APPENDIX W

TECHNICAL REPORT ADDENDA

JUNEAU ACCESS IMPROVEMENTS
FINAL ENVIRONMENTAL IMPACT STATEMENT

STATE PROJECT NUMBER: 71100
FEDERAL PROJECT NUMBER: STP-000S (131)

Prepared by

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JANUARY 2006

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ADDENDA

ACRONYMS AND ABBREVIATIONS

Acronym	Definition
A	
AAC	Alaska Administrative Code
AADT	annual average daily traffic
AASHTO	American Association of State Highway and Transportation Officials
ACMP	Alaska Coastal Management Program
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
ADT	average daily traffic
AHI	Avalanche Hazard Index
AMHS	Alaska Marine Highway System
ANFO	ammonium nitrate and fuel
ANILCA	Alaska National Interest Lands Conservation Act
AWQS	Alaska Water Quality Standards
B	
B.C.	British Columbia
BF	board feet
BMP	Best Management Practice
C	
CAR	Comment Analysis Report
CBJ	City and Borough of Juneau
CFR	Code of Federal Regulations
CO	carbon monoxide
CPI	Consumer Price Index
CZMP	Coastal Zone Management Program
D	
dB	decibel
dBA	average-weighted decibel
DOL&WD	(Alaska) Department of Labor and Workforce Development
DOT&PF	(Alaska) Department of Transportation and Public Facilities
E	
EATB	emulsified asphalt treated base
EFH	essential fish habitat
EIS	Environmental Impact Statement
EO	Executive Order
EPA	(United States) Environmental Protection Agency
ESA	Endangered Species Act

ACRONYMS AND ABBREVIATIONS (continued)

Acronym	Definition
F	
FERC	Federal Emergency Regulatory Commission
FHWA	Federal Highway Administration
FVF	Fast Vehicle Ferry
FY	fiscal year
G	
GIS	Geographic Information System
Goldbelt	Goldbelt, Inc.
I	
ICAP	Indirect Cost Allocation Plan
ips	inches per second
K	
km	kilometers
L	
L_{eq}	Equivalent Sound Level
LUD	Land Use Designation
M	
M&O	maintenance and operations
mm	millimeters
MOA	Municipality of Anchorage
mph	miles per hour
ms	meters per second
M/V	Motor Vessel
N	
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHS	National Highway System
NMFS	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NPS	(United States Department of the Interior), National Park Service
NPV	Net Present Value
NWI	National Wetlands Inventory

ACRONYMS AND ABBREVIATIONS (continued)

Acronym	Definition
O	
OCRM	Office of Coastal Resource and Ocean Management
OHMP	(Alaska Department of Natural Resources) Office of Habitat Management and Permitting
OPMP	Alaska Department of Natural Resources Office of Project Management and Permitting
ORV	off-road vehicle
OW	one-way
P	
ppi	Producer Price Index
R	
RARE	Roadless Area Review and Evaluation
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
ROW	right-of-way
RT	round-trip
S	
SHPO	State Historic Preservation Officer
T	
TLMP	Tongass Land and Resource Management Plan
TPH	total petroleum hydrocarbons
TTRA	Tongass Timber Reform Act
TUS	Transportation and Utility Systems
U	
U.S.	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
V	
VCU	value comparison unit
VQO	Visual Quality Objective
W	
WAA	Wildlife Analysis Area

1.0 INTRODUCTION

The Juneau Access Improvements Project Supplemental Draft Environmental Impact Statement (EIS) with technical reports as appendices was published in January 2005. The Department of Transportation and Public Facilities (DOT&PF), with the Federal Highway Administration (FHWA), has met with the cooperating agencies to address comments on the Supplemental Draft EIS. Agency comments as well as comments received from other organizations and the public were reviewed and addressed. Some comments requested additional investigation, incorporation of new data, and further analysis. Other changes since the Supplemental Draft EIS include the identification of Alternative 2B as the new preferred alternative for the Final EIS. Further, as a response to agency comments, DOT&PF has adjusted the highway alignment for Alternative 2B to reduce impacts to wetlands and has incorporated additional mitigation measures to reduce impacts to wildlife, anadromous streams, essential fish habitat (EFH), and Steller sea lions. A more detailed description of changes to Alternative 2B is included in Section 2.

Addenda have been prepared for the following technical reports included in the Supplemental Draft EIS in order to incorporate new information, analysis, and changes to Alternative 2B, the preferred alternative:

- Traffic Forecast Report (Appendix C)
- Technical Alignment Report (Appendix D)
- User Benefit Analysis (Appendix E)
- Land Use and Coastal Management Technical Report (Appendix F)
- Socioeconomic Effects Technical Report (Appendix H)
- Snow Avalanche Report (Appendix J)
- Noise Technical Report (Appendix L)
- Essential Fish Habitat Assessment (Appendix N)
- Wetlands Technical Report (Appendix O)
- Anadromous and Resident Fish Streams Technical Report (Appendix P)
- Wildlife Technical Report (Appendix Q)
- Bald Eagle Technical Report (Appendix R)
- Steller Sea Lion Technical Report (Appendix S)

These addenda outline changes to project alternatives that affect the resources, include additional information regarding impacts to resources resulting from Alternative 2B and reasonably foreseeable actions, update and provide supplemental resource information, provide new references, propose new mitigation measures where applicable, present changes and/or clarifications based on public comments and coordination with cooperating agencies, and provide errata sheets for some of the original technical reports.

These addenda generally report changes or additional analysis only. The information and alternatives analysis reported in the 2004 technical reports remain valid and are augmented by the new information presented in these addenda, unless otherwise indicated in an addendum. The technical reports for which no addenda are provided include:

- Alternative Screening Report (Appendix A)
- Marine Segments Technical Report (Appendix B)
- Visual Resources Technical Report (Appendix G)
- Household Survey Report (Appendix I)
- Hydrology and Water Quality Technical Report (Appendix K)
- Initial Site Assessment Technical Report (Appendix M)
- Air Quality Modeling Memorandum (Appendix T)
- Indirect and Cumulative Effects Analysis Report (Appendix U)
- Responses to Comments (scoping and 1997 Draft EIS) (Appendix V)
- Karst Technical Report
- Cultural Resources Technical Report

Cumulative impacts are identified and analyzed directly in Section 4.9 of the Final EIS; therefore, the *Indirect and Cumulative Effects Analysis Report* was not updated.

2.0 PROJECT CHANGES

On August 10, 2005, DOT&PF announced that it had changed the preferred alternative for the Juneau Access Improvements Project. Based in part on comments from the National Park Service (NPS) with regard to the contributing status of natural areas within the Skagway and White Pass District National Historical Landmark (NHL), FHWA determined that these areas were protected by Section 4(f) of the Transportation Act. Alternatives that would require the use of Section 4(f)-protected lands within the NHL were determined to be not reasonable, in accordance with the original alternative screening criteria. Based on the new range of reasonable alternatives after consideration of the project purpose and need, each alternative's impacts, and Supplemental Draft EIS comments, DOT&PF identified Alternative 2B as the preferred alternative for the Final EIS.

Changes have been made to the project, which affected the information contained in the Supplemental Draft EIS, including:

- Alternatives 2, 2A, and 2C have been eliminated from further consideration as reasonable project alternatives.
- Alternative 2B has replaced Alternative 2 as the preferred alternative.
- The Alternative 2B alignment has been adjusted between Echo Cove and Antler River and between Slate Cove and Sherman Point in order to completely avoid palustrine emergent wetlands.
- The Antler River crossing (Alternative 2B) has been moved further upstream to bypass important eulachon habitat. This realignment results in fewer in-water bridge piers and avoids any bridge piers in the northern channel documented to have a high density of eulachon spawning.
- The Lace River crossing (Alternative 2B) has been moved approximately 700 feet upstream to further protect vegetated intertidal habitat. The realignment requires a 300-foot-longer bridge, but the highway in this vicinity would remain on upland areas and avoid eagle trees and Johnson Creek.
- The alignment from the south side of the Katzehin River to the proposed ferry terminal site (Alternative 2B) has been revised to avoid estuarine emergent wetlands.
- DOT&PF has proposed in-lieu fee payment for impacts to waters of the United States (U.S.).
- Initial construction costs have been updated to reflect 2005 dollars and actual current funding requirements.

Each addendum contains more detail and background concerning additional information and review for each of the associated disciplines.

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Addendum to Appendix C

Traffic Forecast Report

Prepared by

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With Assistance From
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Portland, Oregon

OCTOBER 2005

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TABLES

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ERRATA SHEET

OCTOBER 2004 TRAFFIC FORECAST REPORT

1. Page 9. Table 3. The following table replaces the table in the 2004 *Traffic Forecast Report* (data in the Non-residents and Market Total rows has been revised).

Table 3
2002 Lynn Canal AMHS Passenger Market Estimates
(Juneau-Haines and Haines-Juneau)

	Juneau - Haines*		Haines - Juneau**	
Market	**Summer**	**Winter**	**Summer**	**Winter**
Juneau residents	5,166	2,901	4,417	2,925
Haines residents	2,417	4,478	2,678	4,632
Skagway residents	15	18	10	65
Yukon residents	102	35	113	46
Other Alaska residents	1,042	706	1,494	1,091
Non-residents	10,649	824	10,101	626
Market Total	**19,391**	**8,962**	**18,813**	**9,385**

Notes: *This is the number of passengers traveling on a ferry from Juneau to Haines. It includes all passengers disembarking in Haines, except those that boarded in Skagway.
**This is the number of passengers boarding a ferry in Haines except those traveling to Skagway.

Source: Derived from the AMHS Reservations Management System (RMS) database.

2. Page 9. Last paragraph, second line. "…12,500 non-resident…" is replaced by "…12,000 non-resident…"

3. Page 9. Last paragraph, third line. "…11,600 traveled…" is replaced by "…11,000 traveled…"

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1.0 SUPPLEMENTAL TRAFFIC FORECAST

1.1 Supplemental Year 1 Traffic Forecast

The *User Benefit Analysis* (Appendix E) employs a set of user costs that are different from those employed in the *Traffic Forecast Report*. The *Traffic Forecast Report* was the first and most time-sensitive report related to Juneau Access Improvements Project economics. The socioeconomic effects and user benefit analyses could not be started until the traffic forecast was complete. The traffic forecast analysis was launched with the understanding that slightly more refined and updated project parameters might be developed and applied in subsequent economic analyses. The decision to proceed in this manner was based on the study team's determination that none of the potential revisions would have any substantial effect on the fundamental findings of the traffic and economic analyses.

The question has been raised about what effect the different user costs would have on the traffic forecast. To answer the question, User Benefit Analysis' user cost data was applied to the traffic model. The result was increases in traffic ranging from 0 to 17 percent, depending on the alternative. The following table presents the two sets of traffic numbers.

	Traffic Forecast Report Estimates*	User Benefit Analysis-Derived Estimates	Percent Difference
Current Service	80	80	0%
1 - No Action	91	106	17%
4C - Dayboat Auke Bay	100	109	9%
4D - Dayboat Sawmill Cove	127	132	4%
4A - FVF Auke Bay	137	141	3%
4B - FVF Sawmill Cove	161	164	2%
3 - West Lynn	305	353	16%
2B - East Lynn Stop @ KTZ	374	386	3%

Note: *Traffic estimates presented in the 2004 *Traffic Forecast Report* were rounded to the nearest ten.

The No Action Alternative and Alternative 3 have the largest differences between the two sets of traffic estimates. These differences stem from differing assumptions in the *Traffic Forecast Report* and the *User Benefit Analysis* regarding time value, fast ferry fares and vehicle travel speeds. As illustrated in the preceding table, these assumptions have different effects on each alternative, depending on the configuration of each alternative. Given that the differences are not substantial and neither set of assumptions is necessarily more accurate as a whole than the other, no changes have been made to the traffic forecast based on these differences. The addendum to the *User Benefit Analysis* discusses the significance of these differences in terms of these economic analyses.

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Addendum to Appendix D

Technical Alignment Report

Prepared by

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OCTOBER 2005

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TABLES

ATTACHMENTS

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1.0 INTRODUCTION

In September 2004, the Juneau Access Improvements Project *Technical Alignment Report* (Appendix D) was completed. Since the *Technical Alignment Report* was completed, public comment has been taken on the Juneau Access Improvements Project Supplemental Draft EIS and the public Comment Analysis Report has been completed. This addendum adds supplemental information, in part, to address substantive issues raised in the public comment process.

This addendum outlines changes to the design criteria, updates the alignment discussion where changes have occurred, provides updated bridge summaries, provides updated plan and profile sheets where changes have occurred, updates ferry terminal layouts and cost estimates, updates the Engineer's Estimate, and provides an errata sheet for the original technical report.

This addendum generally reports changes or additional analysis only. The information reported in the 2004 *Technical Alignment Report* still stands unless new information is presented in this addendum.

2.0 DESIGN STANDARDS

2.1 Highway Design Criteria

Table 2-1, Roadway Design Criteria. Make the following correction:

Criteria Descriptions	Design Criteria
Minimum Allowable Radius of Horizontal Curve – ft	510

Reason: To match 2001 AASHTO.

2.2 Design Exceptions

Replace the table with the following:

AK State National Highway System (NHS) Standard

Criteria Description	AASHTO Standard	Juneau Access Improvements Project
Width of Shoulder	6 Ft.	4 Ft.

Reason: The State of Alaska has adopted the American Association of State Highway and Transportation Officials (AASHTO) Standard as its standard; therefore, these standards are listed together under one column.

Shoulder Widths: AASHTO Standards indicate that a 4-foot-wide usable shoulder should be considered for rural arterials with average daily traffic (ADT) less than 400, that have travel lanes 11 feet wide and Design Speeds from 40 to 55 mph. For ADTs between 400 and 1,500 a 6-foot-wide usable shoulder should be considered.

AASHTO states: “Usable shoulders on arterials should be paved; however, where volumes are low or a narrow section is needed to reduce construction impacts, the paved shoulder may be reduced to 2 feet.”

AASHTO also states: “Where bicyclists and pedestrians are to be accommodated on the shoulders, a minimum usable shoulder width of 4 feet should be used.”

Department of Transportation and Public Facilities (DOT&PF) has elected to use the 4-foot paved usable shoulder width to minimize construction impacts while still providing for bicyclists and pedestrians.

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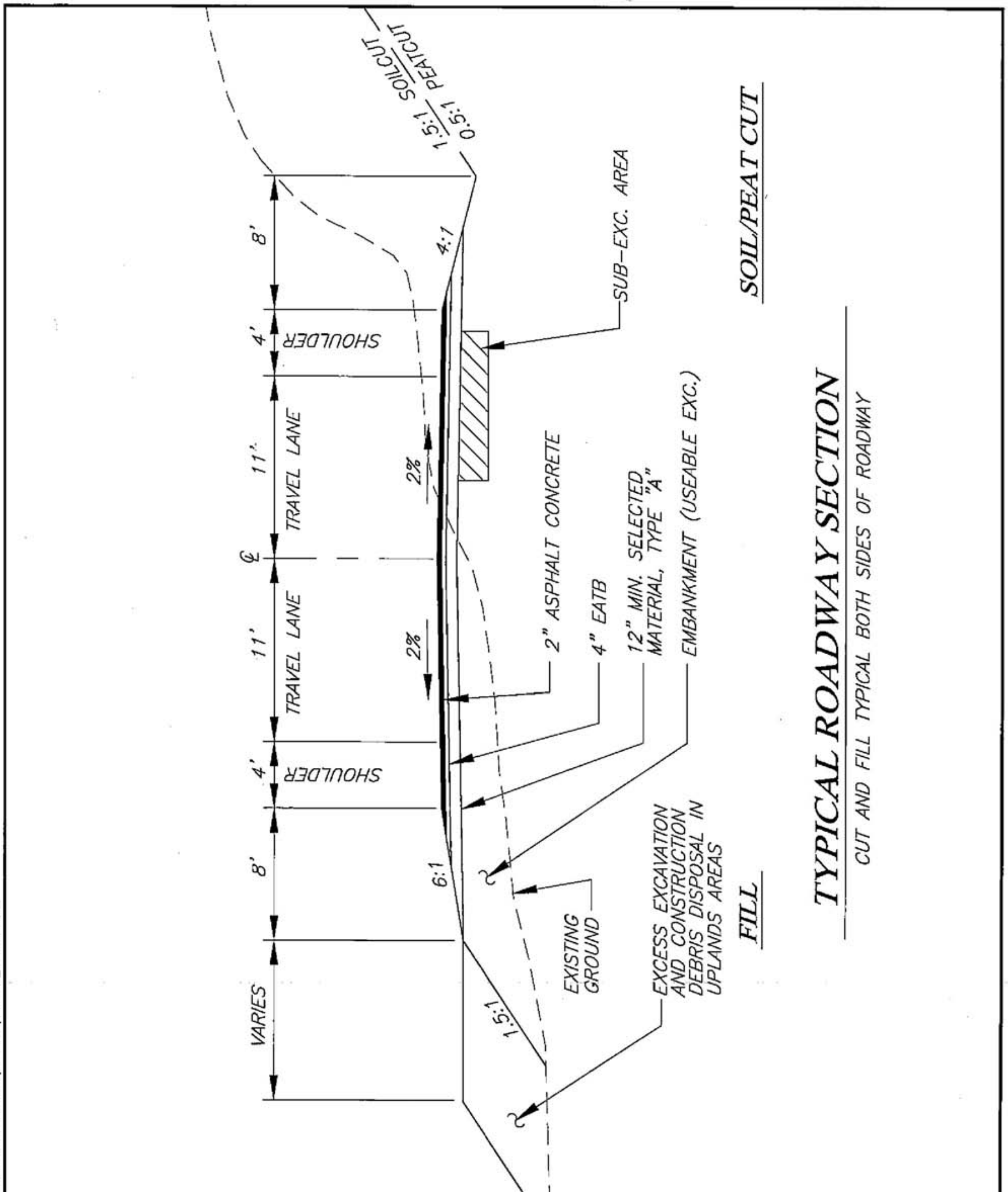
3.0 RECOMMENDED DESIGN

3.1 Typical Sections

The highway typical section has been revised to replace the 6-inch-thick layer of Base Course with a 4-inch-thick layer of Emulsified Asphalt Treated Base (EATB). The EATB will provide a more durable Structural section. The EATB was included in the Supplemental Draft EIS Engineer's Estimates for all alternatives, but was not correctly shown on the typical sections.

The attached Figures 3-1 through 3-6 and 3-8 reflect this change.



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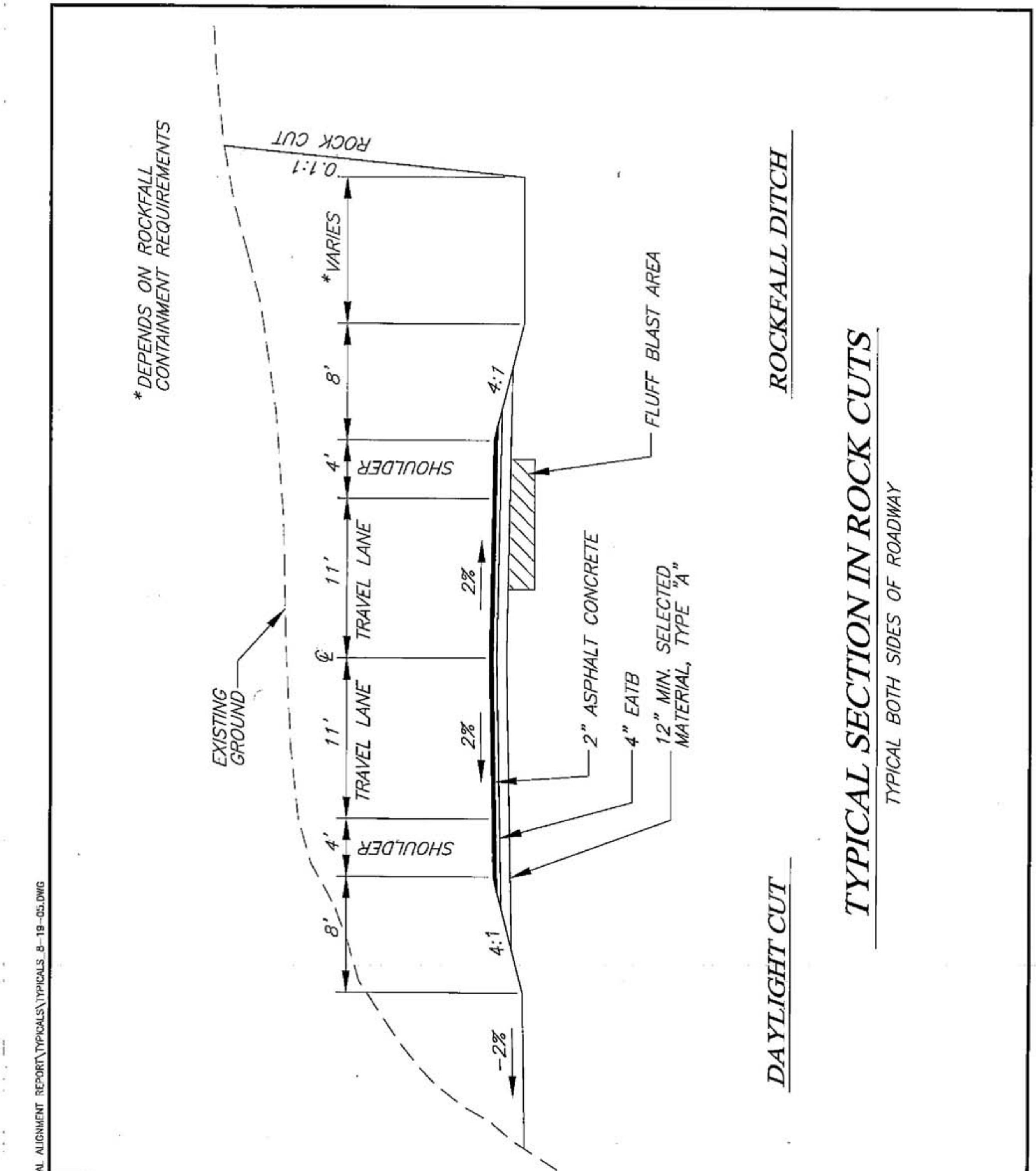
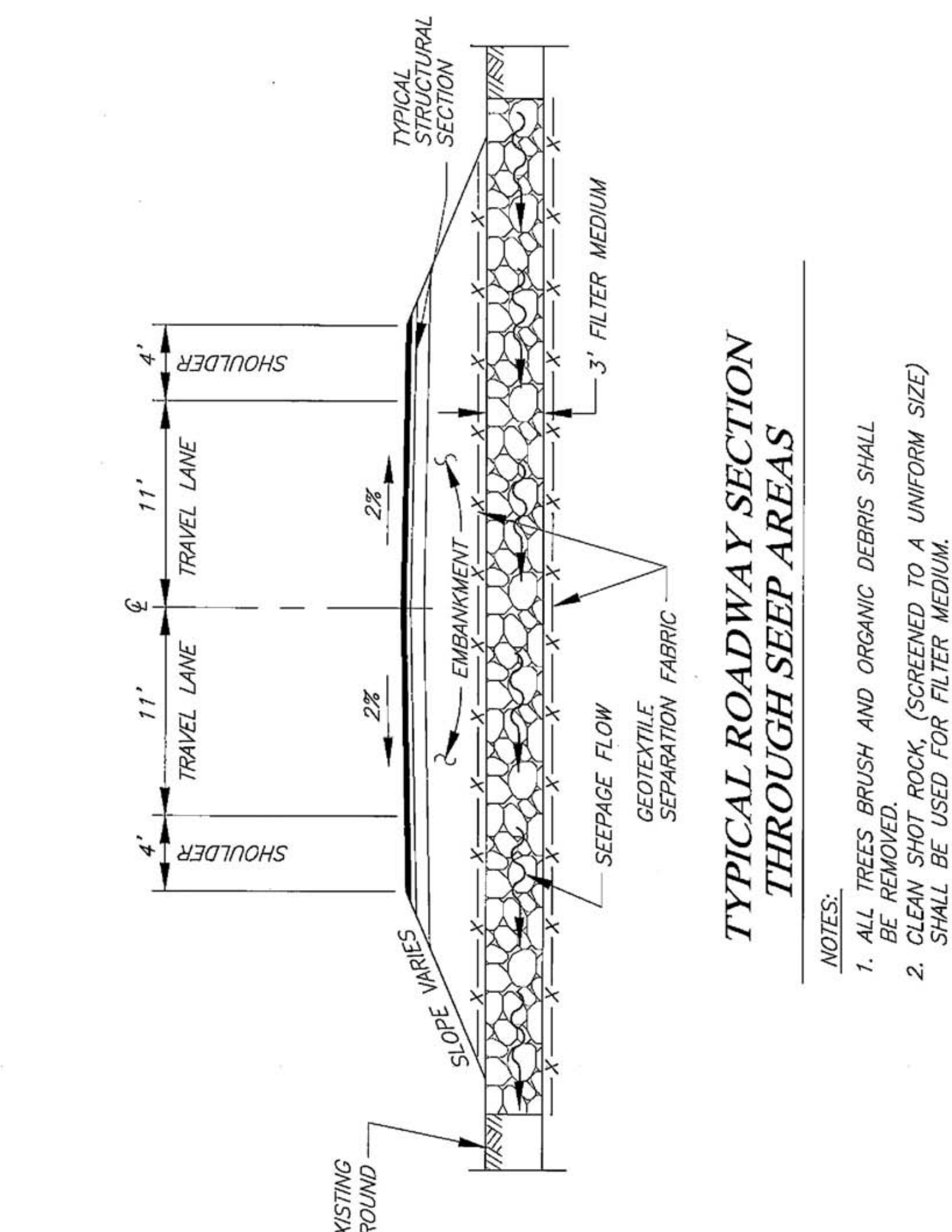
STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES S.E. REGION	*JUNEAU ACCESS IMPROVEMENTS* *PROJECT NO.: 71100* *TYPICAL ROADWAY SECTION*	*FIGURE* 3-1



STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES S.E. REGION	*JUNEAU ACCESS IMPROVEMENTS* *PROJECT NO.: 71100* *TYPICAL SECTION IN ROCK CUTS*	*FIGURE* 3-2



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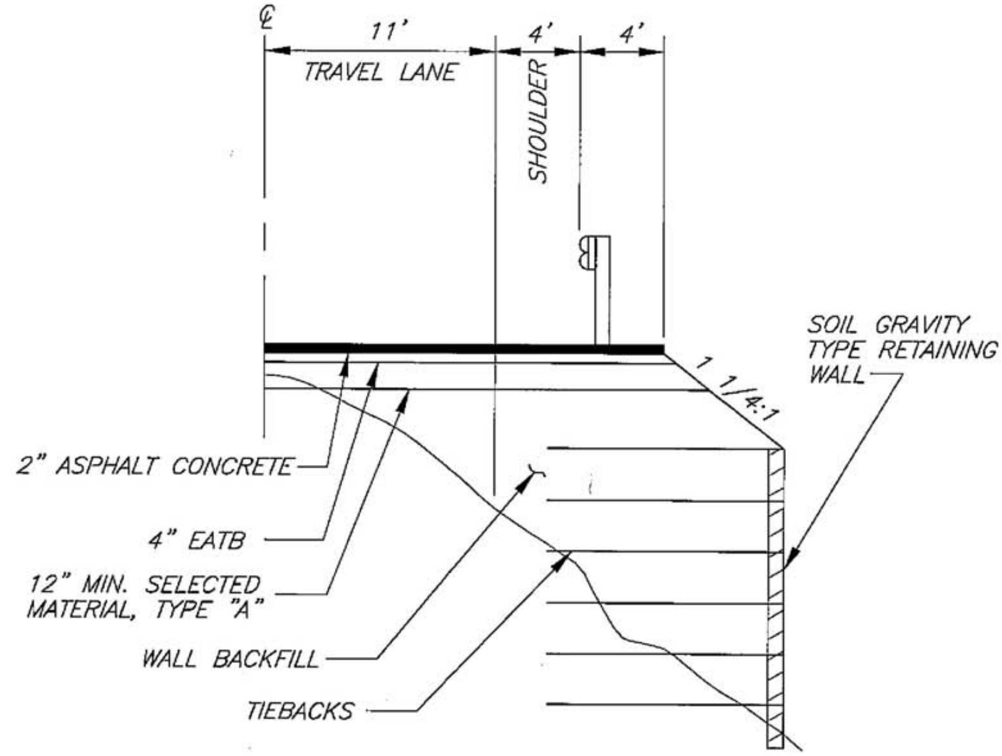
STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES S.E. REGION	*JUNEAU ACCESS IMPROVEMENTS* *PROJECT NO.: 71100* *TYPICAL ROADWAY SECTION THROUGH SEEP AREAS*	*FIGURE* 3-3



TYPICAL RETAINING WALL SECTION

WITH RETAINING WALL MODERATE TO STEEP CROSS SLOPE AREA

STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES S.E. REGION	*JUNEAU ACCESS IMPROVEMENTS* *PROJECT NO.: 71100* *TYPICAL RETAINING WALL SECTION*	*FIGURE* 3-4

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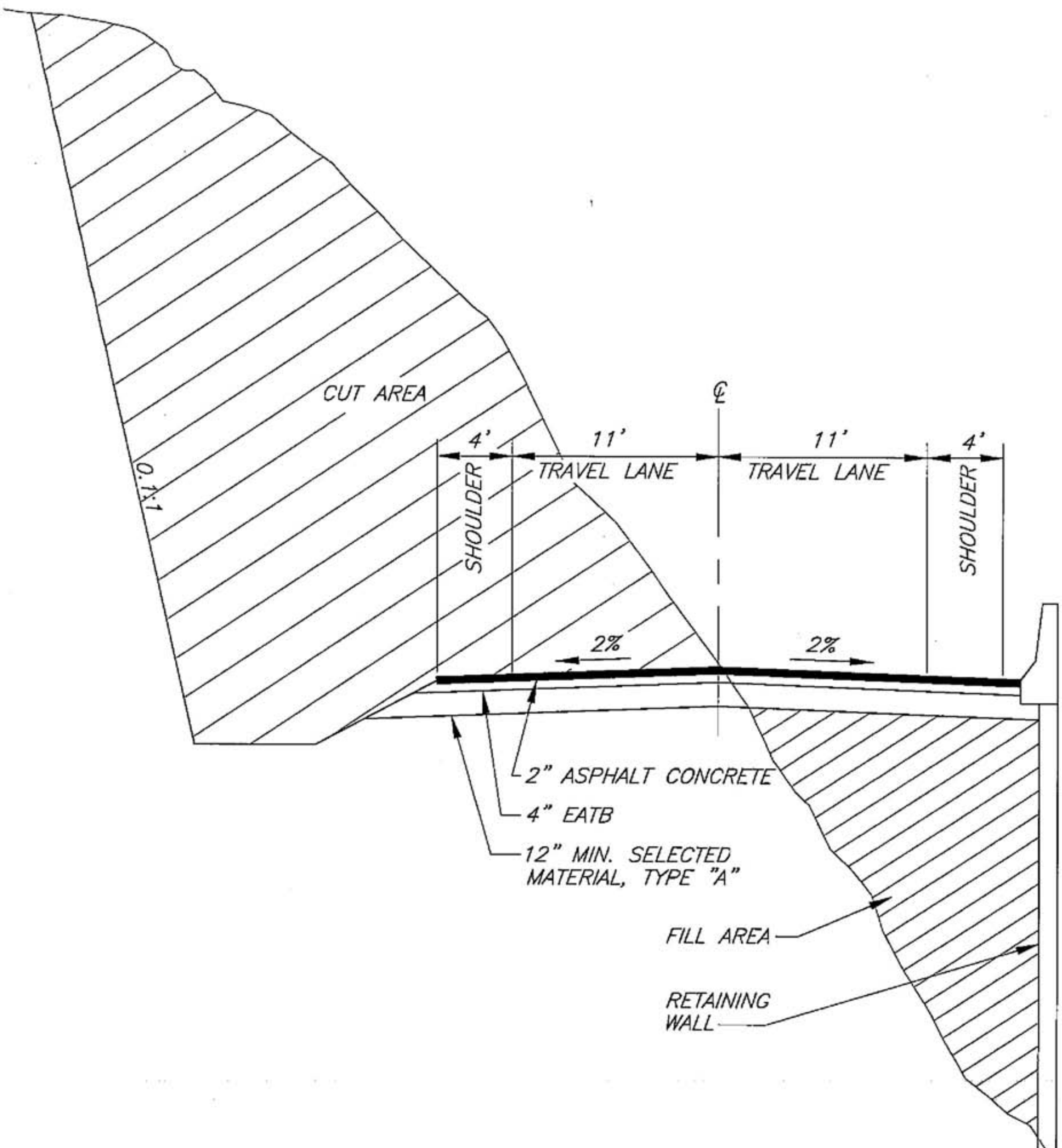

TYPICAL RETAINING WALL SECTION

WITH RETAINING WALL STEEP CROSS SLOPE AREA

STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES S.E. REGION	*JUNEAU ACCESS IMPROVEMENTS* *PROJECT NO.: 71100* *TYPICAL RETAINING WALL SECTION*	*FIGURE* 3-5

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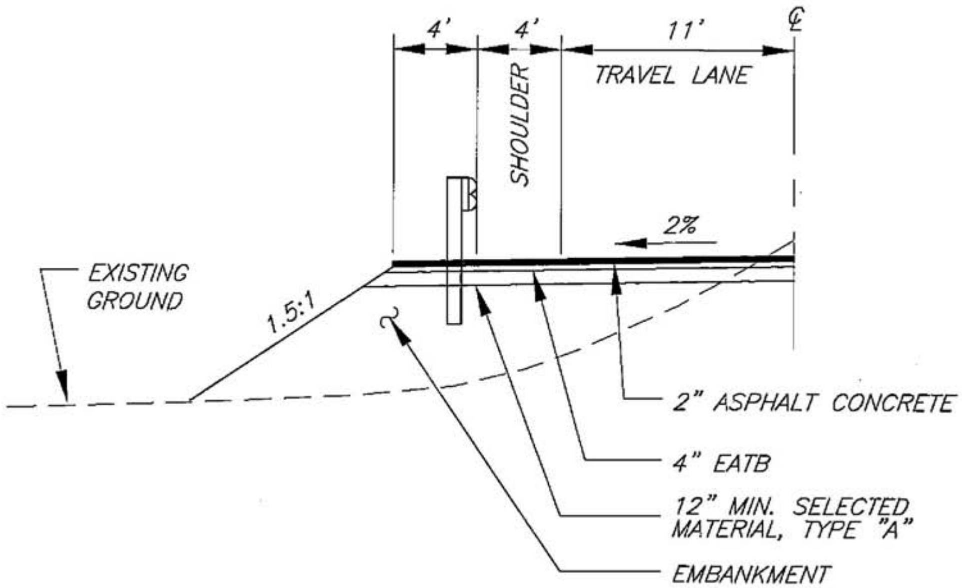

GUARDRAIL TYPICAL

STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES S.E. REGION	*JUNEAU ACCESS IMPROVEMENTS* *PROJECT NO.: 71100* *GUARDRAIL TYPICAL SECTION*	*FIGURE* 3-6

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3.2 Alignment Discussion Overview

3.2.1 East Lynn Canal Discussion

Note: The stationing along this route has changed due to the numerous alignment revisions. The most significant change is in the first two segments, where the stationing was backed in from the Berners/Lace River bridge after the Berners Bay Crossing alignment revisions were completed.

Station 64+75 (MP 40.5) to Station 561+00 (MP 49.9) - Echo Cove to Berners Bay Crossing – This segment was shortened to 9.4 miles due to alignment revisions on the Berners Bay Crossing segment.

The alignment was shifted uphill between Station 64+75 and Station 207+00 to straddle the Goldbelt Cascade Point Road alignment footprint. Additional adjustments to the alignment were made between Station 207+00 and Station 410+00 to avoid emergent wetlands and minimize impacts to lower value wetlands, as well as to provide a more perpendicular bridge crossing over Sawmill Creek. The nature of the terrain remains unchanged.

From Station 477+00 forward, the alignment was optimized by making minor downhill shifts where possible, and by following the curvature of the terrain more closely. This downhill adjustment was required at the end of the segment to provide a suitable approach to the first bridge on the Berners Bay Crossing Segment.

By entering the timbered uplands at Station 561+00, 4,100 feet of steep sidehill cuts were eliminated. This reduced the rock excavation quantities and removed the visual impact of large cut backslopes. This new alignment eliminates potential water quality impacts that an uphill alignment could have to the stream in this area.

Revised Plan and Profile Sheets for this segment (Sheets 2-8) are included in Attachment A.

Station 561+00 (MP 49.9) to Station 754+50 (MP 53.6) - Berners Bay Crossing – This segment was lengthened to 3.7 miles as a result of major alignment revisions, the first of which was outlined in the preceding segment description. This revision moved the alignment off of steep slopes onto relatively flat, timbered uplands.

This realignment also provided a more desirable crossing over the anadromous fish stream here by reducing the skew of the bridge in relation to the stream channel. The bridge length remains at 130 feet.

The crossings over the Antler/Gilkey River and the Berners/Lace River were revised to address resource agency concerns. These revisions increased the bridge lengths to 2,600 feet and 2,750 feet, respectively.

Two new bridges were added to span high use bear trails. The first bridge, located at Station 669+08, crosses an Anter/Gilkey River overflow channel and associated bear trail, and has a preliminary length of 146 feet. The second bridge is a 100-foot-long structure that crosses a bear trail near Station 692+50.

Revised Plan and Profile Sheets for this segment (Sheets 8-9) are included in Attachment A.

Station 754+50 (MP 53.6) to Station 1390+00 (MP 65.6) - Berners Bay Crossing to Independence Lake – This 12.0-mile segment was revised at multiple points to minimize or eliminate impacts to wetlands along the segment. The Revised Plan and Profile Sheets (Sheets 9-13) are included in Attachment A.

Station 1390+00 (MP 65.6) to Station 1503+00 (MP 67.7) - Independence Lake North

Station 1503+00 (MP 67.7) to Station 1640+00 (MP 70.3) - Met Point South

Station 1640+00 (MP 70.3) to Station 2150+00 (MP 80.0) - Met Point North to Level Point

Station 2150+00 (MP 80.0) to Station 2610+00 (MP 88.7) - Level Point to Katzehin River – A new eagle nest at Station 2321+59 forced a downhill shift of the alignment at this location.

The alignment was also moved slightly uphill between Station 2574+00 and Station 2610+00 to eliminate marine wetlands impacts in some areas, and minimize them in others.

The Revised Plan and Profile Sheet for this segment (Sheets 25 and 28) are included in Attachment A.

Station 2610+00 (MP 88.7) to Station 2747+00 (MP 91.3) – South Katzehin River to Katzehin Ferry Terminal – The alignment on this segment was shifted to the northeast between Station 2610+00 and Station 2740+00 to eliminate estuarine wetlands impacts between Station 2700+00 and Station 2720+00. This shift required a reorientation of the Katzehin River Bridge. This reorientation, and an adjustment in the bridge abutment location to satisfy resource agency concerns, resulted in the bridge length being increased to 2,500 feet.

Revised Plan and Profile Sheets for this segment (Sheets 28-30) are included in Attachment A.

3.3 Drainage and Bridges

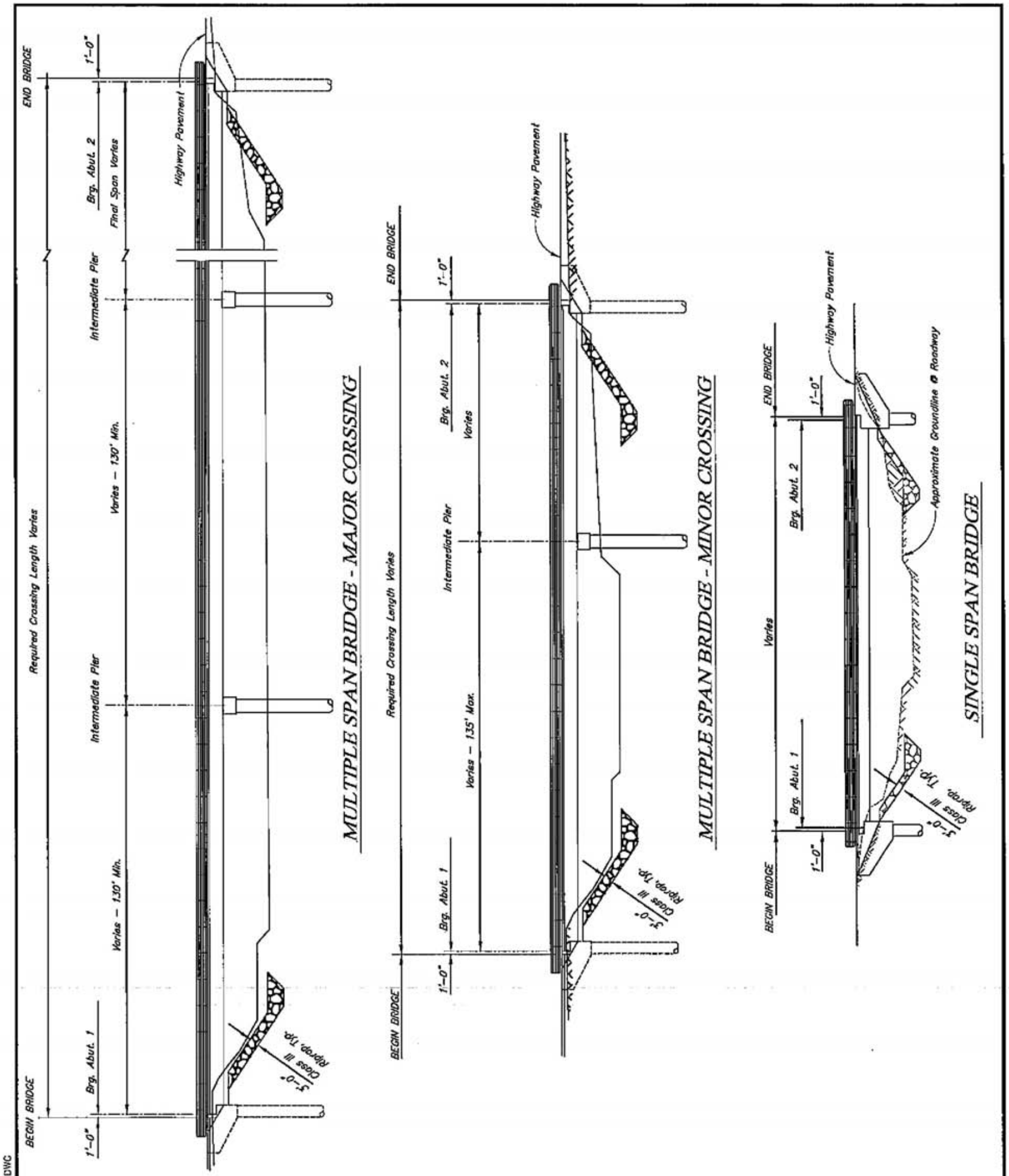
Table 3-1, East Lynn Canal Bridge Summary, has been updated to include the Alternative 2B bridges, the updated Berners Bay and Katzehin River Bridge lengths, and the two Berners Bay Bear Trail Bridges.

Figure 3-8, “Bridge Elevations,” has been updated to distinguish between Multiple Span Bridges for Major and Minor Crossings. Figure 3-7, “Bridge Typical Section,” from the 2004 Supplemental Draft EIS *Appendix O Technical Alignment Report* remained unchanged and is therefore not included in this addendum.

Table 3-1
East Lynn Canal Bridge Summary

Bridge No.	Begin Station	Highway Milepost	Length (ft)	Intermediate Piers	Name
1E	277+50	44.4	100	0	Sawmill Creek (A)
2E	421+53	47.2	110	0	unnamed
3E	567+00	49.9	130	0	unnamed (A)
4Ea	640+00	51.3	2,600	19	Antler/Gilkey Rivers (A)
4Eb	669+08	51.9	146	1	Overflow Channel/Bear Trail
4Ec	692+50	52.3	100	0	Bear Trail
5E	727+00	52.9	2,750	20	Berners/Lace Rivers (A)
6E	908+03	56.4	270	1	Slate Creek (A)
7E	1294+18	63.7	180	1	Sweeny Creek (A)
8E	1328+78	64.3	250	1	Sherman Creek (A)
9E	1439+58	66.4	90	0	Independence Creek (A)
10E	1546+08	68.5	100	0	unnamed
11E	1767+88	72.7	70	0	unnamed
12E	2025+88	77.5	80	0	unnamed
13E	2229+58	81.4	60	0	Yeldagalga Creek
14E	2305+48	82.8	120	0	unnamed
15E	2322+50	83.2	120	0	unnamed
16E	2403+38	84.7	120	0	unnamed
17E	2442+98	85.4	200	1	unnamed
18E	2564+92	87.8	160	1	unnamed
19E	2614+00	88.7	2,500	18	Katzehin River (A)
Total Bridges 21		**Total Length 10,256**			

Note: (A) = Anadromous fish stream



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STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES S.E. REGION	*JUNEAU ACCESS IMPROVEMENTS* *PROJECT NO.: 71100* *BRIDGE ELEVATIONS*	*FIGURE* 3-8

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REVISIONS TO ATTACHMENT A
EAST LYNN CANAL REVISED PLAN AND PROFILE SHEETS

Attachment A has been updated to reflect alignment changes. This alignment incorporates resource agency comments and concerns voiced during the comment period for the Supplemental Draft EIS. It also includes new eagle nest locations and the current highway stationing. Revised Plan and Profile Sheets are included.

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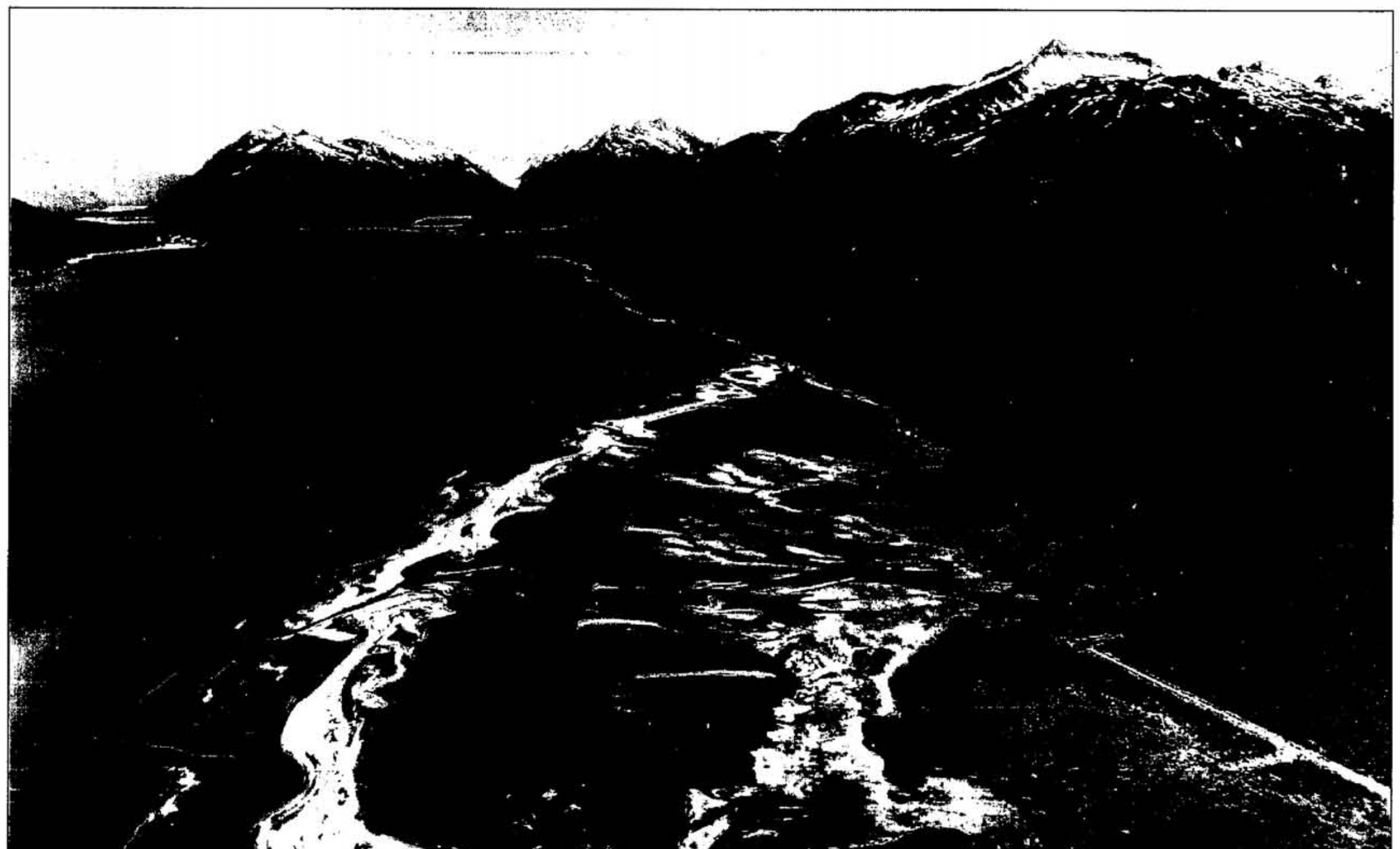
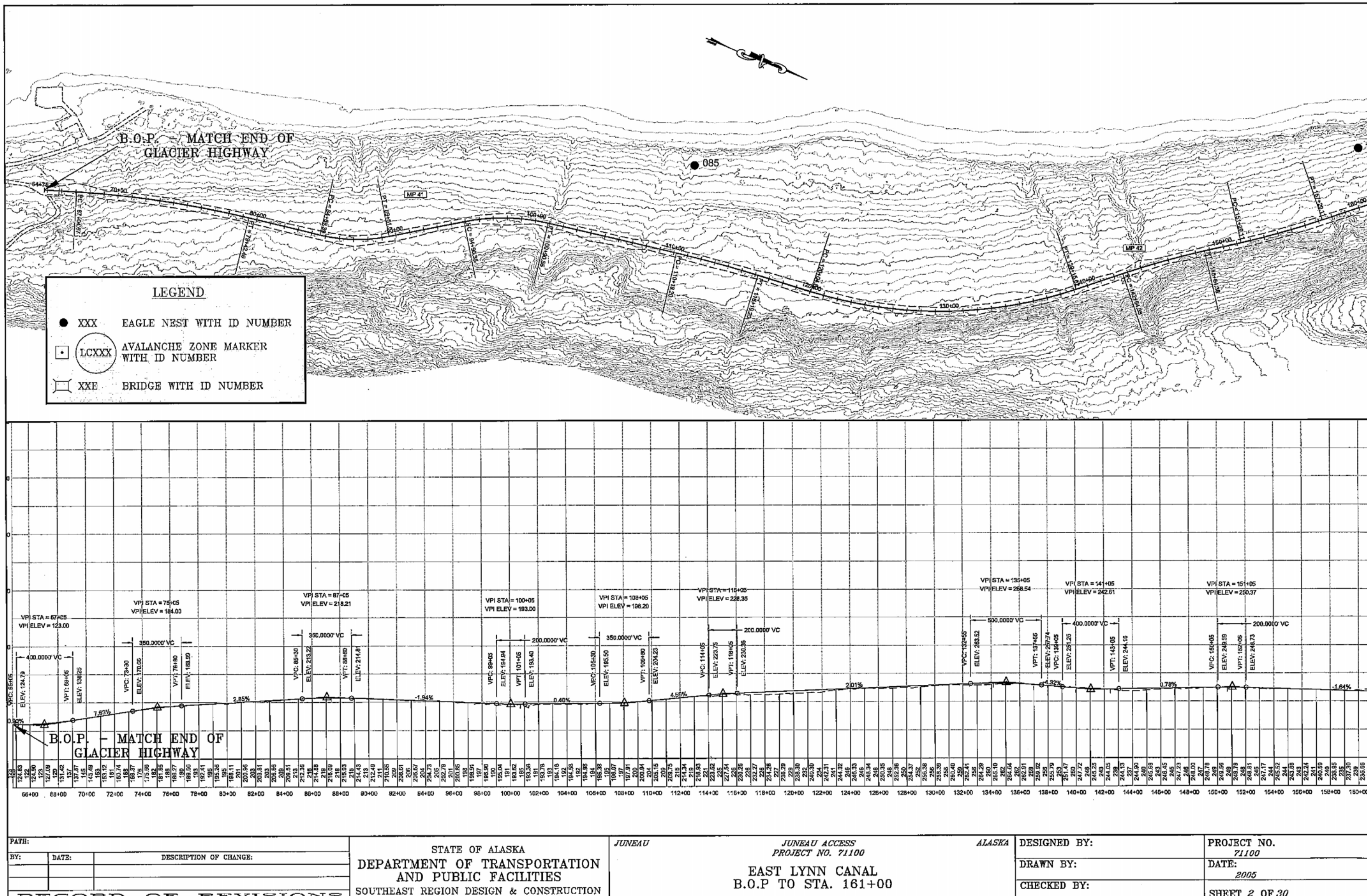
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

