Appendix N – Visual Inventory and Visual Contrast Analyses

N. VISUAL INVENTORY AND VISUAL CONTRAST ANALYSES

This appendix presents the application of the Bureau of Land Management's (BLM's) Visual Resource Management (VRM) methodology to evaluate potential effects on visual resources within the area of the proposed Northern Rail Extension (NRE). BLM has certain management authorities for Federal public lands in the project area that have been withdrawn for military use, including the authority to issue a linear right-of-way grant. The project area also includes Alaska state lands and private lands; however, none of these entities has a system or methodology to assess the visual impacts to the existing landscape. The VRM methodology was also used—for consistency—to assess potential visual impacts for the entire Northern Rail Extension.

N.1 Visual Inventory

A visual resource inventory was conducted for the Tanana River Basin areas from the City of North Pole to Delta Junction, Alaska. The inventory was conducted in accordance with the BLM (2007c) guidelines. The VRM methodology uses three factors to evaluate the visual value of BLM-administered lands:

- Scenic quality of the resource
- Viewer sensitivity
- Observation distance

Based on these factors, visual resources are classified as follows:

- Class I: Most Value
- Class II: High Value
- Class III: Moderate Value
- Class IV: Least Value

The BLM had not previously established a classification of the visual resources within the study area. The assessment presented in this appendix establishes the Interim Visual Resource Management Class for these resources.

N.1.1 Scenic Quality

Scenic quality is a measure of the visual appeal of a tract of land. In the visual resource inventory process, public lands are given an A, B, or C rating based on the apparent scenic quality. Seven key factors determine scenic quality: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. All public lands have scenic value, but areas with the most variety and most harmonious composition have the greatest scenic value. Cultural modifications within a landscape do not necessarily detract from the scenic value; if structures complement the natural landscape, they may enhance the scenic value. VRM evaluations should avoid any bias against cultural modification to natural landscape (BLM 2007a).

Scenic Quality Rating Units

Defining Scenic Quality Rating Units (SQRUs) is the first step of a visual inventory/visual contrast analysis. SQRUs are broad geographic classifications, such as Lowlands, within which

specific visual characteristics can be evaluated. BLM Manuals include the following guidelines for delineating SQRUs.

"The planning area is subdivided into scenic quality rating units for rating purposes. Rating areas are delineated on a basis of: like physiographic characteristics; similar visual patterns, texture, color, variety, *etc.*; and areas which have similar impacts from man-made modifications. The size of SQRUs may vary from several thousand acres to 100 or less acres, depending on the homogeneity of the landscape features and the detail desired in the inventory. Normally, more detailed attention would be given to highly scenic areas or areas of known high sensitivity" (BLM, 2007c).

As directed by these BLM guidelines, the project area was grouped into three SQRUs on the basis of similar physiographic characteristics or impacts from man-made modifications (see Figure N-1). The first (Lowlands) contains terrain in the lowlands of the Tanana River Basin up to a 500-foot elevation. The visual area is dominated by the Tanana River, its tributaries, and the surrounding vegetation in the floodplain and hillsides. The area is characterized by the broad blue and brown waters that meander through the flat, muddy floodplain, creating multiple waterways around mud and rock bars, some of which become side sloughs and oxbow lakes. The shoreline is dominated by spruce and hardwood species surrounded by tall scrub thickets. Roads, agricultural fields, power lines and dispersed residential structures occur throughout this unit.

The second SQRU (Communities) is delineated by physiographic qualities common to the project area's densest cultural modifications, including Eielson Air Force Base (AFB), the communities of Moose Creek, Salcha, and Delta Junction, as well as the adjacent residential areas, agricultural lands, parks, and highways. The visual qualities of the built communities in this SQRU are very different from the surrounding terrain.

The third SQRU (Uplands) contains the foothills of the Alaska Range to the south and bluffs to the north of the Tanana River. This area is dominated by the hills and drainages carved by the glacial and snowmelt water from higher elevations.

SQRU 1 – Lowlands

Landform

The landform of this SQRU is characterized by the Tanana River Basin, which is composed of flat to nearly flat bottomlands, with some hills. Variation in elevation is generally limited to a slope gradient of less than 1 degree (Gallant *et al.*, 1995).

Vegetation

Vegetation communities are dominated by black spruce with occasional stands of white spruce and paper birch, with tall scrub thickets of willow occurring on floodplains, and wetlands of sedge and grass tussocks occurring in wetter sites.

Water

This SQRU is defined by the water features within the Tanana River Basin. Riverine features, such as meandering rivers, side sloughs, and oxbow lakes, are prevalent. The Tanana River is over two miles at its widest with numerous riverlets braiding through sand and gravel bars and islands. The abundant tributaries to the Tanana vary from a few feet to a half-mile wide and from a straight, fast-flowing river to a meandering, slow stream.

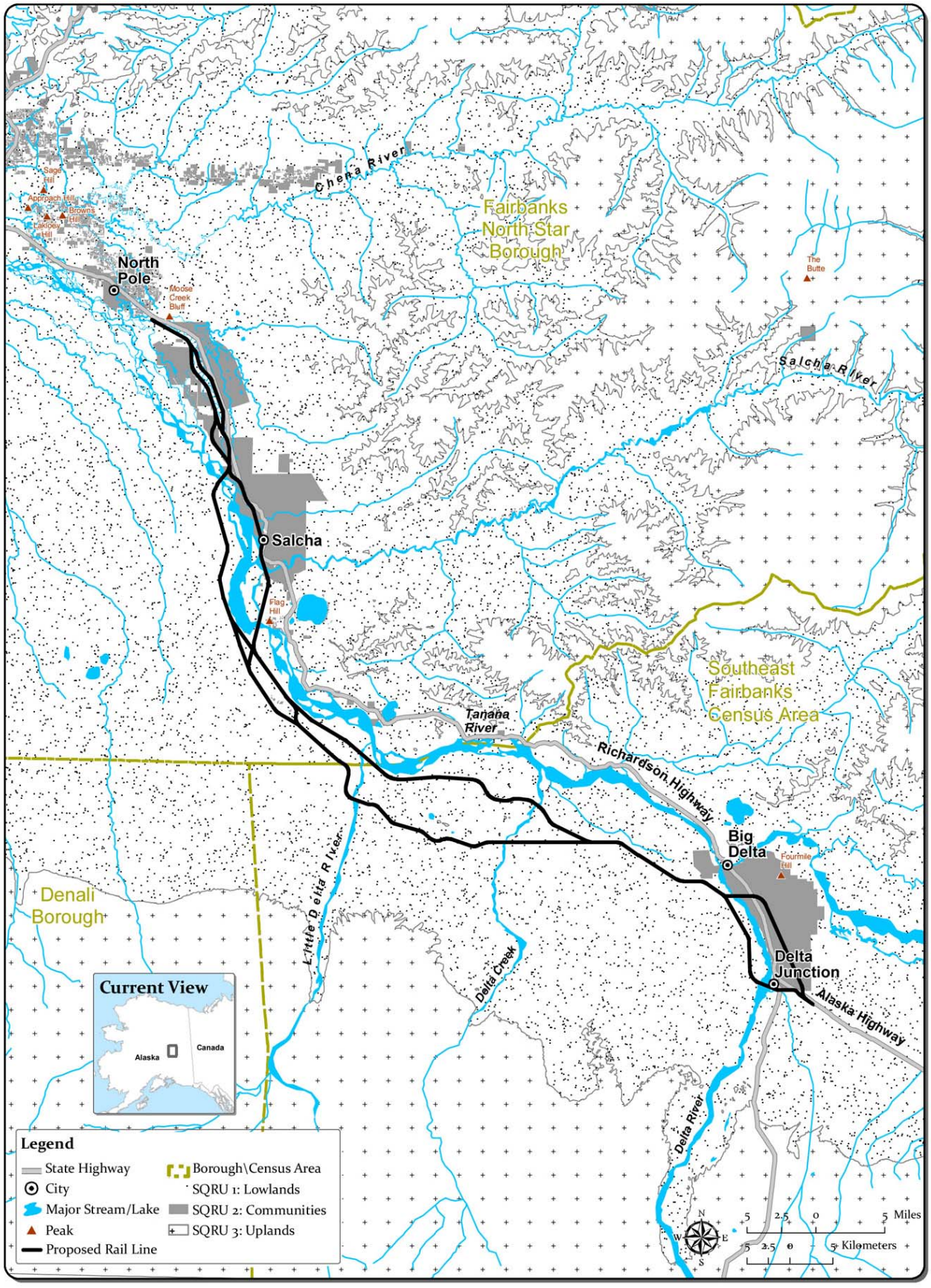

Figure N-1 - Scenic Quality Rating Unit

Color

The colors within this SQRU are primarily earthtone blues, browns, and light tans of the water features and landforms coupled with light to dark greens of the native vegetation. The few human modifications include the colors of gray, white, and yellow with a variety of colors within the communities.

Influence of Adjacent Scenery

At most points in this SQRU, viewing distances are limited, due to the combination of dense vegetation and fairly flat terrain. Longer viewing distances of adjacent scenery can be seen from some points along the river bottom where the expanse of unvegetated landscape provides more open views of the surrounding areas or from elevated positions above the lowlands. At these points, the landforms that can be seen include the larger hills that surround the river basin with a background of the Alaska Range. These views provide depth of perspective to the immediate landscape.

Scarcity

The landforms, water features, and vegetation within this SQRU are fairly unique in the region of Interior Alaska and generally contain unique structures or vegetative patterns that are different from other major interior rivers.

Cultural Modifications

Most cultural modifications within this SQRU consist of roads, telephone and electric poles, signage and dispersed housing structures. In general, the cultural modifications within the region are few but are disharmonious with the natural landscape.

SQRU 2 – Communities

Several residential communities exist near the proposed project area, so an SQRU was developed for these communities. Included in this category are Eielson AFB, the communities of Moose Creek, Salcha, and Delta Junction, and adjacent private residential and agricultural lands.

Landform

The landform of this SQRU is characterized by flat to nearly flat bottomlands, with some hills. Variation in elevation is generally limited to a slope gradient of less than 1 degree (Gallant et al 1995).

Vegetation

Vegetation communities are dominated by white spruce with occasional black spruce stands and hardwood species such as paper birch, balsam poplar and aspen with alder and willow undergrowth. This thick vegetation covers approximately 10 to 50 percent of the land within the towns. Various crops within the agricultural lands present different homogeneous plant communities.

Water

Water features are a major component of this SQRU with the Tanana River and its tributaries being integral parts of Salcha and Delta Junction. The Salcha River meanders through the Town of Salcha and adjacent agricultural lands, providing access to the Tanana River. Delta Junction is located at the junction of the Alaska and Richardson highways and also includes the confluence of the Delta and Tanana rivers, with the Tanana as a major travel route and the Delta

River as a major water attraction. Adjacent to Moose Creek and Eielson AFB are a number of lakes and sloughs that are visible, but not dominant, in the landscape. In general, the water features within this SQRU are a dominant feature.

