

- Seismic Hazards: The separated grade crossing over the George Parks Highway would be designed according to the latest applicable seismic codes.

- Visual: After completion of the project, embankments and staging/stockpile areas would be revegetated so that they blend in color and texture with adjacent vegetated areas.

- Noise: During construction, the contractor would use equipment with mufflers and make certain that equipment is in good working order.

- Utilities: If a short outage is necessary during work on electric utility lines, the outage would be coordinated with the City of Nenana to ensure that no vital services are interrupted and a time of day is selected that causes the least impact to residences.

- Cultural Resources: Should construction activities unearth any archaeological or cultural resources, construction would be halted in the immediate area, and SHPO and local tribes would be contacted.

- Contaminated Sites: In the event contamination is encountered during construction, it would be addressed in accordance with applicable state and federal regulations. BIA would be contacted if contamination is encountered adjacent to restricted lots (Native allotments or restricted townsite lands).

- Traffic Flow and Airport Access: Traffic flow would be controlled by planning and scheduling construction activities to minimize traffic delays within the Nenana area. Signs would be used as appropriate to provide notice of road closures and other pertinent information to the traveling public. The public would be notified in advance of road closings and other construction-related activities so that motorists, residents, and business people could plan travel routes in advance. Access to the community, the airport, and emergency facilities would be maintained.
- BIA Road/Bank Stabilization Project: The BIA road/bank stabilization project and the Proposed Action may affect one another with overlapping alignments. ARRC and BIA would continue to coordinate their activities. If the design and/or construction phases of the two projects overlap, close coordination between ARRC and BIA may help minimize impacts associated with the overlapping alignments and associated costs. If the BIA project is constructed first, the Proposed Action may require relocation of a portion of the newly constructed road and acquisition of additional land for that relocation.

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4.0 CONSULTATION AND COORDINATION

During the preparation of this EA, federal, state, and local agencies, governments, and the public were consulted to obtain descriptive information, identify issues and mitigating measures, and/or assist in the development of reasonable alternatives.

The scoping report for this project, which includes a summary of scoping materials, comments from agencies and the public, and a complete mailing list, is available for review in the associated Technical Reports document or at ARRC's Anchorage office. A number of agencies, tribal organizations, and community councils that were contacted regarding this project are listed below.

Federal Agencies

- Federal Transit Administration, Region 10, Seattle, WA
- National Marine Fisheries Service, Anchorage, AK
- United States Army Corps of Engineers, Regulatory Branch, Anchorage, AK
- United States Fish and Wildlife Service, Ecological Services Office, Fairbanks, AK
- United States Environmental Protection Agency, Anchorage, AK
- Federal Aviation Administration, Anchorage, AK
- Bureau of Indian Affairs, Fairbanks and Juneau, AK
- Federal Emergency Management Agency, Fairbanks, AK

State Agencies

- Alaska Department of Environmental Conservation, Division of Air and Water, Anchorage, AK
- Alaska Department of Fish and Game, Habitat and Restoration Division (now part of Alaska Department of Natural Resources, Office of Habitat Management and Permitting), Anchorage, AK
- Alaska Department of Fish and Game, Subsistence Division, Anchorage, AK
- Alaska Department of Transportation and Public Facilities, Fairbanks, AK
- State Historic Preservation Office, Anchorage, AK

Local Officials, Agencies, Commissions, and Boards

- Nenana City Mayor's Office
- Nenana Planning and Zoning Commission
- Nenana Chamber of Commerce
- Nenana Municipal Airport

Tribal Organizations

- Nenana Native Council
- Toghotthele Corporation
- Tanana Chiefs Conference
- Doyon Corporation

Others

- Businesses and Customers in Nenana
- Nenana Residents

5.0 LIST OF PREPARERS

At the request of the ARRC, URS prepared this EA for, and under the direction of, the FTA. TNH provided engineering support to the project, Northern Land Use Research, Inc. performed the cultural resources survey, and Mullins Acoustics prepared the Noise and Vibration Assessment. A list of the professional members of the EA team is provided below. The EA was reviewed by ARRC, FTA and BIA representatives.

