



July 26, 2019

To: David Navecky
Office of Environmental Analysis
Surface Transportation Board
395 E Street SW
Washington, D.C. 20423-0012

From: Brian Lindamood, Alaska Railroad Corporation

Subject: Port MacKenzie Rail Extension (STB Docket No. FD 35095)
Quarterly Report April 2019 through June 2019.

This quarterly progress report is submitted in accordance with Mitigation Measure #98 of the November 21, 2011 Surface Transportation Board (STB) final decision (Docket No. FD 35095) authorizing the Alaska Railroad Corporation (ARRC) to construct and operate approximately 35 miles of new rail line connecting Port MacKenzie to ARRC's existing main line near Houston, Alaska. This is the first quarterly report for 2019, covering the period from April 2019 through June 2019.

PROJECT PROGRESS

Key activities/milestones conducted during the reporting period are summarized below.

General

- Maintained and updated a project website with current information: <http://www.portmacrail.com/> (**Mitigation Measure No. 72**)
- A Construction Status exhibit (dated March 2019) is attached that shows the current status of each segment (Attachment 1).
- Embankment construction is completed for Segments 1, 3, 4, 5 and 6. Track and signal construction is complete for Segment 6. The scheduled completion for Segment 2 will be determined once additional funding is secured.
- All necessary project right-of-way has been secured.
- The project continues to be funded by existing state capital fund appropriations. No new state funds have been allocated.
- There was a magnitude 7.0 earthquake within 2 miles of Segment 2 on November 30, 2018. A limited project inspection was completed the following week and found some isolated embankment damage on segments 3 and 4. No damage was immediately obvious on any bridge structures. The level of impact to the PMRE infrastructure appears to be consistent with the impact to the rest of the Alaska Railroad in the area. A more detailed inspection was conducted on May 16th as part of our bi-annual culvert inspection. Minor damage was noted to nearly all concrete bridges (spalling near the ends of the spans where adjacent members bumped from the ground motion). None of the damage identified

affects the bridges structurally. Additionally, the gabion wall on the south side of bridge K16.8 (outfall of Diamond Lake) has shifted up to 1-foot. The present condition does not appear that the wall is in danger of failing. However, it does need to be repaired. The Mat-Su Borough has been made aware of this condition and is performing more detailed inspections for reporting to FEMA for disaster relief funds. Only minor grade issues resulting from the earthquake were noted along the entire alignment. All of the culverts inspected are free-flowing and do not appear to have been damaged.

- Agency comments from for the Moose Mitigation Strategy Plan (MM #47) have been incorporated into a draft final report. The final report was sent to the agencies in April 2019. ADF&G did provide some comments that suggest that personnel changes within the department are not familiar with the project development to date. Their comments generally required clarification and explanation regarding how ARRC and ADF&G arrived at some of the content within the Plan, and did not require changes to the final report. The final Moose Mitigation Strategy Plan is attached to this report.
- The Diagnostic Team has prepared a draft Diagnostic Team Report (MM #60). It is currently being reviewed by the stakeholders.

Cultural Resources

- There are no key activities or milestones to report at this time.

Permitting (See attached permit list)

- There are no key activities or miles stones to report at this time. The project is in full compliance with the terms and conditions of all permits issued to date

Planned activities – Next Reporting Period

- Bi –annual inspections of drainage features (e.g. bridges, culverts, ditches and swales) and side slopes was completed on May 16th, 2019. There were no issues identified that require correction at this time.
- A Diagnostic Team has been assembled and continues to assess grade crossing protection measures for the project.

DISCUSSION

- The PMRE project requires additional construction funding to advance Segments 2, 7, and 8.

SCHEDULE

- Segment 1: This 4.7-mile segment begins at the embankment of the Bi-Modal Bulk Facility and related port facility and proceeds northwest, crossing under the Chugach Power transmission lines (where the ARRC right-of-way will begin) to a quarter mile south of Baker Farm Road, where it turns and heads directly north. It stops shortly after crossing the Baker Farm Creek 3-span bridge at MP (Milepost) K5.48.

- Embankment construction is complete.

- Segment 3: This 7.7-mile segment begins southeast of the intersection of Ayrshire Avenue and Guernsey Road. This segment crosses Ayrshire Avenue and continues northwest around the northeast end of My Lake, then curves back northeast, crossing the 5-span bridge at the outflow of Diamond Lake and the historic Iditarod Trail 3-span bridge. It intersects the Iditarod Race Trail 3-span bridge at MP K17.95, loop northwest and then northeast before heading straight north across the Susitna Parkway at grade crossing, ending near Papoose Twins Road.

- Embankment construction is complete.

- Segment 4: This 7.4-mile segment begins at Papoose-Twins Road and continues northeasterly, ending northeast of Little Horseshoe Lake.
 - Embankment construction is complete.
- Segment 5: This 4.5 mile segment connects segments 4 and 6 between little Horseshoe Lake and Millers Reach Road. Embankment construction is complete.
- Segment 6: This segment begins at Miller's Reach Road and ties into the ARRC Mainline near Houston without crossing the Parks Highway. This connection will facilitate the movement of trains both northbound and southbound in a Y configuration. Proposed work involves construction of approximately 1 mile of new track, installation of a new bridge over the Little Susitna River, a fish passage culvert extension at Teddy Creek, and several drainage structures within the existing right-of-way.
 - Embankment construction is complete.

Mitigation Checklist – First Quarter 2019 (January to March)

Mitigation Measure	Compliance Metric	Timeframe	Status Comments
1: The Applicant shall design project-related rail line and associated facilities in accordance with engineering criteria related to permafrost, seismic events, and other geologic hazards to comply with applicable design codes. For example, the Applicant shall design the project in accordance with the latest applicable seismic codes taking into account the region's potential for earthquake activity to mitigate potential damage to bridges and tracks. (V)	Review design criteria	Before construction	No permafrost has been found in the project area. Project has been designed to meet applicable standards and recommended practice of various organizations were applicable, to include: AREMA, AASHTO, AKDOT&PF, FEMA, and the Alaska Railroad
2: The Applicant shall be subject to Alaska Department of Environmental Conservation (ADEC) jurisdiction under the Alaska Pollutant Discharge Elimination System (APDES) for storm water discharges resulting from project-related construction activities. Requirements that are commonly part of a Stormwater Pollution Prevention Plan associated with a APDES Stormwater Construction Permit include the following: • Ground disturbance shall be limited to only the areas necessary for project-related construction activities. • During earthmoving activities, topsoil shall be reused wherever practicable and stockpiled for later application during reclamation of disturbed areas. • Appropriate erosion control measures shall be employed to minimize the potential for erosion of soil stockpiles until they are removed and the area is restored. • Disturbed areas shall be restored as soon as practicable after construction ends along a particular stretch of rail line, and the goal of restoration shall be the rapid and permanent reestablishment of native ground cover on disturbed areas to prevent soil erosion. • The bottom and sides of drainage ditches shall be revegetated using natural recruitment from the native seed sources in the stockpiled topsoil or a seed mix free of invasive plant species. • If weather or season precludes the prompt reestablishment of vegetation, temporary erosion control measures shall be implemented. (V)	SWPPP approval by ADEC	Before construction	Each contractor awarded work is responsible for preparing a SWPPP and submitting it to ADEC. To date, Bristol Environmental Remediation (Segment 1 and 4), Quality Asphalt Paving (Segment 3 and 5), and Granite Construction (Segment 6) have submitted SWPPP's to ADEC, along with a notice of intent for coverage under the ACGP. Segment 1, 3, 4, 5, and 6 construction is complete and the SWPPP for Segments 1, 3, 4, 5 & 6 have been terminated with ADEC. The clearing work on Segment 2 did not require an SWPPP.
3: The Applicant shall obtain Federal permits required by section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act from the U.S. Army Corps of Engineers (USACE) prior to initiation of project-related construction activities in wetlands and waterbodies. The Applicant also agrees to obtain necessary state permits and authorizations (e.g., Alaska Department of Fish and Game (ADF&G) Fish Habitat Permit, Alaska Department of Natural Resources (ADNR) Land Use Permit, and an Alaska Department of Environmental Conservation section 401 water quality certification). The Applicant shall incorporate stipulations into construction contract specifications. (V)	Permits issued; stipulations added to contract specifications	Before construction	A permit status list is attached to this report.

Mitigation Checklist – First Quarter 2019 (January to March)

Mitigation Measure	Compliance Metric	Timeframe	Status Comments
4: The Applicant shall avoid and minimize impacts to waters of the U.S., including wetlands, to the extent practicable. The Applicant shall provide compensatory mitigation for unavoidable impacts to wetlands as part of the USACE section 404 permit, to the extent practicable in accordance with the reasonable requirements of the Clean Water Act. (V)	Section 404 Permit is issued	Before construction	A Section 404 permit application (POA-2007-1586) was issued for the project on September 10, 2012; subsequent modifications to that permit have been issued (POA-2007-1586-M1, M2, M3, M4, and M5). A copy of the permit is available for public review at the ARRC building (327 W, Ship Creek Ave., Anchorage, AK).
5: The Applicant shall design and construct the proposed rail line in such a way as to maintain natural water flow and drainage patterns to the extent practicable. This shall include installing bridges or placing equalization culverts through the embankment as necessary, preventing impoundment of water or excessive drainage, and maintaining the connectivity of floodplains and wetlands. (V)	Review design criteria and Section 404 permit	Before construction	Condition conforms to project design standards and permit requirements. Specifically, as mandated in Special Condition No. 3 of the PMRE Section 404 Permit (POA-2007-1586): <i>Natural wetland drainage and inundation patterns shall be maintained through the incorporation of adequately sized (diameter and length), sloped and spaced culverts and/or bridges. The ARRC shall be responsible for annual monitoring, maintenance, and/or repair, and/or replacement of all culverts and bridges for the life of the project to insure that natural wetland drainages and inundation patterns are maintained. The presence of upslope ponding, erosion, flooding scour, obstruction to aquatic organisms, as a result of failing or poorly installed culverts, shall be evidence of non-compliance with this condition. ARRC shall immediately notify the Corps of any non-compliance with this special condition. Obstruction caused by beaver dams or debris, and their removal does not require notification to the Corps. The notification shall include for Corps review and approval ARRC plans for restoration of the natural drainage.</i>
6: The Applicant shall disturb the smallest area practicable around any streams and, as soon as practicable following project-related construction activities, revegetate disturbed areas using native vegetation.	Review design criteria and Section 404 permit	Before, during, and after construction	Condition conforms to project design standards and permit requirements. Specifically, as mandated in Special Condition No. 5 of the PMRE Section 404 Permit (POA-2007-1586): <i>All riparian areas disturbed during construction, must be restored to pre-project conditions as soon as possible. If construction is not complete prior to the end the same growing season, all disturbed riparian areas shall be stabilized appropriately and effectively, such as with jute matting, to satisfactorily withstand erosion from heavy rain during the fall and the next year's spring breakup. Site shall be restored to pre-project conditions during the growing season following construction (year immediately following disturbance). Revegetation shall be considered successful when percent live cover of native wetland vegetation is similar to adjacent wetlands. Evidence of erosion and sloughing from disturbed areas will be considered non-compliance with this condition.</i>
7: The Applicant shall minimize the number of temporary stream crossings constructed to provide access for contractors, work crews, and heavy equipment to the extent practicable. Where needed, temporary structures shall be placed to avoid overly constricting active channels and shall be removed as soon as practicable after the crossing is no longer needed. (V)	Review design criteria, Section 404, and Title 16 permits	Before and during construction	Condition conforms to project design standards and permit requirements.

Mitigation Checklist – First Quarter 2019 (January to March)

Mitigation Measure	Compliance Metric	Timeframe	Status Comments
8: The Applicant shall coordinate with the Matanuska-Susitna Borough (MSB) Floodplain Administrator to ensure that new project-related stream and floodplain crossings are appropriately designed. For crossings within the mapped 100-year floodplain, drainage crossing structures shall be designed to pass a 100-year flood. (V)	Permit Issued	Before construction	A MSB Floodplain Development Certificate of Completion has been issued by MSB. Construction of the Little Susitna Bridge is complete. A copy of the permit is available for public review at the ARRC building (327 W, Ship Creek Ave., Anchorage, AK).
9: The Applicant shall evaluate project-related construction water needs in relation to stream flow rates and groundwater recharge rates, as appropriate, and shall minimize effects on surface water and groundwater. Water withdrawals shall be subject to prior written approval by the ADNDR Division of Mining, Land and Water, and also from the ADF&G Division of Habitat for withdrawals from fish-bearing waters. (V)	Permit Issued	Before construction	Temporary Water Use Permits have been authorized for the project. Copies of these permits are available for public review at the ARRC building (327 W, Ship Creek Ave., Anchorage, AK).
10: For all project-related crossings of fish-bearing waters that incorporate bridges or culverts, the Applicant shall design, construct, and maintain the conveyance structures in accordance with the National Marine Fisheries Service (NMFS) 2008 publication, “Anadromous Salmonid Passage Facility Design” (National Marine Fisheries Service. 2008. Anadromous Salmonid Passage Facility Design. NMFS, Northwest Region, Portland, Oregon) or equivalent and reasonable requirements. (V)	Review design criteria and Title 16 permits	Before construction	All ADF&G Title 16 Fish Habitat permits have been acquired and are in accordance with this measure. Copies of these permits are available for public review at the ARRC building (327 W, Ship Creek Ave., Anchorage, AK). Future ADF&G permit actions will be done as amendments to the currently held permits.
11: The Applicant shall time project-related construction in anadromous streams to minimize adverse effects to salmon during critical life stages when practicable. The Applicant shall incorporate timing windows (i.e., those time periods when salmon are least vulnerable to disturbances) as specified by the ADF&G Division of Habitat, into construction contract specifications for in-stream work. The Applicant shall design and construct stream crossings so as not to impede fish passage or impair the hydrologic functioning of the water body. (V)	Review design criteria and Title 16 permits	Before construction	All ADF&G Title 16 Fish Habitat permits have been acquired. Copies of these permits are available for public review at the ARRC building (327 W, Ship Creek Ave., Anchorage, AK). Future ADF&G permit actions will be done as amendments to the currently held permits.
12: When project-related activities, such as culvert and bridge construction, require work in stream beds, the Applicant shall conduct activities, to the extent practicable, during either summer or winter low-flow conditions. (V)	Review Title 16 permits	During construction	All ADF&G Title 16 Fish Habitat permits have been acquired and are in accordance with this measure. Copies of these permits are available for public review at the ARRC building (327 W, Ship Creek Ave., Anchorage, AK). Future ADF&G permit actions will be done as amendments to the currently held permits.

