



Juneau Access Improvements Project Draft Supplemental Environmental Impact Statement

2014 Update to Appendix K Hydrology and Water Quality Technical Report

Prepared for:

**Alaska Department of Transportation
& Public Facilities
6860 Glacier Highway
Juneau, Alaska 99801-7999**

**State Project Number: 71100
Federal Project Number: STP-000S(131)**

Prepared by:

**HDR, Inc.
2525 C Street, Suite 305
Anchorage, AK 99503**

May 2014

This page intentionally left blank.

Table of Contents

1. Introduction.....	1
1.1 Project Description.....	2
1.1.1 Alternative 1 – No Action.....	2
1.1.2 Alternative 1B – Enhanced Service with Existing AMHS Assets.....	2
1.1.3 Alternative 2B – East Lynn Canal Highway to Katzehin, Shuttles to Haines and Skagway.....	3
1.1.4 Alternative 3 – West Lynn Canal Highway.....	3
1.1.5 Alternatives 4A through 4D – Marine Alternatives.....	4
2. Regulatory Update.....	6
3. Methodology and Coordination.....	7
4. Affected Environment.....	8
4.1 Climate.....	8
4.2 Water Quality.....	8
4.3 Existing Potential Impacts to Water Quality.....	9
4.3.1 Point Source Discharges.....	9
5. Environmental Consequences.....	10
5.1 Potential Impacts to Hydrology.....	10
5.1.1 Alternative 1B – Enhanced Service with Existing AMHS Assets.....	10
5.2 Potential Impacts to Water Quality.....	10
5.2.1 Alaska Marine Highway System Ferry Service.....	10
6. References.....	11

This page intentionally left blank.

1. Introduction

This report is an update to the October 2004 *Hydrology and Water Quality Technical Report* which was prepared as Appendix P of the Juneau Access Improvements (JAI) Project Supplemental Draft Environmental Impact Statement (EIS).

The 2004 *Hydrology and Water Quality Technical Report* found no irreversible, long-term impacts to hydrology or water quality expected under any of the alternatives evaluated in the JAI Project Supplemental Draft EIS. Highway construction would alter surface water and groundwater flow in the alignment project area, but would result in only minor flow diversion. Also, in-water work associated with both highway and ferry terminal construction would result in temporary and localized impacts to water quality.

Potential pollutants transported to water resources via runoff from increased vehicle traffic and potential spills from vehicle accidents would not result in long-term water quality impacts under any alternative due to the relatively low traffic volumes. Mainline ferry wastewater discharges could introduce concentrations of fecal coliform and total suspended solids, as well as some unregulated metals, above Alaska Water Quality Standards to Lynn Canal. Discharges would be diluted and have only localized impacts to water quality. Fuel and oil spills have been and are expected to continue to be minimal and localized.

During its development of the JAI Project 2006 Final EIS, the Federal Highway Administration (FHWA) and Alaska Department of Transportation and Public Facilities (DOT&PF) responded to comments on the Supplemental Draft EIS, incorporated new data and further analysis for some resources, and incorporated additional mitigation measures to reduce impacts to wildlife and habitat. The FHWA and DOT&PF also made some changes to Alternative 2B and eliminated Alternatives 2, 2A, and 2C from consideration as reasonable alternatives. Many of these changes required update to supporting technical reports with addenda, which DOT&PF prepared and compiled in Appendix W of the 2006 Final EIS. The FHWA and DOT&PF determined the 2004 *Hydrology and Water Quality Technical Report* did not need to be updated at that time.

With more than seven years transpired since the 2006 Final EIS and Record of Decision (ROD) were published, the FHWA and DOT&PF recognized the need to update previous technical reports as part of the JAI Project 2014 Draft Supplemental Environmental Impact Statement (SEIS). Updates are needed to reflect changes in regulations, new information related to the potentially affected environment or conditions, updated analysis, evaluation of the newly added Alternative 1B, changes in the design or alignment for Alternatives 2B and 3, and the widening of the recently constructed Glacier Highway Extension between Echo Cove and Cascade Point that is common to Alternatives 2B, 3, 4B, and 4D. Three key components that affected changes to the design and alignment of Alternative 2B and 3 since the 2006 ROD are changes during the U.S. Army Corps of Engineers (USACE) permitting process to further avoid and minimize impacts to wetlands and reduce the extent of rock side cast areas; changes based on advanced geotechnical survey information; and recent changes in 2012 in response to updated bald eagle nest survey data.

