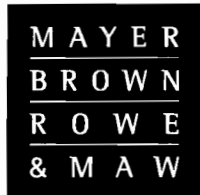


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March 30, 2007

VIA HAND DELIVERY

Ms. Victoria J. Rutson
Chief, Section of Environmental Analysis
Surface Transportation Board
1925 K Street, N.W., Room 504
Washington, D.C. 20423

Re: Finance Docket No. 34658, The Alaska Railroad Corp. -- Petition For Exemption From 49 U.S.C. §10901 To Construct and Operate a Rail Line Between North Pole, Alaska and Delta Junction

Dear Ms. Rutson:

On behalf of the Alaska Railroad Corporation, enclosed for your information in the above-captioned proceeding please find:

- (1) Two copies of "Applicant's Preferred Route Alternative Report", dated March 2007;
- (2) Two copies and one CD rom of a map set entitled "Applicant's Proposed Alignments," dated March 2007, Rev. 5.

Please let me know if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Kathryn K. Floyd".
Kathryn Kusske Floyd

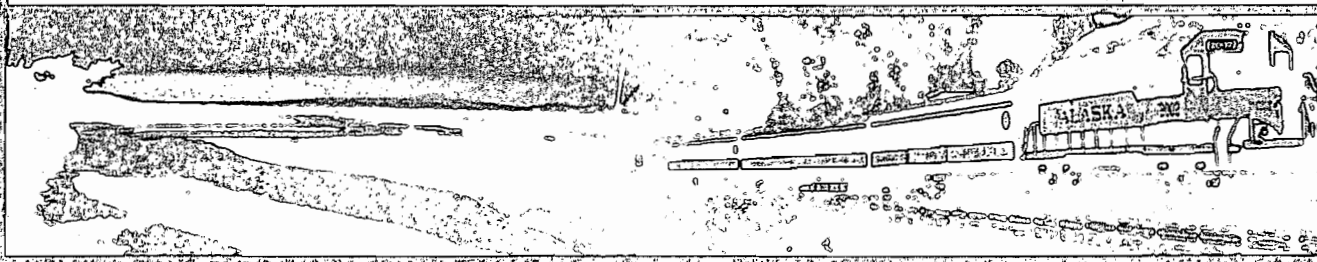
Enclosure

cc: David C. Navecky, SEA
Alan Summerville, ICF
Eileen Reilly, ARRC (w/o encl.)
Brian Lindamood, ARRC (w/o encl.)



March 2007

Applicant's Preferred Route Alternative Report *Alaska Railroad Northern Rail Extension Project*



Finance Docket Number 34658



**Alaska Railroad Corporation
Northern Rail Extension Project**

Applicant's Preferred Route Alternative Report

March 2007

Alaska Railroad Corporation
327 West Ship Creek Avenue
Anchorage, Alaska 99501

STB Finance Docket Number: 34658



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List of Abbreviations, Acronyms, and Short Forms

ARRC	Alaska Railroad Corporation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
ADOT&PF	Alaska Department of Transportation and Public Facilities
AFB	Air Force Base
APRA	Applicant's Preferred Route Alternative
DoD	Department of Defense
FRA	Federal Railroad Administration
Mph	Miles per hour
SEA	Section of Environmental Analysis
STB	Surface Transportation Board
UAF	University of Alaska Fairbanks
USARAK	U.S. Army Alaska

Glossary of Key Terms

Alignment	Portion of an alternative defining the route or corridor (as wide as 1,000 feet) consisting of one or more segments
Corridor	Specific project area that encompassed potential alignments
Route	An alignment connecting two points, used in the same context as 'alignment'
Segment	Portion of an alignment that can be assembled into alignments and alternatives



1.0 INTRODUCTION

The Alaska Railroad Corporation (ARRC)¹ prepared this Report for the purpose of identifying the Applicant's Preferred Route Alternative (APRA) for the proposed Northern Rail Extension. The objectives of the report are to (1) compare and evaluate the route alternatives as provided in the Route Alternative Analysis (2006), (2) propose a preferred action based upon this analysis for consideration by the Surface Transportation Board (STB)² for the proposed project, and (3) provide minor alignment adjustments to the APRA resulting from further engineering refinement and attempts to reduce potential impacts.

Section 1.0 of this report provides background information and a description of the proposed project. Section 2.0 summarizes the ARRC's preferred route alternative³. Section 3.0 summarizes the comparison criteria used in the comparison of each alignment alternative to select the preferred route alternative. Section 4.0 documents and compares the relative potential impacts and benefits of the alignment alternatives in each segment. Section 5.0 discusses route alternatives recommended to be removed from further consideration. Section 6.0 provides documentation and discussion of the alignment refinements to the APRA.

1.1 Project Overview and Objectives

The ARRC proposes to extend the existing railroad system from a point on the existing Eielson Branch near North Pole to the Delta Junction area, a distance of approximately 80 miles. The project would start at the Chena River floodway structure (approximately Mile 20 on the Eielson Branch) and terminate in the Delta Junction area. The purpose of the project is to develop a safe and reliable all-weather rail connection to support anticipated freight and passenger needs along the project corridor. The objectives are to align the route, to the extent possible, to:

- Support commercial freight needs for communities and businesses, including the agricultural, mining, and petrochemical sectors.
- Support passenger service needs and area tourism by providing safe and reliable transportation alternative to the Richardson Highway.
- Provide improved access to the military training areas on the west side of the Tanana River.
- Be designed and constructed to standards that allow Federal Railroad Administration (FRA) Class 5 Track Standards to be easily met and maintained.
- Enhance constructability by minimizing route length and maximizing the use of areas with favorable geotechnical conditions.
- Minimize potential impacts to privately owned land, local communities, and avoid where practical environmentally sensitive areas.

¹ The Alaska Railroad Corporation (ARRC) is a self-sustaining, full service railroad providing freight and passenger services to communities from the port at Seward to the greater Fairbanks area in the interior of the state. Owned by the State of Alaska, one of the priorities of the railroad is to foster the development of Alaska's economy. As part of that effort, the ARRC considers opportunities to expand and improve transportation infrastructure and services in the state.

² The STB is the lead agency under the National Environmental Policy Act (NEPA) for preparing the EIS. The Board's Section of Environmental Analysis (SEA) is responsible for conducting the environmental review process and making recommendations to the STB. Cooperating federal agencies include the Federal Railroad Administration (FRA), Bureau of Land management (BLM), Federal Transit Administration (FTA), U.S. Air Force 354th Fighter Wing Command, U.S. Army Corps of Engineers (USCOE), U.S. Coast Guard (USCG), U.S. Department of Defense Alaskan Command (ALCOM). SEA, together with the cooperating agencies, will decide which alternatives will be studied in the EIS.

³ A complete description of all of the alternatives carried forward up to this point can be found in Applicant's Alignment Alternatives Report, July 2006.



1.2 Project Description

The Alaska Railroad operates and maintains a 29-mile long branch line that runs from the yard facilities in Fairbanks south and west through the community of North Pole, Alaska to Eielson Air Force Base (AFB). The Northern Rail Extension would tie into existing track at approximately Mile 20 of this branch line. Major elements of the project would include:

- Approximately 80 miles of new railroad track.
- Crossings of the Tanana River, Little Delta River, Delta Creek, Delta River, and, depending on the alignment, the Salcha River and Little Salcha River (along with many other small stream crossings).
- Grade separated crossings of the Richardson and Alaska highways depending on the alignment.
- Pipeline and utility crossings, including at least one crossing of the Trans-Alaska Pipeline System (TAPS).
- Sidings and support facilities for passenger, freight, and maintenance operations.
- Ancillary railroad support facilities including, but not necessarily limited to: communications towers and facilities; power; signals; and access roads.

The project may include a spur line to the Blair Lakes Range and/or other facilities to support military operations (sidings, off-load facilities, and end-of-track facilities).

1.3 Applicant's Alternatives Study Process

Applicant's study of the alternative alignments has been ongoing. Throughout the process, ARRC has provided updated information to the STB based on the best information available at the time. During the initial study phases, the ARRC produced several map sets between July 2005 and March 2006 providing multiple alignments between North Pole and Delta Junction. The alignments as presented in these map sets effectively established a study corridor for the project. The study corridor was then further dissected into separate alignments which were then screened for further consideration and analysis. This screening process culminated in the presentation of the Alignment Alternative Analysis and accompanying Map Set Revision 4 produced in July of 2006.

Since that time, particularly during the late summer and fall of 2006, the ARRC undertook a substantial field program and engineering effort in an attempt to gather further information on each of the alignment alternatives. The purpose of these continuing efforts has been to identify Applicant's Preferred Route Alternative and to refine, where appropriate, the design related to each alignment taking into account new information.



2.0 APPLICANT'S PREFERRED ROUTE ALTERNATIVE

ARRC's preferred route alternative for the Northern Rail Extension Project is the combination of: **Eielson East, Salcha West, Tanana West, Donnelly West, and Delta South.**

The results of ARRC's comparison of alignments are summarized in Table 2.1. This table ranks each alignment alternative by segment, with the highest number being the best, lowest value being the least desirable. Where the potential impacts are essentially uniform across all of the alternatives for an individual segment, the values assigned are zero across the category. Where two out of three alternatives are equivalent when compared to the third, the values reflect the equal merits.

TABLE 2.1.

Segment	Total	Land Use	Wet lands	Construc- tability	Operation	Maint- enance	Grade Crossings	Cultural Resources	Habitat	Railroad Traffic	Comments
<i>Eielson</i>											See Discussion, Section 4.1
East	5	2	2	-	-	-	1	-	-	-	
West	4	1	1	-	-	-	2	-	-	-	
<i>Salcha</i>											
East	13	2	1	1	1	2	2	2	2	-	Significant geotechnical concerns
Central	12	1	2	2	2	1	1	1	2	-	Land-use and cultural resource impacts
West	23	3	3	3	2	3	3	3	1	-	Preferred Tanana River crossing location
<i>Tanana</i>											
East	6	-	1	-	1	2	-	2	-	-	
West	6	-	2	-	2	1	-	1	-	-	
<i>Donnelly</i>											
East	11	1	1	2	3	-	-	2	1	1	Fish habitat and wetland impacts
Central	10	2	1	1	2	-	-	1	2	1	Wetland and cultural resource impacts
West	15	2	2	3	1	-	-	2	3	2	Significant long, steep grades
<i>Delta</i>											
North	3	1	-	-	-	-	1	1	-	-	Land use impacts and multiple grade crossings
Central	3	1	-	-	-	-	1	1	-	-	Land use and possible airport impacts
South	7	2	-	-	-	-	2	2	-	-	Fewest land use impacts



3.0 COMPARISON METHODOLOGY

The Alignment Alternatives Report published in July 2006 relied on existing information assembled from previous studies and reports. Since that Report was issued and through fall 2006, ARRC has undertaken extensive field and data collection efforts. New information gained from these efforts has allowed ARRC to further compare the individual alignment alternatives. In addition, information about the alternatives was obtained during meetings with officials from various state and federal agencies from which ARRC needs to obtain project permits or clearances.

3.1 Comparison Approach

ARRC believes the engineering and environmental differences between the alignment alternatives in key areas provide a basis for the selection of a preferred route alignment. Based upon the additional data collection and analysis, ARRC identified several categories that could be assessed and compared between the alignment alternatives. These categories, which are described below, include both environmental considerations and practical engineering concerns relating to constructability and railroad operations. If certain resource impacts typically evaluated in an EIS (e.g., air quality and endangered species) were found to be relatively uniform across all alignment options and of little value in terms of comparison in identifying a preferred route alternative, there were not included in the comparative analysis of this Report.

3.2 Comparison Criteria

Land Use

Land use issues considered a variety of factors including ownership and how land through the corridor alternatives is used. The routes under consideration cross a wide variety of land use and ownership. Only lands which are currently being used for active military use or active transportation corridors (TAPS or roadways) were presumed to be unobtainable for linear right-of-way acquisition purposes. Although total quantities of affected property were considered, the severity of potential impacts based upon existing land use was weighed (from most sensitive to least) as follows:

- Public Recreational (e.g. parks/schools, etc.)
- Private Residential
- Private Agricultural/Commercial
- Native
- State Mental Health Trust
- University of Alaska
- Bureau of Land Management (BLM) military reserve
- BLM non-reserved
- Alaska Department of Natural Resources (ADNR)

Wetlands

A large portion of the interior of Alaska is considered wetland habitat. Given the project corridor described in previous documents and associated map sets, wetlands avoidance is not practical. The area contains a variety of palustrine and riverine wetlands and wetlands mapping shows that all of the



proposed alternatives would result in similar amount of gross area potential impacts. Therefore, the alignment alternatives comparison focused more on the actual type of wetlands impacted. Those wetland systems associated with surface water systems generally assigned a greater value than the isolated wetlands.

Operational Considerations

Unlike the situation in the lower 48 states where most new rail construction has the potential to affect populated areas, the proposed corridor for the Northern Rail Extension project is sparsely populated. Because of this, the proposed corridor offers multiple available routes with adequate room for horizontal geometric considerations. Furthermore, the various route combinations yield total mileage for the project within 5% of each other. Other operational concerns include gradient and total amount of curvature. Gradient affects operations with respect to fuel consumption, maintenance, the number of locomotives relative to traffic, and ultimate line capacity. A flat railroad, for example, is more economical to operate than a hilly one with all other aspects being equal. Likewise, the total curvature affects total route length, as well as long-term maintenance considerations.

Maintenance

Although track maintenance is a function of many factors including location, gradient, and curvature, the continued work to maintain track alignment through areas of poor geotechnical conditions and bank erosion from waterways represents a much higher annual incremental expense. Although some of these negative effects can be mitigated through more robust construction methods, they are often limited in their success in completely alleviating the maintenance problems.

Road Crossings

The need to cross roadways is another factor to evaluate in connection with the alternative routes. Road crossings represent a significant monetary investment for ARRC as they require either construction of grade separations or use of active warning devices for at-grade crossings. Where crossings are at grade, there remains a safety risk (including possible train-vehicular collisions) regardless of the crossing warning devices employed. In addition, the sounding of horns to give advance warning of trains approaching at-grade crossings produces noise. Finally, where two roadways cross the proposed corridor in relatively close proximity to one another, the two may be proposed to be combined into a single crossing, resulting in a small, but continual inconvenience to the current roadway users.

Cultural Resources

The Tanana River system, with the bluffs overlooking a large river valley, has been inhabited and used by peoples for thousands of years. The sparse modern human development, coupled with the remote location of a large portion of the project area, means that there is relatively little available field data about the possible historic sites along the proposed alignment alternatives. The only data available for comparing of the potential impacts of alignment alternatives to archeological resources has been developed by Northern Land Use Research, a subcontractor to the STB's third-party consultant. Based on this information, two general types of sites have been identified; those with established historical significance, and those which have the potential of containing archeological resources. Although the preference would be to avoid all cultural resource sites, more emphasis was placed on avoiding sites with established significance.

Constructability

Two of the largest components of the proposed construction include railroad embankment and bridge construction. The largest risk associated with embankment construction is poor geotechnical conditions. Although some preliminary geotechnical work had been completed in 2005, this field program was expanded in 2006 to supplement the available data. Further consideration was given to the amount of



excavation/grading that would be required to construct the railroad embankment. Large fills would require a significant amount of embankment material, which would likely have to be mined from borrow sites along the route, increasing the overall potential impact. In addition, deep cuts run the risk of icing and ground water issues, which would likely affect the long-term serviceability of the proposed alignment.

Construction considerations associated with bridge construction are a function of total bridge length and restrictions on bridge types or construction methods due to sensitive environmental issues. Additionally, there are four river crossings of large braided rivers that may require special design considerations including river training structures.

Habitat

Habitat considerations fall under two categories, aquatic and terrestrial. In addition to data that has been made available by ADNR, two years worth of field data has been collected to provide information on fish residence, passage, spawning, and rearing habitat. Potential impacts associated with traversing or construction through these areas has been considered in comparing alignment alternatives.

Discussions with several agencies have not resulted in the identification of threatened or endangered species located within the project area. The relatively small potential impact of the proposed project to the overall area is not expected to have substantial impact upon migratory birds. Two years of data has been collected on the presence of raptor nests in the project corridor. These data were considered during alignment placement. Though multiple protected species have been identified to be nesting within the project area, the project is not expected to have substantial potential impact on habitat. Based upon meetings with the Alaska Department of Fish and Game (ADF&G) and ADNR, the primary game animal of concern is moose on certain segments.

Freight and Passenger Traffic Base

Preliminary traffic projections indicate that the origin/destination points for freight and passenger rail service are in the following three locations: Tanana Flats/Blair Lakes Training Area, Donnelly Training Area, and Fort Greeley/Delta Junction. The alignments that best position the railroad for service to these areas were given favorable consideration.