Mitigation Checklist – First Quarter 2019 (January to March)

Mitigation Measure	Compliance Metric	Timeframe	Status Comments
13: The Applicant shall design, construct, and operate the rail line and associated facilities, including bridge abutments, to maintain existing water patterns and flow conditions and provide long-term hydrologic stability by conforming to natural stream gradients and stream channel alignment and avoiding altered subsurface flow to the extent practicable. Project-related supporting structures (e.g., bridge piers) shall be designed to minimize scour and increased flow velocity, to the extent practicable.	Review design criteria	Before construction	Condition conforms to project design standards and permit requirements. Specifically, as mandated in Special Condition No. 3 of the PMRE Section 404 Permit (POA-2007-1586): <i>Natural wetland drainage and inundation patterns shall be maintained through the incorporation of adequately sized (diameter and length), sloped and spaced culverts and/or bridges. The ARRC shall be responsible for annual monitoring, maintenance, and/or repair, and/or replacement of all culverts and bridges for the life of the project to insure that natural wetland drainages and inundation patterns are maintained. The presence of upslope ponding, erosion, flooding scour, obstruction to aquatic organisms, as a result of failing or poorly installed culverts, shall be evidence of non-compliance with this condition. ARRC shall immediately notify the Corps of any non-compliance with this special condition. Obstruction caused by beaver dams or debris, and their removal does not require notification to the Corps. The notification shall include for Corps review and approval ARRC plans for restoration of the natural drainage.</i>
14: Prior to project-related construction, the Applicant shall complete jurisdictional delineations of wetlands and other surface waters that are subject to section 404 of the Clean Water Act for all associated facilities proposed outside of the right-of-way.	Review 2010 Wetland Report	Before construction	Permit-level wetland and waterbody delineations are complete and have been submitted to the USACE. This 2010 delineation served as the basis for the Section 404 permit (POA-2007-1586), issued for the project on September 10, 2012. A wetland delineation reevaluation for Segment 2 was completed in August 2015 and confirmed by USACE in December 2015 (see attached USACE Permit Modification 5).

Mitigation Checklist – First Quarter 2019 (January to March)

Mitigation Measure	Compliance Metric	Timeframe	Status Comments
15: The Applicant shall implement all reasonable best management practices imposed by the USACE under section 404 of the Clean Water Act to minimize project-related impacts to waters of the U.S., including wetlands. Standard best management practices are specified in the USACE Alaska District's Nationwide Permits General Best Management Practice Guide (U.S. Army Corps of Engineers, 2007. "Nationwide Permits: General Best Management Practice." Alaska District, Regulatory Program. Online at: http://www.poa.usace.army.mil/reg/NWPs.htm) and could include the following: • Containing sediment and turbidity at the work site by installing diversion or containment structures. • Disposing of dredge spoils or unusable excavated material not used as backfill at upland disposal sites in a manner that minimizes impacts to wetlands. • Revegetating wetlands as soon as possible, preferably in the same growing season, by systematically removing vegetation, storing it in a manner to retain viability, and replacing it after construction to restore the site. • Using fill materials that is free from fine material. • Stockpiling topsoil and organic surface material, such as root mats, separately from overburden and returning it to the surface of the restored site. • Dispersing the load of heavy equipment such that the bearing strength of the soil (the maximum load the soil can sustain) would not be exceeded. Suitable methods could include, but are not limited to, working in frozen or dry ground conditions, employing mats when working in wetlands or mudflats, and using tracked rather than wheeled vehicles. • Using techniques such as brush layering, brush mattresses, live siltation (a revegetation technique used to trap sediment), jute matting, and coir logs to stabilize soil and reestablish native vegetation	Permit Issued	Before, during, and after construction	A Section 404 permit (POA-2007-1586) was issued for the project on September 10, 2012. The permit complies with this measure. A copy of the permit is available for public review at the ARRC building (327 W, Ship Creek Ave., Anchorage, AK).
16: Prior to initiating project-related construction activities, the Applicant shall mark all stream channels and existing culvert locations in the project construction area before snowfall obscures their location to avoid damage to these areas.	Review design criteria, Section 404, and Title 16 permits	Before and during construction	This measure has been completed for Segments 1, 3, 4, 5 and 6.

Mitigation Checklist – First Quarter 2019 (January to March)

Mitigation Measure	Compliance Metric	Timeframe	Status Comments
17: During project-related design, the Applicant shall align road and track crossings of waterbodies perpendicular or near perpendicular to water bodies, where practicable, to minimize crossing length and potential bank disturbance.	Review design criteria, Section 404, and Title 16 permits	Before construction	Condition conforms to project design
18: During project-related construction, the Applicant shall remove all project-related construction debris (including construction materials, soil, or woody debris) from water bodies, including wetlands, as soon as practicable during the open-water period, or prior to break-up for debris on top of or within ice or snow crossings.	Review contract specifications	Before, during, and after construction	Condition conforms to contract stipulations and permit requirements
19: The Applicant shall construct project-related water crossings in a manner that minimizes disturbances to stream beds, stream banks, and flow. Measures to meet these goals could include installing bridge piers during the winter, and initially constructing permanent project-related crossing structures, when practicable, to avoid the need to construct both temporary and permanent crossing structures.	Review design criteria, Section 404, and Title 16 permits	Before and during construction	Condition conforms to project design
20: During project-related construction, the Applicant shall perform all off-road travel and clearing in a manner that maintains existing surface and subsurface hydrology and water quality, to the extent practicable. Project-related off-road construction activities beyond the 200-foot right-of-way shall be approved by the land owner. Project-related wintertime off-road travel beyond the right-of-way shall be limited to areas where snow and ice depth are sufficient to protect the ground surface and vegetation. Summertime off-road travel beyond the right-of-way shall occur only if it can be accomplished without damaging vegetation or the ground surface, including stream banks that may be crossed.	Review design criteria, ADNR overland land use permit, Section 404, and Title 16 permits	Before and during construction	Condition conforms to stipulations under the ADNR overland land use permit, Section 404 permit and ADF&G Title 16 Fish Habitat permits. Copies of these permits are available for public review at the ARRC building (327 W, Ship Creek Ave., Anchorage, AK).
21: The Applicant shall design, construct, and use winter roads in performing project-related construction so as to avoid degradation of water quality and to protect the road bed from significant rutting, ground disturbance, or thermal erosion of permafrost areas.	None at this time	Before and during construction	The measure has been adhered to during project development.

Mitigation Checklist – First Quarter 2019 (January to March)

Mitigation Measure	Compliance Metric	Timeframe	Status Comments
22: The Applicant shall not mine gravel required for project-related construction within the limits of ordinary high water of water bodies unless otherwise authorized by the ADNLR, Division of Mining, Land, and Water, and the ADF&G. The Applicant also shall consult with the USACE prior to conducting these activities. Mine-site development and restoration within the limits of ordinary high water of waterbodies shall be performed in accordance with the reasonable requirements of the ADNLR, ADF&G, and USACE.	None at this time	Before construction	The Project will not mine gravel in water bodies.
23: The Applicant shall abandon project-related geotechnical boreholes in compliance with the reasonable requirements of ADEC requirements (Alaska Administrative Code 18 § 80.015(e), Well protection, source water protection, and well decommissioning).	Review geotechnical reports and permit conditions	Before, during, and after construction	Condition conforms to geotechnical drilling standards, contract specifications, and permit stipulations
24: The Applicant shall follow all applicable Federal regulations and standard protocols for transporting hazardous substances and other deleterious compounds to minimize the potential for a spill occurrence.	SWPPP approval by ADEC	Before construction	Each contractor awarded work is responsible for preparing a SWPPP and submitting it to ADEC. To date, Bristol Environmental Remediation (Segment 1 and 4), Quality Asphalt Paving (Segment 3 and 5), and Granite Construction (Segment 6) have submitted a SWPPP to ADEC, along with a notice of intent for coverage under the ACGP. Segment 1, 3, 4, 5 and 6 construction is complete and the SWPPP for Segments 1, 3 4, 5 & 6 have been terminated with ADEC. The clearing work on Segment 2 did not require an SWPPP.
25: The Applicant shall comply with the reasonable requirements of the ADEC in the design, construction, operation, and maintenance of project-related tank storage facilities.	None at this time	Before and during construction	Any storage tanks required by contractors during construction will be permitted according to this measure. To date, tank storage facilities have been unnecessary.
26: The Applicant shall direct the operators of project-related construction vehicles not to drive in or cross streams other than at crossing points reasonably established by the ADEC and USACE and, in the case of fish-bearing streams, the ADF&G.	Review contract specifications, Section 404, and Title 16 permits	Before and during construction	Required under the projects ADF&G Title 16 Fish Habitat permits. Copies of these permits are available for public review at the ARRC building (327 W, Ship Creek Ave., Anchorage, AK).
27: During project-related construction, the Applicant shall minimize to the extent practicable, the duration and extent of activity at temporary construction facilities, such as staging areas, and provide surface treatments to minimize soil compaction (e.g., break up compacted soils during reclamation to promote infiltration) and promote vegetation regrowth after the facilities are no longer needed to support construction.	Review contract specifications, Section 404, and Title 16 permits	During and after construction	Required under the projects ADF&G Title 16 Fish Habitat permits. Copies of these permits are available for public review at the ARRC building (327 W, Ship Creek Ave., Anchorage, AK).

Mitigation Checklist – First Quarter 2019 (January to March)

Mitigation Measure	Compliance Metric	Timeframe	Status Comments
28: The Applicant shall ensure that all project-related culverts and bridges are sufficiently clear of debris to avoid blockages to free-fish passage (where applicable), stream-flow alteration, and increased flooding. The Applicant shall inspect all project-related bridges and culverts semi-annually (or more frequently, as seasonal flows dictate) for debris accumulation and remove and properly dispose of debris promptly.	Review inspection reports as necessary	After construction	Since SWPPP inspections are no longer required and occurring, inspections of culverts and bridges will occur twice each year during break-up (thawing) and prior to freeze-up conditions.
29: The Applicant shall use contaminant-free embankment and surface materials in project-related construction.	Review design criteria	During construction	Condition conforms to project design standards
30: The Applicant shall return all project-related stream crossing points to their preconstruction contours to the extent practicable.	Review contract specifications, Section 404, and Title 16 permits	During and after construction	Required under the project's ADF&G Title 16 Fish Habitat permits. Copies of these permits are available for public review at the ARRC building (327 W, Ship Creek Ave., Anchorage, AK).
31: During project-related construction, the Applicant shall use temporary barricades, fencing, and/or flagging in sensitive habitats to contain project-related impacts to the construction area. The Applicant shall locate staging areas in previously disturbed sites to the extent practicable, rather than in sensitive habitat areas.	Review contract specifications, Section 404, and Title 16 permits	During construction	Required under the Section 404 permit and ADF&G Title 16 Fish Habitat permits. Copies of these permits are available for public review at the ARRC building (327 W, Ship Creek Ave., Anchorage, AK). Specifically, as mandated in Special Condition No. 7 of the PMRE Section 404 Permit (POA-2007-1586): <i>The limits of clearing, within wetlands, shall be staked and flagged on the ground prior to any work. No ground disturbing activities shall occur in WOUS, including wetlands, beyond limits of clearing or temporary impacts identified on project plans.</i>
32: The Applicant shall restrict its project-related workers from (1) hunting or fishing while stationed at work camps; (2) harassing wildlife, including winter or calving concentrations of moose (cows with yearling calves can be particularly defensive); (3) approaching known occupied bear dens; and (4) feeding wildlife. (V)	Review contract specifications	During construction	This measure is included in the construction contract specifications.
33: The Applicant shall obtain project-related state permits and authorizations, including the ADF&G Fish Habitat Permit. (V)	Permit Issued	Before construction	All ADF&G Title 16 Fish Habitat permits have been acquired. Copies of these permits are available for public review at the ARRC building (327 W, Ship Creek Ave., Anchorage, AK). Future ADF&G permit actions will be done as amendments to the currently held permits.
34: The Applicant shall implement Essential Fish Habitat (EFH) conservation measures as agreed upon with the NMFS during the EFH consultation process for this project. (V)	Permit Issued	Before and during construction	Completed under the Section 404 permit decision and consultation process.

Mitigation Checklist – First Quarter 2019 (January to March)

Mitigation Measure	Compliance Metric	Timeframe	Status Comments
35: The Applicant shall clear vegetation in preparation for project-related construction 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, the Applicant shall conduct a nest survey and consult with the USFWS, prior to clearing the vegetation, to identify additional appropriate compliance measures. (V)	Review contract specifications	During construction	Clearing for Segments 1, 2, 3, 4, 5 and 6 are complete. Clearing occurred outside of U.S. Fish and Wildlife's (USFWS) recommended time period from avoiding vegetation clearing (May 1-July 15) for Segments 1, 3, 4, and 6. Clearing for Segment 5 was conducted within the bird nesting window; ARRC's contractor contracted trained biologists to conduct a bird nest survey of the segment prior to clearing. No nests were identified and clearing commenced immediately after the survey. ARRC will continue to work with the contractors and set bid dates to try and avoid the bird nesting window; however, as the funding schedule for the project is largely unknown, an exact construction schedule cannot be set and certain project activities may interfere with the bird nesting window. ARRC recognizes this and is ready take the necessary precautions to avoid impacts to nesting birds.
36: During the bald eagle nesting season (typically March through August), the Applicant and its contractor(s) shall use their best efforts to avoid bald eagle disturbance during project-related construction. Nests shall be protected in accordance with USFWS guidelines.	Review contract specifications	During construction	Raptor nest surveys were completed for the entire project alignment on March 15, 2013, April 21, 2014, and April 15, 2015 by an ARRC consultant. To date, three eagle nests have been located (one on Segment 4 and two on Segment 6). Each nest was monitored by ARRC in 2014 and construction activities were adjusted to minimize impacts to the nests. Construction of Segment 6 is now complete and USFWS has stated that future monitoring activities associated with the Segment 6 nests are unnecessary. The Segment 4 nest was inactive in 2015 and construction for that segment is now complete. A formal raptor nest survey was not completed in 2016 for Segment 2 since construction activities did not occur. However, the PMRE Corridor was flown August 29, 2016, for engineering purposes and no eagle nests were noted in Segment 2. Clearing for Segment 2 is complete and occurred outside of U.S. Fish and Wildlife's (USFWS) recommended time period to avoid vegetation clearing (May 1-July 15). Raptor nest surveys were not conducted in February 2017 as previously planned because funding for Segment 2 is not secured and construction is not occurring.
37: Subject to consultation with the ADF&G and ADNR, the Applicant shall work with adjacent land managers to develop alternative preferred habitat away from the proposed rail line and construct a widened embankment to allow moose a place to retreat on one side when a train passes in an effort to reduce the potential for moose strikes. (V)	None at this time	After construction	ARRC has finalized the Moose Mitigation Strategy Plan with input from ADF&G and USFWS. The development of alternative preferred habitat away from the proposed rail line is currently an alternative mitigation measure in the Plan that may be implemented if maximum moose-train collision rates are exceeded. The embankments on Segments 1, 3, 4, 5, and 6 are 40 feet wide, except at bridges and at-grade crossings, where this was not feasible. Segment 2 is currently designed (90% plan set) with 40 foot wide embankments where feasible. Embankments of this width are thought to be sufficient to allow moose to retreat to one side when a train passes.