This 2014 report provides an update to the previous study with additional analysis and new information. The information reported in the 2004 *Hydrology and Water Quality Technical Report* remains valid except for the following updates in this report:

- Updates to regulations that affect the impact analyses for all of the alternatives.
- Updates to changes in impaired status of water bodies in and around the project area.
- Revised analysis of impacts to hydrologic conditions and water quality standards within the project area based on the regulatory and impaired status updates.
- Evaluation of hydrology and water quality impacts from Alternative 1B.
- Revisions to the highway alignment of Alternatives 2B and 3 related to potential impacts to hydrology and water quality.
- Assessment of the widening of the Glacier Highway Extension between Echo Cove and Cascade Point (common to Alternatives 2B, 3, 4B, and 4D) related to potential impacts to hydrology and water quality.

1.1 Project Description

As required by the National Environmental Policy Act (NEPA), this technical report considers the following reasonable alternatives.

1.1.1 Alternative 1 – No Action

The No Action Alternative (Alternative 1) includes a continuation of mainline ferry service in Lynn Canal and incorporates two Day Boat Alaska Class Ferries (ACFs). The Alaska Marine Highway System (AMHS) would continue to be the National Highway System (NHS) route from Juneau to Haines and Skagway, and no new roads or ferry terminals would be built. In addition to the Day Boat ACFs, programmed improvements include improved vehicle and passenger staging areas at the Auke Bay and Haines ferry terminals to optimize traffic flow on and off the Day Boat ACFs as well as expansion of the Haines Ferry Terminal to include a new double bow berth to accommodate the Day Boat ACFs. This alternative is based on the most likely AMHS operations in the absence of any capital improvements specific to the JAI Project.

Mainline service would include two round trips per week in the summer and one per week in the winter with Auke Bay-Haines-Skagway-Haines-Auke Bay routing. During the summer, one Day Boat ACF would make one round trip between Auke Bay and Haines six days per week, and one would make two round trips per day between Haines and Skagway six days per week. The Day Boat ACFs would not sail on the seventh day because the mainliner is on a similar schedule. In the winter, ferry service in Lynn Canal would be provided primarily by the Day Boat ACFs three times per week. The *M/V Malaspina* would no longer operate as a summer day boat in Lynn Canal.

1.1.2 Alternative 1B – Enhanced Service with Existing AMHS Assets

Alternative 1B includes all of the components of Alternative 1, No Action, but focuses on enhancing service using existing AMHS assets without major initial capital expenditures. Similar to Alternative 1, Alternative 1B includes a continuation of mainline ferry service in Lynn Canal; the AMHS would continue to be the NHS route from Juneau to Haines and Skagway; no new

roads or ferry terminals would be built; and in addition to the Day Boat ACFs, programmed improvements include improved vehicle and passenger staging areas at the Auke Bay and Haines ferry terminals to optimize traffic flow on and off the Day Boat ACFs as well as expansion of the Haines Ferry Terminal to include a new double bow berth to accommodate the Day Boat ACFs. Service to other communities would remain the same as with the No Action Alternative. Alternative 1B keeps the *M/V Malaspina* in service after the second Day Boat ACF is brought online to provide additional capacity in Lynn Canal. Enhanced services included as part of Alternative 1B are a 20 percent reduction in fares for trips in Lynn Canal and extended hours of operations for the reservation call center.

Mainline service would include two round trips per week in the summer and one per week in the winter with Auke Bay-Haines-Skagway-Haines-Auke Bay routing. During the summer, the *M/V Malaspina* would make one round trip per day seven days per week on a Skagway-Auke Bay-Skagway route, while one Day Boat ACF would make one round trip between Auke Bay and Haines six days per week, and one would make two round trips per day between Haines and Skagway six days per week. The Day Boat ACFs would not sail on the seventh day because the mainliner would be on a similar schedule. In the winter, ferry service in Lynn Canal would be provided primarily by the Day Boat ACFs three times per week.