Color

The colors within this SQRU have various hues of light to dark greens associated with the native vegetation intertwined with a variety of structures' more primary blacks, yellows, whites, and grays. Water bodies are blue to brown to the white colors of the glacial Tanana. Gravel bars and river banks display a variety of browns and tans.

Influence of Adjacent Scenery

At most points in this SQRU, adjacent scenery includes nearby meandering rivers and densely vegetated hills in the distance. This scenery generally has no cultural modifications and is of high quality.

Scarcity

The landforms, water features, and vegetation within this SQRU are fairly typical of the region and do not generally contain unique structures or vegetative patterns.

Cultural Modifications

The cultural modifications within this SQRU include residential housing, schools, business developments, aircraft hangers, and public and private buildings. Most of these enclosures are one-story buildings interspersed with the native vegetation. Roads, telephone and electric poles, and signage are the predominant fixtures of the communities' infrastructure. In general, the cultural modifications within the region are extensive and disharmonious with the natural landscape.

SQRU 3 – Uplands

Landform

This SQRU is defined by the Alaska Range foothills to the south and the bluffs to the north of the Tanana River. This area is composed of moderate to steep slopes carved into drainages by snowmelt.

Vegetation

Vegetation communities are dominated by white spruce with occasional black spruce stands and hardwood species such as paper birch, balsam poplar and aspen with alder and willow undergrowth, or by the various crops within the agricultural lands.

Water

The water features of this SQRU are characterized by the streams and rivers fed by glacial snowmelt from the mountains.

Color

The colors within this SQRU are primarily various hues of blues and browns of the water features and landforms coupled with light to dark greens of the native vegetation.

Influence of Adjacent Scenery

Views from the hills and mountains extend for many miles in all directions. Views generally include the lowland river drainages described above, as well as other nearby mountain ranges.

Scarcity

The landforms, water features, and vegetation within this SQRU are fairly unique in the region of Interior Alaska and generally contain unique structures or vegetative patterns that are different from other major mountain ranges.

Cultural Modifications

There are very few cultural modifications within this SQRU.

Scenic Quality Rating Summary

Based on the BLM methodology, each of the seven evaluation criteria discussed above for the three SQRU's is assigned a numerical value. For most criteria, scores range between 0 and 5; however, the range for Cultural Modifications is between -4 and 2. Higher values represent greater scenic quality. Tables N-1, N-2, and N-3 provide the ratings assessed for each of the three SQRU's in the project area.

Table N-1
Scenic Quality Rating Summary for SQRU 1 Lowlands

Key Factor	Rating
Landform	1
Vegetation	3
Water	5
Color	4
Adjacent Scenery	5
Scarcity	3
Cultural Modifications	0
Total Score	**21**

Table N-2
Scenic Quality Rating Summary for SQRU 2 Communities

Key Factor	Rating
Landform	1
Vegetation	5
Water	4
Color	3
Adjacent Scenery	5
Scarcity	1
Cultural Modifications	-4
Total Score	**15**

Table N-3
Scenic Quality Rating Summary for SQRU 3 Uplands

Key Factor	Rating
Landform	5
Vegetation	4
Water	4
Color	5
Adjacent Scenery	5
Scarcity	3
Cultural Modifications	0
Total Score	**26**

Scenic Quality Ratings

Scenic quality is summarized by the total score found by summing the numerical values of the seven criteria above and assigning an A, B, or C rating based on that sum. A rating of "A" demarks an area with high scenic quality while a rating of "C" demarks an area with low scenic quality. Scenic Quality is rated as follows:

A = 19 or more total score
B = 12–18 total score
C = 11 or less total score

Based upon BLM Manual Handbook 8410-1 (BLM, 2007c), the scenic quality of SQRU 1 Lowlands, with a total score of 21, is rated A. The scenic quality of SQRU 2 Communities, with a total score of 15, is rated B. The scenic quality of SQRU 3 Uplands, with a total score of 26, is rated A.

Viewer Sensitivity

Sensitivity levels are a measure of public concern for scenic quality. Public lands are assigned high, medium, or low sensitivity levels by analyzing the various indicators of public concern (BLM 2007c). These factors include:

- Types of Users;
- Amount of Use;
- Public Interest;
- Adjacent Land Uses; and
- Special Areas.

Types of Users

There are three general types of users in the vicinity of the build alternatives: residents of the surrounding communities, sightseers and others using Richardson Highway, and outdoor enthusiasts who enjoy a variety of activities throughout the year. Typically, residents are highly sensitive to visual changes surrounding their homes or communities. Richardson Highway is a State Scenic Byway and sightseers travel that route to enjoy beautiful scenery and natural landscapes. These users are highly sensitive to changes in visual quality. Outdoor recreationalists are also sensitive to changes in visual quality. Since one of the major reasons that people participate in outdoor sports and activities is to remove themselves from the influences of cultural modification and civilization, generally they are highly sensitive to changes in visual quality. Therefore, the visual sensitivity of the users of the Tanana River Basin region would be considered "high."

Amount of Use

The amount of use by the residents, sightseers, and outdoor recreationalists varies per location. Richardson Highway has a large amount of traffic from all types of users year-round. Rivers, parks, trails and the scenic roads have a moderate to high amount of use throughout the year. Areas with no access by vehicle or boat have little use throughout the year.

Public Interest

The public interest in the visual quality of a region is difficult to measure, but is indicated by the public response to proposed activities. In 1990, Alaska Department of Natural Resources (ADNR) received public comments for updates to the Tanana Basin Area Plan, a regional general plan that contains the region evaluated in this document. In May of that year, ADNR

held public meetings to discuss the updates to the plan. The cumulative attendance at the public meetings was approximately 200 people. Because of the relatively low population within the area, this level of attendance demonstrates a high rate of public interest in the region. Therefore, the sensitivity level for this factor would be "high" (ADNR 1990).

Adjacent Land Uses

Most of the lands surrounding the project area are undeveloped. These lands are either private, or are owned by the public and managed by the BLM, Department of Defense or State of Alaska. The adjacent lands are used for a variety of residential, agricultural, commercial, recreational and military training activities. While the population level in the surrounding areas is generally low, the residential and recreational land users would be very sensitive to visual quality of the region, and therefore the sensitivity level for this factor would be "high."

Special Areas

Special areas within the area include Richardson Highway, designated as a State Scenic Byway, and the Delta River Critical Habitat Area, which is managed by ADNR. Sightseers choose to travel a scenic byway to enjoy beautiful scenery and natural landscapes and are highly sensitive to changes in visual quality. Therefore the sensitivity level for this factor would be "high."

Sensitivity Level Rating Units

Based on analysis of the five factors above, the study area is grouped into similar sensitivity regions known as Sensitivity Level Rating Units (SLRUs). Because the Type of Users, Public Interest, and Adjacent Land Uses factors are fairly constant throughout the region, only the Amount of Use and Special Areas factors were used to determine the physical boundaries of the SLRUs. Based on these, two SLRUs were delineated (Figure N-2). The boundaries of SLRU 1, rated high sensitivity level, are defined by the roads, trails, parks, rivers, and towns that have high usage by residents, sightseers and outdoor enthusiasts. Views within the region are limited by the dense vegetation in the area; therefore, the boundaries of SLRU 1 are defined by the viewing distance from roads, trails, and rivers as wells as from the boundaries of parks and towns. The viewing distance was derived from the viewshed analysis conducted in the following section, Distance Zones. The boundaries of SLRU 2, rated medium sensitivity level, are defined as all other undeveloped areas within the project area that have far fewer visitors.

Observation Distance

The distance of potential observation points from an area is another determinant of visual value. In general, the greater the distance of an observer from an area, the less impact to the observer of changes in visual quality. For example, the details and dominance of a new action, and therefore impact, diminish with increased viewing distance. Delimiting the landscape into general regions according to their distances from observation points helps to classify the relative impact to observers of changes in an area's visual quality.

Landscapes are subdivided into three distance zones based on relative visibility from travel routes or observation points. The three zones are foreground-middleground, background, and seldom-seen. The foreground-middleground zone includes areas visible from highways, rivers, or other viewing locations within 3 to 5 miles. The background zone includes areas beyond the foreground-middleground zone, less than 15 miles away, but visible from viewing locations. The form, lines and colors in the background zone can still be seen, but texture is not discernable. Areas not seen as foreground-middleground or background (*i.e.*, hidden from view) are in the seldom-seen zone.