4.0 ROUTE ALTERNATIVE COMPARISON

This section of the Report analyzes the relative merits of the alignment alternatives in each segment. Next to the heading of each subsection, in parentheses, is ARRC's preferred route alternative and the other alternatives not selected with the relative comparative ranking from Table 2.1 above (with the highest number being the best). ARRC's preferred route alternative for the Northern Rail Extension Project is the combination of: **Eielson East, Salcha West, Tanana West, Donnelly West, and Delta South.**

Analysis by segment is particularly easy for the three southern segments (Tanana, Donnelly, and Delta) due to the common termination points for these segments. With the exception of the Tanana alternative, the selection of one segment does not have a significant effect on adjoining segments. Although less congruous, the northern segments (Tanana and Eielson) are also somewhat interchangeable, except that nearly one-third of the Eielson alternatives would be truncated by the selection of the Salcha East alternative. The Tanana River crossings themselves are a function of the location of the Salcha alignment alternatives, and the relative merits of each location are compared in this analysis with regard to constructability.

4.1 Eielson (ARRC's Preferred Alignment is East (5); West (4) was not selected)

The first halves of both Eielson alternatives have similar potential impacts with respect to wetlands, cultural resources, railroad operations, constructability, and habitat. However, after the divergence of the Salcha East alternative, the Eielson West alternative shifts to closely follow the Tanana River rather than the Richardson Highway. At the point of departure, there is an opportunity to cross over between Eielson East and Eielson West. To capitalize on this crossover opportunity, the ARRC has added a connection between Eielson East and Eielson West (these have been previously called 'variants') effectively bifurcating the two Eielson alternatives north-to-south (See Map Set Revision 5, maps 3 & 4). For this reason, a comparison of 'Eielson North' and 'Eielson South' is presented below.

Eielson North

Although the number of at-grade crossings along the northern portion of Eielson East is significantly more than Eielson West (six versus two), only one is a public road with any substantial average daily traffic. The majority of the crossings along Eielson East are dirt or gravel roads associated with old gravel pits along the Richardson Highway. These crossings could potentially be consolidated as the engineering effort is further refined.

Land ownership and use are important factors in comparing the northern portion of the Eielson segment alternatives. Eielson West remains to the southwest of Pile Driver Slough on private property within the Eielson Farm District. Community concerns over the project's affects upon land use (Eielson West) need to be weighed against the military's long-term plan for a second parallel runway for Eielson AFB (Eielson East). If that runway were to be built, it would require relocation of the Richardson Highway, a major electric transmission line, and the Eielson East alternative.

Although the northern portion of Eielson West as it is currently being considered would only have the potential to materially impact one farm, its location along the south side of Pile Driver Slough would place it closer to farm residences within the district. By contrast, Eielson East, and the land area between the Richardson Highway and Pile Driver Slough, has already been substantially impacted by gravel mining operations. Comparing Eielson West and Eielson East with respect to the prospect for traffic generation does not reveal any practical advantage. Although the proximity of Eielson East to a major highway may make adjacent land development along more attractive to rail-traffic generating businesses, the adjacent area's land status as military reserve would likely be a limiting factor for much economic development.



In weighing these two alternatives, it would be the ARRC's preference for the Eielson East alignment alternative through the northern portion of the Eielson Segment. This "Eielson north" preference takes into account the potential property impacts, the views of the Eielson Farm District and the existing land disturbance along the Richardson Highway. Despite ARRC's preference for Eielson north, however, there are a number of unknowns factors that could make Eielson north infeasible and unreasonable. For example, the feasibility of Eielson north is contingent upon the military's consent to the railroad being located through the area. Any written agreement between the ARRC and the military must provide that any costs associated with railroad relocation at a future date would not be borne by the ARRC. In addition, there are details to be worked through with BLM on the grant of the right-of-way to the ARRC. Because discussions between the Military, BLM and the ARRC have not yet progressed to the point such where these kinds of concerns have been addressed, the feasibility of Eielson north is still being investigated. It is the ARRC's preferred alignment alternative contingent on the resolution of these issues.

Eielson South

South of mile post 10 (MP 10), Eielson East remains roughly parallel and $\frac{1}{4}$ to 1 mile from the Richardson Highway, while Eielson West shifts west to parallel the east bank of the Tanana River. Eielson East has one more public grade crossing (for a total of two) than Eielson West. Both alternatives have similar overall potential impacts relating to habitat, wetlands and private property. While Eielson West appears to have a greater potential impact on riverine wetland systems, Eielson East's potential impacts are likely to affect isolated wetlands.

A portion of the terrain traversed by the southern half of Eielson East has mostly been cleared for farm use. By contrast, the latter half of the southern portion of Eielson West has not been developed. The total number of land owners likely to be directly impacted by Eielson East (i.e., would require property acquisition and/or residence relocations) is less than Eielson West, as the land use directly and indirectly affected (e.g., noise) along Eielson West is largely residential. Further, the single public at-grade crossing along Eielson West would be in a residential, rather than agricultural setting, resulting in greater potential for noise impacts. Long-term serviceability of the railroad grade, and subsequent construction cost allowances are a greater concern for the southern portion of Eielson West due to its proximity to the Tanana River.

Taking into consideration property, wetland, and serviceability concerns associated with the southern portion of Eielson West, the ARRC is selecting Eielson East as its preferred alternative on this portion of the Eielson Segment. If Eielson West were to be the only possible alternative available on the northern half of the Eielson Segment (for the reasons discussed above), the crossover between the two route alternatives near mile 10 would be utilized to connect the two segments.

4.2 Salcha (ARRC's Preferred Alignment is West (23); East (13) and Central (12) were not selected)

Of the three Salcha route alternatives and the issues associated with each, none is more prominent than the constructability issues associated with the Tanana River crossing. Two crossing options remain for consideration. Down-river is the crossing of the Salcha West alternative (Salcha crossing) at an unusually narrow part of the Tanana River. The Salcha East and Salcha Central alternatives share the Flag Hill crossing location nearly ten miles up river. The Flag Hill location originated from the 2003 UAF study for USARAK, and crosses near a unique geologic rock extrusion on the east bank of the river.

The Tanana River, although not unique to the region, has a number of characteristics which are not common throughout the continental United States. The river is characterized as relatively fast-moving, braided, consisting of multiple channels spaced across a wide flood plain, dynamically moving laterally



over relatively short periods of time. The river is capable of moving large amounts of debris and gravel during higher flows.

The technical challenges associated with crossing this type of river are four-fold.

1. The outer banks must be fairly stable. The Tanana River Valley through the northern portion of the proposed project area is fairly wide, and there are no defined topographic features (e.g., hills) that restrict the laterally meandering nature of the river.
2. As the river braids move, appear, and disappear, the flow carried by any given channel is highly variable. The majority of the total river flow could be carried through nearly any point across the river channel.
3. The river carries a lot of other material other than water, including trees, debris, gravel, and rocks. Bridge structures can snag the wood and debris, altering the flow characteristics resulting in rapid changes in bed load deposits or river bed scour.
4. Although the overall river body is moving in a relatively linear direction, the individual braided channels can move more than 90-degrees out of phase with the river body. Even if a bridge is located to cross the river perpendicular to the river flow, the water may strike portions of substructure across the broad longitudinal face, resulting in inefficient water passage and affecting the location of bed load deposition.

From an environmental standpoint, these crossings also present challenges. The slower-moving side channels provide easier movement for migrating fish. As older channels decline and become isolated the main stem of the river, they may become, at least temporarily, wetland habitat, or clear-water fish rearing habitat. It is the meandering nature of these rivers that provides this type of habitat. Restricting the river to a single location can affect the river morphology for a significant distance up and down stream of the actual bridge location.

The total volume of water which needs to be conveyed at either location is similar ($Q_{100}=110,000$ cfs at Flag Hill, 125,000 cfs at Salcha) for a drainage area exceeding 17,000 square miles. From an entirely hydraulic position, the required bridge openings for less than a one foot rise become approximately 1,300 feet for Flag Hill and 2,400 feet for Salcha. Yet when all the technical and environmental aspects are considered, it is clear that analyzing the river crossing location of the Tanana River is more than a simple issue of conveyance.

One of the attractive aspects of the Flag Hill crossing is that the east bank is relatively fixed by a hard rock hill, which prevents the channel from moving to the east. The river channel is hitting the east face of the hill directly, and then flowing around the south side of the hill through several significant channels. The west bank is less defined. Review of the topography and the gravel bars within the active river braids suggests that the river channel is very dynamic in this area. The vegetation on the gravel bars is young, and the individual channels seem to vary widely over time relative to both location and the amount of water they convey. The western edge of this active movement appears to be up to 5,300 feet from Flag Hill. The dynamic nature of the channel morphology in this area is likely directly related to turbulence from the river acting on Flag Hill.

The Salcha crossing is an area where nearly all of the channels converge to a single channel with the exception of a single back channel along the west bank. It is clear that the majority of the flow is in a single location, and the vegetation on the adjacent banks is older and well-established. The total channel width is only 3,800 to 3,900 feet, with the additional channel about 75 feet wide, and about 1,500 feet west.

The channel width and morphology are both considerations when establishing ultimate bridge length. Given the dynamic nature of the water flow across the river channel, the location at Salcha is significantly



more attractive because the volume of water flow is concentrated through a specific area. At Flag Hill, one approach would be to cross the individual channels with a series of shorter bridges. However, the dynamic nature of the river can result in significant and sudden changes in the amount of water which must be conveyed at each one of these bridges. Further, the channels at Flag Hill are evidently younger (based upon vegetation), which would suggest that their specific location is not fixed. To attempt crossing at Flag Hill with a series of smaller bridges would require not only fixing the existing channels in their present location, but also installing river training structures which would limit the amount of channel migration at each location. Given the turbulent nature of the river acting on the east face of Flag Hill, this sort of river training would be both extensive and difficult. Any ineffectiveness in river training would result in significant maintenance expense and a risk of catastrophic failure of the crossing structure. This significant in-river work would have to be complemented with river shore training along the west bank to keep the river toward the Flag Hill side of the overall channel. The only remaining option would be to increase the bridge length to more closely resemble the overall channel width (5,300 feet at Flag Hill).

In contrast, at Salcha the main channel of the river is already in a relatively narrow location. Though river training along the upstream banks would be required similar to Flag Hill, the amount of in-river training expected would be relatively minor, if at all. The bridge length would be near the 2,400-foot conveyance limit and the overall channel width of 3,900 feet, and likely significantly shorter than Flag Hill. The only issue at Salcha is the existing back channel off the west bank. This channel does not appear to presently carry a significant amount of flow, but it is a resident fish habitat area. A bridge crossing at this location would require limiting the ultimate flow through the channel, as well as maintaining the habitat that the channel represents and mitigating for potential impacts.

When comparing the three Salcha alignment alternatives with respect to land use, Salcha West has clearly the fewest potential impacts. The route is almost exclusively military reserve with the exception of one or two residences on the west bank of the Tanana in the vicinity of the river crossing. The military use of the Tanana Flats Training Area near the river at the Salcha West location is anticipated to be minimal, providing a buffer near the Tanana River and some egress during winter months.

Salcha Central would likely have substantial land use impacts. The proposed alignment would use private residential and commercial property from the divergence of Salcha West to the Salcha River. There remain two bluffs between Salcha and Flag Hill where the Richardson Highway is located on a narrow shelf between the hill and the Tanana River. In both locations, the proposed route would relocate the highway farther into the bluff and assume the location of the highway by the river. At the southern location, the roadway shift may require the relocation of the Salcha School. The Salcha Central alignment crosses the Salcha River near its confluence with the Tanana River. The property traversed through this area is native-owned.

The Salcha East alignment alternative remains on private land between Eielson AFB and the Salcha River. The area is sparsely populated with some farming, with the exception of the area crossing Johnson Road which has more residential development. As with the Salcha Central alignment alternative, Salcha East would cross the Salcha River on a combination of native property and residential properties built along the Salcha River before crossing the Tanana near Flag Hill.

Potential wetland impacts associated with the three Salcha alternatives are very different. Though some small areas of isolated wetlands exist along Salcha West, the predominance of the corridor is uplands or forested scrub wetlands. Salcha Central, following the east bank of the Tanana, would potentially impact riverine wetlands located near the confluence of the Salcha and Little Salcha rivers with the Tanana River. Salcha East has the largest potential impact on wetlands associated with the Salcha and Little Salcha river systems, as well as potential impacts to some wetlands at the southern end of Eielson AFB.



Soil conditions for the Salcha West and Central alternatives are not expected to be a concern. However, soil conditions for Salcha East include a significant amount of frozen ground and difficult/thick peat and organic layers. These soil conditions are anticipated to make construction both costly and difficult. Furthermore, Salcha East would have two significant hills to traverse whereas the other two options remain closer to the Tanana River valley floor.

Both Salcha Central and Salcha East cross the Salcha River downstream of the Richardson Highway. The ARRC has taken a preliminary hydraulic and hydrologic examination at this river crossing and is expecting a required bridge crossing length of nearly 2,000 feet. This represents a length nearly double that of the Richardson Highway crossing of the Salcha River. The cost associated with a structure of this length is anticipated to be significant and prohibitive.

The Salcha West alignment alternative has no apparent grade crossing or potential roadway impacts, but Salcha Central and Salcha East would have such potential effects. Salcha East would be grade-separated with the Richardson Highway at both Eielson AFB (highway over) and north of the Salcha River (railroad over). Additionally, there would be eight public at-grade crossings (Aicuz Ave., TAPS access road, Johnson Road, Canaday Road, Country Road, Flag Hill Road, and two unnamed roads). The Salcha Central alignment alternative would require four at-grade crossings (Old Richardson Highway (2), Ruger Trail, Country Road), and two significant relocations of the Richardson Highway at Salcha and Salcha Bluff, likely totaling over two miles in length.

Both Salcha Central and Salcha East cross and would likely impact an area of substantial interest near the Salcha River. The Salchaket area is the likely location of historic and archeological resources. Though the Salcha East alternative might be shifted east to avoid the area of interest, Salcha Central cannot. No areas of cultural interest were identified along the Salcha West alignment alternative.

The only habitat related issue identified through this segment is located along Salcha West (and the entire Tanana Segment). This alignment traverses one of the most prolific moose calving areas in the state of Alaska. Possible impacts relating to the proposed construction of a railroad line through the area are not known, but have been raised as a concern by the ADF&G. A literature review by both the state and ARRC has resulted in the documentation of many types of moose mitigation having been implemented, but nothing conclusive to measure their effectiveness. Based upon this lack of conclusive data, the ARRC is in the process of developing a MOU with ADNR and the University of Alaska to further study moose/train collisions in order to relate environmental and topographic variables with casualties. It is proposed that the results of this study would be the basis for potential moose mitigation through this area at the time of construction.

Based upon available information, the Salcha West alternative stands out as the least expensive route alternative to construct. It also presents the least total potential impacts with respect to river training, wetlands, land-use, roadways, and cultural resources. Although one area of unknown potential impacts is to the moose population, but the ARRC has taken the initiative to address this issue. Based on all of these considerations, the ARRC therefore is selecting the Salcha West alignment alternative as part of its preferred route alternative.

4.3 Tanana (ARRC's Preferred Alignment is West (6); East (6) was not selected)

The Tanana alignment alternatives connect the Salcha and Donnelly alignments. Tanana East parallels the Tanana River within a mile and Tanana West is 1 to 2 miles farther inland. A variant to Tanana West (V1) climbs the west ridge defining the river valley to connect to the Donnelly West segment. Three differentiating considerations were used to compare the alignments: wetlands, rail operations and cultural resources.

Tanana East, located closer to the Tanana River, has greater potential impacts to wetlands, particularly those associated with water systems and back channels of the Tanana River. The close proximity to the



river is a long-term maintenance concern, as the Tanana River continues to meander and shift significantly from year to year. The Tanana West alternative reduces potential wetland impacts, and is farther from the river, alleviating some of the river morphology concerns.

The Tanana West variant alignment further reduces potential wetland impacts, although it introduces significant grades to climb the ridge that defines the Tanana River channel. This long, sustained incline (1.0%) represents the ruling operational grade for east-bound rail traffic. Furthermore, the analytical modeling conducted as part of the cultural resource investigation predicted a higher possibility of cultural resource sites located along this ridge.

The deciding factor in selecting among the Tanana alignments is related to the selection of the Donnelly Alternative (see section 4.4). Tanana West (including the V1 variant) can join all three of the Donnelly segments, but Tanana East cannot connect to Donnelly West due to grades. It appears that the additional potential impacts to wetlands are comparative to the potential impact to cultural resources such that either alternative would be equally attractive. Based on the selection of the Donnelly Segment as a preferred alternative, the ARRC is selecting the Tanana West segment (with V1 variant) as its preferred alignment.

4.4 Donnelly (ARRC's Preferred Alignment is West (15); East (11) and Central (10) were not selected)

The Donnelly segment (approximately 25 miles) is the longest of the five segments. Two of the alignment alternatives (Donnelly East and Donnelly West) represent very different routes in terms of operations, terrain, and potential impacts. Donnelly Central is a combination of the two, paralleling Donnelly East for the first quarter of the length, then traversing along the base of the Tanana River basin, and connecting with Donnelly West over the last quarter of the segment. Both Donnelly East and Central travel along a narrow shelf between a large hill and the Tanana River. Donnelly Central climbs along the steel west bank of the Little Delta River to the south of the ridge, then cuts across the river canyon to intersect a narrow cut in the east cliff face to continue the steep climb to the divide between the Little Delta River and Delta Creek.