1.1.3 Alternative 2B – East Lynn Canal Highway to Katzehin, Shuttles to Haines and Skagway

Alternative 2B would construct the East Lynn Canal Highway (50.8 miles, including 47.9 miles of new highway and upgrade to 2.9 miles of the existing Glacier Highway) from Echo Cove around Berners Bay to a new ferry terminal 2 miles north of the Katzehin River. Ferry service would connect Katzehin to Haines and Skagway. In addition, this alternative includes modifications to the Skagway Ferry Terminal to include a new end berth and construction of a new conventional monohull ferry to operate between Haines and Skagway. Mainline ferry service would end at Auke Bay. This alternative assumes the following improvements will have been made independent of the JAI Project before Alternative 2B would come on-line: two Day Boat ACFs, improved vehicle and passenger staging areas at the Haines Ferry Terminal to optimize traffic flow on and off the Day Boat ACFs, and expansion of the Haines Ferry Terminal to include two new double bow berths.

During the summer months, one Day Boat ACF would make eight round trips per day between Haines and Katzehin, a second Day Boat ACF would make six round trips per day between Skagway and Katzehin, and the Haines-Skagway shuttle ferry would make two trips per day. During the winter, one Day Boat ACF would make six round trips per day between Haines and Katzehin, and a second Day Boat ACF would make four round trips per day between Skagway and Katzehin. The Haines-Skagway shuttle would not operate; travelers going between Haines and Skagway would travel to Katzehin and transfer ferries.

1.1.4 Alternative 3 – West Lynn Canal Highway

Alternative 3 would upgrade/extend the Glacier Highway (5.2 miles, including 2.3 miles of new highway and upgrade to 2.9 miles of the existing Glacier Highway) from Echo Cove to Sawmill Cove in Berners Bay. New ferry terminals would be constructed at Sawmill Cove in Berners Bay and at William Henry Bay on the west shore of Lynn Canal, and the Skagway Ferry Terminal

would be modified to include a new end berth. A new 38.9-mile highway would be constructed from the William Henry Bay Ferry Terminal to Haines with a bridge across the Chilkat River/Inlet connecting into Mud Bay Road. A new conventional monohull ferry would be constructed and would operate between Haines and Skagway. Mainline ferry service would end at Auke Bay. This alternative assumes the following improvements will have been made independent of the JAI Project before Alternative 3 would come on-line: two Day Boat ACFs, improved vehicle and passenger staging areas at the Haines Ferry Terminal to optimize traffic flow on and off the Day Boat ACFs, and expansion of the Haines Ferry Terminal to include two new double bow berths.

During the summer, two Day Boat ACFs would make six round-trips per day between Sawmill Cove and William Henry Bay (total of 12 trips each direction), and the Haines-Skagway shuttle ferry would make six round-trips per day. During the winter, one Day Boat ACF would make four round-trips per day between Sawmill Cove and William Henry Bay, and the Haines-Skagway shuttle ferry would make four round-trips per day.

1.1.5 Alternatives 4A through 4D – Marine Alternatives

All four marine alternatives would include continued mainline ferry service in Lynn Canal with a minimum of two trips per week in the summer and one per week in the winter with Auke Bay-Haines-Skagway-Haines-Auke Bay routing. Each marine alternative includes a new conventional monohull shuttle that would make two round trips per day between Haines and Skagway six days a week in the summer and a minimum of three round trips per week between Haines and Skagway in the winter. The AMHS would continue to be the NHS route from Juneau to Haines and Skagway. These alternatives assume the following improvements will have been made independent of the JAI Project before the alternative comes on-line: improved vehicle and passenger staging areas at the Auke Bay and Haines ferry terminals to optimize traffic flow on and off the Day Boat ACFs, and expansion of the Haines Ferry Terminal to include new double bow berths.

1.1.5.1 Alternative 4A – Fast Vehicle Ferry Service from Auke Bay

Alternative 4A would construct two new fast vehicle ferries (FVFs). No new roads would be built for this alternative, and the Auke Bay Ferry Terminal would be expanded to include a new double stern berth. A new conventional monohull ferry would be constructed and would operate between Haines and Skagway. The *M/V Malaspina* would no longer operate as a summer day boat in Lynn Canal, and the Day Boat ACFs would no longer operate in Lynn Canal. The FVFs would make two round trips between Auke Bay and Haines and two round trips between Auke Bay and Skagway per day in the summer. During the winter, one FVF would make one round trip between Auke Bay and Haines and one round trip between Auke Bay and Skagway each day.