PROJECT NO. 71100
JUNEAU ACCESS IMPROVEMENTS
ECHO COVE TO KATZEHIN FERRY TERMINAL
1"=600' PLANS

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LEGEND
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XXE BRIDGE WITH ID NUMBER
B.O.P. - MATCH END OF GLACIER HIGHWAY
PATH:
BY: DATE: DESCRIPTION OF CHANGE:
RECORD OF REVISIONS
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION
JUNEAU
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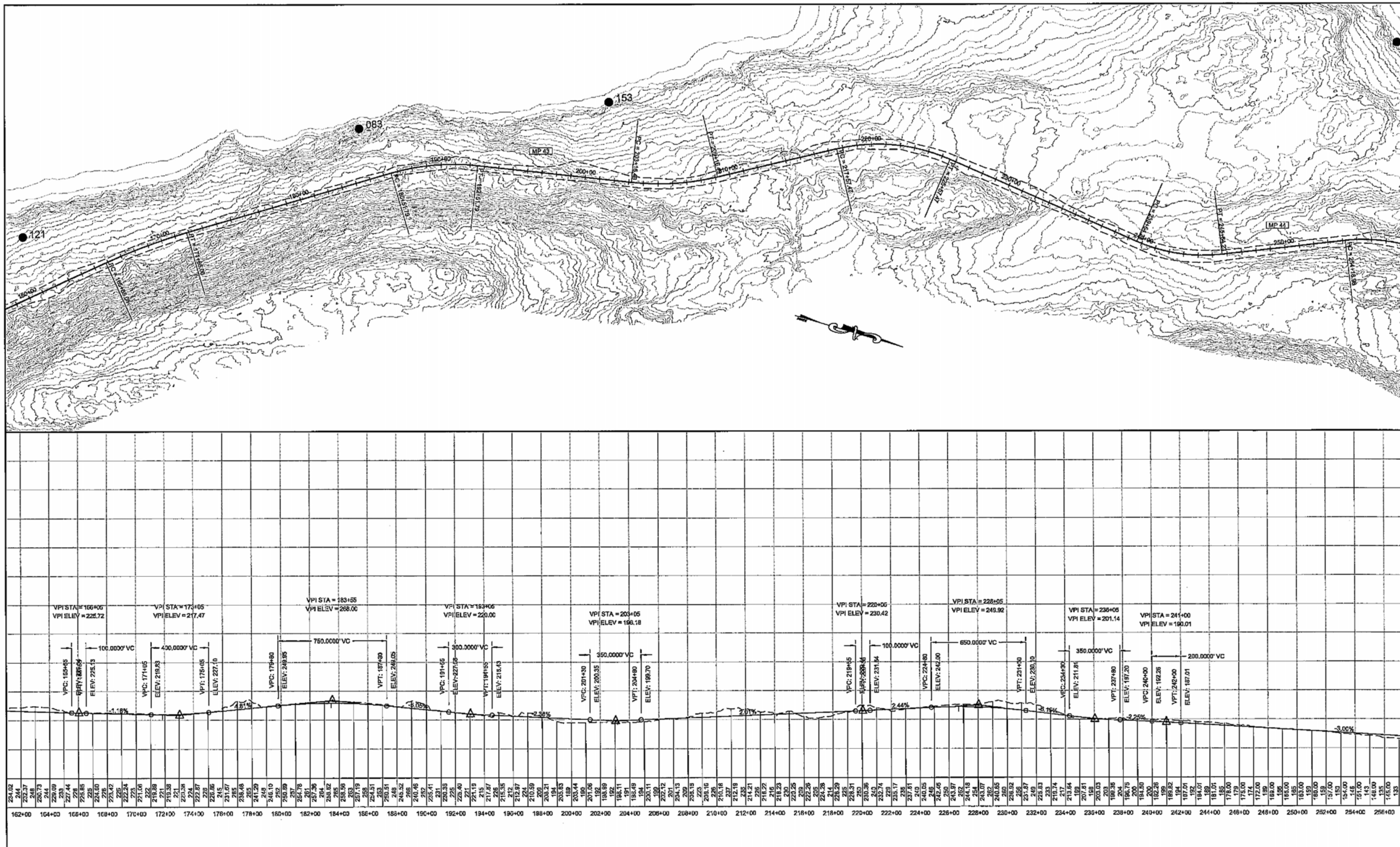
ALASKA
EAST LYNN CANAL
B.O.P TO STA. 161+00
DESIGNED BY:
DRAWN BY:
CHECKED BY:
PROJECT NO. 71100
DATE: 2005
SHEET 2 OF 30



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RECORD OF REVISIONS

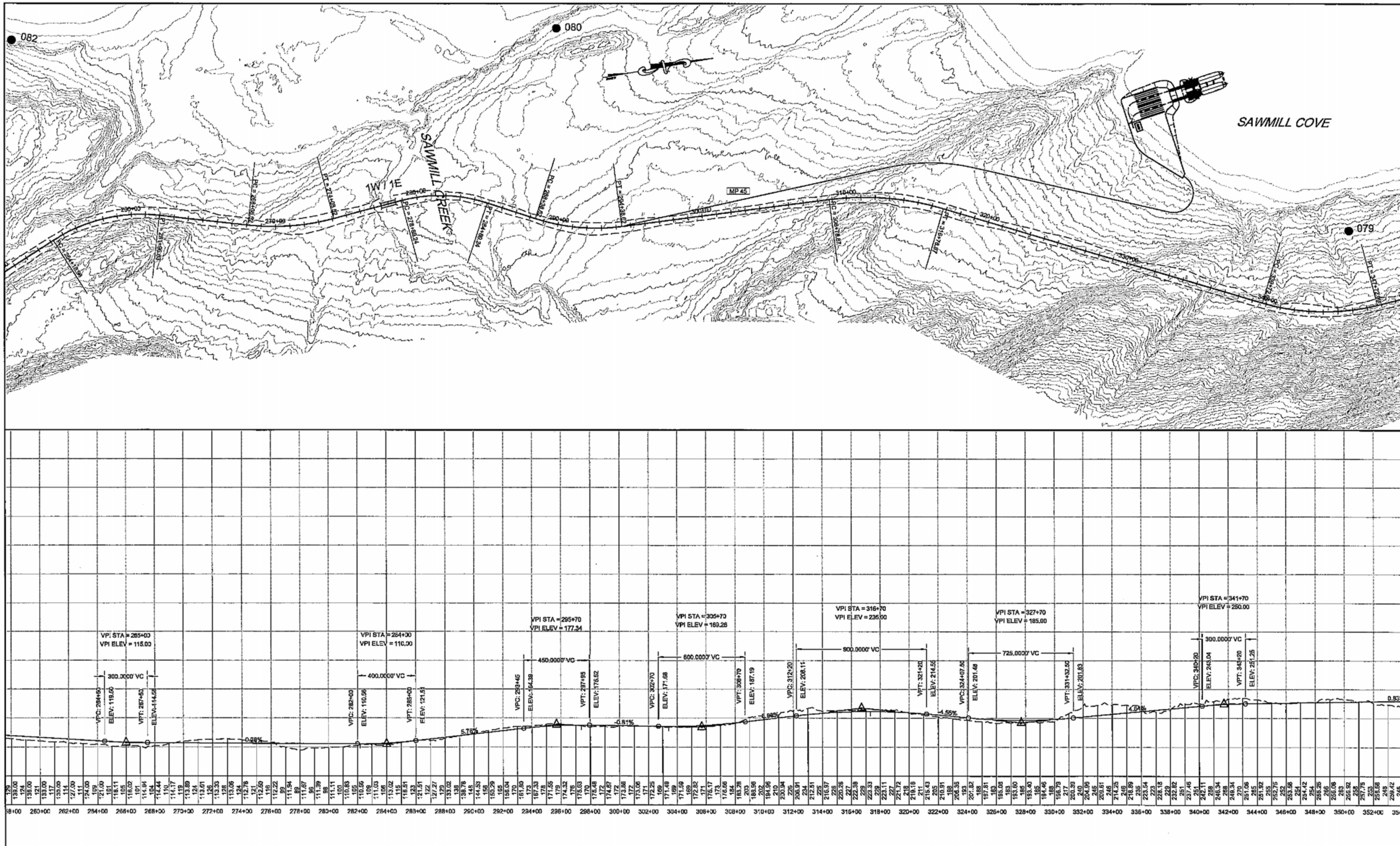
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU | JUNEAU ACCESS PROJECT NO. 71100 | ALASKA

EAST LYNN CANAL
STA. 161+00 TO STA. 258+00

DESIGNED BY:
DRAWN BY:
CHECKED BY:

PROJECT NO. 71100
DATE: 2005
SHEET 3 OF 30



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SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS PROJECT NO. 71100* *ALASKA*

EAST LYNN CANAL
STA. 258+00 TO STA. 354+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2005*
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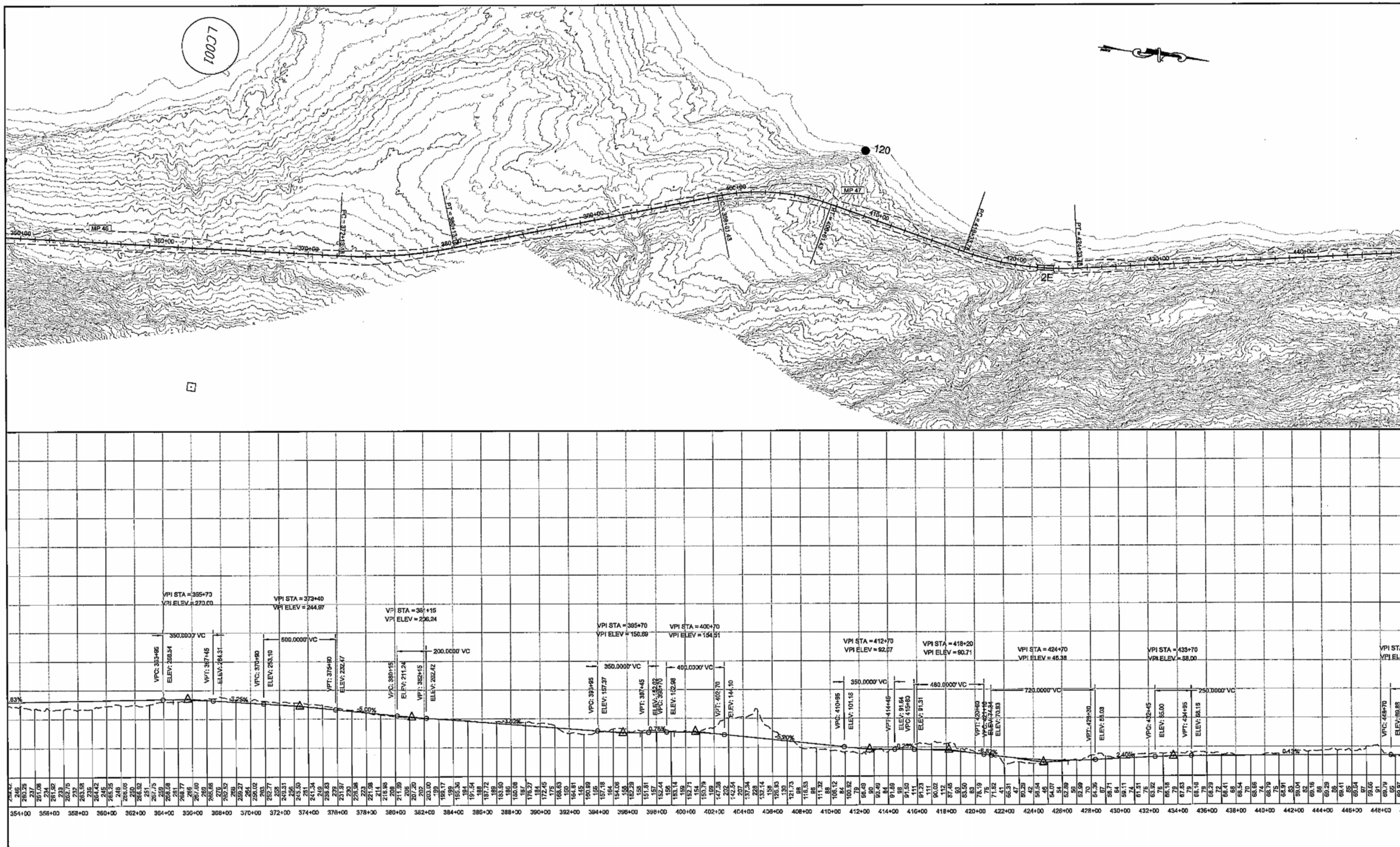

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STATE OF ALASKA
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SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU — JUNEAU ACCESS PROJECT NO. 71100 — ALASKA

EAST LYNN CANAL
STA. 354+00 TO STA. 450+00

DESIGNED BY:
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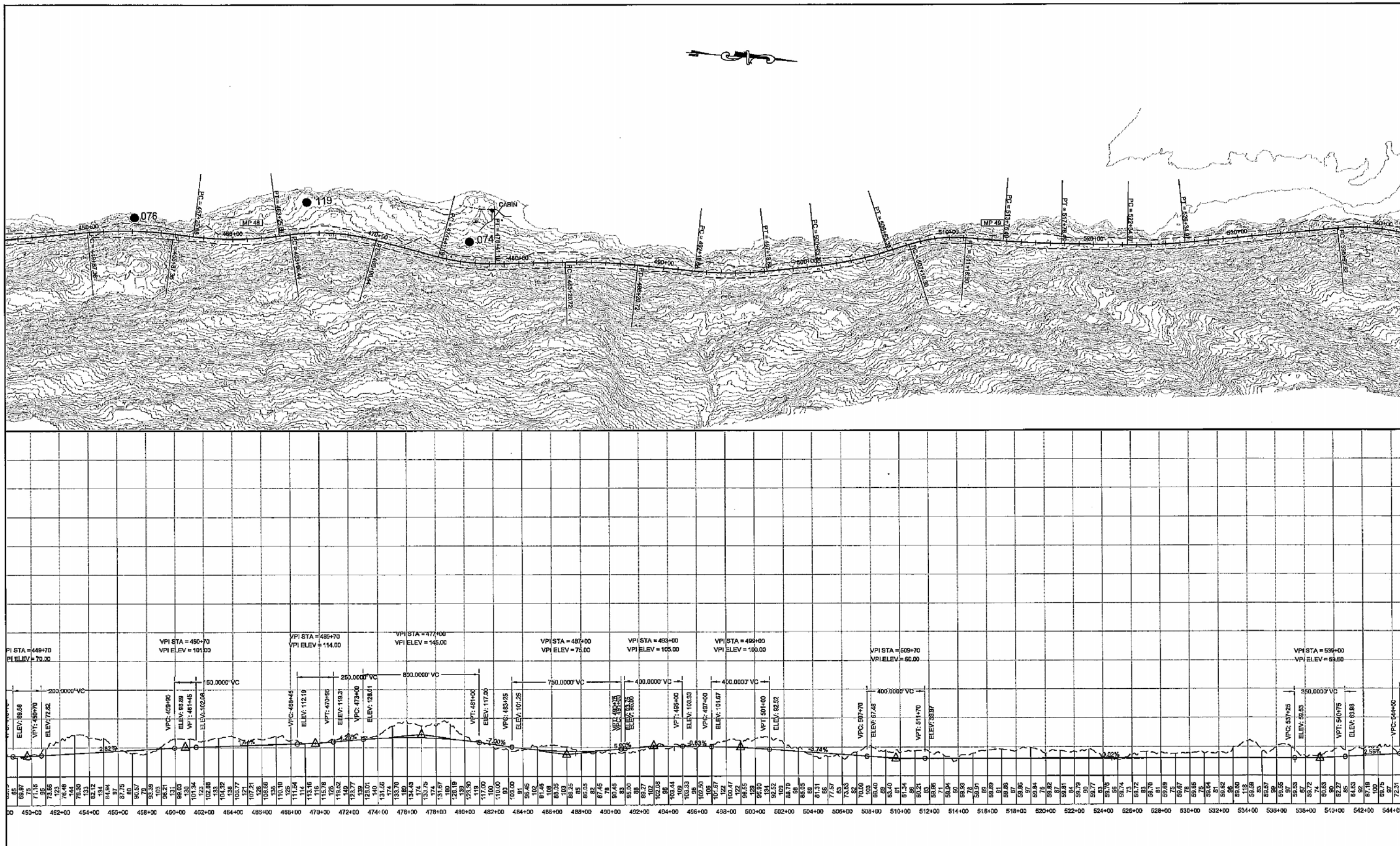
PROJECT NO. 71100
DATE: 2005
SHEET 5 OF 30



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STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS PROJECT NO. 71100* *ALASKA*

EAST LYNN CANAL
STA. 450+00 TO STA. 545+00

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PROJECT NO. *71100*
DATE: *2005*
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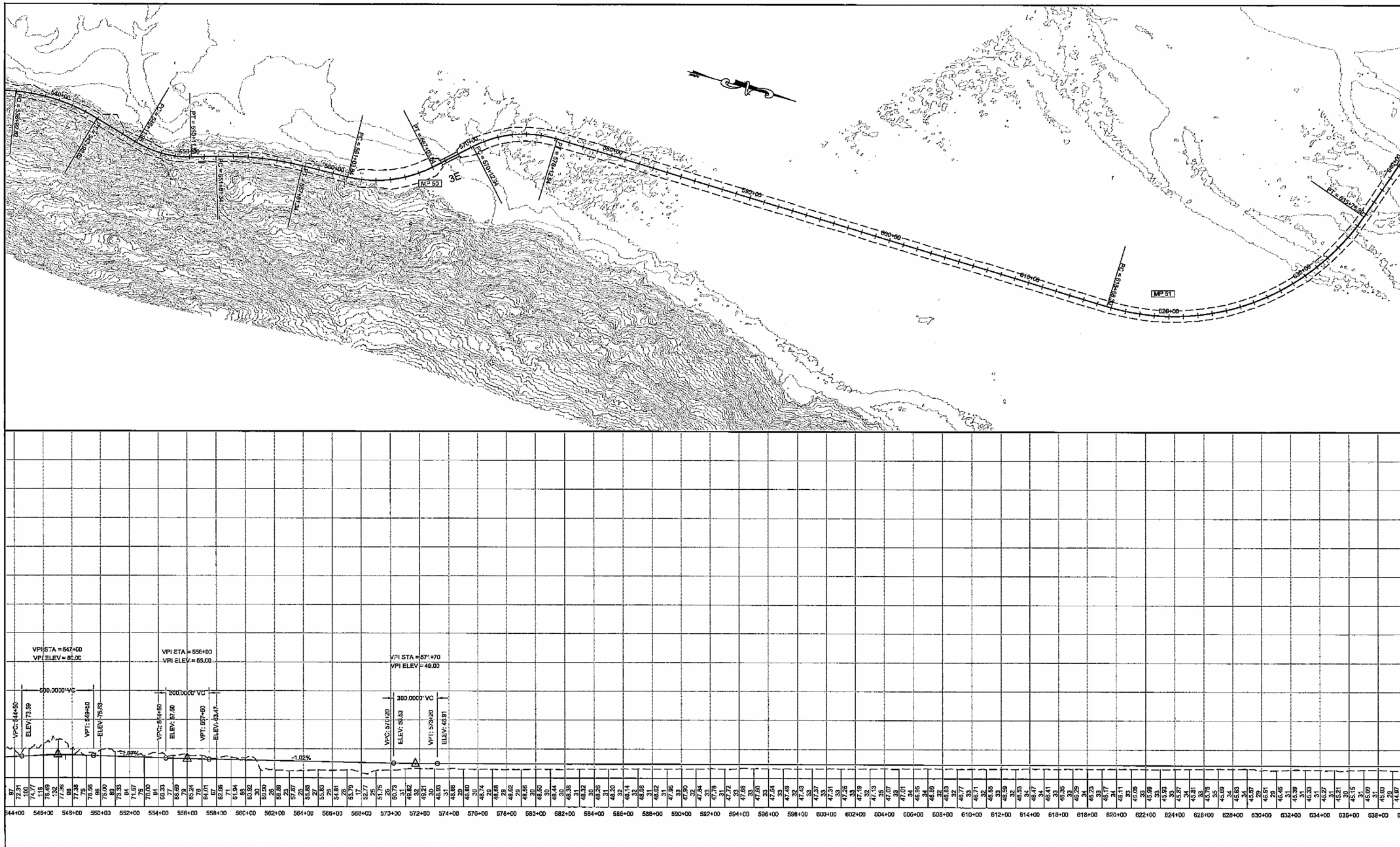

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STATE OF ALASKA
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SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS PROJECT NO. 71100* *ALASKA*

EAST LYNN CANAL
STA. 545+00 TO STA. 640+00

DESIGNED BY:	PROJECT NO. 71100
DRAWN BY:	DATE: 2005
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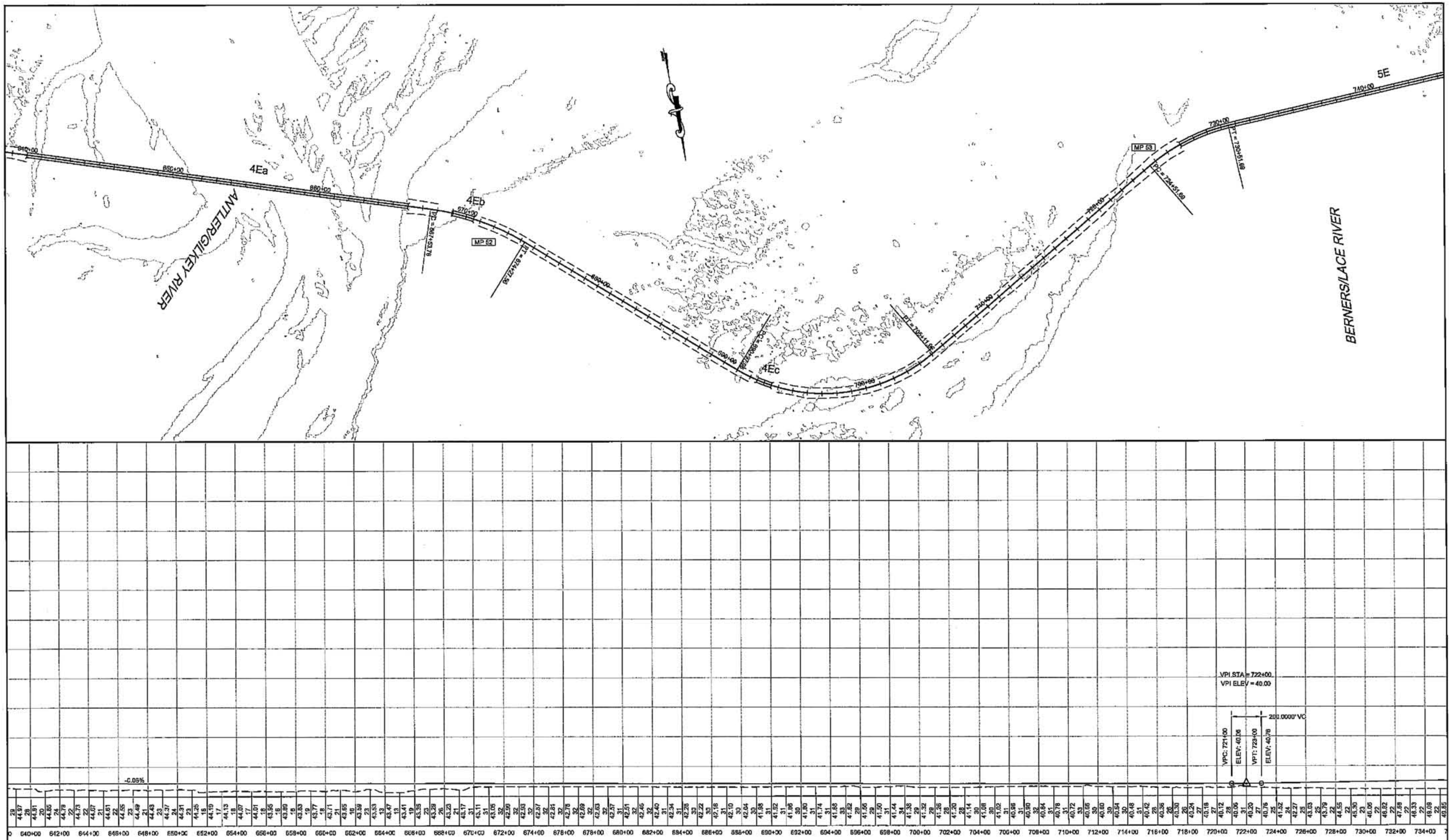

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STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU — JUNEAU ACCESS PROJECT NO. 71100 — ALASKA

EAST LYNN CANAL
STA. 640+00 TO STA. 735+00

DESIGNED BY:	PROJECT NO. 71100
DRAWN BY:	DATE: 2005
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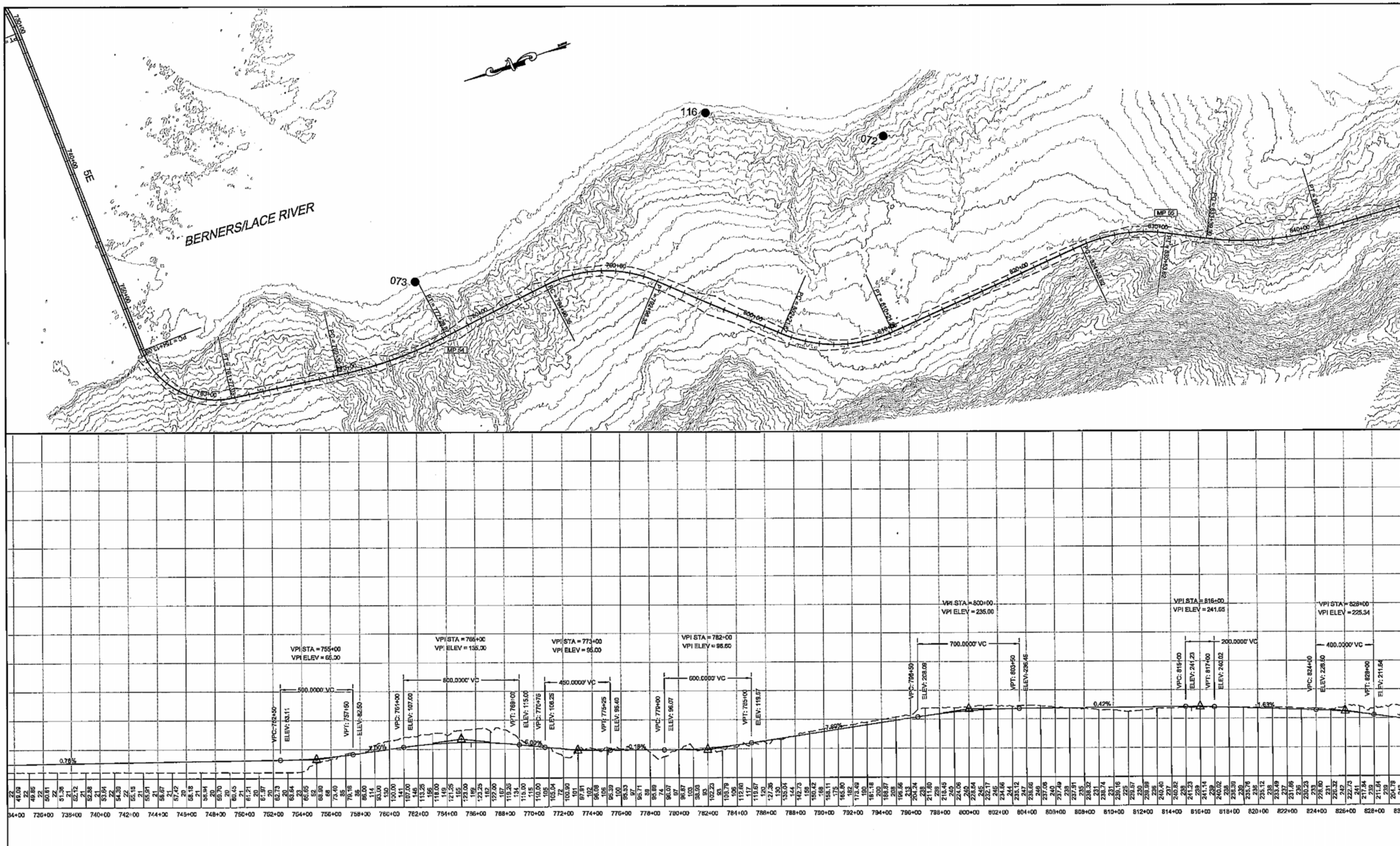

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STATE OF ALASKA
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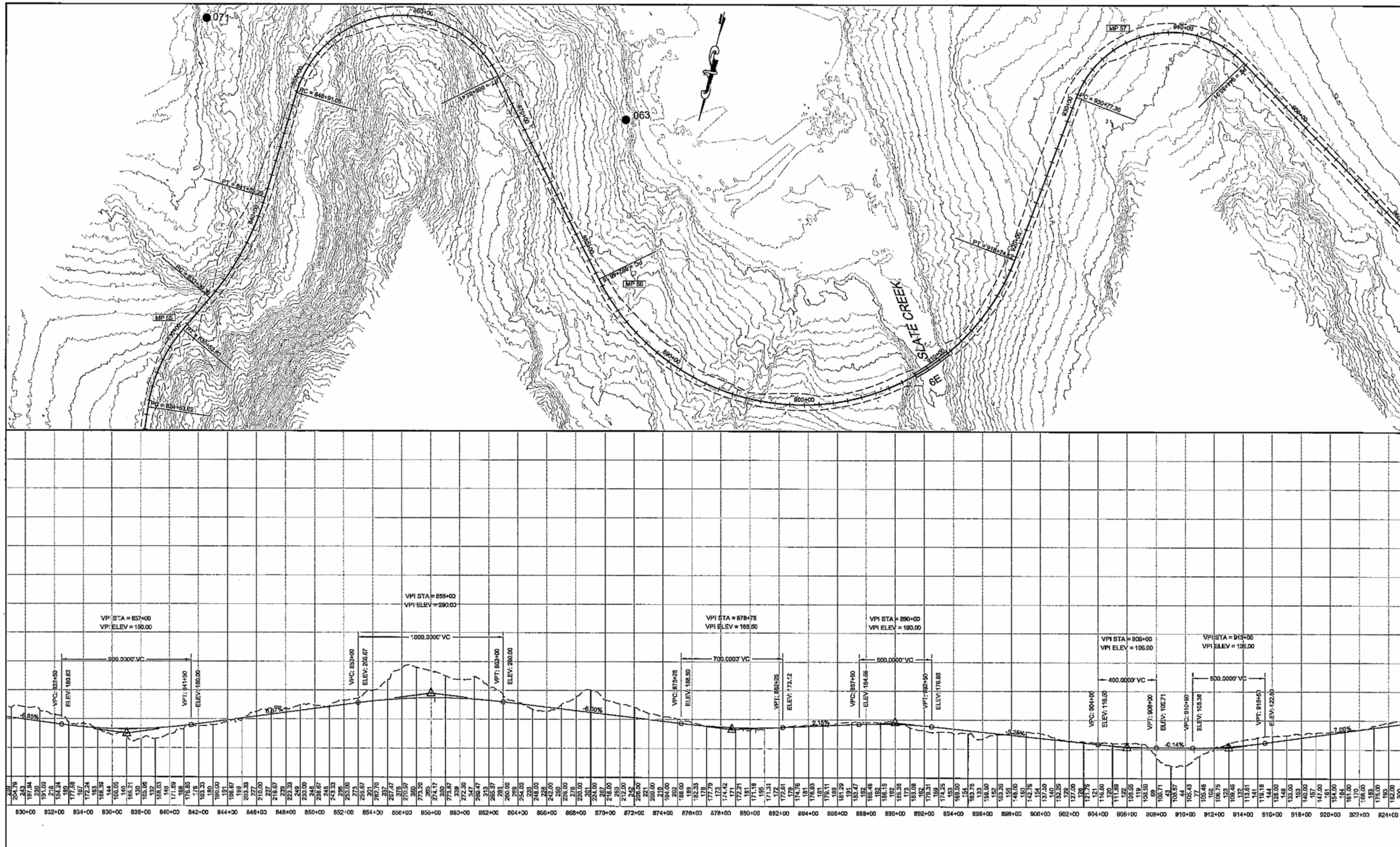
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU — JUNEAU ACCESS PROJECT NO. 71100 — ALASKA

EAST LYNN CANAL
STA. 735+00 TO STA. 831+00

DESIGNED BY:	PROJECT NO. 71100
DRAWN BY:	DATE: 2005
CHECKED BY:	SHEET 9 OF 30



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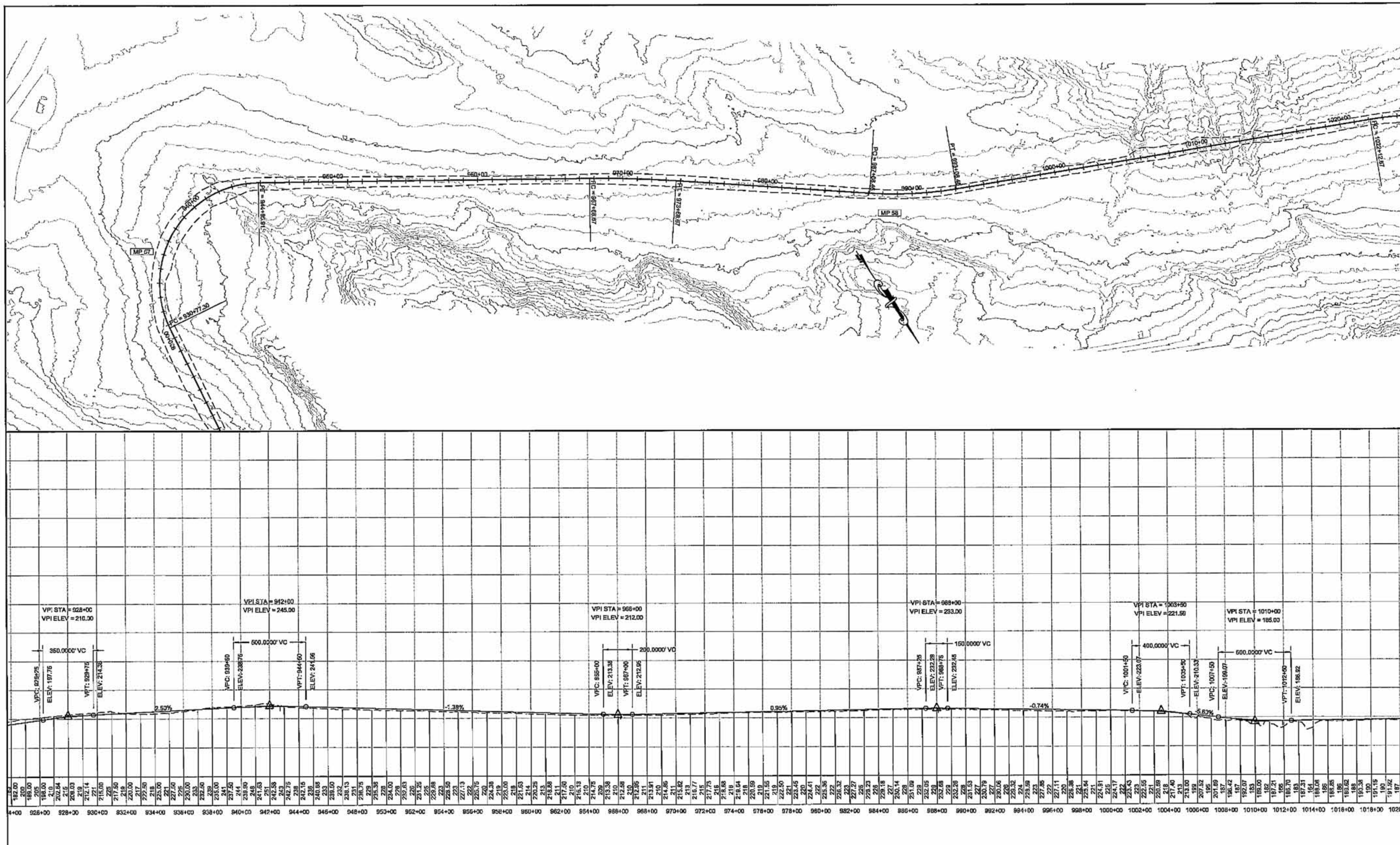
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS PROJECT NO. 71100* *ALASKA*

EAST LYNN CANAL
STA. 831+00 TO STA. 925+00

DESIGNED BY:
DRAWN BY:
CHECKED BY:

PROJECT NO. *71100*
DATE: *2005*
SHEET *10* OF *30*



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SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU — JUNEAU ACCESS PROJECT NO. 71100 — ALASKA

EAST LYNN CANAL
STA. 925+00 TO STA. 1020+00

DESIGNED BY:
DRAWN BY:
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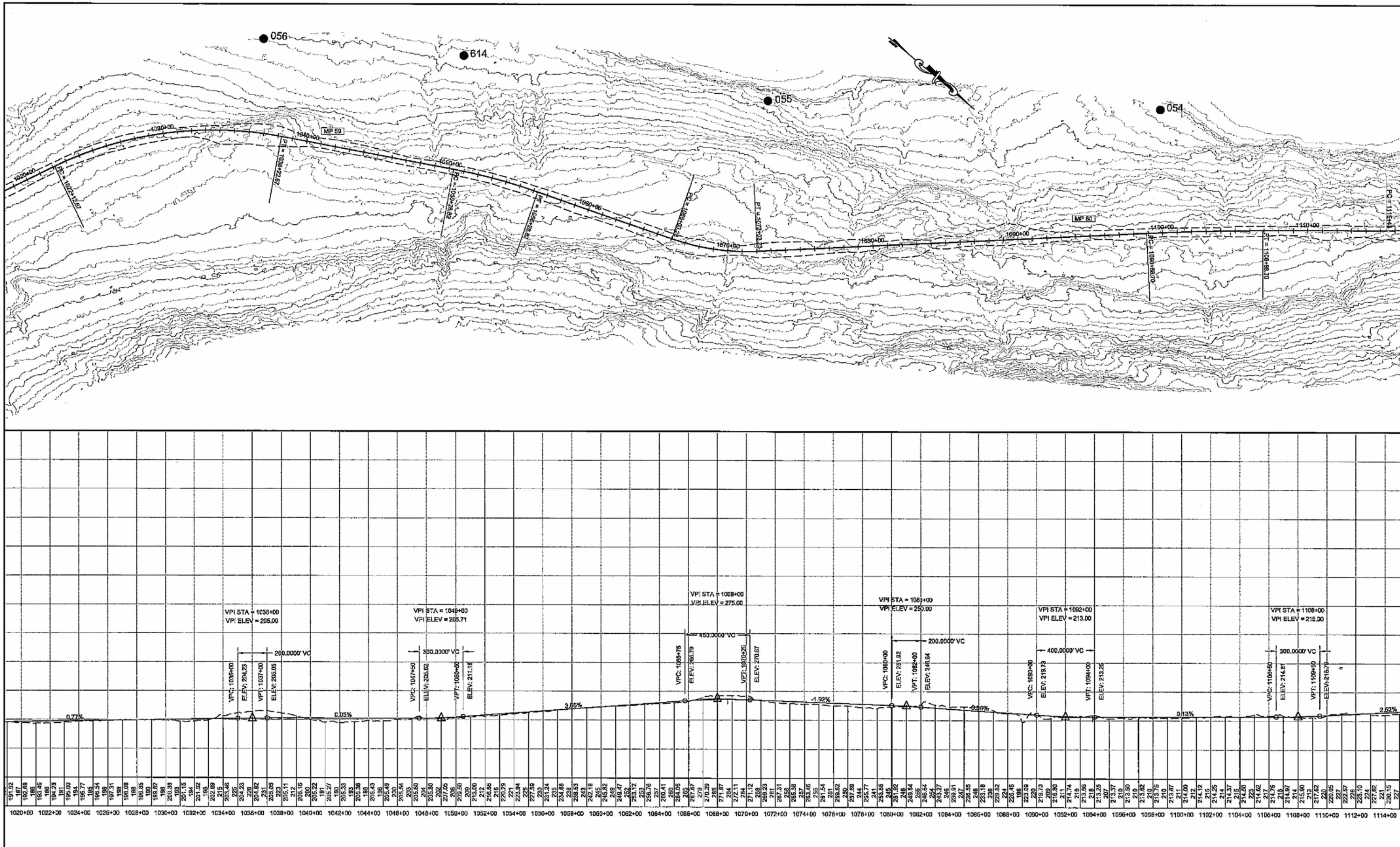
PROJECT NO. 71100
DATE: 2005
SHEET 11 OF 30



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STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 1020+00 TO STA. 1115+00

DESIGNED BY:	PROJECT NO. *71100*
DRAWN BY:	DATE: *2005*
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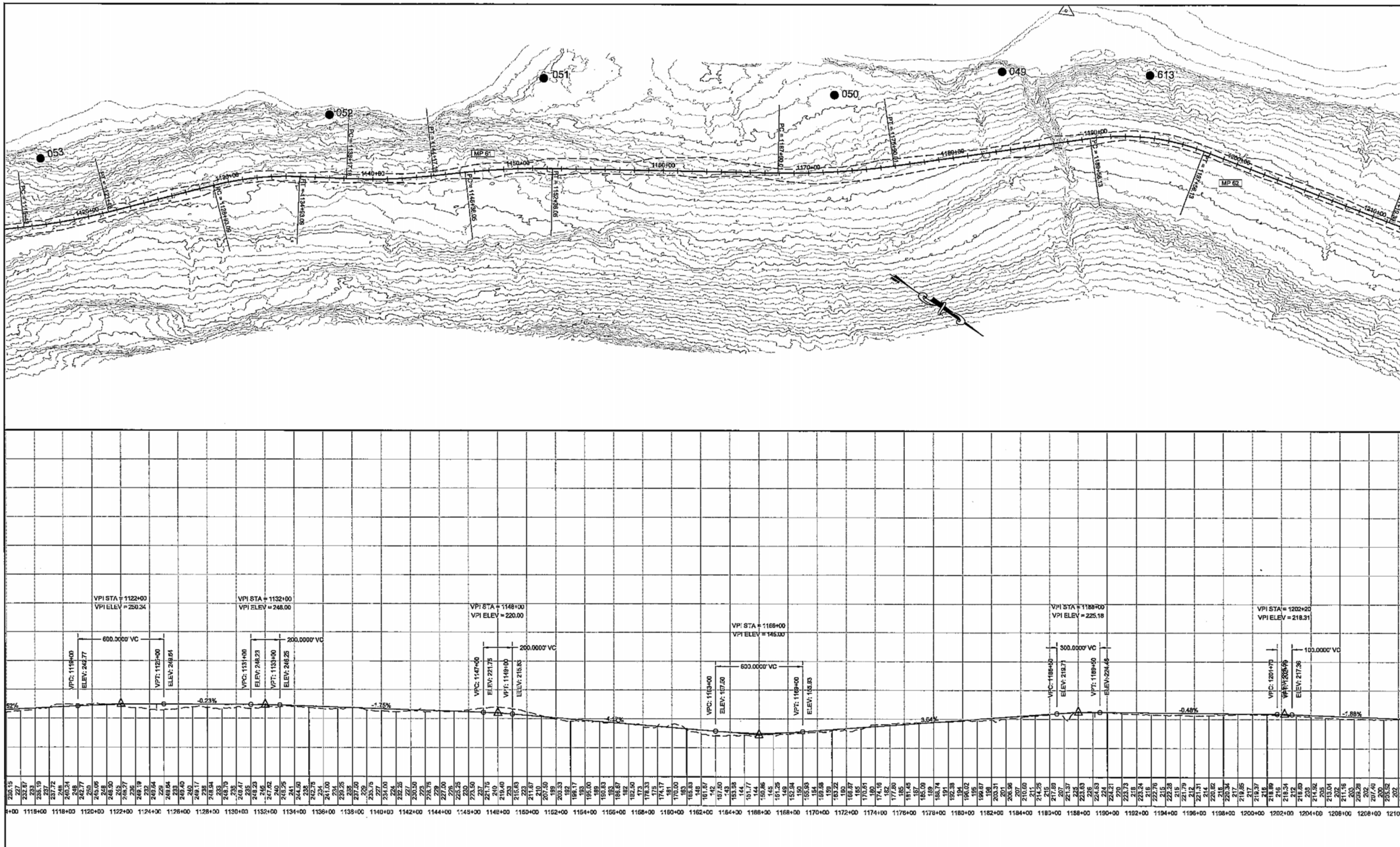

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RECORD OF REVISIONS		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU — JUNEAU ACCESS PROJECT NO. 71100 — ALASKA

EAST LYNN CANAL
STA. 1115+00 TO STA. 1210+00

DESIGNED BY:	PROJECT NO. 71100
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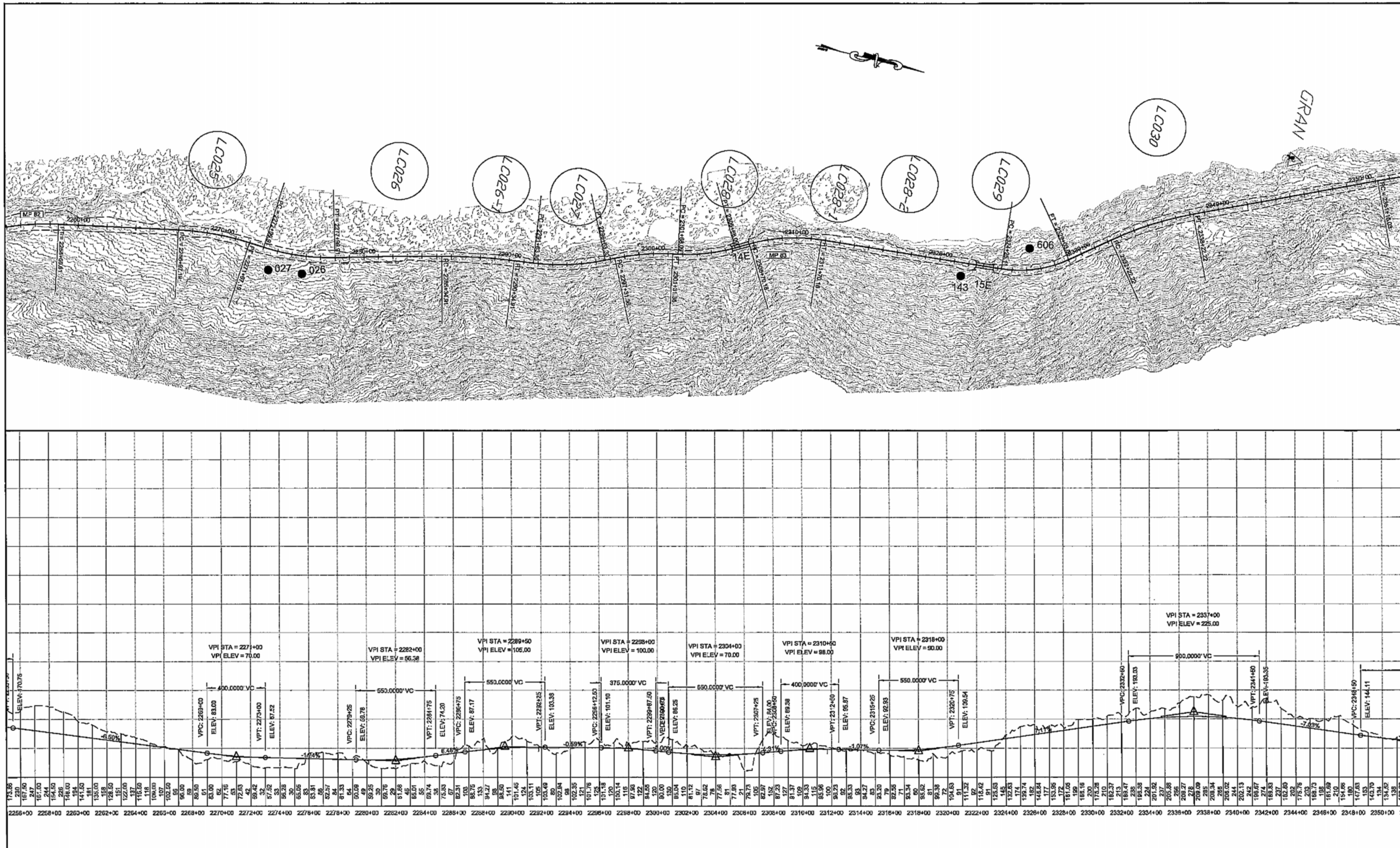
CHECKED BY:	SHEET 13 OF 30



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STATE OF ALASKA
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SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS PROJECT NO. 71100* *ALASKA*

EAST LYNN CANAL
STA. 2256+00 TO STA. 2352+00

DESIGNED BY:
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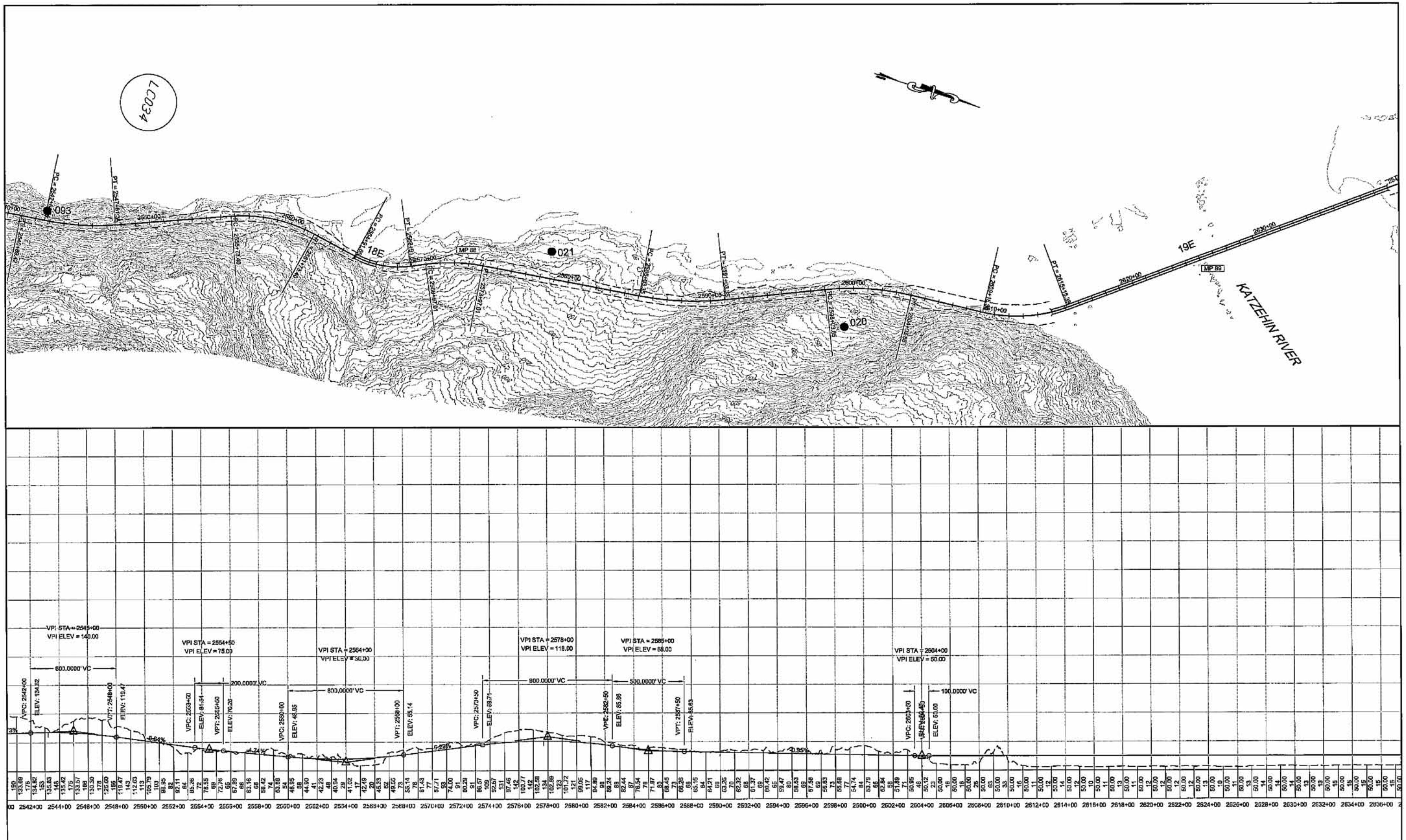
CHECKED BY:

PROJECT NO. *71100*
DATE: *2005*
SHEET *25* OF *30*



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STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS PROJECT NO. 71100* *ALASKA*

EAST LYNN CANAL
STA. 2542+00 TO STA. 2637+00

DESIGNED BY:	PROJECT NO. 71100
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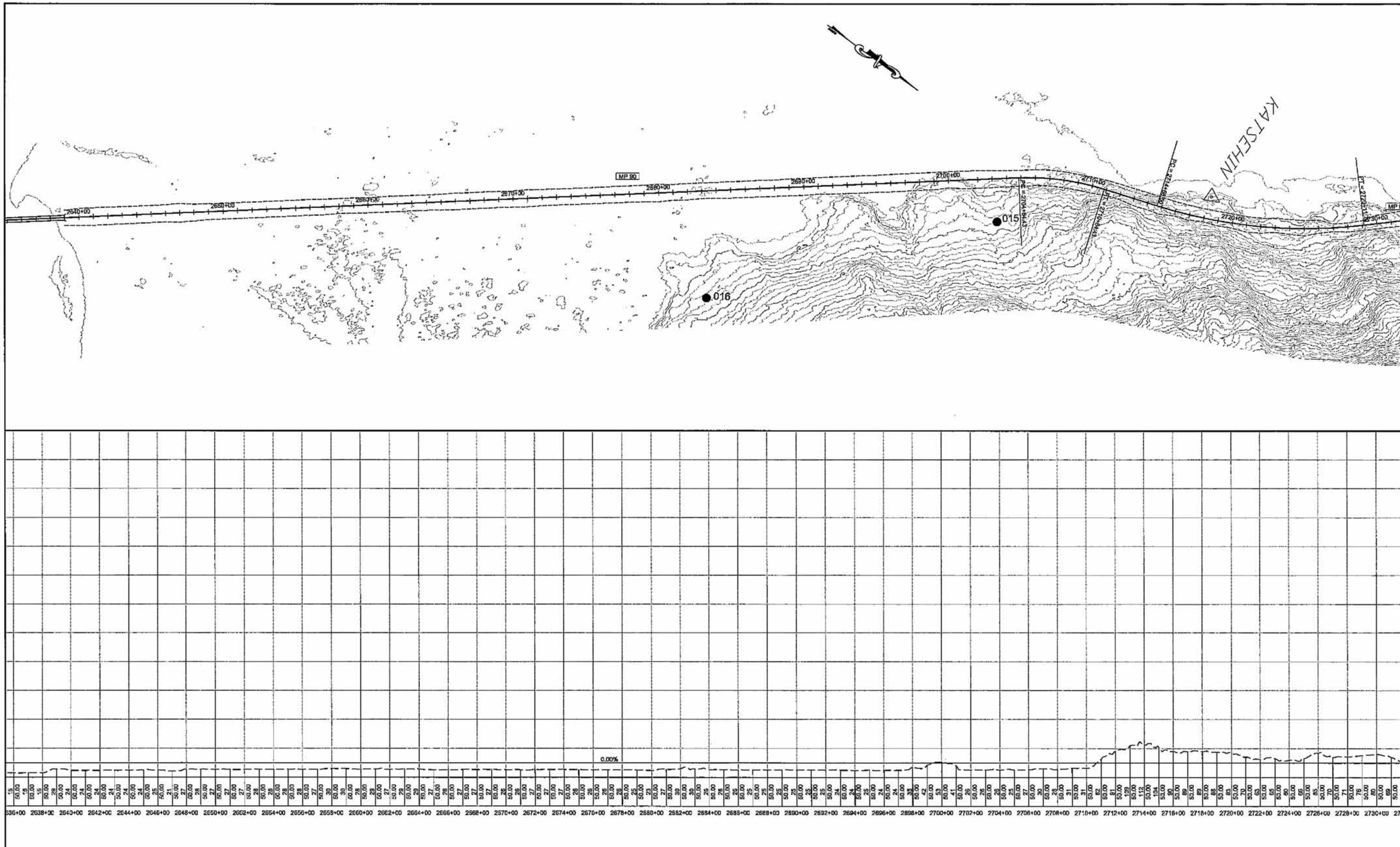

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STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS PROJECT NO. 71100* *ALASKA*

EAST LYNN CANAL
STA. 2637+00 TO STA. 2732+00

DESIGNED BY:
DRAWN BY:
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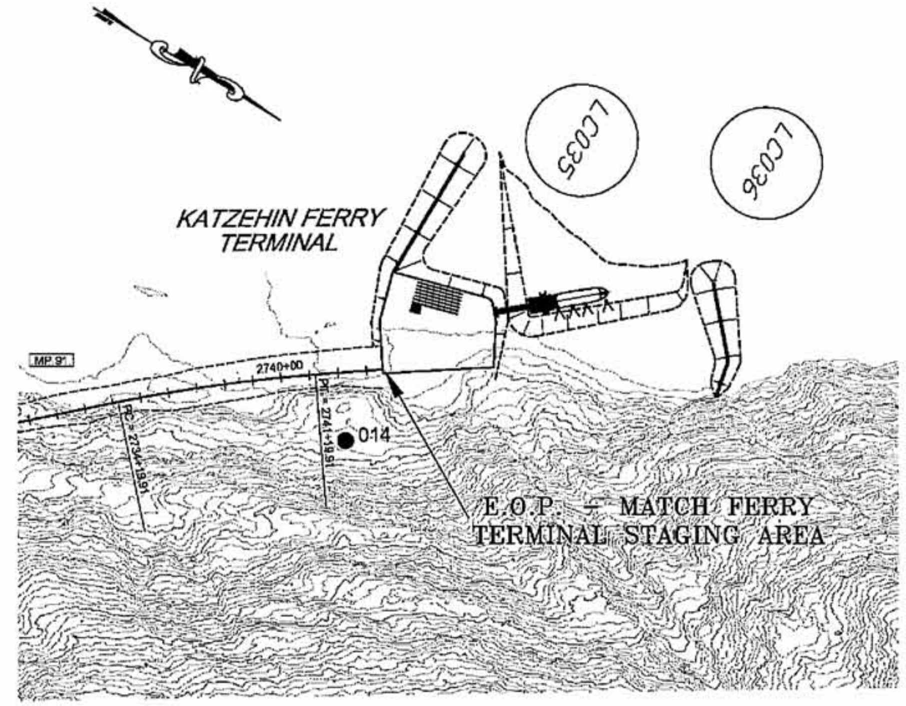
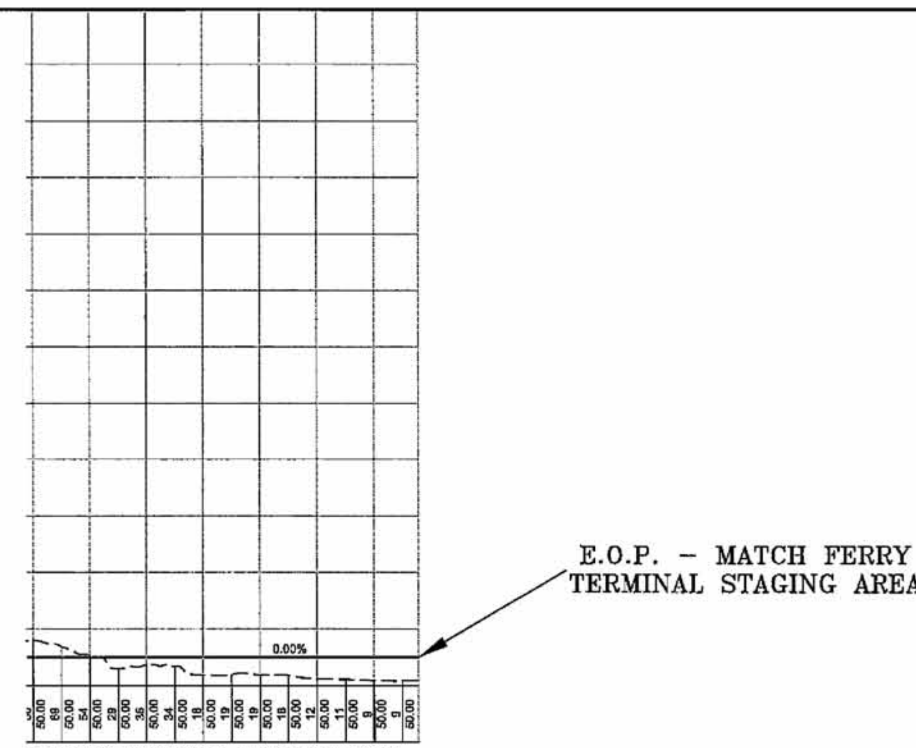
PROJECT NO. *71100*
DATE: *2005*
SHEET *29* OF *30*





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STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU *JUNEAU ACCESS* *ALASKA*
PROJECT NO. 71100

EAST LYNN CANAL
STA. 2732+00 TO E.O.P.