Operationally, both the East and Central segments have relatively mild gradients when compared to Donnelly West. However, the first several miles are on the north facing slope of a large hill exhibiting seeps and icing conditions. Furthermore, the Tanana River is actively cutting toward and into the base of this hill, which limits the railroad's ability to locate away from the base of the ridge. Donnelly Central continues this path 10 miles to Delta Creek.

Once into the wider river plain, Donnelly East travels through an area of ground water upwellings and is known to contain quicksand-type conditions. Donnelly Central, upon crossing Delta Creek, traverses one of the worst geotechnical areas found to date before joining Donnelly West (including substantial wetland systems, large amounts of frozen peat, and ground water upwelling). In contrast, Donnelly West, at an elevation several hundred feet higher, is in an area with a shallower depth of peat over sand and gravel. Although the ground is frozen, the geotechnical conditions along the Donnelly West alignment are far less troublesome with respect to construction, provided the alignment remains north of the glacial outwash south of Whitestone Farms.

The central portion of Donnelly East traverses through sensitive habitat with many clear backwater channels and areas fed by clear springs year round. These areas are prime spawning and rearing habitat for salmon and other fish species. Mitigation for potential impacts to these areas would be very difficult because the water system and clear water sources are not well known or defined. Donnelly Central avoids many of the clear water systems, but has a great likelihood of potential impacts to other high value wetlands. Donnelly West largely avoids these sensitive habitat areas.

Conflicting land use is present along Donnelly East and several of the clear water streams near Delta Creek where there is a concentration of summer/vacation cabins, several of which would be directly



affected. Donnelly West is located inside the northern boundary of the military's Donnelly Training Grounds, but in a buffer area. The location of a railroad within this buffer area would provide positive definition to the military lands, which may be construed as a benefit to the military.

Both Donnelly East and West share a similar level of probability relating to archeological sites. Donnelly Central, however, shows a very high probability of multiple cultural sites along the base of the north-facing bluff.

All three alignment alternatives share the same corridor along the southern edge of the farm district. Traffic potential through the area would be generated from the Donnelly Training Area and the Whitestone Farm District. During meetings with military planners, strategies for the continued development of training areas on the south side of the Tanana River were discussed relevant to possible railhead facilities. The ideal location for the Donnelly Training Area is thought to be at the northwest corner near the military's existing winter road. Based upon this information, a spur closely following the Donnelly West alignment may be considered by the military if one of the other two Donnelly alternatives were ultimately selected and constructed.

Based upon these considerations, ARRC is selecting as its preferred the Donnelly West alignment.

4.5 Delta (ARRC's Preferred Alignment is South (7); North (3) and Central (3) were not selected)

Of the three Delta alignment alternatives, Delta South is substantially better than Delta Central and Delta North with regard to land use, constructability, grade crossings, and cultural resource considerations. Both Delta North and Delta Central cross the Delta River north of the Delta Junction central business district, requiring multiple separated grade crossings including the Richardson Highway, the Alaska Highway, and potentially others. The grade separation of the Richardson Highway near the Delta Junction airport may affect the airspace/approaches due to the vertical requirements for the overpass. The two northern routes bisect the city along a north-south access, potentially restricting future community development. Also, a substantial number of private and commercial properties would potentially be impacted for right-of-way acquisition and potentially from noise and vibration. Finally, several cultural sites have been identified in Delta Junction, which both the North and Central routes may impact.

By contrast, the Delta South alignment bypasses the main portion of the city, and runs along the border between the Fort Greeley military reservation and private/commercial interests to the north. The railroad would cross over the Richardson Highway, and then return to ground level as the alignment becomes parallel to the Alaska Highway. Terminal and potential military railhead facilities would be located with easy vehicular access for both in an area with sparse residential development. For these reasons, the ARRC is selecting as its preferred the Delta South alignment alternative.



5.0 ALTERNATIVES THAT COULD BE DISMISSED FROM DETAILED STUDY

The analysis of field data collected during the fall of 2006 has provided for continued comparison of the alternatives identified in the July 2006 Alignment Alternatives Report. This further examination has revealed that certain routes have potential impacts which either individually or collectively render those alternatives impracticable, unreasonable, or less environmentally preferable when compared with the other alignment alternatives. The ARRC therefore proposes that the alignment alternatives discussed below be dismissed from further detailed analysis.

5.1 Salcha East

The Salcha East alignment alternative is expected to have potential impacts to wetlands, private and native lands, and is known to have great amounts of frozen peat. Furthermore, the alternative may also impact cultural resources in the Salchaket area. The grades required to cross the two bluffs are not favorable. These are all expected to significantly increase the cost of construction. Additionally, the cost of two additional bridge structures crossing the Richardson Highway and the Salcha River would increase the construction cost beyond what is reasonably feasible when compared to the Applicant's Preferred Alternative. For these reasons, the ARRC recommends that Salcha East be dismissed from further analysis.

5.2 Salcha Central

Like Salcha East, the Salcha Central alternative poses substantial potential impacts to private property as well as potentially affecting cultural resources. The costs to relocate the Richardson Highway in two locations is expected to be equivalent to the two grade separations associated with Salcha East, resulting in the cost to construct Salcha Central to be of similar magnitude and outside what is reasonably feasible when compared to the Salcha West alignment alternative. Stabilization and maintenance of the Tanana River bank in two locations is expected to be a costly ongoing maintenance concern. Further, there would likely be impacts to the Salcha School that would need to be addressed should this alignment be carried forward. Given these considerations, the ARRC recommends that the Salcha Central alignment alternative be dismissed from further consideration.

5.3 Donnelly Central

There were three alignments through the Donnelly Segment which were identified in the July 2006 Alignment Alternatives Report. Of these three, Donnelly Central represents the Applicant's least desirable option due to potential cultural resource and wetland impacts, and difficult geotechnical conditions. The route does not provide any apparent advantages over the other routes other than lesser grades than Donnelly West. However, other potential impacts and associated cost of construction and mitigation are not expected to outweigh the operational efficiency of a route with lower elevation. Therefore, the ARRC recommends that the Donnelly Central Alignment be dismissed from further study.

5.4 Delta North and Delta Central

The potential impacts of both northern Delta alignment alternatives (Delta Central and Delta North) are considerable as compared to the Delta South Alternatives. Both northern alignments would require at least two grade separations over both the Richardson and Alaska highways, and would have multiple additional grade crossings. Both alignments would likely pose substantial land-use issues, traversing near or through residential, commercial, and agricultural property. Both northern alignments encircle the north/east side of the community, providing a barrier for further growth and expansion of development. Both alignments have the potential for impact to isolated cultural resources on the east side of the community. Neither of the northern alignment alternatives provides a more favorable Delta River



crossing or other benefits when compared to Delta South. For these reasons, the ARRC recommends that both Delta North and Delta Central alignment alternatives be dismissed from further consideration.



6.0 PREFERRED ROUTE REFINEMENTS

Upon selection of the ARRC's APRA, additional effort was spent refining the preferred route in order to reduce potential environmental impacts and to address or include refined field information in the design and engineering of the route.⁴ These refinements include, but are not limited to, slight modifications to improve crossing angles of roadways or waterways, shifts to reduce land-use conflicts, shifts to reduce wetland or riverine migration concerns, or changes due to refined alignment design. The following outlines the changes as shown in Map Set Revision 5 (March 2007).

- Maps 2-3:* A new Segment, Eielson Central, was added to connect the northern portion of Eielson West with the southern portion of Eielson South. This would allow for the construction of the northern portion of Eielson West, while avoiding the river, habitat, and land use concerns associated with the southern portion of the Eielson West alignment.
- Map 4:* The angle of the Tanana River Crossing was changed to better meet topographic features on the west side of the river.
- Maps 4-6:* The Salcha West alignment was shifted up to 1 mile farther inland from the Tanana River's edge to what is apparently a strip of uplands between two low-lying tributary systems of the river. This was done to reduce long-term river morphology concerns as well as to reduce potential wetlands impacts. The shift was limited to what is felt to be technically necessary in an attempt to balance environmental concerns with further encroachment into the military's Tanana Flats Training Area.
- Map 9:* The east approaches to the Tanana River Crossing at Flag Hill, and the River Crossing were adjusted for a more efficient crossing of the river.
- Map 10:* The Tanana East alignment was adjusted slightly (about 0.25 miles) to reduce wetland impacts.
- Maps 10-11:* Donnelly Central was extended to connect with Tanana East, and then adjusted to climb the ridge to reach the proposed Donnelly West crossing of the Delta River. This was done in an attempt to reduce wetland and cultural impacts, as well as being technically necessary due to the amount of elevation required to reach the Donnelly West alignment.
- Map 16:* The terrain conditions make the alignment design on the northern half of Donnelly West very challenging. The changes made were required once the additional mapping was received in late 2006. The crossing of the Little Delta River, and the associated climb up a steep ravine on the east channel face represent the only route option through this difficult terrain. The east approach to the Little Delta River was shifted further up the Tanana River bluff to reach the new proposed river crossing.
- Maps 17-18:* Also as a result of the new mapping, shifts in the Donnelly West alignment were required to keep gradients within a practical maximum as the alignment alternative lowers into the Delta Creek valley.

⁴ In addition to the refinements to ARRC's APRA, some refinements were made to other alternatives. Those alternatives with refinements (reflected above) were proposed to be dismissed from detailed study in Section 5.0 of this Report.



Map 24: The termination was shifted to parallel the Alaska Highway in such a manner to accommodate a small terminal facility.



References and Citations

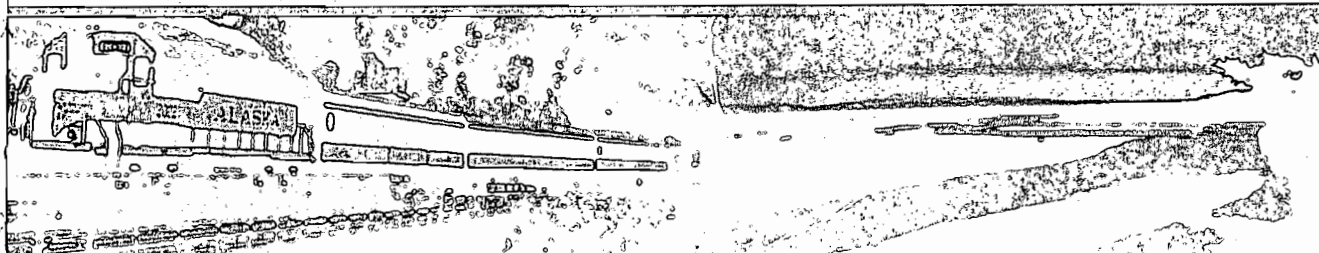
- ABR, Inc. Robert J. Ritchie. *Aerial Surveys to Identify Raptor Nests near Potential ARRC Routes, Eielson AFB to Fort Greely, Alaska*, June 22, 2005.
- Alaska Department of Fish and Game. J. Johnson, Ed Weiss and Scott MacLean. *Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes-Southcentral Region*, Effective January 15, 2005.
- Alaska Department of Fish and Game, Habitat and Restoration Division. James Durst. *Fish Use of Upwellings. An Annotated Biography*. August 2000.
- Alaska Department of Transportation and Public Facilities. *Alaska Railroad Extension, Route Selection, Project #X20089, Eielson to Canadian Border*. July 1979.
- Alaska Department of Natural Resources, Division of Forestry. *Tanana Valley State Forest Management Plan: 2001 Update*.
- Alaska Department of Natural Resources. *Tanana Basin Area Plan*. Adopted in 1985. Updated 1991.
- Alaska Railroad Corporation. *Alaska Northern Rail Extension Project Preliminary Draft Alignments*, Version 0. May 2005.
- Alaska Railroad Corporation. *Alaska Northern Rail Extension Project: Project Background and Overview Document*. June 2005.
- Alaska Railroad Corporation. *Alaska Northern Rail Extension Project: Preliminary Alignments Map Set*, Rev. 1. July 2005.
- Alaska Railroad Corporation. *Alaska Northern Rail Extension Project: Preliminary Alignments Map Set*, Rev. 2. November 2005.
- Alaska Railroad Corporation. *Alaska Northern Rail Extension Project: Applicant's Proposed Alignments Map Set*, Rev. 3. March 2006.
- Alaska Railroad Corporation. *Alaska Northern Rail Extension Project: Applicant's Proposed Alignments Map Set*, Rev. 3a. March 2006.
- Alaska Railroad Corporation. *Alaska Northern Rail Extension Project: Applicant's Proposed Alignments Map Set*, Rev. 4. July 2006.
- Alaska Railroad Corporation. *Alaska Northern Rail Extension Project: Alternatives Analysis Study*, July 2006.
- Duane Miller and Associates, *Geotechnical Exploration, Northern Rail Extension, Fairbanks to Delta Junction, Alaska*. March 14, 2006.
- Duane Miller and Associates, *Geotechnical Exploration, Northern Rail Extension, Tanana River Valley, Alaska*. January 15, 2007.
- Fairbanks North Star Borough Comprehensive Recreational Trail Plan*. October 23, 2003
- Federal Railroad Administration (FRA). *Action Plan for Addressing Critical Railroad Safety Issues*. May 16, 2005, Updated 2006.
- HDR Alaska, Inc. Bob Butera. *Northern Rail Project Drainage Reconnaissance Field Notes*. October 12, 2005
- HDR Alaska, Inc. *Alaska Railroad Northern Rail Extension Project: Preliminary Jurisdictional Determination Map Set*, January 2007.
- Northern Land Use. *Preliminary Cultural Survey Results Presentation*, November 6, 2006.
- Steve DuBois and Randy Rogers. *Delta Bison Management Plan 2000-2005*, Alaska Department of Fish and Game. March 2000.



- Surface Transportation Board. *STB Finance Docket No. 34658*. November 1, 2005.
- University of Alaska, Fairbanks. *Draft Final Report, Preliminary Design and Engineering Economic Analysis of Alternate Access Modes to the Tanana Flats Training Area, Fort Wainwright, Alaska*. June 30, 2005.
- U.S. Department of Agriculture, Natural Resources Conservation Service. *Black and White Air Photography*. 1999
- U.S. Department of Agriculture, Natural Resources & Conservation Service. Soil Surveys: North Star (2002), Greater Fairbanks (2004), Upper Tanana (1999) & Salcha-Big Delta (1973).
- U.S. Department of Transportation, Surface Transportation Board. Letter from Victoria Rutson to Kathryn Kusske Floyd. February 3, 2006.
- U.S. Fish and Wildlife Service, *National Wetland Inventory Maps*. Fairbanks B1, C1; Big Delta A2, A3, A4, A5, B4, B5. Source: <http://www.fws.gov/nwi/>. Date: 2006
- U.S. Geological Survey Topographic Maps 1:250,000 scale and 1:63,360 scale. Fairbanks B1, C1; Big Delta A2, A3, A4, A5, B4, B5
- Kodiak Mapping Inc. Aerial photographs, Scale: 1" 9,600'. Flight elevation 7,200 feet. June 2005.

Communications with representatives of state and federal agencies, local governments, organizations, and the public were considered during the alternatives identification, development, and screening process. Key agencies and organizations providing input include the following:

Alaska Department of Environmental Conservation
Alaska Department of Fish and Game
Alaska Department of Natural Resources
Alaska Department of Transportation and Public Facilities
Alaska Farmers Cooperative
Alaska Mental Health Trust
Bureau of Land Management
City of Delta Junction
City of North Pole
Delta Chamber of Commerce
Delta Fish and Game Advisory Committee
Eielson Air Force Base
Eielson Farm Community
Fairbanks North Star Borough
National Oceanic and Atmospheric Agency
Salcha Dog Mushers Association
Surface Transportation Board
Tanana Chiefs Conference
U.S. Coast Guard
U.S. Army Alaska
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service



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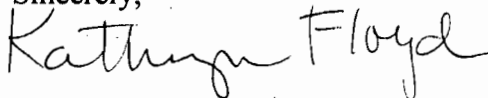
Re: Finance Docket No. 34658, The Alaska Railroad Corp. -- Petition For Exemption From 49 U.S.C. §10901 To Construct and Operate a Rail Line Between North Pole, Alaska and Delta Junction

Dear Ms. Rutson:

On behalf of the Alaska Railroad Corporation (ARRC), enclosed please find a Voluntary Mitigation Development Plan in connection with the above-referenced proceeding.

Please let me know if you have any questions.

Sincerely,



Kathryn Kusske Floyd

Enclosure

cc: David C. Navecky, SEA ✓
Alan Summerville, ICF
Eileen Reilly, ARRC (w/o encl.)
Brian Lindamood, ARRC (w/o encl.)