URS Corporation

Brian F. Kovol	Project Manager, Biologist: M.S. in Biology, University of Alaska, Anchorage, 1998, 11 years experience
Robert Senner	Principal Scientist: Ph.D. in Biology, University of St. Andrews, Scotland, 1971, 27 years experience
James Aldrich, P.E., P.H.	Principal Hydrologist: M.S. in Environmental Science, 1979, University of Alaska, 29 years experience
James Glaspell	Senior Biologist: M.S. in Wildlife Management, 1973, Pennsylvania State University, 30 years experience
Jeffrey Oatley	Hydrologist: M.S. Water Resources Engineering, 2002, University of Alaska, Fairbanks, 14 years experience
Tara Howell	Environmental Scientist: B.A. Environmental Science, 1998, Alaska Pacific University, 6 years experience
Lisa Loy Gray	Project Environmental Planner: M.S. Natural Resources, 1998, Washington State University, 7 years experience
Jon D. Isaacs	Associate Planner: B.A. Environmental Studies, 1972, University of California, Santa Barbara, 30 years experience
Earl L. Kubaskie	Technical Illustrator: Computer Aided Drafting with AutoCAD, 1987, 20 years experience

Tryck Nyman Hayes, Inc.

Norman K. Gutcher, P.E.	Senior Associate Engineer: B.S. Civil Engineering, 1971, Oregon State University, 45 years experience

Northern Land Use Research, Inc.

Peter M. Bowers	Principal Archaeologist: M.A. Anthropology, 1980, Washington State University, 30 years experience
Peter J. Kriz	Staff Archaeologist: M.A. Anthropology, 2003, University of Alaska, Fairbanks, 8 years experience
Joshua D. Reuther	Staff Archaeologist: M.A. Anthropology, 2003, University of Alaska, Fairbanks, 8 years experience
Luke E. Schulze	Staff Archaeologist: B.S. Environmental Studies and Geology, 2002, Alfred University

Mullins Acoustics

Earl Mullins, P.E.	Principal Noise Consultant: B.S. Mechanical Engineering, 1983, Michigan Technological University, 20 years experience

6.0 REFERENCES

Alaska Department of Fish and Game (ADF&G). 1985. Alaska Habitat Management Guide, Interior Region. Map Atlas. ADF&G Division of Habitat, Juneau, Alaska.

Alaska Department of Fish and Game (ADF&G). 1987. Alaska's Wildlife and Habitat. ADF&G Division of Habitat Protection, Juneau, Alaska.

Alaska Department of Fish and Game (ADF&G). 1994. Wildlife Notebook Series. Retrieved from ADF&G website March 11, 2004: http://www.state.ak.us/adfg/notebook/notehome.htm.

Alaska Department of Fish and Game (ADF&G). 1995. Data on moose tagging studies in the Tanana Flats, 1993-1994. ADF&G Division of Wildlife Conservation, Information Management Section.

Alaska Department of Fish and Game (ADF&G). 2004. ADF&G Sport Fish Division, The Tanana River Drainage. Retrieved from ADF&G website March 23, 2004: http://www.sf.adfg.state.ak.us/region3/areas/ltan/ltanhome.cfm.

ADF&G and ARRC. 1991. Cooperative Agreement Between Alaska Railroad Corporation and State of Alaska Department of Fish and Game, Division of Wildlife Conservation.

Alaska Department of Labor (ADOL). 2000. Profile of General Demographic Characteristics. ADOL Research and Analysis Section, Demographics Unit.

Alaska Department of Natural Resources (ADNR). 1991. Tanana Basin Area Plan for State Lands. ADNR, Fairbanks.

Alaska Pacific River Forecast Center (APRFC). 2003. Alaska Breakup Map. Retrieved from APRFC website: http://aprfc.arh.noaa.gov.

American Association of State Highway and Transportation Officials (AASHTO). 2001. A Policy on Geometric Design of Highways and Streets. 4th ed. Washington D.C.: American Association of State Highway and Transportation Officials.

Baumgartner, Jim. 2003. Manager, Construction Permits, Alaska Department of Environmental Conservation, Air Permit Program, Juneau, Alaska. Personal communication with Brian Kovol of URS on November 10, 2003.

Bureau of Land Management (BLM). 1997. Northern Intertie Project, Draft Environmental Impact Statement. December 1997.

Carlton, D. 2004. Civil Engineer, Federal Insurance and Mitigation Division, Federal Emergency Management Agency. Personal communication with James Aldrich of URS on March 29, 2003.

CH2M Hill. 2002. Draft Parks Highway Corridor Management Plan, Vision Statement and Scoping Document, AKSAS Project Number 74833. Prepared for Alaska Department of Transportation and Public Facilities (ADOT&PF), November 2002.

Cowardin, L., V. Carter, F. Golet, and E. Laroe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. USFWS, Biological Services Program, Report FWS/OBS-79/31.

Department of Community and Economic Development (DCED), Alaska. 2004. Community Profile of Nenana. Retrieved from DCED website March 23, 2004: www.dced.state.ak.us/cbd/commdb/CF_BLOCK.cfm.

Federal Aviation Administration (FAA). 2000. US Airport Enplanement Activity for CY 2000. Retrieved from FAA website March 23, 2004: http://www.faa.gov/arp/Planning/v2.htm.