DESIGNED BY:	PROJECT NO. *71100*
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REVISIONS TO ATTACHMENT D
MARINE TERMINAL CONCEPTS

Attachment D has been updated to include the latest DOT&PF estimates. All estimates include the current ICAP rate of 4.3 percent. The Auke Bay Ferry Terminal Estimate and Layout reflect the current AMHS terminal concept for Auke Bay (see attached figure). The Sawmill Cove Ferry Terminal estimate has been reduced by the amount of the Access Road construction costs, which are included in the Alternative 2B Highway Cost Estimate. The Sawmill Cove Ferry Terminal and William Henry Bay Ferry Terminal estimates have been updated to include the latest cost estimates for the General Construction items.

Some printed copies of the Supplemental Draft EIS Appendix D Attachment D were missing one or more of Figures 1 through 8. Therefore, all eight figures are reprinted at the end of this attachment.

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SE Region - Marine Engineering

Project Construction Cost Estimate

PROJECT NUMBER: 71100
PROJECT TITLE: Juneau Access Ferry Terminals
DESCRIPTION: Sawmill Cove Ferry Terminal - Twin Stern Berth

Item No.	Item	Units	Unit Price	Quantity	Amount
1	***General***				
	Mobilization/Demobilization	LS	$700,000	1	$700,000
	Temporary Erosion and Pollution Control	CS	$250,000	1	$250,000
	Constr. Surveying by the Contractor	LS	$50,000	1	$50,000
	Construction Camp Facilities	LS	$75,000	1	$75,000
2	***Dredged Mooring Basin***				
	Dredged Mooring Basin	CY	$8.00	16,000	$128,000
	(Includes placement as upland fill or disposal)				
3	***Marine Facilities***				
	Pile Supported Bridge Approach Abutment	EA	$80,000	2	$160,000
	20'x142' Steel Transfer Bridge	EA	$800,000	2	$1,600,000
	50'x80' Steel Bridge Float	EA	$1,600,000	2	$3,200,000
	(w/ Intermediate Ramp, Apron & Fenders)				
	4-Pile Bridge Float Restraint Dolphins	EA	$250,000	3	$750,000
	6-Pile Double Sided Breasting Dolphins	EA	$350,000	4	$1,400,000
	Electrical Power and Lighting System (Terminal)	LS	$300,000	1	$300,000
3	***Upland Improvements (Access/Staging Area)***				
	Embankment (Local Excavation)	CY	$6.00	68,000	$408,000
	Riprap Slope Protection	CY	$40	5,500	$220,000
	12" Aggregate Surface Course	CY	$20.00	5,000	$100,000
	(Approx 135,000sf)				
	Asphalt Concrete Surfacing (2" thick)	Ton	$60.00	1,500	$90,000
	(Approx 135,000 sf)				
	Metal Beam Guardrail	LF	$40	950	$38,000
	Potable Water Supply (Well & Piping)	LS	$200,000	1	$200,000
	Sanitary Sewer (Pkg Treatment Plant/Outfall)	LS	$300,000	1	$300,000
	Diesel Generator System, Bldg & Fuel Storage Tank	LS	$600,000	1	$600,000
	Electrical Power Supply & Area Lighting System	LS	$300,000	1	$300,000
5	***Building Structures***				
	Terminal Building (24'x40')	SF	$450	960.00	$432,000

Item Totals	*$11,301,000*
Estimating & Construction Contingencies @ 10%	$1,130,100
Construction Subtotal	***$12,431,100***
6% Design & Permitting	$745,866
8% Construction Admin	$994,488
4.3% ICAP	$534,537.30
Project Total =	***$14,705,991***

Prepared by: KDM **Date:** 10/05/05
Checked by: JDB **Date:**

SE Region - Marine Engineering

Project Construction Cost Estimate

PROJECT NUMBER: 71100
PROJECT TITLE: Juneau Access Ferry Terminals
DESCRIPTION: Katzehin Ferry Terminal Option 1 (Unprotected)

Item No.	Item	Units	Unit Price	Quantity	Amount
1	***General***				
	Mobilization/Demobilization	LS	$700,000	1	$700,000
	Temporary Erosion and Pollution Control	CS	$200,000	1	$200,000
	Constr. Surveying by the Contractor	LS	$125,000	1	$125,000
	Construction Camp Facilities	LS	$350,000	1	$350,000
2	***Marine Facilities***				
	Pile Supported Bridge Approach Abutment	LS	$100,000	1	$100,000
	20'x150' Steel Transfer Bridge	LS	$900,000	1	$900,000
	Syncro Lift or Counterweight Lift Towers	EA	$1,000,000	2	$2,000,000
	Stern Breasting Dolphins	EA	$325,000	2	$650,000
	5-Pile Breasting Dolphins	EA	$300,000	4	$1,200,000
	Electrical Power and Lighting System (Terminal)	LS	$350,000	1	$350,000
3	***Upland Improvements (Access/Staging Area)***				
	Import Embankment - Borrow (Classified Materials)	CY	$12.00	90,000	$1,080,000
	Riprap Slope Protection (Class IV)	CY	$30	16,500	$495,000
	12" Aggregate Surface Course (Approx 80,500 sf)	CY	$20.00	3,000	$60,000
	Asphalt Concrete Surfacing (2" thick) (Approx 80,500 sf)	Ton	$60.00	1,000	$60,000
	Metal Beam Guardrail	LF	$40	1,200	$48,000
	Potable Water Supply (Well & Piping)	LS	$200,000	1	$200,000
	Sanitary Sewer (Pkg Treatment Plant/Outfall)	LS	$300,000	1	$300,000
	Diesel Generator System, Bldg & Fuel Storage Tank	LS	$600,000	1	$600,000
	Electrical Power Supply & Area Lighting System	LS	$300,000	1	$300,000
4	***Building Structures***				
	Terminal Building	SF	$450	960.00	$432,000

Item Totals	*$10,150,000*
Estimating & Construction Contingencies @ 10%	$1,015,000
Construction Subtotal	***$11,165,000***
8% Design & Permitting	$893,200
8% Construction Admin	$893,200
4.3% ICAP	$480,095
Project Total =	***$13,431,495***

Prepared by: KDM **Date:** 10/29/03
Checked by: **Date:**

SE Region - Marine Engineering

Project Construction Cost Estimate

PROJECT NUMBER: 71100
PROJECT TITLE: Juneau Access Ferry Terminals
DESCRIPTION: Katzehin Ferry Terminal Option 2 (North & South Breakwaters)

Item No.	Item	Units	Unit Price	Quantity	Amount
1	***General***				
	Mobilization/Demobilization	LS	$700,000	1	$700,000
	Temporary Erosion and Pollution Control	CS	$350,000	1	$350,000
	Constr. Surveying by the Contractor	LS	$150,000	1	$150,000
	Construction Camp Facilities	LS	$350,000	1	$350,000
2	***Mooring Basin & Breakwaters***				
	Dredged Mooring Basin	CY	$8.00	40,000	$320,000
	(Includes placement as upland/breakwater fill where usable)				
	North Rubble Mound Breakwater	LF	$1,800	400	$720,000
	North Sheet Pile Wave Barrier	LF	$1,500	110	$165,000
	Protection Dolphin at Wave Barrier End	EA	$200,000	1	$200,000
	South Rubble Mound Breakwater	LF	$1,800	500	$900,000
	Navigational Aids	EA	$10,000	2	$20,000
3	***Marine Facilities***				
	Pile Supported Bridge Approach Abutment	LS	$100,000	1	$100,000
	20'x150' Steel Transfer Bridge	LS	$900,000	1	$900,000
	50'x80' Steel Bridge Float	LS	$1,600,000	1	$1,600,000
	(w/ Intermediate Ramp & Apron)				
	4-Pile Bridge Float Restraint Dolphins	EA	$250,000	2	$500,000
	5-Pile Breasting Dolphins	EA	$300,000	6	$1,800,000
	Electrical Power and Lighting System (Terminal)	LS	$300,000	1	$300,000
3	***Upland Improvements (Access/Staging Area)***				
	Import Embankment - Borrow	CY	$12.00	50,000	$600,000
	(Classified Materials)				
	Riprap Slope Protection (NIC Breakwaters)	CY	$30	6,000	$180,000
	12" Aggregate Surface Course	CY	$20.00	4,000	$80,000
	(Approx 103,000 sf)				
	Asphalt Concrete Surfacing (2" thick)	Ton	$60.00	1,200	$72,000
	(Approx 103,000 sf)				
	Metal Beam Guardrail	LF	$40	850	$34,000
	Potable Water Supply (Well & Piping)	LS	$200,000	1	$200,000
	Sanitary Sewer (Pkg Treatment Plant/Outfall)	LS	$300,000	1	$300,000
	Diesel Generator System, Bldg & Fuel Storage Tank	LS	$600,000	1	$600,000
	Electrical Power Supply & Area Lighting System	LS	$300,000	1	$300,000
4	***Building Structures***				
	Terminal Building (24'x40')	SF	$450	960.00	$432,000

Item Totals	*$11,873,000*
Estimating & Construction Contingencies @ 10%	$1,187,300
Construction Subtotal	***$13,060,300***
8% Design & Permitting	$1,044,824
8% Construction Admin	$1,044,824
4.3% ICAP	$561,592.90
Project Total =	***$15,711,541***

Prepared by: KDM Date: 10/05/05
Checked by: JDB Date:

SE Region - Marine Engineering

Project Construction Cost Estimate

PROJECT NUMBER: 71100
PROJECT TITLE: Juneau Access Ferry Terminals
DESCRIPTION: Katzehin Mooring Basin - Option 3

Item No.	Item	Units	Unit Price	Quantity	Amount
1	***General***				
	Mobilization/Demobilization	LS	$2,500,000	1	$2,500,000
	Temporary Erosion and Pollution Control	CS	$750,000	1	$750,000
	Constr. Surveying by the Contractor	LS	$225,000	1	$225,000
	Construction Camp Facilities	LS	$650,000	1	$650,000
2	***Mooring Basin & Breakwaters***				
	Dredged Mooring Basin	CY	$4.00	2,400,000	$9,600,000
	(Includes placement as upland/breakwater fill where usable)				
	North Rubble Mound Breakwater	LF	$1,200	2,600	$3,120,000
	South Rubble Mound Breakwater	LF	$1,200	1,500	$1,800,000
	Entrance Channel Markers/Guide Dolphins	EA	$150,000	4	$600,000
	Navigational Aids	EA	$10,000	4	$40,000
3	***Marine Facilities***				
	Pile Supported Bridge Approach Abutment	LS	$100,000	1	$100,000
	20'x150' Steel Transfer Bridge	LS	$900,000	1	$900,000
	50'x80' Steel Bridge Float	LS	$1,600,000	1	$1,600,000
	(w/ Intermediate Ramp & Apron)				
	4-Pile Bridge Float Restraint Dolphins	EA	$250,000	2	$500,000
	5-Pile Breasting Dolphins	EA	$300,000	4	$1,200,000
	Electrical Power and Lighting System (Terminal)	LS	$300,000	1	$300,000
4	***Upland Improvements (Staging Area)***				
	Misc. Import Embankment - Borrow	CY	$12.00	50,000	$600,000
	(Classified Materials)				
	Riprap Slope Protection (Class IV)	CY	$25	4,000	$100,000
	12" Aggregate Surface Course - Grading E	CY	$15.00	21,000	$315,000
	(Approx 600,000 sf)				
	Asphalt Concrete Surfacing (2" thick)	Ton	$60.00	7,000	$420,000
	(Approx 600,000 sf)				
	Metal Beam Guardrail	LF	$40	3,600	$144,000
	Potable Water Supply (Well & Piping)	LS	$200,000	1	$200,000
	Sanitary Sewer (Pkg Treatment Plant/Outfall)	LS	$300,000	1	$300,000
	Diesel Generator System, Bldg & Fuel Storage Tank	LS	$600,000	1	$600,000
	Electrical Power Supply & Area Lighting System	LS	$300,000	1	$300,000
5	***Building Structures***				
	Terminal Building	SF	$450	960.00	$432,000

Item Totals	*$27,296,000*
Estimating & Construction Contingencies @ 10%	$2,729,600
Construction Subtotal	***$30,025,600***
8% Design & Permitting	$2,402,048
8% Construction Admin	$2,402,048
4.3% ICAP	$1,291,100.80
Project Total =	***$36,120,797***

Prepared by: KDM **Date:** 10/29/03
Checked by: **Date:**

SE Region - Marine Engineering

Project Construction Cost Estimate

PROJECT NUMBER: 71100
PROJECT TITLE: Juneau Access Ferry Terminals
DESCRIPTION: William Henry Bay Ferry Terminal - Side Berth w/ Lift Bridge

Item No.	Item	Units	Unit Price	Quantity	Amount
1	***General***				
	Mobilization/Demobilization	LS	$700,000	1	$700,000
	Temporary Erosion and Pollution Control	CS	$25,000	1	$25,000
	Constr. Surveying by the Contractor	LS	$50,000	1	$50,000
	Construction Camp Facilities	LS	$200,000	1	$200,000
2	***Marine Facilities***				
	Pile Supported Bridge Approach Abutment	LS	$80,000	1	$80,000
	24' x 360' Pile Supported Approach Trestle	SF	$225	8,640	$1,944,000
	20'x142' Steel Transfer Bridge	LS	$800,000	1	$800,000
	Bridge Lift Towers & Syncro Lift or Counter Wt	EA	$1,000,000	2	$2,000,000
	5-Pile Breasting Dolphins	EA	$250,000	3	$750,000
	Electrical Power and Lighting System (Terminal)	LS	$425,000	1	$425,000
3	***Upland Improvements (Access/Staging Area)***				
	Clearing & Grubbing	LS	$60,000	1	$60,000
	Embankment (Local Excavation)	CY	$10.00	30,000	$300,000
	Riprap Slope Protection	CY	$40	6,200	$248,000
	12" Aggregate Surface Course (Approx 96,500 sf)	CY	$20.00	3,600	$72,000
	Asphalt Concrete Surfacing (2" thick) (Approx 96,500 sf)	Ton	$65.00	1,200	$78,000
	Metal Beam Guardrail	LF	$45	750	$33,750
	Potable Water Supply (Well & Piping)	LS	$225,000	1	$225,000
	Sanitary Sewer (Pkg Treatment Plant/Outfall)	LS	$325,000	1	$325,000
	Diesel Generator System, Bldg & Fuel Storage Tank	LS	$625,000	1	$625,000
	Electrical Power Supply & Area Lighting System	LS	$350,000	1	$350,000
4	***Building Structures***				
	Terminal Building (24'x40')	SF	$450	960.00	$432,000

Item Totals	*$9,722,750*
Estimating & Construction Contingencies @ 10%	$972,275
Construction Subtotal	***$10,695,025***
8% Design & Permitting	$855,602.00
8% Construction Admin	$855,602
4.3% ICAP	$459,886.08
Project Total =	***$12,866,115***

Prepared by: KDM Date: 10/05/05
Checked by: JDB Date:

SE Region - Marine Engineering

Project Construction Cost Estimate

PROJECT NUMBER: 71100
PROJECT TITLE: Auke Bay Ultimate Buildout - West Side
DESCRIPTION: Two Stern Berths & One Side Berth
Note: Use approx 75% of total project cost for Juneau Access Project.

Item No.	Item	Unit	Unit Price	Quantity	Amount
	General				
110	Mobilization	LS	$700,000	All Req'd.	$700,000
111(1)	Temporary Erosion and Pollution Control	CS	$25,000	All Req'd.	$25,000
112	Constr. Surveying by the Contractor	LS	$25,000	All Req'd.	$25,000
114	Traffic Maintenance and Control	LS	$12,500	All Req'd.	$12,500
116	Furnish and Maintain Field Office	LS	$25,000	All Req'd.	$25,000
201	Demolition & Removal	LS	$500,000	All Req'd.	$500,000
	Marine Facilities				
302(1)	140' Steel Transfer Bridge w/ Apron	EA	$900,000	2	$1,800,000
302(5a)	4-Pile Stern Float Restraint Dolphins	EA	$185,000	7	$1,295,000
302(5b)	3-Pile Float Restraint Dolphins	EA	$160,000	8	$1,280,000
302(6)	Lead In Stern Dolphin w/ Fender System	EA	$245,000	1	$245,000
302(7)	Berth Seperation Dolphins w/ Fender System	EA	$265,000	1	$265,000
302(8)	60'x200' Mooring Float	SF	$185	12,000	$2,220,000
302(12)	4-Pile, Mooring Float Restraint Dolphins	EA	$175,000	8	$1,400,000
502	Pile Supported Bridge Access Docks (2 ea) Steel Piles / Prestressed Concrete Deck	SF	$180	10,500	$1,890,000
626(1)	Sanitary Sewer Pumpout Piping	LF	$168	600	$100,500
627	Potable Water Supply Piping (Heat Trace, Arctic Pipe)	LF	$125	600	$75,000
680	Fuel Supply Piping (Welded Steel/Corrosion Control Wrapped)	LF	$125	600	$75,000
690	Electrical Power and Lighting System (Terminal)	LS	$500,000	All Req'd	$500,000

Item Totals	*$12,433,000*
Estimating & Construction Contingencies @ 10%	$1,243,300.00
Subtotal	*$13,676,300*
8% Design & Permitting	$1,094,104
8% Construction Admin	$1,094,104
4.3% ICAP	$588,080.90
Project Total =	***$16,452,589***
75% Attributable to Juneau Access =	***$12,339,442***

Prepared by: KDM **Date:** 10/05/05
Checked by: JDB **Date:**

FIGURES

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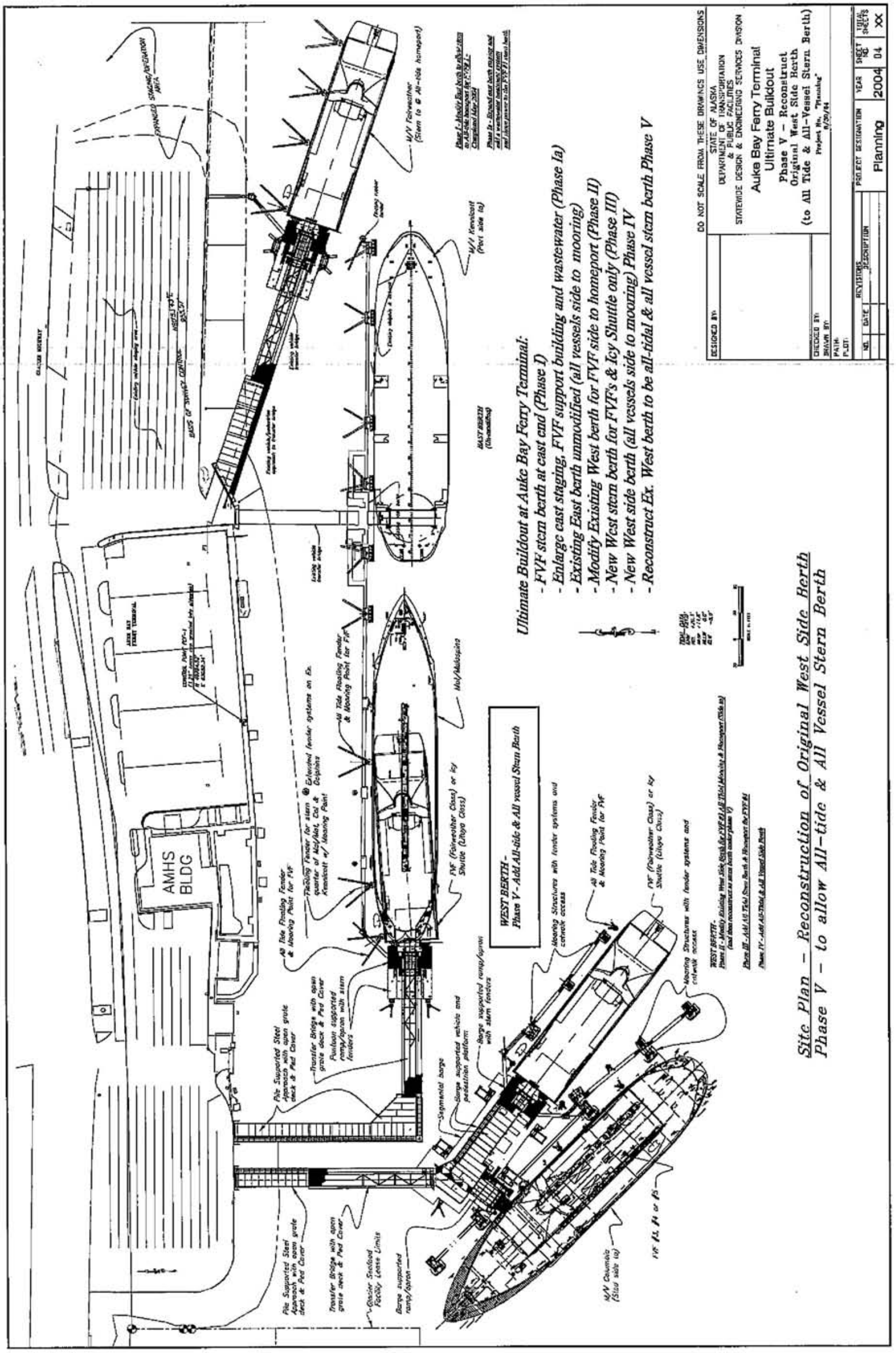
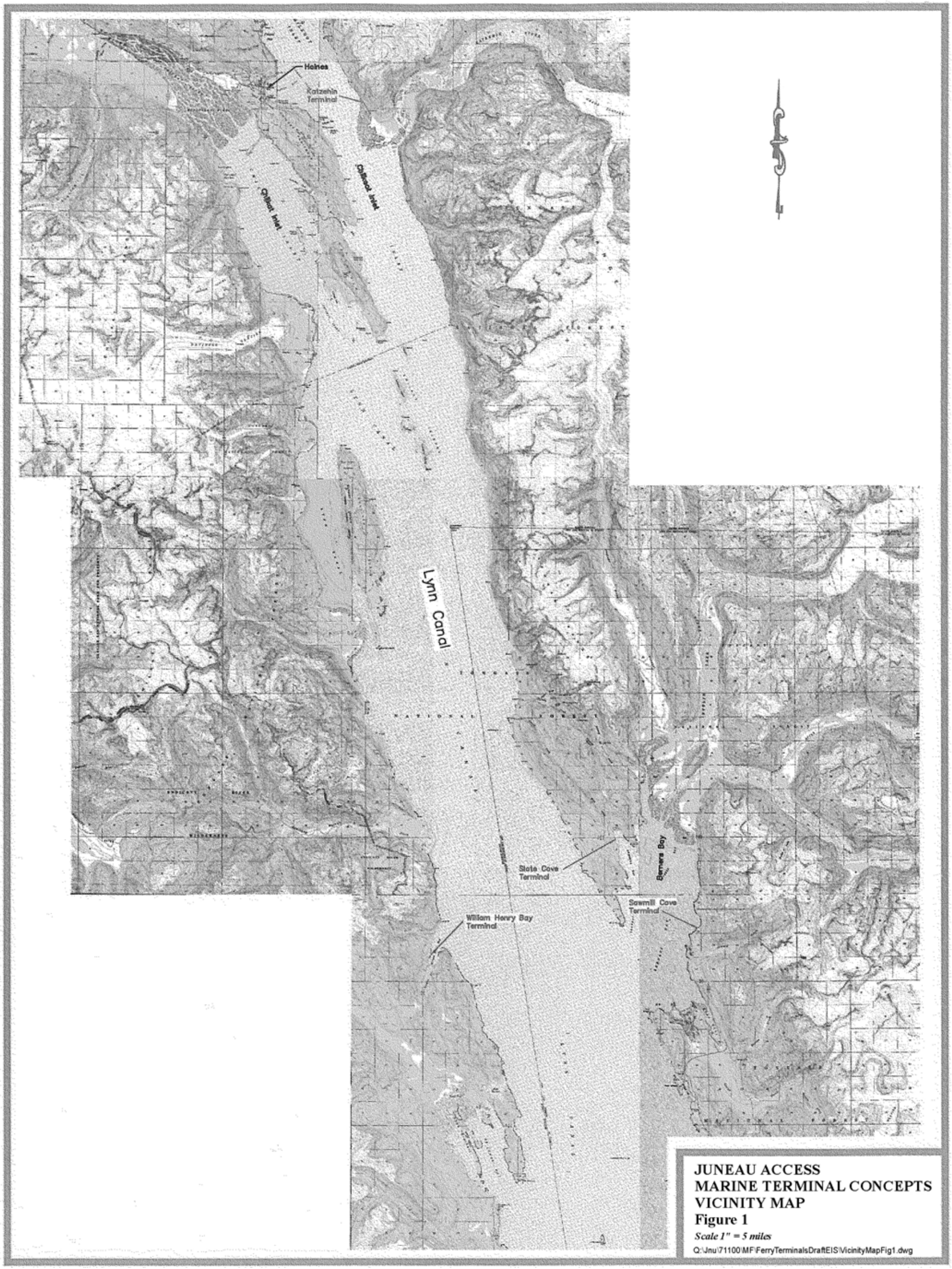
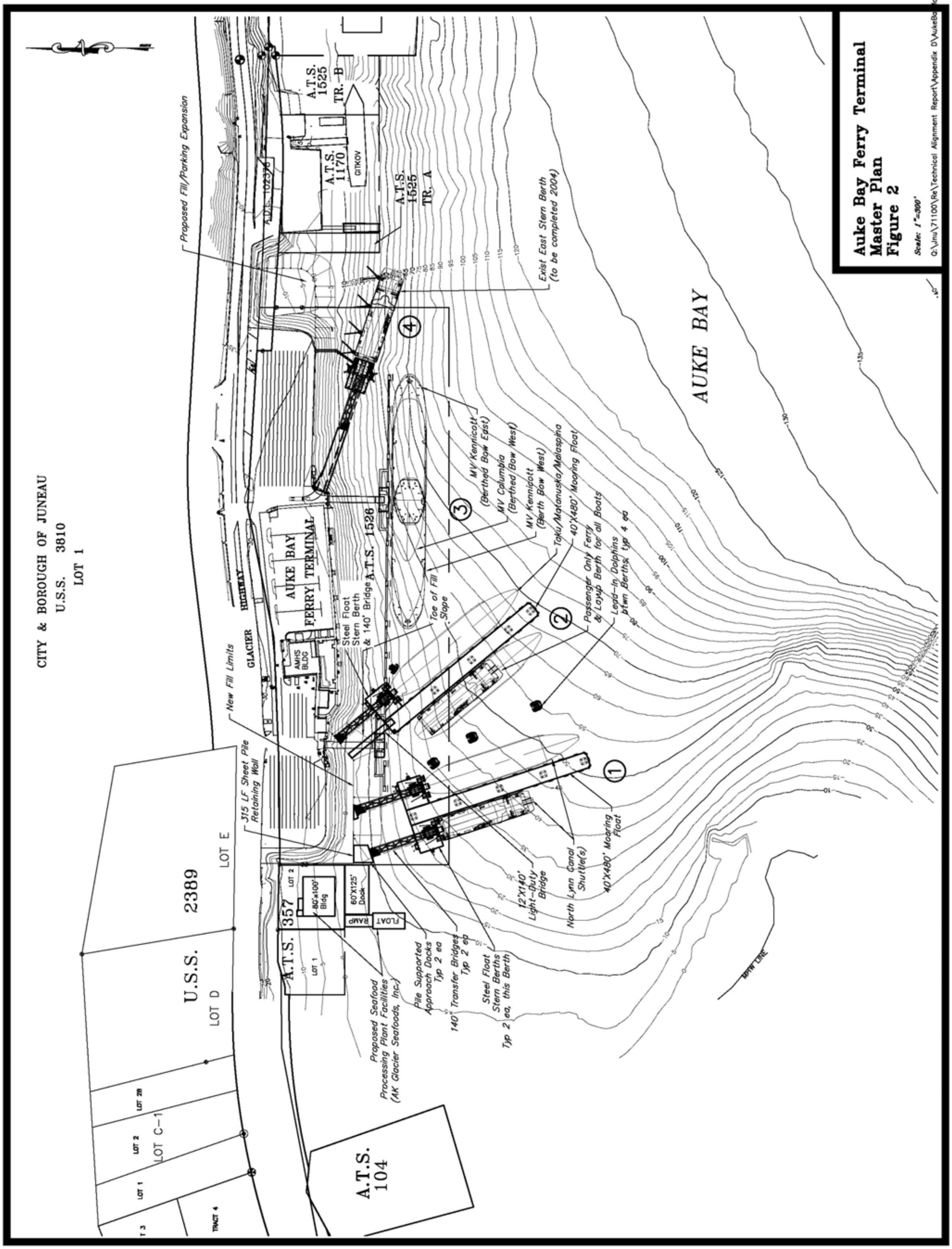
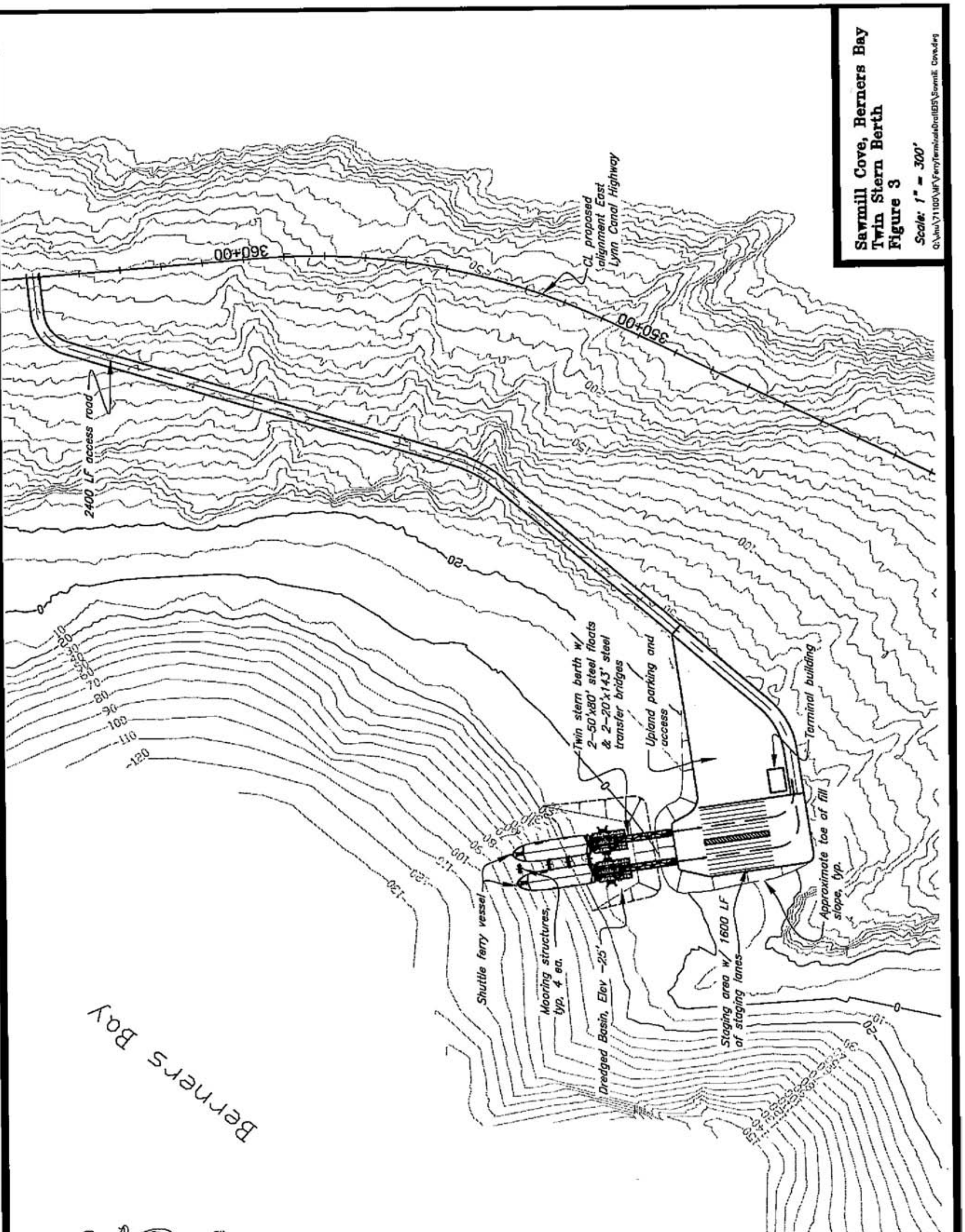

AMHS
BLDG
Pile Supported Steel Approach with open grate deck & Ped Cover
Transfer Bridge with open grate deck & Ped Cover
Glacier Seafood Facility Lease Limits
Barge supported ramp/apron
Segmental barge
Barge supported vehicle and pedestrian platform
Barge supported ramp/apron with stern fenders
Pontoon supported ramp/apron with stern fenders
All Tide Floating Fender & Mooring Point for FVF
Floating Fender for stern quarter of Mal/Mat, Col & Kennicott w/ Mooring Point
Extended fender systems on Ex. Dolphins
FVF (Fairweather Class) or Icy Shuttle (Lituya Class)
Mal/Malaspina
EAST BERTH (Un-modified)
M/V Kennicott (Port side to)
M/V Fairweather (Stern to @ All-tide homeport)
EXPANDED STAGING/OPERATION AREA
BASIS OF SURVEY CONTROL
WEST BERTH - Phase V - Add All-tide & All vessel Stern Berth
Mooring Structures with fender systems and catwalk access
M/V Columbia (Stbd side to)
FVF #3, #4 or #5
Ultimate Buildout at Auke Bay Ferry Terminal:
- FVF stern berth at east end (Phase I)
- Enlarge east staging, FVF support building and wastewater (Phase Ia)
- Existing East berth unmodified (all vessels side to mooring)
- Modify Existing West berth for FVF side to homeport (Phase II)
- New West stern berth for FVF's & Icy Shuttle only (Phase III)
- New West side berth (all vessels side to mooring) Phase IV
- Reconstruct Ex. West berth to be all-tidal & all vessel stern berth Phase V
DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES
STATEWIDE DESIGN & ENGINEERING SERVICES DIVISION
Auke Bay Ferry Terminal
Ultimate Buildout
Phase V - Reconstruct Original West Side Berth (to All Tide & All-Vessel Stern Berth)
DESIGNED BY:
CHECKED BY:
DRAWN BY:
PATH:
PLOT:
REVISIONS
NO. DATE DESCRIPTION
PROJECT DESIGNATION
Planning
YEAR
2004
SHEET NO.
04
TOTAL SHEETS
XX
Site Plan - Reconstruction of Original West Side Berth
Phase V - to allow All-tide & All Vessel Stern Berth



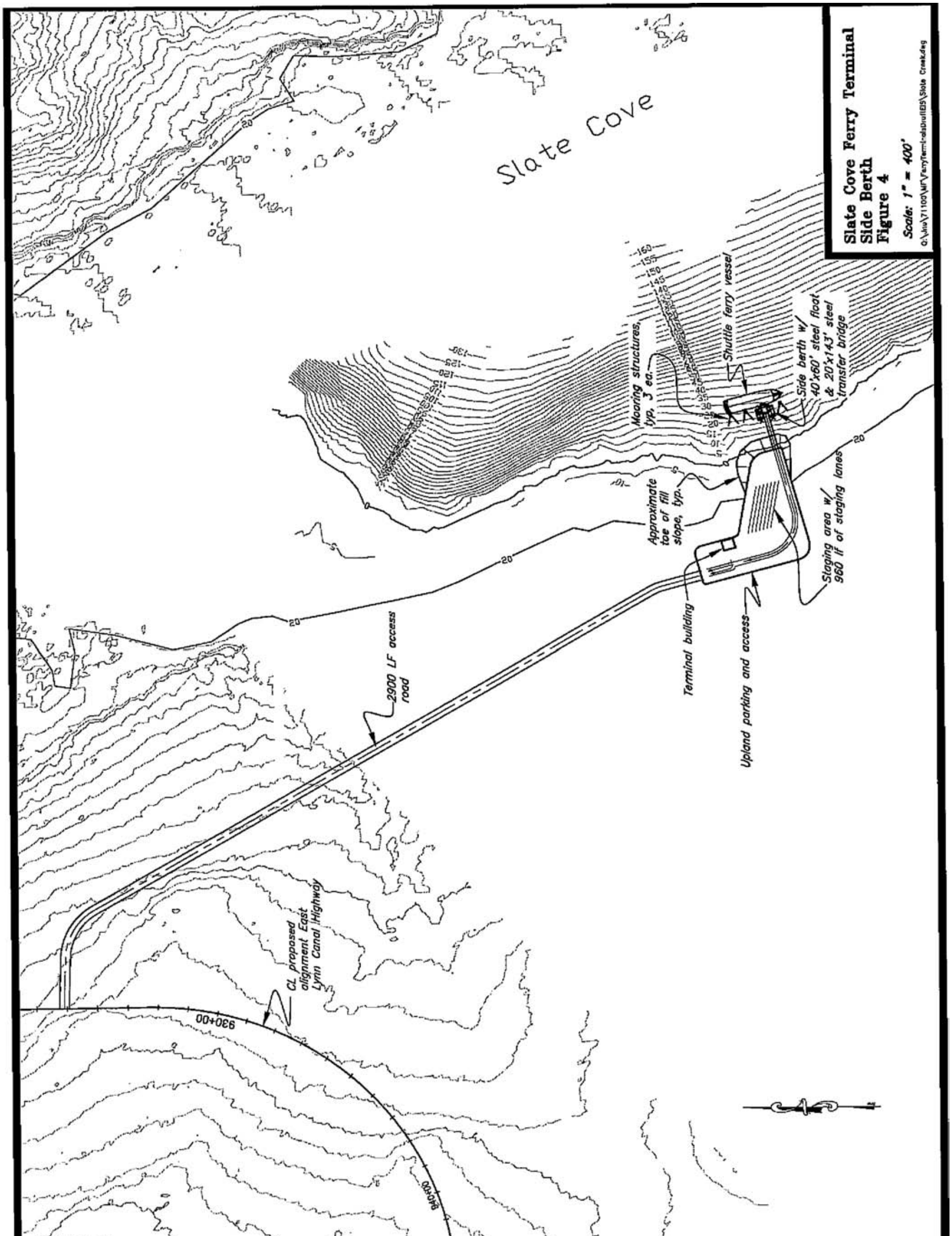
JUNEAU ACCESS
MARINE TERMINAL CONCEPTS
VICINITY MAP
Figure 1
Scale 1" = 5 miles
Q:\Jnu\71100\MF\FerryTerminalsDraftEIS\VicinityMapFig1.dwg

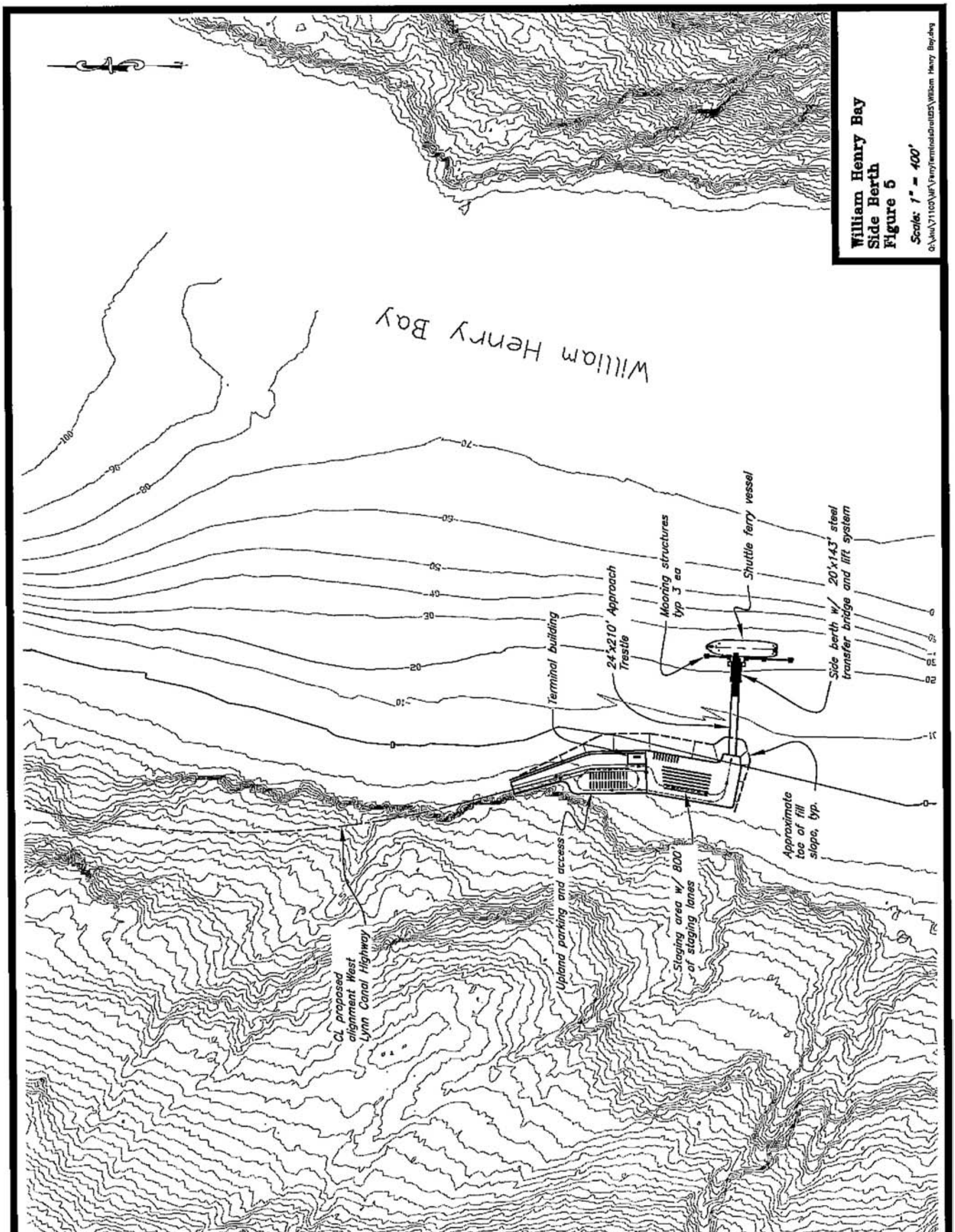


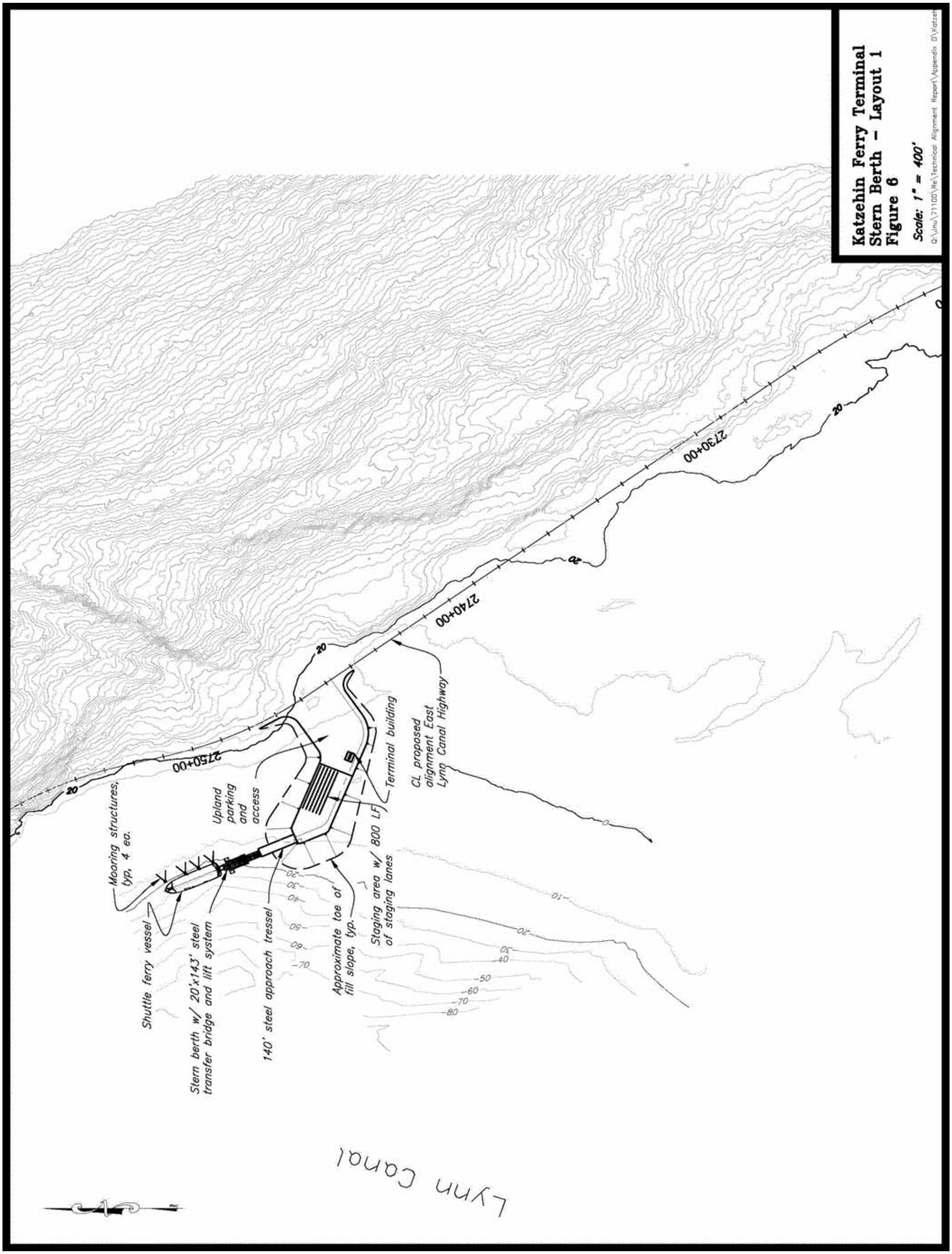
Auke Bay Ferry Terminal
Master Plan
Figure 2
Scale: 1"=300'
CITY & BOROUGH OF JUNEAU
U.S.S. 3810
LOT 1
AUKE BAY
AUKE BAY FERRY TERMINAL
GLACIER HIGHWAY
AMHS BLDG
A.T.S. 1526
A.T.S. 1525
TR. A
A.T.S. 1525
TR. B
A.T.S. 1170
GITKOV
A.T.S. 104
U.S.S. 2389
LOT D
LOT E
LOT C-1
A.T.S. 357
60'X125' Dock
80'x100' Bldg
FLOAT
RAMP
Proposed Fill/Parking Expansion
Exist East Stern Berth (to be completed 2004)
MV Kennicott (Berthed Bow East)
MV Columbia (Berthed Bow West)
MV Kennicott (Berth Bow West)
Taku/Matanuska/Malaspina
40'X480' Mooring Float
Passenger Only Ferry & Layup Berth for all Boats
Lead-In Dolphins btwn Berths, typ 4 ea
Steel Float Stern Berth & 140' Bridge
Toe of Fill Slope
New Fill Limits
315 LF Sheet Pile Retaining Wall
12'X140' Light-Duty Bridge
North Lynn Canal Shuttle(s)
40'X480' Mooring Float
Proposed Seafood Processing Plant Facilities (AK Glacier Seafoods, Inc.)
Pile Supported Approach Docks Typ 2 ea
140' Transfer Bridges Typ 2 ea
Steel Float Stern Berths Typ 2 ea, this Berth
MHW LINE

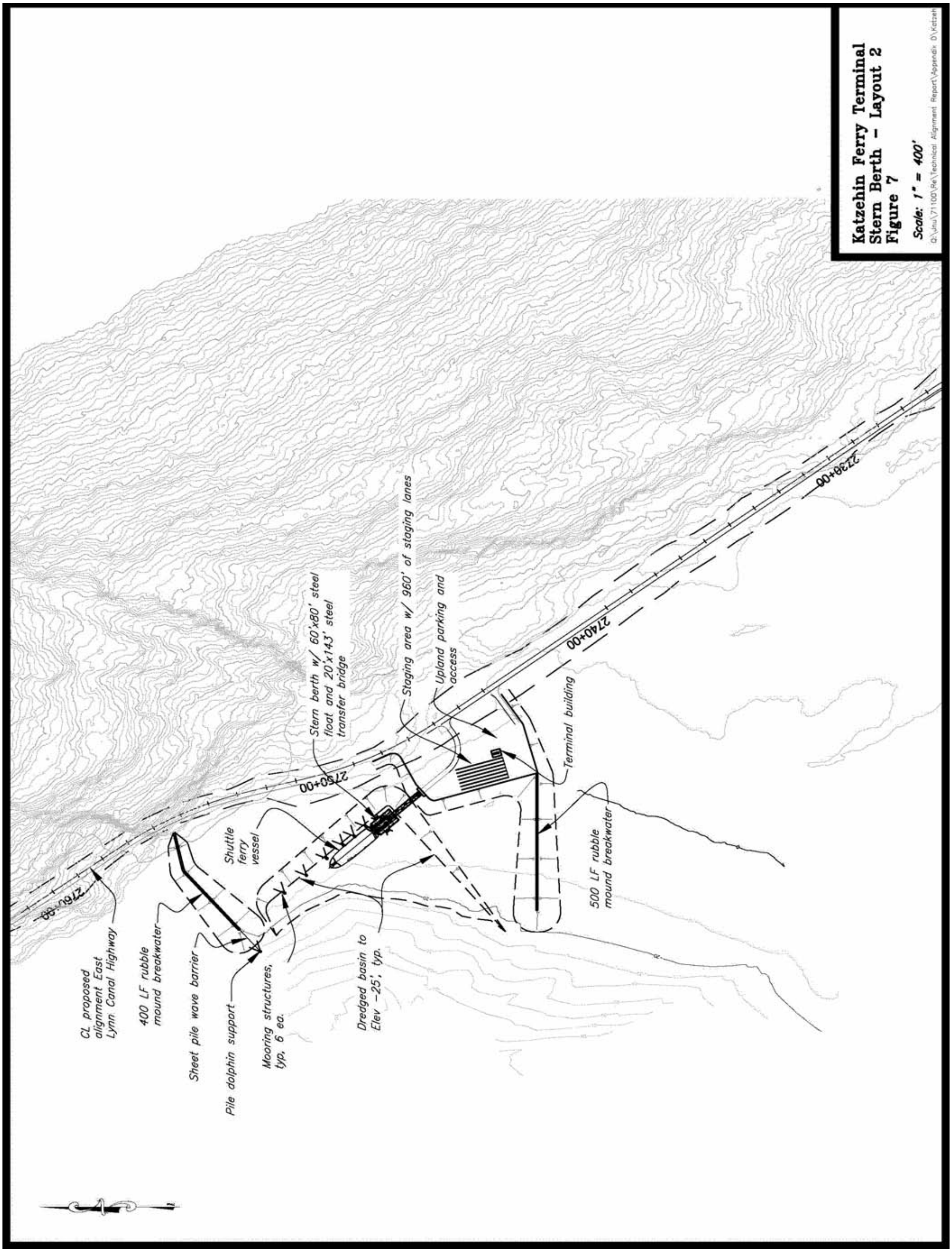


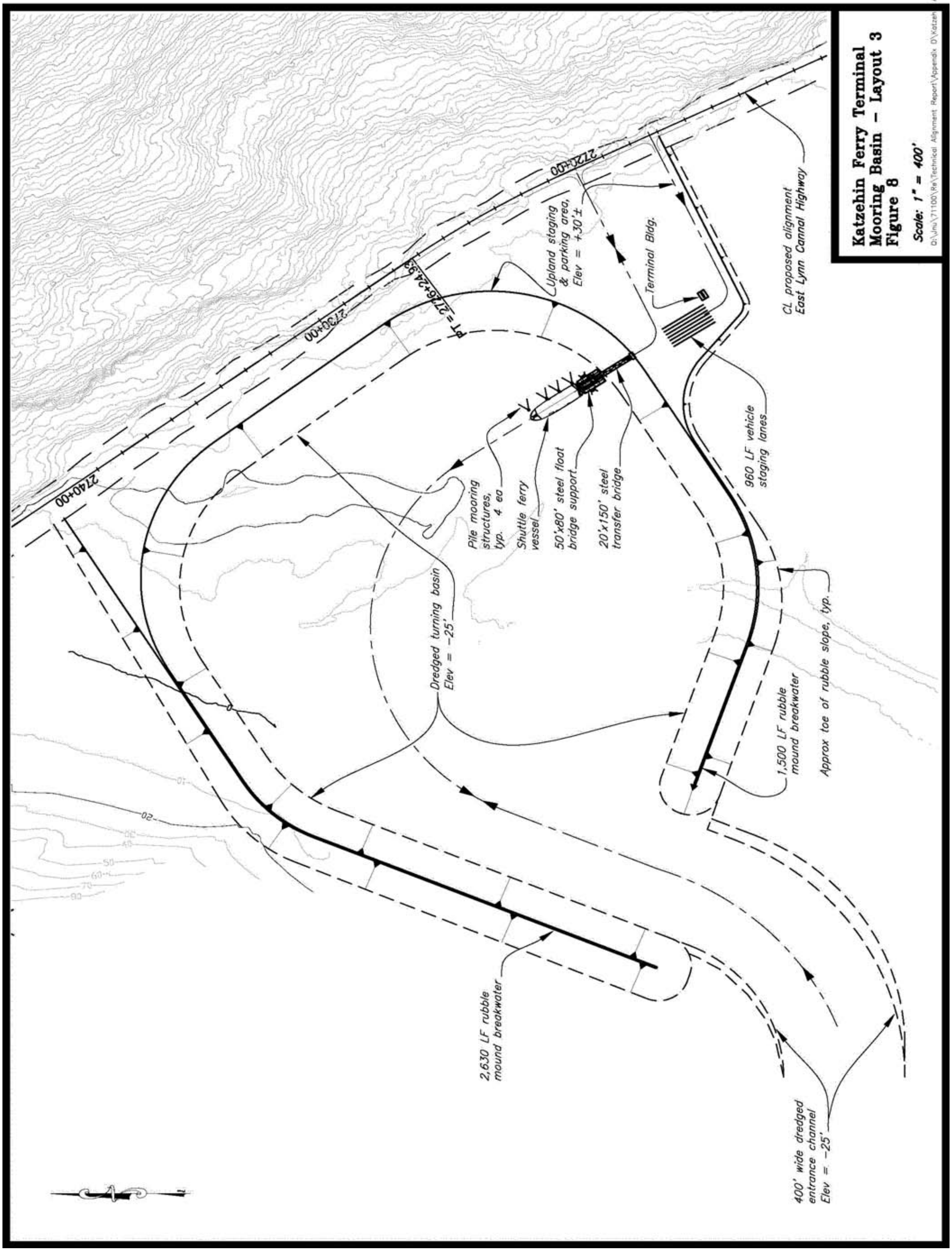
Sawmill Cove, Berners Bay
Twin Stern Berth
Figure 3
Scale: 1" = 300'
CL proposed alignment East Lynn Canal Highway
360+00
350+00
2400 LF access road
Twin stern berth w/ 2–50'x80' steel floats & 2–20'x143' steel transfer bridges
Upland parking and access
Terminal building
Approximate toe of fill slope, typ.
Staging area w/ 1600 LF of staging lanes
Dredged Basin, Elev –25'
Mooring structures, typ. 4 ea.
Shuttle ferry vessel
Berners Bay


Slate Cove Ferry Terminal
Side Berth
Figure 4
Scale: 1" = 400'
Slate Cove
Mooring structures, typ. 3 ea.
Shuttle ferry vessel
Side berth w/ 40'x60' steel float & 20'x143' steel transfer bridge
Approximate toe of fill slope, typ.
Staging area w/ 960 lf of staging lanes
Terminal building
Upland parking and access
2900 LF access road
CL proposed alignment East Lynn Canal Highway
930+00
940+00


William Henry Bay
Side Berth
Figure 5
Scale: 1" = 400'
William Henry Bay
Terminal building
24'x210' Approach Trestle
Mooring structures typ 3 ea
Shuttle ferry vessel
Side berth w/ 20'x143' steel transfer bridge and lift system
Approximate toe of fill slope, typ.
Staging area w/ 800' of staging lanes
Upland parking and access
CL proposed alignment West Lynn Canal Highway


Katzehin Ferry Terminal
Stern Berth – Layout 1
Figure 6
Scale: 1" = 400'
Mooring structures, typ. 4 ea.
Shuttle ferry vessel
Stern berth w/ 20'x143' steel transfer bridge and lift system
140' steel approach tressel
Approximate toe of fill slope, typ.
Staging area w/ 800 LF of staging lanes
Upland parking and access
Terminal building
CL proposed alignment East Lynn Canal Highway
2730+00
2740+00
2750+00
Lynn Canal


Katzehin Ferry Terminal
Stern Berth – Layout 2
Figure 7
Scale: 1" = 400'
Stern berth w/ 60'x80' steel float and 20'x143' steel transfer bridge
Staging area w/ 960' of staging lanes
Upland parking and access
Terminal building
500 LF rubble mound breakwater
Shuttle ferry vessel
CL proposed alignment East Lynn Canal Highway
400 LF rubble mound breakwater
Sheet pile wave barrier
Pile dolphin support
Mooring structures, typ, 6 ea.
Dredged basin to Elev -25', typ.
2760+00
2750+00
2740+00
2730+00


Katzehin Ferry Terminal
Mooring Basin – Layout 3
Figure 8
Scale: 1" = 400'
CL proposed alignment
East Lynn Cannal Highway
Upland staging & parking area, Elev = +30'±
Terminal Bldg.
960 LF vehicle staging lanes
Pile mooring structures, typ. 4 ea
Shuttle ferry vessel
50'x80' steel float bridge support
20'x150' steel transfer bridge
Dredged turning basin Elev = -25'
1,500 LF rubble mound breakwater
Approx toe of rubble slope, typ.
2,630 LF rubble mound breakwater
400' wide dredged entrance channel Elev = -25'
2720+00
2730+00
2740+00
PT = 2726+24.93

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REVISED ATTACHMENT E
ENGINEER'S ESTIMATES

The engineer's estimates for Alternatives 2B, 3, 4B, and 4D have been updated to reflect the current layouts, quantities, and unit prices.