Mitigation Checklist – First Quarter 2019 (January to March)

Mitigation Measure	Compliance Metric	Timeframe	Status Comments
38: The Applicant shall use appropriate methods to handle, store, and dispose of waste generated during project-related construction activities. Food and garbage shall be secured and disposed in a manner to prevent bears from gaining access to such materials and in accordance with applicable and reasonable Federal, state, and local regulations.	Review Plan	During construction	A Bear Interaction Plan was submitted to STB, DNR, and ADF&G in 2012. No comments were received on the plan and ARRC has assumed agency concurrence on the plan until notified otherwise.
39: In conjunction with developing a final engineering design for the project, the Applicant shall consult with the USFWS and the ADF&G to locate project-related facilities to minimize the size and degree of impacts to highly sensitive habitat areas. Disturbed areas shall be restored in accordance with a reclamation plan developed by the Applicant in cooperation with the USFWS, ADF&G, and/or other appropriate agency staff. The Applicant shall submit the reclamation plan for areas to be disturbed by project construction to the Surface Transportation Board's (Board) Office of Environmental Analysis (OEA), USFWS, and ADF&G. The reclamation plan shall be developed in conjunction with final engineering design and clearly designate: (1) areas to be reclaimed; (2) reclamation materials, methods, and timing; and (3) monitoring schedule and contingency plans.	Review Plan and reclamation activities as necessary	During and after construction	A Reclamation Plan was submitted to STB, DNR, USFWS, and ADF&G in 2012. No comments were received on the plan and ARRC has assumed agency concurrence on the plan until notified otherwise.
40: To reduce potential collision and electrocution impacts to birds resulting from project-related power lines and communication towers, the Applicant shall: - Consult with the U.S. Fish and Wildlife Service for current guidelines on tower siting, marking, and guy lines. - Incorporate standard, raptor-proof designs, as outlined in "Suggested Practice for Avian Protection on Power Lines: The State of the Art in 2006" (Avian Power Line Interaction Committee. 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, DC, and Sacramento, CA. Online at http://www.aplic.org/), into the design of electrical distribution lines in areas of identified bird concerns to avoid electrocution of eagles, owls, and other smaller raptors, including: - Use of marking techniques such as balls or flappers to increase transmission line visibility, especially in areas where sandhill cranes and bald eagles are likely to roost, forage, or nest. - Maintain a minimum 60-inch separation between conductors and/or grounded hardware and potentially use insulation materials and other applicable measures, depending on line configuration. - Incorporate standard raptor-proof designs (as outlined in "Avian Protection Plan Guidelines." Avian Power Line Interaction Committee and U.S. Fish and Wildlife Service. 2005. Online at http://www.aplic.org/) into the design of the electrical distribution lines to reduce bird collisions.	Review design criteria	Before and during construction	According to the USFWS Revised (2013) Voluntary Guidelines for Communication Tower Design, Siting, Construction, Operation, Retrofitting and Decommissioning https://www.fws.gov/migratorybirds/pdf/management/usfwscommunicationtowerguidance.pdf "The service considers less than 200 ft. AGL option the "gold standard" and suggests that this is the environmentally preferred industry standard for tower placement, construction and operation – i.e. towers that are unlit, un-guyed, monopole or lattice at less than 200 ft. AGL." Construction of the Houston Tower was completed in accordance with FAA, state, and local regulations. The Port MacKenzie tower, when constructed, will also be in accordance with this measure. The communication tower constructed at Houston meets the USFWS Communication Tower Guidelines based on the following criteria: the communication tower constructed near Segment 5 is 154 ft. AGL to the top of the whip antenna, the tower is unlit, and constructed of a lattice design. The tower is sited in an open upland area that is largely unvegetated, with relatively flat topography and is in an area not known to support a significant number of breeding, feeding, and roosting birds. Security lighting for on-ground facilities is an industry standard "Steady On" photocell operated light.

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41: To the extent practicable, the Applicant shall minimize project-related ground disturbance, clearing of established vegetation, and removal of wildlife habitats and riparian vegetation during project-related construction. The Applicant shall also minimize the reestablishment of vegetation near the rail bed that would be attractive to moose.	Review contract specifications, Section 404, and Title 16 permits	During construction	Required under the Section 404 permit and Title 16 Fish Habitat Permits. . Copies of these permits are available for public review at the ARRC building (327 W, Ship Creek Ave., Anchorage, AK). ARRC has a draft Moose Mitigation Strategy Plan with input from ADF&G and USFWS. Plan has been finalized and will be sent to appropriate agencies in mid-2019. The development of alternative preferred habitat away from the proposed rail line is currently an alternative mitigation measure in the draft Plan that may be implemented if maximum moose-train collision rates are exceeded.
42: Prior to any project-related construction, the Applicant shall consult with the ADNR and develop and implement a mitigation plan to address the spread and control of nonnative invasive plants during project-related construction. The Applicant shall submit this plan to OEA and ADNR. This plan shall designate appropriate: (1) planned seed mixes; (2) weed prevention and eradication procedures; (3) equipment cleaning protocols; (4) revegetation methods; and (5) protocols for monitoring revegetation.	Review Plan and monitor revegetation as necessary	During and after construction	An Invasive Species Control and Management Plan was submitted to STB, DNR, USFWS, and ADF&G in 2012. No comments were received on the plan and ARRC has assumed agency concurrence on the plan until notified otherwise.
43: Unless otherwise approved by the Alaska Department of Fish and Game, project-related detonation of explosives within, beneath, or in proximity to fish-bearing waters shall not result in overpressures exceeding 2.7 pounds per square inch unless the waterbody, including its substrate, is frozen solid. Peak particle velocity stemming from explosive detonation shall not exceed 0.5 inch per second during the early stages of egg incubation.	None at this time	During construction	Explosives will not be used in or near water bodies.
44: The Applicant shall comply with the reasonable requirements of Alaska Statutes (Alaska Stat. § 16.05.841, Fishway Required, and Alaska Stat. § 16.05.871, Protection of Fish and Game) regarding project-related winter ice bridge crossings and summer ford crossings of all anadromous and resident fish streams. If necessary for winter ice bridge crossings, natural ice thickness could be augmented (through snow removal and water to increase ice thickness, or other techniques) if site-specific conditions, including water depth, are suitable for a crossing that would protect fish habitat and maintain fish passage.	Review design criteria and Title 16 permits	During construction	All ADF&G Title 16 Fish Habitat permits have been acquired and are in accordance with this measure. Copies of these permits are available for public review at the ARRC building (327 W, Ship Creek Ave., Anchorage, AK). Future ADF&G permit actions will be done as amendments to the currently held permits. Specifically, as mandated in Special Condition No. 4 of the PMRE Section 404 Permit (POA-2007-1586): <i>All culverts and bridges shall be designed, installed, and maintained so they do not interfere with free and unobstructed passage of all life states of fish (both anadromous and resident) present in the stream under reasonably expected flow levels.</i>
45: The Applicant shall not narrow an anadromous waterbody between its mean high water lines for the project, unless authorized in writing by the ADF&G prior to project-related construction.	Review design criteria and Title 16 permits	During construction	All ADF&G Title 16 Fish Habitat permits have been acquired and are in accordance with this measure. Copies of these permits are available for public review at the ARRC building (327 W, Ship Creek Ave., Anchorage, AK). Future ADF&G permit actions will be done as amendments to the currently held permits.

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Mitigation Measure	Compliance Metric	Timeframe	Status Comments
46: The Applicant shall ensure that project-related culverts in fish-bearing waters (as identified at the time of final design) function properly and continue to accommodate fish passage. The Applicant shall inspect all project-related culverts on fish-bearing waters annually for perched, submerged, or other conditions that could prevent fish passage. A wetland scientist, fisheries biologist, or other qualified individual shall perform the inspections. If perched, submerged, or other conditions that prevent fish passage are identified, the Applicant shall notify the ADNR and ADF&G, and develop and implement a correction action plan in consultation with ADNR and ADF&G.	Review inspection reports as necessary	After construction	Since there is no active construction activity and there are not active SWPPP's associated with the project, inspection frequency has been reduced to twice each year, once at breakup (spring thaw) and again prior to freeze up. Fall/Winter 2018 Culvert inspection memo is attached to this report.
47: The Applicant, in consultation with the ADF&G, ADNR and other appropriate stakeholders shall evaluate, implement, and monitor various aspects of project-related rail design, maintenance, and operation to document moose mortality from collisions with trains, and to develop a strategy to reduce the moose-train collision mortality rate. The Applicant shall document the strategy in a Moose Mitigation Strategy Plan. A draft of the plan shall be prepared and submitted to ADF&G, ADNR, and OEA for review and comment prior to completing final design and before the start of project-related construction. The strategy could include: • Maintaining vegetation along the right-of-way in primary (e.g., grasses/sedges) or late (e.g., old-growth spruce) successional (developmental) stages. If vegetation is allowed to progress to the secondary successional stage (i.e., shrubs), maintaining it at the shortest possible height, not to exceed 0.5 meter, encouraging shrubs of non-preferred moose browse species (e.g., alder, dwarf birch), and minimizing re-growth of willow, paper birch, and aspen. • Mowing vegetation in late summer before energy stores are transferred to the roots. • In winter, plowing snow back from the track to the outer edge of the trackside clearing to allow moose easy access away from the tracks when a train approaches. • Developing a plan in conjunction with the ADF&G to catalog all strikes (not just confirmed or suspected deaths) in a timely manner that shall include, but is not necessarily limited to: precise location (latitude and longitude), date and time; weather and other environmental conditions at the time and location of strike; and attributes associated with the train, such as horn use, speed, and track characteristics. • Designing, constructing, and operating all aspects of the rail line to minimize significant alteration of moose and other wildlife movement and migration patterns.	Plan is submitted and approved	Before, during, and after construction	ARRC has finalized Moose Mitigation Strategy Plan with input from ADF&G and USFWS. The development of alternative preferred habitat away from the proposed rail line is currently an alternative mitigation measure in the draft Plan that may be implemented if maximum moose-train collision rates are exceeded. The embankments on Segments 1, 3, 4, 5, and 6 are 40 feet wide, except at bridges and at-grade crossings, where this was not feasible. Segment 2 is currently designed (90% plan set) with 40 foot wide embankments where feasible. Embankments of this width are thought to be sufficient to allow moose to retreat to one side when a train passes.

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Mitigation Measure	Compliance Metric	Timeframe	Status Comments
48: The Applicant shall prepare and implement a bear interaction plan to minimize conflicts between bears and humans. In consultation with the ADF&G, the Applicant shall develop appropriate educational programs and management plans when project-related construction and operation plans are being prepared.	Review plan	During construction	A Bear Interaction Plan was submitted to STB, DNR, and ADF&G in 2012. No comments were received on the plan and ARRC has assumed agency concurrence on the plan until notified otherwise.
49: The Applicant shall not conduct project-related construction and land clearing activities within 0.5 mile of known occupied bear dens, unless alternative mitigation measures are approved by the ADF&G. The Applicant shall obtain a list of known den sites from the ADF&G Division of Wildlife Conservation prior to commencement of any project-related construction activities and shall report occupied dens encountered.	If a bear den is discovered or identified, ARRC will comply with this condition	During construction	ADF&G was contacted in fall 2012, 2013, 2014, and 2015. No bear dens are known to occur within the project corridor. Based on information from the previous four (4) years of contacting ADF&G regarding the potential for bear den locations in the project area, ADF&G has continually informed ARRC that ADF&G does not maintain a list of bear den locations in the area nor do they have a monitoring program in the area to document bear den locations. Since there is not a list of known bear den sites or monitoring program to document bear den locations, this information is unavailable. However, the Bear Interaction Plan for the project was included as an attachment to the PMRE Segment 2 Clearing bid contract and in accordance with the Mitigation Measure any bear encounters during the clearing activity would have been reported to ADF&G Division of Wildlife Conservation Program. It is important to note that no bear dens or bears were encountered during the recent clearing activities.
50: Prior to initiating project-related construction activities, the Applicant shall consult with the local offices of the Natural Resource Conservation Service and the Palmer Plant Center to develop an appropriate plan for restoration and revegetation of disturbed areas (including appropriate seed mix specifications). This would apply to areas that cannot be revegetated using natural recruitment from the native seed sources in the stockpiled topsoil. Development of the plan shall include consideration of the use of a variety of native grasses and wildflowers appropriate to the surrounding habitat to provide visual interest in areas where vegetation height must be limited due to safety or maintenance considerations.	Review plan	During construction	A Reclamation Plan was submitted to STB, DNR, USFWS, and ADF&G in 2012. No comments were received on the plan and ARRC has assumed agency concurrence on the plan until notified otherwise.
51: The Applicant shall develop protocols to inform and prepare project-related construction supervisors of the importance of protecting archaeological resources, graves, and other cultural resources and how to recognize and treat the resources. (V)	Verify training has taken place	During construction	This measure is a requirement under the Programmatic Agreement with SHPO. ARRC has developed a training curriculum that was provided to contractors and is being conducted annually or as needed. The most recent training was held for contractors on December 8, 2016. Previous trainings occurred on March 18 and 19, 2014; the annual 2015 training was held on June 23, 2015.

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Mitigation Measure	Compliance Metric	Timeframe	Status Comments
52: The Applicant shall comply with the Programmatic Agreement developed through the section 106 process under the National Historic Preservation Act. (V)	Verify PA has been complied with	Before, during, and after construction	Section 106 PA compliance is currently taking place.
53: To minimize fugitive dust emissions created during project-related construction activities, the Applicant shall implement appropriate fugitive dust suppression controls, such as spraying water or other established measures. The Applicant shall also operate water trucks on haul roads as necessary to reduce dust. (V)	Approved Erosion and Sediment Control Plan, review contract specifications	During construction	Each contractor awarded work is responsible for preparing a SWPPP and submitting it to ADEC. To date, Bristol Environmental Remediation (Segment 1 and 4), Quality Asphalt Paving (Segment 3 and 5), and Granite Construction (Segment 6) have submitted a SWPPP's to ADEC, along with a notice of intent for coverage under the ACGP. Segment 1, 3, 4, 5, and 6 construction is complete and the SWPPP for Segments 1, 3, 4, 5 & 6 has been terminated with ADEC. The clearing work on Segment 2 did not require an SWPPP.
54: To limit project-related construction emissions, the Applicant shall work with its contractor(s) to ensure that construction equipment is properly maintained and that required pollution-control devices are in working condition. (V)	Review contract specifications	During construction	Condition conforms to contract specifications
55: The Applicant shall work with its construction contractor(s) to minimize, to the extent practicable, project-related construction noise disturbances near residential areas. Construction and maintenance vehicles shall be in good working order with properly functioning mufflers to control noise. (V)	Review contract specifications	During construction	Condition conforms to contract specifications
56: The Applicant shall consult with affected communities regarding its planned construction schedule to minimize, to the extent practicable, project-related construction noise and vibration disturbances in residential areas during evenings and weekends. (V)	Review contract specifications	During construction	Condition conforms to contract specifications
57: Prior to initiating construction activities, the Applicant shall establish a Community Liaison to consult with affected communities, landowners, and agencies. Among other responsibilities, the Community Liaison shall assist communities or other entities with the process of establishing quiet zones, if requested.(V)	Interview the community liaison	During construction	The Community Liaison has contacted all of the appropriate parties for Segment 1, 2, 3, 4, 5, and 6. No quiet zones were identified or requested for these segments.
58: The Applicant shall not conduct pile driving associated with bridge construction on the Mac East Variant Segment during nighttime hours.	Review contract specifications	During construction	Condition conforms to contract specifications