**Alaska Railroad Corporation
Northern Rail Extension Project**

Voluntary Mitigation Development

**Prepared by: HDR
Prepared for: ARRC**

01/17/08

Revision 1c
STB Finance Docket Number: 34658
Document Control Number: 06-0100-004

Alaska Railroad Corporation
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1.0 Introduction

Since the announcement of the Northern Rail Extension (NRE) project in 2005, the Alaska Railroad Corporation (ARRC) has been actively undertaking to work with the local communities and interested agencies to learn about concerns they have about the project. Based on those consultations, ARRC has worked with a team of technical specialists from various disciplines to develop voluntary mitigation that should address many of the concerns that have been raised. By way of this submission, ARRC would like to offer its voluntary mitigation development to the Surface Transportation Board's Section of Environmental Analysis (SEA) for consideration as part of the ongoing environmental process under the National Environmental Policy Act (NEPA).

Specifically, this submission is designed to offer a series of voluntary mitigation measures to address potential impacts from construction and operation of the NRE. This document presents a range of issues organized by resource categories. The measures identified, in many instances, are ones that have proven successful in mitigating environmental effects for past ARRC projects in other locations. ARRC believes the measures being offered are reasonable, practicable and make sense in the context of the NRE project area. It is ARRC's preference to focus its mitigation efforts in the immediate project area where such measures may offset potential impacts most directly. As the NEPA process continues and permitting documents for the NRE project are developed, it is possible that additional mitigation may become identified and added to the measures identified below.



2.0 Project Area Overview

Broadly defined, the Northern Rail Extension project corridor is located in the East Tanana Valley Basin of Interior Alaska, roughly paralleling the Tanana River from a point on the existing ARRC Eielson Branch near North Pole to the vicinity of Delta Junction. The Tanana Valley lies between two mountain ranges: The Alaska Range to the southwest and the White Mountains to the north. Rugged upland features extend to the east bank of the Tanana River from south of Flag Hill to the confluence of the Tanana and Delta rivers. South and west of the Tanana River, the basin is composed of sloping sedimentary plains that extend to the foothills of the Alaska Range. Throughout the project area, the Tanana River is characterized as a wide-braided or semi-braided stream. The corridor also includes the relatively clear water Salcha River, flowing out of the Yukon Tanana Uplands, and the glacial-fed Little Delta and Delta Rivers and Delta Creek, all originating in the Alaska Range.

The project would traverse both developed and undeveloped terrain. Generally, the areas to the north and east of the Tanana and Delta Rivers are developed, with primary access via the Richardson Highway. Areas to the south of the Tanana River are accessible only by ice bridge during the winter months or by helicopter or small boat during the five- to six-month summer season. The undeveloped area includes military training ranges, scattered private cabins, recreational areas, and the Whitestone agricultural community. The existing Trans-Alaska Pipeline System parallels the project corridor to the east.



3.0 Natural and Biological Resources

The ARRC conducted a constraints analysis in developing its preferred alignment, and, to the extent possible, identified a route that would avoid or minimize impacts to the waterbodies, anadromous fish streams, high value wetland complexes (based on National Wetlands Inventory mapping).

3.1 Wetlands/Water Resources

The project will cross wetland areas along the Tanana River, Little Delta River, Delta Creek, Delta River, and potentially other streams. Impacts to wetlands may include removal of vegetation and placement of fill, and may affect the wetland hydrology. In addition, construction of a raised barrier through wetlands may disrupt surface and subsurface water movement, although mitigation measures would be implemented to minimize this potential impact.

The Tanana River flows through the preferred alignment corridor, as do Delta Creek, the Delta and Little Delta rivers. Pile Driver Slough and Twenty-three-Mile Slough are also important water bodies within the project area. The Northern Rail Extension Project could affect water quality by increasing turbidity and suspended sediments during construction, changing local water balances and water quality through construction water demands, use of river channels or floodplains as material sites, introducing thermal erosion and degrading streambanks and modifying groundwater recharge patterns. Potential mitigation measures include the following.

- The ARRC would obtain all Federal permits, including the Clean Water Act Section 404 permit, required by the U.S. Army Corps of Engineers (USACE) for project-related encroachment of jurisdictional waters of the U.S., including wetlands, prior to initiation of construction in these areas. Permit stipulations would be incorporated into the construction contract specifications.
- The ARRC would obtain coverage from Environmental Protection Agency (EPA) under the National Pollutant Discharge Elimination System General Permit for Storm Water Discharges from Construction Activities. A Stormwater Pollution Prevention Plan (SWPPP) would be prepared and implemented.
- To minimize sedimentation into streams and waterways during construction, the ARRC would employ best management practices (BMPs) as specified in the SWPPP.
- To compensate for unavoidable impacts to jurisdictional wetlands, the ARRC would implement compensatory mitigation negotiated as part of the USACE Section 404 permit for placement of fill in wetlands.
- The ARRC would obtain necessary State permits and authorizations (e.g., Alaska Department of Natural Resources (ADNR) Fish Habitat Permit, and ADNR Land Use Permit). Permit stipulations would be incorporated into the construction contract specifications.
- For the portions of the project within the Fairbanks North Star Borough (FNSB), the ARRC would coordinate with the local FNSB Floodplain Administrator to ensure that new project-related stream and floodplain crossings are appropriately designed. For crossings within the mapped 100-year flood plain, the ARRC would design drainage crossing structures to pass a 100-year flood.
- The ARRC intends to design and maintain bridges and culverts to maintain existing water patterns and flow conditions as practicable.
- ARRC would use contaminant-free embankment and surface materials in construction.



- The ARRC would disturb the smallest area practicable around any streams and would conduct reseeding efforts to promote revegetation of disturbed areas as soon as practicable following project-related construction activities. Disturbed areas, except for the railroad embankment, would be reseeded with native vegetation to provide permanent stabilization and minimize the potential for erosion.
- The ARRC would design and construct culverts used for new fish-stream crossings with a width greater than or equal to 125 percent of the width of the stream at the ordinary high water stage. The culvert grade would approximate the surrounding slope of the stream channel. Whenever possible, new culverts would be buried to approximately 40 percent of their diameter with substrate material that would remain stable at expected flood discharge rates. This would not apply to any water crossing greater than 15-feet in bank-to-bank width due to span length limitations.
- When project-related construction activities, such as culvert and bridgework, require work in streambeds, the ARRC would conduct these activities, to the extent practicable, during low-flow conditions.
- During construction, temporary barricades, fencing, and/or flagging would be used in sensitive habitats to contain project-related impacts to the construction area. Staging areas would be located in previously disturbed sites to the extent practicable and not in sensitive habitat areas.
- During construction, project-related construction vehicles would be directed to avoid driving in or crossing streams at other than established crossing points.
- Areas disturbed during construction would be returned to their preconstruction contours to the extent practicable, and reseeded or replanted within one growing season following construction to stabilize the banks. Seed mixtures would not contain known invasive plant species.
- The ARRC would design and construct the new rail line in such a way as to maintain natural water flow and drainage patterns to the extent practicable. This would include placing equalization culverts through the embankment as necessary to maintain existing drainage patterns, prevent impoundment of water or excessive drainage, and maintain the connectivity of floodplains and wetlands.
- During construction, the ARRC would install appropriate BMPs within its parallel drainage ditches that are within 1,000 feet of perennial waters to provide stormwater retention and filtration. ARRC would maintain drainage ditches as necessary (e.g., by removing accumulated sediments to maintain storm water retention capacity and function).
- Temporary stream crossings would be placed across waterways during construction to provide access for contractors, work crews, and heavy equipment. Temporary stream crossings are generally expected to be needed for one year or less. Minimum standards and specifications would be established for typical crossings to minimize damaging the waterway, blocking fish passage, and generating sediment.
- Temporary structures would avoid overly constricting active channels and would be placed in service for the shortest time possible.



3.2 Fisheries

The project corridor includes rivers and streams considered Essential Fish Habitat by the National Marine Fisheries Service (NMFS), as well as many clear water streams and sloughs and associated lakes and ponds. Those along the south side of the Tanana River between Little Delta River and Delta River are considered important fish habitat, as are natural upwellings at the confluence of the Tanana River and Delta River that remain open during the winter.

- The ARRC would obtain necessary State permits and authorizations (e.g., Alaska Department of Natural Resources (ADNR) Fish Habitat Permit). Permit stipulations would be incorporated into the construction contract specifications.
- The ARRC would implement EFH conservation measures as agreed upon with NMFS during the EFH consultation process.
- When project-related construction activities, such as culvert and bridgework, require work in streambeds, the ARRC would conduct these activities, to the extent practicable, during low-flow conditions.
- Construction in anadromous streams would be timed where practicable to minimize adverse effects to salmon during critical life stages whenever possible. Timing windows, as specified by ADNR's Office of Habitat Management and Permitting, would be incorporated into construction contract specifications for in-stream work.
- The ARRC would design and construct stream crossings that do not impede fish passage or impair the hydrologic functioning of the waterbody.

3.3 Birds

Many migratory birds use the corridor for nesting and staging. Rusty blackbirds, which occur in the area, are a State-listed species of special concern. Raptor nest surveys found bald and golden eagle and other raptor nests within the project corridor; Bald and Golden eagles are protected under Bald and Golden Eagle Protection Act and other bird species are protected under the Migratory Bird Treaty Act. Potential direct effects are primarily related to noise effects during construction, removal of individual nest trees during construction, and permanent removal of habitat within the project footprint.

- Clearing of vegetation in preparation for construction would occur before or after the typical migratory bird nesting season as identified by the U.S. Fish and Wildlife Service (USFWS) (typically May 1 to July 15) to the extent possible to ensure compliance with the Migratory Bird Treaty Act. If clearing is required during the nesting season, a nest survey would be conducted and the USFWS would be consulted, as necessary, to identify additional compliance measures. This would also mitigate potential impacts to moose and many other mammals, as it encompasses the most sensitive time when young are born.
- During the bald eagle nesting season (typically March through August), ARRC and its contractor(s) would use their best efforts to avoid bald eagle disturbance during construction. Active nest trees would be protected by vegetative buffer zones in accordance with USFWS guidelines.



3.4 Moose

The Alaska Department of Fish and Game (ADF&G) has identified winter moose habitat and prime moose calving habitat in an area west of the Tanana River and north of Flag Hill. A Cooperative Agreement between the ARRC and the ADF&G in 1991 developed measures in an attempt to minimize moose kills. Implementation of these measures over the past 15 years has allowed the ARRC and ADF&G to monitor effectiveness of particular measures.

- The ARRC would work with adjacent land managers to develop alternative preferred habitat located away from the proposed rail line, crating suitable browse in an area that moves moose away from the railroad right-of-way (ROW).
- ARRC would construct a widened embankment to allow moose a place to retreat on one side when a train passes to reduce the potential for moose strikes.



4.0 Land Use

The project area contains lands on both Fort Wainwright and Fort Greely military reservations. These areas are used by the military for aerial and on-the-ground training exercises. Construction and operation of the proposed rail extension will need to be coordinated with proposed training exercises and future plans for military facilities.

The preferred alignment corridor traverses the Delta and Eielson farming communities, two of Alaska's few agricultural areas. Farming activities include livestock and cropland. The alignment is also within the floodplains of a number of major river systems.

The ARRC has an established history of acquiring a 200-foot on-center ROW for rail operations, except as limited by topography or land ownership. Additional ROW is likely to be needed for ancillary facilities, such as material sources and construction staging areas. The project would require the acquisition of ROW along the route and would involve take of or effects to individual properties. In some cases, relocation may be required. There may also be properties within the ROW where improvements may have been constructed that are not covered under Alaska or federal regulations (such as unauthorized cabins on public lands).

4.1 Community Outreach

The ARRC held a series of meetings with communities and community organizations within the project area during the course of the Northern Rail Extension planning process. Community outreach and regular communication will continue to be important during construction.

- Prior to initiation of construction activities related to this project, and for a period of one year following start-up of operations on the new rail line, ARRC would establish a Community Liaison to consult with affected communities, businesses, and agencies; develop cooperative solutions to local concerns; be available for public meetings; and conduct periodic public outreach. ARRC would provide the name and phone number of the Community Liaison to mayors and other appropriate local officials in each community through which the new rail line passes.
- ARRC would continue its ongoing community outreach efforts by maintaining a Web site about the project throughout the period of construction of the new line.

4.2 Residential

- Project-related construction vehicles, equipment, and workers would not access work areas by crossing residential properties without the permission of the property owners.
- Public land areas that are directly disturbed by project-related construction and are not owned by the ARRC (such as temporary access roads, haul roads, and crane pads) would be restored to their original condition, as may be reasonable and practicable, upon completion of construction.
- In the unlikely event of any inadvertent damage, ARRC would work with affected landowners to appropriately redress any damage to each landowner's property caused by project-related construction activities.
- Concerns about fragmentation of neighborhoods and farm properties would be addressed by maintaining the connectivity of major roadways, and working with local residents on specific right-of-way acquisition issues.



4.3 Business and Agricultural

- Project-related construction vehicles, equipment, and workers would not access work areas by crossing business or agricultural areas, including parking areas or driveways, without advance notice to the owner.
- In business and industrial areas, project-related equipment and materials would be stored in established storage areas or on ARRC property. Parking of equipment or vehicles, or storage of materials along driveways or in parking lots, is prohibited unless agreed to by the property owner.
- ARRC would work with affected businesses or farms to appropriately address project related construction activity issues affecting any business or farm.
- To the extent practicable, ARRC would ensure that entrances and exits for businesses are not obstructed by project-related construction activities, except as required to move equipment.
- Fencing would be considered on a case-by-case basis for agricultural areas.

4.4 Utility Corridors

- The ARRC would make reasonable efforts to identify all utilities that are reasonably expected to be materially affected by the proposed construction within the ROW or that cross the ROW. ARRC would consult with utility owners during design and construction so that utilities are protected during project-related construction activities. ARRC would notify the owner of each such utility identified prior to project-related construction activities and would coordinate with the owner to minimize damage to utilities.
- The ARRC would make reasonable efforts to minimize the utility disruptions by timing construction work and outages to low use time periods. The ARRC would notify residents and other utility customers in advance of construction activities requiring temporary service interruptions.



5.0 Transportation

The existing regional transportation system between Fairbanks and Delta Junction consists primarily of the Richardson Highway. Secondary paved and gravel roads are located within areas of development adjacent to the highway; other transportation options in the preferred alignment corridor include boats, off-road vehicles, and private air services.

The proposed rail extension will cross water bodies considered navigable that are regulated by the U.S. Coast Guard under the authority of Section 9 of the Rivers and Harbors Act of 1899 and the General Bridge Act of 1946. The Coast Guard reviews projects crossing navigable water to determine if the project meets the reasonable needs of current and future navigation.

Recreation activities in the corridor include recreational hunting, boating, fishing, hiking, snowmachining, dog mushing, and other summer and winter activities. The proposed alignment may cross established and informal summer and winter trails, including existing dog mushing, off-road vehicle, and pedestrian trails.

Subsistence activities in the vicinity include hunting, trapping, fishing, and gathering berries.

5.1 Safety

- The ARRC would construct grade-separated crossings of the Richardson Highway.
- The ARRC would consult with appropriate State and local transportation agencies to determine the final design and other details of grade-crossing warning devices.
- ARRC would establish a Diagnostic Team comprised of ARRC staff, community members, ADOT&PF, and others to apply Federal and State regulations regarding roadway/railroad crossings. This process will result in appropriate safety measures for every roadway/railroad crossing.
- During construction of tracks across existing roads, road users would be notified of temporary road closings and other construction-related activities. The ARRC would provide for detours and associated signage, as appropriate, or maintain at least one open lane of traffic at all times to allow for the quick passage of emergency and other vehicles. Signs providing the name, address, and telephone number of a contact person would be displayed on-site to assist the public in obtaining immediate responses to questions and concerns about project activities.
- To the extent practicable, the ARRC would confine all project-related construction traffic to project specific roads within the ROW or established public roads. Where traffic cannot be confined to these roads, ARRC would make necessary arrangements with landowners to gain access. Any temporary access roads constructed outside the rail line ROW would be removed and restored upon completion of construction unless otherwise agreed to with the landowners.
- ARRC would coordinate with Alaska Command (ALCOM) and Bureau of Land Management (BLM) personnel, as appropriate, regarding activities occurring within military base and training areas.

5.2 Navigation

- The ARRC would obtain a Section 9 Bridge Permit from the U.S. Coast Guard for construction of bridges over navigable rivers (e.g., Tanana, Little Delta, and Delta rivers and



Delta Creek). Permit stipulations would be incorporated into the construction contract specifications.

- The ARRC would coordinate with the U.S. Coast Guard to provide adequate clearances for navigation of recreational boats on navigable rivers.

5.3 Access and Recreation

- Depending on the alignment selected, during construction of the crossings over navigable rivers, some short-term temporary restrictions of watercraft traffic could occur for safety purposes. The ARRC would install warning devices to notify boaters of project-related bridge construction activities. Signs providing the name, address, and telephone of a contact person would be displayed on-site to assist waterway users in obtaining immediate responses to questions and concerns about project activities.
- Public access would be maintained to and from legally authorized trails and FNSB recognized trail easements. The ARRC would work with trail user groups to design and construct trail crossings.



6.0 Cultural Resources

The corridor along the preferred alignment was used historically as a transportation corridor by pre-historic and historic Native peoples, as well as by Euro-American settlers, miners, and trappers.