Federal Emergency Management Agency (FEMA). 1999. Flood Insurance Study; City of Nenana, Alaska.

Federal Emergency Management Agency (FEMA). 1999. Flood Insurance Rate Map, City of Nenana, Alaska.

Federal Transit Administration (FTA). 1995. Transit Noise and Vibration Impact Assessment, Final Report. Prepared by Harris Miller Miller & Hanson, Inc. for the US Department of Transportation, Federal Transit Administration, DOT-T-95-16, April 1995.

Ketzler, Joe. 2004. ARRC Nenana Foreman. Personal communication with Greg Lotakis of ARRC on July 26, 2004.

Koshak, S. 2004. Senior Engineering Technician, Golden Valley Electrical Association, Inc. Personal communication with Brian Kovol of URS on February 20, 2004.

Mayrand, Jason. 2004. Mayor of Nenana, Alaska. Personal communication with Brian Kovol of URS on February 20, 2004.

Mullins, E. 2003. Alaska Railroad Nenana Rail Realignment, Noise and Vibration Assessment. Prepared for URS Corporation, November 26, 2003.

National Resources Conservation Service (NRCS). 2003. Design Report, NRCS PS580, Streambank and Shoreline Protection, Tanana River at Nenana, Nenana, Alaska.

Northern Land Use Research, Inc. 2003. Cultural Resources Survey of a Proposed Railroad Re-Route in Nenana, Alaska. Prepared for URS Corporation, August 2003.

Peltz, L. 2003. Area Coordinator, National Marine Fisheries Service. Personal communication with Brian Kovol of URS on April 26, 2004.

Plumb, Ed. 2003. Hydrologist, National Weather Service. Personal communication with James Aldrich of URS on September 17, 2003.

Rafson, J. 2003. Alaska Department of Transportation and Public Facilities. Personal communication with Robin Senner of URS on October 30, 2003.

Selkregg, L. 1976. Alaska Regional Profiles, Yukon Region. University of Alaska, Arctic Environmental Information and Data Center. Prepared for the Office of the Governor and the Joint Land Use Planning Commission for Alaska.

Shinkwin, A. and M. Case. 1984. Modern Foragers: Wild Resource Use in Nenana Village, Alaska. Alaska Department of Fish and Game, Division of Subsistence, Technical Paper No. 91.

Smith, M.E., J.L. Hechtel, and E.H. Follman. 1994. Black bear denning ecology in Interior Alaska. International Conference on Bear Research and Management. 9(1):513-522.

Spindler, M. and B. Kessel. 1980. Avian Populations and Habitat Use in Interior Alaska Taiga. Syesis, Volume 13.

Tryck Nyman and Hayes, Inc. (TNH). 2003. Memo from Norm Gutcher, TNH, to Brian Kovol, URS Corporation, July 25, 2003.

United States Census Bureau. 2000. Census 2000 information. Retrieved from United States Census Bureau website March 24, 2004: http://www.census.gov.

United States Department of Agriculture (USDA). 1977. Soil Survey of Goldstream-Nenana Area, Alaska. USDA Soil Conservation Service. 45 p.

United States Department of Labor. 2004. Bureau of Labor Statistics, Employment/Unemployment Data. Retrieved from United States Department of Labor website May 18, 2004: http://stats.bls.gov/cps/home.htm.

United States Fish and Wildlife Service (USFWS). 1994. Unpublished Survey Data. USFWS, Migratory Birds-Raptors. Juneau, Alaska.

United States Geological Survey (USGS). 2003. Water resources of Alaska. Retrieved from USGS website: http://ak.water.usgs.gov.

URS Corporation (URS). 2003a. Alaska Railroad Nenana Rail Realignment, Scoping Summary Report. Prepared for the Alaska Railroad Corporation, July 25, 2003.

URS Corporation (URS). 2003b. Alaska Railroad Nenana Rail Realignment, Environmental Field Survey and Preliminary Jurisdictional Determination of Wetlands. Prepared for the Alaska Railroad Corporation, November 4, 2003.

URS Corporation (URS). 2003c. Alaska Railroad Nenana Bypass Track Realignment Environmental Assessment, Evaluation of Land Status and Related Issues. Prepared for the Alaska Railroad Corporation, July 11, 2003.

URS Corporation (URS). 2004. Alaska Railroad Nenana Rail Realignment, Preliminary Hydrology Assessment. Prepared for the Alaska Railroad Corporation, April 2, 2004.

Viereck, L.A., C.T. Dyrness, A.R. Batten, and K.J. Wenzlick. 1992. The Alaska Vegetation Classification, General Technical Report No. PNW-GTR-286. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, Oregon.