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Mitigation Measure	Compliance Metric	Timeframe	Status Comments
59: The Applicant shall not conduct construction activities in the vicinity of West Holstein Avenue on the Mac East Variant Segment during nighttime hours.	Review contract specifications	During construction	Condition conforms to contract specifications
60: The Applicant shall establish a Diagnostic Team comprised of Applicant staff, community members, representatives of the Alaska Department of Transportation and Public Facilities (ADOT&PF) and other appropriate entities regarding project-related roadway/rail line crossings, in consultation with Federal Railroad Administration safety officials. This process shall result in appropriate safety measures for every roadway/rail line crossing. (V)	None at this time	After construction	Diagnostic Team is in the process of analyzing the crossings in preparation of making recommendations.
61: The Applicant shall coordinate with Federal, state and local emergency management officials in the project area. The Applicant shall provide, upon request, applicable hazardous-materials training and/or project-related information to enhance readiness. The Applicant shall incorporate the proposed rail line into its existing emergency response process and shall update its Oil Spill Contingency Plan to include the proposed rail line. (V)	None at this time	After construction	To be completed at a later date; likely following completion of construction
62: During construction of project-related tracks across existing roads, the Applicant shall notify road users of temporary road closings and other construction-related activities. The Applicant shall 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. The Applicant shall display signs providing the name, address, and telephone number of a contact person onsite to assist the public in obtaining immediate responses to questions and concerns about project activities. (V)	Review contract specifications	During construction	Access is provided during construction and in accordance with this measure. A Project Office (327 W, Ship Creek Ave., Anchorage, AK), website (www.portmacrail.com), and hotline (907-892-6000) are available for the public to access information.
63: To the extent practicable, the Applicant shall confine all project-related construction traffic to project-specific roads within the right-of-way or established public roads. Where traffic cannot be confined to these roads, the Applicant shall make necessary arrangements with landowners to gain access. The Applicant shall remove and restore upon completion of project-related construction any temporary access roads constructed outside the rail line right-of-way unless otherwise agreed to with the landowners. (V)	Review contract specifications	During construction	Access is provided during construction and in accordance with this measure. A Project Office (327 W, Ship Creek Ave., Anchorage, AK), website (www.portmacrail.com), and hotline (907-892-6000) are available for the public to access information.
64: The Applicant shall consult with appropriate state and local transportation agencies to determine the final design and other details of project-related grade crossings and warning devices. (V)	Review contract specifications	Before construction	Crossings are designed in accordance with ARRC and DOT&PF guidelines.

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Mitigation Measure	Compliance Metric	Timeframe	Status Comments
65: Before the start of project-related operations, the Applicant shall contact appropriate local, state, and Federal emergency response organizations and shall provide them with information concerning the proposed operations, schedules, and any site hazards or restrictions that could impact responders. (V)	Interview the community liaison	During construction	The Community Liaison has contacted the appropriate emergency response organizations.
66: The Applicant shall obtain a section 9 Bridge Permit from the U.S. Coast Guard for construction of project-related bridges over navigable rivers. (V)	Section 9 permit issued	Before construction	The (lack of) response by USCG to ARRC's letter dated 4/25/12 implies concurrence that the determination that the Little Susitna River crossing is within scope of 33 CFR Section 115.70, Advanced Approval of Bridges for a Section 9 Bridge Permit. USCG has the permit application upon which they can act, but it is not required for the commencement of construction. There have been no changes to this permit position during last quarter.
67: In coordination with the U.S. Coast Guard, the Applicant shall provide adequate clearances for navigation of recreational boats on navigable rivers. (V)	Section 9 permit issued	Before construction	Clearance provided by the new bridge proposed on the Little Susitna River exceeds the existing clearance of the bridge immediately down-stream.
68: In conjunction with final engineering design, the Applicant shall consult with the ADNR and the ADF&G and develop and implement a plan to ensure that project-related bridges and culverts placed on navigable or public waters are designed and installed to accommodate: (1) navigation by recreational boat users in a manner that shall not impede existing uses, to the extent practicable, and (2) public access and use of the statutory easements as established by the reasonable requirements of Alaska Statute (Alaska Stat. § 38.05.127, Access to Navigable or Public Water). The Applicant shall submit the plan to OEA, ADNR, and ADF&G.	Review plan	Before construction	A Maintenance of Navigable and Public Waterway Rights Plan was submitted to STB and DNR. No comments were received on the plan and ARRC has assumed agency concurrence on the plan until notified otherwise.
69: The Applicant shall develop a spill prevention, control, and countermeasure plan for petroleum products and/or response plan for hazardous materials, as required by applicable Federal and state regulations, prior to initiating any project-related construction activities. These plans shall address methods for preventing discharges and spill control, and containment and cleanup should a release occur. Plans shall include a requirement to conduct weekly inspections of equipment for any fuel, lube oil, hydraulic, or antifreeze leaks. The plan shall provide that, if leaks are found, the Applicant shall require the contractor(s) to immediately remove the equipment from service and repair or replace it. (V)	SWPPP approval by ADEC	Before construction	Each contractor awarded work is responsible for preparing a SPCC plan as required by and in accordance with state and federal regulations. The SPCC plan is available for public review at the ARRC building (327 W, Ship Creek Ave., Anchorage, AK).

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Mitigation Measure	Compliance Metric	Timeframe	Status Comments
70: As part of the APDES Stormwater Construction Permit and Stormwater Pollution Prevention Plan, the Applicant shall: • Restore land used for temporary staging areas during project-related construction to natural conditions if occurring on undeveloped ADNR land or to its former uses if occurring on private land. • Restore public land areas that were directly disturbed by project-related construction equipment and not owned by the Applicant (such as temporary access roads, haul roads, and crane pads) to their original condition, as reasonable and practicable, upon completion of construction. • In business and industrial areas, store project-related equipment and materials in established storage areas or on the Applicant's property. The Applicant shall prohibit parking of equipment or vehicles, or storage of materials along driveways or in parking lots, unless agreed to by the property owner. • Prohibit project-related construction vehicles, equipment, and workers from accessing work areas by crossing business or agricultural areas, including parking areas or driveways, without advance notice to or permission from the owner. (V)	SWPPP approval by ADEC	Before construction	Each contractor awarded work is responsible for preparing a SWPPP and submitting it to ADEC. To date, Bristol Environmental Remediation (Segment 1 and 4), Quality Asphalt Paving (Segment 3 and 5), and Granite Construction (Segment 6) have submitted a SWPPP's to ADEC, along with a notice of intent for coverage under the ACGP. Segment 1, 3, 4, 5, and 6 construction is complete and the SWPPP for Segments 1, 3, 4, 5 & 6 has been terminated with ADEC. The clearing work on Segment 2 did not require an SWPPP.
71: For each of the public grade crossings on the rail line, the Applicant shall provide permanent signs prominently displaying both a toll-free telephone number and a unique grade crossing identification number in compliance with Federal Highway Administration regulations (23 Code of Federal Regulations part 655). The Applicant's personnel shall answer the toll-free number 24 hours a day. (V)	Interview the community liaison	During construction	Signage at each crossing is provided. A Project Office (327 W, Ship Creek Ave., Anchorage, AK), website (www.portmacrail.com), and hotline (907-892-6000) are available for the public to access further information.
72: The Applicant shall continue its ongoing community outreach efforts by maintaining a Web site about the project throughout the construction period of the rail line. (V)	Interview the community liaison	During construction	The Project website (www.portmacrail.com) and ARRC website (www.alaskarailroad.com) are active and will be updated during the duration of construction.
73: In the event of any damage caused by project-related construction activities, the Applicant shall work with affected landowners to appropriately redress any damage to each landowner's property. (V)	Interview the community liaison	During construction	If warranted, this measure will be employed.
74: The Applicant shall work with affected businesses or farms to appropriately address project-related construction activity issues affecting any business or farm. (V)	Interview the community liaison	During construction	If warranted, this measure will be employed.
75: To the extent practicable, the Applicant shall ensure that entrances and exits for businesses are not obstructed by project-related construction activities, except as required to move equipment. (V)	Interview the community liaison	During construction	If warranted, this measure will be employed.

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Mitigation Measure	Compliance Metric	Timeframe	Status Comments
76: During construction of the crossings over navigable rivers, some short-term temporary restrictions of watercraft traffic could occur for safety purposes. In that event, the Applicant shall install warning devices to notify boaters of project-related bridge construction activities. The Applicant also shall display signs providing the name, address, and telephone number of a contact person onsite to help waterway users obtain immediate responses to questions and concerns about project activities. (V)	Interview the community liaison	During construction	Signage at each crossing is provided. A Project Office (327 W, Ship Creek Ave., Anchorage, AK), website (www.portmacrail.com), and hotline (907-892-6000) are available for the public to access further information.
77: The Applicant shall make reasonable efforts to minimize disruptions to utilities by scheduling project-related construction work and outages to low-use periods. The Applicant shall notify residents and other utility customers in advance of project-related construction activities requiring temporary service interruptions. (V)	Interview the community liaison	During construction	If warranted, this measure will be employed.
78: The Applicant shall make reasonable efforts to identify all utilities that are reasonably expected to be materially affected by the project-related construction within the right-of-way or that cross the right-of-way. The Applicant shall consult with utility owners during design and construction so that utilities are protected during project-related construction activities. The Applicant shall notify the owner of each such utility identified prior to project-related construction activities and shall coordinate with the owner to minimize damage to utilities. (V)	Interview the community liaison, review contract specifications	During construction	If warranted, this measure will be employed.
79: The Applicant shall bury all project-related utilities along the 200-foot right-of-way and within the terminal reserve. (V)	Review design criteria	During construction	Project-related utilities will be installed underground.
80: In accordance with the Applicant's Oil Spill Contingency Plan and Emergency Response Plan, the Applicant shall make the required notifications to the appropriate Federal and state environmental agencies in the event of a reportable hazardous materials release. The Applicant shall work with the appropriate agencies, such as the ADEC, the USEPA, and the USFWS, to respond to, and remediate releases. (V)	SWPPP approval by ADEC	Before construction	Each contractor awarded work is responsible for preparing a SWPPP and submitting it to ADEC. To date, Bristol Environmental Remediation (Segment 1 and 4), Quality Asphalt Paving (Segment 3 and 5), and Granite Construction (Segment 6) have submitted a SWPPP's to ADEC, along with a notice of intent for coverage under the ACGP. Segment 1, 3, and 6 construction is complete and the SWPPP for Segments 1, 3, 4, 5 & 6 has been terminated with ADEC. The clearing work on Segment 2 did not require an SWPPP.

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Mitigation Measure	Compliance Metric	Timeframe	Status Comments
81: At least one month before initiating construction activities in the area, the Applicant shall provide the information described below regarding project-related construction of the rail line, and other information, as appropriate, to fire departments within the project area, the Federal Emergency Management Agency, and the MSB Emergency Operations Department: • 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 24-hour emergency telephone number to reach the Applicant in the event of an emergency; • The name and number of the Applicant's project contact, who shall be available to answer questions or attend meetings for the purpose of informing emergency-service providers about the project-related construction and operations; and • Revisions to this information, including changes in construction schedule, as appropriate. (V)	Interview the community liaison	Before construction	The Community Liaison is currently performing this duty.
82: Prior to project-related construction, the Applicant shall consult with Alaska Department of Natural Resources (ADNR) and other appropriate agencies, including the Alaska Department of Fish and Game (ADF&G), and user groups to develop a plan to ensure construction activities occur during the most appropriate timeframe to limit, to the extent practicable, potential impacts on recreation activities. The plan shall be developed prior to completion of final engineering plans and following consultation with the ADNR, the ADF&G, other appropriate government agencies, and user groups to determine the location of all officially recognized trails that would be crossed by the rail line. The plan shall designate temporary access points if main access routes must be obstructed during project-related construction and include an agreed-upon number and location of access points as determined during consultation with applicable agencies. (V)	Review plan	Before and during construction	To ensure the safety of trail users, there may be periodic, temporary closures or detours to trails during the construction period. Notice would be provided to trail users at each crossing indicating the closures, construction schedule, and alternate access points. It is the intent of ARRC to maintain continued access at all trail crossings during construction; in most cases, having an on-site flag person present to assist trail users in crossing the construction area safely. ARRC and MSB will continue to work with area stakeholders, including the Big Lake Trails Committee, Alaska Department of Natural Resources (ADNR), and the Alaska Department of Fish & Game in an effort to schedule construction activities around seasonal usage of trails. During the construction of each segment, contractors are being required to develop a segment specific Traffic Control Plan. The Plan will identify temporary trail closure dates and provide ARRC with a plan to ensure a crossing opportunity remain available to trail users. Information related to appropriate signage and flag persons will also be submitted as necessary to facilitate safe passage during construction. To date, no significant issues of related to recreation activities or access have arisen.
83: The Applicant shall consult with the appropriate management agencies, including the ADNR and the ADF&G to ensure that project-related bridges and culverts are designed, constructed, and maintained to accommodate travel by winter modes of transportation (snow machine, dog sled, etc.) on streams and rivers used for recreational access and subject to the provisions of Alaska Statute (Alaska Stat. § 38.05.127, Access to Navigable or Public Water).	Review plans	Before and during construction	A Maintenance of Navigable and Public Waterway Rights Plan was submitted to STB and DNR. No comments were received on the plan and ARRC has assumed agency concurrence on the plan until notified otherwise.

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Mitigation Measure	Compliance Metric	Timeframe	Status Comments
84: The Applicant shall consult with resource management agencies, including the ADNR and the ADF&G, appropriate user groups, and property owners regarding the location and design of crossings for trail easements that intersect with the proposed rail line.	Review plan	Before and during construction	Extensive consultation has been completed at the direction of STB and SHPO. Trail crossing design plans are available on the project website. A revised IDSHD Summary and Implementation Plan was submitted to STB, SHPO, and other consulting parties on November 21, 2012. The plan is available on the project website.