1.1.5.2 Alternative 4B – Fast Vehicle Ferry Service from Berners Bay

Similar to Alternative 4A, Alternative 4B would construct two new FVFs. This alternative would upgrade/extend Glacier Highway (5.2 miles, including 2.3 miles of new highway and 2.9 miles of the existing Glacier Highway) from Echo Cove to Sawmill Cove in Berners Bay, where a new ferry terminal would be constructed. The Auke Bay Ferry Terminal would be expanded to include a new double stern berth. A new conventional monohull ferry would be constructed and

would operate between Haines and Skagway. The *M/V Malaspina* would no longer operate as a summer day boat in Lynn Canal, and the Day Boat ACFs would no longer operate in Lynn Canal. In the summer, the FVFs would make two round trips between Sawmill Cove and Haines and two round trips between Sawmill Cove and Skagway per day. During the winter, one FVF would make one round trip between Auke Bay and Haines and one round trip between Auke Bay and Skagway each day.

1.1.5.3 Alternative 4C – Conventional Monohull Service from Auke Bay

Alternative 4C would use Day Boat ACFs to provide additional ferry service in Lynn Canal. No new roads would be built for this alternative. The Auke Bay Ferry Terminal would be expanded to include a new double stern berth, and the Skagway Ferry Terminal would be expanded to include a new end berth. A new conventional monohull ferry would be constructed and would operate between Haines and Skagway. In the summer, one Day Boat ACF would make one round trip per day between Auke Bay and Haines, and one Day Boat ACF would make one round trip per day between Auke Bay and Skagway. During the winter, one Day Boat ACF would alternate between a round trip to Haines one day and a round trip to Skagway the next day.

1.1.5.4 Alternative 4D – Conventional Monohull Service from Berners Bay

Alternative 4D would use Day Boat ACFs to provide additional ferry service in Lynn Canal. This alternative would upgrade/extend Glacier Highway (5.2 miles, including 2.3 miles of new highway and 2.9 miles of the existing Glacier Highway) from Echo Cove to Sawmill Cove in Berners Bay, where a new ferry terminal would be constructed. The Auke Bay Ferry Terminal would be expanded to include a new double stern berth, and the Skagway Ferry Terminal would be expanded to include a new end berth. This alternative includes construction of a new conventional monohull ferry that would operate between Haines and Skagway. In the summer, the Day Boat ACFs would make two trips per day between Sawmill Cove and Haines and two trips per day between Sawmill Cove and Skagway. During the winter, a Day Boat ACF would operate from Auke Bay, alternating between a round trip to Haines one day and to Skagway the next day.

2. Regulatory Update

Since release of the 2004 *Hydrology and Water Quality Technical Report*, the Alaska Department of Environmental Conservation (ADEC) water quality standards (AWQS) have been amended. The following is a summary of updated regulations that supplements the regulations described in Section 1.3 of the 2004 *Hydrology and Water Quality Technical Report*:

- 18 Alaska Administrative Code (AAC) 70, *ADEC Water Quality Standards* as amended May 26, 2011. ADEC is required to update Water Quality Standards on a routine basis. The JAI Project is required to maintain these water quality standards during construction and operation.
- *ADEC Final 2010 Integrated Water Quality Monitoring and Assessment Report* (July 2010). This report is updated every two years by ADEC. The 2010 update notes impaired waterbody status, and other waterbodies that may have not attained water quality standards for designated uses. The status has changed for several waterbodies discussed in the 2004 *Hydrology and Water Quality Technical Report* (see Section 4.2 of this report).
- *ADEC Alaska Water Quality Criteria Manual for Toxic and other Deleterious Organic and Inorganic Substances* as amended through December 12, 2008. ADEC routinely updates this portion of the Water Quality Standards. The JAI Project is required to maintain these water quality standards during construction and operation.
- ADEC 18 AAC 69, *Commercial Passenger Vessel Environmental Compliance Program*, as amended through May 18, 2006. This regulation prohibits the owner or operator of a small commercial passenger vessel from discharging treated sewage, graywater, and other wastewater in Alaska waters.
- In 2009, ADEC took over administration of the NPDES program in Alaska. ADEC has authority over most discharge permits and policies as part of the Alaska Pollutant Discharge Elimination System (APDES) program from the Environmental Protection Agency. The JAI project alternatives would require an APDES Construction General Permit for construction activities. Construction and operations for the JAI Project would also be required to meet the water quality standards described above and in Section 1.3 of the 2004 *Hydrology and Water Quality Technical Report*.