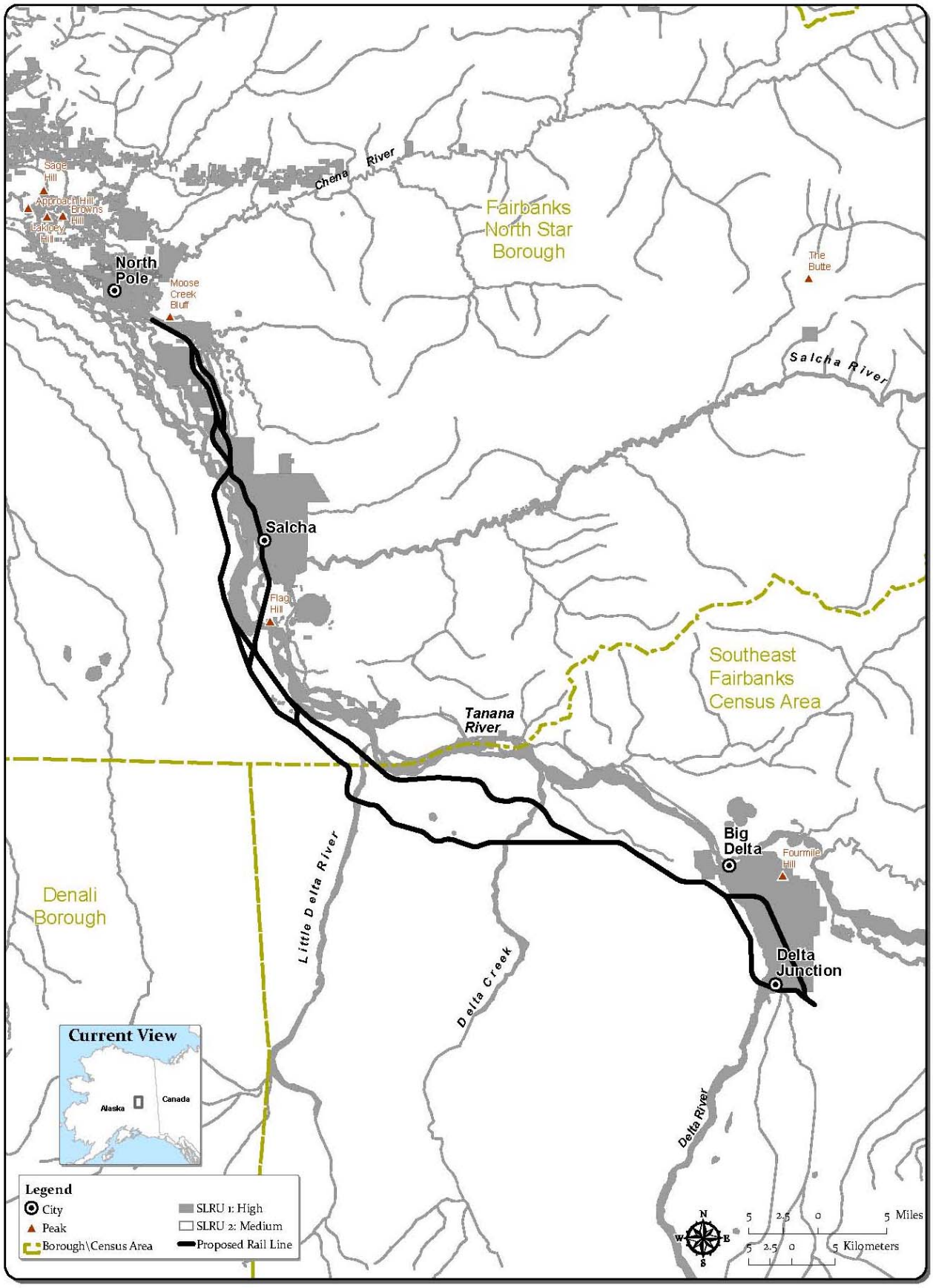

Figure N-2 – Sensitivity Level Rating Units

A viewshed analysis was conducted to determine the boundaries of the distance zones (see Figure N-3). The foreground-middleground zone is defined by the viewing distance from roads trails and rivers as wells as from the boundaries of parks, towns, and cultural modifications. Due to the relatively flat terrain and wide river expanse, views up and down the river and from elevated positions can extend up to 3 miles or more. Visitors use the parks and trails of this area, so that most of this area is within foreground-middleground region. However, the dense vegetation lining some areas of the highway and rivers typically limits the viewing distance to within a few hundred feet of the highway or river edge.

There are hills bordering Richardson Highway that would provide views of over 5 miles of the Tanana River Basin, but there is little road or trail access to most of these hills, resulting in few observation points of surrounding terrain. The Alaska Range and other surrounding mountains fall into the seldom-seen zone, where the vegetation is no longer discernable except as form and outline.

Visual Resource Inventory Class Assignment

Visual Management Inventory Classes for this project area are assigned based on scenic quality, sensitivity level, and distances zones. Table N-4 shows how the combination of the three evaluations establishes the VRM Classes.

Table N-4
Basis for Determining Visual Resource Inventory Classes

		Visual Sensitivity						
		High			**Medium**			**Low**
Special Areas		I	I	I	I	I	I	I
Scenic Quality	A	II	II	II	II	II	II	II
	B	II	III	III IV	III	IV	IV	IV
	C	III	IV	IV	IV	IV	IV	IV
		f/m	**b**	**s/s**	**f/m**	**b**	**s/s**	**s/s**
		Distance Zones						
		f/m = foreground/middleground b = background s/s = seldom seen						

Source: BLM, 2007c

Figure N-4 shows the results of combining the SQRU, SLRU, and Distance Zones map overlays to delineate the region's management classes. In general, the entire Tanana River Basin is designated Class II. Portions of Eielson AFB are rated Class III and IV because of their lower scenic quality, sensitivity, and location within the background Distance Zone. The management objectives for these Visual Resources Classes are defined below (BLM, 2007a).

Class II Objective: Preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

Class III Objective: Partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

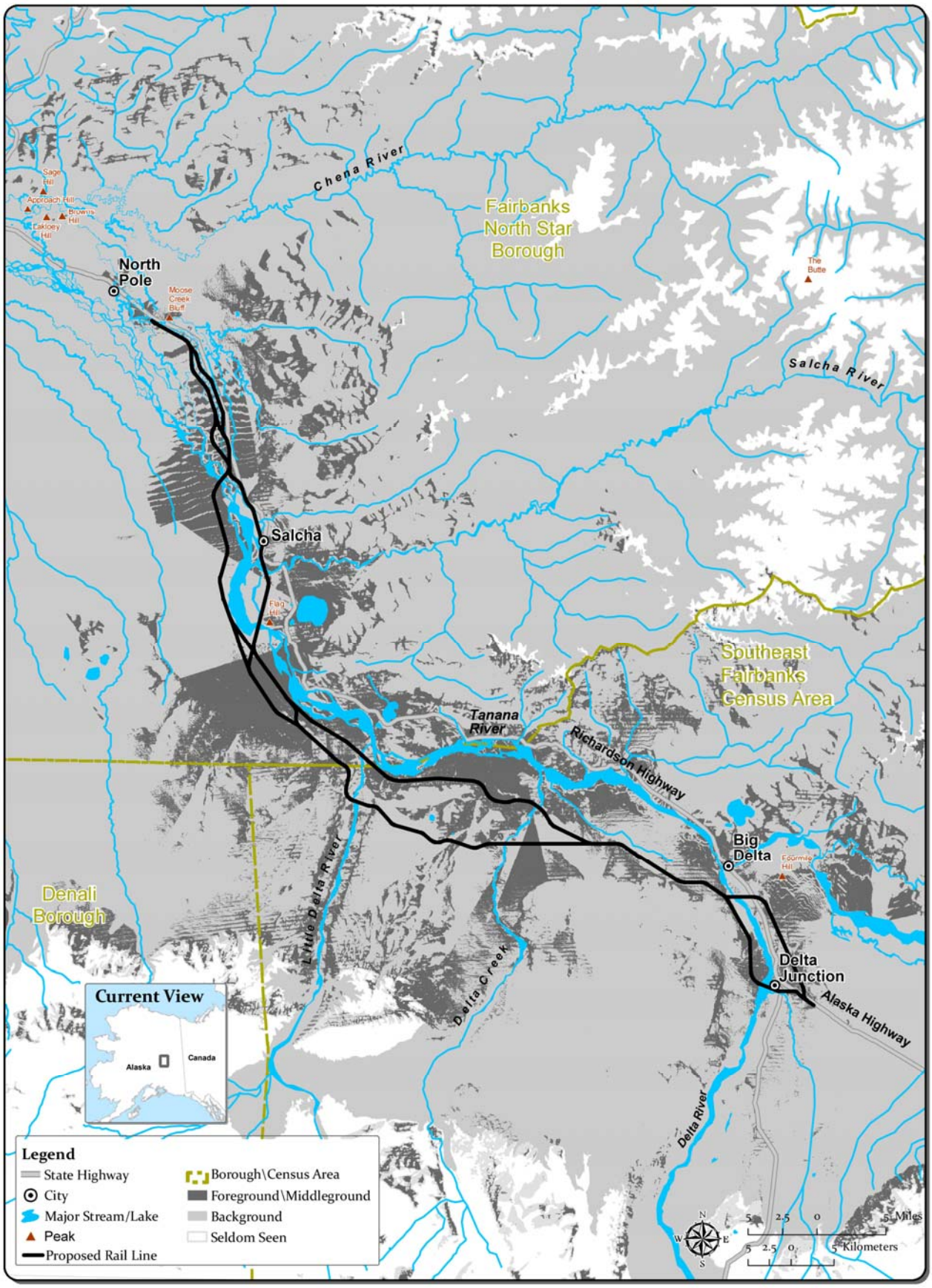

Figure N-3 - Distance Zone Delineation

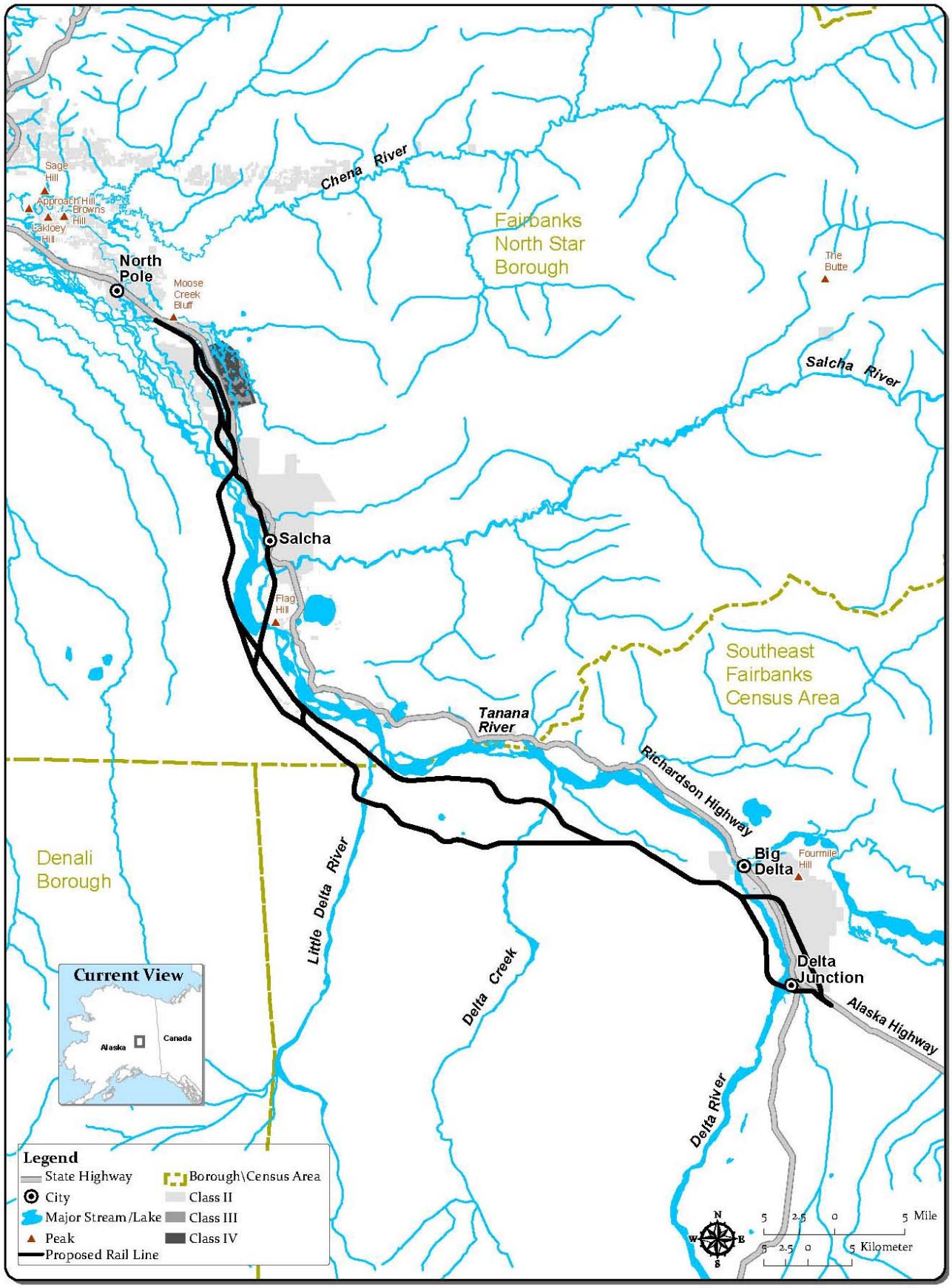

Figure N-4 – Visual Classifications

Class IV Objective: Provide for management activities that require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

N.1.2 Visual Contrast Rating

The Visual Contrast Rating process of BLM's VRM methodology was used to determine whether the potential visual impacts from the build alternatives would meet the management objectives established in the Visual Resources Inventory, or whether mitigation measures would be required. This process provides a systematic comparison of the proposed project components with the major features in the existing landscape using the basic design elements of form, line, color, and texture (BLM, 2007b). It also provides a mechanism for comparing impacts of the different alternative segments.