Updated earthwork tables are also provided for Alternatives 2B, 3, 4B, and 4D.

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Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Southeast Region

Project Name: **Juneau Access**

Project Number: **71100-alt2b_Final**

Item No	Pay Item	Pay Unit	Unit Price	Quantity	Amount
		Basic Bid			
201(1A)	Clearing	Lump Sum	$575,000.00	All Required	$575,000.00
203 (2)	Rock Excavation	Cubic Yard	$6.50	6475600	$42,091,400.00
203 (3)	Unclassified Excavation	Cubic Yard	$2.50	993300	$2,483,250.00
203 (10)	Controlled Blasting	Square Yard	$10.00	594500	$5,945,000.00
301(2)	Crushed Aggregate Base	Cubic Yard	$20.00	10600	$212,000.00
307(3)	EATB	Square Yard	$5.11	858100	$4,384,891.00
401(1)	Asphalt Concrete Pavement	Ton	$23.00	104397	$2,401,131.00
401(2)	Asphalt Cement	Ton	$250.00	6264	$1,566,000.00
501(1)	Bridge Structure	Linear Foot	$4,400.00	10256	$45,126,400.00
602(2)	Structural Plate Pipe	Linear Foot	$600.00	80	$48,000.00
603(17-24)	24-inch pipe	Linear Foot	$45.00	20708	$931,860.00
603(17-36)	36-inch pipe	Linear Foot	$59.50	7862	$467,789.00
603(17-48)	48-Inch Pipe	Linear Foot	$76.50	3600	$275,400.00
603(17-72)	72-Inch Pipe	Linear Foot	$108.00	2304	$248,832.00
606(1)	W-beam guardrail	Linear Foot	$16.00	29266	$468,256.00
606(11)	Terminal End Section	Each	$2,000.00	182	$364,000.00
611(1)	Riprap	Cubic Yard	$6.00	574500	$3,447,000.00
614(1a)	Monumentation with cases	Each	$500.00	370	$185,000.00
615(1)	Standard Sign	Square Foot	$50.00	4000	$200,000.00
618(1)	Seeding	Lump Sum	$80,000.00	All Required	$80,000.00
633(1)	Silt Fence	Linear Foot	$1.00	186000	$186,000.00
637(1)	MSE Wall	Square Foot	$31.00	543790	$16,857,490.00
637(2)	Screening Structure	Lump Sum	$584,000	All Required	$584,000
640 (4)	Worker Meals and Lodging, or Per Diem	Lump Sum	$1,000,000.00	All Required	$1,000,000.00
640(1)	Mobilization and Demobilization	Lump Sum	$10,975,000.00	All Required	$10,975,000.00
641(1)	Erosion and Pollution Control	Contingent Sum	$370,000.00	All Required	$370,000.00

Prepared by <u>**Chuck Hakari**</u> **Date 09/06/05** **Checked by** <u>**Jack Beedle**</u> **Date 09/06/05**

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Southeast Region

Project Name: **Juneau Access**

Project Number: **71100-alt2b_Final**

Item No	Pay Item	Pay Unit	Unit Price	Quantity	Amount
642(1)	Construction Surveying	Lump Sum	$1,400,000.00	All Required	$1,400,000.00
670 (1)	Painted Pavement Markings	Lump Sum	$177,500.00	All Required	$177,500.00
670 (8)	Recessed Pavement Marker	Each	$25.00	6566	$164,150.00
			Basic Bid	Subtotal:	$143,215,349.00

********************************Project Summary********************************

Project Subtotal:	$143,215,349.00
Contingencies @ 8.00%	$11,457,227.92
Construction Engineering @ 8.00 %	$12,373,806.15
Construction Subtotal:	$167,046,383.07
4.30 % ICAP	$7,182,994.47
Highway Construction Total	$174,229,377.54

Preliminary Development	$8,000,000.00
Mitigation	$3,000,000.00
Right of Way	$45,000.00
Maintenance Building	$1,000,000.00
Avalanche Control CIP	$2,670,000.00
Highway Sub Total	$189,000,000.00
Terminal Construction	$15,700,000.00
Highway & Terminal Sub Total	$204,700,000.00
Vessel Construction	$53,000,000.00
Project Total	$257,700,000.00

Prepared by **Chuck Hakari** **Date 09/06/05** **Checked by** **Jack Beedle** **Date 09/06/05**

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Southeast Region

Project Name: Juneau Access

Project Number: 71100-alt3_Final

Item No	Pay Item	Pay Unit	Unit Price	Quantity	Amount
		Basic Bid			
201(1A)	Clearing	Lump Sum	$530,000.00	All Required	$530,000.00
203 (2)	Rock Excavation	Cubic Yard	$6.50	4060000	$26,390,000.00
203 (3)	Unclassified Excavation	Cubic Yard	$2.50	2118000	$5,295,000.00
203(10)	Controlled Blasting	Square Yard	$10.00	77918	$779,180.00
301(2)	Crushed Aggregate Base	Cubic Yard	$20.00	8943	$178,860.00
307(3)	EATB	Square Yard	$5.11	724383	$3,701,597.13
401(1)	Asphalt Concrete Pavement	Ton	$23.00	90948	$2,091,804.00
401(2)	Asphalt Cement	Ton	$250.00	5460	$1,365,000.00
501(1)	Bridge Structure	Linear Foot	$4,400.00	15885	$69,894,000.00
602(2)	Structural Plate Pipe	Linear Foot	$600.00	2232	$1,339,200.00
603(17-24)	24-inch pipe	Linear Foot	$45.00	14088	$633,960.00
603(17-36)	36-inch pipe	Linear Foot	$59.50	13026	$775,047.00
603(17-48)	48-Inch Pipe	Linear Foot	$76.50	3560	$272,340.00
603(17-72)	72-Inch Pipe	Linear Foot	$108.00	3844	$415,152.00
606(1)	W-beam guardrail	Linear Foot	$16.00	8900	$142,400.00
606(11)	Terminal End Section	Each	$2,000.00	130	$260,000.00
611(1)	Riprap	Cubic Yard	$6.00	164500	$987,000.00
614(1a)	Monumentation with cases	Each	$500.00	208	$104,000.00
615(1)	Standard Sign	Square Foot	$50.00	3400	$170,000.00
618(1)	Seeding	Lump Sum	$200,000.00	All Required	$200,000.00
633(1)	Silt Fence	Linear Foot	$1.00	206000	$206,000.00
637(1)	MSE Wall	Square Foot	$31.00	77446	$2,400,826.00
640 (4)	Worker Meals and Lodging, or Per Diem	Lump Sum	$1,000,000.00	All Required	$1,000,000.00
640(1)	Mobilization and Demobilizaiton	Lump Sum	$9,950,000.00	All Required	$9,950,000.00
641(1)	Erosion and Pollution Control	Contingent Sum	$350,000.00	All Required	$350,000.00

Prepared by <u>Chuck Hakari</u> **Date** 09/06/05 **Checked by** <u>Jack Beedle</u> **Date** 09/06/05

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Southeast Region

Project Name: **Juneau Access**

Project Number: **71100-alt3_Final**

Item No	Pay Item	Pay Unit	Unit Price	Quantity	Amount
642(1)	Construction Surveying	Lump Sum	$1,300,000.00	All Required	$1,300,000.00
670 (1)	Painted Pavement Markings	Lump Sum	$155,000.00	All Required	$155,000.00
670 (8)	Recessed Pavement Marker	Each	$25.00	4052	$101,300.00
			Basic Bid	Subtotal:	$130,987,666.13

******************************Project Summary******************************

Project Subtotal:	$131,987,666.13
Contingencies @ 8.00%	$10,479,013.29
Construction Engineering @ 8.00 %	$11,317,334.35
Construction Subtotal:	$152,784,013.77
4.30 % ICAP	$6,569,712.59
Highway Construction Total	$159,353,726.36

Preliminary Development	$8,500,000.00
Mitigation	$3,000,000.00
Right of Way	$1,255,000.00
Maintenance Building	$500,000.00
Avalanche Control CIP	$2,640,000.00
Highway Sub Total	$175,250,000.00
Terminal Construction	$27,600,000.00
Highway & Terminal Sub Total	$202,850,000.00
Vessel Construction	$65,000,000.00
Project Total	$267,850,000.00

Prepared by <u>Chuck Hakari</u> **Date** 09/06/05 **Checked by** <u>Jack Beedle</u> **Date** 09/06/05

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Southeast Region

Project Name: **Juneau Access**

Project Number: **71100-alt4b,d_Final**

Basic Bid

Item No	Pay Item	Pay Unit	Unit Price	Quantity	Amount
201(1A)	Clearing	Lump Sum	$10,000.00	All Required	$10,000.00
203 (2)	Rock Excavation	Cubic Yard	$6.50	270500	$1,758,250.00
203 (3)	Unclassified Excavation	Cubic Yard	$2.50	270500	$676,250.00
203(10)	Controlled Blasting	Squard Yard	$10.00	15400	$154,000.00
301(2)	Crushed Aggregate Base	Cubic Yard	$20.00	1100	$22,000.00
307(3)	EATB	Square Yard	$5.11	73000	$373,030.00
401(1)	Asphalt Concrete Pavement	Ton	$23.00	8500	$195,500.00
401(2)	Asphalt Cement	Ton	$250.00	510	$127,500.00
501(1)	Bridge Structure	Linear Foot	$4,400.00	100	$440,000.00
603(17-24)	24-inch pipe	Linear Foot	$45.00	2560	$115,200.00
603(17-36)	36-Inch Pipe	Linear Foot	$59.50	908	$54,026.00
603(17-48)	48-inch pipe	Linear Foot	$76.50	444	$33,966.00
603(17-72)	72-Inch Pipe	Linear Foot	$108.00	132	$14,256.00
606 (1)	W-beam guardrail	Linear Foot	$16.00	630	$10,080.00
606(11)	Terminal End Section	Each	$2,000.00	6	$12,000.00
611 (1)	Riprap	Cubic Yard	$6.00	1000	$6,000.00
614(1a)	Monumentation with cases	Each	$500.00	30	$15,000.00
615 (1)	Standard Sign	Square Foot	$50.00	200	$10,000.00
618 (1)	Seeding	Lump Sum	$10,000.00	All Required	$10,000.00
633 (1)	Silt Fence	Linear Foot	$1.00	20000	$20,000.00
637 (1)	MSE Wall	Square Foot	$31.00	350	$10,850.00
640 (1)	Mobilization and Demobilization	Lump Sum	$170,000.00	All Required	$170,000.00
640 (4)	Worker Meals and Lodging, or Per Diem	Lump Sum	$100,000.00	All Required	$100,000.00
641 (1)	Erosion and Pollution Control	Contingent Sum	$20,000.00	All Required	$20,000.00
642 (1)	Construction Surveying	Lump Sum	$20,000.00	All Required	$20,000.00

Prepared by **Chuck Hakari** **Date: 09/06/05** **Checked by** **Jack Beedle** **Date: 09/06/05**

Engineers Estimate

State of Alaska -- Department of Transportation and Public Facilities -- Southeast Region

Project Name: **Juneau Access**

Project Number: **71100-alt4b,d_Final**

Item No	Pay Item	Pay Unit	Unit Price	Quantity	Amount
670 (1)	Painted Pavement Markings	Lump Sum	$25,000.00	All Required	$25,000.00
670 (8)	Recessed Pavement Marker	Each	$25.00	330	$8,250.00
			Basic Bid	Subtotal:	$4,411,158.00

******************************Project Summary*****************************

Project Subtotal:	$4,411,158.00
Contingencies @ 8.00%	$352,892.64
Construction Engineering @ 8.00 %	$381,124.05
Construction Subtotal:	$5,145,174.69
4.30 % ICAP	$221,242.51
Highway Construction Total	$5,366,417.20

Preliminary Development	$200,000.00
Mitigation	$30,000.00
Right of Way	$0.00
Highway Sub Total	$5,600,000.00
Terminal Construction	$27,000,000.00
Highway & Terminal Sub Total	$32,600,000.00
Alternative 4B Vessel Construction	$109,000,000.00
Project Total Alternative 4B	$141,600,000.00
Alternative 4D Vessel Construction	$70,000,000.00
Project Total Alternative 4D	$102,600,000.00

Prepared by **Chuck Hakari** **Date: 09/06/05** **Checked by** **Jack Beedle** **Date: 09/06/05**

East Lynn Canal Alternative 2B

Segment	Total Volume of Excavation	% Rock	Rock Excavation	Unclassified Excavation	Embankment	Processed Materials	Select "A"	Total Volume of Embankment
Echo Cove to Berners Bay Crossing Station 73+14 to Station 560+00	1,330,608	91.00%	1,210,853	119,755	347,949	32,214	81,611	461,774
Berners Bay Crossing Station 560+00 to Station 761+00	1,588	0.00%	0	1,588	472,910	7,680	17,231	497,822
Berners Bay Crossing to Independence Lake Station 761+00 to Station 1390+00	1,158,405	34.00%	393,858	764,547	880,350	38,127	96,385	1,014,862
Independence Lake North Station 1390+00 to Station 1503+00	39,942	95.00%	37,945	1,997	316,990	6,865	17,371	341,226
Met Point South Station 1503+00 to Station 1640+00	667,583	97.00%	647,556	20,027	129,588	8,327	21,074	158,989
Met Point North to Level Point Station 1640+00 to Station 2150+00	1,411,380	98.00%	1,383,152	28,228	1,250,097	31,092	78,797	1,359,985
Level Point to Katzehin River Station 2150+00 to Station 2590+00	2,843,628	98.00%	2,786,755	56,873	410,393	26,547	66,973	503,914
South Katzehin River to Katzehin Point Station 2590+00 to Station 2754+00	15,791	98.00%	15,475	316	820,682	9,040	21,849	851,572
TOTAL	**7,468,925**	-	**6,475,594**	**993,331**	**4,628,959**	**159,892**	**401,292**	**5,190,143**

West Lynn Canal Alternative 3

Segment	Total Volume of Excavation	% Rock	Rock Excavation	Unclassified Excavation	Embankment	Processed Materials	Select "A"	Total Volume of Embankment
Echo Cove to Sawmill Cove Station 73+14 to Station 343+00	541,000	50%	270,500	270,500	136,700	21,998	55,748	214,446
William Henry Bay to Endicott River Crossing Station 4025+00 to Station 4293+00	1,161,928	71%	824,969	336,959	290,517	16,072	40,438	347,028
Endicott River Crossing Station 4293+00 to Statoin 4346+00	2,574	56%	1,441	1,133	337,576	2,770	6,508	346,854
Endicott River Crossing to the Sullivan River Crossing Station 4346+00 to Station 4757+00	1,915,360	56%	1,072,602	842,758	650,934	24,682	62,139	737,755
Sullivan River Crossing Station 4757+00 to Station 4910+00	303,553	50%	151,777	151,777	417,444	9,026	22,540	449,010
Sullivan River Crossing North Station 4910+00 to Station 5107+00	397,009	50%	198,505	198,505	160,624	11,992	30,372	202,988
Glacier Point S Base South Station 5107+00 to Station 5412+00	642,449	81%	520,384	122,065	512,754	18,239	45,829	576,822
Davidson Glacier Station 5412+00 to Station 5660+00	122,512	84%	102,910	19,602	494,915	14,767	37,035	546,718
South Chilkat River Station 5660+00 to Station 5970+00	1,091,544	84%	916,897	174,647	547,987	18,473	46,345	612,805
Chilkat River Crossing Station 5970+00 to Station 6078+00	106	100%	106	0	139,978	2,685	2,479	145,142
TOTAL	**5,637,035**	-	**4,060,090**	**2,117,945**	**3,552,729**	**140,704**	**349,435**	**4,179,567**

East Lynn Canal Alternative 4B and 4D

Segment	Total Volume of Excavation	% Rock	Rock Excavation	Unclassified Excavation	Embankment	Processed Materials	Select "A"	Total Volume of Embankment
Echo Cove to Sawmill Cove Station 73+14 to Station 343+00	541,000	50.00%	270,500	270,500	136,700	21,998	55,748	214,446
TOTAL	541,000	-	270,500	270,500	136,700	21,998	55,748	214,446

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NEW ATTACHMENT F
ENGINEER'S ESTIMATE – UNIT PRICE ANAYLSIS

This is a new attachment that explains how the unit prices for major items were established.

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Overview

There are several factors that affect the estimated unit bid prices for the Juneau Access Improvements Project:

1. Large quantities will provide economies of scale that will result in unit prices significantly lower than usual Southeast Alaska unit prices.

2. Unlimited use of off-road equipment will result in lower unit prices.

3. Numerous access points from which to construct the project will result in lower unit prices.

4. Barge access points at Slate Cove near the Berner's/Lace and Antler/Gilkey River Crossings and at Katzehin Ferry Terminal near the Katzehin River Crossing allows use of economical over length and overweight components in construction of the major river crossings.

5. Perhaps the most significant factor is that there will be no public access conflicts, which usually slow down construction, during the duration of the project. This will result in lower unit prices for almost every bid item on the project.

   Working around buildings and maintaining traffic flow can impact efficiency, productivity and unit bid prices by 50 percent or more. The Juneau Access Improvements Project will not contend with private vehicle traffic or work in proximity to buildings any time during construction.

The importance of this last factor is demonstrated by the Juneau Cascade Point Road Project. Bid in December 2004 and currently under construction, this 20-foot-wide by 3.2-mile-long project's total price was $810,000 or approximately $250,000 per mile. The project is being constructed in the same area as the Juneau Access Improvements Project and had no private vehicle traffic or buildings to contend with. The Cascade Point Road Project included clearing, culverts, excavation and embankment. It did not include base, pavement, and guardrail. A similar project being built while maintaining traffic control would be expected to cost over $500,000 per mile.

Methodology

Quantities were calculated for each Pay Item for each Juneau Access Improvements Project Alternative. Bid Tabulations for projects bid statewide were reviewed for similar pay items and quantities. Unit prices were adjusted up or down to take into account Juneau Access estimating factors and inflation. The Juneau Access Improvements Project Alternative quantities were multiplied by the established unit price to obtain each pay item's estimated cost.

Inflation

Estimated inflation since the time the similar projects were bid was based on data from the Federal Bureau of Labor Statistics summarized in the following table:

Year Bid	Anchorage CPI	CPI Adjustment Factor	Producer Price Index	PPI Adjustment Factor
1998	146.9	1.135	146.8	1.134
1999	148.4	1.123	148.9	1.118
2000	151.0	1.104	150.7	1.104
2001	155.2	1.074	150.6	1.104
2002	158.2	1.054	151.3	1.100
2003	162.5	1.026	153.6	1.083
2004	166.7	1.000	166.4	1.000

The Anchorage Consumer Price Index (CPI) identifies inflation in the Anchorage area. The Producer Price Index (PPI) is a measure of inflation on national materials and components of construction. The Anchorage CPI and the PPI show a strong correlation in inflation. The PPI was used in this unit price analysis.

In order to obtain the approximate 2004 cost of items bid in a prior year, the unit price was multiplied by the Year Bid PPI Adjustment Factor. As noted in the item narratives the unit prices are set higher than this amount to allow for 2005 prices.

Item 201 (1A) Clearing
Per Lump Sum

This is a lump sum bid item; however, there are approximately 428 vegetated acres for Juneau Access Alternative 2B and 395 vegetated acres for Alternative 3 that will require clearing. According to the Juneau Access Socioeconomic Report there is approximately $400,000 worth of harvestable timber within the Alternative 2B clearing limits and $450,000 worth of harvestable timber within Alternative 3 clearing limits.

The clearing for Juneau Access will be a large quantity of work, completed with large equipment, and include no traffic interruptions.

The following comparison projects were used:

- Project 69844 Juneau Glacier Highway – Indian Point to Point Louisa. Bid April 1998. Work was clearing 35 acres. New alignment full width clearing similar to Juneau Access, however with a much smaller quantity. The minimum amount bid was $1,200 per acre. The average of the 2 low bids was $1,600 per acre.
- Project 52312 Parks Highway – MP 57-67. Bid May 2001. Work was clearing 181 acres. Low bid $809.40 per Acre. Average of 3 low bids $1,079.20.

The Glacier Highway project was 1/13 the size of Juneau Access and the Parks Highway project 40 percent of Juneau Access. Averaging all bids for the two projects results in $1,340 per acre (low bids only average $1,005 per acre). The $1,340 per acre average is 65 percent higher than the 2001 low bid for this work. Efficiencies in the Juneau Access Improvements Project from large quantities, and no public access conflicts, plus the use of a unit price 65 percent higher than the 2001 project will more than offset the PPI inflation of approximately 10.4 percent since 2001.

Based on these projects the Juneau Access clearing bid item was estimated at $1,340 per acre and rounded up to the nearest $5,000 for the lump sum amount. Depending on the right-of-way (ROW) transfer agreement with the USFS the value of timber harvested within the ROW could reduce the bids.

The net effect on the Supplemental Draft EIS Engineer's Estimate for this item is to decrease Alternative 2B by approximately $55,000 and to decrease Alternative 3 by approximately $10,000.

Item 203(2) Rock Excavation
Per Cubic Yard

The estimated quantity of rock excavation for Juneau Access Alternative 2B is 6,475,600 cubic yards. The quantity for Alternative 3 is 4,060,000 cubic yards.

The following comparison projects were used:

- Project 68035 Ketchikan Airport – West Taxiway Construction. Bid August 2002. Item is Borrow Embankment. Work was to drill, shoot, load, haul and embank 600,000 cubic meters (784,770 cubic yards) of rock at the Ketchikan Airport. Shooting and hauling operations were limited by scheduled airlines operations. Low bid $4.95 per cubic yard. Average of 3 low bids $5.46 per cubic yard.

Many DOT & PF projects utilize Item 203(3) Unclassified Excavation, which includes rock as well as common excavation. The rock excavation work under this pay item will not show up in a search of rock excavation Items only. Two large SE Region projects with a significant amount of rock excavation included in the Unclassified Excavation are:

- Project 69844 Juneau Glacier Highway – Indian Point to Point Louisa. Bid April 1998. Work was Unclassified Excavation 339,500 cubic yards of which approximately 50 percent was rock excavation. This work included hauling and embanking. Hauling was performed with street legal trucks. New alignment so traffic control issues were minimal. Some residences nearby. Low bid $3.20 per cubic yard. Average of 3 low bids $3.23 per cubic yard.
- Project 71483 Haines Highway – M.P. 25.5 to Little Boulder Creek. Bid September 1998. Work was Unclassified Excavation 511,700 cubic yards of which approximately 50 percent was rock excavation. This work included hauling and embanking. Widening and realignment with traffic flow maintained during construction. Low bid $1.95 per cubic yard. Average of 3 low bids $3.48 per cubic yard.

There has been only one project recently advertised in SE Region that contained a significant amount of rock excavation as a bid item.

- Project No. 71811 Ketchikan 3rd Avenue Extension. Bid December 1999. Work was rock excavation 151,000 cubic yards. New alignment; extremely close proximity to residential neighborhoods; limitations on fly rock, size of shot, hours of operation, and extensive preblast surveys. Significant penalties for fly rock events. Low bid $11.00 per cubic yard. Average of 3 low bids $11.67 per cubic yard.

The Ketchikan Airport Project was considered the most reasonable basis of estimate for Juneau Access and was confirmed by the other projects listed. The basic unit price of $5.50 per cubic yard (average of 3 low bids) was adjusted to $6.50 per cubic yard to account for additional expense for preparation work on the steeper areas. Haul has been minimized by the allowance of sidecasting and deep water disposal. The Ketchikan Airport project was constructed in 2003 and 2004. Efficiency was reduced approximately 20 percent due to operational limitations from aircraft traffic. Efficiencies in the Juneau Access Improvements Project from the use of large off road equipment, minimal restrictions on work, and no public access conflicts or other work restrictions, plus the inefficiencies included in the Ketchikan Airport project will more than offset the PPI inflation of approximately 10 percent since this project was bid in 2002.

The unit price for rock excavation is increased $.25 per cubic yard over the Supplemental Draft EIS unit price and the quantities for rock excavation are reduced for both Alternative 2B and 3 based on minor alignment changes. The net effect on the Supplemental Draft EIS Engineer's Estimate for this item is to decrease Alternative 2B by approximately $3,165,000 and to increase Alternative 3 by approximately $475,000.

Item 203(3) Unclassified Excavation
Per Cubic Yard

The estimated quantity of Unclassified Excavation (common excavation only, includes no rock) for Juneau Access Improvements Project Alternative 2B is 993,300 cubic yards. The estimated quantity for Alternative 3 is 2,118,000 cubic yards.

The following comparison projects were used:

- Project 52685 Glenn Highway – MP 61-67 Rehabilitation. Bid September 2000. Work was Unclassified Excavation 86,317 cubic meters (112,212 cubic yards). Traffic flow maintained during construction. Low bid $2.28 per cubic yard. Average of 3 low bids $2.42 per cubic yard.
- Project 52921 Palmer-Wasilla Extension. Bid June 2001. Work was Unclassified Excavation 96,722 cubic meters (125,739 cubic yards). Traffic impacts during construction. Low bid $2.18 per cubic yard. Average of 3 low bids $2.60 per cubic yard.
- Project 53989 Parks Highway – MP 37-39. Bid September 2001. Work was Unclassified Excavation 651,570 cubic meters (847,041 cubic yards). Traffic flow maintained during construction. Low bidder $2.47 per cubic yard. Average of 3 low bids $2.29 per cubic yard.

These three projects all include large quantities of work, but lower quantities than Juneau Access. The low bids for these three projects averaged $2.31 per cubic yard. The averages of the 3 low bidders on each project was $2.44 per cubic yard. All of these projects included traffic maintenance impacts. Inflation from the time these projects were bid is more than offset by no public access conflicts. The Juneau Access Unclassified Excavation unit price was conservatively set at $2.50 per cubic yard.

The unit price is the same as used in the Supplemental Draft EIS, however the quantities of Unclassified Excavation are reduced for both Alternative 2B and 3, based on alignment changes. The net effect on the Supplemental Draft EIS Engineer's Estimate is to decease Alternative 2B by approximately $1,150,000 and to decrease Alternative 3 by approximately $215,000.

Item 203(10) Controlled Blasting
Per Square Yard

The estimated quantity of Controlled Blasting for Juneau Access Alternative 2B is 594,500 square yards and the estimated quantity for Alternative 3 is 77,918 square yards.

The work to be completed involves large quantities of work and will be completed without public access conflicts during construction.

The following comparison projects were used:

- Project 71483 Haines Highway – MP 25.5 to Little Boulder Creek. Bid September 1998. Work was Controlled Blasting 63,000 square yard. Work completed while maintaining traffic. Low bidder $10 per square yard. Second low bidder $8 per square yard.
- Project 71874 Haines Highway – Big Boulder Creek to the Border. Bid December 1999. Work was Controlled Blasting 4,500 square yards. Work completed while maintaining traffic. Low bidder $10 per square yard. Second low bidder $20 per square yard. Third low bidder $8 per square yard.

Inflation will be offset by large quantities and primarily by no public access conflicts during construction. Based on these two projects the Juneau Access Controlled Blasting unit price was established as $10 per square yard.

The pay unit for Controlled Blasting was changed from station in the Supplemental Draft EIS to square yard to more accurately account for the height of the rock cut on the estimated cost for this item. The net effect on the Supplemental Draft EIS Engineer's Estimate is to increase Alternative 2B by approximately $2,585,000 and to decrease Alternative 3 by approximately $1,325,000.

Item 307(3) Emulsified Asphalt Treated Base
Per Square Yard

The estimated quantity of EATB for Juneau Access Improvements Project Alternative 2B is 858,100 square yards. The estimated quantity for Alternative 3 is 724,383 square yards.

This work will be completed prior to opening the highway to traffic. No traffic control conflicts combined with a large quantity of work will result in competitive pricing.

The estimate for EATB includes the oil, Portland Cement, Crushed Aggregate Base, and EATB processing. The unit price was established as $5.11 per square yard based on the attached project comparison and price extensions for all work incorporated into this item. Oil prices were based on 2005 construction project unit prices and are included in the unit price of $5.11 per square yard.

The unit price for the EATB is increased $1.36 per square yard over the Supplemental Draft EIS unit price and the quantities are adjusted to account for alignment changes. The net effect on the Supplemental Draft EIS Engineer's Estimate for this item is to increase Alternative 2B by approximately $1,027,000 and to increase Alternative 3 by approximately $1,137,000.

EATB

#	NAME	YEAR	QUANTITY (s.y.)	LOW	2ND	3RD	AVG.
55005	N. KENAI SPUR MP 22.0-29.7	2001	161400	$1.01	$0.63	$1.05	$0.90
55068	SEWARD HWY. RUT AND FROST HEAVE REPAIR	2001	490486	$0.84	$0.84	$0.67	$0.78
55657B	DIAMOND BLVD. AND HOME DRIVE REHAB	2002	32501	$0.70	$0.50		$0.60
56583	KENAI PENINSULA RESURFACING PROGRAM	2004	148000	$1.00	$0.68	$1.00	$0.89
	AVERAGES			**$0.89**			**$0.79**

PORTLAND CEMENT

#	NAME	YEAR	QUANTITY (ton)	LOW	2ND	3RD	AVG.
67948	WRG AIRPORT ACCESS RD/ZIMOVIA HWY	2005	40	$173.60	$150.00	$225.00	$182.87
68096	JNU-GLACIER HWY & TRAILHEAD	2005	315	$150.00	$250.00	$350.00	$250.00
68165	MITKOF HWY COASTAL PATH AND HWY	2005	170	$150.00	$175.00	$250.00	$191.67
	AVERAGES			**$157.87**			**$208.18**

CSS-1

THE UNIT PRICE FOR CSS-1 GENERALLY IS THE SAME A ASPHALT CEMENT. SEE ASPHALTCONC. TAB.

USE **$235.50**

9a

Length of Project	73+15	to	2750+00	267685 ft.		
Length of Bridges				0 ft.		
EATB Length				267685 ft.		
Width of Roadway				30 ft.		
EATB Area				8030550 s.f.	or	892283.3 SY.
CSS-1	$235.50 per ton					
Portland Cement	$157.87 per ton					
Portland Cement Application Rate for 4-inch depth	4.5 lbs./s.y.					
CAB	$20.60 per c.y.					
CSS-1 Application Rate for 4-inch depth	1.7 gal. per s.y.					
CSS-1 Estimating Factor	240 gal. per ton					
CAB per S.Y. 4-inch depth	0.111 c.y.					
Cost per S.Y. for CSS-1	$1.67					
Cost per S.Y. for Portland Cement	$0.36					
EATB Processing per S.Y.	$0.79					
Cost per S.Y. for CAB	$2.29					
Cost per S.Y. of EATB	**$5.11**					
TOTAL COST FOR EATB	**$4,555,594.69**					

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Item 401(1) Asphalt Concrete Pavement
Per Ton

The estimated quantity of Asphalt Concrete Pavement for Juneau Access Alternative 2B is 104,397 tons. The estimated quantity for Alternative 3 is 90,948 tons.

It is estimated that this work will be accomplished in large segments, possibly as much as one half the entire project prior to allowing the public on the highway. A large quantity of work combined with no traffic impacts will result in bids significantly lower than normal.

The following comparison projects were used:

- Project 71483 Haines Highway – MP 25.5 to Little Boulder Creek. Bid September 1998. Work was Asphalt Concrete Pavement, Type II, Class B, 16,900 tons. Work completed while maintaining traffic. Low bid $20.00 per ton. Average of 3 low bids $25.38 per ton.
- Project 71874 Haines Highway – Big Boulder Creek to the Border. Bid December 1999. Work was Asphalt Concrete Pavement, Type II, Class B, 17,500 tons. Work completed while maintaining traffic. Low bid $18.00 per ton. Average of 3 low bids $23.33 per ton.
- Project 52312 Parks Highway – MP 57-67. Bid May 2001. Work was Asphalt Concrete, Type II, Class A, 66,256 tons. Work completed while maintaining traffic. Low bid $18.14 per ton. Average of 3 low bids $19.35 per ton.

The Juneau Access Improvements Project is over 5 times as large as the Haines projects, however, the bids verify that economical paving prices have occurred in large projects near the project area. The Parks Highway Project is the closest in size and more recently completed project and was used for the Juneau Access estimates. The Parks Highway Project was bid in 2001. The increase in asphalt cement oil prices is covered under Item 401(2) Asphalt Cement, which uses prices for 2005 construction projects. The Parks Highway Project's average unit price for Asphalt Concrete Pavement was increased by approximately 20 percent to cover increased equipment fuel costs for this equipment intensive item. (Note that the PPI inflation since 2001 was approximately 10.4 percent.) The Juneau Access unit price for Concrete Asphalt Pavement was set at $23.00 per ton based on this comparison.

The unit price for Concrete Asphalt Pavement is decreased $2.00 per ton from the Supplemental Draft EIS unit price and the quantities are adjusted to account for alignment changes. The net effect on the Supplemental Draft EIS Engineer's Estimate for this item is to decrease Alternative 2B by approximately $150,000 and to increase Alternative 3 by approximately $90,000.

Item 401(2) Asphalt Cement
Per Ton

The estimated quantity of Asphalt Cement for Juneau Access Improvements Project Alternative 2B is 6,264 tons. The estimated quantity for Alternative 3 is 5,460 tons.

The work to be completed involves large quantities and will be completed without public access conflicts during construction.

The following comparison projects were used:

- Project 56583 Kenai Peninsula Resurfacing Program. Bid May 2004. Work was Asphalt Cement Grade PG 52-28 1,300 ton. Work completed while maintaining traffic. Low bidder $1 per ton (discounted*). Second and third low bids $230 and $195 per ton.
- Project 56567 North Kenai Spur – MP 22.0-29.7. Bid December 2004. Work was Asphalt Cement Grade PG 52-28 1,400 ton. Work completed while maintaining traffic. Low bid $230. per ton. Second bid $1 per ton (discounted*). Third bid $270 per ton.
- Project 55620 Hope Road Pavement Rehabilitation. Bid September 2004. Work was Asphalt Cement Grade PG 52-28 1,750 ton. Work completed while maintaining traffic. Low bid $222 per ton. Second bid $1 per ton (discounted*). Third bid $220 per ton.

Based on these three recently bid projects, the Juneau Access Asphalt Cement unit price was established as $250 per ton. Inflation is not a factor as bids were for work to be completed in 2005. Savings from no traffic impacts are accounted for in Item 401(1) Asphalt Concrete Pavement. Unit prices increased by approximately 10 percent for extra delivery cost.

The unit price for Asphalt Cement is decreased by $100 per ton from the Supplemental Draft EIS unit price and the quantities are adjusted to account for alignment changes. The net effect on the Supplemental Draft EIS Engineer's Estimate for this item is to decrease Alternative 2B by approximately $570,000 and to decrease Alternative 3 by approximately $315,000.

* discounted means that this unit price bid was not included in setting this item's unit price estimate. These discounted unit prices reflect a bidding strategy instead of a realistic unit price bid.

Item 501(1) Bridge Structure
Per Linear Foot

The estimated quantity of Bridge structure for Juneau Access Improvements Project Alternative 2B is 10,256 linear feet. The estimated quantity for Alternative 3 is 15,885 linear feet.

The Juneau Access bridges will be 33 feet wide and all multi-span bridges will utilize approximately 130-foot-long bulb-tee girders.

To date in Alaska there have not been any projects constructed that have similar quantities and construction logistics. The vicinity of major river crossings along the Juneau Access alignments are accessible by barge which allows the use of overlength and overweight components. And as mentioned previously there will be no public access conflicts.

Two projects were used to establish the unit price for Juneau Access:

- Project 60751 Valdez – Dayville Road. Bid June 2004. Work was bridge replacement. Traffic access was maintained during construction to the Alaska Pipeline terminal and to industrial and recreation sites. Bid unit prices are not comparable because of the traffic delay impacts on construction, however the quantity of bulb-tee girders (100 girders) was sufficient to obtain a comparison for girder fabrication costs. A price quoted to the contractor for girders delivered to the barge in the Seattle area was $32 per square foot. The cost to transport the bulb-tee girders to Lynn Canal, construct the substructure including piling and caps, install the girders, and bridge railing is estimated to be 4 times the girder fabrication cost. This results in a unit price of $128 per square foot or $4,224 per linear foot for the Juneau Access bridges.
- A project completed in 2002 to construct the San Mateo-Hayward Bridge in San Francisco, CA has similarities to the major Juneau Access bridges. The bridge was constructed across a shallow (0 to 15-foot-deep) environmentally sensitive bay. The project was constructed with precast, prestressed bulb-tee girders. The San Mateo-Hayward bridge was 4.6 miles long and 60-foot wide. An adjacent bridge was kept open at all times during construction. This bridge's total in-place cost was $73 per square foot. To adjust this unit price to Juneau Access prices, the $73 per square foot construction cost was increased by 25 percent for quantity, 20 percent for weather and 20 percent for proximity to fabrication facilities. This results in a unit price of approximately $132 per square foot for $4,356 per linear foot.
- Based on these two projects Item 501(1) Bridge Structure was estimated at $4,400 per linear foot or $133 per square foot.

Check for Reasonableness:

The average bridge costs for 2000-2003 from the Federal Highways – Bridge Construction Unit Cost per square foot for Federal–Aid Highways in Alaska was $165 per square foot. This average is compiled from several projects having independent bridges with very little economy of scale. They also required maintaining traffic during construction. It is anticipated that the Berners Bay (5,350 linear feet) and Katzehin River (2,500 linear feet) bridges will experience a much lower unit price because of the quantity. Many of the remaining bridges will bear on rock or roller compacted concrete and will not require a pile foundation. The Juneau Access bridges will also not encounter public access conflicts during construction. Applying a 20 percent savings to the statewide average, which is generated from ease of access to the bridge sites, quantity savings, and no public access conflicts results in unit price of $132 per square foot.

The unit price for Bridge Structure is unchanged from the Supplemental Draft EIS. The quantity increased for Alternative 2B due to alignment changes in the Berners Bay area. The quantity for Alternative 3 is unchanged. The net effect on the Supplemental Draft EIS Engineer's Estimate is to increase Alternative 2B by approximately $5,000,000.

Items 603(17-24), (17-36), (17-48) & (17-72)
24-inch, 36-inch, 48-inch and 72-inch Pipe

For Juneau Access Improvements Project Alternative 2B the estimated quantity of 24-inch pipe is 20,708 linear feet, for 36-inch pipe is 7,862 linear foot, for 48-inch pipe is 3,600 linear feet, and for 72-inch pipe is 2,304 linear feet.

For Alternative 3 the estimated quantity of 24-inch pipe is 14,088 linear feet, for 36-inch pipe is 13,026 linear feet, for 48-inch pipe is 3,560 linear feet, and for 72-inch pipe is 3,844 linear feet.

The effect that not having to contend with traffic conflict issues is demonstrated by two projects recently bid in Juneau that are currently under construction.

- Project 67471 Juneau – Cascade Point Road. Bid December 2004. Work was 24-inch pipe, 2,268 linear feet at $48 per linear foot, 36-inch pipe, 126 linear feet at $70 per linear foot, 48-inch pipe 68 linear feet at $90 per linear foot, and 72-inch pipe, 64 linear feet at $135 per linear foot.
- Project 68097 Juneau – Glacier Highway & Trailhead. Bid January 2005. Work was 24-inch CSP, 80 linear feet at $55 per linear foot, 30-inch CSP, 20 linear feet at $65 per linear foot, 48-inch corrugated aluminum pipe, 34 linear feet at $250 per linear foot, and 72-inch corrugated aluminum pipe, 62 linear feet at $275 per linear foot.

The Cascade Point Road is similar to the Juneau Access project in that there are no traffic control issues. The project is completely blocked off to the public and only accessible to contractor forces. The Glacier Highway project must accommodate 780 ADT with minimum roadway closures. Comparing these two projects for 48-inch and 72-inch pipe with similar quantities reveals that the project with no traffic to contend with and no pipes to dig up is approximately ½ as expensive to build.

For the Juneau Access Improvements Project, the Cascade Point Road Project was used as the basis of the estimate. The bid prices are current, the construction conditions are similar and the unit prices only need to be adjusted for quantity.

Unit prices established for Juneau Access are:

24-inch pipe: $45 per linear foot
36-inch pipe: $59.50 per linear foot
48-inch pipe: $76.50 per linear foot
72-inch pipe: $108 per linear foot

Prices based on $3 per linear foot savings on 24-inch pipe, 15 percent savings on 36-inch and 48-inch pipe and 20 percent savings on 72-inch pipe since quantities are so small compared to Juneau Access for the last 3 items.

The unit prices for 24-inch pipe and 48-inch pipe are increased by approximately 50 percent over the Supplemental Draft EIS unit prices. Bid items are added for 36-inch pipe and 72-inch pipe. All quantities are updated to reflect the current alignments. The net effect on the Supplemental Draft EIS Engineer's Estimate from all 603 pipe items is to increase Alternative 2B by approximately $1,140,000 and to increase Alternative 3 by approximately $905,000.

Item 606(1) W-beam Guardrail
Per Linear Foot

The estimated quantity of W-beam guardrail for Juneau Access Improvements Project Alternative 2B is 29,266 linear feet and for Alternative 3 is 8,900 linear feet.

This work will be completed prior to opening the highway to traffic. Minimum conflicts combined with a large quantity of work will result in significantly lower prices than normal.

The following comparison projects were used:

- Project 71483 Haines Highway – M.P. 25.5 to Little Boulder Creek. Bid September 1998. Work was W-beam guardrail 20,475 linear feet. Work completed while maintaining traffic. Low bid $14 per linear foot. Average of 3 low bids $15.04 per linear foot.
- Project 71874 Haines Highway – Big Boulder Creek to the Border. Bid December 1999. Work was W-beam guardrail 2,662.5 linear feet. Work completed while maintaining traffic. Low bid $12 per linear foot. Average of 3 low bids $14.50 per linear foot.
- Project 56547 Anchorage International Airport Terminal Expansion. Bid June 2003. Work was W-beam guardrail 7,650 linear feet. Work completed while maintaining traffic. Low bid $14 per linear foot. Average of 3 low bids $14.50 per linear foot.
- Project 56571 Old Glenn Highway: Glenn Highway to Plumley Road. Bid April 2004. Work was W-beam guardrail 14,375 linear feet. Work completed while maintaining traffic. Low bid $16.30 per linear foot. Average of 3 low bids $17.77 per linear foot.

Juneau Access will have a much larger quantity than these projects and no traffic control conflicts or delays. Based on these projects a unit price of $16 per linear foot was established for Juneau Access W-beam guardrail.

The unit price for W-beam guardrail is decreased $6 per linear foot from the Supplemental Draft EIS unit price and quantities are adjusted to reflect current alignments and guardrail warrants. The reason for the $6 per linear foot decrease is that the Supplemental Draft EIS unit price included terminal end sections in the unit price for W-beam guardrail. The current estimate has separate bid items for W-beam guardrail and terminal end section. The net effect on the Supplemental Draft EIS Engineer's Estimate is to decrease Alternative 2B by approximately $1,235,000 and to decrease Alternative 3 by approximately $235,000.

Item 611(1) Riprap
Per Cubic Yard

The estimated quantity of riprap for Juneau Access Improvements Project Alternative 2B is 574,500 cubic yards. The estimated quantity for Alternative 3 is 164,500 cubic yards.

The riprap for the Juneau Access Improvements Project will be generated on site from rock excavation. The rock excavation item includes drilling, shooting, and embanking or disposing of the rock and the rock excavation quantity includes the necessary riprap quantities. Therefore the unit price for riprap only needs to include any additional cost for sorting and placing the riprap on the slopes.

Based on their being no public access conflicts during construction and the large quantities, the extra cost for sorting and placing the riprap was set at $6 per cubic yard.

The unit price for riprap is decreased by $ 9 per cubic yard from the Supplemental Draft EIS unit price. The Supplemental Draft EIS Engineer's Estimates did not account for the riprap being generated from rock excavation. The quantities remain unchanged from the Supplemental Draft EIS. The net effect on the Supplemental Draft EIS Engineer's Estimate is to decrease Alternative 2B by approximately $5,170,000 and to decrease Alternative 3 by approximately $1,480,000.

Item 637(1) MSE Wall
Per Square Foot

The estimated quantity of MSE wall for Juneau Access Improvements Project Alternative 2B is 543,790 square feet. The estimated quantity for Alternative 3 is 77,446 square feet.

The work to be completed involves large quantities and will be completed without public access conflicts during construction.

The following comparison projects were used:

- Project 52921 Palmer-Wasilla Extension. Bid June 2001. Work was mechanically stabilized embankment retaining walls 1,640 square meters (17,712 square feet). Work completed while maintaining traffic. Low bidder $30.93 per square foot. Average of 3 low bids $29.14 per square foot.
- Project 53989 Parks Highway – MP 37-39. Bid September 2001. Work was mechanically stabilized embankment retaining walls 2,360 square meters (25,488 square foot). Work completed while maintaining traffic. Low bidder $32.41 per square foot. Average of 3 low bids $30.93 per square foot.
- Project 55264 Glenn Highway – MP 100-109; Caribou Creek. Bid November 2002. Work was mechanically stabilized embankment retaining walls 3,225 square meter (34,830 square feet). Work completed while maintaining traffic. Low bidder $23.15 per square foot. Average of 3 low bids $28.55 per square foot.

Inflation will be offset by large quantities and no public access conflicts during construction. Based on these three projects the Juneau Access MSE wall unit price was established as $31 per square foot.

Two bid items, gabions and reinforced earth wall, in the Supplemental Draft EIS Engineer's Estimate are replaced by one item MSE wall. Quantities are recalculated to reflect current design and alignments. The net effect on the Supplemental Draft EIS Engineer's Estimate is to increase Alternative 2B by approximately $5,632,000 and to decrease Alternative 3 by approximately $1,724,000.

Item 637(2) Screening Structure
Per Lump Sum

This item was not included in the Supplemental Draft EIS Engineer's Estimate. The purpose of the screening structure is to restrict the Gran Point and Met Point Sea Lion Haulouts from access and view. The area to be restricted extends 3,000 feet either side from the main haulout area. The screening structures will consist of sections of rock thru-cuts, sections of concrete barrier with screening fence on top, and sections of 8-foot-high screening fence. For Gran Point there are 3,750 feet of rock thru-cut, 1,300 feet of concrete barrier with screening fence and 950 feet of 8-foot-high screening fence. For Met Point there are 1,200 feet of rock thru-cut, 1,500 feet of concrete barrier with screening fence, 1,800 feet of 8-foot-high screening fence and approximately 1,500 feet where natural screening and restricted access do not require screening.

For rock thru-cuts the cost is included in the rock excavation item. For estimating the cost of concrete barrier with screening fence the barrier is estimated to be a concrete jersey barrier with a 3 to 4-foot-high screening fence on top. For estimating the cost of the 8-foot-high screening fence; the fence is estimated to be an 8-foot-high chain link fence with screening fabric.