- The ARRC would develop a Programmatic Agreement (PA) with the Alaska State Historic Preservation Office (SHPO) governing the identification and treatment of cultural resources. The PA would detail procedures and methodologies for identification of resources, reporting, reviewing, and implementing appropriate treatment measures for any cultural resources found within the project area. The PA would identify appropriate actions should previously undiscovered archaeological or cultural resource sites be unearthed during construction activities.
- ARRC would develop protocols to inform and prepare construction supervisors of the importance of protecting archaeological resources, graves, and other cultural resources and how to recognize and treat the resources.



7.0 Geology/Soils

- The ARRC would design project facilities in accordance with engineering criteria relating to permafrost, seismic events, and other geologic hazards.
- The ARRC would limit ground disturbance to only the areas necessary for project-related construction activities.
- During earthmoving activities, the ARRC would reuse topsoil wherever practicable. The ARRC would also stockpile topsoil for later application during reclamation of disturbed areas along the ROW. The ARRC would use appropriate erosion control measures to minimize the potential for erosion of stockpiles until their removal and the area restored.
- The ARRC would restore disturbed areas as soon as practicable after construction ends along a particular stretch of rail line. The goal of restoration would be the rapid and permanent reestablishment of native ground cover on disturbed areas. If weather or season precludes the prompt reestablishment of vegetation, the ARRC would use temporary erosion control measures as specified in the stormwater management plan (SWPPP).
- The ARRC would, to the extent practicable, revegetate the bottom and sides of the drainage ditches using natural recruitment from the native seed sources in the stockpiled topsoil or a seed mix free of invasive plant species.

7.1 Seismic

- The project would be designed and take into account the region's potential for earthquake activity to mitigate potential damage to bridges and tracks. Separated grade crossings would be designed in accordance with the latest applicable seismic codes.



8.0 Other

8.1 Air Quality

- To minimize fugitive dust emissions created during project-related construction activities, the ARRC would implement appropriate fugitive dust suppression controls, such as spraying water or other approved measures. The ARRC would also operate water trucks on haul roads as necessary to reduce dust.
- The ARRC would work with its contractor(s) to make sure that construction equipment is properly maintained and that mufflers and other required pollution-control devices are in working condition in order to limit construction-related air emissions.

8.2 Noise and Vibration

- The ARRC would work with its construction contractor(s) to minimize, to the extent practicable, construction-related noise disturbances near residential areas. Construction and maintenance vehicles would be in good working order with properly functioning mufflers to control noise.

8.3 Hazardous Materials/Potential Spills

- Prior to initiating any project-related construction activities, ARRC or its contractor(s) would develop a spill prevention plan for petroleum products or other hazardous materials during construction activities as required by state and federal regulations. The plan would include a requirement to conduct weekly inspections of equipment for any fuel, lube oil, hydraulic, or antifreeze leaks. If leaks are found, ARRC would require the contractor(s) to immediately remove the equipment from service and repair or replace it.
- Standard spill-prevention measures would be implemented during construction and spill clean-up equipment (e.g., oil-absorbent pads) would be available onsite.
- ARRC would require contractor(s) to dispose of waste generated during project-related construction activities in accordance with applicable Federal, State, and local regulations.
- The ARRC would incorporate the new rail line into the existing ARRC Emergency Response process and would update its Oil Spill Contingency Plan to include the new rail line.
- In accordance with the ARRC's Oil Spill Contingency Plan, updated as required, the ARRC would make the required notifications to the appropriate Federal and State environmental agencies in the event of a reportable hazardous materials release. The ARRC would work with the appropriate agencies such as the Alaska Department of Environmental Conservation (ADEC), EPA and USFWS to respond to and remediate releases with the potential to affect sensitive habitats such as wetlands.
- The ARRC would continue its ongoing efforts with community officials to identify the public emergency response teams located in the project area and would provide, upon request, hazardous material training.



8.4 Emergency Response

- At least one month prior to initiation of construction activities in the area, the ARRC would provide the information described below regarding project-related construction of the new rail line, as well as any additional information, as appropriate, to fire departments within the project area, FEMA, FNSB Emergency Operations Department and the Delta Greely Local Emergency Planning Committee.
 - The schedule for construction throughout the project area, including the sequence of construction of public grade crossings and approximate schedule for these activities at each crossing.
 - A number for the ARRC's contact, who would be available to answer questions or attend meetings for the purpose of informing emergency-service providers about the project construction and operation.
 - Revisions to this information, including changes in construction schedule, as appropriate.
- Before the start of operations, the ARRC would contact the appropriate departments and agencies to provide them with information concerning the proposed operations to allow the departments and agencies to incorporate the information into local response plans.
- For each of the public grade crossings on the new and existing rail line, the ARRC would provide and maintain permanent signs prominently displaying both a toll-free telephone number and a unique grade-crossing identification number in compliance with Federal Highway Regulations (23 CFR Part 655). The toll-free number would be answered 24 hours per day by ARRC personnel.

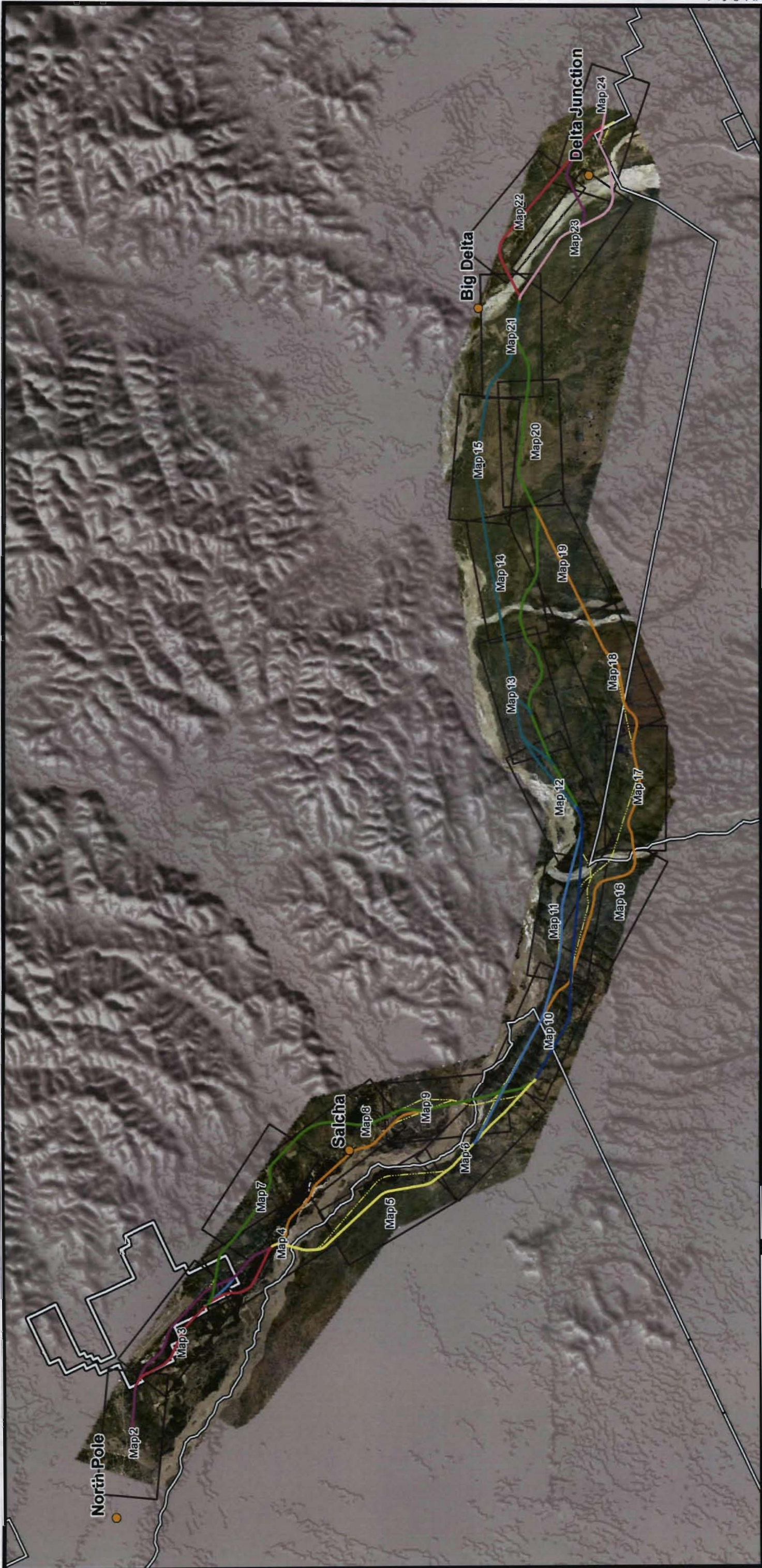


March 2007

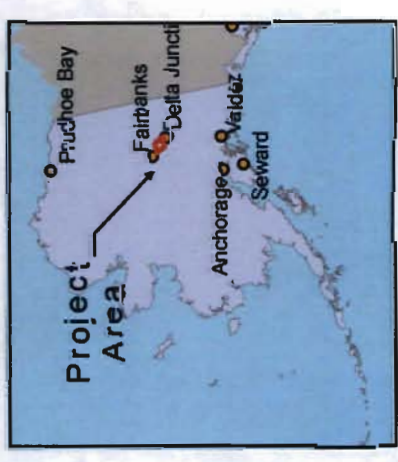
Applicant's Proposed Alignments *Alaska Railroad Northern Rail Extension Project*



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Document 01-0800-001 Rev. 5



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Northern Rail Extension**



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Data is to be used for reference only.
Sources:
USGS 1:63360 Topographic maps
ARRC 2006 Color Aerial Photography
Alaska State Plane Zone 3 NAD 83

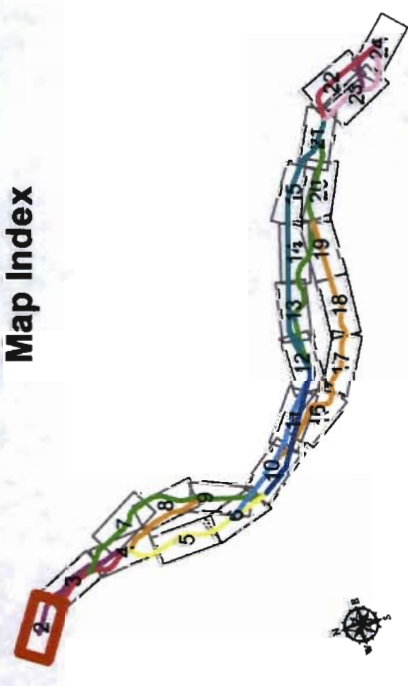
Date: March 29, 2007	Author: HDR Alaska
Version: REV5.1	Sources: USGS, ARRC, TNH Hanson and HDR



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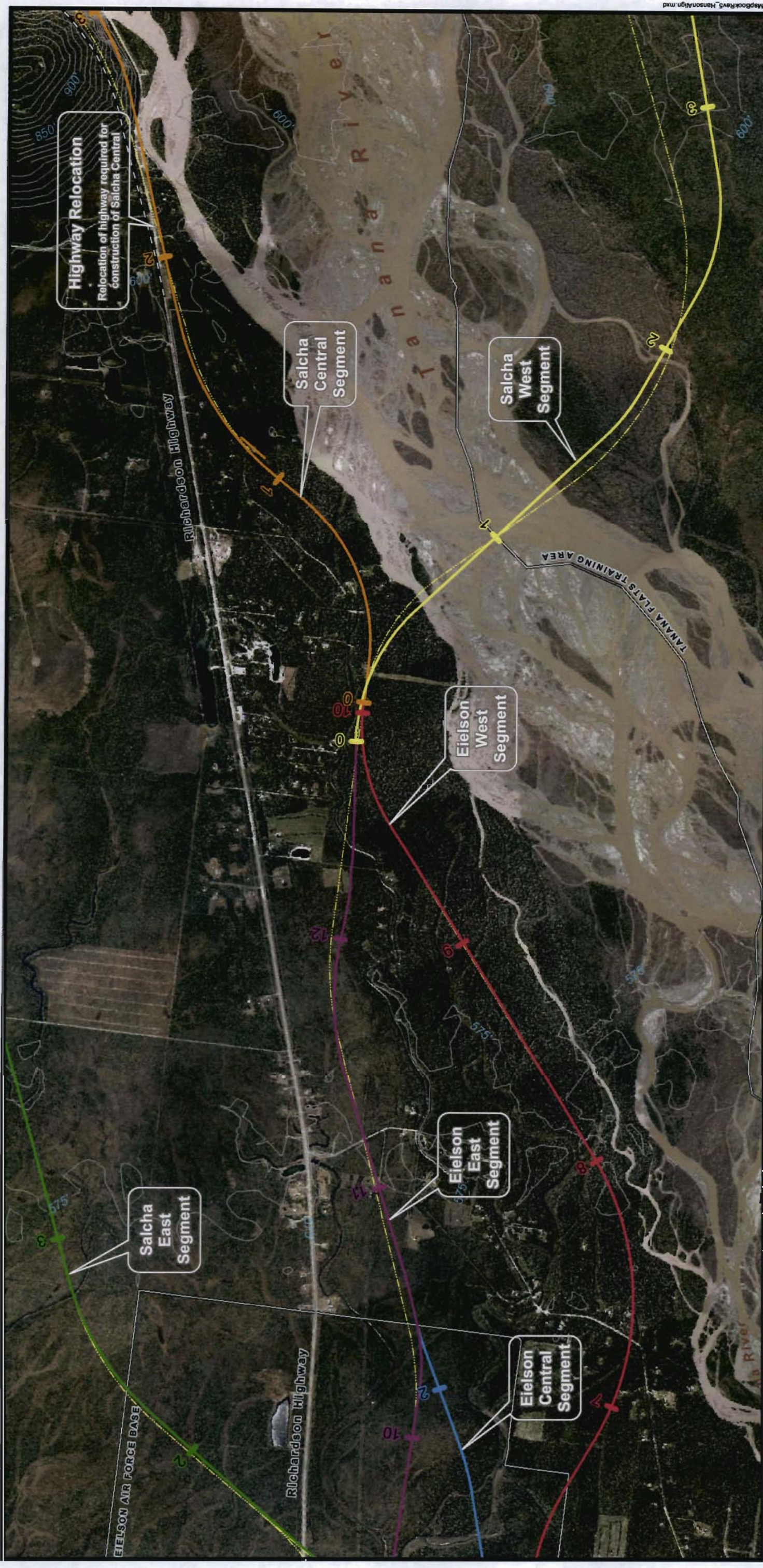
Map 2
Applicant's Proposed
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Sources:
USGS 1:63360 Topographic maps
ARRC 2005-2006 Color Aerial Photography
Alaska State Plane Zone 3 NAD 83

Date: March 29, 2007 Author: HDR Alaska

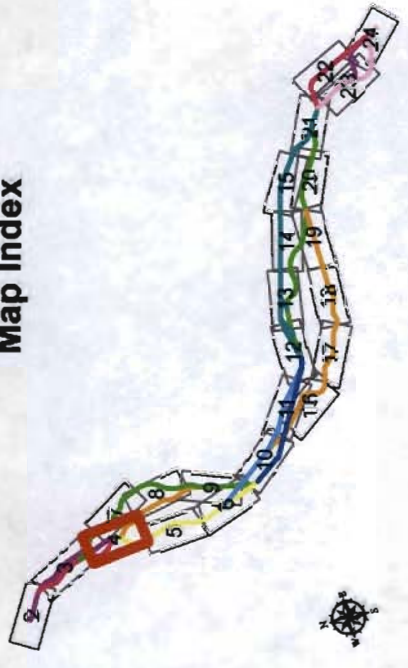
Version: REV6.1 Sources: USGS, ARRC, TNH Hanson and HDR



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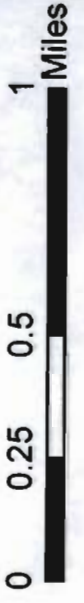