3. Methodology and Coordination

Using the same methods as presented in Section 2.1 of the 2004 *Hydrology and Water Quality Technical Report*, the project team compared the available water quality data to the current AWQS. Updated water quality data were obtained from the July 2010 *Integrated Water Quality Monitoring and Assessment Report* (ADEC 2010).

Other cited materials were checked for updates to data used in the original technical report. If changes were found they are updated in this report.

4. Affected Environment

4.1 Climate

In the 2004 *Hydrology and Water Quality Technical Report*, data from the Alaska Department of Community and Economic Development (ADCED) website (accessed on November, 2003) were used to provide climate information specific to Juneau, Haines, and Skagway. In this 2014 update, information was researched through the same source to determine if any changes had occurred since 2004.

Juneau and Skagway climate information is found to be the same as discussed in Section 3.1 of the 2004 *Hydrology and Water Quality Technical Report*. Haines climate information changed slightly with summer temperatures of 50°F to 70°F compared to temperatures of 46°F to 66°F reported in 2004 (ADCED 2012). Winter temperature ranges remain at 10°F to 35°F (ADCED 2012).

4.2 Water Quality

The current status of the water quality of waterbodies in the project area is based on the July 2010 *Integrated Water Quality Monitoring and Assessment Report* (ADEC 2010). The information below updates Section 3.7 of the 2004 *Hydrology and Water Quality Technical Report*.

- Sawmill Creek near Haines is a category 2 waterbody. This waterbody was category 4 in 2004 but improved after extensive cleanup was undertaken beginning in 2006 and trash disposal laws were more diligently enforced. Category 2 indicates that some of the water quality standards for the designated uses are attained, but data and information to determine if the water quality standards for the remaining uses are attained are insufficient or absent.
- Duck Creek, near Juneau, is a category 4 waterbody. A category 4 waterbody is determined to be impaired but does not need a Total Maximum Daily Load (TMDL).
- Jordan Creek is a category 4a waterbody. A category 4a waterbody is an impaired water with a final/approved TMDL. A TMDL for debris cleanup was completed for Jordan Creek in 2009 and a TMDL for sediment and low dissolved oxygen was approved in 2009.
- Lemon Creek, near Juneau, is a category 4 waterbody for turbidity and sediment.
- Pullen Creek, near Skagway, and Vanderbilt Creek, near Juneau, are category 4a waterbodies.
- Skagway Harbor is listed as a Category 5 Section 303(d) listed waterbody for a 1-acre area. A category 5 waterbody is a waterbody in which water quality standards for one or more designated uses are not attained and the waterbody requires a TMDL or recovery plan. The listing occurred in 1990 for non-attainment of cadmium, copper, lead, mercury, and zinc. The trace metal contamination was due to an ore loading facility (Robinson-Wilson and Malinkay 1986). The ore terminal was recently rebuilt and refurbished to accommodate copper concentrate that has been shipped through Skagway since 2007 (SDC 2012).

4.3 Existing Potential Impacts to Water Quality

Water quality in Lynn Canal is influenced by, but not limited to, topography, surrounding land use, tidal fluctuation, water circulation, quality of the freshwater entering the canal, vessel activity, permitted and accidental discharges from vessels and other point sources, and nonpoint sources of pollution such as vehicular activity or construction. The following section updates Section 3.8.2 of the 2004 *Hydrology and Water Quality Technical Report*.