Mitigation Checklist – First Quarter 2019 (January to March)

84A: At a minimum, the Applicant shall provide at grade-separated or grade-separated crossings of all officially recognized trails crossed by the proposed rail line. As of the date of the Final EIS, a total of 8 officially recognized trails had been identified that intersect the Mac East- Variant Connector 3 Variant- Houston-Houston South Alternative. This number could change due to various factors including updates to trail plans, route selection, and final engineering. For the purposes of this mitigation measure, the Applicant shall adhere to the definition of an officially recognized trail provided below. “An officially recognized trail is one that is specifically established within currently adopted plans by ADNR and/or MSB, or are established within these plans at the time of construction or right-of-way acquisition by the Applicant or the MSB (whichever occurs first). In addition, an officially recognized trail is used primarily for recreational purposes. The locations of officially recognized trails may or may not be provided for by recorded easements or right-of-way instruments. In some cases, officially recognized trails may be adopted by or mapped in a recognized trail plan, but a recorded easement or right-of-way instrument may not exist. The presence of a recorded easement or right-of-way easement is not sufficient alone to make the property an officially recognized trail.” Based on the Applicant's January 2008 inventory of officially recognized trails, the following recognized trails are crossed by the Mac East Variant- Connector 3 Variant - Houston-Houston South Alternative: • Crooked Lake Trail • Iditarod National Historic Trail • Houston Lake Loop Trail • Flat Lake Connector Trail Based on OEA's analysis, the following additional officially recognized trails are crossed by the Mac East Variant- Connector 3 Variant - Houston-Houston South Alternative: • Big Lake Trail #1 • Big Lake Trail #2 • Big Lake Trail #5 • Big Lake Trail #14	Review plan	Before construction	<u>Segment 1:</u> Figure 8 Lake Trail: Installed oversized culvert under the rail located on Matanuska-Susitna Borough land. No change to the trail alignment. <u>Segment 3:</u> Historic Iditarod Trail: Bridge built over the trail on DNR land. No trail realignment within the existing trail easement. DNR Authorization # ADL 231373. Iditarod Race Trail (Big Lake Trail #14): Bridge built over the trail on DNR land. No trail realignment within the existing trail easement. DNR Authorization # ADL 227588. Crooked Lake Trail: Trail was realigned to cross state land as directed by DNR's Final Administrative Decision. <u>Segment 4:</u> Flat Lake Connector Trail (Big Lake Trail #6) and Iron Dog Connector (Big Lake Trail #5): Bridge built over the creek and trail on TLO land. The new alignments accommodate safer approaches to the rail crossing. Klondike Inn and Call of the Wild Trail (Big Lake Trail #1) & Houston Lake Loop Trail: Bridge built over the trail on TLO land. <u>Segment 5:</u> Big Lake Trail #2 (Beaver Lakes North/ Little Susitna River Trail): At-Grade crossing built within the section line easements. <u>PRESERVING TRAIL ACCESS</u> A Master Trails Easement Agreement was executed on August 1, 2013, between the MSB and TLO in order to preserve the existing trails and construct the new trail realignments within Segment 4 and part of Segment 5. The Borough is working with agency land owners, TLO, DNR, and the Borough Land & Resource Management Division, to complete the surveying, mapping, and recording easement documents to satisfy the terms of the DNR Administrative Decision and TLO's trail agreements. <u>TRAIL REALIGNMENT MAPS</u> Maps were completed in 2015 and installed on kiosk at trailheads and intersections. <u>ABBREVIATIONS</u> TLO = Alaska Mental Health Trust, Trust Land Office DNR = State of Alaska, Department of Natural Resources
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Mitigation Checklist – First Quarter 2019 (January to March)

Mitigation Measure	Compliance Metric	Timeframe	Status Comments
84B: The Applicant shall design each crossing to accommodate existing trail users as determined at the time of construction, or right-of-way acquisition by the Applicant or MSB (whichever comes first).	Review plan	Before construction	Extensive consultation has been completed at the direction of STB and SHPO. Trail crossing design plans are available on the project website. A revised IDSHD Summary and Implementation Plan was submitted to STB, SHPO, and other consulting parties on November 21, 2012. The plan is available on the project website.
84C: The Applicant shall provide a sufficient number of at grade or grade-separated trail crossings to ensure that the average distance between trail crossings over the length of the rail line is not greater than 3.0 miles (i.e., length of the new rail line divided by total number of Applicant-supplied, trail crossings). Trail crossings provided by the Applicant to meet this minimum crossing frequency may be collocated with project-related stream and road crossings if the collocated trail reasonably and safely accommodates existing trail users as determined at the time of construction, or right-of-way acquisition by the Applicant or MSB (whichever comes first). Any trails that the Applicant proposes to combine at one grade-separated trail crossing under mitigation measure 91 shall count as one trail in calculating the average crossing distance of 3.0 miles. Each grade-separated trail crossing provided by the Applicant under mitigation measure 92 (i.e., the trails that contribute to the integrity of the Iditarod Sled Dog Historic District) can be included in the calculation of the average crossing distance of 3.0 miles, regardless of officially recognized status.	Review plan	Before construction	Extensive consultation has been completed at the direction of STB and SHPO. Trail crossing design plans are available on the project website. A revised IDSHD Summary and Implementation Plan was submitted to STB, SHPO, and other consulting parties on November 21, 2012. The plan is available on the project website.
84D: If the applicant proposes to construct an at-grade crossing of any officially recognized trails, the applicant shall submit a report to OEA for review and concurrence prior to the start of project-related construction of the rail segment containing the proposed at-grade crossing. The subject report shall address the following items for each officially recognized trail at which an at-grade crossing is proposed: • Identify each officially recognized trail. • Explain why a grade separated crossing is not feasible or appropriate. Specify engineering constraints or potential environmental impacts of a grade-separated crossing, as applicable. • Specify the safety controls and devices that would be installed or implemented for the proposed at-grade crossing. • Identify the current principal users or user groups of the proposed at-grade crossing, consult with these parties, and summarize their degree of acceptance of the proposed at-grade crossing and its proposed safety measures. • Explain any substantive objections of the parties to an at-grade crossing or its safety measures.	Review and approve plan	Before construction	Extensive consultation has been completed at the direction of STB and SHPO. Trail crossing design plans are available on the project website. A revised IDSHD Summary and Implementation Plan was submitted to STB, SHPO, and other consulting parties on November 21, 2012. The plan is available on the project website.

Mitigation Checklist – First Quarter 2019 (January to March)

Mitigation Measure	Compliance Metric	Timeframe	Status Comments
85: When project-related construction takes place on state and private land, the Applicant shall consult with the ADNDR Division of Forestry to salvage or dispose of commercial and personal use timber within the right-of-way in accordance with the reasonable requirements of the Alaska Forest Resources and Practices Act (Alaska Stat. § 41.17) and the Susitna Forestry Guidelines.	Review form	Before construction	In a letter dated March 20, 2013, ARRC received notification from the State of Alaska Division of Forestry Office that the project is in compliance with Alaska Division of Forestry – Forest Resources and Practices Act regulations. A Detailed Plan of Operations filing was determined to be unnecessary for the project.
86: The Applicant shall ensure that field-work contractors engaged in project-related construction are provided with training for the identification of hazardous materials, including unexploded ordnance (UXO) that could be encountered during project-related construction. If unanticipated sources of hazardous or regulated materials, including UXO, or potentially contaminated areas are encountered during project-related construction activities, the Applicant shall immediately notify the ADEC and stop all work in the area until a response plan has been approved by ADEC. Handling, treatment, and disposal of any hazardous materials shall occur in full compliance with all Federal, state, and local requirements.	Review contract specifications	During construction	This measure is included in the construction contract specifications.
87: The Applicant shall conduct project-related right-of-way acquisition in conformance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 United States Code § 4601), regulations promulgated pursuant to that statute (49 Code of Federal Regulations part 24), and all reasonable terms and conditions of Alaska Statute (Alaska Stat. § 34.60.010 through 34.60.150, Relocation Assistance and Real Property Acquisition Practices).	Interview ARRC and MSB right-of-way staff, confirm compliance	Before construction	Condition conforms to project right-of-way acquisition process.
88: The Applicant shall consult with local airports in the vicinity of new project-related communication towers and the ADOT&PF and the Federal Aviation Administration to ensure that the towers are appropriately sited and that notice has been given to pilots of the construction and location of the new towers.	Review design criteria	Before and during construction	Construction of the Houston Tower was completed in accordance with FAA, state, and local regulations. The Port MacKenzie tower, when constructed, will also be in accordance with this measure.
89: If the USACE completes a full-scale remedial investigation and feasibility study of the nature and extent of contamination or explosive hazards for the former Susitna Gunnery Range, and the USACE's study area encompasses portions of the project-related right-of-way, the Applicant shall observe the findings and recommendations of the study as approved by ADEC.	Review contract specifications	Before and during construction	If warranted, this measure will be employed.

Mitigation Checklist – First Quarter 2019 (January to March)

Mitigation Measure	Compliance Metric	Timeframe	Status Comments
90: Prior to initiation of project-related construction activities, and for a period of 1 year following start-up of operations on the rail line, the Applicant shall establish a Community Liaison to consult with affected communities, businesses, and appropriate agencies; develop cooperative solutions to local concerns; be available for public meetings; and conduct periodic public outreach. The Applicant shall provide the name and phone number of the Community Liaison to mayors and other appropriate local officials in each community through which the proposed rail line passes.	Interview community liaison	Before and during construction	The Project Office has been temporarily moved to 327 W, Ship Creek Ave., Anchorage, AK. Mr. David Kabella (ARRC) has been assigned as the Community Liaison and project manager. The Project website (www.portmacrail.com) and ARRC website (www.alaskarailroad.com) will be updated with Project news and contact numbers.
91: Project-related construction vehicles, equipment, and workers shall not access work areas by crossing residential properties without the permission of the property owners.	Review contract specifications	Before and during construction	If private property access is necessary, this measure will be employed.
92: Prior to completing final project design, the Applicant shall prepare a draft report on any officially recognized trails that it proposes to relocate rather than provide grade-separated or at-grade crossings of the trails. The draft report shall address the rationale for the proposed trail relocations; describe potential impacts to existing trail users if the trails are relocated rather than being equipped with grade-separated crossings; and summarize the Applicant's discussions with user groups and other interested parties affected by the proposed relocations. The draft report shall identify all parties consulted with by the Applicant regarding proposed trail relocations. All consulted parties shall be provided a copy of the draft report for review and comment for a period not to exceed 30 calendar days. The Applicant shall prepare a final report and submit the final report to OEA and the parties. In addition to the contents required in the draft report, the final report shall summarize all substantive comments from the parties and the Applicant's comment responses.	Review and approve plan	Before construction	Extensive consultation has been completed at the direction of STB and SHPO. Trail crossing design plans are available on the Project website. A revised IDSHD Summary and Implementation Plan was submitted to STB, SHPO, and other consulting parties on November 21, 2012. The plan is available on the project website.

Mitigation Checklist – First Quarter 2019 (January to March)

Mitigation Measure	Compliance Metric	Timeframe	Status Comments
93: Prior to completing final project design, the Applicant shall prepare a draft report that identifies the location and use of all trails contributing to the Iditarod Dog Sledding Historic District. The draft report shall identify the contributing trails, state of current use for dog sledding (if any), and information on sources and parties consulted pertaining to trail use. OEA and all consulted parties shall be provided a copy of the draft report for review and comment for a period not to exceed 30 calendar days. The Applicant shall prepare a final report and submit the final report to OEA and the parties. In addition to the contents required in the draft report, the final report shall summarize all substantive comments from the parties and the Applicant's comment responses. Based on the final report, all trails that are determined to be contributing to the integrity of the historic district, are in use for dog sledding, and are necessary to maintain the connectivity of the district, shall be provided with grade-separated crossings to allow for continued use.	Review and approve plan	Before construction	A revised IDSHD Summary and Implementation Plan was submitted to STB, SHPO, and other consulting parties on November 21, 2012. The plan is available on the project website.
94: To reduce glare from lighting used during nighttime project-related construction activities, and during operation of the terminal reserve, the Applicant shall require construction contractors to direct lighting onto the immediate area under construction only and to avoid shining lights toward residences, businesses, recreational areas, and down roadway or trail corridors.	Review contract specifications	During construction	This measure is included in the construction contract specifications.
95: To minimize the visual impact of the cleared right-of-way including the terminal reserve for this project, the Applicant shall minimize clearing at road and trail crossings, which could be accomplished by leaving a few larger trees and some smaller trees and shrubs untouched, to reduce visual contrast and mimic natural clearings in the landscape, where practical and consistent with safety and maintenance requirements.	Review design criteria and contract specifications	During construction	Clearing has been limited to only the areas needed to facilitate construction. The entire right-of-way will not be cleared; in general, only the footprint and a small area (~20') outside of the footprint will require clearing.

Mitigation Checklist – First Quarter 2019 (January to March)

Mitigation Measure	Compliance Metric	Timeframe	Status Comments
96: Where practicable to reduce visual impact in areas of high visibility (such as residential areas, road and trail crossings, and crossings of the Little Susitna River, and the areas surrounding the terminal reserve) without increasing the project footprint and when appropriate given maintenance, access, safety considerations, and natural vegetation patterns, the Applicant shall: - Plant native vegetation along the right-of-way and perimeter of the terminal reserve to reduce the contrast with line, color, and texture. Plant species that are preferred by moose as browse shall be avoided to the extent practicable. - Plant native trees and bushes around the base of bridge supports located on land to reduce the visual prominence of such features and break up the uniform lines, colors, and smooth textures of the bridge supports. A variety of plant types native and indigenous to the project area shall be used to provide multiple layers, seasonality, and reduced susceptibility to disease. Plant species that are preferred by moose as browse shall be avoided to the extent practicable. - In areas with hill cuts, shape slopes to reflect the natural landscape, where practicable, and plant with native materials to provide an amorphous and irregular form and rough texture. - Dispose of excess material in a suitable fill location and not cast on downhill slopes.	Review Reclamation Plan and Invasive Species Control and Management Plan	During and after construction	This measure is being implemented Project wide; as described in the Reclamation Plan and Invasive Species Control and Management Plan submitted to STB in 2012.
97: If there is a material change in the facts or circumstances upon which the Board relied in imposing specific environmental mitigation conditions, and upon petition by any party who demonstrates such material change, the Board may review the continuing applicability of its final mitigation, if warranted.	Review project design, permits, and contract specifications	Before, during, and after construction	If warranted, this measure will be employed.
98: The Applicant shall submit quarterly reports to the OEA on the progress of, implementation of, and compliance with all Board-imposed mitigation measures. The reporting period for these quarterly reports shall begin on the date of a Board Final Decision authorizing the project until 1 year after the Applicant has completed project-related construction activities. The Applicant shall submit copies of the quarterly reports within 30 days following the end of each quarterly reporting period and distribute the reports to appropriate Federal and state agencies, as specified by OEA.	Review and approve reports	During and after construction	As included in this quarterly submittal.
99: Within 60 days following a Board decision authorizing the project, the Applicant shall prepare and submit an annotated outline of the required quarterly report to the OEA for review and approval.	Review and approve outline	Before construction	A Quarterly Report Annotated Outline has been submitted and approved by STB.

Mitigation Checklist – First Quarter 2019 (January to March)

Mitigation Measure	Compliance Metric	Timeframe	Status Comments
100: The Applicant shall retain a third-party contractor to assist the OEA in the monitoring and enforcement of mitigation measures until 1 year after the Applicant has completed project-related construction.	Confirm with ARRC	Before construction	ARRC has coordinated with STB to retain ICF for this position.