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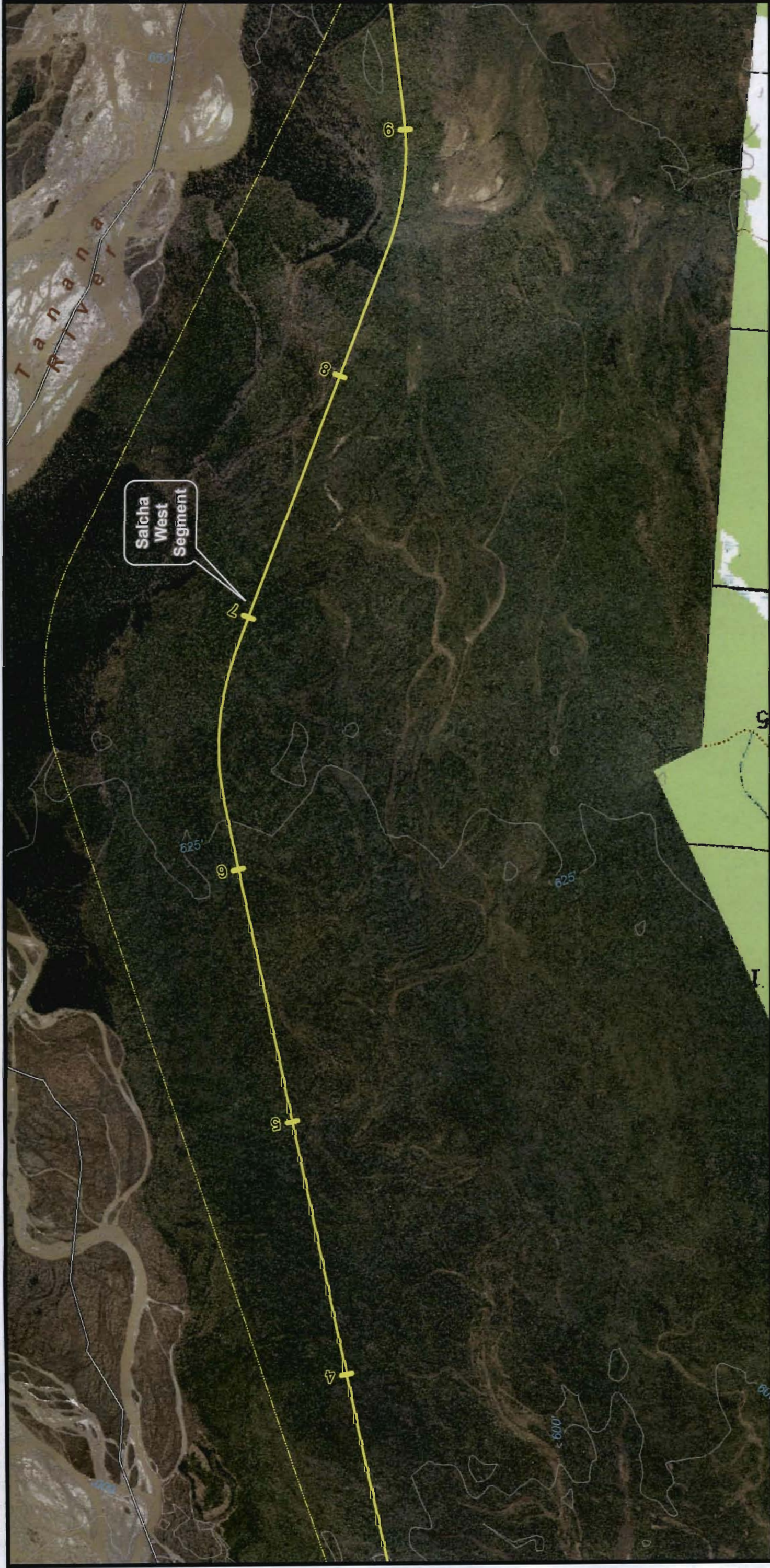


Map 4
Applicant's Proposed
Alignments

Data is to be used for reference only.
Sources:
USGS 1:63360 Topographic maps
ARRC 2005-2006 Color Aerial Photography
Alaska State Plane Zone 3 NAD 83

Date: March 29, 2007 Author: HDR Alaska

Version: REV5.1 Sources: USGS, ARRC, TNH Hanson and HDR



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**Map 5
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Sources:
USGS 1:63360 Topographic maps
ARRC 2005-2006 Color Aerial Photography
Alaska State Plane Zone 3 NAD 83



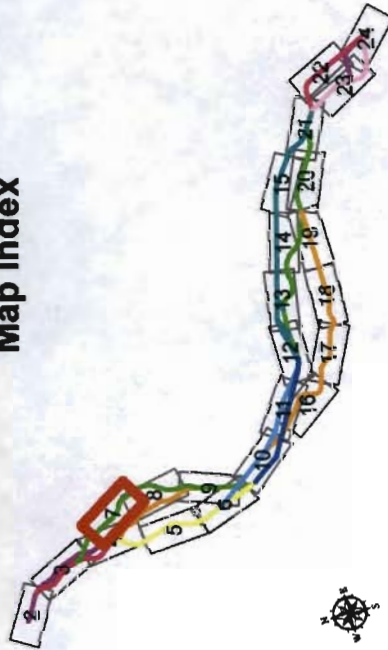
Date: March 29, 2007 Author: HDR Alaska
Version: REV5.1 Sources: USGS, ARRC, TNH Hanson and HDR



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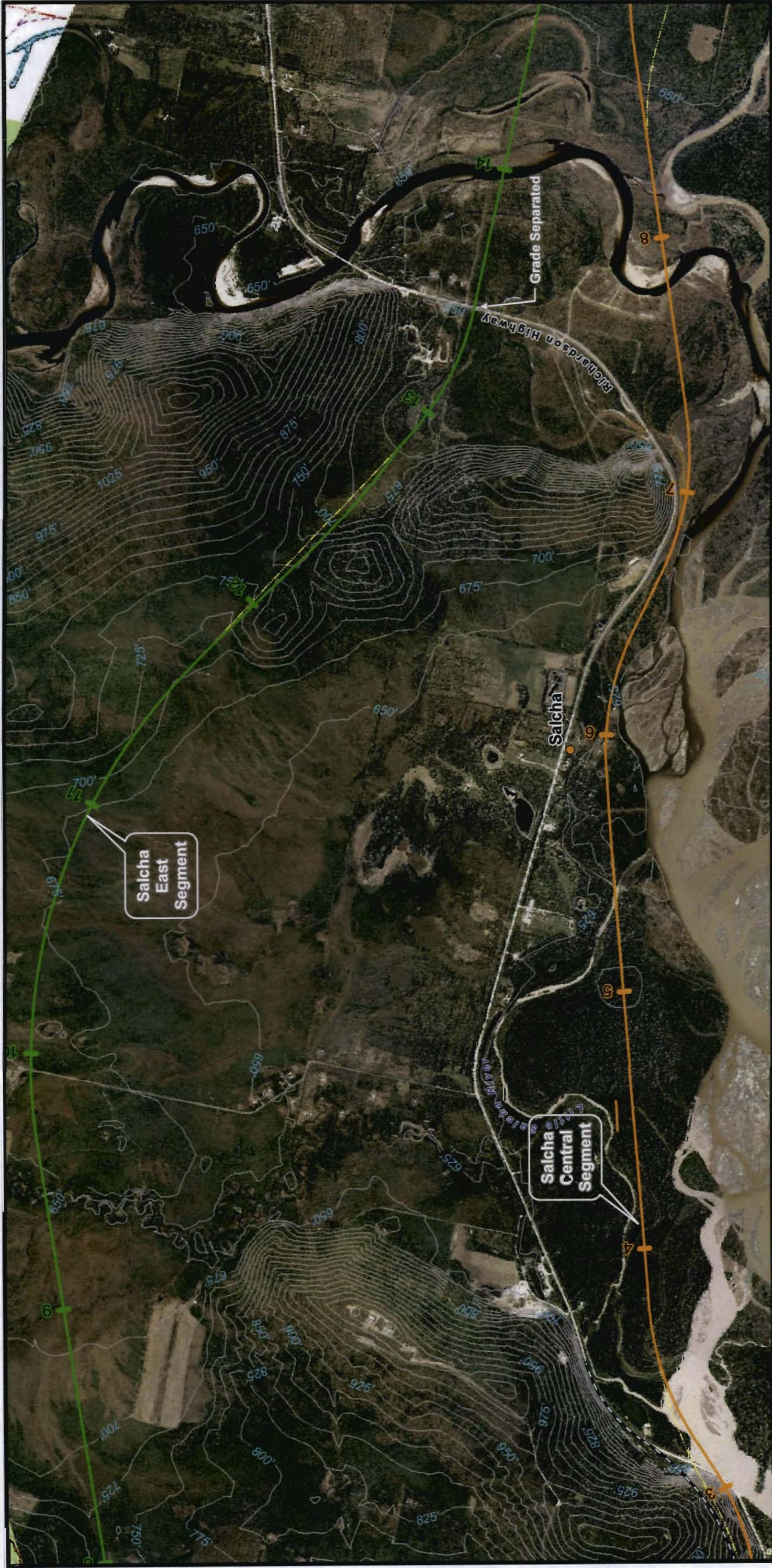


Map 7
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Data is to be used for reference only.
Sources:
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ARRC 2005-2006 Color Aerial Photography
Alaska State Plane Zone 3 NAD 83



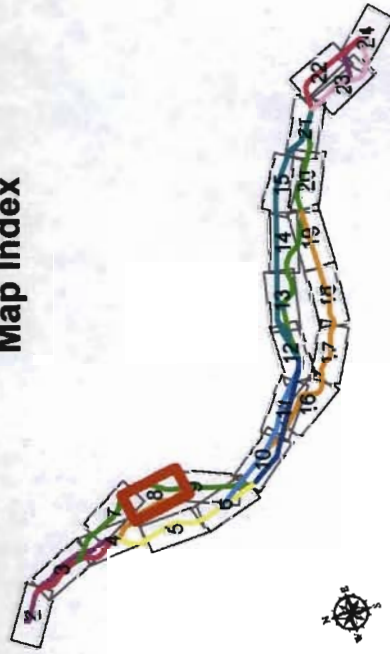
Date: March 28, 2007 Author: HDR Alaska
Version: REV6.1 Sources: USGS, ARRC, TNH Hanson and HDR



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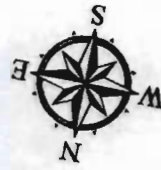


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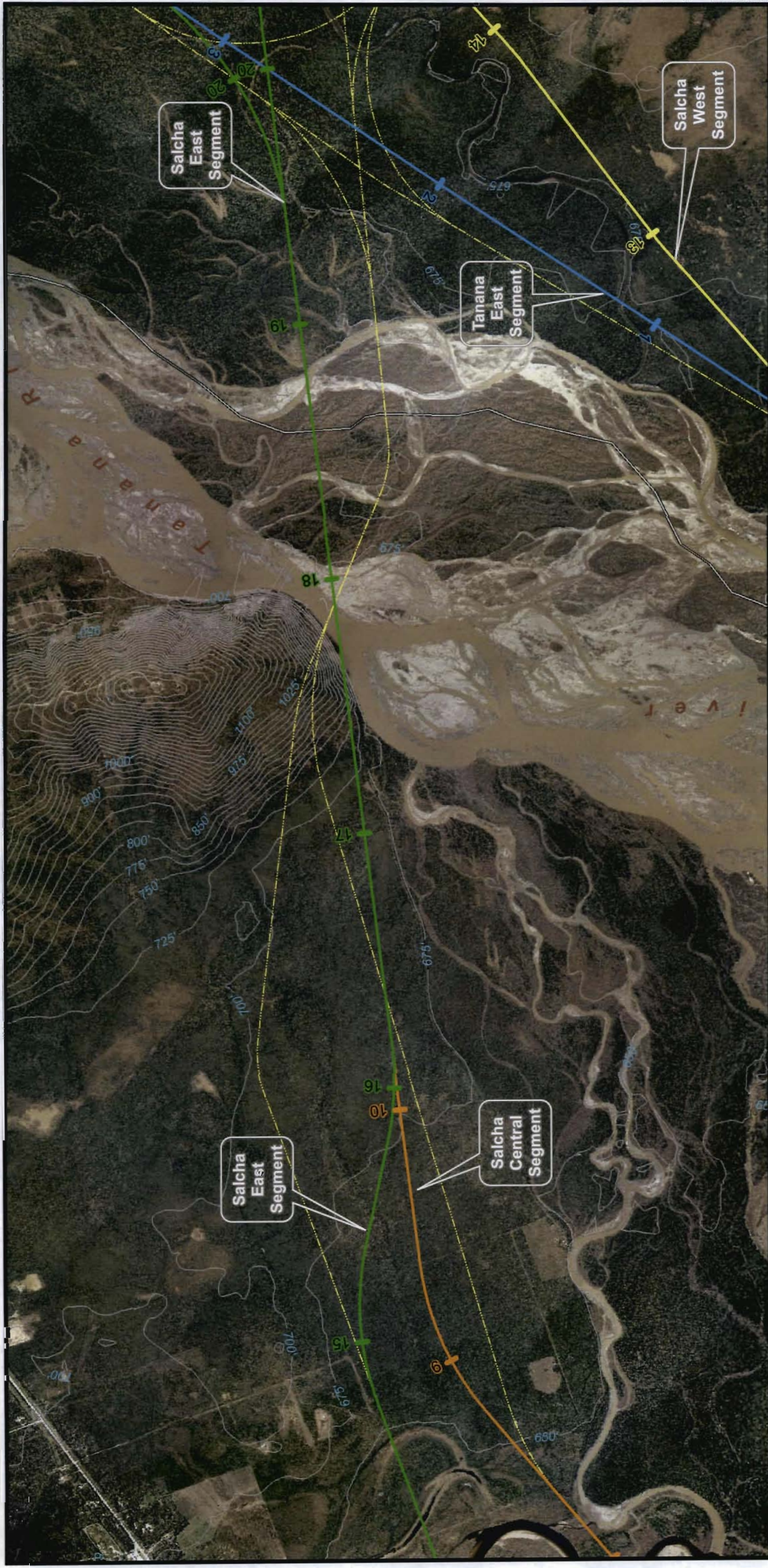
**Map 8
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Sources:
USGS 1:63360 Topographic maps
ARRC 2005-2006 Color Aerial Photography
Alaska State Plane Zone 3 NAD 83



Date: March 28, 2007 Author: HDR Alaska

Version: REV6.1 Sources: USGS, ARRC, TNH Hanson and HDR



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Map 9 Applicant's Proposed Alignments



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Sources:
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Alaska State Plane Zone 3 NAD 83

Date: March 29, 2007 **Author:** HDR Alaska

Version: REV5.1
Sources: USGS, ARRC, TNH Hanson and HDR



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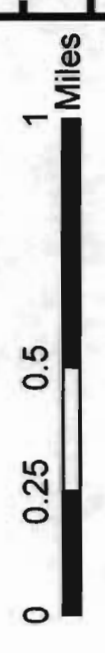


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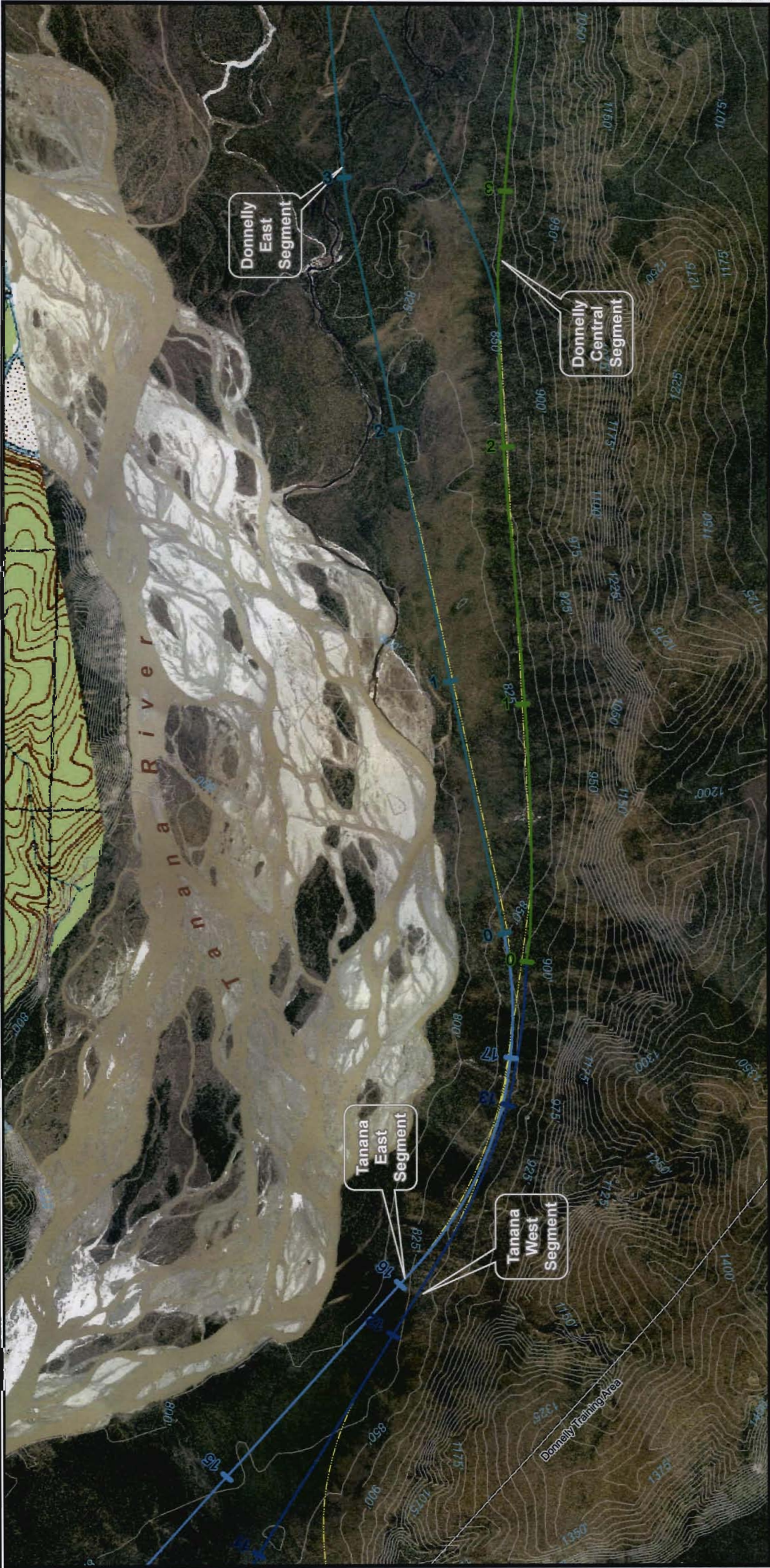
Map 11 Applicant's Proposed Alignments