The following comparison projects were used:

- Project 67408 Skagway – Klondike Highway jersey barrier. Bid August 2004. Work was lump sum to mobilize and remove 1,000 feet of guardrail and replace with concrete jersey barrier. Work completed while maintaining traffic. Low bid $99,890 lump sum or approximately $100 per linear foot including mobilization and removing guardrail.
- Project 73652 Valdez – Ferry Terminal Improvements. Bid May 2003. Work was 8-foot chain link fence, 1,776 linear feet. Low bid $60 per linear foot. Average of 3 Low bids $60.33 per linear foot.

Based on these two projects the estimated cost for the concrete jersey barrier with 3 to 4-foot-high screening fence is $135 per linear foot ($75 for jersey barrier and $60 for fence). The cost of the 8-foot-high screening fence is estimated at $75 per linear foot including screening fabric. Lump sum estimate is based on 2,800 linear feet of concrete barrier with screening fence and 2,750 linear feet of 8-foot-high screening fence.

The net effect on the Supplemental Draft EIS Engineer's Estimate is to increase Alternative 2B by approximately $584,000.

Item 640(1) Mobilization and Demobilization
Per Lump Sum

There are no quantities associated with mobilization and demobilization. This item covers the cost to move personnel, equipment, supplies and incidentals to and from the project site.

The following comparison projects were used:

- Project 60751 Valdez – Dayville Road Reconstruction. Bid June 2004. Work was mobilization and demobilization per lump sum. Low bid for mobilization and demobilization was $2,619,000 or 8.8 percent of the total bid of $29,643,055.50. Second low bidder was $2,150,000 or 7.3 percent of their total bid of $29,643,598.00.
- Project 68096 Juneau – Glacier Highway and Trailhead. Bid January 2005. Work was mobilization and demobilization per lump sum. Low bid for mobilization and demobilization was $700,000 or 7 percent of their total bid of $9,966,670. Second low bidder was $675,000 or 6.5 percent of their total bid of $10,342,564.

Based on these projects, mobilization and demobilization was set at approximately 7.5 percent of the total engineer's estimate for all bid items.

The net effect on the Supplemental Draft EIS Engineer's Estimate is to decrease Alternative 2B by approximately $1,025,000 and to decrease Alternative 3 by approximately $3,050,000.

Item 640(4) Worker Meals and Lodging, or Per Diem
Lump Sum

This bid item was not included in the Supplemental Draft EIS Engineer's Estimate. This bid item was added to state contracts after October 2004 to comply with Alaska Department of Labor and Workforce Development requirements.

The net effect on the Supplemental Draft EIS Engineer's Estimate is to increase both Alternative 2B and Alternative 3 by approximately $1,000,000.

Item – Highway Contingency

Most of the items included in the engineer's estimate are sufficiently accurate that a contingency is not warranted. The only items that could change based on field geotechnical work are the backslopes in the rock cut areas and the depths of foundation piling at the major river crossings. To cover any overruns due to field changes an 8 percent contingency was applied to the total project estimate. This means that either the rock excavation or the Bridge Structure could overrun by approximately 25 percent and still be within the estimate or that they could both overrun by approximately 12 percent and still be within the estimate.

Item – Construction Engineering

This item covers the cost for state forces to inspect, monitor and document the Contractor's construction activities. This project will not require traffic control monitoring or utility construction inspection. On large projects the Construction Engineering is a lower percent of the Engineer's Estimate than on smaller projects. Construction Engineering at 8 percent was also used in the Supplemental Draft EIS Engineer's Estimate.

Item – 4.3 Percent ICAP

The Indirect Cost Allocation Plan (ICAP) is an overhead rate assessed by DOT&PF, on all capital projects. For State Fiscal Year 2006 the rate for FHWA Highway projects has been set at 4.3 percent. The rate at the time of the Supplemental Draft EIS Engineer's Estimate was 3.55 percent. The net effect on the Supplemental Draft EIS Engineer's Estimate is to increase Alternative 2B by approximately $1,390,000 and to increase Alternative 3 by approximately $945,000.

Item – Preliminary Development

This item is to cover the cost of project development, design and final permitting. The estimated amounts for this item are the same as used in the Supplemental Draft EIS Engineer's Estimate.

Item – Mitigation

This item is to cover the cost to mitigate for the construction impacts of the alternatives. Some of each alternative's mitigation is included in bid items that cover on site mitigation. The mitigation item is to cover off site mitigation or fee in lieu of mitigation. The amounts shown are based on preliminary discussions with resource agencies.

Item – Right of Way

This item is to cover the estimated cost of acquiring right of way to construct each alternative. Amounts shown are the same as used in the Supplemental Draft EIS Engineer's Estimate.

Item – Maintenance Building

This item covers the cost of constructing a Maintenance Station at Comet for Alternative 2B and Equipment and sand storage at William Henry Bay for Alternative 3. Amounts shown are the same as used in the Supplemental Draft EIS Engineer's Estimate. The $500,000 estimate for the William Henry Bay Building is confirmed by the May 2005 bid to construct the Skagway Klondike Highway Storage Building. This 5,000-square-foot building was bid at $482,000 for a similar remote location building. The Comet Maintenance Station is estimated at $1,000,000 to include public restroom facilities.

Item – Avalanche Control CIP

This item is to cover the cost of constructing ammunition storage units, weather stations, and repeaters and to obtain all avalanche maintenance equipment. Costs are taken from the Snow Avalanche Report. Amounts used are the same as used in the Supplemental Draft EIS, however are broken out as an item to allow for easier identification.

Item – Road Assistance

This item was included in the Supplemental Draft EIS Engineer's Estimate. It was to account for the improvements to be constructed by Goldbelt and Coeur on the Cascade Point Road. This item has been deleted since the roadway has been constructed and each alternative's quantities have been reduced by the actual amount of construction that has occurred.

Highway Construction Total

The cumulative effect of new Pay items, different Pay Units, Revised Unit Prices and Quantities and current ICAP, over the Supplemental Draft EIS Engineer's Estimate is to increase the Alternative 2B Highway Construction Total estimate by approximately $5,345,000 and to decrease the Alternative 3 Highway Construction Total estimate by approximately $4,850,000.

Items – Terminal Construction and Vessel Construction

These items are added to the Engineer's Estimate so that each alternative's total estimated cost is provided in one document. For changes from the Supplemental Draft EIS estimates for these items see the updated Terminal Construction Cost Estimates and the Vessel Construction Cost Update.

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NEW ATTACHMENT G
VESSEL CONSTRUCTION COST UPDATE

This is a new attachment that explains how vessel construction costs changed between the Supplemental Draft EIS estimate in January 2004 and the Final EIS estimates in August 2005.

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PO Box 22223
Juneau, AK 99802
907-586-3148

August 29, 2005

Mr. Reuben Yost
Special Projects Manager
SE Region, DOT&PF
Juneau, AK 99801

Subject: JAI Marine Segments CIP Cost Update

Dear Mr. Yost:

At your request, we have examined the difference in cost of vessel construction over the period January 2004 to August 2005 for the purpose of updating the vessel acquisition costs in the 2003 JAI Marine Segments Report.

The time period in question was marked by a large increase in the cost of steel, a minor increase in general economic inflation, and a large increase in the cost of petroleum products.

Over this period the cost of American Bureau of Shipping certified, wheeled and primed, structural steel went from about .25 $ per pound to about .90 $ per pound. In order to accurately account for this increase in raw material cost, we isolated and quantified the amount and cost of steel, as a portion of the total vessel construction cost. Although a normal day-boat ferry contains about 75 percent steel by weight, we calculated that the increase in the total vessel cost, due solely to the increase in price of steel, would have been about 6.2 percent over this period.

Aluminum costs have not increased to the extent of steel costs. Aluminum prices vary with thickness, grade, and availability and are quoted on specific lots. Based on standard size (6'x20') 5086 marine grade aluminum plate, the price of aluminum increased from about 1.65 $ per pound to about 2.23 $ per pound, over the period January 2004 to August 2005. Assuming an average cost of aluminum plates and shapes and assuming high speed aluminum day-boats are about 55 percent aluminum by weight, the increase in total vessel cost due solely to the increase in aluminum cost over this period, was about 2.1 percent.

A general economic inflation factor must be applied to the overall vessel cost because of the increase in cost of manufactured components (like main engines)

Coastwise Corporation
Naval Architects • Marine Engineers
Juneau, Alaska

and the increase in cost of services and utilities. Our analysis indicated that most vessel construction costs (other than hull material) increased by a small and somewhat uniform amount. The increase in general economic inflation was measured primarily by Consumer Price Index (CPI) calculations both nationally and in Alaska. National CPI data indicates an overall inflation increase of 5.1 percent for the period January 2004 to August 2005, and was slightly less in Alaska.

Also, we separately investigated average earnings and personal income figures in shipbuilding areas to determine the impact of the cost of labor. Earnings and wages varied, but in general they outpaced the CPI by less than 1 percent. We believe that the 5.1 percent general inflation cost is an accurate measure of the general vessel construction cost increase and should be applied to our 2003 vessel cost calculations.

Based on our analysis, the construction cost for the steel vessels in the JAI Marine Segments Report has increased by 11.1 percent over the time period January 2004 to August 2005. This figure reflects the general inflation cost for all items excluding steel and the increase due to the cost of steel.

Based on our analysis, the construction cost for aluminum high speed vessels in the JAI Marine Segments Report has increased by 6.8 percent over the time period January 2004 to August 2005. This figure reflects the general inflation cost for all items excluding aluminum and the increase due to the cost of aluminum.

Vessel acquisitions costs in the Marine Segments report include a program management cost equal to 20 percent of the vessel construction cost. Based on the fact that a large portion of program costs are also subject to general economic inflation, we believe that the calculation of program management cost should remain at 20 percent of the increased vessel cost.

Our analysis is based on general economic trends and costs and is intended to be applied only to the limited vessel types and sizes in the 2003 Marine Segments Report. This information is being supplied for the purpose of transportation planning. If you need information on a specific route or vessel size/type, we would be happy to provide a more detailed analysis. Please advise us, if you have any questions.

Sincerely,

Patrick Eberhardt, PE
Principal
Coastwise Corporation
(907) 586-3148

Addendum to Appendix E

User Benefit Analysis

Prepared by

McDowell Group, Inc.
Juneau • Anchorage, Alaska

OCTOBER 2005

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1.0 ECONOMIC EFFICIENCY OF ALTERNATIVES

1.1 Supplemental Analysis of Traffic and Economic Efficiency

The 2004 *User Benefit Analysis* employs a set of user costs that are different than are employed in the 2004 *Traffic Forecast Report*. The *Traffic Forecast Report* was the first and most time-sensitive report related to Juneau Access Improvements Project economics. The socioeconomic effects and user benefit analyses could not be started until the traffic forecast was complete. The traffic forecast analysis was launched with the understanding that slightly more refined and updated project parameters might be developed and applied in subsequent economic analyses. The decision to proceed in this manner was based on the study team's determination that none of the potential revisions would have any substantial effect on the fundamental findings of the traffic and economic analyses.

The question has been raised about what effect the different user costs would have on the traffic forecast. To answer the question, the study team applied the User Benefit Analysis' user cost data to the traffic model and found increases in traffic ranging from 0 to 17 percent, depending on the alternative. The following table presents the two sets of traffic numbers.

	Traffic Forecast Report Estimates*	User Benefit Analysis-Derived Estimates	Percent Difference
Current Service	80	80	0%
1 - No Action	91	106	17%
4C - Dayboat Auke Bay	100	109	9%
4D - Dayboat Sawmill Cove	127	132	4%
4A - FVF Auke Bay	137	141	3%
4B - FVF Sawmill Cove	161	164	2%
3 - West Lynn Canal Highway	305	353	16%
2B - East Lynn Canal Highway	374	386	3%

Note: *Traffic estimates presented in the 2004 *Traffic Forecast Report* were rounded to the nearest ten.

The No Action Alternative and Alternative 3 have the largest differences between the two sets of traffic estimates. These differences stem from differing assumptions in the *Traffic Forecast Report* and the *User Benefit Analysis* regarding time value, fast ferry fares and vehicle travel speeds. As illustrated in the preceding table, these assumptions have different effects on each alternative, depending on the configuration of each alternative.

The impact of these different traffic estimates on the overall economic evaluation is only meaningful if a change in economic efficiency ranking were to result. In terms of Net Present Value (NPV), among the alternatives carried forward to the Final EIS, East Lynn Alternative 2B is ranked number 1 in the *User Benefit Analysis*, at $70 million. Alternative 3 is second at $32 million. The 16-percent higher traffic estimate derived from the User Benefit analysis for Alternative 3 (353 average annual daily traffic [AADT] versus 305 AADT) compared to the 3 percent increase for Alternative 2B (386 AADT versus 374 AADT) would reduce the differential between the top two alternatives in terms of NPV, but would not change the ranking. In terms of benefit/cost ratio, Alternative 2B is highest, with a ratio of 1.45/1, and Alternative 3 is number 2 at 1.197/1. Higher traffic for Alternative 3 relative to Alternative 2B would move these alternatives closer together in terms of benefit/cost ratio but would not change the ranking.

In summary, the implications of using traffic estimates derived from *User Benefit Analysis* user costs (as opposed to the user costs originally developed in the *Traffic Forecast Report*) would be to move Alternatives 2B and 3 closer together in terms of benefit/cost and net present value analysis, but would not change the relative ranking of the two alternatives.

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2.0 USER COSTS

2.1 AMHS Fares

As explained on page 23 of the 2004 *Appendix E User Benefit Analysis Technical Report* from the Supplemental Draft EIS, the fares used in the analysis for shuttles associated with Alternatives 2B and 3 were computed based on flat fees of $2.00 per passenger and $6.00 per vehicle plus $0.30 per mile for passengers and $0.60 per mile for vehicles. This fare basis was established by a preliminary fare analysis prepared by the Department of Transportation and Public Facilities (DOT&PF) to use in the economic analysis. In March 2004, DOT&PF refined the fare projections for the Haines/Katzehin/Skagway and Sawmill Cove/William Henry Bay shuttle systems (*Proposed Marine Segments Fare Structures*, March 2004, revised August 2005). The Supplemental Draft EIS and the Final EIS use the March 2004 proposed fares. These fares are the same as the fare basis for the User Benefit Analysis, with the exception of the per mile vehicle fare, which is $0.80 rather than the earlier $0.60. Also, the estimates for a family of four in the EIS uses a half fare for children under 12, while the User Benefit Analysis does not. These differences are small, and are offsetting. They would therefore have little effect on the overall user costs and the outcome of the analysis.

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Addendum to Appendix F

Land Use and Coastal Management Technical Report

Prepared by

URS Corporation
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DECEMBER 2005

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TABLES

FIGURES

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1.0 AFFECTED ENVIRONMENT

Because Alternatives 2, 2A, and 2C are no longer reasonable alternatives, no discussions regarding impacts to the Dewey Lakes Recreation Area, the Skagway unit of the Klondike Gold Rush National Historic Park, and the Chilkoot Trail are provided in this addendum. The following subsections introduce supplemental and updated information identified since publication of the Supplemental Draft EIS for several still relevant aspects of the affected environment: old-growth forest habitat; inventoried roadless areas; the Goldbelt quarry, which received a City and Borough of Juneau (CBJ) Conditional Use Permit on November 30, 2004; the Channel Construction quarry on Goldbelt land, which received a CBJ Conditional Use Permit on May 10, 2005; the Kensington Gold Project; the City of Skagway ordinance creating the Dewey Lakes Recreation Area Management Plan; and the recently revised Alaska Coastal Management Program (ACMP).

1.1 Land Ownership and Management Status

1.1.1 United States Forest Service

Old-Growth Forest Habitat – Most of the land in the Juneau Access Improvements Project area is part of the Tongass National Forest, federally owned and managed by the United States Forest Service (USFS). (Federal land in the project area not managed by the USFS is managed by the National Park Service [NPS]). The 1997 Tongass Land and Resource Management Plan (TLMP) contains Land Use Designations (LUDs) to manage land parcels within the Tongass National Forest. There are two main LUD categories in the TLMP: Non-Development (which maintains old-growth forest habitat) and Development. Each LUD category describes the purpose and objectives of management for each area of the Tongass National Forest and establishes specific constraints for the various uses. Figure 1 depicts the locations of current TLMP land use designations within the project area.

The Non-Development LUD category contains two groups: Wilderness and National Monument, and Mostly Natural. The Development LUD category also consists of two groups: Moderate Development and Intensive Development. Each of these four groups consists of sub-categories of LUD designations, which are described in detail in the *Land Use and Coastal Management Technical Report*. Old-growth forest habitat has been described in the following discussion to clarify its purpose and importance within the Non-Development LUDs in the Tongass National Forest ecosystem. Lands on both sides of Lynn Canal, in the vicinity of the Juneau Access Improvements Project, contain a few contiguous areas of high volume old-growth forest habitat, as well as intermittent areas of high and low volume old-growth forest habitat (USFS, 1997a).

Old-growth forest habitat is managed under two methods by the USFS. The majority of old-growth forest habitat is being conserved within lands designated as one of the Non-Development LUDs that function as medium and/or large old-growth forest reserves. A smaller amount of old-growth forest habitat that meets specific criteria, size, spacing, and composition requirements (for specific requirements see the addendum to the *Wildlife Technical Report*, or Appendix K of the 1997 TLMP [USFS, 1997b]) will be preserved as small reserves, and are mapped on the TLMP Land and Resource Management Map as Old-Growth Habitat LUDs (see Figure 1). These two kinds of old-growth forest habitat reserves are intended to sustain healthy forest ecosystems and a mix of habitats to maintain variable and well distributed wildlife populations across the Tongass (USFS, 1997b).

According to Appendix K of the TLMP, evaluating any modification of mapped old-growth reserves must include consideration of Non-Development LUDs that maintain the integrity of the old-growth forest habitat ecosystem and contribute to a forest-wide system of old-growth forest habitat. Where the Non-Development LUDs do not fulfill size, spacing, and composition criteria of old-growth habitat reserves, it would be necessary to add or modify old-growth reserves to meet the criteria. The USFS Kensington Gold Project Record of Decision (ROD) expanded the small old-growth reserves in value comparison units (VCUs) 160, 190, and 200 (extending the boundary of the small old-growth reserve in VCU 200 into VCU 160). Figure 1 of this addendum reflects these changes.

Roadless as Resource – Inventoried roadless areas provide similar functions as designated wilderness areas and have been inventoried and evaluated for potential to be designated as wilderness in the future (under the Wilderness Act of 1964). Consequently, roadless areas are considered a resource and any potential effects to them need to be evaluated. Roadless areas are categorized as inventoried roadless or small unroaded areas (smaller areas identified but not included in the inventory) and are managed to protect their wildland character (Figure 2). The definitions of these two are (USFS, 2003):

- **Inventoried roadless area**: "Undeveloped areas typically exceeding 5,000 acres that met the minimum criteria for wilderness consideration under the Wilderness Act and that were inventoried during the Forest Service's Roadless Area Review and Evaluation (RARE II) process, subsequent assessments, or forest planning."

  Roadless areas exclude buffer zones by all existing roads and harvest units, as all areas within 1,200 feet of an existing road and 600 feet of an existing harvest unit are considered developed areas.

- **Unroaded area**: "Any area, without the presence of a classified road, of a size and configuration sufficient to protect the inherent characteristics associated with its roadless condition. Unroaded areas do not overlap with inventoried roadless areas." There are two categories of unroaded areas: (1) 1,000 to 5,000 acres in size, and (2) less than 1,000 acres.

After evaluating roadless areas for wilderness recommendations[1], the USFS determined that it would not be necessary to recommend additional designated wilderness on the Tongass National Forest because of several factors: (1) almost 40 percent of the Tongass is currently designated as wilderness, National Monument, or other Non-Development land use designations; (2) most of the remaining Tongass is managed to remain in a largely untouched, wildland state or to assure long-term sustainability; and (3) effects to communities' economies. Approximately 92 percent of the Tongass is either wilderness (35 percent) or inventoried roadless area (57 percent). The USFS goal is to indefinitely manage most of the Tongass as

[1] The 1979 TLMP recommended 10 areas for wilderness that, with minor changes, were made part of the National Wilderness Preservation System in 1980 by the Alaska National Interest Lands Conservation Act (ANILCA). In 1990 the Tongass Timber Reform Act (TTRA) designated 5 new wilderness areas on the forest and enlarged 1 wilderness and 12 legislated Land Use Designation II (LUD) areas to retain their roadless and wildland character. The TLMP was amended in February 1991 to incorporate the TTRA changes, with a TLMP Revision and ROD issued in 1997. After appeals, the Final EIS and ROD for the 1997 TLMP were issued in 1999. However, the Court determined that the 1997 TLMP should have considered making wilderness recommendations for the National Wilderness Preservation System. The USFS prepared a Supplemental EIS in 2003 to evaluate roadless areas for wilderness recommendations. Congressionally designated LUD II areas are included in the roadless assessment.

undeveloped, and manage most of the non-designated wilderness lands as wild and roadless (USFS, 2003). The inventoried roadless areas and unroaded areas in the Tongass National Forest are managed according to the current 1997 TLMP, as supplemented by the February 2003 Supplemental EIS, according to the management prescriptions for the corresponding LUD. The TLMP protects lands managed for a natural setting through a Non-Development LUD. Table 1 shows the percentage of Development and Non-Development LUDs for Roadless Areas 301, 303, and 304 (USFS, 2003).

Table 1
Development and Non–Development LUDs in Roadless Areas

Roadless Area	Development LUDs	Non-Development LUDs
301 – Juneau-Skagway Icefield	2%	98%
303 – Sullivan	22%	78%
304 – Chilkat-West Lynn Canal	23%	77%

Following are brief descriptions of these inventoried roadless areas (USFS, 2003) crossed by Alternatives 2B, 3, 4B, and 4D. Roadless Area 301 (Juneau–Skagway Icefield) is crossed by Alternatives 2B, 3, 4B, and 4D. Alternative 3 also crosses Roadless Areas 303 (Sullivan) and 304 (Chilkat).

Roadless Area 301 – **Juneau-Skagway Icefield** – This roadless area extends from the Juneau vicinity to Skagway on the east side of Lynn Canal, with the south boundary at the shoreline abutting Area 305 near Cascade Point. Access to Area 301 is by boat and aircraft, and hiking trails off the Juneau road system.

Area 301 encompasses 1,201,474 acres with 159 miles of shoreline bordering Lynn Canal. There are approximately 129,669 acres mapped as forestland, of which 60,528 acres (47 percent) are productive old-growth forest.

Area 301 is generally unmodified and natural. It provides a very high opportunity for solitude and primitive recreation as well as sport and commercial fishing. The primary Recreation Opportunity Spectrum (ROS) class is Primitive, covering 90 percent of Area 301. The Wilderness Attribute Rating System of Area 301 is 25 out of 28 possible points for wilderness characteristics (natural integrity, apparent naturalness, outstanding opportunity for solitude, and primitive recreation opportunities).

Area 301 is managed under nine LUDs: Modified Landscape, Minerals, Transportation and Utility System (TUS), Remote Recreation, Semi-Remote Recreation, LUD II, Wild River, Research Natural Area, and Old-Growth Habitat. The Minerals LUD is secondary, overlaying the other land uses. The TUS LUD is also secondary, with land in this LUD managed for the other land uses it overlays until a transportation or utility is constructed in the LUD. The Development LUD, Modified Landscape, covers 2 percent of the roadless area, with the remaining 98 percent managed as Non-Development LUDs. Current uses of the area are hydroelectric power plants, scientific research, dispersed recreation, wilderness viewing opportunities, use of the icefield, the Berners Bay cabin and Berners Bay, and minor fishing use (USFS, 2003). Roadless Area 301 is not typically used for subsistence (Alaska Department of Fish and Game [ADF&G], 1998).

Roadless Area 303 – **Sullivan** – This roadless area encompasses federal land from the Endicott River Wilderness boundary to the north boundary of the Tongass National Forest on the Chilkat Peninsula mainland. Area 303 is accessed by water or plane. There is a usable airstrip adjacent to the area on an alluvial fan along Lynn Canal. The shoreline is flat and accessible at two river mouths from Lynn Canal.

Area 303 covers 66,143 acres including 30 miles of shoreline on the west side of Lynn Canal. It also contains three small unroaded areas less than 1,000 acres in the Sullivan River delta area at the shoreline. There are 17,135 acres of forestland in Area 303, of which 75 percent is productive old-growth forest. The productive old-growth forest includes 5,693 acres of high volume, coarse canopy old-growth.

Area 303 is managed under five LUDs: Modified Landscape, Scenic Viewshed, Minerals, TUS, and Semi-Remote Recreation. The Minerals and TUS LUDs are secondary, overlaying the other land uses. The Development LUDs, Modified Landscape and Scenic Viewshed, cover 22 percent of Area 303. The remaining 78 percent is designated as a Non-Development LUD, Semi-Remote Recreation.

Area 303's overall natural integrity is high and its appearance is primarily natural. There is a very high opportunity for solitude and an outstanding opportunity for primitive recreation. Recreation use is low due to poor accessibility. Timber harvest previously occurred in four areas along the shoreline. Mining began in more recent history, and currently, there are active mineral claims. Other than mining, documented historic use has been minimal. Hunting is a primary interest here, although subsistence use is limited.

The primary ROS classes in Area 303 are Primitive and Semi-Primitive Non-Motorized, which cover 54 and 38 percent, respectively, of the roadless area. Along the shoreline of Lynn Canal there is an increased probability of seeing or hearing human activity, including small planes, ferries, small boats, or cruise ships. The Wilderness Attribute Rating System of Area 303 is 26 out of 28 possible points for its natural integrity, apparent naturalness, outstanding opportunity for solitude, and primitive recreation opportunities.

Roadless Area 304 – Chilkat-West Lynn Canal – Roadless Area 304 encompasses federal land from the south end of the Chilkat Peninsula north to Endicott River, and is bordered on the east by Lynn Canal. Areas 303 and 304 are separated by a previously harvested timber unit and development area. Access to Area 304 is possible via boat and floatplane. There are no places suitable for landing wheeled airplanes, and access into the interior is by foot or helicopter.

Area 304 covers 198,109 acres; 82,300 acres is forested land. Fifty-eight percent of the forested land is productive old-growth forest. This old-growth forest includes 23,789 acres of high volume, coarse canopy old-growth forest.

The area is managed under five LUDs: Scenic Viewshed, Timber Production, TUS, Semi-Remote Recreation, and Old-Growth Habitat. The TUS LUD is secondary, overlaying the other land uses. The development LUDs, Timber Production and Scenic Viewshed, cover 23 percent of Area 304. The remaining 77 percent is designated as Non-Development LUDs (Semi-Remote Recreation and Old-Growth Habitat).

Roadless Area 304 is largely unmodified and maintains its natural integrity and apparent naturalness. There is a very high opportunity for solitude and an outstanding opportunity for primitive recreation. The primary ROS classes for Area 304 are Primitive and Semi-Primitive Non-Motorized, which cover 48 and 44 percent, respectively, of the roadless area. Along the shoreline of Lynn Canal there is an increased potential for seeing or hearing human activity, including small planes, ferries, small boats, or cruise ships. The Wilderness Attribute Rating System for Area 304 is 25 out of 28 possible points for its natural integrity, apparent naturalness, outstanding opportunity for solitude, and primitive recreation opportunities.

Current recreation uses are mostly dispersed. There are no public recreation facilities. There is documented subsistence use. There have been three previous USFS timber sales adjacent to the roadless area. The roadless area has been suitable for human occupation, with documented prehistoric sites recorded. Recent uses have been mining and black bear and mountain goat hunting. This roadless area has high scenic quality with a mostly natural appearing landscape. Developed areas are visible from only some locations. Existing modifications include small mining claims and timber harvest activities. Three areas previously harvested are found at the alluvial fans formed by glacial rivers.

1.1.2 Private Land

East Lynn Canal

Goldbelt Incorporated – Goldbelt, a Native Corporation based in Juneau, owns 3,200 acres near Juneau, and 1,382 of these acres are in the Juneau Access Improvements study area surrounding Echo Cove. Goldbelt is a for-profit Native Corporation with approximately 3,200 shareholders established under the Alaska Native Claims Settlement Act (ANCSA). After two decades of business activity primarily in timber harvest, the Vision 2000 management plan was created for the corporation to plan an exit from the timber industry and enter Southeast Alaska's tourism industry, now operating 12 tourism-based subsidiaries (Goldbelt, 2005).

In 1996, Goldbelt prepared the Echo Cove Master Plan and in 1998, the USFS issued a Record of Decision (ROD) for a proposed access highway from Echo Cove to Cascade Point in Berners Bay. The Goldbelt Corporation was granted a CBJ Conditional Use Permit in November 2004, to reopen and expand an existing rock quarry to supply shot rock for construction of a 2.5-mile extension of Glacier Highway from its terminus to Cascade Point. The road will provide access to a commercial dock at Cascade Point, which was approved by the Juneau Planning Commission in 2004 to support Kensington Mine. Both the road and dock were submitted as part of Goldbelt's Master Plan for Echo Cove in 1996. The quarry project site will include a 10-acre project area, of which 3 acres will be the quarry site, a 1.5-acre expansion of the current 1.5-acre quarry (CBJ, 2004).

In May 2005, a rock quarry on Goldbelt land was approved by the CBJ through a Conditional Use Permit issued to Channel Construction. This quarry site is near the Goldbelt quarry at Echo Cove. Use of material from this quarry is not tied to any specific project.

Kensington Gold Project – At present, no mining is occurring along the east side of Lynn Canal in the project area. Coeur Alaska, Inc., a mining company based in Idaho, acquired the Kensington and Jualin mines in the 1990s and received all permits required to begin construction and operations following publication of the *1997 Kensington Gold Project Final Supplemental Environmental Impact Statement* and issuance of a USFS ROD. In December 2004 the USFS finalized the Final SEIS and issued the ROD for the modified Kensington Gold Project (Alaska Department of Natural Resources [ADNR], 2005a). In June 2005, Coeur Alaska, Inc. received the National Pollutant Discharge Elimination System Permit; later it received the 404 Wetlands Permit from the U.S. Army Corps of Engineers (USACE) to authorize construction of a tailings facility, millsite road improvements, and a Slate Creek Cove dock facility. In an effort to increase efficiency and reduce disturbance in the area, Coeur Alaska, Inc. submitted an amended Plan of Operations, which was approved in the USFS 2004 ROD. The project is expected to begin production in 2007 (Coeur Alaska, Inc., 2005).

1.2 Land and Resource Uses

Timber Harvests – In 1997, 1999, and 2000, Goldbelt conducted a timber harvest in the Cascade Point/Echo Cove area. The 40-acre site that was clear cut in 1999-2000 is now being developed as a quarry. In 2005, the right-of-way for the Cascade Point access highway was logged. There are no plans on national or state forest lands for timber harvests in the project area. Management plans for these lands are unlikely to change in the reasonable foreseeable. There are no current plans to harvest timber on private or trust lands; however, construction of a highway on the west side of Lynn Canal could lead to some timber harvest on Mental Health and University Trust lands. It is not possible to quantitatively predict a reasonably foreseeable amount of timber harvest. Therefore, the potential effects of logging on these lands were evaluated qualitatively. The only logging included as reasonably foreseeable in a quantitative evaluation of cumulative impacts is the logging within the right-of-way for construction of one of the alternatives for the Juneau Access Improvements Project, the logging associated with the Kensington Mine Project, and land clearing associated with Goldbelt development at Cascade Point.

Mineral Development – The Goldbelt Corporation was granted a Conditional Use Permit in November 2004, to reopen an existing rock quarry to supply shot rock for construction of a 2.5-mile extension of Glacier Highway from its terminus to Cascade Point. Also, in May 2005, Channel Construction was granted a CBJ Conditional Use Permit to develop a new quarry on previously logged Goldbelt land.

1.3 Residential, Commercial, Industrial and Public Land Use

New commercial and industrial developments within the Juneau Access Improvements Project area include two quarries on Goldbelt's land and construction of a 2.5-mile extension of Glacier Highway. The quarries and road extension are within the CBJ boundary.

1.4 Parks and Recreation Facilities

The Lower Dewey Lake area is a popular hiking and picnicking destination and trail hub owned by the City of Skagway. The area has many trails connecting to Sturgill's Landing, Icy Lake, Upper Reid Falls, Upper Dewey Lake, and Devil's Punchbowl. On October 7, 2004, the City of Skagway adopted an ordinance creating the Dewey Lakes Recreation Area Management Plan. This ordinance sets forth allowable and prohibited activities for this management area.

1.5 Coastal Zone Management

On January 21, 2003, revisions to the ACMP Coastal Consistency Review process (6 Alaska Administrative Code [AAC] 50) went into effect to clarify the regulations and modify the process used to evaluate a proposed project with regard to statewide and district coastal management plan enforceable policies. On April 15, 2003, the responsibilities for the ACMP were transferred from the Office of the Governor, Division of Governmental Coordination, to the Office of Project Management and Permitting (OPMP) within the ADNR. In 2004, the ACMP implementing regulations (6 AAC) were renumbered and adopted in Title 11 as 11 AAC 110, 112, and 114.

The National Oceanic and Atmospheric Administration, Office of Ocean and Coastal Resource Management (OCRM) is currently in the process of reviewing an amendment to the ACMP to determine if the management program, as changed by the amendment request, will meet federal requirements. The State's ACMP amendment consists of changes to 11 AAC Chapters 110, 112, and 114. In September 2005, OCRM issued a Draft EIS to review the State's amendments to the ACMP, and comments were received in November 2005. OCRM expects to issue a ROD and Program Amendment Approval by the end of December 2005.

Three local coastal districts lie within the Juneau Access Improvements Project area: the City of Skagway, Haines Borough, and CBJ. These districts are required to submit amendments to their coastal management plans for approval by ADNR by March 1, 2006; after approval by ADNR and OCRM, plans would go into effect and would be incorporated into the ACMP. If any coastal district plan is not approved by March 1, 2007, the district's original plan would sunset at that time, according to 11 AAC 114. The Skagway and Haines coastal districts submitted revised coastal management plans to ADNR in 2005. As of December 2005 the CBJ had not submitted any revision.

The ACMP statewide standards are the criteria used during a State of Alaska coastal consistency review of activities within and affecting coastal zone uses and resources. Enforceable policies developed by local districts provide supplemental criteria that are specifically applicable to the local district.

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2.0 IMPACTS

Methods

Roadless Areas as a Resource – Roadless areas are discussed in terms of wilderness because they are a resource for future wilderness designation, although they do not have a permanent protection status like a wilderness designation. The USFS uses three criteria for a wilderness evaluation: capability, availability, and need. For this assessment, potential impacts of project alternatives on roadless areas were evaluated on the basis of their effects to the elements of the capability criterion. The other two criteria, availability and need, pertain to USFS management issues and responsibilities that neither the Federal Highway Administration (FHWA) nor the Department of Transportation and Public Facilities (DOT&PF) can direct. Therefore, they were not used in the impact analysis. Elements or values of the capability criterion used in the impact assessment were natural integrity and appearance (apparent naturalness); opportunities for solitude and serenity, self-reliance, adventure, challenging experiences, and primitive recreation; wilderness attribute rating system; and scientific and education values.

Old-Growth Reserves – The assessment of the potential impacts of project alternatives on old-growth reserves was based on the long-term loss of old-growth forest habitat resulting from the construction of project facilities.

2.1 Alternative 2B

2.1.1 Consistency with Land Use and Management Plans

2.1.1.1 Roadless Areas as a Resource

Alternative 2B would construct a 50.5-mile highway from the end of Glacier Highway at Echo Cove around Berners Bay to Katzehin. Approximately 48.0 miles of the highway (the first 2.5 miles of highway at Echo Cove is not in Area 301) would go through Roadless Area 301.

The highway would have a cleared width of approximately 100 feet. The corridor of "road effect" would consist of the width of the highway clearing, and 1,200 feet on either side of the new highway. This would result in a 2,500-foot-wide road-effect corridor where sufficient land exists. For the most part, Alternative 2B would be near the shoreline, resulting in a narrower corridor due to the small amount of land on the shoreward side in some places. In Alternative 2B, the highway would be the farthest from the shoreline near the Antler River in Berners Bay, at the Point Saint Mary ridge, and at the Katzehin River Delta. In Roadless Area 301, from Cascade Point to the Katzehin River, Alternative 2B would create a road-effect corridor 1,300 to 2,500 feet wide, affecting 3,120 acres on the shoreward side (west side) of the alignment and affecting 7,255 acres on the upland side (east side) of the alignment. The total area of road effect for Alternative 2B within Area 301 would be about 10,375 of 1,201,474 acres. Alternative 2B would reduce the size of Roadless Area 301 by 0.9 percent.

Roadless Area Capability – Natural Integrity and Appearance (Apparent Naturalness) and Opportunities for Solitude – Alternative 2B would not change the natural integrity and appearance or opportunities for solitude in Area 301. While the roadless area would be decreased by this alternative, the decrease would be a very small percentage. Area 301 is a very large undeveloped area of mostly unmodified and naturally appearing land containing 1,201,474 acres. Most of Area 301 (98 percent) is managed as Non-Development LUDs. The boundary of the roadless area would be adjusted to exclude the road-effect corridor. The remaining acreage of the modified roadless area would continue to be eligible for wilderness designation under the National Wilderness Preservation System, because it would contain at least 5,000 acres with no roads and retain a roadless character.

Roadless Area Management Consistency – Alternative 2B is consistent with the management direction in Appendix C of the USFS 2003 TLMP Supplemental EIS, Section III(8), "Availability for Management as Wilderness." The TLMP Appendix C states that the highway would be within Roadless Area 301, and "the Forest Plan retains a proposed state road corridor … along this area."

2.1.1.2 Old-Growth Reserves

Alternative 2B would impact three mapped small Old-Growth Habitat LUDs that are reserves established under the old-growth reserve system: VCU 160 in the Slate Cove Area; VCU 200 at the south end of Point Saint Mary Peninsula, adjacent to VCU 160; and VCU 190 from north of Comet to approximately Met Point. Alternative 2B would reduce the VCU 160 mapped small old-growth reserve by 2 percent, VCU 200 mapped small old-growth reserve by 0.5 percent, and VCU 190 mapped small old-growth reserve by 1.4 percent.

In addition to the mapped old-growth reserves, Alternative 2B would go through old-growth forested areas within lands designated as Non-Development LUDs that function as medium and/or large old-growth reserves. Alternative 2B would reduce the size of the old-growth forest habitat in all VCUs, as well as create a separation of some old-growth forest habitat areas into downslope and upslope areas. Alternative 2B would remove approximately 286 of 76,279 acres of old-growth forest habitat along the east side of Lynn Canal (USFS, 2003 for total old-growth forest acres).

The USFS, in consultation with the Alaska Department of Fish and Game (ADF&G) and the U.S. Fish and Wildlife Service (USFWS), would adjust the boundaries of the Old-Growth Habitat LUDs affected by Alternative 2B in accordance with old-growth reserve standards in the TLMP.

2.1.2 Land and Resource Uses

The USFS has concurred with FHWA that the Berners Bay cabin is a specific recreational site on USFS land within the project study area, though Alternative 2B would not take land from this recreation site (Griffin, 2004). Therefore, FHWA has determined that Alternative 2B would not require use of land protected by Section 4(f). On August 27, 2004, the USFS concurred that the cabin area is significant and a trail and parking area are desirable; road access to the cabin would be advantageous to many users, but the loss of a water-access experience within the Juneau Ranger District would be undesirable. DOT&PF and FHWA agreed to provide a trail to the existing cabin as an enhancement of an existing Section 4(f) resource, and to provide a new water-accessed cabin as a general mitigation for impacts to Berners Bay users desiring a remote, water-access experience (DOT&PF, 2005). Improved access to the Berners Bay cabin would be desirable to many recreationists. Building the second cabin to assure water-access values are sustained, would maintain more remote recreation values.

Opening up recreation opportunities of the coastline along the east side of Lynn Canal would be perceived as a negative impact to the quality of the experience by those who enjoy the existing remote nature of the region, including some outfitters who currently provide wilderness trips there. Current users of Berners Bay who travel there by kayak, canoe, small boat, or float plane would find the experience there different. DOT&PF would construct a new remote-access cabin for the USFS at a location selected by the USFS.

2.1.2.1 Roadless Areas as a Resource

Land that would be affected by Alternative 2B is located mostly along the waterfront area of Lynn Canal. The corridor would be at the shoreward edge of Roadless Area 301 and would not intrude far into its inner part, leaving the larger portion of the roadless area unaffected and available for apparent naturalness and opportunities for solitude. Also, the highway would be in an area already affected by frequent water and air traffic and other activities.

With the exception of access via the major rivers, recreationists would access the roadless area by highway, rather than by water. Under Alternative 2B, recreationists would be exposed to development and human activity at the point of access from the highway.

Roadless Area 301 is split into four classes in the USFS Recreation Opportunity Spectrum (ROS) system. One of the classes, Semi-Primitive Motorized ROS setting, is a narrow strip adjacent to the shore of Lynn Canal. Upland of the narrow strip is a Semi-Primitive Non-Motorized ROS, and the remaining land in Area 301, upland of the Semi-Primitive Non-Motorized ROS, is a large area classified as Primitive Recreation ROS. Based on these configurations, the primary ROS for Area 301 is Primitive (90 percent of the roadless area). Alternative 2B would be in the Semi-Primitive Motorized, Semi-Primitive Non-Motorized, and Roaded Natural ROS classes.

TLMP provisions allow the UFSF to change recreation settings in locations where approved activities would affect the ROS settings. The ROS settings where the Alternative 2B highway corridor would occur would be changed to Roaded Natural.

Capability – Scientific and Education Values – Alternative 2B would not affect any identified scientific and education areas in Area 301 (identified features are glaciers and icefields, and a Research Natural Area at Warm Pass).

2.1.3 Coastal Zone Management

Alternative 2B would be within the coastal zone, primarily on USFS managed land. Federal lands owned, leased, or held in trust or whose use is otherwise subject by law solely to the discretion of the federal government, are excluded from the coastal zone boundary of the Alaska ACMP and local plans. Uses and activities on excluded federal lands that affect the coastal zone must be consistent with the ACMP (ADNR, 2005b).

The ACMP statewide standards are the criteria used during a State of Alaska coastal consistency review of activities within and affecting coastal zone uses and resources. Enforceable policies, developed by local districts, provide supplemental criteria that are specifically applicable to the local district. The topics addressed by the enforceable policies of the ACMP and the district coastal management plans that are relevant to Alternative 2B are coastal development; geophysical hazards; recreation; transportation and utilities; timber harvest; mining and mineral processing; subsistence; biological habitats; air, land, and water quality; and prehistoric and historic resources.

Alternative 2B has been sited in consideration of the enforceable policies of the ACMP and district coastal management plans. These enforceable policies would also be considered in the development of design parameters for the alternative selected for the proposed project. In accordance with the CZMP, DOT&PF will obtain a determination from ADNR of the consistency of the selected alternative with the state coastal management program and Juneau coastal management plan following the USACE and ADNR public notice period as part of the process to obtain the necessary state and federal permits for the project.

The following is a brief description of how Alternative 2B would be consistent with the major statewide standards and district coastal management enforceable policies. This discussion is based on existing statewide standards and coastal district policies. ADNR is currently in the process of obtaining federal approval of revised ACMP statewide standards and is currently working with coastal districts to revise coastal district enforceable policies. The enforceable policies under 6 AAC 80 are currently used until ADNR receives approval on the amendment to the ACMP from the National Oceanic and Atmospheric Administration, OCRM.

2.1.3.1 Statewide ACMP Standards

Geophysical Hazard Areas (6 AAC 80.050) – DOT&PF has identified and mitigated known geophysical hazards through preliminary design measures.

Recreation (6 AAC 80.060) – DOT&PF would maintain public access to coastal waters. There are no recreation areas designated by coastal districts in the project area.

Habitats (6 AAC 80.130) – DOT&PF has coordinated with state and federal agencies to identify coastal habitats that may be impacted by Alternative 2B. DOT&PF has adjusted the highway alignment to avoid all palustrine emergent wetlands and to avoid other wetlands and sensitive habitats to the greatest extent possible.

Air, Land, and Water Quality (6 AAC 80.140) – During construction, operation, and maintenance of Alternative 2B, DOT&PF would ensure compliance with all Alaska Department of Environmental Conservation (ADEC) regulations regarding water, air, and land quality. Best Management Practices (BMPs) would be used to avoid downstream water degradation below water quality standards.

Historic, Prehistoric, and Archaeological Resources (6 AAC 80.150) – No historic, prehistoric, and archaeological areas of significance are identified in the CBJ coastal management plan. DOT&PF has worked closely with the State Historic Preservation Officer to complete all necessary cultural resource surveys to identify any areas important to state or local history or prehistory. DOT&PF would implement mitigation measures to protect the Jualin Mine Tram and Comet/Bear/Kensington Railroad.

2.1.3.2 City and Borough of Juneau Coastal Management Program Enforceable Policies

Coastal Development (49.70.905) – DOT&PF would comply with the Coastal Development policies through use of BMPs for design and construction to avoid or minimize hazards. Dredging and filling necessary for construction of the highway would be avoided to the greatest extent possible in highly productive tidelands or wetlands, subtidal lands important for shellfish, and habitat important to resident or anadromous fish. Transportation facilities are exempt from meeting the policy prohibiting intertidal fill below mean high tide.

Geophysical Hazards (49.70.910) – Alternative 2B would comply with these policies by reducing erosion possibilities and visible scarring to the landscape through mitigation and BMPs during design and construction. Hazards such as avalanche and rockslide chutes have been identified, and design and avalanche control measures would be implemented to ensure the safety of the public and property. Areas impacted during construction would be revegetated with native species where necessary. All large floodplains along the highway corridor would be crossed with bridges. Multiple-span bridges would be supported on pilings that would be of size and distribution as to create no significant flood risks. Smaller flood plains of streams that do not support anadromous fish would be crossed with culverts. Where construction within the floodplain is necessary, facilities would be constructed to meet 100-year flood requirements.

Transportation and Utilities (49.70.925) – DOT&PF, to the extent feasible, has located the highway alignment to avoid wetlands, intertidal marshes, and aesthetic degradation. DOT&PF has moved the alignment for Alternative 2B (Preferred Alternative) to avoid all palustrine emergent wetlands and reduce impacts to estuarine wetlands. All anadromous stream crossings would be designed to avoid impacts to fish passage and habitat disturbance including the avoidance of in-stream work during spawning or times of critical period for anadromous fish. Where possible, the highway alignment has been adjusted to avoid sensitive coastal areas.

Fish and Seafood Propagation and Processing (49.70.930) – All anadromous stream crossings and EFH crossed by Alternative 2B would be designed and constructed as to have no impact to spawning or migration of these fish species or impacts that may degrade water quality (See Air, Land, and Water Quality 49.70.955).

Timber Harvest and Processing (49.70.935) – Land clearing and timber harvest conducted as part of the construction of Alternative 2B would be done to minimize any environmental impacts, and avoid impacts to movement of fish in coastal waters. No log processing facilities, in-water log dumping and storage, or additional roads are proposed as part of the clearing and timber harvesting.

Habitat (49.70.950) – Impacts to coastal habitat areas are identified and mitigated to maintain habitat values of esturaries, wetlands, tide flats, rivers and streams. The alignment was designed to avoid these areas to the greatest extent possible, avoiding all palustrine and estuarine emergent wetlands in the CBJ. The highway would be constructed with a minimum-width fill footprint in wetlands. Impacts to vegetated and mud tideflats have been avoided; impacts to rocky tide flats would be minimized by using steepened side slopes and sidecasting only in steep areas where the material would settle in subtidal depths. Impacts to streams and rivers would be minimized by bridging over all anadromous fish streams, timing in-water work to avoid fish, and clear spanning the eulachon spawning area in the Antler River. Based on these measures, and the extent of the remaining areas of estuary, wetland, and tide flat habitat in the project area, these habitats would continue to sustain necessary biological, physical, and chemical characteristics.

Air, Land, and Water Quality (49.70.955) – During construction, operation, and maintenance of Alternative 2B, DOT&PF would ensure all ADEC regulations are met. BMPs would be used to avoid downstream water degradation below water quality standards.

2.1.4 Subsistence

Alternative 2B would not impact subsistence hunting on Sullivan, Lincoln, Shelter, Chichagof, or Admiralty islands, the lands adjacent to Taiya Inlet, and the south shore of James Bay. It would not impact subsistence fishing in Taiya Inlet or subsistence hunting of marine mammals anywhere in Lynn Canal.

Haines and Skagway residents use the Katzehin River area for subsistence harvest of marine invertebrates and marine mammals. Alternative 2B, combined with USFS plans for potential public access locations along the highway, would increase access to areas for subsistence harvest activities that previously were accessible only by boat or aircraft. This access could increase competition for subsistence resources from recreational hunting and fishing. These changes to subsistence opportunities would be viewed as beneficial for some subsistence harvesters, but for others the increased competition for resources would be negative.

Juneau is not recognized as a subsistence community under the Alaska National Interest Lands Conservation Act (ANILCA). However, some residents of Juneau use Berners Bay and Lynn Canal for personal use harvests of fish and shellfish.

Based on the 1998 USFS subsistence study, the 1994 ADF&G analysis of subsistence impacts, 2003 scoping comments for the Supplemental Draft EIS, Supplemental Draft EIS hearing and written comments, and an analysis of these sources of information, FHWA has determined that Alternative 2B would not significantly restrict subsistence uses.

2.2 Alternative 3

2.2.1 Consistency with Land Use and Management Plans

2.2.1.1 Roadless Areas as a Resource

Alternative 3 would construct a 5.2-mile road from Echo Cove to Sawmill Cove on the east side of Lynn Canal, and a 38.9-mile highway between William Henry Bay and Haines on the west side of Lynn Canal. Approximately 2.5 miles of highway would go through Roadless Area 301 (to Sawmill Cove), 6 miles in Roadless Area 304 (William Henry Bay to Endicott River), and approximately 15 miles in Roadless Area 303.

As discussed in Alternative 2B the road-effect corridor would be 2,500 feet wide, where sufficient land exists. For the most part, Alternative 3 would be near the shoreline, resulting in a narrower corridor due to the small amount of land on the shoreward side. The Alternative 3 highway alignment would be farthest from the shoreline at the deltas of the Endicott and Sullivan rivers, and at a delta opposite the north end of Sullivan Island. Alternative 3 would have the following effects on roadless areas:

- In Roadless Area 301, over 2.1 miles from Cascade Point to Sawmill Cove, Alternative 3 would create a road-effect corridor 1,300 to 2,500 feet wide, affecting 293 acres on the shoreward side (west side) of the highway alignment and affecting 349 acres on the east side of the alignment. The total area of road effect for Alternative 3 within Roadless Area 301 would be about 642 of 1,201,474 acres. Alternative 3 would reduce the size of Roadless Area 301 by 0.05 percent.
- In Roadless Area 304, from William Henry Bay to the Endicott River, Alternative 3 would create a road-effect corridor 1,300 to 2,500 feet wide, affecting 156 acres on the shoreward side (east side) of the alignment and affecting 818 acres on the upland side (west side) of the alignment. The total road effect for Alternative 3 within Roadless Area 304 would be about 975 of 198,109 acres, reducing this roadless area by 0.5 percent.

- In Roadless Area 303, from the Endicott River to the north boundary of the Tongass, Alternative 3 would create a road-effect corridor 1,300 to 2,500 feet wide, affecting 1,087 acres on the shoreward side (east side) of the alignment and affecting 2,592 acres on the upland side (west side) of the alignment. The total area of road effect for Alternative 3 within Roadless Area 303 would be about 3,678 of 66,143 acres, reducing this roadless area by 5.6 percent.

Roadless Area Capability – Natural Integrity and Appearance (Apparent Naturalness) and Opportunities for Solitude – Alternative 3 would not change the natural integrity and appearance or opportunities for solitude in the majority of Roadless Areas 301, 303 and 304. While Alternative 3 would reduce Areas 301, 303, and 304 in size, the reduction would be a very small percentage of each area. Roadless Area 301 is a very large undeveloped area of mostly unmodified and natural appearing land, containing 1,201,474 acres. Most of Area 301 (98 percent) is managed as Non-Development LUDs. Area 303 consists of 66,143 acres of primarily natural land. Area 303 contains 66,143 acres. Most of Area 303 (78 percent) is managed as Non-Development LUDs. Area 304 contains 198,109 acres, most of which (77 percent) are managed as Non-Development LUDs. Area 304 is largely unmodified and has an overall appearance of naturalness.

The boundaries of the roadless areas would be adjusted to exclude the road effect corridor. The remaining acreage of Areas 301, 303, and 304 would continue to be eligible for wilderness designation under the National Wilderness Preservation System, because they would contain at least 5,000 acres with no roads and retain a roadless character.

Roadless Area Management Consistency – Alternative 3 is consistent with management direction for Roadless Areas 301, 303, and 304 in Appendix C of the USFS 2003 TLMP Supplemental EIS, Section III(8), "Availability for Management as Wilderness." The TLMP Appendix C states that the highway would be within Areas 301, 303 and 304, and "The Forest Plan retains a proposed state road corridor along this area."

In Roadless Area 303, Alternative 3 would bypass three small unroaded areas, each less than 1,000 acres that were identified in the USFS 2003 TLMP Supplemental EIS at the Sullivan River delta at the shoreline of the eastern side of the delta. Alternative 3 would have no effect on them.

2.2.1.2 Old-Growth Reserves

Alternative 3 would not impact any mapped old-growth reserves. Alternative 3 would go through old-growth forested areas within lands designated as Non-Development LUDs that function as medium and/or large old-growth forest habitat reserves. Alternative 3 would reduce the size of the old-growth forest stands in all VCUs, as well as create a separation of some old-growth forest areas into downslope and upslope areas. Alternative 3 would remove approximately 314 of 74,470 acres of old-growth forest habitat along the east and west sides of Lynn Canal (USFS, 2003).

The USFS, in consultation with ADF&G and USFWS, would adjust the boundaries of the Old-Growth Forest Habitat LUDs affected in accordance with old-growth reserve standards in the TLMP.

2.2.2 Land and Resource Uses

Alternative 3 and pullouts would improve opportunities for recreational activities such as hiking, camping, sightseeing, boating, bicycling, fishing, and hunting. These opportunities would provide benefits for residents and visitors, and spread out recreation activities that are currently concentrated along the existing highway systems in Juneau, Haines, and Skagway. Improved access to fish streams and the resultant higher level of use by sport fishers would require a greater level of effort by ADF&G in terms of surveying streams and enforcing regulations. Increased access to Juneau and the resultant increase in visitors would put additional pressure on existing sport fishing facilities, particularly boat ramps. The CBJ would be responsible for evaluating the need for additional or expanded facilities as demand increases.

Opening up these recreational opportunities on the coastline along the east side of Lynn Canal to Sawmill Cove and the west side of Lynn Canal from William Henry Bay to Haines would have a negative effect on the quality of the experience to those who enjoy the existing remote nature of the region, including some outfitters who currently provide wilderness trips in these areas.