Permit Status – Port MacKenzie Rail Extension Project

Active Permit Reviews

None at this time

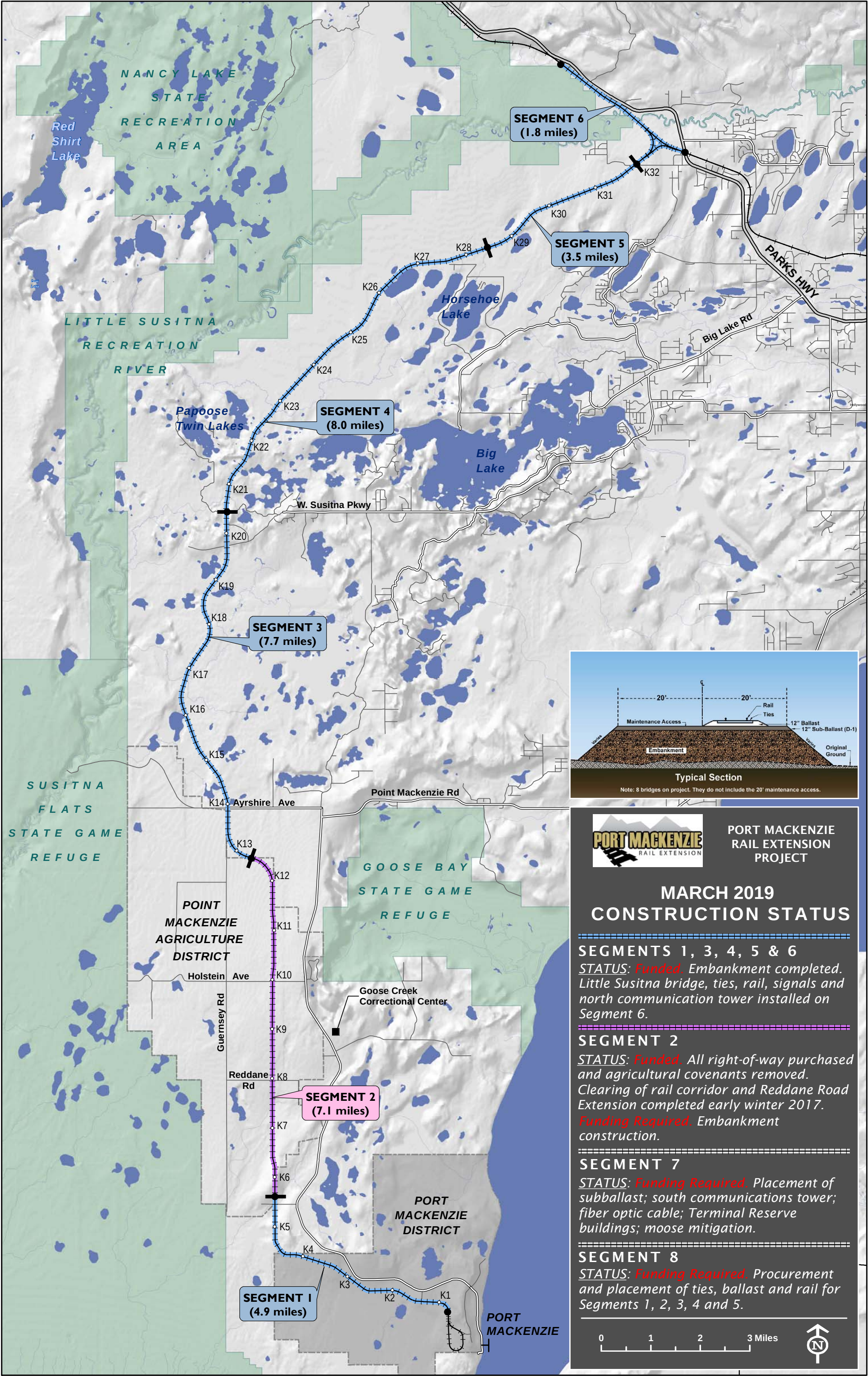
Segment						Acquired Permits			
1	2	3	4	5	6	Permit Type	Agency Responsible	Date Acquired	Status
X	X	X	X	X	X	Section 404 Permit	USACE	September 2012; February 2013 (M1), July 2013 (M2), February 2014 (M3), April 2015 (M4), December 2015 (M5)	Permit Issued (POA-2007-1586); Five modifications to the permit have been authorized to date (POA-2007-1586-M1, M2, M3, M4, and M5).
X	X	X	X	X	X	Section 401 Water Quality Certification	ADEC	March 20, 2012	Permit issued (Reference No. POA-2007-1586)
X						Title 16 Fish Habitat Permit: Baker Farm Road, MC 4.5 (aka MP K5.5)	ADF&G	July 2011, April 2013 (Amend 1)	Permit Issued (Permit #FH 11-IV-0286); Amendment 1 Issued
		X				Title 16 Fish Habitat Permit: Houston 0.8, Outlet of Diamond Lake (aka MP K16.8)	ADF&G	July 2011, September 2013 (Amend 1)	Permit Issued (Permit #FH 11-IV-0287); Amendment 1 Issued
			X			Title 16 Fish Habitat Permit: Houston 4.3, Outlet of Crooked Lake (aka MP K20.7)	ADF&G	July 2011, April 2014 (Amend 1)	Permit Issued (Permit #FH 11-IV-0288)); Amendment 1 Issued
			X			Title 16 Fish Habitat Permit: Houston 6.3, Trib. of Little Susitna River (aka MP K22.8)	ADF&G	July 2011, April 2014 (Amend 1)	Permit Issued (Permit #FH 11-IV-0289)); Amendment 1 Issued
				X		Title 16 Fish Habitat Permit: Houston South 1.0, Outflow of Little Horseshoe Lake (aka MP K27.8)	ADF&G	July 2011, April 2014 (Amend 1)	Permit Issued (Permit #FH 11-IV-0291)); Amendment 1 Issued
					X	Title 16 Fish Habitat Permit: MP 174.3, Little Susitna River Crossing	ADF&G	July 2011, September 2013 (Amend 1)	Permit Issued (Permit #FH 11-IV-0292); Amendment 1 Issued
X	X	X	X	X	X	Title 16 Fish Habitat Permit: Temporary Water Use Sites	ADF&G	July 2011	Permit Issued (Permit #s FH 11-IV-0294 through 0302)
			X			Title 16 Fish Habitat Permit: Temporary Water Use of Muleshoe Lake	ADF&G	April 2012	Permit Issued (Permit #FH 12-IV-0161)

Acquired Permits									
Segment									
1	2	3	4	5	6	Permit Type	Agency Responsible	Date Acquired	Status
					X	Title 16 Fish Habitat Permit: MP 175.0, Trib. Little Susitna River	ADF&G	May 2012, June 2013 (Amend 1), October 2013 (Amend 2)	Permit Issued (Permit #FH 11-IV-0293); Amendment 1 and 2 Issued
			X			Title 16 Fish Habitat Permit: MP K22.2 Papoose Twins Lake Stream	ADF&G	March 2012, March 2014 (Amend 1)	Permit Issued (Permit #FH 12-IV-0080); Amendment 1 Issued
				X		Title 16 Fish Habitat Permit: MP K 26.2 Unnamed lake.	ADF&G	July 6, 2011 December 4, 2015 (Amend 1)	Permit Issued (Permit #FH 11-IV-0296) Amendment 1 Issued
		X				Title 16 Fish Habitat Permit: MP K 14.0 Unnamed Pond near Ayrshire Rd.	ADF&G	July 6, 2011 December 4, 2015 (Amend 1)	Permit Issued (Permit #FH 11-IV-0300) Amendment 1 Issued
X						Title 16 Fish Habitat Permit: Unnamed stream near Baker Farm Road	ADF&G	July 6, 2011 December 4, 2015 (Amend 1)	Permit Issued (Permit # FH 11-IV-0302) Amendment Issued
		X	X	X	X	Temporary Water Use Permit: Northern Sources (5)	ADNR-DMLW	May 2012, May 2014 (Amend.)	Permit Issued (TWUP A2011-53); Water withdrawal rates amended
			X	X		APDES Construction General Permit	DEC	March 2016 (Seg. 4) April 2016 (Seg. 5)	Segment 4 CGPNOIREI-0342 Segment 5 CGPNOIREI-0047
X	X	X				Temporary Water Use Permit: Southern Sources (5)	ADNR-DMLW	May 2012	Permit Issued (TWUP A2011-54)
					X	Floodplain Development	MSB	June 2011; March 2015	Permit Issued (FHDP 172920110019); Certificate of Completion issued March 25, 2015
X						Port Development Permit	MSB	January 2012	Permit Issued (Permit #172320120001)
					X	Section 9 Bridge Permit, Little Susitna River	USCG	March 2011	No longer necessary to start construction as the Little Susitna River crossing is within scope of 33 CFR Section 115.70, Advanced Approval of Bridges for a Section 9 Bridge. USCG may act on permit application at their discretion
X	X	X	X	X		DNR Land Use (ADL 227588); DNR Easements, DNR Authorizations, DNR Permits	ADNR, DMLW	April 2013	Permit issued on April 1, 2013.
Permits Acquired by ARRC Contractors									
			X			Title 16 Fish Habitat Permit: MP K22.2, Temporary Crossing of Inlet Stream of	ADF&G	March 2014	Permit Issued (#FH 14-IV-0238) to Bristol Environmental Remediation Services

						Acquired Permits			
Segment						Permit Type	Agency Responsible	Date Acquired	Status
1	2	3	4	5	6				
						East Papoose Twins Lake			
			X			Title 16 Fish Habitat Permit: MP K27.9, Temporary Crossing of Unnamed Tributary of Little Susitna River	ADF&G	November 2013; March 2014 (Amend 1)	Permit Issued (#FH 13-IV-0856) to Bristol Environmental Remediation Services; Amendment 1 Issued
			X			Title 16 Fish Habitat Permit: MP K22.8, Temporary Crossing of Unnamed Tributary of Little Susitna River	ADF&G	November 2013;	Permit Issued (#FH 13-IV-0855) to Bristol Environmental Remediation Services
			X			Title 16 Fish Habitat Permit: MP 20.7, Temporary Crossing of Unnamed Tributary of Little Susitna River	ADF&G	November 2013; March 2014 (Amend 1)	Permit Issued (#FH 13-IV-0854) to Bristol Environmental Remediation Services; Amendment 1 Issued
		X				Title 16 Fish Habitat Permit: MP 16.8, Temporary Winter Stream Crossing of Diamond Lake Outlet Stream	ADF&G	January 2014	Permit Issued (#FH 13-IV-0899) to Bristol Environmental Remediation Services
		X				Title 16 Fish Habitat Permit: MP 16.8, Temporary Bridge Installation of Diamond Lake Outlet Stream	ADF&G	May 2013; September 2013 (Amend 1)	Permit Issued (#FH 13-IV-0531) to QAP dba Colaska; Amendment 1 Issued
					X	Title 16 Fish Habitat Permit: Water Withdrawal of Little Susitna River – Water Body 247-41-10100	ADF&G	April 2013	Permit Issued (#FH 13-IV-0272) to Granite Construction
			X			Title 16 Fish Habitat Permit: Water Withdrawal Sites (four locations)	ADF&G	May 2014	Permits Issued (#FH 14-IV-0432+ and 14-IV-0434+) to Bristol Environmental Remediation Services
			X			Temporary Water Use Permit: Segment 4 Sources (4)	ADNR-DMLW	May 2014	Permit Issued (TWUP A2013-22)
X						APDES Construction General Permit	DEC	March 2012	Permit Issued (AKR10DY32) to Bristol Construction Services LLC; Notice of Termination 10/20/15
X						APDES Construction General Permit	DEC	March 2012	Permit Issued (AKR10DZ24) to ARRC; Notice of Termination 10/22/15
		X				APDES Construction General Permit	DEC	April 2013	Permit Issued (AKR10EI67) to QAP; Notice of Termination 12/4/15
		X				APDES Construction General Permit	DEC	April 2013	Permit Issued (AKR10EJ13) to ARRC, Construction; Notice of Termination 9/29/15.
			X			APDES Construction General Permit	DEC	September 2013	Permit Issued (AKR10EN90) to Bristol Construction Services LLC; Notice of Termination 9/2/16
			X			APDES Construction General Permit	DEC	October 2013	Permit Issued (AKR10EO70) to ARRC; Notice of

Acquired Permits									
Segment									
1	2	3	4	5	6	Permit Type	Agency Responsible	Date Acquired	Status
									Termination 9/9/16
				X		APDES Construction General Permit	DEC	May 2015	Permit Issued (AKR10FB44) to QAP; Notice of Termination 7/27/16
				X		APDES Construction General Permit	DEC	April 2015	Permit Issued (AKR10FB50) to ARRC; Notice of Termination 7/27/16
					X	APDES Construction General Permit	DEC	March 2013; November 2014	Permit Issued (AKR10EI53) to Granite Construction; Notice of Termination 11/25/14
					X	APDES Construction General Permit	DEC	April 2013	Permit Issued (AKR10EJ14) to ARRC; Notice of Termination 11/25/14
		X	X	X	X	APDES Construction General Permit	DEC	January 2014	Permit Issued (AKR10EP64) to ARRC for trail clearing work; Notice of Termination 11/16/15

Attachment 1.
PMRE Construction Status Map



Port MacKenzie Rail Extension Project Moose Mitigation Plan - Final



PREPARED FOR
Alaska Railroad Corporation



PREPARED BY



March 2019

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1.0 Introduction

1.1 Background

The Alaska Railroad Corporation's (ARRC) Port MacKenzie Rail Extension (PMRE) project is situated in the Alaska Department of Fish and Game's (ADF&G) Game Management Unit 14A; an area that provides widespread habitat for approximately 8,500 moose (per ADF&G 2013 estimate). The PMRE crosses areas used by moose during migration periods. Although it is known that moose use habitat within the area of the PMRE, specific migration corridors and concentration areas have not been mapped at this time.

ARRC's preparation of this Moose Mitigation Strategy Plan (Mitigation Plan) is required by the Federal Surface Transportation Board's (STB) Office of Environmental Analysis (OEA) as outlined in the November 21, 2011 PMRE Record of Decision (ROD) (Docket No. FD 35095) authorizing ARRC to construct and operate the rail line extension. Further information on expected impacts to moose populations and moose-train collision mortality can be found in Appendix E of the PMRE Final EIS.

In order to develop this Mitigation Plan, the ARRC worked proactively with regulatory agencies to develop strategies that reduce the potential for moose-train collisions along the PMRE. On September 29, 2010, ARRC held a meeting with the U.S. Fish and Wildlife Service (USFWS) and ADF&G to consider engineering design concepts, adaptive mitigation measures, and train operation protocols that could help meet this goal. Discussions from that meeting, subsequent permitting meetings, and concepts from the PMRE Environmental Impact Statement (EIS) were the basis for the Moose Mitigation Strategy, which was prepared for the PMRE in 2012¹ (Appendix A). These aforementioned meetings and documents are the basis for the strategies outlined in this document.

To date, construction of the PMRE is largely complete and only Segment 2 remains to be built. Once the final piece of the rail line extension is completed, ARRC will be able to lay down rail lines and commence train operations thereafter. At this time, construction is paused and the project schedule remains uncertain; therefore, the date of when train operations may begin is unknown. As such, there is currently no potential for moose-train collisions within the project area. However, once project construction resumes, ARRC will adhere to the applicable strategies to reduce moose-train collisions or other strategies developed through adaptive management processes.

1.2 Purpose

The purpose of this Mitigation Plan is to provide strategies that minimize moose-train collisions within the PMRE project area. In addition, this Mitigation Plan will document project compliance with construction-related strategies to date.

1.3 Approach

The overall approach of this plan is considered adaptive; initially using concepts and management practices that have been proven successful along the existing main line and offering ARRC the flexibility to modify the strategies in the future if needed. *Port MacKenzie Rail Extension: Moose Mitigation Strategy* (Alaska Railroad Corporation, 2012)

¹ Alaska Railroad Corporation. *Port MacKenzie Rail Extension: Moose Mitigation Strategy* (Alaska Railroad Corporation, 2012).