4.3.1 Point Source Discharges

The number of discharge permits issued is useful in determining the amount and type of pollutants entering a waterbody and also aids ADEC in determining if new discharge permits should be issued. There are currently 100 wastewater discharge permits, authorizations, and certifications that have been issued in the Juneau area as compared to the 14 reported in the 2004 *Hydrology and Water Quality Technical Report*. In the area of Skagway there are four wastewater discharge permits, authorizations, and certifications that have been issued as compared to two previously reported. Twelve discharge permits have been issued, authorized, or certified in the area of Haines (ADEC 2012) as compared to three previously reported.

The AMHS is held to compliance requirements for discharge to waters of the United States by the ferries used in the system according to 18 AAC 69 (Commercial Passenger Vessel Environmental Compliance Program) amended in 2006. This regulation prohibits the owner or operator of a small commercial passenger vessel from discharging treated sewage, graywater, and other wastewater in Alaska waters.

5. Environmental Consequences

5.1 Potential Impacts to Hydrology

The results of the hydrology impact analysis completed in Section 4.1 of the 2004 *Hydrology and Water Quality Technical Report* remain valid for the original alternatives, including the alignment changes that have occurred to Alternatives 2B and 3, and the widening of the Glacier Highway Extension from Echo Cove to Cascade Point for Alternatives 2B, 3, 4B, and 4D.

5.1.1 Alternative 1B – Enhanced Service with Existing AMHS Assets

Enhanced service with existing AMHS assets would have no additional impact to hydrology under Alternative 1B relative to the No Action Alternative. Alternative 1B does not include construction of any additional facilities to aid in additional services. Therefore, it is unlikely that impacts to the hydrology of both freshwater and the marine system would occur.

5.2 Potential Impacts to Water Quality

The results of the water quality impact analysis completed in Section 4.2 of the 2004 *Hydrology and Water Quality Technical Report* remain valid for the project alternatives. Amendments to state and federal water regulations that have occurred since 2004, the changes to Alternatives 2B and 3, and the proposed widening of the Glacier Highway Extension from Echo Cove to Cascade Point for Alternatives 2B, 3, 4B, and 4D do not require an update of the water quality impact analysis in that report. Activities associated with Alternative 1B would not affect water quality relative to the No Action Alternative.

5.2.1 Alaska Marine Highway System Ferry Service

According to Section 4.2.2.2 of the 2004 *Hydrology and Water Quality Technical Report*, mainline ferry wastewater discharges could cause localized adverse impacts to water quality; however, shuttle ferries, including conventional monohull ferries and fast vehicle ferries, would not discharge wastewater to Lynn Canal under regulation 18 AAC 69; therefore, impacts to water quality from discharge of wastewater from the AMHS mainline ferries under Alternatives 1B, 4A, 4B, 4C, and 4D is no longer anticipated.

6. References

- Alaska Department of Commerce, Community, and Economic Development (ADCED). 2012. Climate information for Juneau, Haines, and Skagway. Available online at: http://commerce.alaska.gov/dca/commdb/CF_CIS.htm (accessed June 28, 2012).
- Alaska Department of Environmental Conservation (ADEC). 2008. *Alaska Water Quality Criteria Manual for Toxic and other Deleterious Organic and Inorganic Substances* (as amended through December 12, 2008).
- . 2010. *Final 2010 Integrated Water Quality Monitoring and Assessment Report*. July 15, 2010.
- . 2011. 18 AAC 70. *Water Quality Standards* (as amended May 26, 2011).
- . 2012. 18 AAC 72. *Wastewater Disposal* (as amended through April 8, 2012).
- Alaska Department of Transportation and Public Facilities (DOT&PF). 2006. *Juneau Access Project: Final Environmental Impact Statement*. Juneau, Alaska. Available online at: http://dot.alaska.gov/sereg/projects/juneau_access/documents.shtml#feis.
- Robinson-Wilson, E. F., and G. Malinkay. 1986. “Trace metals contamination at an ore loading facility in Skagway, Alaska.” *U.S. Fish and Wildlife Service annual report of the Environmental Contaminants Program, Region 7*. U.S. Fish and Wildlife Service Publications Unit, Washington, DC.
- Skagway Development Corporation (SDC). 2012. *Port of Skagway*. Available online at: <http://www.skagwaydevelopment.org/portofskagway.html> (accessed June 28, 2012).

This page intentionally left blank.