The Visual Contrast Rating process comprises the following five steps: obtain action description, identify VRM objectives, select key observation points, prepare visual simulations, and determine whether VRM objectives are met.

Using these five steps, the contrast of the alternative segments to the existing landscape was evaluated to determine if the VRM objectives would be met with project implementation. Mitigation measures for the action were developed to minimize the project's visual impacts in accordance with these objectives (see Chapter 20 for proposed mitigation measures).

Key Observation Points

Key Observation Points (KOPs) are locations selected to be representative of critical locations from which the project would be seen. Based on the KOP analysis, the potential visual impacts of the permanent mainline rail features as well as temporary features are discussed. In accordance with VRM methodology, visual impacts are examined in relation to their impacts on land and water features, vegetation, and structures. The associated facilities and temporary facilities are not evaluated through the KOP contrast analysis process due to a lack of available detail regarding location and structures as well as expected low visual impact of some of those features.

Select Key Observation Points

In July 2006, 29 KOPs were established and photographed (Figure N-5, Table N-5). The photographs document the various segments from Delta Junction to Fairbanks and were taken mainly from Richardson Highway and along the Tanana River and its tributaries. These points were chosen based on public use such as outdoor recreation and scenic viewing. Each of these points was visited in the field and analyzed to determine if the proposed rail line could be seen and to obtain a visual inventory. These 29 points were then narrowed down to eight KOPs for further analysis. These eight KOPs were selected because they best represented the various types of views of the project from likely observation points within the region. The eight KOPs analyzed for contrast rating are shaded grey in Table N-5, while the KOP number is highlighted in bold for the three KOPs analyzed that included photo simulations.

KOP selection is intended to identify those locations in proximity to the project site that best represent overall views of the segment that would be seen from public places such as roads, recreation areas and trails, as well as adjacent residential communities. KOPs are generally

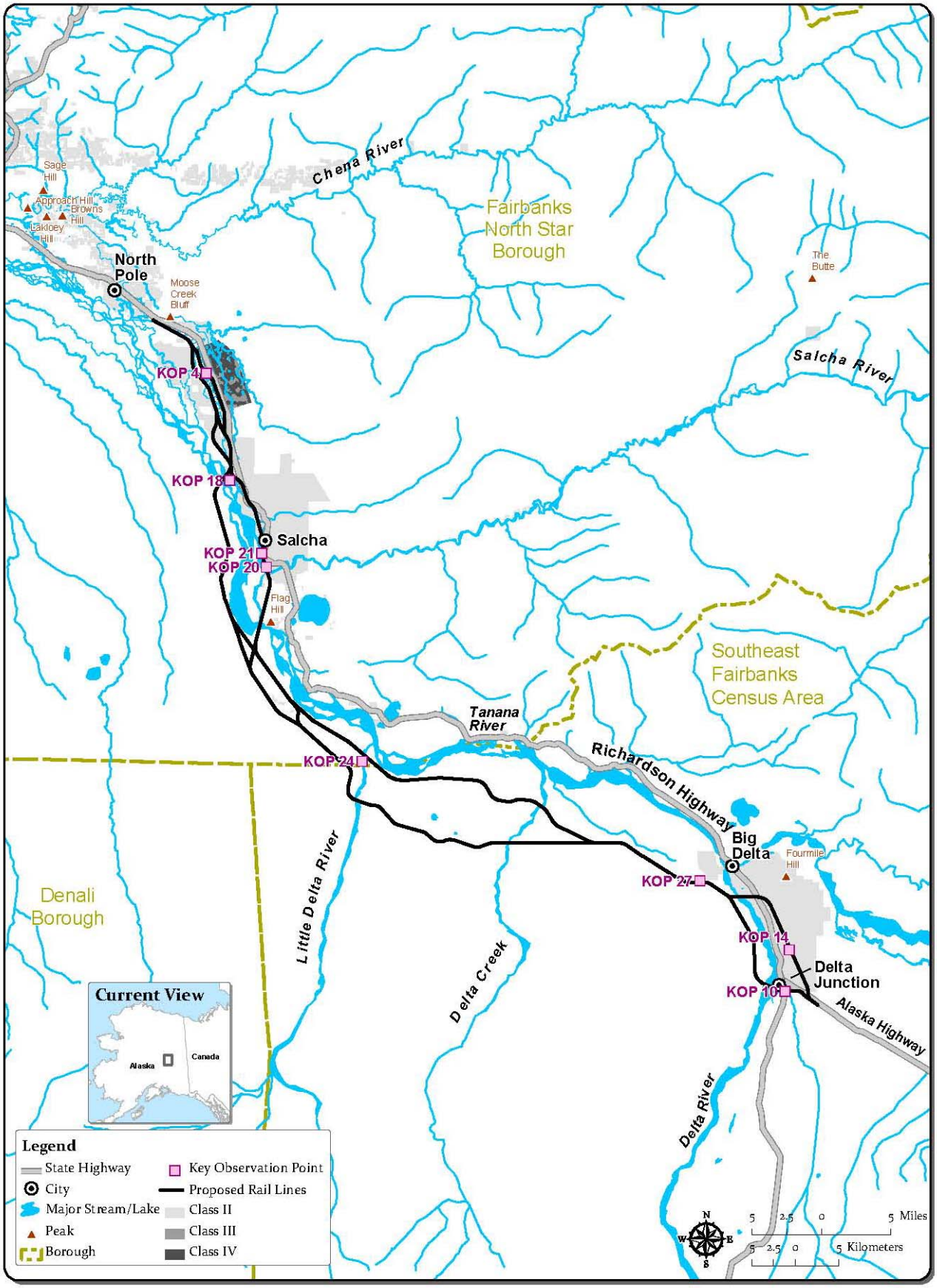

Figure N-5 – Select Key Observation Points

Table N-5
Key Observation Points
(Shaded segments were analyzed for contrast rating, bold for photo simulations)

KOP No.	Viewing Location	Project Site Visibility	Proposed Action Segments: North Common	Eielson 3	Salcha 1	Connector B	Central 2	Connector E	Donnelly 1	South Common	Delta 1	Alternative Segments: Eielson 1	Eielson 2	Salcha 2	Connector A	Connector C	Connector D	Central 1	Donnelly 2	Delta 2	Comments
			Views from a river																		
17	Mainstem of the Tanana River	Open			✓																View of Tanana River crossing location
18	**Mainstem Tanana River upstream from Little Salcha River**	**Open**												✓							**Mainstem Tanana River from boating perspective**
19	Sandbar in Tanana River side channel near confluence with Little Salcha	Open												✓							View downstream of crossing an edge of the side channel.
20	South bank of the Salcha River just east of the proposed alternative crossing	Open												✓							Boat ramp just upstream, likely boat traffic in area
21	On a gravel bar on west bank of Salcha river south of the confluence with Tanana River, looking southeast towards the bank where the alternative would cut across the hillside	Open												✓							Potential hillside cutout highly visible from river
22	West side Tanana River south of confluence with Salcha River	Open												✓							View of Tanana River crossing location
23	East side of Tanana River south of confluence with Salcha River	Open												✓							View of Tanana River crossing location
24	Little Delta River just west of Tanana River	Open							✓												View of Little Delta River crossing location

Table N-5
Key Observation Points
(Shaded segments were analyzed for contrast rating, bold for photo simulations) (continued)

KOP No.	Viewing Location	Project Site Visibility	Proposed Action Segments: North Common	Eielson 3	Salcha 1	Connector B	Central 2	Connector E	Donnelly 1	South Common	Delta 1	Alternative Segments: Eielson 1	Eielson 2	Salcha 2	Connector A	Connector C	Connector D	Central 1	Donnelly 2	Delta 2	Comments
26	Sandbar in middle of Delta River just south of Big Delta	Open																		✓	View of Little Delta River crossing location
29	Sandbar in Delta creek just east of confluence with the Tanana River	Open																	✓		View of Delta creek crossing location
	Views from a Road																				
1	Richardson Highway, north of proposed North Common Segment	None	.									.									View of existing rail line
2	East side of Bathing Beauty pond near Richardson Highway	None		.								.									Dense vegetation would screen view of Build alternative
3	Eielson Farm Road south of Bathing Beauty pond where alternative would cross the road	Open	✓									.									Signs of recreation use in area. There is an existing electricity line and newly constructed large utility lines running through the area also between alternative and most lakes.
4	West of Richardson Highway on east side of the Eielson Air Force Base	Open		✓																	Some recreation in area, close to Fairbanks
5	Richardson Highway location with view of Tanana Flats	Open												✓							Alternative would cause relocation of the Richardson Highway in this location

Table N-5
Key Observation Points
(Shaded segments were analyzed for contrast rating, bold for photo simulations) (continued)

KOP No.	Viewing Location	Project Site Visibility	Proposed Action Segments									Alternative Segments									Comments
			North Common	Eielson 3	Salcha 1	Connector B	Central 2	Connector E	Donnelly 1	South Common	Delta 1	Eielson 1	Eielson 2	Salcha 2	Connector A	Connector C	Connector D	Central 1	Donnelly 2	Delta 2	
6	Richardson Highway Viewpoint of Tanana at Mile 297.7	None																			The Northern Rail Extension at this point (Donnelly Alternatives) would be located across the Tanana River from the Richardson Highway and far enough from the river that the alternative is not expected to be visible
7	Richardson Highway Photo point of Tanana at mile 296.5	None																			Similar to KOP 6.
8	Richardson Highway just south of Big Delta	Open																		✓	View of grade separated alternative crossing Richardson Highway
9	Richardson Highway just north of Delta Junction	None																			
10	**Richardson Highway south of Delta Junction near Jarvis Creek**	**Open**																		✓	**Grade separated crossing of the Richardson Highway would be visible**
11	Alaska Highway just southeast of Delta Junction	Open																		✓	Grade separated crossing of the Alaska Highway would be visible
12	Emmaus Road east of Delta Junction	Open																		✓	At-grade crossing would be visible
13	Junction near Nestler and Emmaus Roads east of Delta Junction	Open																		✓	At-grade crossing would be visible

Table N-5
Key Observation Points
(Shaded segments were analyzed for contrast rating, bold for photo simulations) (continued)

KOP No.	Viewing Location	Project Site Visibility	Proposed Action Segments: North Common	Eielson 3	Salcha 1	Connector B	Central 2	Connector E	Donnelly 1	South Common	Delta 1	Alternative Segments: Eielson 1	Eielson 2	Salcha 2	Connector A	Connector C	Connector D	Central 1	Donnelly 2	Delta 2	Comments
14	Jack Warren Road just north of Delta Junction	Open																		✓	At-grade crossing would be visible
15	Boat Ramp on Salcha River near Richardson Highway crossing of river													✓							Parking lot full; popular boating area on Salcha River
16	Rock outcrop near Eielson AFB on the northeastern side of Richardson Highway	Limited	✓																		Popular hangout spot with elevated view.
25	East Bank of Delta River at Delta Junction	Open									✓										View of the crossing of the Delta River.
27	**View from recreation road northwest of Delta Junction**	**Limited**								✓											**Dense vegetation screens parallel alternative from this viewpoint**
28	Recreation "road" near proposed rail line crossing	Open								✓											Winter recreation road, not usable by a vehicle in summer – KOP accessed by helicopter

Project Site Visibility Terms: Open = an unobstructed view of the rail alternative segment; Limited = a partially obstructed view of the rail alternative segment; None = a fully obstructed view of the rail alternative segment.

selected for one or two reasons: (1) the location provides representative views of the landscape along a specific route segment or in a general region of interest; and/or (2) the viewpoint effectively captures the presence of a potentially significant project impact in that location. KOPs are typically established in locations that provide high visibility to relatively large numbers of viewers and/or sensitive viewing locations such as residential areas, recreation areas, and vista points.