2.0 Moose-Train Collision Mitigation Measures

The Moose-Train Collision Mitigation Measures (mitigation measures), as presented in the PMRE ROD, both require the development of this Mitigation Plan and address various aspects of what should be included in this Mitigation Plan. Mitigation measures in the PMRE ROD included both STB-imposed measures as well as voluntary mitigation measures proposed by ARRC. These mitigation measures are presented in the following subsections. The strategies presented in this Mitigation Plan that were developed to comply with these mitigation measures are provided in Section 3.0.

2.1 STB Mitigation Measure No. 47

STB Mitigation Measure No. 47 requires that ARRC develop a moose-train collision mitigation strategy plan. The specific measure, as presented in the ROD is provided below.

- **Mitigation Measure No. 47:** *The Applicant, in consultation with the ADF&G, ADNR and other appropriate stakeholders shall evaluate, implement, and monitor various aspects of project-related rail design, maintenance, and operation to document moose mortality from collisions with trains, and to develop a strategy to reduce the moose-train collision mortality rate. The Applicant shall document the strategy in a Moose Mitigation Strategy Plan. A draft of the plan shall be prepared and submitted to ADF&G, ADNR and OEA for review and comment prior to completing final design and before the start of project-related construction. The strategy could include:*
 - *Maintaining vegetation along the right-of-way in primary (e.g., grasses/sedges) or late (e.g., old-growth spruce) successional (developmental) stages. If vegetation is allowed to progress to the secondary successional stage (i.e., shrubs), maintaining it at the shortest possible height, not to exceed 0.5 meter, encouraging shrubs of non-preferred moose browse species (e.g., alder, dwarf birch), and minimizing re-growth of willow, paper birch, and aspen*
 - *Mowing vegetation in late summer before energy stores are transferred to the roots*
 - *In winter, plowing snow back from the track to the outer edge of the trackside clearing to allow moose easy access away from the tracks when a train approaches*
 - *Developing a plan in conjunction with the ADF&G to catalog all strikes (not just confirmed or suspected deaths) in a timely manner that shall include, but is not necessarily limited to: precise location (latitude and longitude), date and time; weather and other environmental conditions at the time and location of strike; and attributes associated with the train, such as horn use, speed, and track characteristics*
 - *Designing, constructing, and operating all aspects of the rail line to minimize significant alteration of moose and other wildlife movement and migration patterns*

In reference to Mitigation Measure No. 47, and in consultation with ADF&G and USFWS, ARRC developed strategies 1–11 to comply with this measure.

2.2 STB Mitigation Measure No. 41 and 96

STB Mitigation Measure No. 41 and 96 both have components that encourage ARRC to avoid areas of preferred moose browse, effectively limiting the extent of moose browse along the PMRE. The specific mitigation measures, as presented in the ROD, are included below.

- **Mitigation Measure No. 41:** *To the extent practicable, the Applicant shall minimize project-related ground disturbance, clearing of established vegetation and removal of wildlife habitats*

and riparian vegetation during project-related construction. **The Applicant shall also minimize the reestablishment of vegetation near the rail bed that would be attractive to moose.**

- **Mitigation Measure No. 96:** *Where practicable to reduce visual impact in areas of high visibility (such as residential areas, road and trail crossings, crossings of the Little Susitna River, and the areas surrounding the terminal reserve) without increasing the project footprint and when appropriate given maintenance, access, safety considerations, and natural vegetation patterns, the Applicant shall:*
 - *Plant native vegetation along the right-of-way and perimeter of the terminal reserve to reduce the contrast with line, color, and texture. **Plant species that are preferred by moose as browse shall be avoided to the extent practicable.***
 - *Plant native trees and bushes around the base of bridge supports located on land to reduce the visual prominence of such features and break up the uniform lines, colors, and smooth textures of the bridge supports. A variety of plant types native and indigenous to the project area shall be used to provide multiple layers, seasonality, and reduced susceptibility to disease. **Plant species that are preferred by moose as browse shall be avoided to the extent practicable.***
 - *In areas with hill cuts, shape slopes to reflect the natural landscape, where practicable, and plant with native materials to provide an amorphous and irregular form and rough texture.*
 - *Dispose of excess material in a suitable fill location and not cast on downhill slopes.*

ARRC developed 11 strategies related to Mitigation Measure No. 47 that include clearing of moose browse from the rail corridor and replanting disturbed areas with vegetation that is typically undesirable to moose. Strategic plantings intended to minimize moose from using the rail line as a movement corridor are also proposed, however, these may not be implemented until problem areas are defined. The ARRC has will continue to avoid using browse species (e.g. willow, birch) in their revegetation efforts. Please see

Table 1. Revegetation Seed Type A, Table 2. Revegetation Seed Type B, and Table 3. Revegetation Seed Type C, for more details.

2.3 ARRC Voluntary Mitigation Measure No. 32 and 37

During preparation of the EIS, ARRC also proposed the following two voluntary Mitigation Measure, No. 32 and 37 that were intended to lessen the project's impact on moose.

- **Mitigation Measure No. 32:** *The Applicant shall restrict its project-related workers from (1) hunting or fishing while stationed at work camps; (2) **harassing wildlife, including winter or calving concentrations of moose (cows with yearling calves can be particularly defensive);** (3) approaching known occupied bear dens; and (4) **feeding wildlife.***
- **Mitigation Measure No. 37:** *Subject to consultation with the ADF&G and ADNR, the Applicant shall work with adjacent land managers to develop alternative preferred habitat away from the rail line and construct a widened embankment to allow moose a place to retreat on one side when a train passes in an effort to reduce the potential for moose strikes.*

In reference to Mitigation Measure No. 32 and 37, ARRC developed strategies 01–15 to comply with These mitigation measure.

3.0 Strategies

ARRC, in consultation with ADF&G and USFWS, developed a number of strategies to comply with each of the STB-imposed and ARRC voluntary mitigation measures. The following subsections describe the strategies developed to comply with each of the mitigation measures. Specifically, Subsection 3.1 presents the strategies that were developed for construction activities and describes those that have been implemented to date. Subsection 3.2 presents the strategies that will be adhered to both during PMRE operations and on an annual basis. Subsection 3.3 describes ARRC's adaptive management strategy and how compliance will be monitored. Finally, Subsection 3.4 presents additional strategies that may be implemented in the future.

All of the strategies presented in this Mitigation Plan were agreed upon as reasonable and routine mitigation, at least in concept, by the relevant resource agencies during the permitting stage of the project. Please refer to Table 1 for a list of the strategies associated with each mitigation measure.

3.1 *Strategies for Construction Activities*

ARRC identified 15 strategies that would be implemented to reduce moose-train collision mortality along the PMRE, including eight (Strategies 2, 3, 5, 7, 12, 13, 14, and 15) that would occur during construction. Each of the construction-related strategies are described below, followed by with a brief explanation of compliance with these strategies to date. Note that applicable construction-related strategies will be complied with, as necessary, once construction of the final segment of PMRE resumes.

In reference to Mitigation Measure No. 47, ARRC complied (and will continue to do so as necessary) with the following construction-related strategies:

Strategy 2: ARRC will construct and maintain an embankment wide enough to allow moose a place to retreat to one side when a train passes. ARRC has proposed to construct an approximately 40-foot wide embankment top for the length of the rail line.

Compliance: ARRC constructed a 40-foot wide embankment for the length of the rail line. Very few exceptions were made to this standard embankment width, but were necessary to accommodate bridges and at-grade crossings.

Strategy 3: Following construction, ARRC will replant temporarily impacted areas on the embankment with vegetation species undesirable to moose. Proposed species are included in the PMRE Reclamation Plan; further consultation with ADF&G and USFWS may be required to determine if the species proposed are compatible with this strategy.

Compliance: ARRC adhered to the PMRE Reclamation Plan and replanted temporarily impacted areas with vegetation species that are undesirable to moose. According to construction specifications, reseeding of Segments 1, 3, 4, and 6 used one of three different seed mixtures (Seed Types A, B, and C) depending on the soil types present (i.e., upland, wetland, or adjacent to wetlands). In all upland areas not adjacent to wetlands, Seed Type A was used. On all embankment fill slopes adjacent to wetlands, Seed Type B was used. In any disturbed wetland areas, Seed Type C was used.

Only one seed mixture was used during revegetation of Segment 5. This mixture included Red Fescue (40%), Slender Wheatgrass (50%), and Annual Ryegrass (10%). The seed types and their percentage composition for Segments 1, 3, 4, and 6 are shown in the following tables:

Table 1. Revegetation Seed Type A

Seed Type A	Scientific Name	% of Total Mix	Minimum Percent Sproutable Seed (pure live seed)
Red Fescue	<i>Festuca rubra</i> 'Aretared' or 'Boreal'	60	78
Slender Wheatgrass	<i>Elymus trachycaulus</i>	30	80
Annual Ryegrass	<i>Elymus lolium</i>	10	76

Table 2. Revegetation Seed Type B

Seed Type B	Scientific Name	% of Total Mix	Minimum Percent Sproutable Seed (pure live seed)
Tufted Hairgrass	<i>Deschampsia caespitosa</i> 'Nortan'	60	71
Red Fescue	<i>Festuca rubra</i> 'Aretared' or 'Boreal'	30	78
Annual Rye	<i>Elymus lolium</i>	10	76

Table 3. Revegetation Seed Type C

Seed Type C	Scientific Name	% of Total Mix	Minimum Percent Sproutable Seed (pure live seed)
Tufted Hairgrass	<i>Deschampsia caespitosa</i> 'Nortan'	60	71
American Sloughgrass	<i>Beckmannia syzigachne</i> 'Egan'	30	67
Alpine Bluegrass	<i>Poa alpina</i> 'Gruening'	5	72
Annual Rye	<i>Elymus lolium</i>	5	76

Strategy 5: Portions of the rail line extension, including segments in the agricultural district and across the Miller Reach burn, will be constructed using a low-profile embankment as practicable and will be situated along flat open areas which allow for a good line of sight for both moose and the train operators.

Compliance: ARRC constructed Segments 4 and 5, which cross the Miller Reach burn area, as designed. The design profiles were minimized to meet mitigation requirements, reduce construction costs, and to maximize train efficiency through the use of minimal gradients.

Strategy 7: ARRC has proposed to construct bridge crossings that are of sufficient height to allow moose passage underneath.

Compliance: ARRC constructed 9 bridges as part of the PMRE alignment and one bridge remains to be constructed at Reddane Avenue. Table 4. Approximate Vertical Clearances, below, shows the approximate vertical clearances of each bridge constructed or planned along the PMRE. **Figure 1** presents a typical design plan for moose and wildlife crossings, which will be used for bridges crossing roads, trains, and water.

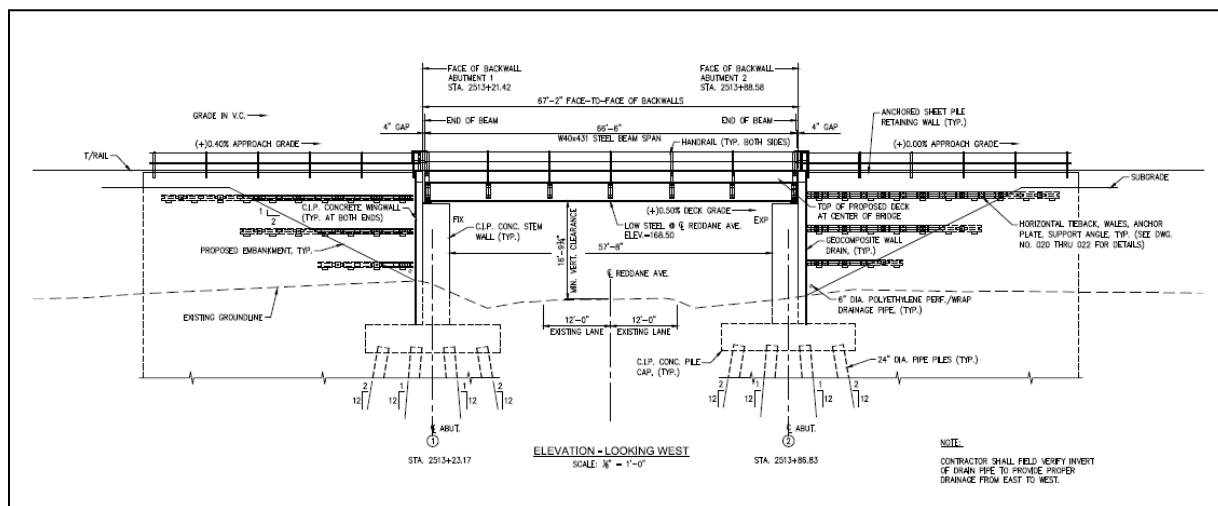
Table 4. Approximate Vertical Clearances

BRIDGE LOCATION	SEGMENT*	VERTICAL CLEARANCE
Baker Farm	1	12 ft 1-3/4 in
Reddane Avenue (not constructed)	2**	16 ft 9-3/4 in
MP K9.96	2**	23 ft 6 in
MP K16.78	3	14 ft 0 in (+/-)
MP K17.08	3	14 ft 0 in (+/-)
MP K17.95	3	14 ft 0 in (+/-)
MP K20.76	4	14 ft 0 in (+/-)
MP K22.79	4	14 ft 0 in (+/-)
MP K27.88	4	14 ft 0 in (+/-)
MP K33.10 (over Little Susitna River)	6	14 ft 0 in (+/-)

* Segment 5 has no bridges.

** Segment 2 has not yet been constructed; elevations are from 90% plans (10/05/2015).

Figure 1. Typical Design Plan for PMRE Moose and Wildlife Crossings



In reference to voluntary mitigation measure No. 32, ARRC complied (and will continue to do so as necessary) with the following strategies:

Strategy 12: During construction, all employees or contractors will be briefed on relevant mitigation measures prior to the start of construction or other field related activities. Harassing, feeding or otherwise disturbing any wildlife will not be tolerated.

Compliance: It is standard ARRC operating procedure to brief all employees and contractors on relevant mitigation measures prior to beginning work in the field. All employees and contractors were informed that harassing, feeding, or otherwise disturbing wildlife would not be tolerated and the consequences for doing so, which could include termination, were communicated to all employees and contractors. Additionally, daily safety briefings frequently addressed moose interaction. No incidents were recorded or observed.

Strategy 13: *During construction, all vehicles and equipment will follow safe speed limits and will yield the right-of-way to wildlife.*

Compliance: It is standard ARRC operating procedure that all construction vehicles and equipment will follow safe speed limits and yield the right-of-way to wildlife. This strategy was strictly enforced during construction and no incidents involving wildlife were recorded or observed.

Strategy 14: *During construction, all employees or contractors should report direct wildlife encounters and interactions of any other kind to the site safety personnel immediately. If the designated safety personnel are not available, employees should notify their supervisor immediately.*

Compliance: It is standard ARRC operating procedure that all employees or contractors report direct wildlife encounters to site safety personnel immediately. It is the understanding of ARRC that all direct wildlife encounters were immediately reported to site safety personnel or supervisors and appropriate actions were taken.