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Sources:
USGS 1:63360 Topographic maps
ARRC 2005-2006 Color Aerial Photography
Alaska State Plane Zone 3 NAD 83

Date: March 29, 2007 Author: HDR Alaska

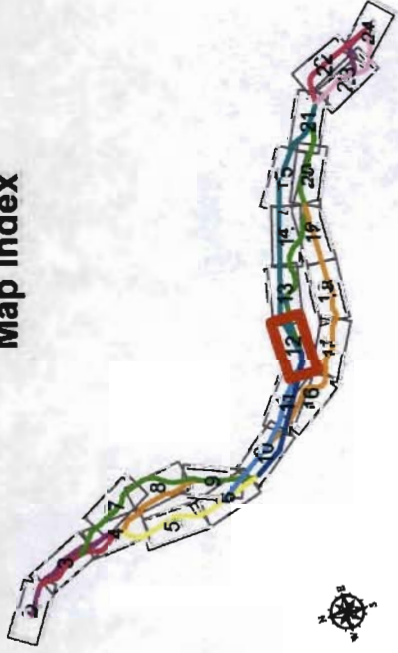
Version: REV 6.1 Sources: USGS, ARRC, TNH Hanson and HDR



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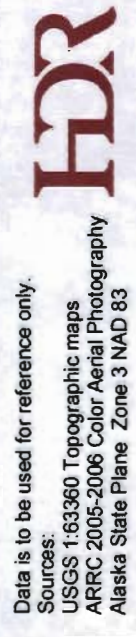


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Map 12
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Date: March 29, 2007 Author: HDR Alaska
Version: REV5.1 Sources: USGS, ARRC, TNH Hanson and HDR



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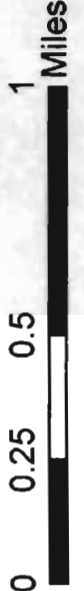


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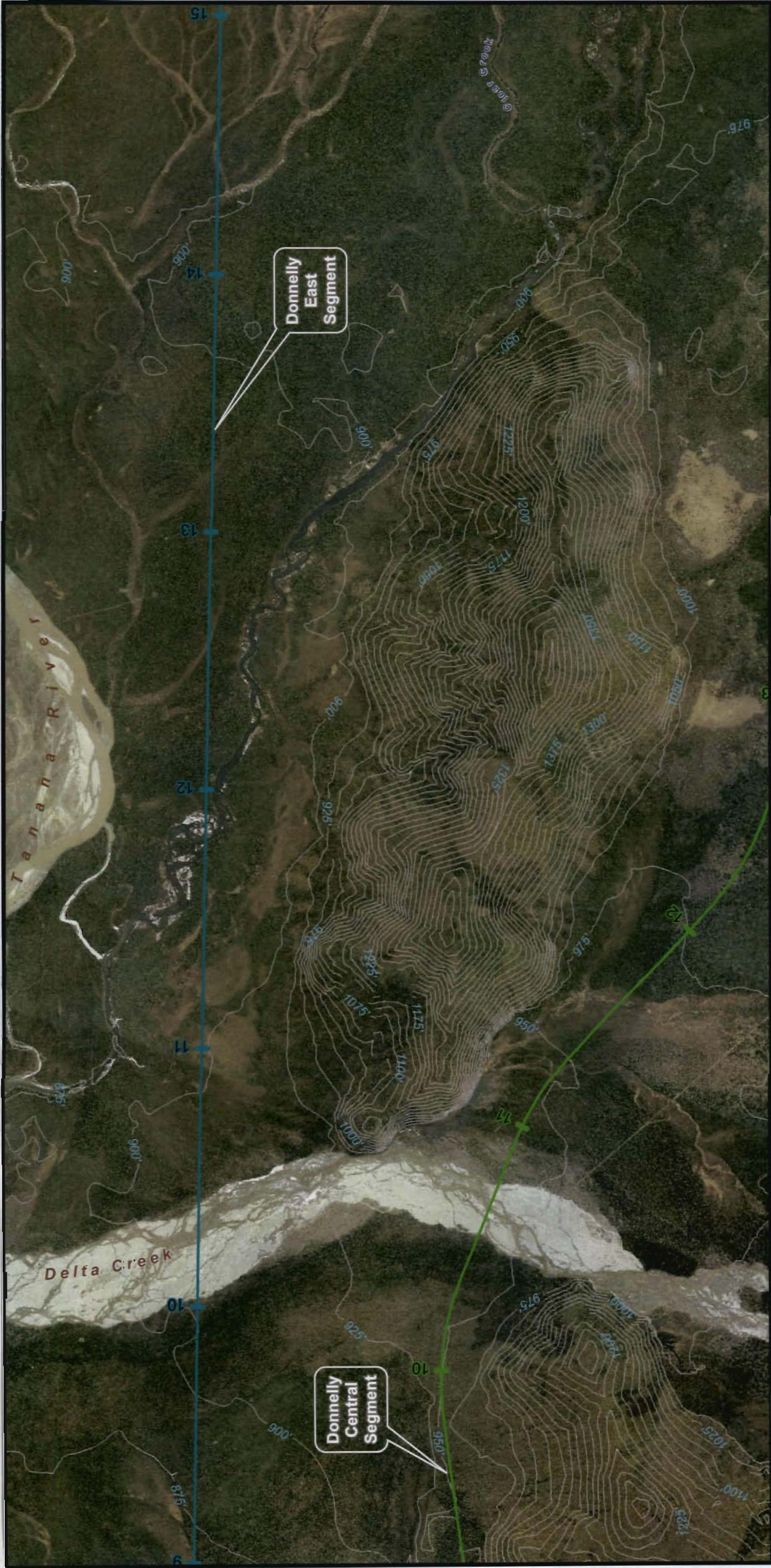
**Map 13
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Sources:
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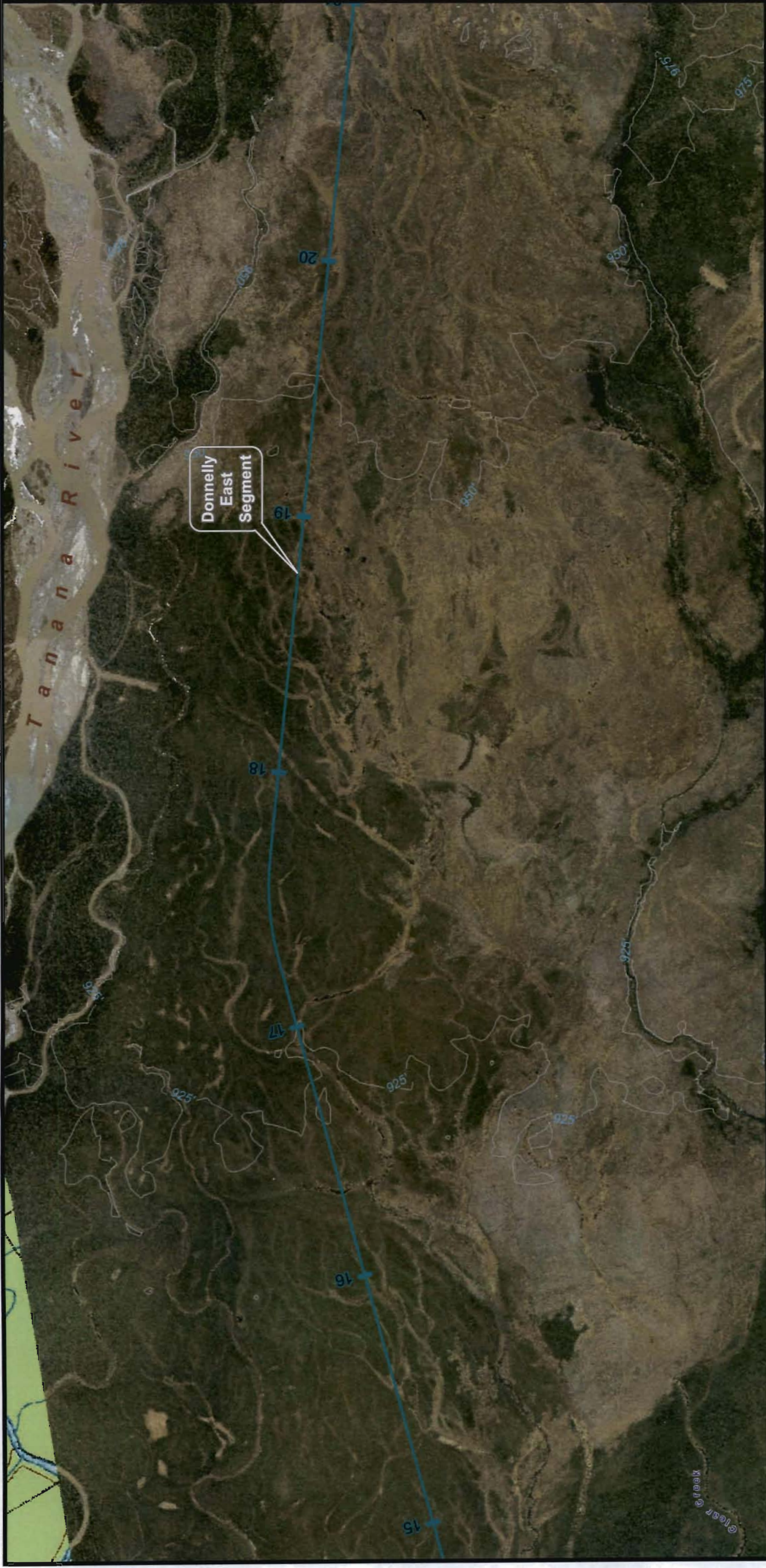


**Map 14
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Data is to be used for reference only.
Sources:
USGS 1:63360 Topographic maps
ARRC 2005-2006 Color Aerial Photography
Alaska State Plane Zone 3 NAD 83

Date: March 29, 2007 Author: HDR Alaska

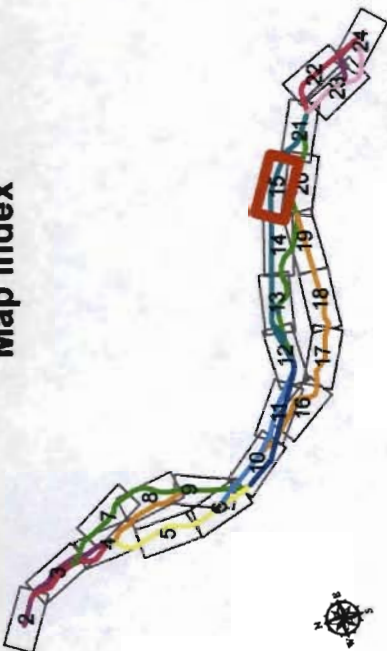
Version: REV5.1 Sources: USGS, ARRC, TNH Hanson and HDR



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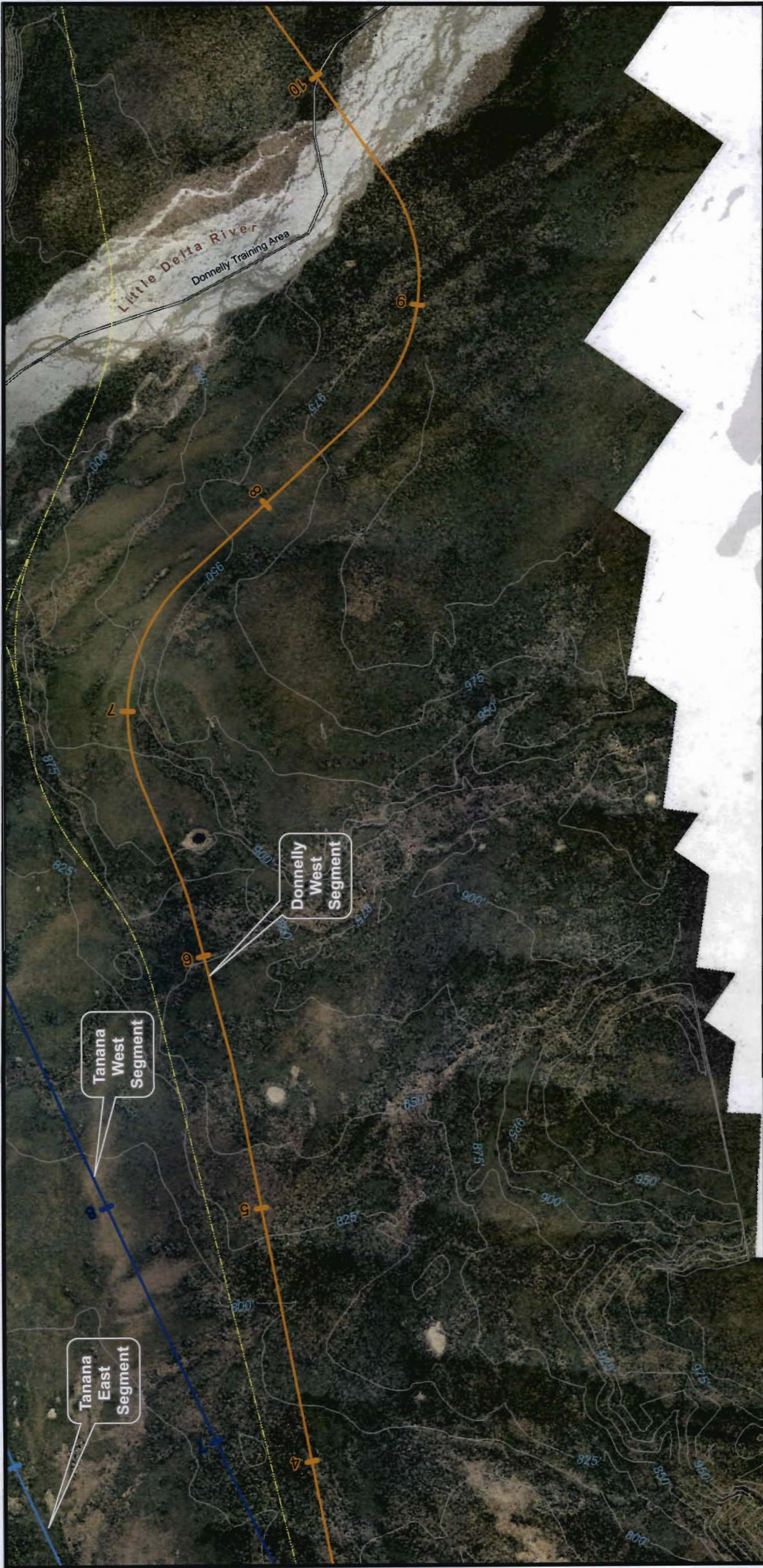
**Map 15
Applicant's Proposed
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Data is to be used for reference only.
Sources:
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ARRC 2005-2006 Color Aerial Photography
Alaska State Plane Zone 3 NAD 83

Date: March 29, 2007 Author: HDR Alaska

Version: REV5.1 Sources: USGS, ARRC, TNH Hanson and HDR

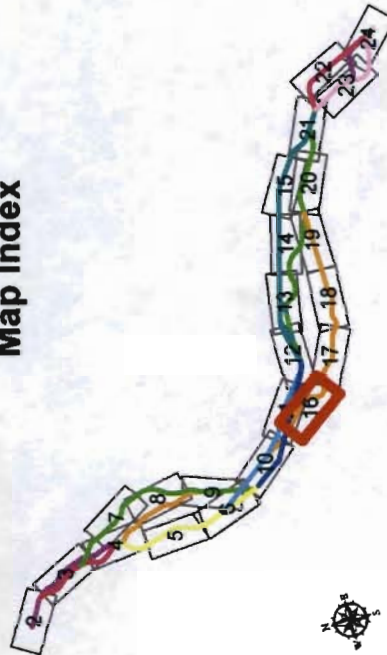


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Map 16 Applicant's Proposed Alignments



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Sources:
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ARRC 2005-2006 Color Aerial Photography
Alaska State Plane Zone 3 NAD 83

Date: March 29, 2007 Author: HDR Alaska

Version: REV5.1 Sources: USGS, ARRC, TNH Hanson and HDR



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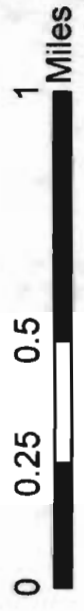


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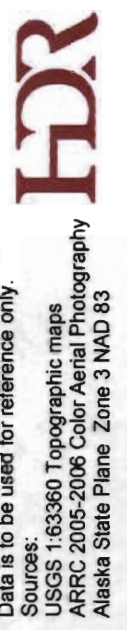