2.2.2.1 Roadless Areas as a Resource

The land affected by Alternative 3 is located mostly along the waterfront area of Lynn Canal. For the most part, the corridor would not intrude into the inner parts of Areas 301, 303, and 304, leaving the larger portion of the roadless areas unaffected and available for apparent naturalness and opportunities for solitude. Also, the highway would be in an area already affected by frequent water and air traffic and other activities.

Under Alternative 3, users of the roadless areas would have highway access, rather than the current water access. At the point of access from the highway, recreationists would be exposed to development and human activity.

Alternative 3 would impact natural integrity and apparent naturalness and opportunity for solitude in a limited area in the Cascade Point to Sawmill Cove vicinity. There is currently a significant amount of recreation use in Berners Bay, and there are activities on adjacent land near Berners Bay; the Alternative 3 effects to solitude would be less in Berners Bay than other areas along the corridor, because Berners Bay is relatively heavily used.

Roadless Areas 301, 303, and 304, within the area affected by Alternative 3, are split into three classes in the USFS ROS system. The areas have the same basic configuration on both sides of Lynn Canal. Alternative 3 would be within a narrow strip of the current Semi-Primitive Motorized ROS setting, adjacent to the shore on both the east and west sides of Lynn Canal. Upland of the narrow shoreline strip of Semi-Primitive Motorized ROS on both sides of Lynn Canal are Semi-Primitive Non-Motorized ROS and, further upland, Primitive ROS. Based on these configurations, the primary ROS for Area 301 is Primitive (90 percent of the roadless area); the primary ROSs for Area 303 are Primitive (54 percent) and Semi-Primitive Non-Motorized (38 percent); and, the primary ROS for Area 304 is Primitive (48 percent) and Semi-Primitive Non-Motorized (44 percent).

TLMP provisions allow the USFS to change recreation settings in locations where approved activities would affect the ROS settings. The ROS settings where Alternative 3 would occur would be changed to Roaded Natural.

Capability – Scientific and Education Values – Alternative 3 would not affect any identified scientific and education areas for Roadless Areas 301, 303 or 304. In Area 301, the following features were identified: glaciers and icefields, and a Research Natural Area at Warm Pass. There are no identified special features in Areas 303 and 304.

2.2.3 Coastal Zone Management

The proposed West Lynn Canal Highway and ferry terminals are located in the coastal zone. The highway from Echo Cove to Sawmill Cove and the proposed Sawmill Cove Ferry Terminal are within the CBJ coastal management area. The West Lynn Canal Highway connection to Mud Bay Road would be in the Haines Borough coastal management area. Therefore, Alternative 3 would need to comply with the enforceable policies of the ACMP and segments of the alternative would need to comply with the CBJ and Haines coastal management plans.

The topics addressed by the enforceable policies of the ACMP and the coastal management plans that are relevant to Alternative 3 are coastal development; geophysical hazards; recreation; transportation and utilities; timber harvest; mining and mineral processing; subsistence; biological habitats; air, land, and water quality; and prehistoric and historic resources. These policies provide goals and performance criteria for activities within the coastal zone, including transportation projects.

Alternative 3 has been sited in consideration of the enforceable policies of the ACMP and district coastal management plans. These enforceable policies would also be considered in the development of design parameters for the alternative selected for the proposed project. In accordance with the CZMP, DOT&PF will obtain a determination from ADNR of consistency of the selected alternative with the state coastal management program and Juneau and Haines coastal management plans prior to obtaining the necessary state and federal permits for the project.

The following is a brief description of how Alternative 3 would be consistent with the major statewide standards and district coastal management enforceable policies. This discussion is based on existing statewide standards and coastal district policies. ADNR is in the process of obtaining federal approval of revised ACMP statewide standards and is currently working with coastal districts to revise coastal district enforceable policies. The enforceable policies under 6 AAC 80 are currently used until ADNR receives approval on the amendment to the ACMP from the National Oceanic and Atmospheric Administration, OCRM.

2.2.3.1 Statewide ACMP Standards

Geophysical Hazard Areas (6 AAC 80.050) – DOT&PF has identified and mitigated known geophysical hazards through preliminary design measures.

Recreation (6 AAC 80.060) – DOT&PF would maintain public access to coastal waters. There are no recreation areas designated by coastal districts in the project area.

Habitats (6 AAC 80.130) – DOT&PF has coordinated with state and federal agencies to identify coastal habitats that may be impacted by Alternative 3. DOT&PF has adjusted the highway alignment to avoid fill of emergent and palustrine wetlands and sensitive habitats to the greatest extent possible.

Air, Land, and Water Quality (6 AAC 80.140) – During construction, operation, and maintenance of Alternative 3, DOT&PF would ensure compliance with all ADEC regulations regarding water, air, and land quality. BMPs would be used to avoid downstream water degradation below water quality standards.

Historic, Prehistoric, and Archaeological Resources (6 AAC 80.150) – No historic, prehistoric, and archaeological areas of significance are identified in the City of Haines coastal management plan. DOT&PF has worked closely with the State Historic Preservation Officer to complete all necessary cultural resource surveys to identify any areas important to state or local history or prehistory. DOT&PF would implement mitigation measures to protect the Dalton Trail (see Section 4.4.4).

2.2.3.2 City and Borough of Juneau Coastal Management Program Enforceable Policies

The 5.2-mile extension of the highway from Echo Cove to Sawmill Cove and construction of the Sawmill Cove Ferry Terminal would be within the CBJ Coastal Zone Management District. For this reason, only the following enforceable policies are applicable to Alternative 3.

Coastal Development (49.70.905) – DOT&PF would comply with the coastal development policies through use of BMPs for design and construction to avoid or minimize hazards. Dredging and filling necessary for construction of the highway would be avoided to the greatest extent possible in highly productive tidelands or wetlands, subtidal lands important for shellfish, and habitat important for resident or anadromous fish. All in-water construction for the Sawmill Cove terminal would be completed in such a way as to not change water circulation patterns and to minimize shoreline alterations. Transportation facilities are exempt from meeting the policy prohibiting intertidal fill below mean high tide.

Geophysical Hazards (49.70.910) – Alternative 3 would comply with these policies by reducing erosion possibilities and visible scarring to the landscape through mitigation and BMPs during design and construction. Areas impacted during construction would be revegetated with native species where necessary. Anadromous fish streams would be spanned. Small flood plains of streams that do not support anadromous fish would be crossed with culverts. Where construction within the floodplain is necessary, facilities would be constructed to meet 100-year flood requirements.

Transportation and Utilities (49.70.925) – DOT&PF to the extent feasible, has located the highway alignment and Sawmill Cove Ferry Terminal to avoid wetlands, intertidal marshes, and aesthetic degradation. DOT&PF has moved the alignment for Alternative 3 to avoid all emergent wetlands on the east side of Lynn Canal and reduce impacts to palustrine wetlands. All anadromous stream crossing would be designed to avoid impacts to fish passage and habitat disturbance including the avoidance of in-stream work during spawning or times of critical period for anadromous fish. Where possible, the highway alignment has been adjusted to avoid sensitive coastal areas.

Fish and Seafood Propagation and Processing (49.70.930) – All anadromous stream crossings and EFH crossed by Alternative 3 would be designed and constructed as to have no impact to spawning or migration of these fish species or impacts that may degrade water quality (see Air, Land, and Water Quality 49.70.955).

Timber Harvest and Processing (49.70.935) – Land clearing and timber harvest conducted as part of the construction of Alternative 3 would be done to minimize any environmental impacts, and to avoid impacts to movement of fish in coastal waters. No log processing facilities, in-water log dumping and storage, or additional roads are proposed as parting of the clearing and timber harvesting.

Habitat (49.70.950) – Impacts to coastal habitat areas within the CBJ district are identified and mitigated to the greatest extent possible to maintain habitat values of wetlands, tideflats, rivers, and streams. DOT&PF has adjusted the highway alignment to avoid fill of emergent wetlands and palustrine wetlands and in sensitive habitats to the greatest extent possible. In addition to changes to the alignment, a minimum-width fill footprint with steepened slopes would be used for the highway in wetland areas to reduce the footprint. Impacts to tideflats from the ferry terminal at Sawmill Cove would be minimized by timing construction to avoid impacts to fish, by using clean fill, and by minimizing the terminal and dredging footprints to the smallest size practicable. The remaining undisturbed tideflats in Sawmill Cove would be of sufficient size to continue to provide adequate important habitat for fish and wildlife. Impacts to streams would be mitigated by a clearspan bridge over Sawmill Creek, an anadromous fish stream, and by the use of BMPs to avoid water quality impacts. Based on these measures, and because of the large size of remaining wetland and tideflat habitats in the project area, the habitats in wetlands, tideflats, and streams would continue to sustain the biological, physical, and chemical characteristics necessary to support living resources. During final engineering design of the selected alternative, DOT&PF would continue to investigate ways to further minimize encroachment on wetlands and tideflats. If Alternative 3 were selected, further consultation with NMFS and OHMP would occur to determine whether additional conservation measures regarding herring spawning in Sawmill Cove would be required.

Air, Land, and Water Quality (49.70.955) – During construction, operation, and maintenance of Alternative 3, DOT&PF would ensure all ADEC regulations are met. BMPs would be used to avoid downstream water degradation below water quality standards.

2.2.3.3 Haines Coastal Management Program Enforceable Policies

The connection of the Chilkat River bridge, from the mean lower low water line to the Mud Bay Road, in Haines, would be subject to the Haines District Coastal Management Plan. Pyramid Island is outside the Haines Coastal District.

Coastal Development (A-1 through A-7, A-9 through A-12) – DOT&PF would comply with the applicable Coastal Development policies through use of BMPs for design and construction to avoid or minimize hazards. Dredging and filling necessary for construction within the district would avoid to the greatest extent possible highly productive tidelands, wetlands, or subtidal lands important for fish. No wetlands or anadromous streams within the Haines coastal district would be impacted by this alternative. All in-water construction would be completed in such a way as not to change water circulation pattern and minimize shoreline alterations where the Pyramid Island Bridge joins the Chilkat Peninsula.

Geophysical Hazard Areas (B-1 through B-3) – DOT&PF would comply with these policies by reducing erosion possibilities and reducing visible scarring to the landscape through mitigation and BMPs during design and construction. Areas impacted during construction would be revegetated with native species where necessary.

Recreation and Tourism (C-3 through C-7) – DOT&PF would maintain public access to waters within the Chilkat Inlet. DOT&PF would also ensure any easements and rights of way for public and private landowners within the Alternative 3 alignment are maintained.

Transportation and Utilities (E-2 through E-4) – DOT&PF through BMPs and necessary mitigation measures would limit adverse impacts to habitats, biological resources, coastal resources and uses, and recreation and traditional subsistence use activities. Further, design of the Pyramid Island Bridge would be designed to maintain water circulation in harbor areas.

Habitats (J-2, J-3A, J-6, andJ-7) – Design, operation, and maintenance of the Pyramid Island Bridge would maintain the habitat values of the tideflats for anadromous fish (rearing, migration, overwintering, access to spawning habitat), bald eagles, humpback whales, and Steller sea lions. Impacts to tideflats would be minimized by timing construction to minimize impacts to fish, using clean fill, and by placing the east abutment of the Chilkat River/Inlet crossing above the high tide line on the Chilkat Peninsula. The habitats would continue to sustain the biological, physical, and chemical characteristics to support living resources.

Historic, Prehistoric, and Archaeological Resources (L-2 and L-3) – DOT&PF has worked closely with the SHPO to complete all necessary cultural resource surveys to identify any areas important to state or local history or prehistory.

2.2.4 Subsistence

Alternative 3 would not impact subsistence hunting on Sullivan, Lincoln, Shelter, Chichagof, or Admiralty islands, the lands adjacent to Taiya Inlet, and the south shore of James Bay. It would not impact subsistence fishing in Taiya Inlet or subsistence hunting of marine mammals anywhere in Lynn Canal.

Alternative 3 would have no direct effects on subsistence uses. Improved access to subsistence use areas along the Alternative 3 alignment in the Sullivan River area could indirectly affect the intensity of subsistence harvest and the availability of resources. Alternative 3, together with USFS plans for potential public access locations along the highway, would make Lynn Canal much more accessible for other hunters. Alternative 3 could increase competition for subsistence resources from recreational hunting and fishing. These changes to subsistence opportunities would be viewed as beneficial for some subsistence harvesters, but others would perceive the increased competition for resources as a negative impact.

Based on the 1998 USFS subsistence study, the 1994 ADF&G analysis of subsistence impacts, the 2003 scoping comments for the Supplemental Draft EIS, the Supplemental Draft EIS hearing and written comments, and an analysis of these sources of information, FHWA has determined that Alternative 3 would not significantly restrict subsistence uses.

2.3 Alternatives 4A and 4C

2.3.1 Coastal Zone Management

Modifications of the existing ferry terminal at Auke Bay would need to be consistent with the enforceable policies of the ACMP and the CBJ coastal management plan. In accordance with the Coastal Zone Management Program, DOT&PF will obtain a determination from ADNR of consistency of the selected alternative with the state coastal management program and the

Juneau coastal management plan prior to obtaining the necessary state and federal permits for the project.

The following is a brief description of how Alternatives 4A and 4C would be consistent with the major statewide standards and district coastal management enforceable policies. This discussion is based on existing statewide standards and coastal district policies. ADNR is currently in the process of obtaining federal approval of revised ACMP statewide standards and is currently working with coastal districts to revise coastal district enforceable policies. The enforceable policies under 6 AAC 80 are currently used until ADNR receives approval on the amendment to the ACMP from the National Oceanic and Atmospheric Administration, OCRM.

2.3.1.1 Statewide ACMP Standards

Habitats (6 AAC 80.130) – DOT&PF has coordinated with state and federal agencies to identify coastal habitats that may be impacted by Alternatives 4A and 4C. Construction, operation, and maintenance would be implemented to avoid impacts to coastal habitat.

Air, Land, and Water Quality (6 AAC 80.140) – During operation, DOT&PF would ensure compliance with all ADEC regulations regarding water, air, and land quality.

2.3.1.2 City and Borough of Juneau Coastal Management Program Enforceable Policies

The only portion of Alternatives 4A and 4C within the CBJ coastal zone district would be the construction of new stern berths in Auke Bay.

Coastal Development (49.70.905) – DOT&PF would comply with the applicable coastal development policies through use of BMPs for design and construction to avoid or minimize hazards. Dredging and filling necessary for construction would be avoided to the greatest extent possible in highly productive tidelands or wetlands, subtidal lands important for shellfish, and habitat important to anadromous fish. All in-water construction would be completed in such a way as to not change water circulation patterns and to minimize shoreline alterations.

Habitat (49.70.950) – Impacts to the tideflat habitat areas at Auke Bay would be mitigated to the greatest extent possible to maintain habitat values. Some of the measures to mitigate impacts to tideflats are timing in-water work to avoid impacts to fish and the use of clean fill.

Special Waterfront Areas (49.70.960) – Reconstruction at the existing Auke Bay Ferry Terminal would be located within a Special Waterfront Area managed by a coastal management enforceable policy unique to the CBJ. Fill proposals within the special waterfront area are not subject to a fill prohibition of the Juneau Coastal Development Enforceable Policy 49.70.905(13) regarding whether a project is water dependent or water-related (49.70.960(a)(2)). Also, the significant public need and feasible and prudent alternative analysis under the Juneau Habitat Standard 49.70.950(d) does not apply to state projects (49.70.960(a)(6)). The ferry terminal reconstruction activities would comply with 49.70.960(b)(1)(B), meeting water-relevancy requirements of 49.70.905 for floats, docks, and dolphins.

Air, Land, and Water Quality (49.70.955) – During construction, operation, and maintenance of Alternatives 4A and 4C, DOT&PF would ensure all ADEC regulations are met.

2.4 Alternatives 4B and 4D

2.4.1 Consistency with Land Use and Management Plans

2.4.1.1 Roadless Areas

Alternatives 4B and 4D would extend Glacier Highway 5.2 miles from Echo Cove to a ferry terminal in Sawmill Cove; approximately 2.1 miles of the highway would be constructed within Area 301. For the most part, Alternatives 4B and 4D would be near the shoreline, resulting in a narrower, less than 2,500-foot-wide corridor, due to the small amount of land on the shoreward side in some places. In Roadless Area 301 over 2.1 miles from Cascade Point to Sawmill Cove, Alternatives 4B and 4D would create a road effect corridor 1,300 to 2,500 feet wide, affecting 293 acres on the shoreward side (west side) of the highway alignment and affecting 349 acres on the upland side (east side) of the alignment. The total area of road effect for Alternatives 4B and 4D within Area 301 would be about 642 of 1,201,474 acres.

Roadless Area Capability – Natural Integrity and Appearance (Apparent Naturalness) and Opportunity for Solitude – The road effect corridor would not change the natural integrity and appearance or opportunity for solitude in the majority of Area 301. While Roadless Area 301 would be decreased by the Alternatives 4B and 4D road effect corridor, the decrease would be a very small percentage. Roadless Area 301 is mostly unmodified and in a natural appearing condition, and it includes a very large undeveloped land area, containing 1,201,474 acres. Non-Development LUDs make up 98 percent, and Area 301 provides primarily primitive recreation opportunities. The boundary of the roadless area would be adjusted to exclude the road effect corridor. The remaining acreage of Area 301 would continue to be eligible for wilderness designation under the National Wilderness Preservation System, because it would contain at least 5,000 acres with no roads and retain a roadless character.

Roadless Area Management Consistency – Alternatives 4B and 4D are consistent with management direction for Roadless Area 301 in Appendix C of the USFS 2003 TLMP Supplemental EIS, Section III(8) "Availability for Management as Wilderness." The TLMP Appendix C states that the highway would be within Area 301, and "the Forest Plan retains a proposed state road corridor … along this area."

Old-Growth Forest Habitat Reserves – Alternatives 4B and 4D would not impact any mapped Old-Growth Forest Habitat reserves. The highway segment for these alternatives would go through old-growth forested areas within lands designated as Non-Development LUDs that function as medium and/or large old-growth forest habitat reserves. Alternatives 4B and 4D would reduce the size of the old-growth forest habitat reserves in all VCUs, as well as create a separation of some old-growth forest areas into downslope and upslope areas. These alternatives would remove approximately 25 of 74,470 acres of old-growth forest along the east side of Lynn Canal (USFS, 2003).

The USFS, in consultation with ADF&G and USFWS, would adjust the boundaries of the Old-Growth Forest Habitat LUDs affected in accordance with old-growth forest habitat reserve standards in the TLMP.

2.4.2 Land and Resource Uses

2.4.2.1 Roadless Areas as a Resource

The land affected by Alternatives 4B and 4D is mostly along the waterfront area of the south part of Berners Bay. This results in a less intrusive development, leaving the larger portion of Area 301 unaffected and available for apparent naturalness and opportunities for solitude. Also, the highway would be in an area already affected by frequent water and air traffic and other activities.

Under Alternatives 4B and 4D, recreationists would access Area 301 by highway in the vicinity of Cascade to Sawmill Cove. The access to the majority of Area 301 would not change. At the point of access from the highway, recreationists would be exposed to development and human activity.

Impacts from Alternatives 4B and 4D to the natural integrity and apparent naturalness and opportunity for solitude would be limited to the area of the Cascade Point vicinity to Sawmill Cove. Because there is currently a significant amount of recreation use in Berners Bay, and there are activities on adjacent land near Berners Bay, the effects of Alternatives 4B and 4D to solitude would be less in Berners Bay than other areas along the corridor.

Roadless Area 301, in the area affected by Alternatives 4B and 4D, is split into three classes in the USFS ROS system. One ROS class is a narrow strip adjacent to the shore of the east side of Lynn Canal. Upland of the narrow shoreline strip, is a Semi-Primitive Non-Motorized ROS. The remaining land in Area 301, further upland of the Semi-Primitive Non-Motorized ROS, is a large area classified as Primitive Recreation ROS. Based on these configurations, the primary ROS for Area 301 is Primitive (90 percent of the roadless area). Alternatives 4B and 4D would be within the narrow shoreline strip in the current Semi-Primitive Motorized ROS setting.

TLMP provisions allow the USFS to change recreation settings in locations where approved activities would affect the ROS settings. The ROS settings where Alternatives 4B and 4D would occur would be changed to Roaded Natural.

Roadless Area Capability – Scientific and Education Values – The Alternatives 4B and 4D road effect corridor would not affect any identified scientific and education areas in Area 301. The following features were identified: glaciers and icefields, and a Research Natural Area at Warm Pass.

2.4.3 Coastal Zone Management

Proposed facilities for Alternatives 4B and 4D are located in the coastal zone. The highway from Echo Cove to Sawmill Cove and the proposed Sawmill Cove Ferry Terminal are within the CBJ coastal management plan. Therefore, Alternatives 4B and 4D would need to comply with the enforceable policies of the ACMP and the CBJ coastal district plan.

The topics addressed by the enforceable policies of the ACMP and the coastal management plans that are relevant to Alternatives 4B and 4D are coastal development; geophysical hazards; recreation; transportation and utilities; subsistence; biological habitats; air, land, and water quality; and prehistoric and historic resources. These policies provide goals and performance criteria for activities within the coastal zone, including transportation projects.

Alternatives 4B and 4D have been sited in consideration of the enforceable policies of the ACMP and the coastal management plans. These enforceable policies would also be considered in the development of design parameters for the alternative selected for the proposed project. In accordance with the CZMP, DOT&PF will obtain a determination from ADNR of consistency of the selected alternative with the state coastal management program and applicable coastal management plans prior to obtaining the necessary state and federal permits for the project.

The following is a brief description of how Alternatives 4B and 4D would be consistent with the major statewide standards and district coastal management enforceable policies. This discussion is based on existing statewide standards and coastal district policies. ADNR is currently in the process of obtaining federal approval of revised ACMP statewide standards and is currently working with coastal districts to revise coastal district enforceable policies. The enforceable policies under 6 AAC 80 are currently used until ADNR receives approval on the amendment to the ACMP from the National Oceanic and Atmospheric Administration, OCRM.

2.4.3.1 Statewide ACMP Standards

Geophysical Hazard Areas (6 AAC 80.050) – DOT&PF has identified and mitigated known geophysical hazards through preliminary design measures.

Recreation (6 AAC 80.060) – DOT&PF would maintain public access to coastal waters. There are no recreation areas designated by coastal districts in the project area.

Habitats (6 AAC 80.130) – DOT&PF has coordinated with state and federal agencies to identify coastal habitats that may be impacted by Alternatives 4B and 4D. DOT&PF has adjusted the highway alignment to avoid all emergent wetlands and to avoid palustrine wetlands and sensitive habitats to the greatest extent possible.

Air, Land, and Water Quality (6 AAC 80.140) – During construction, operation, and maintenance of Alternatives 4B and 4D, DOT&PF would ensure compliance with all ADEC regulations regarding water, air, and land quality. BMPs would be used to avoid downstream water degradation below water quality standards.

2.4.3.2 City and Borough of Juneau Coastal Management Program Enforceable Policies

The 5.2-mile extension of the highway from Echo Cove to Sawmill Cove, construction of the Sawmill Cove Ferry Terminal, and modifications of the Auke Bay Ferry Terminal would be within the CBJ Coastal Zone Management District. For this reason, the following enforceable policies are applicable to Alternatives 4B and 4D.

Coastal Development (49.70.905) – DOT&PF would comply with the coastal development policies through use of BMPs for design and construction to avoid or minimize hazards. Dredging and filling necessary for construction of the highway would be avoided to the greatest extent possible in highly productive tidelands or wetlands, subtidal lands important for shellfish, and habitat important for resident or anadromous fish. All in-water construction for the Sawmill Cove terminal would be completed in such a way as to not change water circulation patterns and to minimize shoreline alterations. Transportation facilities are exempt from meeting the policy prohibiting intertidal fill below mean high tide.

Geophysical Hazards (49.70.910) – Alternatives 4B and 4D would comply with these policies by reducing erosion possibilities and visible scarring to the landscape through mitigation and BMPs during design and construction. Areas impacted during construction would be revegetated with native species where necessary. Anadromous fish streams would be spanned. Small flood plains of streams that do not support anadromous fish would be crossed with culverts. Where construction within the floodplain is necessary, facilities would be constructed to meet 100-year flood requirements.

Transportation and Utilities (49.70.925) – DOT&PF, to the extent feasible, would design the highway alignment, Sawmill Cove Ferry Terminal, and Auke Bay Ferry Terminal modifications to avoid wetlands, intertidal marshes, and aesthetic degradation. DOT&PF has moved the alignment for Alternatives 4B and 4D to avoid all emergent wetlands on the east side of Lynn Canal and to reduce impacts to palustrine wetlands. All anadromous stream crossings would be designed and constructed to avoid impacts to fish passage and habitat disturbance, including the avoidance of in-stream work during spawning or times of critical period for anadromous fish. Where possible, the highway alignment would be adjusted to avoid sensitive coastal areas.

Fish and Seafood Propagation and Processing (49.70.930) – All anadromous stream crossings and EFH crossed by Alternatives 4B and 4D would be designed and constructed as to have no impact to spawning or migration of these fish species or impacts that may degrade water quality (see Air, Land, and Water Quality 49.70.955).

Timber Harvest and Processing (49.70.935) – Land clearing and timber harvest conducted as part of the construction of Alternatives 4B and 4D would be done to minimize any environmental impacts and to avoid impacts to the movement of fish in coastal waters. No log processing facilities, in-water log dumping and storage, or additional roads are proposed as part of the clearing and timber harvesting.

Habitat (49.70.950) – Impacts to coastal habitat areas have been identified and would be mitigated to maintain habitat values of wetlands, tideflats, and streams. Impacts to wetlands have been minimized by adjusting the preliminary alignment to avoid all emergent wetlands and to avoid palustrine wetlands and sensitive habitat to the greatest extent possible. A minimum-width fill footprint would be used for the highway in wetland areas.

Impacts to tideflats would be minimized by timing construction to avoid impacts to fish, using clean fill for the Sawmill Cove Ferry Terminal, and minimizing terminal and dredging footprints to the smallest size practicable. Remaining tideflats in Sawmill Cove would be of sufficient size to continue to provide adequate habitat. Impacts to streams would be minimized by constructing a clearspan bridge over Sawmill Creek, an anadromous fish stream, and using BMPs during culvert installation to protect water quality at other streams. Based on these measures and the large areas of wetland and tideflat habitat in the project area, the habitats in wetlands, tideflats, and streams would continue to sustain the biological, physical, and chemical characteristics to support living resources. If Alternative 4B or 4D were selected, further consultation with NMFS and OHMP would occur to determine whether additional conservation measures would be required to address herring spawning in Sawmill Cove.

Special Waterfront Areas (49.70.960) – Reconstruction at the existing Auke Bay Ferry Terminal would be located within a Special Waterfront Area managed by a coastal management enforceable policy unique to the CBJ. Fill proposals within the special waterfront area are not subject to a fill prohibition of the Juneau Coastal Development Enforceable Policy 49.70.905(13) regarding whether a project is water dependent or water-related (49.70.960(a)(2)). Also, the significant public need and feasible and prudent alternative analysis under the Juneau Habitat Standard 49.70.950(d) does not apply to state projects (49.70.960(a)(6)). The ferry terminal reconstruction activities would comply with 49.70.960(b)(1)(B), meeting water-relevancy requirements of 49.70.905 for floats, docks, and dolphins.

Air, Land, and Water Quality (49.70.955) – During construction, operation, and maintenance of Alternatives 4B and 4D, DOT&PF would ensure all ADEC regulations are met. BMPs would be used to avoid downstream water degradation below water quality standards.

2.4.4 Subsistence

The only new highway segment for these alternatives would be an extension of an existing Juneau road. Juneau is not a subsistence community under ANILCA. Because Alternatives 4B and 4D would not substantially change transportation facilities and visitor trips in Lynn Canal, they would not result in direct or indirect impacts to subsistence uses.

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FIGURES

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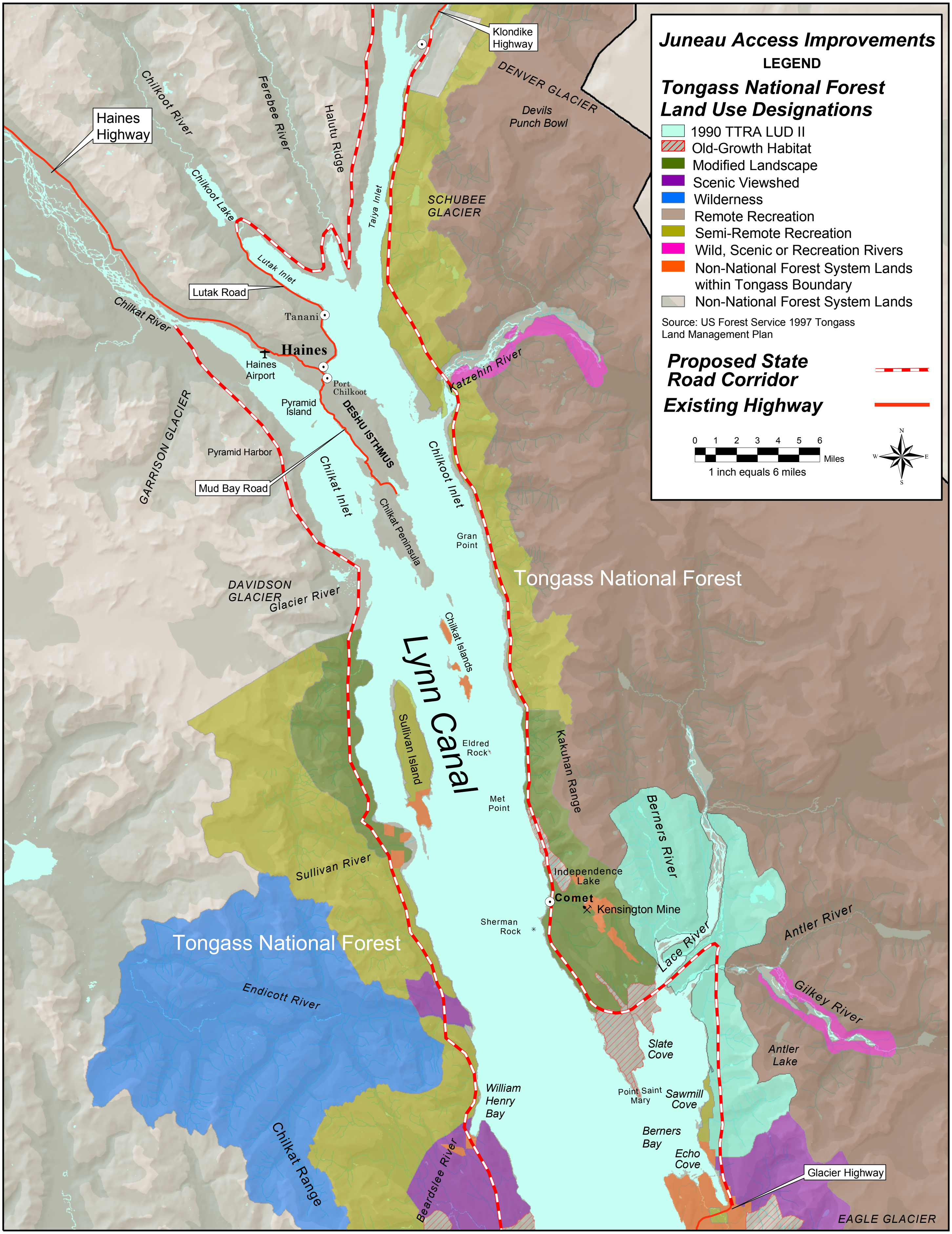

Figure 1
Tongass Land Management Plan Land Use Designations

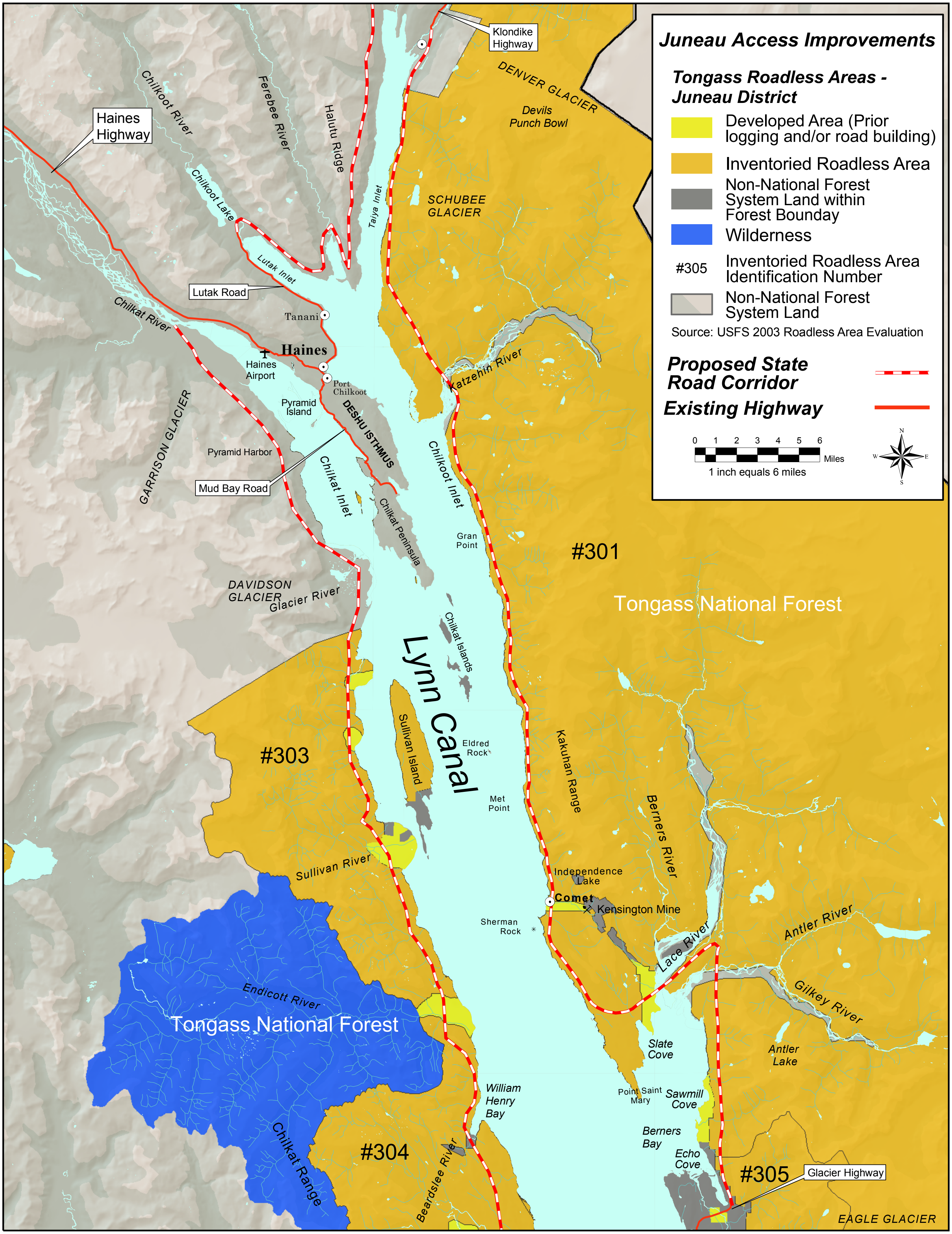

Figure 2
Inventoried Roadless Areas

Addendum to Appendix H

Socioeconomic Effects Technical Report

Prepared by

McDowell Group, Inc.
Juneau • Anchorage, Alaska

OCTOBER 2005

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ERRATA SHEET

OCTOBER 2004 SOCIOECONOMIC EFFECTS TECHNICAL REPORT

1. Section 2.3.1.3, page 67, first full paragraph, last line. Reference should read “Gummow, 2003” rather than “Grummow, 2003”. Also on second full paragraph, fourth line.

2. Section 3.1.3.2, Page 105, last paragraph. Insert “2003” prior to *Juneau Access Household Survey*.

3. Section 3.1.3.3, Page 114, last paragraph. Insert “2003” prior to *Juneau Access Household Survey*.

4. Section 3.1.3.4, Page 120, last paragraph. Alternative 2C should read Alternative 2B and Alternative 2 should read Alternative 2C.

5. Section 3.1.7.1, Page 145, Table 32. Total Ferry Traffic (AADT) for 4B should read 170 rather than 165.

6. Section 3.1.7.4, Page 148 (“Effects of Haines Population”). Last line should read “...have a minor impact (approximately 30 new residents) on population.”

7. Section 3.1.7.4, Page 148, last paragraph, fifth line. “…therefore no reduction in business profit or the cost of living…” should read “…therefore no increase in business profit of reduction in the cost of living…”

8. Section 3.1.7.4, Page 149, first paragraph, fourth line. “…Haines (70 AADT)…” should read “…Skagway (80 AADT)…”

9. Section 3.2.4.3, Page 153, second paragraph, third line. “…which is expected to range between 8 and 10 percent…” should read “…which would be approximately 6 percent…”

10. Section 3.3.1.3, page 158, third full paragraph, last line. Reference should read “Gummow, 2003” rather than “Grummow, 2003”.

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1.0 EFFECTS OF ACCESS IMPROVEMENT

1.1 Ground Transportation Services

Concern has been expressed about how Lynn Canal travelers who are now walk-on ferry passengers would travel between Juneau and Haines/Skagway if a highway is constructed and ferry service discontinued. The following analysis is intended as a supplement to Section 3.1.1.2 "General Effects of the Improved Access on the Transportation Industry," presented in the 2004 *Socioeconomic Effects Technical Report*.

As a preface to addressing the question about bus service, it is important to recognize that cost is a key reason people choose to travel as walk-ons. As demonstrated in the 2004 *Traffic Forecast Report*, personal travel vehicle cost would be significantly reduced in Lynn Canal with a highway. The 2004 round-trip cost for a car and driver on the ferry from Juneau to Haines was approximately $265 (vehicle up to 19 feet) and from Juneau to Skagway, approximately $300[2] The total cost to make the same Juneau-Haines-Juneau round-trip under alternative 2B would be approximately $100 based on *total* vehicle operating and ownership costs of $0.44/mile[3] and shuttle ferry costs of $3.85 per person and $9.70 per vehicle one way. Juneau-Skagway-Juneau round-trip costs would total about $110 for car and driver for Alternative 2B. Actual out-of-pocket expenses, for fuel and shuttle ferry fares would account for about 60 percent of these total costs. Further, under Alternative 2B the highway travel cost of each additional passenger in a personal vehicle is zero, with additional ferry passenger costs of about $7.70 per person round-trip, Juneau-Haines-Juneau, for example. Meanwhile each additional passenger using the existing ferry service must pay the $70 round-trip passenger fare for Juneau-Haines-Juneau travel. This means that many walk-ons would choose to drive their own vehicle (or travel with friends) rather than not travel or seek transportation services from the private sector.

As additional background information, it should be noted that 92.6 percent of Juneau households own at least one vehicle, while 7.4 percent (859 households) do not own a vehicle, according to the 2000 Census. More specifically, 37.1 percent of Juneau households own one vehicle, 40.5 percent own two, and 15.0 percent own three or more vehicles. The numbers are very similar for the Haines Borough, with 8.1 percent of households with no vehicles, 37.5 percent with one vehicle, 40.7 percent with two, and 13.7 percent have three or more vehicles. In Skagway, 8.2 percent have none, 31.3 percent have one, 42.7 percent have two, and 17.9 percent have three or more vehicles.

Whether owning a car or not, some of the existing Alaska Marine Highway System (AMHS) walk-on market would prefer or require some form of transportation service between Juneau and Haines/Skagway. Further, some of the traffic induced by the highway might also occasionally prefer to travel by bus or van, depending on the cost and frequency of service.

To predict what type of bus service might develop if highway access were available, we first estimated the potential market size for such service. We also interviewed a number of bus operators from around the region to gauge their response, in terms of service levels, to this particular market opportunity. We also collected information on bus services from elsewhere in

[2] AMHS Lynn Canal fares vary depending on the vessel. Fast vehicle ferry (FVF) fares are 10 percent higher than mainline fares.

[3] Based on 2003 vehicle operating costs. Fuel prices in 2005 are approximately 30 percent higher than in 2003. At today's gas price, total vehicle operating and ownership costs would be three to four cents per mile higher than in 2003.

the region and Alaska. Finally, we prepared a summary assessment of the nature of bus service likely to develop if a highway link is constructed between Juneau and Skagway.

1.1.1 Market size

Approximately 49,000 passengers and 13,600 vehicles traveled Lynn Canal northbound from Juneau to Haines or Skagway, with about the same volume moving southbound via the ferry in 2004. The average number of passengers per vehicle on highways in the Lynn Canal corridor is approximately 2.3. Assuming the same number of passengers per vehicle on the ferry, approximately 31,000 passengers on the ferry traveled with a vehicle. Walk-on traffic is estimated to be approximately 18,000 people, one way (calculated by subtracting the 31,000 passengers who traveled with a vehicle from the total number of passengers.) The seasonal distribution of passenger volumes was assumed to be 70 percent in the summer and 30 percent in the winter.

The percentage of baseline AMHS walk-on traffic that would choose to travel in their own vehicle, if a highway were in place, would depend on a number of factors, such as the cost, frequency and convenience of a bus or van service. On the other hand, the cost, frequency and convenience of a bus or van service will depend on the size of the market. Following completion of highway construction, there would be a period of transition as entrepreneurs, or established bus/van service providers, test the market by offering some moderate level of service, such as one or two round-trips daily between communities during the summer (allowing Haines residents to take day-trips to Juneau, for example, or Juneau visitors to travel to Skagway and back in a day).

For purposes of this analysis it was estimated that the initial size of the market for bus service might be between 9,000 and 18,000 annual north-bound and south-bound travelers if a bus service was available and reasonably affordable, This is equivalent to between 25 and 50 percent of 2004 walk-on ferry traffic. This is not a measure of the number of travelers who would be unable to make a trip in the absence of ferry service. It is an estimate of the number of travelers that would choose to use a bus service if it were available and reasonably affordable. It includes travelers that do not own a vehicle (estimated at approximately 8 to 10 percent of the overall market – about 9,000 travelers – which is slightly above the regional ownership average of 7 to 8 percent, to account for non-residents traveling without vehicles). It also includes the potential for an equal number of travelers (up to as many as 9,000 travelers) that would choose bus service, rather than take their own car, because it is more convenient.

Based on the estimate that this market is split roughly 70 percent into a 150-day summer season and 30 percent into a 215-day winter season, peak summer passenger traffic would be between 40 and 85 passengers per day (split equally northbound and southbound). Winter traffic would be between 12 and 25 passengers daily.

1.1.2 Case studies

Commercial passenger bus/van services available elsewhere in Alaska were examined as case studies to support the determination of what type of passenger service might be offered between Juneau and communities to the north. While market size and characteristics may be different, these case studies provide a general indication of the cost and frequency of bus service that is likely to be available.

The Alaska Park Connection offers regular bus service between Seward and Denali National Park, with a stop in Anchorage. The 127-mile Seward/Anchorage trip costs $49 per person, one-way (OW). In the summer, two trips are offered daily, with 10:45 AM and 6:00 PM departures from Seward and 7:00 AM and 3:00 PM departures from Anchorage. The trip is approximately 3 hours in duration.[4] The service appears to be targeted primarily at the visitor market, but does also serve residents. Service is offered May 20 through September 12. Alaska Park Connection operates full-size and 25-passenger coaches.

Homer Stage Lines offers bus service between Homer and Soldotna (78 miles, $30 OW, $50 round trip [RT]), Homer and Kenai (89 miles, $35 OW, $60 RT), Homer and Seward (173 miles, $45 OW, $85 RT) as well as other areas of the Kenai Peninsula. Homer Stage Lines also offers bus service between Homer and Anchorage (224 miles, $55 OW, $100 RT). At least daily service is available in the summer. Service frequency is reduced in winter to a couple trips per week.[5]

Alaska Trails offers summer bus service between Anchorage, Wasilla, and Talkeetna, with continuing service to Healy. The 50-minute trip from Anchorage to Wasilla (49 miles) costs $30 OW or $44 RT. A one-way ticket for travel between Anchorage and Talkeetna is $44, and round-trip travel is $74. Alaska Trails also offers bus service between Fairbanks and Delta Junction ($40 OW for the 2 hour, 15 minute trip, $64 RT). Service between Fairbanks and Tok (206 miles) is $64 OW and $114 RT.[6] The drive from Fairbanks to Tok is approximately four hours.

Alaska Direct Bus Lines offers summer bus service between Fairbanks and Whitehorse three times weekly, with stops in Delta Junction ($25 OW) and Tok ($45 OW). The Fairbanks/Whitehorse fare is $140 OW. Alaska Direct also offers service from Skagway, as ferry traffic-related demand warrants.

Yukon Alaska Tourist Tours provides motorcoach service between Skagway and Whitehorse three times daily during the summer (May 10 to September 15.) A one-way ticket is $30 while a round-trip ticket is $50.[7] The trip is 108 miles one-way.

A literature search was conducted to find information on private sector transportation providers' response to new transportation linkages; however, very little relevant information was identified in the literature. Sources included United States Department of Agriculture (USDA) Rural Information Center, USDA Economic Research Center, the Bureau of Transportation Statistics' National Transportation Library, the Federal Highway Administration (FHWA), US Department of Health and Human Services Rural Assistance Center, and the American Association of State Highway and Transportation Officials (AASHTO).

1.1.3 Operator interviews

Interviews were conducted with 12 land transportation service providers in Juneau, Skagway, Anchorage, and other Alaska communities to determine whether the assumed summer and winter volumes would be sufficient to justify offering service.

[4] http://www.alaskaone.com/connect/schedule.htm#rates
[5] http://homerstageline.com/
[6] http://www.alaskaone.com/phe/route01.htm
[7] http://www.yukonalaskatouristtours.com/dailybustours.html

In summary, the potential Lynn Canal bus market is definitely of interest to the private sector. All but one of the operators interviewed said the market would be of interest to them or would have good potential. Schedules and fares would depend on the volume of users and the demand distribution through the day, month and year. Fares will also depend on whether the provider offers scheduled or charter service on a reservation-only basis, and whether the provider offers a tour component (stops for sightseeing) or whether the route is a direct transportation-only service.

Scheduling would be a significant challenge for bus service operators. The bus service needs of local Juneau, Haines and Skagway residents are likely to be different, in terms of schedule, than travelers arriving on the ferry or traveling to Juneau to meet a ferry. The seasonality of demand would also present a scheduling challenge, with significant variations in demand even within the summer season. Demand would peak in June, July and August, and would likely be at a low-point in January and February. Several operators noted that off-season scheduled service could be difficult to develop based on the estimated winter volume, though charter service for groups (for example, school activities) would be available.

1.1.4 Summary

While there would likely be some period of adjustment to market conditions, the study team believes that, with highway access, daily summer coach service would link the communities of Juneau, Haines, Skagway, and probably Whitehorse. Winter service would be less frequent, with bus service offered perhaps every other day to Haines/Skagway. Cost would ultimately depend on the size of the market (which would be a key factor in determining the number of competitors in the market), but would likely be in the range of $35 to $50 one-way (Juneau/Skagway). This would place the cost roughly equal to the current AMHS adult passenger fare of $44 for the Juneau/Skagway link. Service to Whitehorse could be about double the Juneau/Skagway fare.

There is uncertainty in the estimates of the size of the Lynn Canal bus passenger market. But the potential market is large, including 33,000 residents in Juneau, Haines and Skagway, 20,000 residents in Whitehorse, 100,000 to 150,000 independent visitors to Northern Southeast, and an equally large number of independent visitors to the Yukon. As has occurred elsewhere in Alaska, the private sector can be expected to respond aggressively to this market potential.

1.2 Air Taxi Operations

The effects of improved access on air taxi operations is considered in section 3.1.1.2, General Effects of Improved Access on the Transportation Industry in the 2004 *Socioeconomic Effects Technical Report*. The following narrative supplements that analysis.

The 2004 technical report estimated that between 10 percent and 40 percent of air taxi traffic in Lynn Canal would be diverted to surface transportation, if surface transportation is improved, depending on the alternative. This range is encompassed by Alternative 4C (10 percent decline in air taxi traffic) and Alternative 2B (40 percent decline in air taxi traffic).

The economic impact of this potential decline in air traffic includes the loss of jobs and loss of air taxi business sales. In 2003, the three primary air taxi operations serving Lynn Canal employed an annual average of 118 workers (this includes LAB, Wings of Alaska, and Skagway Air). The dependence of these three carriers on Lynn Canal traffic ranges from approximately 40 percent to 85 percent of total revenues. Based on these percentages, air taxi employment in the Lynn Canal market averaged 54 jobs in 2003 (this is a weighted average based on each carrier's employment and dependence on Lynn Canal).

If 10 percent of air traffic is diverted to surface transportation, and if it is assumed that the result is a 10 percent decline in employment, the employment loss would total approximately five to six jobs. Lost payroll would total between $160,000 and $190,000 annually, based on an average Juneau air transportation sector monthly wage of $2,687 (as reported by the Alaska Department of Labor and Workforce Development [DOL&WD] for 2003).

If 40 percent of air traffic is diverted to surface transportation, and if it is assumed that the result is a 40 percent decline in Lynn Canal air taxi employment, the employment loss would total approximately 22 jobs, along with approximately $700,000 in annual payroll.

The impact of improved access on air taxi revenues can also be approximated, though no secondary data is available on carrier revenues, either in the Lynn Canal market or for the sector overall. The Lynn Canal air taxi market, which included approximately 27,000 travelers between Juneau and Haines/Skagway and another 1,300 between Haines and Skagway, likely accounted for approximately $2.5 million in total gross revenues in 2003. A 10 percent reduction in the market would result in a quarter million dollar loss to carriers. A 40 percent decline in the market would cost carriers approximately $1 million in sales.

Some of the loss in air carrier employment and sales could be offset by commercial ground transportation services that would develop if a highway linking Juneau and Northern Lynn Canal were constructed. Further, the decline in air taxi employment and sales does not necessarily represent a net loss to the region's economy. Lower transportation costs will provide a savings to travelers. Juneau, Haines and Skagway residents comprise approximately 60 percent of the Lynn Canal air taxi market. Money saved by residents through lower-cost transportation is likely to be spent in the local economy on other goods or services. Similarly, lower-cost transportation for non-resident visitors would also free up money for local spending on other goods and services (which could generate new employment in those sectors where additional spending occurs).

The impact of improved surface access could include a reduction in the frequency of air service in Lynn Canal. Service frequency could decline, though not necessarily, at about the same rate as traffic overall, that is, from 10 percent (Alternative 4C) to 40 percent (Alternative 2B). Carriers could reduce the number of flights and/or use smaller-capacity aircraft to adjust to the reduced demand for service. With a shift to smaller aircraft, service frequency may not decline.

A reduction in the demand for Lynn Canal air taxi service could affect airfares. With some reduction in economy-of-scale, the per-traveler cost to provide air taxi service in Lynn Canal could increase. Carriers may pass this increase in cost on to their customers.

It is not the case, as is asserted by some commenters, that travelers would be forced to use air taxi service on those days when the road is closed. When the road is closed, the Haines/Skagway shuttle ferry would be available to provide service to and from Juneau.

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Addendum to Appendix J

Snow Avalanche Report

Prepared by

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OCTOBER 2005

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TABLES

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ERRATA SHEET

OCTOBER 2004 SNOW AVALANCHE REPORT

1. Page 35, Table 5: Elevated Fills, Conversion. The wrong conversion factor was used for the metric units of thrust. Using the conversion 1 Kpa = 20.9 pounds per square foot (psf), the parenthetical value on the first line of the thrust column for ELC002 should be 201 Kpa and the parenthetical value on the second line for ELC 014 should be 321 Kpa.

2. Page 98, Page Number. A typographical error resulted in this page being numbered as 998.

3. Page 277, Juneau Area Avalanche History Analysis Table. The second page of the table, provided below, is missing and should be inserted as page 278.

Table E-1
Juneau Area Avalanche History Analysis

Avalanche season from…	To…	Number of avalanches	Largest size avalanche	Avg. Annual # of avalanches for period	Average size avalanche for period	Period type
1949	1950	0.0				
1950	1951	1.0	3.0			
1951	1952	1.0	4.0			
1952	1953	1.0	3.0	1.0	3.3	Warm period
1953	1954	0.0				
1954	1955	7.0	3.0			
1955	1956	2.0	3.0			
1956	1957	0.0				
1957	1958	0.0				
1958	1959	1.0	3.0			
1959	1960	0.0				
1960	1961	0.0				
1961	1962	5.0	3.0			
1962	1963	0.0				
1963	1964	4.0	4.0			
1964	1965	1.0	3.0			
1965	1966	8.0	3.0			
1966	1967	1.0	3.0			
1967	1968	0.0				
1968	1969	0.0				
1969	1970	0.0				
1970	1971	9.0	3.0			
1971	1972	6.0	5.0			
1972	1973	1.0	3.0			
1973	1974	6.0	4.0			
1974	1975	3.0	4.0			
1975	1976	11.0	4.0	2.8	3.4	Cold period
1976	1977	0.0				
1977	1978	0.0				
1978	1979	0.0				
1979	1980	1.0	3.0			
1980	1981	0.0				
1981	1982	1.0	3.0			
1982	1983	0.0				
1983	1984	0.0				

Table E-1 (continued)
Juneau Area Avalanche History Analysis

Avalanche season from…	To…	Number of avalanches	Largest size avalanche	Avg. Annual # of avalanches for period	Average size avalanche for period	Period type
1984	1985	8.0	4.0			
1985	1986	0.0				
1986	1987	0.0				
1987	1988	0.0				
1988	1989	6.0	4.0			
1989	1990	0.0				
1990	1991	2.0	3.0			
1991	1992	0.0				
1992	1993	0.0				
1993	1994	0.0				
1994	1995	0.0				
1995	1996	1.0	3.0			
1996	1997	2.0	3.0			
1997	1998	1.0	3.0			
1998	1999	0.0		1.0	3.3	Warm period
1999	2000	4.0	3.0			
2000	2001	0.0				
2001	2002	7.0	3.0			
2002	2003	0.0		2.8	3.0	Cold period
Cold period average				2.1	3.5	
Warm period average				0.8	3.4	
Warm to cold multiplier				2.6	1.0	

1.0 ADDITIONS TO THE OCTOBER 2004 SNOW AVALANCHE REPORT

1. Page 13. Table 1. Avalanche Hazard Index (AHI) Comparison – The following table has been updated by listing Alternative 2B and adding Thane Road.