Strategy 15: *If moose or other wildlife travel into the active work site, all work should stop and site safety personnel should be notified. Safety personnel should monitor the situation and decide on the best course of action.*

Compliance: It is standard ARRC operating procedure to stop work if wildlife are present in an active work site and their presence poses a potential harm to personnel or wildlife.

3.2 Annual and Operational Strategies

To ensure continued compliance with STB Mitigation Measure No. 47, the ARRC will carry out the following strategies, outlined below, today and into the future.

Strategy 1: *ARRC will discourage growth of moose browse along the rail line extension to avoid attracting moose. ARRC will attempt to cut vegetation back 20-25 ft. on each side of track using a brush cutter as needed.*

Strategy 4: *During winter months the embankment will be plowed as practicable to allow sufficient space for moose to retreat. ARRC has proposed to construct a 40-foot wide embankment top for the length of the rail line allowing for wider swath to be cleared of snow.*

Strategy 6: *ARRC will use train horns to haze moose off of the tracks. ARRC anecdotal information suggests that this is successful up to 50-75% of the time.*

Strategy 8: *ARRC train operators will report incidents where moose are struck. Field salvage crews will report specific information (see below) on the moose if practicable. ARRC's Maintenance of Way Department will track this data in a database and report it to ARRC management and ADF&G on a quarterly basis. It should be noted that this reporting process is currently being used by ARRC on the main line. Incident reports submitted to ADF&G generally include the following information:*

- *number of animals struck*
- *number of fatalities*
- *number of salvageable*

3.3 *Adaptive Management Strategy and Monitoring*

On September 29, 2010, ARRC facilitated a workshop with ADF&G and USFWS intended to develop a framework for addressing moose-train collisions. As a result of that meeting, ARRC agreed to implement an adaptive management strategy; requiring a moose-train collision maximum threshold, that if reached, would trigger reevaluation.

As part of the adaptive management strategy, a maximum limit of 10 moose-train collisions a year within a linear mile of track would require ARRC re-engage ADF&G and USFWS to assess the moose mortality data and develop additional strategies, if warranted. ARRC will monitor collision data for five years and if the threshold has been met for three or more of the years, then adaptive management may be implemented. See Section 3.4 for a description of additional strategies.

3.4 *Additional Strategies*

If the maximum acceptable limit of moose-train collisions (determined in consultation with ADF&G and USFWS) is exceeded, ARRC will re-engage these agencies to assess moose mortality data and develop additional strategies. Additional foreseeable strategies that have been discussed with ADF&G and USFWS may include the following:

Strategy 9: ARRC developing and implementing a plan to create alternative browse opportunities for moose away from the rail line. This could involve planting, periodic clearing, or modifying seed mixes used for erosion control.

Strategy 10: ARRC employing strategic planting scenarios to discourage moose in problem areas, as defined through consultation with ADF&G and USFWS.

Strategy 11: ARRC expanding areas of brushing, beyond the 20-25 feet (Strategy 1), around the rail line to discourage browsing immediately adjacent the track.

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Appendix A:

Reference Materials



Moose Mitigation Strategy

Port MacKenzie Rail Extension Project

1.0 Purpose

The Port MacKenzie Rail Extension (PMRE) project is situated in the Alaska Department of Fish and Game's (ADF&G) Game Management Unit 14A; an area that provides widespread habitat for approximately 6,600 moose (per ADF&G estimates). The new rail line would cross areas used by moose for both fall migration and winter congregation. While specific migration corridors and concentration areas have not been mapped, the Alaska Railroad Corporation (ARRC) has been working proactively with regulatory agencies to develop strategies that reduce the potential for moose-train collisions along the new rail line. On September 29, 2010, ARRC held a meeting with the U.S. Fish and Wildlife Service (USFWS) and ADF&G to consider engineering design concepts, adaptive mitigation measures, and train operation protocols that could help meet this goal. Discussions from that meeting, subsequent permitting meetings, and concepts from the PMRE Environmental Impact Statement (EIS) are the basis for the strategies outlined in this document.

ARRC's preparation of this moose mitigation strategy is required by the Surface Transportation Board's Office of Environmental Analysis (OEA) as outlined in the November 21, 2011 PMRE Record of Decision (ROD) (Docket No. FD 35095) authorizing ARRC to construct and operate the new rail line. The ROD mitigation measures related to moose are included below; followed by ARRC's proposal to comply with each. ARRC's voluntary mitigation measures are presented as well. Further information on expected impacts to moose populations and moose-train collision mortality can be found in Appendix E of the PMRE Final EIS.

2.0 Moose-Train Collision Mitigation Measures

The following mitigation measures, as presented in the PMRE ROD, address various aspects of what should be included in this moose mitigation strategy. Compliance metrics or explicit directives are generally not given by OEA; as such, ARRC proposed strategies for complying with each measure are discussed below. Many of the strategies presented here have been agreed upon, at least in concept, by the relevant resource agencies during the permitting stage of the project. The overall approach of this plan is considered adaptive; initially using concepts and management practices that have been proven successful along the existing main line and offering ARRC the flexibility to modify the strategies in the future if needed.

2.1 Requirement for a Moose Mitigation Strategy Plan

Mitigation Measure No. 47 requires that ARRC develop a moose-train collision mitigation strategy plan. The specific measure, as presented in the ROD is included below.

Mitigation Measure No. 47: The Applicant, in consultation with the ADF&G, ADNR and other appropriate stakeholders shall evaluate, implement, and monitor various aspects of project-related rail design, maintenance, and operation to document moose mortality from collisions with trains, and to develop a strategy to reduce the moose-train collision mortality rate. The Applicant shall document the strategy in a Moose Mitigation Strategy Plan. A draft of the plan shall be prepared and submitted to ADF&G, ADNR and OEA for review and comment prior to completing final design and before the start of project-related construction. The strategy could include:

- Maintaining vegetation along the right-of-way in primary (e.g., grasses/sedges) or late (e.g., old-growth spruce) successional (developmental) stages. If vegetation is allowed to progress to the secondary successional stage (i.e., shrubs), maintaining it at the shortest possible height, not to exceed 0.5 meter, encouraging shrubs of non-preferred moose browse species (e.g., alder, dwarf birch), and minimizing re-growth of willow, paper birch, and aspen*
- Mowing vegetation in late summer before energy stores are transferred to the roots*
- In winter, plowing snow back from the track to the outer edge of the trackside clearing to allow moose easy access away from the tracks when a train approaches*
- Developing a plan in conjunction with the ADF&G to catalog all strikes (not just confirmed or suspected deaths) in a timely manner that shall include, but is not necessarily limited to: precise location (latitude and longitude), date and time; weather and other environmental conditions at the time and location of strike; and attributes associated with the train, such as horn use, speed, and track characteristics*
- Designing, constructing, and operating all aspects of the rail line to minimize significant alteration of moose and other wildlife movement and migration patterns*

ARRC, in consultation with ADF&G and USFWS have developed a number of strategies to comply with this measure. Initially, on September 29, 2010, ARRC facilitated a workshop with ADF&G and USFWS intended to develop a framework for addressing moose-train collisions. As a result of that meeting, ARRC agreed to implement an adaptive management strategy; requiring a moose-train collision maximum threshold, that if reached, would trigger reevaluation. The following strategies were agreed upon as reasonable, routine measures that ARRC would implement during PMRE operations:

- **Strategy 1:** ARRC will discourage growth of moose browse along the new rail line to avoid attracting moose. ARRC will attempt to cut vegetation back 20-25 ft on each side of track using a brush cutter as needed.
- **Strategy 2:** ARRC will construct and maintain an embankment wide enough to allow moose a place to retreat to one side when a train passes. ARRC has proposed to construct an approximately 40-foot wide embankment top for the length of the rail line.
- **Strategy 3:** Following construction, ARRC will replant temporarily impacted areas on the embankment with vegetation species undesirable to moose. Proposed species are included in the PMRE Reclamation Plan; further consultation with ADF&G and USFWS may be required to determine if the species proposed are compatible with this strategy.
- **Strategy 4:** During winter months the embankment will be plowed as practicable to allow sufficient space for moose to retreat. ARRC has proposed to construct a 40-foot wide embankment top for the length of the rail line allowing for wider swath to be cleared of snow.
- **Strategy 5:** Portions of the new rail, including segments in the agricultural district and across the Miller Reach burn, will be constructed using a low-profile embankment as practicable and will be

situated along flat open areas which allow for a good line of sight for both moose and the train operators.

- **Strategy 6:** ARRC will use train horns to haze moose off of the tracks (anecdotal information suggests that this is successful up to 50-75% of the time).
- **Strategy 7:** ARRC has proposed to construct bridge crossings that are of sufficient height to allow moose passage underneath.
- **Strategy 8:** ARRC train operators will report incidents where moose are struck. Field salvage crews will report specific information (see below) on the moose if practicable. ARRC's Maintenance of Way Department will track this data in a database and report it to ARRC management and ADF&G on a quarterly basis. It should be noted that this reporting process is currently being used by ARRC on the main line. Incident reports submitted to ADF&G generally include the following information:
 - number of animals hit
 - sex of the animal
 - whether the animal was a calf, juvenile or adult
 - location where the animal was struck (ARRC milepost)
 - whether the meat was salvageable
 - date and time of the strike
 - whether the animals were killed in the incident

As part of an adaptive strategy, a maximum acceptable limit of moose-train collisions will be determined in consultation with ADF&G and USFWS, that if exceeded, would require that ARRC re-engage ADF&G and USFWS to assess the moose mortality data and develop additional mitigation strategies, if warranted. Additional strategies could include the following:

- **Strategy 9:** ARRC developing and implementing a plan to create alternative browse opportunities for moose away from the rail line. This could involve planting, periodic clearing, or modifying seed mixes used for erosion control.
- **Strategy 10:** ARRC employing strategic planting scenarios to discourage moose in problem areas, as defined through consultation with ADF&G and USFWS.
- **Strategy 11:** ARRC expanding areas of brushing, beyond the 20-25 feet (Strategy 1), around the rail line to discourage browsing immediately adjacent the track.

2.2 Avoidance of Moose Browse Species in Revegetation

Mitigation Measures No. 41 and 96 both have components that encourage ARRC to avoid areas of preferred moose browse, effectively limiting the extent of moose browse along the new rail line. The specific measures, as presented in the ROD are included below.

Mitigation Measure No. 41: *To the extent practicable, the Applicant shall minimize project-related ground disturbance, clearing of established vegetation and removal of wildlife habitats and riparian vegetation during project-related construction. **The Applicant shall also minimize the reestablishment of vegetation near the rail bed that would be attractive to moose.***

Mitigation Measure No. 96: *Where practicable to reduce visual impact in areas of high visibility (such as residential areas, road and trail crossings, crossings of the Little Susitna River, and the areas surrounding the terminal reserve) without increasing the project footprint and when appropriate given maintenance, access, safety considerations, and natural vegetation patterns, the Applicant shall:*

- *Plant native vegetation along the right-of-way and perimeter of the terminal reserve to reduce the contrast with line, color, and texture. **Plant species that are preferred by moose as browse shall be avoided to the extent practicable.***
- *Plant native trees and bushes around the base of bridge supports located on land to reduce the visual prominence of such features and break up the uniform lines, colors, and smooth textures of the bridge supports. A variety of plant types native and indigenous to the project area shall be used to provide multiple layers, seasonality, and reduced susceptibility to disease. **Plant species that are preferred by moose as browse shall be avoided to the extent practicable.***
- *In areas with hill cuts, shape slopes to reflect the natural landscape, where practicable, and plant with native materials to provide an amorphous and irregular form and rough texture.*
- *Dispose of excess material in a suitable fill location and not cast on downhill slopes.*

As presented in Section 2.1, ARRC's proposed strategies include clearing of moose browse from the rail corridor and replanting disturbed areas with vegetation that is typically undesirable to moose. Strategic plantings intended to minimize moose from using the rail line as a movement corridor are also proposed, however, these may not be implemented until problem areas are defined. The ARRC will avoid using browse species (e.g. willow, birch) in their revegetation efforts.

2.3 ARRC Voluntary Mitigation Measures

During preparation of the EIS, ARRC also proposed the following two voluntary mitigation measures that were intended to lessen the project's impact on moose.

*Mitigation Measure No. 32: The Applicant shall restrict its project-related workers from (1) hunting or fishing while stationed at work camps; (2) **harassing wildlife, including winter or calving concentrations of moose (cows with yearling calves can be particularly defensive);** (3) approaching known occupied bear dens; and (4) **feeding wildlife.***

Mitigation Measure No. 37: Subject to consultation with the ADF&G and ADNR, the Applicant shall work with adjacent land managers to develop alternative preferred habitat away from the rail line and construct a widened embankment to allow moose a place to retreat on one side when a train passes in an effort to reduce the potential for moose strikes.

In reference to measure No. 32, ARRC is proposing the following strategies:

- **Strategy 12:** During construction, all employees or contractors will be briefed on relevant mitigation measures prior to the start of construction or other field related activities. Harassing, feeding or otherwise disturbing any wildlife will not be tolerated.
- **Strategy 13:** During construction, all vehicles and equipment will follow safe speed limits and will yield the right-of-way to wildlife.
- **Strategy 14:** During construction, all employees or contractors should report direct wildlife encounters and interactions of any other kind to the site safety personnel immediately. If the designated safety personnel are not available, employees should notify their supervisor immediately.
- **Strategy 15:** If moose or other wildlife travel into the active work site, all work should stop and site safety personnel should be notified. Safety personnel should monitor the situation and decide on the best course of action.

In reference to measure No. 37, ARRC has had success with and recognizes the value of developing alternative preferred moose habitat, specifically browse habitat, away from the rail line. This technique has proven successful on several previous Alaska rail projects; effectively lowering moose collisions by more than 60 percent on an annual basis. As of January 2012, ARRC is still developing design criteria and concepts for creating preferred browse habitat. These concepts will be submitted to ADF&G and USFWS upon completion.

Historic ARRC main line moose-train collision data indicates that strikes are most abundant in the lower Susitna Valley during winter when moose frequent the rail embankment to escape deep snow. Existing trends and experience also indicate that areas with a widened rail embankment tend to result in far fewer moose-train collisions in the winter. The wider embankment offers a greater opportunity for moose to avoid train collisions by giving them room to escape to the side of the track.

3.0 Conclusion

Moose-train collisions on ARRC railroads are an ongoing issue. Proactive management strategies, design criteria, operational procedures, and consultation with resource experts are tools already used by ARRC to reduce the number of collisions. Environmental variables (snow, vegetation succession, fires) continually challenge ARRC's ability to achieve that goal. ARRC has consulted with relevant resource agencies in an attempt to define specific known migration corridors or concentration areas for moose in the project corridor, but no detailed mapping currently exists to identify such areas. Further, certain environmental variables may influence or change such locations from year to year. To minimize the potential for collisions along the new rail line, ARRC proposes the strategies presented above. In addition, ARRC proposes to implement an adaptive strategy mechanism, whereby ARRC would follow-up with ADF&G and USFWS if moose-train collisions exceed acceptable limits, the parties would discuss the need for additional mitigation measures.