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**Map 17
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- 23 Mile Post



**Map 18
Applicant's Proposed
Alignments**

Data is to be used for reference only.
Sources:
USGS 1:63360 Topographic maps
ARRC 2005-2006 Color Aerial Photography
Alaska State Plane Zone 3 NAD 83



Date: March 29, 2007 Author: HDR Alaska
Version: REV5.1 Sources: USGS, ARRC, TNH Hanson and HDR



Z:\09595 ARRC\22779 Northern Rail Extension\GIS\MXD\Mapbook_Rev5_Hanson\Mapbook_Rev5_HansonAlign.mxd

Proposed Alaska Railroad
Northern Rail Extension



Map Index



Legend

- Towns
- 25 ft Contours
- Military Boundary
- Existing Railroad
- Rev 4 Alignment
- Highway Relocation
- Mile Post



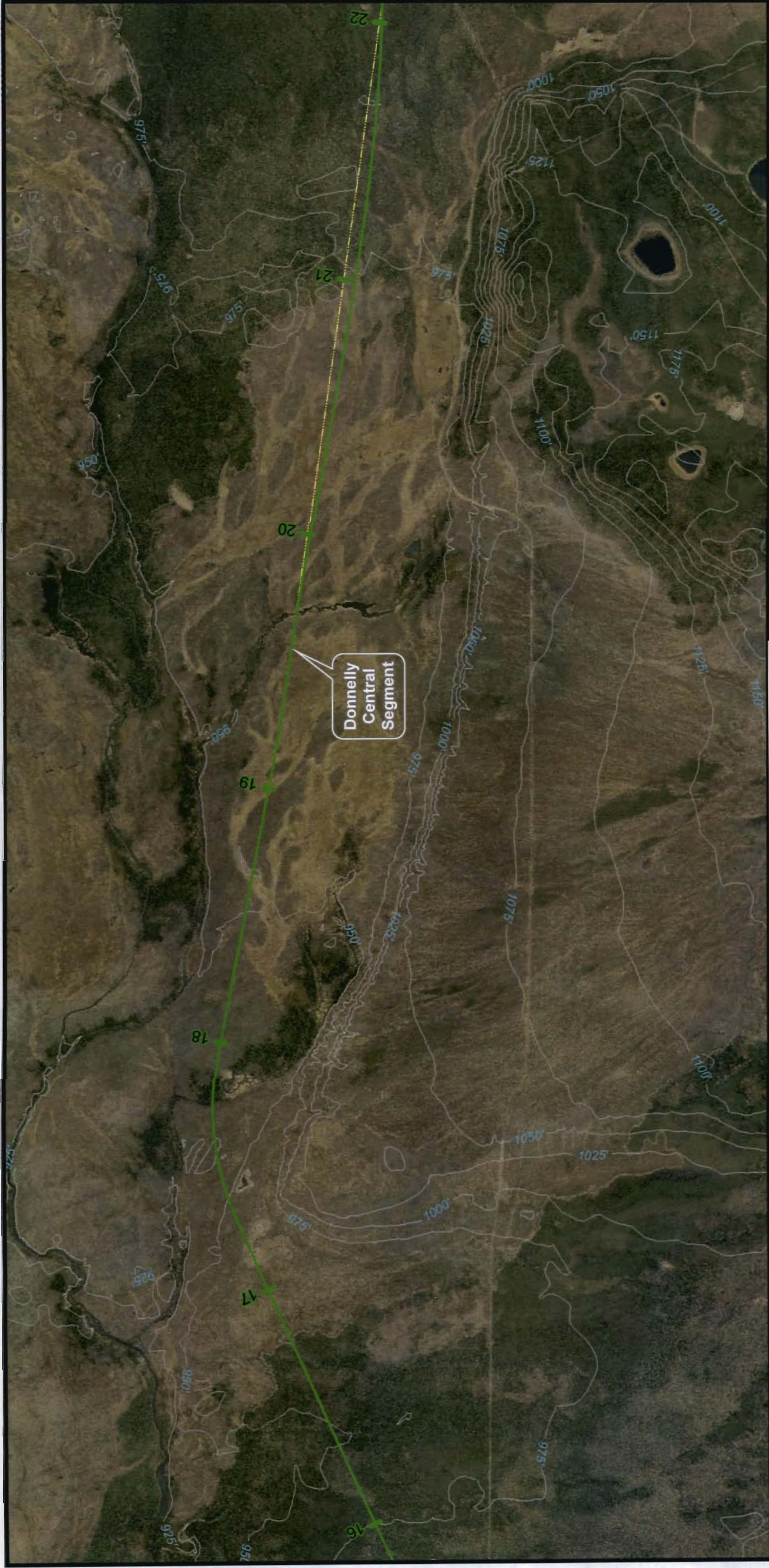
Map 19
Applicant's Proposed
Alignments



Data is to be used for reference only.
Sources:
USGS 1:63360 Topographic maps
ARRC 2005-2006 Color Aerial Photography
Alaska State Plane Zone 3 NAD 83

Date: March 29, 2007 Author: HDR Alaska

Version: REV5.1 Sources: USGS, ARRC, TNH Hanson and HDR

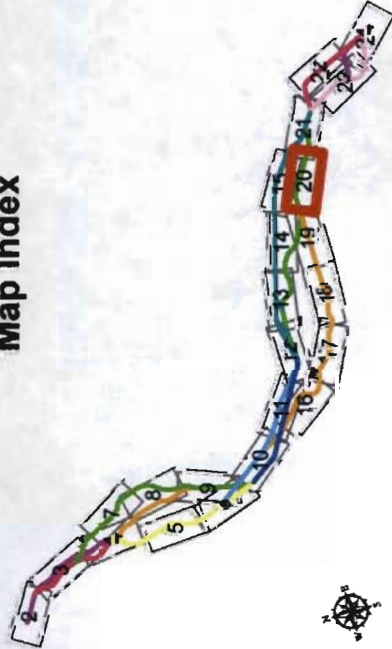


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Proposed Alaska Railroad Northern Rail Extension



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- 23 Mile Post



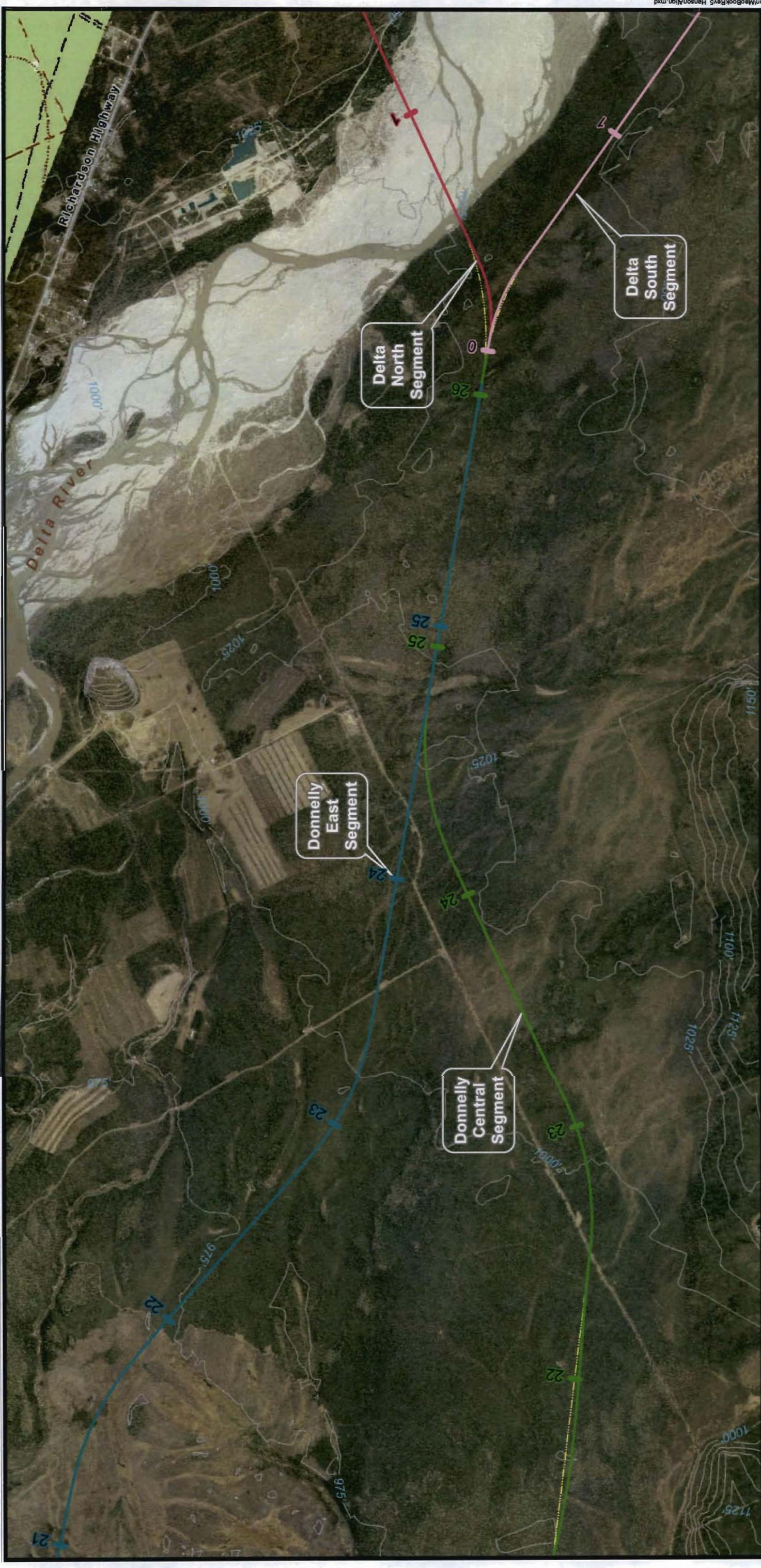
Map 20 Applicant's Proposed Alignments



Data is to be used for reference only.
Sources:
USGS 1:63360 Topographic maps
ARRC 2005-2006 Color Aerial Photography
Alaska State Plane Zone 3 NAD 83

Date: March 28, 2007 Author: HDR Alaska

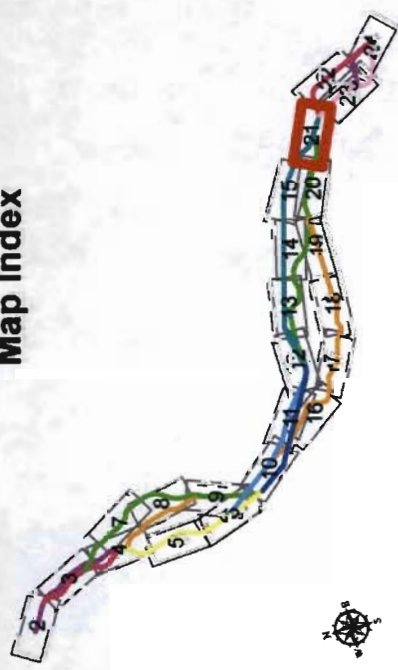
Version: REV6.1 Sources: USGS, ARRC, TNH Hanson and HDR



**Proposed Alaska Railroad
Northern Rail Extension**



Map Index

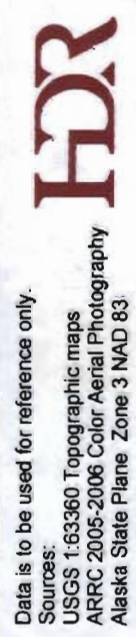


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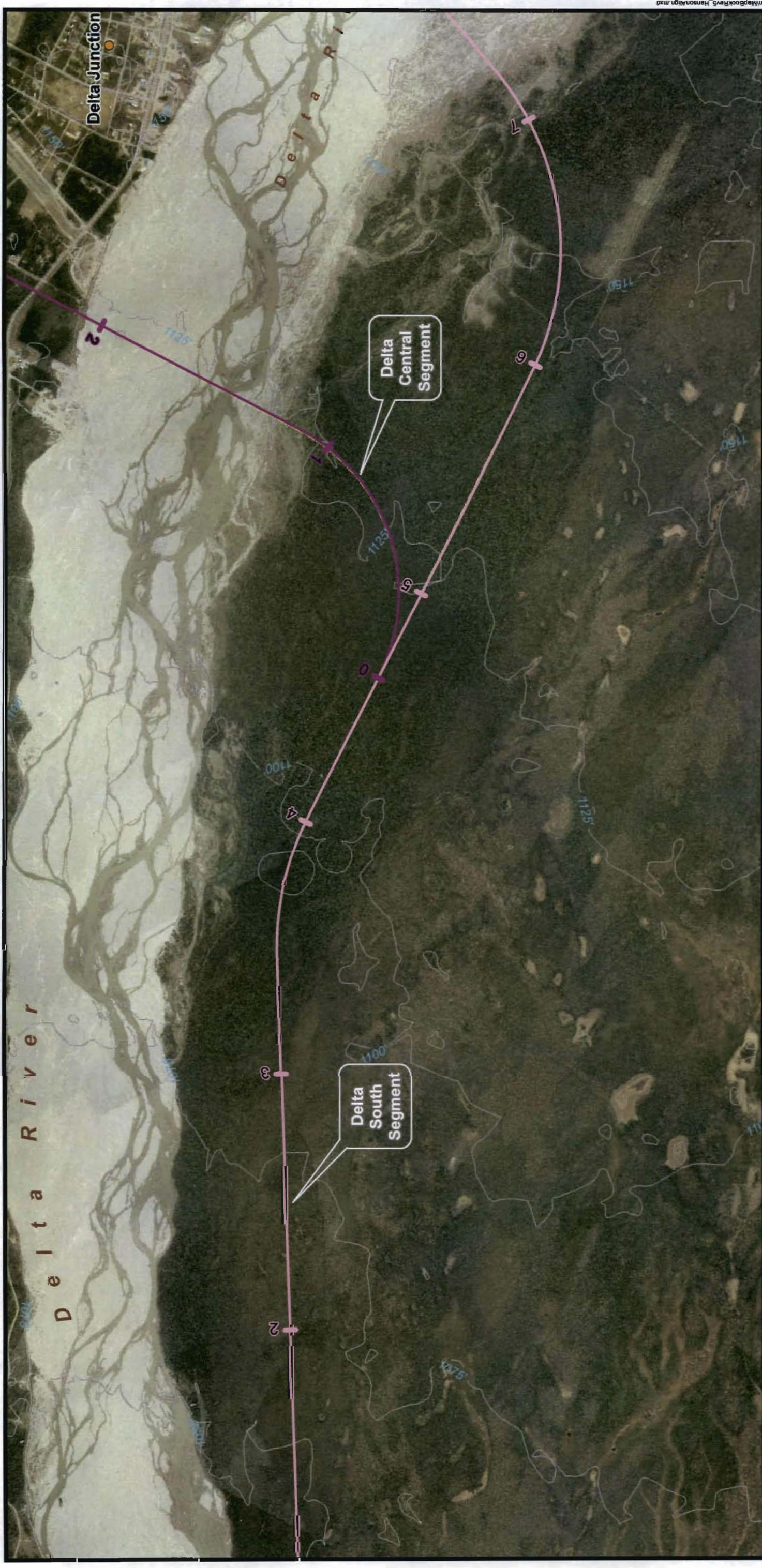
- Towns
- 25 ft Contours
- Military Boundary
- Existing Railroad
- Rev 4 Alignment
- Highway Relocation
- 25 Mile Post



**Map 21
Applicant's Proposed
Alignments**



Date: March 29, 2007 Author: HDR Alaska
Version: REV5.1 Sources: USGS, ARRC, TNH Hanson and HDR



Delta Junction

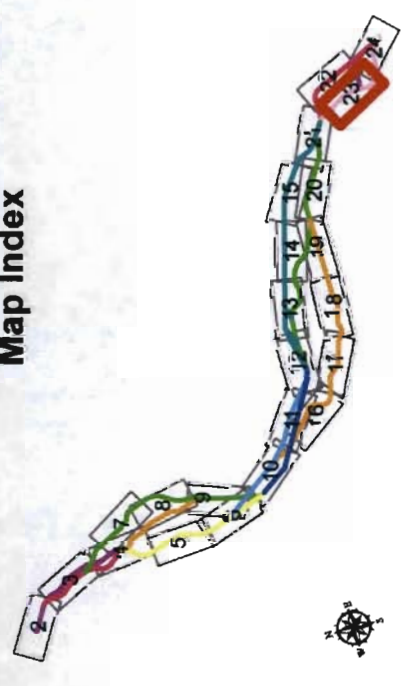
Delta Central Segment

Delta South Segment

Proposed Alaska Railroad
Northern Rail Extension



Map Index



Legend

- Towns
- 25 ft Contours
- Military Boundary
- Existing Railroad
- Rev 4 Alignment
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Map 23
Applicant's Proposed
Alignments

Data is to be used for reference only.
Sources:
USGS 1:63360 Topographic maps
ARRC 2005-2006 Color Aerial Photography
Alaska State Plane Zone 3 NAD 83



Date: March 29, 2007 Author: HDR Alaska
Version: REV5.1 Sources: USGS, ARRC, TNH Hanson and HDR