Table 1
AHI Comparison

Highway	Unmitigated AHI	Daily Observations & Forecasts	Forecasting, Closure, & Explosives	Structural Mitigation	Special Explosives Methods
Rogers Pass, BC	1004	x	x	x	X
Red Mtn. Pass, CO	335	x	x	x	
* Seward Highway, AK (Anchorage-Seward, old alignment)	331	x	x	x	
* Seward Highway, AK (Anchorage-Girdwood, old alignment)	188	x	x	x	
East Lynn Alt 2B, AK	186	x	x	x	
Coal Bank/Molas, CO	108	x	x		
West Lynn, AK	100	x	x	x	
Berthoud Pass, CO	93	x	x		
Coquihalla, BC	90	x	x	x	x
Loveland Pass, CO	80	x	x		
Wolf Creek Pass, CO	54	x	x	x	
Silverton-Gladstone, CO	49	x	x		
Teton Pass, WY	47	x	x		x
Lizard Head Pass, CO	39	x	x		
I-70 Tunnel Approaches, CO	27	x	x	x	
Thane Road, AK	21		x	x	

Note: * Historical data for AHI calculation is only available for the pre-1998 Seward Highway alignment.

2. Page 16. The following subsection should be added to findings following Lynn Canal Mitigation Options – Explosive Delivery

   Forest Service Permits for Avalanche Program

   U.S. Forest Service and any other land use permits for highway alternatives must include provisions for the avalanche program, including access, explosive use, any installations in the avalanche paths, and permits for the weather station sites.

3. Page 33. Add the following subsections to Avalanche Mitigation following Table 4, Highway Residual AHI Comparison

   Mitigated AHI Target Value

   Like most avalanche standards, acceptable mitigated AHI values are not absolutes, but are established by industry practice. The target residual AHI of 30 or less was chosen because it is accepted as an adequate level of mitigation for similar highways in North America. Tables 4A and 4B detail the level of avalanche mitigation on the North American highways for which figures are available. For most highways in the tables, unmitigated AHI multiplied by 0.21 is used to calculate Residual AHI, using the average residual risk as calculated in Table 4. A Residual AHI factor of 0.04 is used for Rogers Pass based on the reduction calculated for its intensive mitigation program in the Five Mountain Parks Highway Avalanche Study. The Lynn Canal routes listed here have a Residual AHI factor of 0.15 multiplied by the structurally mitigated AHI value. These East Lynn Canal values are for the option without snowsheds and use conservative criteria for extended closures as detailed under Risk Management, Avalanche Forecasting, and Highway Closures in this section.

Table 4A
Residual AHI Comparison

AHI Category	Highway	Unmitigated AHI	Residual AHI
Very High AHI Highways	Rogers Pass, BC	1004	40
	Red Mtn. Pass, CO	335	70
	* Seward Highway, AK (Anchorage-Seward, old alignment)	331	70
	* Seward Highway, AK (Anchorage-Girdwood, old alignment)	188	39
	Coal Bank/Molas, CO	108	23
	Average, Very High AHI highways	**393**	**48**
High AHI Highways	Berthoud Pass, CO	93	20
	Coquihalla, BC	90	19
	Loveland Pass, CO	80	17
	Wolf Creek Pass, CO	54	11
	Silverton-Gladstone, CO	49	10
	Teton Pass, WY	47	10
	Average, High & Very High AHI highways	**216**	**30**
Moderate AHI Highways	Lizard Head Pass, CO	39	8
	I-70 Tunnel Approaches, CO	27	6
	Thane Road, AK	21	4
	Average, all listed highways	**176**	**25**
Lynn Canal	East Lynn Alt 2B, AK (very high)	186	27
	West Lynn, AK (high)	100	15

Note: *Historical data for AHI calculation is only available for the pre-1998 Seward Highway alignment.

Table 4A compares the unmitigated and the mitigated, or residual, AHI levels for highways grouped by AHI range. The average residual AHI for Very High unmitigated AHI category highways is 48. The unmitigated AHI values for the East Lynn Canal, Alternative 2B route is in the Very High category. The chosen target residual AHI of 30 is the average for the highways in the next lower AHI category, High and Very High, giving a safety margin of one full step on the chart. The other highways on the chart are considered to have adequate operational safety margins. The target figure of AHI 30 for the East Lynn Canal route, Alternative 2B allows an additional margin of 38 percent. The unmitigated AHI for the West Lynn Canal route, Alternative 3, is at the very top of its High category, bordering on Very High. The target AHI 30 meets the average residual AHI standard for highways in both the High and Very High categories, yielding a similar margin to that for the East Lynn Canal route.

Table 4B
Mitigated AHI Per Unit Distance Comparison

AHI Category	Highway	Unmitigated AHI	Avalanche Zone, Miles	Residual AHI/Mile	Avalanche Zone, Km	Residual AHI/Km
Very High AHI Highways	Rogers Pass, BC	1004	24.8	1.6	40.0	1.0
	Red Mtn. Pass, CO	335	17.4	4.1	28.0	2.5
	* Seward Highway, AK (Anchorage-Seward, old alignment)	331	88.9	0.8	143.1	0.5
	* Seward Highway, AK (Anchorage-Girdwood, old alignment)	188	16.5	2.4	26.6	1.5
	Coal Bank/Molas, CO	108	34.0	0.7	54.7	0.4
	Average, Very High AHI highways	**393**	**36.3**	**1.9**	**58.5**	**1.2**
High AHI Highways	Berthoud Pass, CO	93	16.0	1.2	25.7	0.8
	Coquihalla, BC	90	12.4	1.5	20.0	0.9
	Loveland Pass, CO	80	8.0	2.1	12.9	1.3
	Wolf Creek Pass, CO	54	18.4	0.6	29.6	0.4
	Silverton-Gladstone, CO	49	6.5	1.6	10.5	1.0
	Teton Pass, WY	47	13.8	0.7	22.2	0.4
	Average, High & Very High AHI highways	**216**	**23.3**	**1.6**	**37.6**	**1.0**
Moderate AHI Highways	Lizard Head Pass, CO	39	21.0	0.4	33.8	0.2
	I-70 Tunnel Approaches, CO	27	15.0	0.4	24.1	0.2
	Thane Road, AK	21	2.9	1.5	4.6	1.0
	Average, all listed highways	**176**	**21.1**	**1.4**	**34.0**	**0.9**
Lynn Canal	East Lynn Alt 2B, AK (very high)	186	50.5	0.5	81.3	0.3
	West Lynn, AK (high)	100	33.3	0.4	53.7	0.3

Notes: *Historical data for AHI calculation is only available for the pre – 1998 Seward Highway alignment.
Km = kilometers

Another way to compare residual AHI is to look at AHI per unit distance as shown in Table 4B. This method factors in the length of the route, allowing fair comparison between long and short routes. Alternative 2B and Alternative 3, have values below the average for the highways in the next lower AHI category, High and Very High, giving a safety margin of one full step on the chart. The East Lynn Canal segment from paths ELC 002 – 030 has the highest number of large avalanche paths per unit distance of any portion of the route, with an AHI of 185 over 17.4 miles (28.0 kilometers [km]), yielding values of 1.5 AHI/mile (0.9 AHI/Km). These values are lower than the average for the High and Very High residual AHI categories, yielding a safety margin of more than one full step on the chart.

AHI Values and Risk to Travelers and Workers

The AHI numbers commonly used in avalanche hazard evaluation do not express the probability of death, damage, or injury per unit time or per thousand travelers, as do studies in some other fields like medicine. The AHI is used for comparing the hazard rather than evaluating the level of risk. It is a relative index, as noted in AHI Overview on pages 25 through 27 and in Appendix 1: AHI Calculation on pages 265 through 267 of the 2004 *Snow Avalanche Report*. Many avalanche-exposed highways have not had their AHI values determined because it is an involved, time-consuming calculation, but the AHI has been calculated for enough avalanche-exposed highways in North America to make it the most useful available method for avalanche hazard comparison. The AHI numbers cannot be translated directly into probability of adverse encounters and there is no compilation of figures available from which to determine absolute probabilities.

Risk Management Records of Three Very High AHI Highways

The three highways with the highest AHI values listed in this report are Rogers Pass at 1004 (mitigated to 40), Red Mountain Pass at 335 (mitigated to 70), and the old alignment of the Seward Highway from Anchorage to Seward at 331 (mitigated to 70). The Trans-Canada Highway over Rogers Pass in British Columbia has operated for the 42 years since 1962 with a state-of-the-art avalanche program. There have been no deaths to the traveling public on the Rogers Pass highway, but there have been two highway worker deaths. The same secondary avalanche killed both workers in 1966 while they were clearing debris from an earlier slide. The highway was closed to the public at the time. There have been 33 avalanche involvements, 8 of which resulted in vehicle or building damage and 3 in injury or death.

Red Mountain Pass in Colorado has had a full avalanche program for the 11 years since the winter of 1992-93. During that time, there have been no deaths, damaged vehicles, or injuries. There was one involvement. A Colorado DOT&PF truck was hit by an intentionally triggered slide but was undamaged.

Figures for the Seward Highway are available for the 23 years since 1981, during which there has been a full avalanche program. There were no deaths to the traveling public. There was one highway worker killed by a secondary avalanche in 2000 while clearing debris from an earlier slide. The highway was closed to the public at the time. There were 12 avalanche involvements, spanning a range from dust clouds causing loss of control to avalanches striking vehicles, but a breakdown of the involvements was not available in the records. One of the 12 incidents was the 2000 fatality.

Table 4C
Avalanche Risk Summary, Three Very High AHI Highways

Category	Events Per Year
All Avalanche Involvements	0.61
Avalanche Involvements, Damage to Vehicles or Buildings	0.15
Avalanche Involvements, Injuries or Deaths	0.04
Avalanche Deaths, Highway Workers	0.04
Avalanche Deaths, Traveling Public	<0.01

The history of the three Very High AHI highways totals 76 years of combined operational records, summarized in Table 4C. There have been no deaths to the traveling public, or less than 0.01 deaths per operational year. There have been three deaths to highway workers, or 0.04 per operational year. The higher risk to highway workers underscores the need for strict adherence to the avalanche program and risk management protocols presented in this study, particularly when reopening the highway after avalanches have occurred. There have been 46 avalanche involvements, or 0.61 per operational year. A complete breakdown is only available for 53 of those operational years, but those records show 0.15 incidents with vehicle or building damage per operational year and 0.04 with injuries or deaths per operational year.

Table 4D
Effectiveness of Avalanche Programs on Two Very High-AHI Transportation Corridors

Death Rate Without Avalanche Programs	1.55
Death Rate With Avalanche Programs	0.04
Improvement Factor	39.24

Effectiveness of avalanche programs on Very High-AHI highways is best evaluated where death rates per year can be compared for periods with and without avalanche programs. Before the Trans-Canada Highway was opened over Rogers Pass, the Canadian Pacific Railroad operated for the 76 years from 1885 to 1962 with only flimsy wooden snowsheds for avalanche defense. Records for these early years are incomplete, but the best available references state that "more than 200 people died in avalanches" there. Red Mountain Pass has been plowed throughout each winter since 1935. In the 57 years of operation until the modern avalanche program began in 1992-93, six people were killed. The history of these two routes totals 133 years of combined operational records before modern avalanche programs. At least 206 people died, or greater than 1.55 deaths per operational year. The death rate without modern avalanche programs is almost 39 times the death rate of 0.04 per year for high AHI highways with them. This large difference suggests that avalanche programs are an effective and necessary means of reducing risk to travelers and highway workers.

Table 4E
Comparison of Risks to Alaskans with Highway Avalanche Risk

Category	Deaths Per Year
Alaska, All Motor Vehicles	102.00
Alaska, Highways	95.00
Alaska, Other Accidental	51.00
Alaska, Poisonings	51.00
Alaska, Other Transport Accidents	48.00
Alaska, Drownings & Submersions	25.00
Alaska, Falls	18.00
Alaska, Smoke, Fire, and Flames	15.00
Alaska, Firearms, Accidental	5.00
Alaska Highways, Avalanches, Highway Workers	0.06
High AHI Highways, Avalanches, Highway Workers	0.04
Alaska Highways, Avalanches, Traveling Public	<0.03
High AHI Highways, Avalanches, Traveling Public	<0.01

Table 4E compares a number of risks to Alaskans with highway avalanche risk in terms of deaths per year. Among Alaska highways, only the Seward and the Richardson Highways have full modern avalanche programs. There are limited programs on the Dalton Highway, the Copper River Highway, and Thane Road. The Parks Highway, the Haines Highway, the Alaskan portion of the Klondike Highway, and several other less-traveled roads in Alaska have avalanche issues but no avalanche programs.

Alaska has had no highway avalanche deaths to the traveling public in the 35 years since 1969, and two highway worker avalanche deaths. Both were clearing debris from previous avalanches while the highway was closed to the public. One death was in Southeast Alaska, on Thane Road in 1974. There have been no highway avalanche deaths to the traveling public in Alaska during this period, or less than 0.03 deaths per year, and there have been 0.06 deaths per year to highway workers. In contrast, the total traffic death rate for Alaska over the most recent ten-year period for which figures are available is 95.

For comparison with non-highway risks, the total Alaska motor vehicle accident death rate for the most recent ten-year period for which figures are available, including off-road accidents, is 102 deaths per year. The rate for poisonings is 51 deaths per year, for other transport accidents it is 48 deaths per year, for drowning and submersion it is 25 per year, for falls it is 18 per year, for exposure to smoke, fire, and flame it is 15 per year, and for accidental discharge of firearms it is 5 per year. For other accidental deaths, it is 51 deaths per year.

4. Page 337. Appendix 13. References. The following references were used for this addendum in the discussions of residual risk and should be added to the references appendix:

Goodrich, J. 2005. Personal communication on accident figures, Parks Canada avalanche forecaster for Rogers Pass, BC. Summer 2005.

Marshall, J. and Roberts, J. 1993. Vol. 1 Living (and dying) in Avalanche Country, Simpler Way Book Company, PO Box 556, Silverton, CO 81433.

Matthews, M. 2005. Personal communication on Alaska accidental death figures, from Alaska Department of Health and Social Services vital statistics. Summer 2005.

National Highway Transportation Safety Administration 2003. State Traffic Safety Information for Year 2003, Alaska Toll of Motor Vehicle Crashes. http://www.nhtsa.dot.gov/STSI/State_Info.cfm?year=2003&State=AK&Accessibl e=0

Onslow, T. 2005. Personal communication on accident figures, Alaska DOT&PF avalanche forecaster for the Seward Highway. Summer 2005.

Roberts, J. 2005. Personal communication on accident figures, Colorado Avalanche Information Center highway avalanche forecaster for Colorado Department of Transportation on Red Mountain Pass. Summer 2005.

5. Page 339. Appendices. Add Appendix 14: Peer Review. This study was peer reviewed at the draft stage by three nationally prominent avalanche specialists: Dr. Edward LaChappelle of McCarthy, Alaska, Doug Fesler of Anchorage, Alaska, and Dr. Chris Landry of Silverton, Colorado. Their recommendations were incorporated to the extent possible into the final study.

Addendum to Appendix L

Noise Technical Report

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OCTOBER 2005

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1.0 ENVIRONMENTAL CONSEQUENCES

This addendum includes Alternative 2B specific noise impacts. The Appendix L *Noise Technical Report* prepared for the Supplemental Draft EIS contained specific receptor impacts for Alternative 2 only. This addendum reflects results from the noise analysis done for Alternative 2B.

1.1 Noise Impacts for Alternative 2B

There are three sensitive noise receptors close to the highway alignments for project alternatives on the east side of Lynn Canal that are outside the limits of existing urban development: Echo Cove campground, Adlersheim Lodge, and the USFS cabin in Berners Bay. The *Noise Technical Report* provided a worst-case analysis of project noise impacts at these receptors in 2038 based on projected peak noise-hour traffic volumes for Alternative 2. Because this alternative has been eliminated from consideration, a new noise analysis was conducted at these sensitive receptors for Alternative 2B, the preferred alternative. Differences in projected 2038 peak noise-hour traffic volumes for Alternative 2 and 2B at these receptors are listed below.

Table 1
2038 Projected Peak Noise-Hour Traffic Volumes at Specific Sensitive Receptors

Sensitive Receptor	Alternative 2	Alternative 2B
Echo Cove Campground	228	174
Adlersheim Lodge	193	139
Berners Bay Cabin	212	153

The reduced peak noise-hour traffic with Alternative 2B also reduces the worst-case traffic noise level at the sensitive receptors by approximately 1.4 average-weighted decibels (dBA) equivalent sound level (L_{eq}). Therefore, Alternative 2B would result in the following worst-case peak noise-hour noise levels at the three sensitive receptors:

Echo Cove Campground 44 dBA L_{eq}
Adlersheim Lodge 59 dBA L_{eq}
Berners Bay Cabin 47 dBA L_{eq}

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Addendum to Appendix N

Essential Fish Habitat Assessment

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1.0 AFFECTED ENVIRONMENT

An addendum to Appendix N*, Essential Fish Habitat Technical Assessment Report,* from the Supplemental Draft EIS was completed to incorporate additional information from the Kensington Gold Project Final EIS, development plans and permits associated with the Kensington Gold Project and Cascade Point Marine Terminal. Additional references were reviewed following comments from the public and cooperating agencies received during the Supplemental Draft EIS public comment period. Further, the highway alignment from Alternative 2B has been adjusted to avoid all palustrine emergent and most estuarine emergent wetlands, and shift the Antler River crossing further upstream to reduce impacts to essential fish habitat (EFH). Fill amounts also changed due to highway alignment changes and included in Table 3-7 of this addendum.

1.1 Fill/Side Casting Sites

Because Alternatives 2, 2A, and 2C are no longer project alternatives, EIT 6 and EIT 9, located in Taiya Inlet, are removed from the list of sites identified in Section 4.2.2 as potentially requiring fill placement.

1.2 Pacific Herring

There are many potential factors for the decline of the Lynn Canal herring stock including over-fishing, increased predator populations, disease, habitat alteration/degradation and unfavorable oceanographic conditions. All of these factors (not increased predation by Steller sea lions alone) could be involved to some degree in this decline; however, the magnitude of impact for any given factor is unknown.

1.3 Eulachon

The following paragraphs are provided to supplement text provided in Section 4.4.6.2 of the 2004 *Essential Fish Habit Assessment*.

Moffitt et al. (2002) describes how eulachon begin entering river systems as early as January in southeast Alaska, with water temperature possibly dictating entrance time. However, Spangler and Koski (2003) found that the run in the Antler River in 2002 commenced on April 19 and continued until May 21. They documented that the maximum distance migrated up the Antler River was about 4 kilometers and 99 percent of all observations were found in the lower 2-kilometer section of the river. Mean daily water temperatures during the run varied from 3.03 to 5.45 degrees Celsius (°C) with a mean of 4.16°C for the spawning period. Eulachon were observed to prefer spawning on gravel (2 to 25 millimeters [mm]) and areas of moderate current velocity (0.2-0.6 meters per second [m/s]).

Eulachon eggs hatch after 30 to 40 days at temperatures of 4.4 to 7.2 C°, and the small larvae are quickly carried into the marine environment. Little is known of eulachon life history after the larvae enter the marine environment until they return to spawn. Pre-spawning aggregations of eulachon in Berners Bay attract large numbers of sea lions and the eulachon pulse may be critical to Steller sea lions during a period of high energetic demands (Sigler et al., 2004).

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2.0 ALTERNATIVE ANALYSES

Because of the August 2005 realignment, additional text is presented in the following subsections to supplement the discussion of impacts to EFH provided in Section 5.4 of the 2004 EFH Assessment. Also, a revised Table 3-7 is provided with new fill volumes for intertidal areas.

2.1 Alternative 2B – East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway

Alternative 2B would cross nine streams that are known to support populations of anadromous fish: Sawmill Creek, an unnamed creek south of Antler River, Antler River, Berners/Lace River, Slate Creek, Sweeny Creek, Sherman Creek, an unnamed creek north of Comet, and the Katzehin River. Three of these anadromous rivers, the Antler, the Berners/Lace, and the Katzehin, would require multi-span bridges with in-stream piers. Single-span bridges constructed without in-stream piers would cross the remaining identified anadromous fish streams.

2.1.1 Construction Impacts

Stream Crossing Structures

In response to EFH Conservation Recommendations made by the National Marine Fisheries Service (NMFS), the August 2005 realignment of Alternative 2B moves the Antler River crossing upstream to further avoid important eulachon habitat. This realignment reduces the number of in-stream bridge piers and eliminates the need for any in-stream bridge piers in the northern channel, which is documented to have a high density of eulachon spawning.

Effects of Ferry Terminal Construction

Fish passage gaps or large box culverts would be included in the design for the Katzehin Ferry Terminal breakwaters. These additions would reduce impacts to anadromous EFH by providing fish passage close to shore. Pile driving would be limited to a period when larval and juvenile EFH species are not present.

2.1.2 Long-Term Impacts

The August 2005 realignment eliminates potential impacts from highway fill to habitats at EIT 11, a sediment beach, and at EIT 12, a wetland/slough location. The approximate total acreage of intertidal/subtidal habitat that would be buried or otherwise impacted by the Alternative 2B highway is 25.6 acres, an increase of 3.7 acres from the previous alignment. The direct effects on marine EFH from placing in-water fill in specific intertidal and subtidal zones would be realized throughout the 25.6 acres (includes the fill volumes in Table 3-7 plus 2.66 acres of subtidal fill).

Approximately 6.4 acres of intertidal sediment beach and subtidal area at the Katzehin Ferry Terminal location would be buried with fill and would no longer be available for colonization. This is an increase of 2.1 acres from the previous alignment. Dredging for the terminal would impact 4.4 acres (a reduction of 0.1 acre from the previous alignment) of subtidal boulder/cobble/gravel habitat.

2.1.3 Summary of Alternative 2B Impacts

Approximately 36.4 acres of intertidal/subtidal habitat would be buried or otherwise impacted under Alternative 2B (25.6 acres for the highway construction and 10.8 acres at the Katzehin Ferry Terminal). There would be no effects from sidecasting or fill placement in Taiya Inlet north of the Katzehin River.

3.0 CUMULATIVE EFFECTS

The following subsections replace Section 5.9 in the 2004 *Essential Fish Habitat Assessment*.

3.1 Past, Present, and Reasonably Foreseeable Future Effects

The following reasonable foreseeable projects would cause loss of marine EFH due to the placement of fill in the intertidal and shallow subtidal zones:

- Alaska Glacier Seafoods Plant – 0.63 acre of fill for a pad extending into Auke Nu Cove, and an 80-foot by 110-foot pile-supported dock (U.S. Army Corps of Engineers [USACE], 2003).
- Goldbelt Cascade Point Marine Terminal – 1.3 acres of fill for a breakwater and 1.6 acres of dredge for a turning basin (Alaska Department of Natural Resources [ADNR], 2005a).
- Kensington Mine Slate Cove facilities – 2.1 acres of fill for a marine terminal (ADNR, 2005b).
- Otter Creek Hydroelectric Plant – 0.7 acre of fill in intertidal and subtidal habitat for a deep marine jetty and floating dock (Federal Emergency Regulatory Commission [FERC], 2002).

Various hypotheses have been put forward as to why Lynn Canal herring stocks have declined, although none have been substantiated through careful scientific analysis. These hypotheses include one or some combination of the following factors: overfishing, increased predator populations, disease, habitat alteration or degradation (especially in Auke Bay), water pollution, and unfavorable oceanographic conditions (see Attachment C in the 2004 EFH Assessment). Thus, one or more of these factors in Lynn Canal and/or Berners Bay could have affected Pacific herring stocks such that the species' ability to recover has been compromised and the population remains below harvestable levels. Past direct and indirect impacts on Pacific salmon, eulachon, crabs, and sculpin have not been observable at the population level.

Many of the effects from the reasonably foreseeable projects would be short-term and temporary, such as increased turbidity during construction. Other longer-term impacts on water quality could be realized due to effluent from the seafood plant, hydroelectric facility, and mine, and spills from vessels associated with the Cascade Point/Slate Cove improvements. Marine vessel and harbor operations could cause short-term impacts to water quality due to discharges (permitted and unintentional sanitary waste discharge), and unintentional fuel discharge. These water quality changes could result in mortality of individual Pacific herring, crabs, and sculpins. Other future foreseeable or ongoing events occurring within Lynn Canal that have the potential to impact habitat and fish and invertebrates include commercial, sport and subsistence/personal use fishing, and recreation.

3.1.1 Alternative 1 – No Action Alternative

3.1.1.1 Cumulative Effects

The intertidal and shallow subtidal habitat that would be lost as a result of these projects is used by juvenile salmon, particularly pink salmon, during their early marine life stages, as well as by prey species for fish stocks in Lynn Canal. When they first enter marine waters, pink salmon spend most of their time in a few centimeters of water (Groot and Margolis, 1991). Other juvenile salmonids such as chum, coho, and sockeye salmon also use shallow nearshore habitat for rearing, but not to the same extent as pink salmon. Reasonable foreseeable projects would result in impacts to approximately 8 acres of nearshore habitat used by juvenile salmon. Because much of the Lynn Canal coastline provides suitable rearing habitat for juvenile salmon, this loss would not measurably affect salmon populations in Lynn Canal.

Construction of the dock facility at Slate Creek for the Kensington Gold Project could affect both adult eulachon returning to spawn and juvenile eulachon, depending on timing. Noise and increased boat traffic due to construction could disrupt the migration of some adult eulachon returning to spawn if these activities occur in the April to May spawning period. Avoiding construction during this period could mitigate this effect. Some juvenile eulachon feeding in Berners Bay could be affected by dock construction at Slate Creek; however, these fish are found mostly along the bottom in deeper water (Smith and Saalfeld, 1955). Because construction would impact a small area of eulachon foraging habitat and construction would last for a short period of time, no measurable effects to eulachon populations in Lynn Canal would occur (USFS, 2004).

Approximately 2 acres of potential spawning habitat for Pacific herring at Cascade Point would be lost due to construction of the dock and breakwater. If the filled and dredged area at Cascade Point were entirely lost for spawning, approximately 350 feet of shoreline would be affected (USFS, 2004). This is equivalent to less than 2 percent of the along-shore herring spawning length (approximately three miles) observed in Berners Bay in 2003.

The Kensington Gold Project and Alaska Glacier Seafoods project would increase marine vessel traffic in Lynn Canal. Until recently, treatment of wastewater discharged from marine vessels did not need to meet water quality standards that were completely protective of aquatic life. New compliance regulations effective in 2005 require wastewater discharges to meet Alaska Water Quality Standards (AWQS). Therefore, even though marine vessel traffic and corresponding wastewater discharges may increase under the No Action Alternative, those discharges should not alter water quality in Lynn Canal because of improved wastewater treatment.

3.1.2 Alternative 2B

3.1.2.1 Indirect Effects

Alternative 2B would result in improved access to the east side of Lynn Canal. This is likely to result in increased recreational fishing for anadromous fish along the eastern shoreline of Lynn Canal, as well as the anadromous streams crossed by the alignment. No boat ramps would be constructed along the highway for this alternative. Therefore, Alternative 2B would not increase the number of access points in the project study area for boats other than small, highly portable recreational craft such as kayaks and canoes.

Alternative 2B is projected to result in an increase in non-resident visitors and a small population increase in Juneau, Haines, and Skagway. This would increase the volume of effluent discharged from the wastewater treatment facilities in these communities. This increase would not reduce water quality in the receiving waters because these facilities must meet National Pollution Discharge Elimination System (NPDES) discharge limitations protective of aquatic life.

3.1.2.2 Cumulative Effects

The Alternative 2B highway would be on the shoreline at several locations between Sherman Point and the Katzehin River. This would result in filling 25.6 acres of intertidal and shallow subtidal habitat. An additional 6.4 acres of intertidal and subtidal habitat would be filled for the proposed Katzehin Ferry Terminal. An additional 4.4 acres of subtidal habitat would be dredged for a ferry mooring basin at the terminal site. Therefore, Alternative 2B would impact about 36.4 acres of intertidal and subtidal habitat.

Alternative 2B in combination with reasonable foreseeable projects would result in the loss of 44 acres of nearshore intertidal and shallow subtidal habitat used by juvenile salmon. Because much of the Lynn Canal coastline provides suitable rearing habitat for juvenile salmon, this loss would not measurably effect salmon populations in Lynn Canal.

The Slate Creek dock facilities for the Kensington Gold Project would impact 2.1 acres of foraging habitat for juvenile eulachon. Short-term loss of benthic resources would occur, but recolonization would be expected. Schooling pelagic species, like herring and eulachon, may temporarily avoid the crew shuttle boat route due to noise, although some acclimation to frequent noise would be expected. Overall, there would be adverse effects on EFH prey resources, although most impacts are expected to be short-term (ADNR, 2005c). Eulachon also use the Katzehin River for spawning. Because the proposed Katzehin Ferry Terminal would be located north of the river delta, it would not impact spawning runs of this species. In addition, the design for the breakwaters at the Katzehin Ferry Terminal would include fish passage gaps or large box culverts to provide fish passage close to shore.

The Pacific herring population in Lynn Canal has been substantially reduced over the past few decades, to the point that it is no longer a viable commercial fishery. Various hypotheses have been put forth as to why the stocks have declined, though none have been substantiated by scientific analysis. These hypotheses include one or some combination of the following factors: overfishing, increased predator populations, disease, habitat alteration/degradation, water pollution, and environmental changes such as unfavorable oceanographic conditions.

Alternative 2B in combination with other reasonable foreseeable projects in the region were evaluated for the potential to impact EFH through changes in water quality. This evaluation considered discharges of sanitary wastewater from marine and ferry terminals as well as marine vessels, leakage of fuels and lubricants from marine vessels, highway stormwater runoff, and catastrophic spills from marine vessels and vehicles using a highway.

Sanitary wastewater would be discharged from the Katzehin terminal into Lynn Canal. These discharges would not substantially alter water quality. Wastewater would go through tertiary treatment using ultraviolet light disinfection prior to discharge and discharges would be at the appropriate distance from shore and depth of water to meet permit guidelines for mixing. Treated wastewater would meet AWQSs protective of aquatic life. There are no plans for wastewater treatment and discharge at the proposed Coeur Slate Cove and Goldbelt Cascade Point marine facilities in Berners Bay. However, Coeur has been permitted for an outfall that will discharge treated domestic wastewater into Lynn Canal. Discharges from this outfall are not expected to substantially alter water quality (ADNR, 2005d). Because discharge of wastewater from ferry terminals proposed for Alternative 2B would not result in substantial water quality changes in Lynn Canal and other reasonable foreseeable marine facilities that would be located there do not include wastewater treatment and discharge facilities, there would be no cumulative water quality impacts from this source.

The highway proposed for Alternatives 2B would be located along the eastern shore of Berners Bay, and at times it would be within 200 feet of the shore. Results of stormwater research by the Federal Highway Administration (FHWA) indicate that stormwater runoff from low to medium traffic volumes (under 30,000 vehicles per day) on rural highways exerts minimal to no impact on the aquatic components of most receiving waters (United States Department of

Transportation [USDOT] & FHWA, 1987). Annual average daily traffic (AADT) on the proposed highway is projected to average 670 vehicles in 2038, which is about 3 percent of the maximum traffic volume considered in the FHWA research.

Studies conducted in Anchorage, Alaska, under the Municipality of Anchorage (MOA) Watershed Management Program similarly concluded that street runoff has minimal impacts to the water quality of receiving waters from most potential pollutants (MOA, 2000). These studies evaluated runoff from residential streets (<2,000 average daily traffic [ADT]) to major arterials (>20,000 ADT), including water quality impacts from snowmelt. The studies showed dissolved concentrations of calcium, chromium, magnesium, and zinc to be below AWQSs and polynuclear aromatic hydrocarbons (PAHs) to be below U.S. Environmental Protection Agency (USEPA) water quality criteria. Only dissolved concentrations of copper and lead were noted to be above their AWQSs; however, modest dilution would likely reduce these concentrations below their AWQSs. Because of the rural setting of Alternative 2B and the predicted low annual ADT, lower concentrations of pollutants would be present in runoff from the highway proposed for this alternative than were found in the Anchorage studies. Based on the results of those studies and FHWA research, runoff from Alternative 2B would not cause water quality impacts in Berners Bay.

Alternative 2B would end Alaska Marine Highway System (AMHS) service at Auke Bay, but would increase shuttle ferry traffic in Chilkoot and Taiya Inlets. Shuttle ferries would be equipped with sanitary waste holding tanks that would be pumped out and the waste would be treated onshore at an appropriate treatment plant or wastewater would be treated onboard to appropriate standards prior to discharge. Therefore, wastewater from these ferries would not impact water quality in Chilkoot and Taiya Inlets, and would not contribute to cumulative water quality impacts.

The potential for introduction of oil into Chilkoot and Taiya Inlets exists from fueling operations at ferry terminals, leakage from ferry decks or other sources from ferry vessels, and spills from marine casualties. The shuttle system would consist of three vessels running between Katzehin, Haines, and Skagway during the summer (ferry traffic would decrease during winter):

- An Aurora class shuttle between Katzehin and Haines with a 34-vehicle capacity;
- A shuttle serving Katzehin and Skagway with a 53-vehicle capacity; and
- A shuttle between Haines and Skagway with a 16-vehicle capacity.

The amount of in-water spillage could range from small amounts of fuel and lubricants up to a catastrophic release of petroleum. The amount of spillage onto ferry decks that discharge overboard could range from a few ounces to approximately 200 gallons. Sources of on-board spills would be fueling operations or vehicle fuel or oil leaks while underway. Fuel is pumped at the rate of 200 gallons per minute; in any event of leakage shutdown of pumping would be immediate and would be completed within a few seconds. (Potential fueling accidental spills could occur at the Lutak or Skagway terminals; fueling would not occur at the Katzehin ferry terminal.) The amount of oil discharged from vehicle tank leaks while on board could be from a few drops to 200 gallons, as fuel tanks in large trucks may be as large as 200 gallons.

The amount of an in-water oil spill from a marine casualty, such as grounding, etc., could range from a few gallons to the maximum fuel capacity of the ferry. The maximum fuel capacities of the three ferries, based on vessel size, are[8]:

- Katzehin-Haines shuttle ferry (34 vehicles, Aurora class), up to 46,000 gallons;
- Katzehin-Skagway shuttle ferry (53 vehicles), up to 74,000 gallons.
- Haines-Skagway shuttle (16 vehicles), up to 9,300 gallons.

Timing of a catastrophic oil spill would be a factor in the degree of impact experienced. For example, weather would affect cleanup, or the size of a spill would be smaller if it were to occur at the end of the voyage when most of the fuel would be expended.

The National Oceanic and Atmospheric Administration (NOAA) believes typical levels of hydrocarbons near AMHS ferry terminals would be very low. Because of requirements for fueling operator training and monitoring, as well as requirements for cleanup equipment on board ferries and spill response plan for fueling operations, fuel introduced into water by leakage from fueling operations or vessel traffic is not likely to impact essential fish habitat in Lynn Canal. The vessels would carry absorbent sheets (50 would pick up approximately 17 gallons) and other absorbent materials such as booms, etc. (AMHS, personal communication, 2005). Currently, vessels carry 50 absorbent sheets (each picks up 1/3 gallon), absorbent booms, and other absorbent material (AMHS, personal communication, 2005). All of the equipment would provide the capacity to pick up approximately up to 100 gallons on deck (Alaska Department of Environmental Conservation [ADEC], personal communication, 2005). Fueling operations are currently monitored by the U.S. Coast Guard and require special training of personnel and periodic equipment inspections (Petro Marine, personal communication, 2005).

A catastrophic oil spill, depending on size, timing, and response speed and capability, could substantially impact essential fish habitat of Chilkoot and Taiya inlets. Currently, the AMHS has an existing contract for spill response in Alaska, Canada and Washington, as part of the ISM and the Safety Management System (AMHS, personal communication, 2005).

3.1.3 Alternative 3

3.1.3.1 Indirect Effects

Alternative 3 would result in improved access to the west side of Lynn Canal. This is likely to result in increased recreational fishing for anadromous fish along the western shoreline of Lynn Canal, as well as the anadromous streams crossed by the alignment. No boat ramps would be constructed along the highway for this alternative. Therefore, Alternative 3 would not increase the number of access points in the project study area for boats other than small, highly portable recreational craft such as kayaks and canoes.

Alternative 3 is projected to result in an increase in non-resident visitors in Juneau, Haines, and Skagway and in population growth in Juneau and Haines. Subsequently, the volume of effluent discharged from the wastewater treatment facilities in these communities would increase. This

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[8] The fuel capacities for the 16-, 34-, and 53-vehicle capacity ferries are based on fuel capacities of existing vessels. The *M/V Lituya* is representative of the 16-vehicle vessel, the *M/V Aurora* is representative of the 34-vehicle vessel, and the *M/V Taku* is representative of the 53-vehicle vessel, though the *Taku* can carry 69 vehicles and has a maximum fuel capacity of 74,386 gallons.

increase would not reduce water quality in the receiving waters because these facilities must meet NPDES discharge limitations protective of aquatic life.

3.1.3.2 Cumulative Effects

Alternative 3 would be on the shoreline approximately two miles north of the Endicott River, resulting in the fill of 0.09 acre of intertidal habitat. Construction of the causeway between the proposed bridges over the Chilkat River/Inlet would also fill 4.8 acres of intertidal habitat. The proposed ferry terminals at Sawmill Cove and William Henry Bay would fill and dredge a total of about eight acres of intertidal and shallow subtidal habitat.

Nearshore intertidal and shallow subtidal habitat is used by juvenile salmon, particularly pink salmon, during their early marine life stages, as well as by prey species for fish stocks in Lynn Canal. Alternative 3 in combination with reasonable foreseeable projects would result in the loss of 19.2 acres of this habitat. Because much of the Lynn Canal coastline provides suitable rearing habitat for juvenile salmon, this loss would not measurably effect salmon populations in Lynn Canal.

The Goldbelt Cascade Point Marine Facility and the Sawmill Cove Ferry Terminal proposed for Alternative 3 would have a cumulative impact on existing Pacific herring spawning habitat. The Goldbelt Cascade Point Marine Facility breakwater and dredging would impact approximately 2.9 acres of intertidal and subtidal habitat. The Sawmill Cove Ferry Terminal would require fill and dredge of 3.2 acres of intertidal and subtidal habitat in areas that Pacific herring are known to currently spawn in Berners Bay. Based on a 2003 site survey, the proposed Sawmill Cove terminal site is suitable herring spawning habitat because it supports patches of blade kelp that were sparse but persistent and evenly distributed throughout the subtidal area. There is no eelgrass or stalked kelp. The Cascade Point marine facility would result in a loss of important herring spawning habitat from the dredging of the boat basin and fill associated with the breakwater. Short-term loss of the benthic resources would occur, but some recolonization would be expected. In addition, schooling pelagic fish, like herring, may temporarily avoid the crew shuttle boat route due to noise, although some acclimation to frequent noise events would be expected (ANDR, 2005a). Alternative 3 in combination with reasonable foreseeable activities would impact a total of approximately 6 acres of spawning habitat currently used by Pacific herring in Berners Bay. The footprint of the Sawmill Cove Ferry Terminal is approximately 300 feet of shoreline at mean lower low water, which is equivalent to less than 2 percent of the along-shore herring spawning length observed in Berners Bay in 2003. The footprint of the Cascade Point marine facility in combination with the Sawmill Cove terminal proposed for Alternative 3 would result in the cumulative loss of 4.4 percent of the known along-shore Pacific herring spawning habitat in Berners Bay. This would be a cumulative impact to Pacific herring. Approximately 4.8 acres of this habitat would be lost to terminal filling and dredging at William Henry Bay. However, Pacific herring spawning is currently limited to Berners Bay and no spawning takes place in any of these other locations in Lynn Canal.

The Slate Creek dock facilities for the Kensington Gold Project would impact 2.1 acres of foraging habitat for juvenile eulachon. Short-term loss of benthic resources would occur, but recolonization would be expected. Schooling pelagic species, like herring and eulachon, may temporarily avoid the crew shuttle boat route due to their noise, although some acclimation to frequent noise would be expected. Overall, there would be adverse effects on EFH prey resources, although most impacts are expected to be short-term (ADNR, 2005c).

Alternative 3 in combination with other reasonable foreseeable projects in the region were evaluated for the potential to impact essential fish habitat through changes in water quality. This evaluation considered discharges of sanitary wastewater from marine and ferry terminals as well as marine vessels, leakage of fuels and lubricants from marine vessels, highway stormwater runoff, and catastrophic spills from marine vessels and vehicles using a highway.

Sanitary wastewater would be discharged from the Sawmill Cove terminal into Berners Bay and from the William Henry Bay terminal into that bay. These discharges would not substantially alter water quality. Wastewater would go through tertiary treatment using ultraviolet light disinfection prior to discharge and discharges would be at the appropriate distance from shore and depth of water to meet permit guidelines for mixing. Treated wastewater would meet AWQSs protective of aquatic life. There are no plans for wastewater treatment and discharge at the proposed Slate Creek and Cascade Point marine facilities in Berners Bay. However, Coeur has been permitted for an outfall that will discharge treated domestic wastewater into Lynn Canal. Discharges from this outfall are not expected to substantially alter water quality (ADNR, 2005d). Because discharge of wastewater from ferry terminals proposed for Alternative 3 would not result in substantial water quality changes in Berners Bay and other reasonable foreseeable marine facilities that would be located there do not include wastewater treatment and discharge facilities, there would be no cumulative water quality impacts from this source.

Alternative 3 would end AMHS service at Auke Bay but would increase shuttle ferry traffic in Lynn Canal and introduce shuttle ferry traffic in Berners Bay. Shuttle ferries would be equipped with sanitary waste holding tanks that would be pumped out and the waste treated onshore at an appropriate treatment plant, or wastewater would be treated onboard to appropriate standards prior to discharge. Therefore, wastewater from these ferries would not impact water quality in Lynn Canal and Berners Bay, and would not contribute to cumulative water quality impacts.

The increased marine vessel traffic in Berners Bay associated with Alternative 3 and reasonable foreseeable projects at Slate Creek and Cascade Point could lead to an increase in total petroleum hydrocarbons (TPHs) in the bay from fuel and lubricant leaks. However, because of the small volume of vessel traffic that would result from Alternative 3 and reasonable foreseeable projects, it is unlikely that hydrocarbon leaks would be large enough to impact essential fish habitat in Berners Bay.

The highway proposed for Alternative 3 would be located along the eastern shore of Berners Bay to Sawmill Cove. Based on the results of stormwater runoff studies conducted by the Municipality of Anchorage and FHWA, runoff from Alternative 3 would not cause water quality impacts in Berners Bay.

The potential for a catastrophic release of petroleum in Berners Bay would increase with Alternative 3 and the reasonable foreseeable projects. Depending on the timing and location of such a spill, it could substantially impact the Pacific herring spawning population in the bay.

3.1.4 Alternatives 4A and 4C

3.1.4.1 Indirect Effects

Alternative 4A is projected to result in an increase in non-resident visitors and in a small amount of population growth in Juneau, Haines, and Skagway. Subsequently, the volume of effluent discharged from the wastewater treatment facilities in these communities would increase. This increase would not reduce water quality in the receiving waters because these facilities must meet NPDES discharge limitations protective of aquatic life.

3.1.4.2 Cumulative Effects

Alternatives 4A and 4C in combination with the reasonable foreseeable expansion of the Alaska Glacier Seafoods Plant would result in the loss of about 1.5 acres of nearshore intertidal and shallow subtidal habitat in Auke Bay. Other marine facilities have been constructed in Auke Bay including the existing Auke Bay ferry terminal, a boat launch ramp, several marinas including fueling facilities, a harbormaster's office, associated parking, and residential and commercial wastewater facilities. Although the acreage of impacted intertidal and subtidal habitat has not been computed, development occurs all along the waterfront of Auke Bay. A large portion of most of the facilities is on the surface of the water away from the nearshore habitat (such as the finger float system of a marina), and parts of the facilities occupy a smaller portion of intertidal or subtidal habitat (such as a staging dock and access ramp). In such instances, the amount of nearshore habitat impacted is not commensurate with the size of the entire development. Because the remaining Auke Bay nearshore intertidal and subtidal habitat and most of the Lynn Canal coastline provides suitable rearing habitat for juvenile salmon, prey species, and crabs, this loss would not measurably affect fish and invertebrate populations in Lynn Canal.

3.1.5 Alternatives 4B and 4D

3.1.5.1 Indirect Effects

Alternative 4B is projected to result in an increase in non-resident visitors and in a small amount of population growth in Juneau, Haines, and Skagway. The same types of increases are also projected for Alternative 4D, but for only Juneau and Haines. Subsequently, the volume of effluent discharged from the wastewater treatment facilities in these communities would increase. This increase would not reduce water quality in the receiving waters because these facilities must meet NPDES discharge limitations protective of aquatic life.

3.1.5.2 Cumulative Effects

Alternatives 4B and 4D in combination with the reasonable foreseeable expansion of the Alaska Glacier Seafoods Plant would result in the loss of about 1.5 acres of nearshore intertidal and shallow subtidal habitat in Auke Bay. Other marine facilities have been constructed in Auke Bay including the existing Auke Bay Ferry Terminal, a boat launch ramp, several marinas including fueling facilities, a harbormaster's office, associated parking, and residential and commercial wastewater facilities. Although the acreage of impacted intertidal and subtidal habitat has not been computed, development occurs all along the waterfront of Auke Bay. A large portion of most of the facilities is on the surface of the water away from the nearshore habitat (such as the finger float system of a marina), and parts of the facilities occupy a smaller portion of intertidal or subtidal habitat (such as a staging dock and access ramp). In such instances, the amount of nearshore habitat impacted is not commensurate with the size of the entire development.

Because the remaining Auke Bay nearshore intertidal and subtidal habitat and most of the Lynn Canal coastline provides suitable rearing habitat for juvenile salmon, prey species, and crabs, this loss would not measurably affect fish and invertebrate populations in Lynn Canal.

Alternatives 4B and 4D would result in the loss of 3.2 acres of intertidal and subtidal habitat from dredging and filling at the proposed Sawmill Cove Ferry Terminal site. Nearshore intertidal and shallow subtidal habitat is used by juvenile salmon, particularly pink salmon, during their early marine life stages, as well as by prey species for fish stocks in Lynn Canal. Alternatives 4B and 4D in combination with reasonable foreseeable projects would result in the loss of about 9 acres of this habitat. Because much of the Lynn Canal coastline provides suitable rearing habitat for juvenile salmon, this loss would not measurably effect salmon populations in Lynn Canal.

The Goldbelt Cascade Point Marine Facility and the Sawmill Cove Ferry Terminal proposed for Alternatives 4B and 4D would have a cumulative impact on existing Pacific herring spawning habitat. The Goldbelt Cascade Point Marine Facility breakwater and dredging would impact approximately 2.9 acres of intertidal and subtidal habitat. The Sawmill Cove Ferry Terminal would require fill and dredge of 3.2 acres of intertidal and subtidal habitat in areas that Pacific herring are known to currently spawn in Berners Bay. Based on 2003 site surveys, the proposed Sawmill Cove terminal site is suitable habitat for Pacific herring spawning. The Cascade Point marine facility would result in a loss of important herring spawning habitat from the dredging of the boat basin and fill associated with the breakwater. Short-term loss of benthic resources would occur, but some recolonization is expected. However, the construction of the breakwater would result in some permanent loss of benthic resources. In addition, schooling pelagic fish, like herring, may temporarily avoid the crew shuttle boat route due to noise, although some acclimation to frequent noise events would be expected (ADNR, 2005c). Alternatives 4B and 4D in combination with reasonable foreseeable projects would impact a total of approximately 6 acres of spawning habitat currently used by Pacific herring in Berners Bay. The footprint of the Sawmill Cove Ferry Terminal is approximately 300 feet of shoreline at mean lower low water, which is equivalent to less than 2 percent of the along-shore herring spawning length observed in Berners Bay in 2003. The footprint of the Cascade Point marine facility in combination with the Sawmill Cove terminal proposed for Alternatives 4B and 4D would result in the cumulative loss of 4.4 percent of the known along-shore Pacific herring spawning habitat in Berners Bay. This would be a cumulative impact to Pacific herring because the regional population is depressed.

The Slate Creek dock facilities for the Kensington Gold Project would impact 2.1 acres of foraging habitat for juvenile eulachon. Short-term loss of benthic resources would occur, but recolonization would be expected. Schooling pelagic species, like herring and eulachon, may temporarily avoid the crew shuttle boat route due to their noise, although some acclimation to frequent noise would be expected. Overall, there would be adverse effects on EFH prey resources, although most impacts are expected to be short-term (ADNR, 2005c).

Alternatives 4B and 4D in combination with other reasonable foreseeable projects in the region were evaluated for the potential to impact essential fish habitat through changes in water quality. This evaluation considered discharges of sanitary wastewater from marine and ferry terminals as well as marine vessels, leakage of fuels and lubricants from marine vessels, highway stormwater runoff, and catastrophic spills from marine vessels and vehicles using a highway. Sanitary wastewater would be discharged from the Sawmill Cove terminal into Berners Bay. This discharge would not substantially alter water quality. Wastewater would go through tertiary treatment using ultraviolet light disinfection prior to discharge and discharges would be at the appropriate distance from shore and depth of water to meet permit guidelines for mixing. Treated wastewater would meet AWQSs protective of aquatic life. There are no plans for wastewater treatment and discharge at the proposed Slate Creek and Cascade Point marine facilities in Berners Bay. However, Coeur has been permitted for an outfall that will discharge treated domestic wastewater into Lynn Canal. Discharges from this outfall are not expected to substantially alter water quality (ADNR, 2005d). Because discharge of wastewater from the ferry terminal proposed for Alternatives 4B and 4D would not result in substantial water quality changes in Berners Bay and other reasonable foreseeable marine facilities that would be located there do not include wastewater treatment and discharge facilities, there would be no cumulative water quality impacts from this source.

Sanitary waste discharged from AMHS vessels in Lynn Canal must meet AWQSs. Shuttle ferries would be equipped with sanitary waste holding tanks that would be pumped out and the waste treated onshore at an appropriate treatment plant, or wastewater would be treated onboard to appropriate standards prior to discharge. Therefore, wastewater from these ferries would not impact water quality in Lynn Canal and Berners Bay, and would not contribute to cumulative water quality impacts.

The increased marine vessel traffic in Berners Bay associated with Alternatives 4B and 4D and reasonable foreseeable projects at Slate Creek and Cascade Point could lead to an increase in TPHs in the bay from fuel and lubricant leaks. However, because of the small volume of vessel traffic that would result from Alternatives 4B and 4D and reasonable foreseeable projects, it is unlikely that hydrocarbon leaks would be large enough to impact EFH in Berners Bay.

The highway proposed for Alternatives 4B and 4D would be located along the eastern shore of Berners Bay to Sawmill Cove. Based on the results of stormwater runoff studies conducted by the MOA and FHWA, runoff from Alternatives 4B and 4D would not cause water quality impacts in Berners Bay.

The potential for a catastrophic release of petroleum in Berners Bay would increase with Alternatives 4B and 4D and the reasonable foreseeable projects. Depending on the timing and location of such a spill, it could substantially impact the Pacific herring spawning population in the bay.

4.0 DOT&PF PROPOSED CONSERVATION MEASURES

Based, in part, on conservation measures supplied by NMFS, DOT&PF has included additional conservation measures that are applicable to ferry terminal construction and operation that were not identified in Section 6 of *Appendix N Essential Fish Habitat Assessment Technical Report* included in the Supplemental Draft EIS.

Ferry Terminal Construction

- The design for the breakwaters at the Katzehin ferry terminal would include fish passage gaps or large box culverts.
- No in-water work would be conducted from March 15 through June 15 at the Katzehin Ferry Terminal site to protect out-migrating salmonids.

Highway Construction

- No in-water work would be conducted between March 15 and June 15 at the Antler, Lace, and Katzehin rivers to protect out-migrating salmonids and spawning eulachon.

Ferry Operations

- Alternatives 4B and 4D would have only summertime operations from a Berners Bay terminal. If either of these alternatives were selected, seasonal operation would not commence until after the herring spawning period.
- If Alternative 3 were selected, further discussion of other potential operational mitigation would be necessary. Both of these alternatives are based on the year-round operation of shuttle service from the east side of Berners Bay, and a two-week prohibition would be difficult to incorporate into an operational plan.
- All AMHS ferries would have a Spill Response Plan approved by the U.S. Coast Guard.
- Oil-absorbent materials, booms, and other oil spill cleanup equipment, as required by the U.S. Coast Guard-approved Spill Response Plan, would be carried on all ferries for the purpose of cleaning up oil spilled on the ferry deck, preventing spilled oil on the deck discharging overboard into the water, and containing in-water oil spills. The ferries would carry a sufficient amount of cleanup materials to provide the capacity for handling 100 gallons of spilled oil on vessel decks. The cleanup kits required by the Spill Response Plan would contain items such as oil-absorbent materials, booms, absorbent sheets, and other equipment.
- The AMHS would provide for cleanup of catastrophic in-water oil spills that are larger than the cleanup capability of the on-board spill response equipment. This would be accomplished through contracted outside agency responders with expertise and appropriate equipment. In such a spill event, the AMHS would immediately contact notify the outside response agency, the U.S. Coast Guard, and the AMHS response contacts.
- Spare drums would be available at ferry terminals at all times, for immediate replacement on ferries when necessary.
- Booms would be stored at each terminal where fueling occurs.

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5.0 REFERENCES

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TABLES

This section provides a revised edition of Table 3-7, Intertidal Survey Evaluation Summary, that was presented in the December 2004 *Essential Fish Habitat Assessment Technical Report*.

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Table 3-7
Intertidal Survey Evaluation Summary

Section ID (Location)	Site Status	Acres of fill	Survey Date	Survey Time Range (military time) [1]	Tide Level (feet) [2]	Survey Method	Weather	Estimated Total Section Length (feet) [3]	Estimated Length Surveyed (feet)	General Shoreline Classification	Geomorphology: Slope (low [flat]-med-high [steep]); Wave exposure (low-med-high)	General Observations of Intertidal Zone (ITZ)
EIT 1	No longer within alignment	0	26-Aug-03	05:42 - 06:05	1.4 to 0.3	Foot & Boat	Sun	150	50 by foot, 100 by boat	**Sediment Beach** (Boulder, cobble, & sand)	Slope: 30% low, 70% med; Wave: low	Kasidaya Creek. Mussel beds.
EIT 2	No longer within alignment	0	26-Aug-03	06:17 - 06:29	-0.1 to - 0.5	Foot & Boat	Sun	250	100 by foot, 50 by boat	**Sediment Beach** (Boulder, cobble, & sand)	Slope: 100% low; Wave: med	Mussels on boulders, lower ITZ.
EIT 3	No longer within alignment	0	26-Aug-03	06:33 - 06:38	-0.5 to - 0.7	Foot & Boat	Sun	250	50 combined foot and boat	**Sediment Beach** (Boulder, cobble, & gravel)	Slope: 80% low, 20% med; Wave: med	Dense mussel beds. Typical zonation similar to EIT 2.
EIT 4	No longer within alignment	0	26-Aug-03	06:49 - 06:51	-0.89 to - 0.91	Boat	Sun	150	150	**Bedrock Cliff / Vertical Face**	Slope: 100% high	Extremely dense mussel beds, narrow bands of Fucus and barnacles, *Verrucaria*. Typical zonation similar to EIT 3.
EIT 5	No longer within alignment	0	26-Aug-03	06:52 - 06:55	-0.92 to - 0.95	Boat	Sun	100	100	**Bedrock Cliff** (Rock face)	Slope: 100% high	Very similar to EIT 4, narrow bands of Fucus and mussels, *Verrucaria*.
EIT 6	No longer within alignment	0	26-Aug-03	07:01 - 07:03	-1.00 to - 1.01	Boat	Sun	100	100	**Sediment Beach** (Steep boulders)	Slope: 100% high	Very similar to EIT 4, narrow bands of Fucus and mussels, *Verrucaria*.