While every view toward the project is not represented, the KOPs identified are representative of typical views with potential for visual impacts generated by the proposed rail line, and they facilitate review and discussion. The KOPs chosen are representative of key sensitive viewer types, key sensitive viewer locations, and/or key visual simulation locations that would best show typical views along the build alternatives.

Prepare Visual Simulations

Three KOPs were selected for visual simulation: KOP 10, KOP 18, and KOP 27. These KOPs represent three typical viewpoints; including a view of the proposed rail line crossing Richardson Highway (grade separated), a view of the proposed rail line parallel to a roadway, and a view of the proposed alternative crossing the Tanana River.

Determine Whether VRM Objectives Are Met

In this final step, contrast of the build alternatives to the existing landscape is evaluated to determine if the VRM objectives would be met with project implementation. In the VRM methodology, there are four degrees of contrast rating: none, weak, moderate, and strong. Only none to weak contrast ratings are typically considered to meet VRM Class II objectives. The VRM manual states that the Class II management class objective is to "retain the existing character of the landscape with a minimal level of change" and not attract attention. In this analysis, the build alternatives were evaluated for contrast and visual impact to the existing landscape to determine if VRM objectives would be met for the Class II management classification. Generalized potential visual impacts are derived from these site-specific analyses.

N.1.3 Common Impacts

This section describes potential visual impacts that would be common to many of the alternative segments. Much of the proposed NRE would be located in densely vegetated areas not visible from travel areas, urban areas, or other frequently visited sites. However, all segments include one or more visible facilities such as grade separated road crossings, at-grade road crossings, bridges for river crossings, and alternative segments paralleling both land and water transportation routes. The analysis focuses on these four common visible project features.

Based on the KOP analysis, the impacts of these four common features are generalized. In addition, the potential visual impacts of other permanent features as well as temporary features are discussed, although these are not evaluated through the KOP contrast analysis process due to a lack of available detail regarding location and structures as well as expected low visual impact of other features. Such features include offload and end of track facilities, passenger facilities, communication towers, borrow areas, rip-rap and ballast sources, as well as temporary construction bridges, construction staging areas, and construction camps. In accordance with VRM methodology, visual impacts are examined in relation to their impacts on land and water features, vegetation, and structures.

Impacts Evaluated by KOP Contrast

The eight KOPs selected for evaluation include one of the four frequent types of views that would occur repeatedly for the proposed NRE: the proposed rail line crossing a road via a bridge (*i.e.*, grade separated); the proposed rail line crossing a road at-grade; the proposed rail line crossing a river on a bridge; and the proposed rail line running parallel to a road or water travel area. The contrast rating analyses of the KOPs for these four common views of the rail line are generalized in Table N-6. As noted in the methodology section, contrast ratings of none to weak meet VRM Class II management objectives.

Table N-6
Visual Contrast Rating of Common Structures

Structure Type	Elements	Features			Class II VRM Objectives Met?	Mitigation Measures Recommended?
		Land/ Water Body	Vegetation	Structures		
Road Crossing At-Grade	Form	Weak	Moderate	Weak	No	Yes
	Line	Weak	Moderate	Moderate		
	Color	Weak	Weak	Moderate		
	Texture	Weak	Moderate	Weak		
Road Crossing Grade Separated	Form	Moderate	Moderate	Moderate-Strong	No	Yes
	Line	Moderate	Moderate	Moderate-Strong		
	Color	Weak	Moderate	Weak		
	Texture	Weak	Moderate	Moderate		
Alternative Parallel to Travel Area	Form	Moderate	Moderate	Moderate	No	Yes
	Line	Moderate	Moderate	Moderate		
	Color	Weak	Moderate	Weak		
	Texture	Weak	Moderate	Weak		
Bridge Over River	Form	Strong	Strong	Strong	No	Yes
	Line	Strong	Strong	Strong		
	Color	Moderate	Strong	Moderate		
	Texture	Moderate	Strong	Moderate		

At-Grade Road Crossings

Several proposed alternative segments would cross roads, and some would cross several roads. These can be found along the North Common Segment; Eielson Alternative Segments 1, 2 and 3; Salcha Alternative Segment 2; and Delta Alternative Segment 2. Except for crossings of the Alaska and Richardson highways, the crossings would typically be at-grade. At-grade is defined as an intersection (crossing) where roadways (and rail lines) join or cross at the same level (FHWA, 2007). Based on the KOP analysis, it is expected that the visual contrast at locations where the alternative would cross a road at-grade would result in weak to moderate visual impacts. In general, at-grade road crossings would require ballast to slightly elevate the rail line and access road alternative from the existing landscape to a level that would approximate the grade level of the road being crossed. Right-of-way clearing would also occur. The landform in the right-of-way may be leveled. Leveling would contrast slightly with the undulating, but generally flat, terrain of the road right-of-way and would result in weak impacts to land form. Ballast materials may contrast in color with the green hues of surrounding vegetation.

Regarding impacts to vegetation, right-of-way clearing for rail line construction and maintenance would create a contrast with the surrounding vegetation. However, a rail line at road crossings is typically perpendicular to the line of sight of travelers on the road, and is therefore largely obscured by adjacent vegetation except for the short length of time when passing the alternative. The at-grade road crossings are expected to be accompanied by minimal structures, typically consisting of road crossing warning devices such as gates with flashing lights. These devices are smooth, painted red and white, and vertical most of the time in a predominately irregular, green, horizontal landscape. These structures are common in the built environment associated with transportation facilities. Therefore, visual contrast of structures at road crossings is expected to be weak to moderate.

Grade-Separated Road Crossings

For segments that cross Richardson or Alaska highways, the rail line crossings would be grade separated, where the rail line would pass over the highway, or vice versa, on a bridge structure. These can be found along Delta Alternative Segments 1 and 2. Section of Environmental Analysis (SEA) anticipates that these crossings would result in moderate to strong visual contrast. In general, grade-separated road crossings would require fill to elevate the rail line or the road above the existing landscape to a level (18 feet, 6inches minimum for rail over road and 23 feet minimum for road over rail) that would allow traffic to pass underneath. Clearing of the right-of-way would also occur. The visual contrast of a grade separated crossing on land and vegetation features would result in an elevated horizontal line with blocky abutments in an irregular, flat landscape. SEA anticipates that the visual contrast to vegetation features would be weak to moderate based on the expectation that earthen sides of the bridge abutments would be covered in vegetation with similar color. The gray concrete of the bridge structure would be similar to the gray road, but would contrast with the green hues of the surrounding vegetation and therefore would have a moderate color contrast rating.

SEA anticipates that the visual contrast to existing structures on Richardson or Alaska highways would be moderate to strong. The form of the bridge, a long, flat, horizontal structure supported by straight, smooth, deck or platform, would have a moderate to strong contrast to a flat, generally straight road, and vertical but irregular vegetation. The smooth, regular textures of the bridge would have a moderate texture contrast when compared to the coarse vegetation and stippled (flecked) roads. The texture of a predominantly irregular forest landscape would contrast with a predominately smooth grass landscape of the abutment approaches.

Segments Parallel to Travel Area

At least a portion of all alternative segments would be parallel to another travel area, either a waterway, road, or trail. These can be found along all alternatives except the South Common rail line. A typical railbed is 10 to 12 feet wide and elevated above existing ground level to a minimum height of 4 feet with a width of 25 to 30 feet at existing grade. Where an access road would be constructed parallel to the rail line, it also would be built above existing ground level to a minimum height of 4 feet and add between 13 to 24 feet in width, resulting in a total width of 40 to 50 feet. This is comparable to the elevation and width of major travel routes in the project area. Clearance of the right-of-way would also change the patterns of the vegetation to contrast with the natural forest structures of the surrounding landscape.

It is expected that the visual contrast of the rail line at locations where the segment runs parallel to a travel area would be none to moderate. The proposed rail line would be sited at least 700 feet from a travel route or frequently used site, and generally on flat terrain, with the exception of locations immediately adjacent to where it would cross a travel route. Based on the visual

resource analysis, often the only major visual contrast of a parallel alternative would be the temporary effects of a passing train or maintenance vehicles on the associated road due to the dense vegetation in the project area. Visual impacts would be greater, however, in any areas with less dense vegetation or where the alternative would be more elevated.

In general, SEA anticipates that the visual contrast of segments parallel to roads or rivers would be weak to moderate. The railbeds would introduce an elevated, horizontal, smooth, straight line and regular form into a predominately natural landscape characterized by irregular texture, irregular lines, and rough form. Ballast materials would introduce browns and grays into a predominately green landscape. These contrasts are common in the built environment associated with major ground transportation systems.

Bridges Over Rivers and Streams

Bridge crossings typically result in moderate to strong visual impacts due to the visual contrast of the structural features of the bridge to the surrounding landscape. These can be found along the Salcha Alternative Segments 1 and 2, Donnelly Alternative Segments 1 and 2, and Delta Alternative Segments 1 and 2. For the alternative segments that would cross the Tanana River, or where bridge crossings of several tributaries to the Tanana River would occur, SEA anticipates that the visual contrast created at these locations would be moderate to strong. Additionally, on each segment there would be small rail bridges that would cross streams and sloughs.

In general, changes to the landscape would result from right-of-way being cleared of vegetation, approach abutments, and the bridge structure itself. These potential impacts would be similar to those described under grade separated road crossings only as viewed from a water travel route. If viewed from a parallel travel route such as a trail or road, the impacts would be similar to those described above under Segments Parallel to Travel Area.

Major bridge crossing structures may have main spans 75 to 150 feet wide and 1,100 to 4,000 feet long, while spans on smaller bridges would be 35 to 75 feet wide and about that in length. At stream crossings on the west side of the Tanana River, vehicular bridges (for the access road) would be constructed adjacent to the rail bridges. Many of the rivers and streams in the project area are not currently spanned by a bridge. Therefore, most new bridges would be set in a natural landscape. The bridges' long, flat, structural form supported by straight, vertical piers, would have strong contrast to the wide, smooth, flat rivers and dense, multi-layered, rough and irregular vegetation. The horizontal or vertical continuous lines of the proposed structures would have a strong contrast with a curved river and the irregular lines of the vegetation. SEA anticipates that the grey and silver colors typical of bridges would have a moderate contrast against the silver, grey, blue, and tan hues of the gravel and sand bars and water and various hues of greens of surrounding vegetation. SEA anticipates that the smooth, regular textures of the bridges would have a moderate contrast when compared to the mixture of coarse and smooth textures of the sands, gravel, woody debris, river water and vegetation.

Common Impacts Not Evaluated by the KOP Analysis

The build alternatives also include other permanent structures as well as temporary features that were not analyzed in the KOP contrast analysis process due to the limited information available about their appearance. Permanent facilities include end-of-track facilities, passenger facilities, culverts, and communication towers and power lines. This section provides an overview of these facilities and discusses the potential for permanent and temporary visual impacts.

End-of-track and passenger facilities would be constructed in Delta Junction. Passenger facilities would be located on short sidings that would allow loading and unloading of passengers

off the mainline to prevent platforms from interfering with freight transport. These facilities would be located in a built environment with existing structures such as roads and buildings. SEA anticipates that these facilities would result in relatively low visual contrast to the existing built environment.

Culverts would be constructed for crossing water bodies, including streams and wetlands, on all of the alternative segments. Because most culverts (as opposed to bridges) would not be visible from a KOP or frequently utilized travel area, SEA anticipates that they would result in low impacts to visual resources.

Other permanent structures that would be constructed by Alaska Railroad Corporation and common to all alternatives include communication towers. The three proposed towers, which would be on approximately 0.2-acre sites and a maximum of 180 feet tall, would be located at the following sites: Moose Creek Bluff at the Eielson Construction Staging Area along the North Common Segment, near Tanana Flats Training Area along Salcha Alternative Segment 1, and south of Delta Creek along the South Common Segment. All three towers would require a primitive or secondary gravel access road.

The visual impact of the proposed towers would vary depending on location, based on whether they are visible from travel areas or other frequently visited locations, and depending on the adjacent structures and vegetation. In general, the locations would be in the natural landscape. Because the towers are generally placed on the highest point in the area, they are expected to extend above the surrounding vegetation and landforms and be visible from a distance. They introduce a smooth, regular, shiny, straight structure into a rough, irregular landscape. Access roads would have similar impacts as those described in other sections with access roads.

The right-of-way for the rail line would include power lines. Power lines are assumed to be of similar height to some of the trees in the surrounding vegetation. The power poles would be brown, regular, vertical structures that would create contrast in color, form, and texture to the rough, primarily green and irregular vegetation and landscape. The horizontal lines of the power lines would contrast with the mainly vertical lines of the surrounding vegetation on the flat, rolling landscape. The visual impact of the power lines would vary depending on location, based on whether they are visible from travel areas or other frequently visited locations, and depending on the adjacent structures and vegetation.

Temporary construction facilities or operations common to all alternatives include borrow and bale areas (material source areas), construction bridges, construction staging areas, and construction camps. Many of these temporary facilities would be located away from travel areas, urban areas, or other frequently visited sites or would likely be hidden from view at KOP sites due to screening by vegetation.

Borrow and bale areas and source material sites would be located at approximately 2.5-mile intervals or other appropriate sites along the right-of-way in soils that would provide abundant granular material suitable for sub-grade construction. The borrow areas are expected to be 1,500 feet by 500 feet with excavation depths of up to 20 feet and cover approximately 17 to 20 acres each. The final locations of borrow pits are not yet determined. The visual impact of borrow areas and source material sites would vary substantially by location. If visible from travel areas or other frequently visited sites, borrow and bale areas and source material sites could result in strong visual contrast on vegetation and land features through the removal of vegetation and by altering the landform by the removal of topsoil, gravel materials, fill materials and rock for ballast. Bale areas located in Delta Creek, Little Delta River, and Delta River would provide large quantities of granular material for rail line construction. A temporary impact to visual

resources would be the equipment used to process and the stockpiling of materials which would change the line, form, color and texture from the surrounding natural landscape and introduce smooth line, conical forms, browns, tans and grays and regular textures into a irregular line, irregular form, predominantly green or blue-brown irregular texture landscape.

Temporary construction facilities would include bridges, staging areas, and camps located throughout the project area. Temporary construction bridges would likely be needed in some areas, but the locations are not yet determined. While in use, these facilities would include a bridge span with pilings as needed and possible scaffolding and would introduce straight horizontal and vertical lines, angular or blocky forms, and smooth textures with hues of gray into a predominately natural landscape of irregular form, rough line and texture, and hues of green. It is anticipated that there would be four construction staging areas: the Eielson Construction Staging Area would be located along the North Common Segment and would cover approximately 140 acres; the Delta Construction Staging Area would be located along the South Common Segment and would cover approximately 40 acres; a rail-to-truck transload and staging area along the Eielson alternative segments that may require vegetation clearing depending upon location; and a storage yard at the Alaska Railroad Depot in Fairbanks. Construction staging areas would provide for staging, storing materials and supplies, and maintaining earth-moving equipment as well as potentially serving as construction camp facilities including space for recreational vehicles and housing facilities. As exact location of the construction areas is not yet determined, visibility of the proposed sites from travel areas and frequently visited areas is not known. If visible, these sites would likely have a strong visual impact due to expected strong contrast to existing vegetation and structural features of the landscape. These impacts would include introducing geometrical, straight lines, and forms, smooth texture, and bright colors into an irregular, rough, green landscape.

The actual use of the rail line and access roads would produce a temporary impact to visual resources. They introduce movement, color and blocky form into a static, predominately green, irregular landscape. Travel along the access roads would also introduce dust plumes temporally. The length of time these impacts would be visible would vary on the length of the train (maximum length of approximately 1.14 miles, average length of approximately 640 feet), train speed (anticipated to range from 20 mph to 76 mph depending on location), and the viewshed of the observer.

N.1.4 Alternative Segment Analysis

This section analyzes the visual impacts of facilities along specific rail segments. Each segment is described in detail below in conjunction with the KOPs selected for the area.

North Common Segment

North Common Segment would be a 2.7-mile length of track running parallel to Richardson Highway approximately 0.5 mile to the south. KOP 3 is the only KOP near the North Common Segment from which the rail line would be visible. This segment would cross streams and Eielson Farm Road. There are existing electricity and utility lines running through the same area.

Eielson Alternative Segment 1

Eielson Alternative Segment 1 would be located between Richardson Highway and the Tanana River, starting at the end of the North Common Segment west of the community of Moose Creek and ending at the start of the Salcha alternative segments south of Eielson AFB. Eielson

Alternative Segment 1 would be the farthest from Richardson Highway of the three Eielson alternative segments and would include one at-grade road crossing of the unimproved Old Valdez Trail near the Eielson Farm Community. This alternative segment would be to the west of Piledriver Slough, which is a recreation area for residents. However, this alternative segment would also be the most proximate to the Eielson Farm Community and farmland on the western side of Piledriver Slough and could potentially be seen from fields, roads, or residences.

Eielson Alternative Segment 2

Eielson Alternative Segment 2 would be located between Richardson Highway and the Tanana River, starting at the end of North Common Segment west of Moose Creek and ending at the start of the Salcha alternative segments south of Eielson AFB. Eielson Alternative Segment 2 would share the same right-of-way path as Eielson Alternative Segment 1 along the northern portion, then split to the southeast, farther away from the densest area of the Eielson Farm Community. While this alternative could come close to a few residential houses, it would not intersect the Eielson Farm Community as Eielson Alternative Segment 1 would. This alternative segment does not cross any existing roads; however, the rail line would bridge the southern section of Piledriver Slough.

Eielson Alternative Segment 3

Eielson Alternative Segment 3 would be located between Richardson Highway and the Tanana River, starting at the end of the North Common Segment west of the community of Moose Creek and ending at the start of the Salcha alternative segments south of Eielson AFB. A key observation point (KOP 4) analysis was performed for this alternative segment, as discussed below.

KOP 4 – View Looking West-Southwest along Eielson AFB Road

KOP 4 is located along an unnamed, unimproved road west of Richardson Highway on the Eielson AFB (see Figure 14-2 and Tables N-7 and N-8). From this point, there would be an open view to Eielson Alternative Segment 3 crossing the road at-grade. The landform consists of primarily flat terrain dotted with lakes and ponds and carved by the nearby Piledriver Slough. Vegetation consists of spruce and hardwood species surrounded by tall scrub thickets. The only existing structure that can be seen from this point is the unnamed road, a single-lane dirt road that curves between the surrounding water features. This KOP was chosen because it is located on Eielson AFB and relatively close to Fairbanks and there are signs of recreation in the nearby area.

Table N-7
Characteristic Landscape and Build alternatives Description for KOP 4

Characteristic Landscape Description			
	Land/Water Body	**Vegetation**	**Structures**
Form	Flat terrain	Dense, multi-layered vegetation	Long, flat, curving road
Line	Strongly horizontal	Vertical with a choppy upper edge	Horizontal and slightly curved
Color	Various hues of browns and grays of native rock	Light to dark green, yellow, brown with a little purple	Varying shades of gray, tan and silver
Texture	Medium to fine, random	Coarse	Coarse

Table N-7
Characteristic Landscape and Build alternatives Description for KOP 4 (continued)

Build alternatives Description – At-Grade Road Crossing			
	Land/Water Body	**Vegetation**	**Structures**
Form	Flat terrain	Dense, single-layered vegetation of grass	Low, regular, and geometric tracks with horizontal road on a small bed of ballast; Thin, horizontal and vertical crossing guards
Line	Strongly horizontal	Vertical with a smooth edge, some interrupted horizontal due to 200-foot clearing for rail line right-of-way	Horizontal and vertical very straight
Color	Various hues of browns and grays	Uniform green of grass	Black, gray, red, tan, and silver
Texture	Coarse, dense, even railbed	Smooth	Regular, smooth in some areas and coarse in others

Table N-8
Summary of Degree of Contrast for KOP 4

Structure Type	**Elements**	**Features**			**VRM Objectives Met?**	**Mitigation Measures Recommended?**
		Land/ Water Body	**Vegetation**	**Structures**		
Minor At-grade Road Crossing	Form	Weak	Moderate	Weak	No	Yes
	Line	Weak	Moderate	Moderate		
	Color	Weak	Weak	Moderate		
	Texture	Weak	Moderate	Weak		

The visual impacts found at KOP 4 are the same as those described above for at-grade road crossings. Some development of transportation or other facilities may be expected on minor access roads. This KOP is located within a VRM Class II area, which allows for little modification. Therefore, with weak to moderate contrast ratings for all feature types, the class objectives at this location would not be met.

Salcha Alternative Segment 1

Salcha Alternative Segment 1 would start at the southern end of the Eielson alternative segments north of the Town of Salcha on the northeastern bank of the Tanana River and would end at the north end of Connector Segments A and B. Salcha Alternative Segment 1 would cross to the southwestern side of the Tanana River almost immediately, and run primarily along the southwestern side of the river. KOP 17 was an observation point along the mainstem of the Tanana River from which Salcha Alternative Segment 1 could be viewed. As discussed above, the crossings of the Tanana River would have moderate to strong visual impacts.

Salcha Alternative Segment 2

Like Salcha Alternative Segment 1, Salcha Alternative Segment 2 would start at the southern end of the Eielson alternative segments north of the Town of Salcha on the northeastern bank of the Tanana River and would end at the north end of Connector Segments C and D. Salcha Alternative Segment 2 would remain on the northeastern side of the Tanana River and would parallel the river for several miles.

Salcha Alternative Segment 2 would cross the Tanana River when approximately parallel with Harding Lake to the east. This alternative includes a crossing of a popular river travel route, the Salcha River (the only segment to do so), as well as a relocation of a portion of Richardson Highway. The railbed and bridges in Salcha Alternative Segment 2 would have similar contrast to those described in the Impacts Common to all Alternatives section, with the exception to the impacts at KOP 21. North of the Salcha River crossing, Salcha Alternative Segment 2 would create several hill cuts in the terrain to accommodate the 200-foot-wide right-of-way crossing a hillside. The KOP 21 analysis assesses the visual impacts of a parallel alternative railbed hill cut. Finally, this segment would go through the Salcha residential community, an area that would be considered sensitive to visual changes.

KOP 21 – View Looking Southeast from Gravel Bar in the Tanana River toward the Salcha River Mouth

KOP 21 is located on a gravel bar towards the western bank of the Salcha River, just south of the confluence with the Tanana River, approximately 5.5 miles south of KOP 18 and 0.1 mile west of Richardson Highway. From this point, there would be an open view to a hill cut associated with Salcha Alternative Segment 2. The level terrain of the gravel bar is bordered by the Salcha River, with braided channels of the Tanana River nearby and a hill across the river to the east (Figure N-6). Vegetation on the islands and river banks consists of spruce and hardwood species surrounded by tall scrub thickets. Although Richardson Highway is only 0.1 miles away, the only visible evidence of cultural modifications is the linear cut of the road in the thick vegetation. This KOP was chosen because it would show the most extensive hill cut into elevated terrain visible to users of both Richardson Highway and the Salcha and Tanana rivers.

This alternative results in the proposed rail line running parallel to a travel area, and requiring a hill cut. It is expected that the visual contrast of this hill cut would be strong. The major visual contrast of a parallel rail line along this segment would be the cut and fill required for construction of the railbed and the temporary effects of trains. Any hill cut would result in the removal of vegetation and source material resulting in exposed soils. Clearance of the right-of-way would also change the patterns of the vegetation to contrast with the natural forest structures of the surrounding landscape. In general, the visual contrast of proposed rail lines parallel to roads or rivers with associated cut and or fill is expected to be moderate to strong due to the change in form, line and color produced by the cut (Table N-9). The rail line and railbed would introduce an elevated, horizontal, smooth, straight line and regular to irregular form into a predominately natural landscape characterized by irregular texture, irregular line, and rough form. Ballast and cut and fill materials would introduce shades of brown and gray into a predominately green landscape. Visual impacts may be greater in any areas with less dense vegetation than typical. These contrasts are common in the built environment associated with major ground transportation systems. However the contrast would be higher as viewed from roads, trails, and water routes.

Table N-9
Characteristic Landscape and Build Alternatives Description for KOP 21

Characteristic Landscape Description			
	Land/Water Body	**Vegetation**	**Structures**
Form	Prominent domed hill with wide linear river	Dense, multi-layered vegetation in the distance	Not visible from this location
Line	Curved landscape with a horizontal river, cut and fill visible for horizontal road	Vertical with a choppy, horizontal upper edge, weak, horizontal line in vegetation due to road cut	Not visible from this location
Color	Shades of brown and blue	Light to dark green, brown	Not visible from this location
Texture	Smooth water and coarse land	Coarse	Not visible from this location
Build Alternatives Description – Parallel Alternative Hill cut			
	Land/Water Body	**Vegetation**	**Structures**
Form	Flat, horizontal surface of cut into the domed hill	Short uniform vegetation in right-of-way	Flat railbed and access road
	Land/Water Body	**Vegetation**	**Structures**
Line	Straight and vertical	Horizontal cut in vegetation at base of hill, defined line of edge of vegetation around hill cut	Horizontal line of railbed and power line, vertical line of power poles
Color	Browns and grays	Light green	Shades of brown and gray
Texture	Regular rough	Smooth, uniform	Regular, coarse

Figure N-6 – Photograph of KOP 21

The visual impacts found at KOP 21 are unique from the common impacts described in Table N-10. At this location, the track's right-of-way would cut deeply into a hillside slope, removing the vegetation and exposing the soil. The cut would change the form and line of the hill from a gentle slope and curve to a square, flat form and sharp lines, resulting in a strong contrast rating.

Because the soil is covered by vegetation in the existing landscape, the soil's texture and color exposed by the hill cut would have a strong contrast to the surrounding vegetation. The form, line, and texture of the vegetation would have similar changes and would also have a moderate to strong contrast rating. The power lines and railbed structures may be visible from KOP 21, and would result in moderate to strong contrast. With the moderate and strong contrast ratings for the landscape, structure, and vegetation features, VRM Class II management criteria would not be met at this location.

Table N-10
Summary of Degree of Contrast for KOP 21

Structure Type	Elements	Features			VRM Objectives Met?	Mitigation Measures Recommended?
		Land/ Water Body	Vegetation	Structures		
Parallel	Form	Strong	Moderate	Moderate	No	Yes
Alternative	Line	Strong	Strong	Strong		
Hill Cut	Color	Moderate	Strong	Moderate		
	Texture	Moderate	Moderate	Moderate		

KOP 20 – View Looking West along Salcha River

KOP 20 is located downstream of the Salcha River State Recreation Site and a boat launch on the Salcha River approximately 1.0 mile upstream from the confluence with the Tanana River. From this point, there would be an open view to Salcha Alternative Segment 2 crossing the Salcha River (see Figure 14-3). The level terrain of the gravel point bar protrudes into the meandering river. Vegetation on the river banks consists of spruce and hardwood species surrounded by tall scrub thickets. No structures are apparent, but there are several residences in the vicinity as well as upstream of this site. This KOP was chosen because the views are representative of outdoor recreationalists' views on a popular clear water tributary to the Tanana River. The contrast at KOP 20 shown in Figure 14-3 is similar to other bridges over rivers analyzed above.

KOP 18 – View Looking Northwest in Tanana River

KOP 18 is located at a gravel bar in the Tanana River approximately 0.3 miles south from where Salcha Alternative Segment 1 would cross the Tanana River. From this point, there would be an open view to Salcha Alternative Segments 1 and 2. The level terrain of the multiple gravel bars is surrounded by the branching channels of the Tanana River with curving hills along the horizon. Vegetation on the distant river banks consists of spruce and hardwood species surrounded by tall scrub thickets. There are no currently visible cultural modifications at this site, as evident in Figure N-7. This KOP was chosen because the photograph simulation view depicted in Figure N-8 of the bridge at this location is representative of outdoor recreationalists' and sightseers' views on the Tanana River and illustrates the visual contrast of bridges over rivers or streams.

Figure N-7 – Photograph of KOP 18

Figure N-8 – Visual Simulation of KOP 18

The visual impacts found at KOP 18 are similar to those described under Bridges Over Rivers and Streams. The bridge's structure, changes to the landform due to the bridge approach, and vegetation on abutments would have a strong contrast with the natural landscape (Tables N-11 and N-12). The form, color and texture contrast are moderate to strong due to viewing distance and elements of the existing landscape. The line contrast would remain strong because the straight, horizontal line of the bridge is sharply outlined by the sky, vegetation and landform.

Table N-11
Characteristic Landscape and Build alternatives Description for KOP 18

Characteristic Landscape Description			
	Land/Water Body	**Vegetation**	**Structures**
Form	Flat terrain with irregular, gentle, rounded waterways	Thin ribbon of vegetation in the distance	None
Line	Strongly horizontal, curved waterways	Horizontal with a curving and irregular upper edge	None
Color	Brown, gray, tan and blue	Dark green	None
Texture	Varying from smooth to coarse	Stippled	None
Build Alternatives Description – Bridge over River			
	Land/Water Body	**Vegetation**	**Structures**
Form	Sloped, geometric approach abutments; flat railbed with vertical, geometric approach abutments	Regular form of grass and right-of –way clearings	Low flat, rectangular bridge divided by vertical rectangular shapes
Line	Horizontal and diagonal line of approach abutments; strongly horizontal railbed with straight, vertical abutments	Horizontal with a curving and regular edges	Straight horizontal and vertical
Color	Various hues of gray	Light green of grass on abutments	Black and gray
Texture	Varying from smooth to coarse	Smooth and regular of low growing vegetation	Regular, smooth in some areas and coarse in others

Table N-12
Summary of Degree of Contrast for KOP 18

Structure Type	**Elements**	**Features**			**VRM Objectives Met?**	**Mitigation Measures Recommended?**
		Land/ Water Body	**Vegetation**	**Structures**		
Bridge Over River	Form	Strong	Strong	Strong	No	Yes
	Line	Strong	Strong	Strong		
	Color	Moderate	Strong	Moderate		
	Texture	Moderate	Strong	Moderate		

This KOP is within a VRM Class II area, which allows for little modification. Therefore, with the moderate and strong contrast ratings for the structure, the class objectives at this location would not be met.

Connector Segments

The connector segments are rail alignments between 0.9 and 4.4 miles long that connect the Central alternative segments to the Salcha and Donnelly alternative segments. Each of the five connector segments is located on the west side of the Tanana River. The segments used for the project would depend on the selection of the Salcha, Central and Donnelly alternative segments. These segments would have no major river crossings or road crossings, but would cross winter recreation trails and streams. These segments are isolated from viewpoints along the Tanana River and Richardson Highway. The visual contrast of this segment is therefore weak, so SEA anticipates that the connector segments would meet the VRM Class II management objectives.

Central Alternative Segment 1

Central Alternative Segment 1 would be a 5.1-mile length of track connecting the Salcha alternative segments via Connector Segment A from Salcha Alternative Segment 1or Connector Segment C from Salcha Alternative Segment 2. The segment would run parallel to the southwestern shore of the Tanana River. This segment would have no major river crossings or road crossings, but would cross winter recreation trails. It is not expected that Central Alternative Segment 1 would be visible from Richardson Highway or other viewing locations on the northeastern side of the Tanana River. As Central Alternative Segment 1 would be farther away from the Tanana River shore than Central Alternative Segment 2, recreationalists would be less likely to see the visual contrast created by this segment.

Central Alternative Segment 2

Central Alternative Segment 2 would be a 3.6-mile length of track running parallel to the southeastern shore of the Tanana River between the Salcha alternative segments via Connector Segments B and D and the Donnelly alternative segments and Connector E. This segment would have no major river crossings or road crossings, but would cross winter recreation trails. Although Central Alternative Segment 2 would be located closer to the Tanana River, unless trains are passing SEA does not expect that it would be visible from Richardson Highway or other viewing locations on the northeastern side of the Tanana River because of the dense vegetation and flat terrain in the area.

Donnelly Alternative Segment 1

Donnelly Alternative Segment 1 would start at the south end of the Central Alternative Segment 1 and Connector E northwest of the Little Delta River and run southeast until it reaches the northern end of the South Common Segment. It would roughly parallel the Tanana River, but would be located several miles inland (south) of the river channel. Both Donnelly alternative segments would be located in areas of dense vegetation and cross the Little Delta River and Delta Creek. It is not expected that either Donnelly Alternative Segments 1 or 2 would be visible from Richardson Highway or other viewing locations on the northeastern side of the Tanana River. The railbed and bridges would have similar contrast to those described in the Impacts Common to All Segments Section. Figure N-9 is from KOP 24 looking north towards the proposed location for Donnelly Alternative Segment 1.

KOP 24 – View Looking North along the Little Delta River

KOP 24 is located on a gravel bar in the Little Delta River, approximately 2.0 miles upstream from the Tanana River. From this point, there would be an open view to Donnelly Alternative Segment 1. The level terrain of the multiple gravel bars is surrounded by the branching confluences of the Little Delta River with curving hills along the horizon. Vegetation on the distant river banks consists of spruce and hardwood species surrounded by tall scrub thickets. There are no visible cultural modifications at this site. This KOP was chosen because the views are representative of outdoor recreationalists' and sightseers' views on a typical tributary to the Tanana River.

Figure N-9 – Photograph of KOP 24

The visual impacts found at KOP 24 are similar to those described under Bridges Over Rivers and Streams. The bridge's structure, changes to the landform due to the bridge approach, and vegetation on abutments would have a strong contrast with the natural landscape. This KOP is within a VRM Class II area, which allows for little modification. The number of sensitive viewers in this location would be few but, with the moderate and strong contrast ratings for the structure, the class objectives at this location would not be met.

Donnelly Alternative Segment 2

Donnelly Alternative Segment 2 would start at the south end of Central Alternative Segment 2 northwest of the Little Delta River and roughly parallel the southwestern banks of the Tanana River until it reaches the northern end of the South Common Segment. While both Donnelly alternative segments would be located in areas of dense vegetation and cross the Little Delta River and Delta Creek, Donnelly Alternative Segment 2 would be located closer to the banks of the Tanana River. It is not expected that Donnelly Alternative Segment 2 would be visible from Richardson Highway or other viewing locations on the northeastern side of the Tanana River. The railbed and bridges would have similar contrast to those described in the Impacts Common to All Segments Section. The crossing of the Little Delta River would have similar impacts to those described for Donnelly Alternative Segment 1. However, since Donnelly Alternative Segment 2 would include a bridge crossing of the Little Delta River that is closer to the Tanana River, recreationists on the Tanana River would be more likely to see the bridge for Donnelly Alternative Segment 2.

South Common Alternative Segment

The South Common Segment would start at the southern end of the Donnelly alternatives east of Delta Creek and continue towards the southeast to the Delta River. This segment would cross four winter travel routes, but does not include any major river or paved road crossings. KOP 27 provides a view of the South Common Segment.

KOP 27 – View Looking South along Winter Travel Route

KOP 27 is located northwest of the Town of Delta Junction along a winter travel route approximately 2 miles from the Tanana River. From this point, the South Common Segment would be located approximately 700 feet away, screened by thick vegetation. The landform consists of primarily flat terrain with no nearby water features. Vegetation consists of spruce and hardwood species surrounded by tall scrub thickets. There are no structures in this area. This KOP was chosen because the views are representative of the predominant vegetation of the project area with a narrow viewshed at or below the level of the proposed structures and limited by black spruce with understory brush. This KOP was also chosen because at this location the proposed rail line is running parallel to a winter travel route at a distance of 700 feet, which is the closest distance of an alternative segment to a travel area, with the exception of where the proposed rail line crosses a road or waterway. The photograph simulation of the project at this location shows that the visual impact is confined to the temporary effect of a passing train visible through the dense vegetation (Figure N-10).

The visual impacts found at KOP 27 are the same as those described for Alternatives Parallel to Travel Areas (Tables N-13 and N-14). Due to the viewing distance and thick vegetation, the changes to land and water, vegetation features would not be seen at KOP 27, with the exception of seeing the top of an occasional passing train through the vegetation gaps. This KOP is within a VRM Class II area, which allows for little modification. The contrast rating for the land/water, vegetation, and structure features would be none and would meet the class objectives at this location.

Figure N-10 – Visual Simulation of KOP 27

Table N-13
Characteristic Landscape and Build Alternatives Description for KOP 27

	Characteristic Landscape Description		
	Land/Water Body	**Vegetation**	**Structures**
Form	Flat terrain	Dense, multi-layered vegetation	Long, flat winter trail
Line	Strongly horizontal	Tall, vertical elements with curving lower lines of brush	Horizontal, parallel
Color	Varying shades of gray and white	Light to dark green, yellow, brown	Varying shades of green
Texture	Sandy and stippled	Coarse	Coarse
Build Alternatives Description Parallel to Travel Area			
Form	Flat terrain	Dense, multi-layered vegetation	Long, flat railbeded
Line	Strongly horizontal	Tall, vertical elements with curving lower lines of brush, horizontal line in the top of the vegetation showing the absence of vegetation in the ROW	Horizontal, parallel
Color	Varying shades of gray and white	Light to dark green, yellow, brown	Varying shades of gray, tan and silver
Texture	Sandy and stippled	Coarse	Coarse

Table N-14
Summary of Degree of Contrast for KOP 27

Structure Type	Elements	Features			VRM Objectives Met?	Mitigation Measures Recommended?
		Land/ Water Body	Vegetation	Structures		
Alternative Parallel to Travel Area	Form	None	None	None	Yes	No
	Line	None	None	None		
	Color	None	None	None		
	Texture	None	None	None		

Delta Alternative Segment 1

Delta Alternative Segment 1 connects the southern end of the South Common Segment to the build alternative's terminus south of Delta Junction. Delta Alternative Segment 1 would extend south along the western side of the Delta River and cross the river south of Delta Junction, near Jarvis Creek and the northern edge of the Fort Greely Military Reservation. It would extend east to the southern rail terminus. KOP 10 provides a view of Delta Alternative Segment 1.

KOP 10 – View Looking North along Richardson Highway (South of Delta Junction)

KOP 10 is located on Richardson Highway just north of the bridge over Jarvis Creek. From this point, there would be an open view to Delta Alternative Segment 1 as it crosses Richardson Highway. The landform consists primarily of flat terrain with the nearby linear Jarvis Creek. Vegetation at the site consists of grassy vegetation adjacent to the highway, while farther from the highway the vegetation changes abruptly to dense stands of spruce and hardwood trees. In addition to the highway, structures at the site include a power line running parallel to the highway on the west side, a telephone line running parallel to the highway on the east side, and road signs next to the highway. This KOP was chosen because it is representative of the flat

terrain, vegetation, and types of structures visible at sites along Richardson Highway. The photograph simulation of the project at this location is shown in Figure N-11.

Figure N-11 – Simulation of KOP 10

The visual impacts found at KOP 10 would be similar to those described for grade separated road crossings (Tables N-15 and N-16). Some development of transportation or other facilities are expected on major roads. This KOP is within a VRM Class II area, which allows for little modification. Therefore, with the moderate to strong contrast ratings for land and structure, the class objectives at this location would not be met.

Table N-15
Characteristic Landscape and Build Alternatives Description for KOP 10

Characteristic Landscape Description			
	Land/Water Body	**Vegetation**	**Structures**
Form	Flat terrain	Open grassland near the road, dense, tall, multi-layered vegetation several yards from the road	Long, flat, curving road, geometric structures and signs
Line	Strongly horizontal	Horizontal grasses, vertical trees and brush with a irregular upper edge	Horizontal and vertical with some curves
Color	Varying shades of gray	Light to dark green, yellow, brown and white	Gray, while, yellow, red, and silver
Texture	medium to fine and stippled	Coarse to fine and stippled	Stippled in some areas, smooth in others
Build Alternatives Description - Grade Separated Road Crossing			
	Land/Water Body	**Vegetation**	**Structures**
Form	Sloped terrain for abutments and rectangular terrain	Small, dense, single-layered vegetation on earthen fill	Rectangular, horizontal form with vertical rectangular supports. Thin, horizontal and vertical crossing guards

Table N-15
Characteristic Landscape and Build Alternatives Description for KOP 10 (continued)

	Land/Water Body	Vegetation	Structures
Line	Strongly horizontal railbed with vertical abutments	Rough edged line between existing vegetation and on the earthen fill for the bridge	Horizontal, diagonal, and vertical, very straight
Color	Varying shades of gray and white	Light to dark green	Grey, green, silver
Texture	medium to fine and stippled	Stippled and fine	Regular, smooth in some areas and coarse in others

Table N-16
Summary of Degree of Contrast for KOP 10

Structure Type	Elements	Features			VRM Objectives Met?	Mitigation Measures Recommended?
		Land/ Water Body	Vegetation	Structures		
Richardson Highway Crossing Grade Separated	Form	Moderate	Moderate	Moderate-Strong	No	Yes
	Line	Moderate	Moderate	Moderate-Strong		
	Color	Weak	Moderate	Weak		
	Texture	Weak	Moderate	Moderate		

Delta Alternative Segment 2

Delta Alternative Segment 2 would extend from the south end of the South Common Segment and cross the Delta River immediately. It would cross near the community of Big Delta and would extend south on the east side of the Delta River, crossing several minor roads and farmland prior to reaching the southern terminus. Delta Alternative Segment 2 includes one grade separated crossing of Old Richardson Highway and two grade separated crossings for Richardson and Alaska highways, as well as two additional at-grade crossings of less frequently traveled roads. In general, the railbed, bridges and at-grade road crossings and grade separated road crossings of Delta Alternative Segment 2 would have similar contrast ratings to those described in the Impacts Common to All Alternatives Section. Figure N-12 is a photograph from KOP 14, from which point Delta Alternative Segment 2 would be visible as it crosses Jack Warren Road.

KOP 14 – View Looking East along Jack Warren Road in Delta Junction

KOP 14 is located on Jack Warren Road less than 0.1 miles west of Phillips Road. From this point, there would be an open view to Delta Alternative Segment 2 as it crosses Jack Warren Road. The landform consists of primarily flat terrain with some undulating rises. Vegetation at the site consists of grassy vegetation adjacent to the road, while farther from the road the vegetation changes abruptly to dense stands of spruce and hardwood trees. In addition to the road, structures at the site include a power line running parallel to the road on the north side, several side roads intersecting Jack Warren Road, and road signs next to the road. This KOP was chosen because it is representative of the flat terrain, vegetation, and types of structures visible at sites along a typical minor roadway.

Figure N-12 – Photograph of KOP 14

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