Table 3-7 (continued)
Intertidal Survey Evaluation Summary

Section ID (Location)	Site Status	Acres of fill	Survey Date	Survey Time Range (military time) [1]	Tide Level (feet) [2]	Survey Method	Weather	Estimated Total Section Length (feet) [3]	Estimated Length Surveyed (feet)	General Shoreline Classification	Geomorphology: Slope (low [flat]-med-high [steep]); Wave exposure (low-med-high)	General Observations of Intertidal Zone (ITZ)
EIT 7	No longer within alignment	0	26-Aug-03	07:05 - 07:07	-1.02 to -1.03	Boat	Sun	75	75	**Bedrock Cliff & Sediment Beach** (Boulders)	Slope: 80% med, 20% high; Wave: med	Steep boulder beach leading to rock face. Very similar to EIT 5.
EIT 8	No longer within alignment	0	26-Aug-03	07:25 - 07:35	-1.0 to -0.8	Foot	Sun	200	50	**Sediment Beach** (Cobble & gravel)	Slope: 80% med, 20% high; Wave: med	Less Fucus here – may be more protected; sea lion scat on boulder beach/rock outcrop north of site. Dungeness crab shells observed on shore.
EIT 9	No longer within alignment	0	26-Aug-03	07:38 - 07:42	-0.80 to -0.77	Foot	Sun	200	10	**Sediment Beach** (Boulders)	Slope: 100% high	Extensive barnacle cover.
EIT 10	No longer within alignment	0	26-Aug-03	08:32 - 08:44	0.8 to 1.3	Foot	Sun	550	550	**Sediment Beach** (Boulder & cobble)	Wave: med	Numerous very small littorines (*Littorina sitkana*).
EIT 11	Fill into water	3.63 plus 2.74 (break water fill)	26-Aug-03	09:01 - 09:06	2.2 to 2.5	Boat	Sun	500	500	**Sediment Beach** (Boulder, cobble, & gravel)	Slope: 20% med, 80% high	Typical zonation similar to other boulder/cobble sites. Transitions from steep boulder beach to less steep cobble beach. Ferry terminal site, contiguous to south.

Table 3-7 (continued)
Intertidal Survey Evaluation Summary

Section ID (Location)	Site Status	Acres of fill	Survey Date	Survey Time Range (military time) [1]	Tide Level (feet) [2]	Survey Method	Weather	Estimated Total Section Length (feet) [3]	Estimated Length Surveyed (feet)	General Shoreline Classification	Geomorphology: Slope (low [flat]-med-high [steep]); Wave exposure (low-med-high)	General Observations of Intertidal Zone (ITZ)
EIT 12	Uplands	0	26-Aug-03	09:24 - 09:47	3.5 to 5.0	Foot	Sun	1,000	1,000	**Wetland**	N/A	Not intertidal, see photos. Observed grasses, sedges, eagles chattering, and saltwater channels.
EIT 13	Bridge and approaches fill in intertidal zone	2.60	27-Aug-03	07:05 - 07:24	-1.4 to - 1.8	Foot	Cloudy	4,500	All but river. Extent of foot survey: 59° 11' 79", 135° 17' 16" (main river channel)	**Sediment Beach** (Cobble, sand, & gravel)	Slope: 100% low; Wave: low	Broad sandy beach with gravel. Cobbles in places with clumps of Fucus on top. Many tidal channels. Small fish in tidal pools.
EIT 14	Fill down to 11.4 feet	0.09	27-Aug-03	07:26 - 07:36	-1.8 to - 1.9	Foot	Cloudy	550	550	**Sediment Beach** (Cobble, sand, gravel, & mud)	Slope: 100% low; Wave: low	Large stream with waterfall, river otter tracks.
EIT 15	No longer within alignment	0	27-Aug-03	07:50 - 07:55	-2.01 to - 2.00	Foot	Cloudy	250	250	**Sediment Beach** (Cobble, sand, & gravel)	Slope: 100% low; Wave: low	Gravel/cobble beach, numerous interbedded mussels. Long, low angle beach, mussels also on rock face at back of beach. Small fish in tidal pools. King crab carcasses were observed on shore.

Table 3-7 (continued)
Intertidal Survey Evaluation Summary

Section ID (Location)	Site Status	Acres of fill	Survey Date	Survey Time Range (military time) [1]	Tide Level (feet) [2]	Survey Method	Weather	Estimated Total Section Length (feet) [3]	Estimated Length Surveyed (feet)	General Shoreline Classification	Geomorphology: Slope (low [flat]-med-high [steep]); Wave exposure (low-med-high)	General Observations of Intertidal Zone (ITZ)
EIT 16	No longer within alignment	0	27-Aug-03	08:35 - 08:38	-1.21 to - 1.24	Boat	Cloudy	600	600	**Bedrock Cliffs** (Platform)	Slope: 20% med, 80% high; Wave: med	Just past Gran Pt. sea lion haulout. Four sea lions (cows) present on site. Could only approach to within 100 feet. No evidence of sea lion disturbance. Typical rocky intertidal zonation.
EIT 17	No longer within alignment	0	27-Aug-03	08:43 - 08:46	-1.0 to - 0.7	Boat	Cloudy	400	400	**Bedrock Cliffs**	Slope: 100% high; Wave: med	Typical zonation. Small waterfall.
EIT 18	Fill at 20 feet	0.01	27-Aug-03	08:50 - 08:53	-0.6 to - 0.5	Boat	Cloudy	200	200	**Bedrock Cliffs**	Slope: 100% high; Wave: med	Steep boulder beach. Evidence of sea lion use.
EIT 19	Fill at 15.8 feet	0.09	27-Aug-03	09:20 - 09:24	0.7 to 1.0	Boat	Cloudy	300	300	**Bedrock Cliffs**	Slope: 100% high; Wave: med	Steep rock face leading to steep boulder beach. Sea lion observed off bow of boat. Typical zonation.
EIT 20	Fill at 5.5 feet	0.84	27-Aug-03	09:27 - 09:30	1.09 to 1.14	Boat	Cloudy	300	300	**Sediment Beach** (Boulder, cobble, & gravel)	Slope: 100% high; Wave: med	Moderate angle beach. Small creek. Pocket beach w/ gravel, cobbles, and boulders to the south.

Table 3-7 (continued)
Intertidal Survey Evaluation Summary

Section ID (Location)	Site Status	Acres of fill	Survey Date	Survey Time Range (military time) [1]	Tide Level (feet) [2]	Survey Method	Weather	Estimated Total Section Length (feet) [3]	Estimated Length Surveyed (feet)	General Shoreline Classification	Geomorphology: Slope (low [flat]-med-high [steep]); Wave exposure (low-med-high)	General Observations of Intertidal Zone (ITZ)
EIT 21	Fill at 10 feet	3.2	27-Aug-03	09:48 - 10:15	2.4 to 4.3	Foot & Boat	Cloudy	5,500	150 by foot, remainder by boat.	**Sediment Beach** (Boulder, cobble, & gravel)	Slope: 10% low, 90% med; Wave: med	Long site – cobble beach & gravel. South of waterfall. Dense mussels on boulders, dense Fucus on steep boulder beach to south. Small fish in tidal pools.
EIT 22	Fill at 5 feet	1.08	28-Aug-03	06:29 - 06:41	2.3 to 1.3	Boat	Sun	600	600	**Bedrock Cliffs & Sediment Beach** (Boulder & cobble)	Slope: 40% med, 60% high; Wave: med	Mussel spats on boulders.
EIT 23	Fill at 6.6 feet	1.52	28-Aug-03	06:45 - 06:53	1.3 to 0.6	Boat	Sun	600	600	**Bedrock Cliffs & Sediment Beach** (Boulder)	Slope: 20% med, 80% high; Wave: med	Very similar to EIT 22. Steep boulder beach.
EIT 24	Fill at 21 feet	0.11	28-Aug-03	06:55 - 06:58	0.6 to 0.3	Boat	Sun	700	700	**Bedrock Cliffs & Sediment Beach** (Boulder)	Slope: 50% med, 50% high; Wave: med	Very steep boulder beach. Dense coralline algae. Typical zonation.
EIT 25	Fill at 10 feet	4.64	28-Aug-03	07:00 - 07:15	0.2 to - 0.7	Boat	Sun	1,500	1,500	**Bedrock Cliffs & Sediment Beach** (Boulder)	Slope: 50% med, 50% high; Wave: med	Beach begins with steep rock face. High angle boulder beach. Slide area. Very similar to EIT 24. Very dense mussel spat at waterline.
EIT 26	Fill at 9.9 feet	1.15	28-Aug-03	07:17 - 07:25	-0.77 to - 1.1	Boat	Sun	1,500	1,500	**Bedrock Cliffs & Sediment Beach** (Boulder)	Slope: 80% med, 20% high; Wave: med	Boulder beach with steep outcrops.

Table 3-7 (continued)
Intertidal Survey Evaluation Summary

Section ID (Location)	Site Status	Acres of fill	Survey Date	Survey Time Range (military time)[1]	Tide Level (feet)[2]	Survey Method	Weather	Estimated Total Section Length (feet)[3]	Estimated Length Surveyed (feet)	General Shoreline Classification	Geomorphology: Slope (low [flat]-med-high [steep]); Wave exposure (low-med-high)	General Observations of Intertidal Zone (ITZ)
EIT 27	Alignment moved uphill out of fill	0	28-Aug-03	07:28 - 07:40	-1.2 to - 1.4	Foot & Boat	Sun	400	400 combined foot and boat	**Sediment Beach** (Boulder, cobble, & gravel)	Slope: 50% low 50% med; Wave: med	Small fish in ponds.
EIT 28	Fill at 18.8 feet	0.05	28-Aug-03	07:42 - 07:45	-1.8 to - 1.9	Boat	Sun	500	500	**Bedrock Cliffs & Sediment Beach** (Boulder)	Slope: 100% high; Wave: med	Rock outcrop with boulders. Dense coralline algae.
EIT 29	No longer within alignment	0	28-Aug-03	07:50 - 07:55	-2.1 to - 2.2	Boat	Sun	750	750	**Sediment Beach** (Boulder)	Slope: 100% med; Wave: med	Dense barnacles; minimal Fucus and *Alaria* spp. – could be more exposed.
EIT 30	No longer within alignment	0	28-Aug-03	07:55 - 08:05	-2.2 to - 2.4	Boat	Sun	200	200	**Sediment Beach** (Boulder, cobble, & gravel)	Slope: 50% low, 50% med	Dense mussel spat in lower ITZ.
EIT 31	No longer within alignment	0	28-Aug-03	08:10 - 08:15	-2.45 to - 2.50	Boat	Sun	450	450	**Sediment Beach** (Boulder & cobble)	Slope: 100% med; Wave: med	Minimal *Alaria* spp., dense coralline algae.
EIT 32	No longer within alignment	0	28-Aug-03	08:18 - 08:20	-2.52 to - 2.52	Boat	Sun	100	100	**Bedrock Cliffs & Sediment Beach** (Boulder)	Slope: 100% high; Wave: med	Very short site. Boulder rock face and typical zonation.
EIT 33	No longer within alignment	0	28-Aug-03	08:20 - 08:21	-2.52 to - 2.52	Boat	Sun	100	100	**Bedrock Cliffs**	Slope: 100% high; Wave: med	Very short site. Rock/cliff face. Dense *Alaria* spp. and typical zonation as with EIT 32.

Table 3-7 (continued)
Intertidal Survey Evaluation Summary

Section ID (Location)	Site Status	Acres of fill	Survey Date	Survey Time Range (military time) [1]	Tide Level (feet) [2]	Survey Method	Weather	Estimated Total Section Length (feet) [3]	Estimated Length Surveyed (feet)	General Shoreline Classification	Geomorphology: Slope (low [flat]-med-high [steep]); Wave exposure (low-med-high)	General Observations of Intertidal Zone (ITZ)
EIT 34	No longer within alignment	0	28-Aug-03	08:21 - 08:23	-2.52 to - 2.52	Boat	Sun	200	200	**Bedrock Cliffs**	Slope: 100% high; Wave: med	Very short site. Rock face. Typical zonation.
EIT 35	Fill at 9.3 feet	0.72	28-Aug-03	08:25 - 08:38	-2.52 to - 2.49	Foot & Boat	Sun	300	300 combined foot and boat	**Sediment Beach** (Boulder, cobble, & gravel)	Slope: 100% high; Wave: med	Moderately steep boulder beach. Dense urchins and limpets. Typical zonation. Stream nearby.
EIT 36	Fill at 8.0 feet	4.57	28-Aug-03	08:55 - 09:27	-2.2 to - 1.0	Foot	Sun	2,200	2,200	**Sediment Beach** (Boulder, cobble, & gravel)	Slope: 100% low; Wave: med	Gravel/cobble/boulder beach, low angle beach. Small fish in ponds. Avalanche chute area.
EIT 37	Fill at 13.5 feet	0.47	28-Aug-03	09:28 - 09:41	-1.0 to - 0.30	Foot	Sun	400	400	**Sediment Beach** (Cobble)	Slope: 100% low; Wave: med	Small stream crosses the site. More diversity at the stream.
EIT 38	No fill in intertidal zone	0	28-Aug-03	09:46 - 09:50	-0.05 to - 0.19	Foot	Sun	200	200	**Sediment Beach** (Cobble & gravel)	Slope: 100% low; Wave: med	Mouth of fairly large stream with typical intertidal zonation of other sites. Banks of stream are washed clean – very fast stream.
EIT 39	No longer within alignment	0	28-Aug-03	10:10 - 10:16	1.5 to 1.8	Foot	Sun	800	200	**Sediment Beach** (Cobble)	Slope: 100% low; Wave: med	Boulder/cobble low angle lens fairly exposed.
EIT 40	No longer within alignment	0	28-Aug-03	10:24 - 10:30	2.4 to 2.9	Foot	Sun	500	300	**Sediment Beach** (Cobble)	Slope: 100% low; Wave: med	Cobble, low angle beach.

Table 3-7 (continued)
Intertidal Survey Evaluation Summary

Section ID (Location)	Site Status	Acres of fill	Survey Date	Survey Time Range (military time)[1]	Tide Level (feet)[2]	Survey Method	Weather	Estimated Total Section Length (feet)[3]	Estimated Length Surveyed (feet)	General Shoreline Classification	Geomorphology: Slope (low [flat]-med-high [steep]); Wave exposure (low-med-high)	General Observations of Intertidal Zone (ITZ)
EIT 41	Berners/ Lace rivers	0	Not surveyed (Berners/Lace rivers)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WHB	Ferry terminal site	4.8	29-Aug-03	07:18 - 08:15	1.5 to -1.7	Foot	Sun	3,000	3,000	**Sediment Beach** (Boulder, cobble, sand, gravel, & rocky outcrops)	Slope: 100% low; Wave: low/med	Ferry terminal site. Extremely rich intertidal area. Sand gravel beach changing to boulders. Sculpins in tidal pools, fish egg mass.
SLA-1	Ferry terminal site	1.1	29-Aug-03	09:09 - 09:43	-2.4 to -1.7	Foot	Sun	1,700	1,300	**Sediment Beach** (Cobble, sand, gravel, & mud)	Slope: 100% low; Wave: med	Ferry terminal site. Mud/silty bottom with occasional boulders/cobbles. Rock outcrop with typical zonation. Crescent gunnels present.
SAW	Ferry terminal site	3.2	29-Aug-03	11:15 - 11:18	3.9 to 4.1	Boat	Sun	3,500	3,500	**Sediment Beach** (Boulder, cobble, sand, & gravel)	Slope: 100% low; Wave: low/med	Ferry terminal site. Typical zonation on rock outcrops and boulders. Minimal life on cobbles at center of beach.
EIT 42	Antler River	0	29-Aug-03 (twice)	11:50 - 11:55 13:30 - 14:00	11.8 to 12.2 14.7 to 16.4	Boat	Cloudy	2,500	N/A	(Antler River)	N/A	Photos taken at low tide and 1 hr prior to high tide.

Table 3-7 (continued)
Intertidal Survey Evaluation Summary

Section ID (Location)	Site Status	Acres of fill	Survey Date	Survey Time Range (military time) [1]	Tide Level (feet) [2]	Survey Method	Weather	Estimated Total Section Length (feet) [3]	Estimated Length Surveyed (feet)	General Shoreline Classification	Geomorphology: Slope (low [flat]-med-high [steep]); Wave exposure (low-med-high)	General Observations of Intertidal Zone (ITZ)
EIT 43	No longer within alignment	0	29-Aug-03	13:04 - 13:06	12.9 to 13.0	Foot	Cloudy	300	300	**Wetland/Tidal Slough**	Slope: 100% low; Wave: low	Wetlands area. Very similar to EIT 44 and 46. Slough with sandy bottom and small fish. No tidal influence. Numerous bear signs (tracks, burrows for roots, scat).
EIT 44	No longer within alignment	0	29-Aug-03	13:01 - 13:03	12.6 to 12.8	Foot	Cloudy	250	250	**Wetland/Tidal Slough**	Slope: 100% low; Wave: low	Wetlands area. Very similar to EIT 45. Small fish present. No tidal influence.
EIT 45	No longer within alignment	0	29-Aug-03	12:53 - 12:55	12.1 to 12.2	Foot	Cloudy	250	250	**Tidal Slough**	Slope: 100% low; Wave: low	Large dead fall. Tidal influence not likely. Small fish and bear sign observed.
EIT 46	No longer within alignment	0	29-Aug-03	12:28 - 12:34	10.0 to 10.5	Foot	Cloudy	500	500	**Tidal Slough**	Slope: 100% low; Wave: low	Tidally influenced slough. Surrounded by saltmarsh grasses. Small fish present.

Notes: Biologists Sue Ban and Rich Kleinleder were field crew on all sites.
[1] AST-Alaska Standard Time
[2] Measurement taken at Taiya Inlet, near Skagway.
[3] Lengths measured from GIS map.

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Addendum to Appendix O

Wetlands Technical Report

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TABLES

FIGURES

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1.0 INTRODUCTION

This addendum reflects comments from resource agencies and changes to the highway alignment for Alternative 2B following the Supplemental Draft EIS public comment period. Changes made by DOT&PF to the highway alignment were done to avoid all palustrine emergent and most estuarine emergent wetlands. The Anlter River crossing was also adjusted resulting in changes to wetland fill quantities and wetland impacts. The construction of the Cascade Point Road also affected the total number of wetland acres that would be impacted by the Juneau Access Improvements Project.

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2.0 ALTERNATIVE ANALYSES

2.1 Alternative 2B (Preferred): East Lynn Canal Highway to Katzehin with Return Shuttles to Haines and Skagway

Due to small adjustments to the Alternative 2B alignment and incorporation of the newly constructed Cascade Point Road between Echo Cove and Sawmill Cove, there are revisions to the number of acres of impacted wetlands and marine areas from this alternative. Construction of the highway under the revised Alternative 2B alignment would require fill and excavation of 102 acres of wetlands and marine areas within the footprint of the proposed highway and the ferry terminal at Katzehin. This total includes 69.8 acres of palustrine wetlands, primarily forested wetlands, 0.2 acre of estuarine emergent wetlands, and 32 acres of non-vegetated marine areas, consisting primarily of rocky shores.

The following subsections replace Section 4.3 in the 2004 *Wetlands Technical Report* and provide footprint acreage information and impacts to wetland functions and values based on the current Alternative 2B alignment.

2.1.1 East Lynn Canal Sub-Region 1 — Berners Bay

Footprint Acreage

The highway from Echo Cove to Sawmill Cove would follow the proposed Cascade Point Road, impacting 1.9 acres of wetlands along this alignment for the Juneau Access Improvements Project primarily to widen the Cascade Point Road (Figures 1, 2, and 3). Portions of eleven individual wetlands would be filled to construct a highway from the mouth of Echo Cove to the Slate Creek drainage. Forested wetlands would be impacted the most (7.7 acres, comprised of 3.7 acres of needle-leaved evergreen and 4.0 acres of deciduous forested wetlands). Most of the forested needle-leaved wetlands (PFO4B) occur between Echo Cove and Sawmill Creek (Figures 1 and 2). Deciduous forested wetlands (PFO1A and PFO1A/PSS1A) are adjacent to the Antler and Lace/Berners rivers (680-2 and 735-4; Figures 4 and 5). Loss of a scrub-shrub/forested wetland would constitute 0.7 acre (340-1; Figure 2). Table 4-1 presents the total fill areas for East Lynn Canal Sub-Region 1. Regular maintenance and operation activities that would occur following the completion of the highway would not be expected to result in the fill of additional wetlands.

Bridges and fill for the highway at the head of Berners Bay will not affect any estuarine emergent (salt marsh) habitat or intertidal flats. The October 2003 realignment of the highway through this area reduced the amount of wetland fill by approximately 3.1 acres for emergent wetlands and 2.9 acres for salt marsh. The December 2003 realignment of the bridge and the highway approach to the bridge was shifted farther upriver to avoid impacts to the salt marsh; this eliminated the remainder of the 4.4 acres potentially affected by the October 2003 alignment (735-1; Figures 4 and 5). The August 2005 realignment of Alternative 2B moves the Antler River crossing further upstream to bypass important eulachon spawning habitat and moves the Lace River crossing approximately 700 feet upstream to place greater distances between the highway and vegetated intertidal habitat (Figures 4 and 5).

Impacts to Wetland Functions and Values

Impacts to functions and values for each individual wetland on the east side of Lynn Canal are presented in Table 4-4. The proposed highway would act as a partial barrier to the flow of shallow groundwater and surface water. Shallow groundwater blocked by the highway bed would eventually flow to the surface and be diverted by ditches to culverts under the roadbed. This diversion would adequately maintain water's natural down-gradient flow. Culvert end sections or rock dissipaters would be used to disperse high volume/velocity outfall to protect soils and vegetation below culvert outfalls from erosion of adjacent wetlands. The diversion of water into culverts and roadside ditches could disrupt water flow to some downslope wetlands and alter wetland hydrology; however, the high volume of annual rainfall in this region could reduce the magnitude of any impacts to wetland hydrology. Alteration of hydrology because of the roadbed could result in corresponding changes to the vegetation and, over time, affect wetland functions. The extent of this direct effect would depend on the location, but could potentially extend beyond the right-of-way. These effects could be minimized by adequate design of cross-drainage structures and ditching.

The loss of forested wetlands from fill for the highway would modify the groundwater recharge functions, the groundwater discharge/lateral flow functions, and the surface hydrologic control functions of these wetlands. The remaining portions of these forested wetlands, and the wetlands in unaffected areas outside the highway corridor, would continue to provide these functions. Proper ditches and drainage structures under the highway would minimize effects on the hydrologic functions of these wetlands.

The salt marshes (Figures 4, 5, and 6) at the head of Berners Bay adjacent to the Antler, Lace, and Berners rivers and at the head of Slate Cove provide a wildlife habitat function. The Alternative 2B alignment does not directly impact the salt marsh wetlands; however, the highway alignment has the potential to impact terrestrial wildlife movement between the salt marsh areas and adjacent uplands. A further discussion of potential wildlife corridor impacts is included in the 2004 *Wildlife Technical Report.*

It is important to note that the marine intertidal area adjacent to the shoreline from Sawmill Cove to south of the Antler River area is herring spawning habitat (M. Ingle, personal communication, January 2004). There are no direct marine intertidal impacts occurring along this segment of the shoreline for Alternative 2B. A discussion of potential impacts to herring spawning habitat is presented in the *Essential Fish Habitat Assessment*.

Contaminants, including oils, fuels, sediment, and debris can be introduced to the ecosystem during construction activities. These pollutants often settle in wetlands, but can move downstream when re-suspended. The introduction of contaminants and excess sediment loading can be avoided with implementation of Best Management Practices (BMPs). Contaminant concentrations in runoff from the proposed highway would not be expected to exceed Alaska Water Quality Standards (AWQS) or adversely impact the water quality of receiving waters for the long-term. Invasive plant species can also be introduced during construction activities. Alaska Department of Transportation and Public Facilities (DOT&PF) and Federal Highway Administration (FHWA) regulations require construction contractors to utilize specific techniques and procedures to minimize the accidental introduction of foreign plant species carried on construction equipment and to use native or non-invasive plant species for hydro-seeding of exposed embankments. Compliance with these BMPs should minimize the risk of introducing foreign plant species to the highway corridor and thus minimize the chance of causing wildlife habitat loss though this mechanism related to construction activities.

The use of salt treated abrasives (sand and 3-5 percent salt) to improve road conditions could potentially affect roadside vegetation (Stormwater, 2001). High rainfall in this region would minimize any impact from road salt. Most soil and vegetation damage from sand or salt is localized to within 60 feet of the road, with the greatest impacts right next to the pavement (U.S.

Roads, 1997). Salt treated abrasives would be used minimally along the highway route; thus, negligible impacts on adjacent vegetation would be expected.

2.1.2 East Lynn Canal Sub-Region 2 — Slate Cove to Sherman Point

Footprint Acreage

The July 2005 Alternative 2B alignment includes adjustments between Slate Cove and Sherman Point in an effort to further avoid emergent wetlands. The alignment from Slate Cove to Sherman Point would impact only palustrine wetlands; the alignment does not contact the shoreline. Forested wetlands dominate the land cover in this region. Of the 60.5 acres of potential wetland fill in this sub-region, all would occur in forested wetlands (Table 4-1).

Impacts to Wetland Functions and Values

Excavation or fill of wetlands for construction of the highway would intersect the drainage patterns of most of the wetlands in this sub-region. Impacts will include modifying the groundwater recharge functions, the discharge/lateral flow functions, the surface hydrologic control functions, and the sediment retention functions of these wetlands. Expanses of similar habitat in the surrounding areas, and adequate ditching and drainage structures, will moderate losses of any of these functions.

Wildlife habitat for four wetlands in this subsection is rated as a moderate-high value (wetlands 910-2, 955-2, 1185-1, and 1220-1; Figures 6 and 7; Table B-1). The approximate total acreage of these wetlands is 1,343 acres, of which 4 percent (52.4 acres) would be impacted. These wetlands have a moderate-high value because permanent standing fresh or brackish water or permanently flooded emergent marsh is present (emergent wetlands) and the wetlands are adjacent to spruce/hemlock forest or deciduous scrub-shrub (forested and scrub-shrub wetlands), which provides food and water with nearby cover for terrestrial animals such as bear. All other wetlands impacted by Alternative 2B in this sub-region have a moderate-low to low wildlife habitat value (Table B-1 and Appendix D). A further discussion on wildlife habitat impacts is included in the 2004 *Wildlife Technical Report*.

Regional ecological diversity will not likely be substantially affected by the loss of wetlands in this sub-region since these wetlands are very common and widespread throughout the surrounding area. The highway alignment avoids the seasonally flooded emergent/scrub-shrub wetland along this area. Replacement cost is considered high for the forested wetlands.

2.1.3 East Lynn Canal Sub-Region 3 — Sherman Point to Katzehin River

Footprint Acreage

Construction along this segment would affect 1.2 acres of forested wetlands, occurring just north of Sherman Creek, in the southern portion of this sub-region. Estuarine rocky shores and unconsolidated beaches along this sub-region would be affected by direct fill for the highway. The impact of this activity is discussed in the 2004 *Essential Fish Habitat Assessment*. Fill during construction would affect numerous small areas of marine habitat, for a total amount of 24.0 acres.

Impacts to Wetland Functions and Values

The loss of 1.2 acres of forested wetland (1360-1 and 1375-1; Figure 9) near Independence Lake will have minimal effect on groundwater function since the highway would pass through the lower portion of the wetland. Surface hydrologic control would also likely be modified. Erosion sensitivity of this wetland will be low and not substantially affected by the highway.

The two intertidal marine areas in this sub-region are rated high for fish habitat (1380-1 and 1480-1; Table B-1). Approximately 5.05 acres of 1380-1 and 18.94 acres of 1480-1 would be impacted (Figures 9 and 10). Impacts to fish habitat associated with this fill are discussed in the 2004 *EFH Assessment.*

2.1.4 East Lynn Canal Sub-Region 4 — Katzehin River

Footprint Acreage

Within this sub-region, no palustrine wetlands occur to any extent within the corridor surveyed for the proposed highway (Table B-1). Only 0.21 acre of estuarine emergent wetland, near the proposed Katzehin Ferry Terminal, would be impacted (2750-1; Figures 10 and 11). Rocky shore and beach bar fill areas along this portion of the highway are relatively small; the total affected area would comprise approximately 5.2 acres. Additionally, fill for the Katzehin Ferry Terminal would require approximately 2.7 acres of rocky shoreline habitat for breakwaters and terminal facilities. Approximately 4.4 acres of subtidal would likely have to be dredged, but this area is not included in the total (see the 2004 *Essential Fish Habitat Assessment*).

Impacts to Wetland Functions and Values

Wildlife habitat value for the emergent wetlands is rated as high (wetlands 2750-1; Table B-1). The total impact to this wetland due to fill is approximately 0.21 acre (Figures 10 and 11; sized by aerial photography, and ground elevation surveys). Wildlife habitat is also rated as high for one estuarine beach bar area (2735-2; Table B-1). The estuarine beach bar area is approximately 1.87 acres of which 85 percent (1.59 acres) would be impacted (Table 4-4). These wetlands are rated has having a high wildlife habitat value because Lyngbye's sedge, seaside plantain, seaside arrow-grass, or ditch grass occur, which provides food for migrating waterfowl and terrestrial species such as brown and black bear. A further discussion on wildlife habitat impacts is included in the 2004 *Wildlife Technical Report.*

The salt marshes north of the Katzehin River provide a wildlife habitat function. The Alternative 2B alignment has the potential to impact terrestrial wildlife movement between the salt marsh areas and adjacent uplands (2630-1, 2670-1, 2690-1, and 2735-1; Figures 10 and 11). A further discussion of potential wildlife corridor impacts is included in the 2004 *Wildlife Technical Report.*

The Katzehin Ferry Terminal would impact approximately 3.63 acres of marine intertidal areas with high fish habitat values (2745-T and 2765-1; Table B-1; Figure 11). Impacts to fish habitat associated with this fill are discussed in the 2004 *Essential Fish Habitat Assessment*.

2.2 Alternative 3: West Lynn Canal Highway

Alternative 3 would extend the Glacier Highway from Echo Cove to Sawmill Cove along the proposed Cascade Point Road and would impact 1.9 acres of wetlands along the segment where the Juneau Access Improvements Project would widen the Cascade Point Road.

Most of the footprint acreages and all of the discussions of impacts to wetlands functions and values presented in the 2004 *Wetlands Technical Report* for Alternative 3 remain valid. Only the information pertaining to the footprint acreage of the project segment between Echo Cove and the Sawmill Cove Ferry Terminal needs revision. Fill of wetlands and marine areas from Echo Cove to the Sawmill Cove Ferry Terminal would include 1.2 acres of forested wetlands, 0.7 acre of scrub-shrub/forested wetlands, and 1.9 acres of rocky shore intertidal habitat. Additionally, 1.9 acres of subtidal dredging for the ferry terminal would be required.

The new alignment under Alternative 3 would necessitate a total of 38.2 acres of wetland and marine fill. This total would include 26.4 acres of wetlands and 11.6 acres of marine areas. A small amount of vegetated shallows associated with small ponds would also be filled (0.2 acre).

2.3 Alternatives 4B and 4D: Marine Alternatives – Berners Bay

These build alternatives would also extend the Glacier Highway from Echo Cove to Sawmill Cove and widen the Cascade Point Road. This would impact 1.9 acres of wetlands along the segment where the Juneau Access Improvements Project would widen the Cascade Point Road. All of the discussions of impacts to wetlands functions and values presented in the 2004 *Wetlands Technical Report* for Alternatives 4B and 4D remain valid. The only modification being that construction of the current alignment would require the filling of approximately 1.2 acres of forested wetlands, 0.7 acre of scrub-shrub/forested wetlands and 1.9 acres of marine fill at the Sawmill Cove Ferry Terminal site. In addition, there would be 0.7 acre of subtidal fill for terminal modification at Auke Bay to accommodate a stern berth.

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3.0 COMPENSATORY MITIGATION FOR IMPACTS TO WETLANDS AND OTHER WATERS OF THE UNITED STATES

The preferred alternative, Alternative 2B, would impact approximately 70 acres of wetlands and 32 acres of unvegetated intertidal and subtidal areas. No wetland restoration, enhancement, or creation opportunities have been identified in the watersheds that would be impacted, as there are many similar wetlands in the project area and few have been affected to date. For this reason DOT&PF is proposing a combination of on-site out-of-kind mitigation and in-lieu fee compensation.

The preferred alternative would impact approximately 69.1 acres of palustrine forested wetlands and 0.7 acre of a palustrine scrub/shrub wetland. None of these wetlands are fish habitat, and with the exception of the wetlands on either side of Slate Creek and on the east side of the Lace River, the wetlands that would be impacted do not provide riparian support. All of the wetlands that would be filled function as wildlife habitat, and some are rated as moderate to high for this function. All wetlands in the project area rated high as wildlife habitat would be avoided; however, some of the affected wetlands would potentially become isolated by the proposed highway. This is the case for the estuarine emergent wetlands between the Lace and Antler rivers used by bears. Therefore, DOT&PF proposes to construct a 100-foot-wide wildlife underpass at the location of an identified bear travel corridor near the east bank of the Lace River as on-site out-of-kind compensatory mitigation for impacts to forested and scrub/shrub wetlands. The cost of this underpass is estimated at $440,000. (Six other wildlife underpasses would be constructed to mitigate impacts to wildlife in non-wetland areas.)

The preferred alternative would also impact approximately 0.2 acre of estuarine emergent wetland and 32 acres of unvegetated beach and subtidal habitat. DOT&PF proposes to provide in-lieu fee compensation for these impacts to waters of the U.S., which are also Essential Fish Habitat under the Magnuson-Stevens Fisheries Conservation and Management Act. Based on discussions with resource agencies, DOT&PF proposes to make a payment to the Southeast Alaska Land Trust to be used to acquire property or fund habitat projects to be specified in the Department of Army Section 404 permit.

DOT&PF proposes in-lieu fee payment for impacts to waters of the U.S. as follows:

- Estuarine emergent wetland (approximately 0.2 acre) $60,000/acre
- Non-vegetated intertidal and subtidal areas (approx. 32 acres) $24,000/acre

These per-acre values are based on values used in past DOT&PF projects that involved fee in-lieu payments for impacts to wetlands and waters of the U.S. and increased to account for inflation and ensure a two to one mitigation ratio. Based on the current alignment of the preferred alternative, the in-lieu fee payment for fill in waters of the U.S. would total $780,000.

All palustrine emergent wetlands and all but 0.2 acre of estuarine emergent wetlands have been avoided. Potential wetland impacts have been minimized by alignment changes, extension of bridges and slope steepening. Further minimization is not practicable. Bridging via a pile-supported causeway is estimated to cost $4,400 per lineal foot. The average wetland fill width would be 80 feet, or 544.5 lineal feet per acre. The avoidance cost therefore would be $2.4 million per acre. See the Draft Section 404(b)(1) Analysis in Appendix X for more detail.

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TABLES

The section includes updated versions of the following tables that were presented in the 2004 *Wetlands Technical Report.*

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Table 4-1
East Lynn Canal – Preferred Alternative 2B
Total Impacted Areas (Acres) by Wetland Type and Sub-Region, August 2005 Alignment

Sub-Region	Classification	Area of Fill Alternative 2B
East Sub-Region 1	**Wetlands**	
	Palustrine Forested	7.4
	Palustrine Scrub-Shrub	0.7
	Sub Total	8.1
East Sub-Region 2	**Wetlands**	
	Palustrine Forested	60.5
	Sub Total	60.5
East Sub-Region 3	**Wetlands**	
	Palustrine Forested	1.2
	Sub Total	1.2
	Marine Areas	
	Rocky Shores	24.0
	Sub Total	24.0
East Sub-Region 4	**Wetlands**	
	Estuarine Emergent	0.2
	Sub Total	0.2
	Marine Areas	
	Beach Bar	1.6
	Rocky Shores	6.4
	Sub Total	8
All East Lynn Canal Sub-Regions	**Wetlands**	
	Palustrine Forested	69.1
	Palustrine Scrub-Shrub	0.7
	Estuarine Emergent	0.2
	Sub Total	70.0
	Marine Areas	
	Beach Bars	1.6
	Rocky Shores	30.4
	Sub Total	32.0
	Sub-Regions Totals	
	Total Wetlands	70.0
	Total Marine Areas	32.0
	Total Acres	102

Note: Acreages do not include riverine areas intersected by the proposed alignments.

Table 4-2
West Lynn Canal – Alternative 3
Total Impacted Areas (Acres) by Wetland Type and Sub-Region

Sub-Region	Classification	Area of Fill (Acres)
West Sub-Region 1	**Wetlands**	
	Palustrine Emergent	1.9
	Palustrine Forested	18.7
	Estuarine Emergent	0.4
	Sub Total	21.0
	Marine Areas	
	Beach Bars	0.09
	Rocky Shores	4.8
	Sub Total	4.9
West Sub-Region 2	**Wetlands**	
	Palustrine Emergent	0.4
	Palustrine Forested	1.1
	Sub Total	1.5
	Fresh Water Aquatic Areas	
	Palustrine Aquatic Beds	0.2
	Sub Total	0.2
West Sub-Region 3	**Wetlands**	
	Palustrine Forested	0.9
	Estuarine Emergent	1.1
	Sub Total	2.0
	Marine Areas	
	Beach Bars	4.8
	Sub Total	4.8
East Sub-Region 1	**Wetlands**	
	Palustrine Forested	1.2
	Palustrine Scrub-Shrub	0.7
	Sub Total	1.9
	Marine Areas	
	Rocky Shores	1.9
	Sub Total	1.9
All West Lynn Canal Sub-Regions (plus East Sub-Region 1)	**Wetlands**	
	Palustrine Emergent	2.3
	Palustrine Forested	21.9
	Palustrine Scrub-Shrub	0.7
	Estuarine Emergent	1.5
	Sub Total	26.4
	Fresh Water Aquatic Areas	
	Palustrine Aquatic Beds	0.2
	Sub Total	0.2
	Marine Areas	
	Beach Bars	4.9
	Rocky Shores	6.7
	Sub Total	11.6
All Sub-Regions (plus East Sub-Region 1)	**Sub-Regions Total**	
	Total Wetlands	26.4
	Total Fresh Water Aquatic Areas	0.2
	Total Marine Areas	11.6
	Total Acres	38.2

Note: Acreages do not include riverine areas intersected by the proposed alignments.

Table 4-3
Total Area Wetlands (Acres) and other Waters of the United States Affected by Project Alternatives, August 2005 Alignment

Wetlands and Other Waters of the U.S	Alternative 2B (Preferred)	Alternative 3	Alternatives 4B and 4D
	East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway	West Lynn Canal Highway and Glacier Highway to Sawmill Cove	Glacier Highway to Sawmill Cove
Wetlands			
Palustrine Emergent	0.0	2.3	0.0
Palustrine Forested	69.1	21.9	1.2
Palustrine Scrub-Shrub	0.7	0.7	0.7
Estuarine Emergent	0.2	1.5	0.0
Sub Total	70.0	26.4	1.9
Fresh Water Aquatic Areas			
Aquatic Beds	0.0	0.2	0.0
Sub Total	0.0	0.2	0.0
Marine Areas			
Beach Bar	1.6	4.9	0.0
Rocky Shore Beaches	30.4	6.7	1.9
Sub Total	32	11.6	1.9
Total Acres	102	38.2	3.8

Note: Acreages do not include riverine areas intersected by the proposed alignments.

Table 4-4
Impacts to Functions and Values for Individual Wetlands and Estuarine Sites, East Lynn Canal Alignment, July 2005 Alternative 2B (Preferred) Alignment

Habitat Type	Cowardin Class	Wetland Type	Wetland ID	Total Area	Impacted Area	Impacts to Functions and Values Description (Fill for highway construction unless otherwise noted)
				Acres		
Sub-Region 1 – Echo Cove to Slate Cove						
Wetlands	PFO4B	Forested	115-1	2.70	0.02	This small wetland appears to be fed by groundwater Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.
	PFO4B	Forested	135-1	2.44	0.10	This small wetland appears to be fed by groundwater. Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.
	PFO4B	Forested	150-1	22.58	0.45	This forested wetland appears to be fed by a groundwater source. Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.
	PFO4B	Forested	165-1	44.46	0.38	This wetland appears to be fed by groundwater from hillside. Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.
	PFO4B	Forested	190-1	2.24	0.05	This small wetland appears to be fed by groundwater seep. Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.
	PFO4B	Forested	195-1	1.88	0.03	Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.
	PFO4B	Forested	235-1	3.20	0.21	This small wetland appears to be fed by groundwater seep. Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.
	PFO4B	Forested	415-1	67.91	2.51	Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.
	PFO1A/PSS1A	Forested/Emergent	735-4	57.01	2.19	Modification of groundwater recharge, groundwater discharge/lateral flow functions and riparian support.
	PFO1A	Forested	680-2	80.99	1.48	Modification of groundwater recharge/discharge functions and riparian support.
	PSS1B/PFO4B	Scrub-Shrub/Forested	340-1	4.51	0.72	Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.

Table 4-4 (continued)
Impacts to Functions and Values for Individual Wetlands and Estuarine Sites, East Lynn Canal Alignment, August 2005 Alternative 2B (Preferred) Alignment

Habitat Type	Cowardin Class	Wetland Type	Wetland ID	Total Area (Acres)	Impacted Area (Acres)	Impacts to Functions and Values Description (Fill for highway construction unless otherwise noted)
Sub-Region 2 – Slate Cove to Sherman Point						
Wetlands (continued)	PFO4B	Forested	895-1	88.06	4.77	Modification of groundwater recharge/discharge functions, riparian support, and wildlife habitat.
	PFO4B	Forested	910-2	6.44	0.57	Modification of groundwater recharge/discharge functions, riparian support, and wildlife habitat.
	PFO4B	Forested	955-2	1103.85	37.77	Modification of surface hydrologic control and groundwater recharge functions. Some loss of wildlife habitat functions.
	PFO4B/PSS1B	Forested/Scrub-Shrub	1185-1	205.49	12.24	Modification of groundwater recharge/discharge functions, nutrient transport, riparian support, and wildlife habitat.
	PFO4B/PSS1B	Forested/Scrub-shrub	1220-1	27.40	1.83	Modification of groundwater recharge/discharge functions and wildlife habitat.
	PFO4B	Forested	1260-1	30.07	1.78	Modification of groundwater discharge/recharge functions.
	PFO4B	Forested	1275-1	23.41	1.49	Modification of groundwater discharge/recharge functions.
Sub-Region 3 – Sherman Point to Katzehin River						
Wetlands	PFO4B	Forested	1360-1	33.74	1.08	Modification of groundwater discharge/recharge functions.
	PFO4B	Forested	1375-1	58.76	0.12	Functions not substantially impacted due to small fill area.
Marine Areas	E2RS2N/E2US1N	Rocky Shore/ Unconsolidated Shore	1380-1	NA	5.05	Modification of fish habitat.
	E2RS2N	Rocky Shore	1480-1	NA	18.94	Modification of fish habitat.
Sub-Region 4 – Katzehin River to Skagway						
Wetlands	E2EM1N	Estuarine Emergent	2750-1	NA	0.21	Modification of groundwater recharge/discharge functions, riparian support, and fish and wildlife habitat.
Marine Areas	E2BB1P	Beach Bar	2735-2	1.87	1.59	Modification of wildlife habitat.
	E2RS2N	Rocky Shore	2765-1	NA	6.37	Modification of fish/wildlife habitat.

Notes: The total acreage of a given marine intertidal area is a function of the beach slope and beach length. Because of the continuous nature of these marine types (i.e., rocky shores, beach bars, and unconsolidated shores), and the variability of seaward slope distances, delineation of these marine intertidal boundaries was only conducted in the vicinity of potential impacts.

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Attachment B-1
Wetland Functions and Values

Sub-Regions	Wetland ID	Field Date	Cowardin Class	Estimated Total Wetland Acreage	Impact Area	Groundwater Recharge	Groundwater Discharge/Flow and Lateral Flow	Surface Hydrologic Control	Sediment/ Toxicant Retention	Nutrient Transformation/ Export	Riparian Support	Fish Habitat	Wildlife	Regional Ecological Diversity	Ecological Replacement	Erosion Sensitivity	Notes	Downstream/ Coastal Beneficiary Sites
	WETLANDS																	
Sub-Region 1	115-1	aerial	PFO4B	2.70	0.02	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low		Low
	125-1	aerial	PFO4B	1.70	0.00	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low		Low
	135-1	aerial	PFO4B	2.44	0.10	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low		Low
	150-1	aerial	PFO4B	22.58	0.45	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low		Low
	165-1	aerial	PFO4B	44.46	0.38	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-High	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low		Low
	190-1	aerial	PFO4B	2.24	0.05	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-High	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low		Low
	195-1	aerial	PFO4B	1.88	0.03	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low		Low
	200-1	aerial	PFO4B	1.28	0.00	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low		Low
	235-1	aerial	PFO4B	3.20	0.21	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low		Low
	265-1	aerial	PFO4B	6.11	0.00	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low		Low
	340-1	7/22/2003	PSS1B/PFO4B	4.51	0.72	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Moderate-High	Moderate-High	Low		Low
	330-1	7/22/2003	PFO4B/PSS1B	1.74	0.00	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Moderate-High	Moderate-High	Moderate-Low		Low
	415-1	7/31/2003	PFO4B	67.91	2.51	High to Moderate	High to Moderate	High	Low	Moderate	Moderate-Low	Very Low	Low	Moderate-High	High	Moderate-Low		Low
	800-1	7/28/2003	PFO4B	26.48	0.00	High to Moderate	Low	Moderate-High	High	Low	Low	Very Low	Low	Moderate-High	High	Moderate-Low		Low
	800-3	7/28/2003	PFO4B	12.13	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low		Low
	830-1	7/28/2003	PFO4B	17.03	0.00	High to Moderate	Low	Moderate-High	High	Low	Low	Very Low	Low	Moderate-High	High	Moderate-Low		Low
	735-4	7/28/2003	PFO1A/PSS1A	57.01	2.19	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-High	Very Low	Moderate-Low	Moderate-High	High	Low		Low
	680-2	7/28/2003	PFO1A	80.99	1.48	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-High	Very Low	Moderate-Low	Moderate-High	High	Low		Low
	735-2	7/28/2003	PEM1S	31.19	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-High	Very Low	High	High	Low	Low		Low
	420-1	7/31/2003	PEM1B/PSS4B	13.38	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Moderate-Low	Moderate	Low		Low
	440-1	7/31/2003	PEM1B/PSS4B	6.63	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Moderate-Low	Moderate	Low		Low
	320-1	7/22/2003	PEM1B/PSS1B	2.16	0.00	High to Moderate	High to Moderate	Low	Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	Moderate	Moderate-High		Low
	330-2	7/22/2003	PEM1B/PFO4B	3.47	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Moderate-High	Moderate-High	Low		Low
	270-1	aerial	PEM1B	0.62	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Low	Moderate	Low		Low
	275-1	aerial	PEM1B	1.39	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Low	Moderate	Low		Low
	800-2	7/28/2003	PEM1B	7.40	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Moderate	Low		Low
	800-4	7/28/2003	PEM1B	1.13	0.00	High to Moderate	Low	High	High	Low	Low	Very Low	Low	Low	Moderate	Low		Low
	830-2	7/28/2003	PEM1B	2.54	0.00	High to Moderate	Low	High	High	Low	Low	Very Low	Low	Low	Moderate	Low		Low
	680-3	aerial	PSS1S/PFL1S	23.64	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-High	Very Low	Moderate-Low	Moderate-High	Low	Moderate-High		Low
	690-2	aerial	PSS1R	2.61	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-High	Very Low	Moderate-Low	Moderate-High	Low	Moderate-High		Low
	735-1	7/28/2003	E2EM1P	52.31	0.00	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	High	Moderate-Low	High	High	High	Low		Low
	MARINE AREAS																	
	370-T	7/31/2003	E2RS2N	2.78	See Notes	Low	Low	Low	Low	NA	NA	High	High	High	Low	Low	Sawmill Cove Ferry Terminal	Low

Attachment B-1 (continued)
Wetland Functions and Values

Sub-Regions	Wetland ID	Field Date	Cowardin Class	Estimated Total Wetland Acreage	Impact Area	Groundwater Recharge	Groundwater Discharge/Flow and Lateral Flow	Surface Hydrologic Control	Sediment/ Toxicant Retention	Nutrient Transformation/ Export	Riparian Support	Fish Habitat	Wildlife	Regional Ecological Diversity	Ecological Replacement	Erosion Sensitivity	Notes	Downstream/ Coastal Beneficiary Sites
	WETLANDS																	
Sub-Region 2	990-1	aerial	PSS4B/PEM1B	39.04	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	High	Moderate-High	Moderate	Low		Low
	1015-1	aerial	PFO4B/PEM1B	2.80	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Low	Moderate-High	Moderate-Low		Low
	1020-1	aerial	PFO4B/PEM1B	6.04	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Low	Moderate-High	Moderate-Low		Low
	895-1	7/31/2003	PFO4B	88.06	4.77	High to Moderate	High to Moderate	Low	Low	Moderate	Moderate-High	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low		Low
	910-2	7/30/2003	PFO4B	6.44	0.57	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	High	Very Low	Moderate-High	Moderate-High	High	Moderate-Low		Low
	955-2	7/30/2003	PFO4B	1103.85	37.77	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	High	High	Very Low	Moderate-High	Moderate-High	High	Moderate-Low		Low
	920-1	aerial	PEM1B/PSS4B	0.58	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Moderate	Low		Low
	950-1	7/30/2003	PEM1B/PSS4B	161.23	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	High	Moderate-High	Moderate	Low		Low
	955-1	7/30/2003	PEM1B/PSS4B	42.84	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	High	Moderate-High	Moderate	Low		Low
	975-1	aerial	PEM1B/PSS4B	1.83	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Moderate	Low		Low
	1010-1	aerial	PEM1B/PSS4B	1.13	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Moderate	Low		Low
	1040-1	aerial	PEM1B/PSS4B	16.55	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Moderate	Moderate-High		Low
	1185-1	7/30/2003	PFO4B/PSS1B	205.49	12.24	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	High	High	Very Low	Moderate-High	Moderate-High	High	Moderate-Low		Low
	1220-1	aerial	PFO4B/PSS1B	27.40	1.83	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Moderate-Low	Moderate-High	Low		Low
	1070-1	aerial	PFO4B/PEM1B	8.45	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Moderate-Low	Moderate-High	Low		Low
	1260-1	7/26/2003	PFO4B	30.07	1.78	High to Moderate	High to Moderate	Low	Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-Low	High	Moderate-Low		Low
	1275-1	aerial	PFO4B	23.41	1.49	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-Low	High	Low		Low
	1110-1	aerial	PEM1B/PSS4B	2.30	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Moderate	Low		Low
	1135-1	aerial	PEM1B/PSS4B	1.02	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Low	Moderate	Low		Low
	1150-1	aerial	PEM1B/PSS4B	4.63	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Moderate	Low		Low
	1260-2	aerial	PEM1B/PSS4B	1.35	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Low	Moderate	Moderate-High		Low
	1125-1	aerial	PEM1B	0.43	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Low	Moderate	Low		Low
	1185-2	aerial	PEM1B	1.49	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Low	Moderate	Low		Low
	900-1	7/30/2003	E2EM1P	18.05	0.00	High to Moderate	High to Moderate	Low	Moderate-High	High	High	Moderate-Low	High	High	High	Moderate-Low		Low
	MARINE AREAS																	
	900-T	7/30/2003	E2BB1N	3.19	0.00	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	Moderate-High	High	High	High	Low	Low	Slate Creek Ferry Terminal	Low

Attachment B-1 (continued)
Wetland Functions and Values

Sub-Regions	Wetland ID	Field Date	Cowardin Class	Estimated Total Wetland Acreage	Impact Area	Groundwater Recharge	Groundwater Discharge/Flow and Lateral Flow	Surface Hydrologic Control	Sediment/ Toxicant Retention	Nutrient Transformation/ Export	Riparian Support	Fish Habitat	Wildlife	Regional Ecological Diversity	Ecological Replaceme nt	Erosion Sensitivity	Notes	Downstream/ Coastal Beneficiary Sites
Sub-Region 3	**WETLANDS**																	
	1360-1	aerial	PFO4B	33.74	1.08	High to Moderate	High to Moderate	Low	Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-Low	High	High		Low
	1375-1	aerial	PFO4B	58.76	0.12	High to Moderate	High to Moderate	Low	Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-Low	High	High		Low
	2590-1	aerial	E2EM1N	16.25	0.00	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	High	High	High	High	High	Low		Low
	MARINE AREAS																	
	1300-1	aerial	E2RS2N/E2US	NA	0.00	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low		Low
	1380-1	aerial	E2RS2N/E2US	NA	5.05	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low		Low
	1480-1	aerial	E2RS2N	NA	18.94	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low		Low
Sub-Region 4	**WETLANDS**																	
	3565-1	aerial	PSS4B	0.15	0.00	High to Moderate	Low	High	High	Low	Low	Very Low	Low	Low	Moderate	Low		Low
	3560-1	aerial	PEM1B	0.17	0.00	High to Moderate	Low	High	High	Low	Low	Very Low	Low	Low	Moderate	Low		Low
	2670-1	aerial	E2EM1P	46.11	0.00	High to Moderate	High to Moderate	Low	Moderate-High	High	High	Moderate-Low	High	High	High	Low		Low
	2690-1	aerial	E2EM1P	14.37	0.00	High to Moderate	High to Moderate	Low	Moderate-High	High	High	Moderate-Low	High	High	High	Low		Low
	2630-1	7/27/2003	E2EM1N	39.04	0.00	High to Moderate	High to Moderate	Low	Moderate-High	High	High	High	High	High	High	Low		Low
	2735-1	7/27/2003	E2EM1N	135.04	0.00	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	High	High	High	High	High	Low		Low
	2750-1	aerial	E2EM1N	0.21	0.21	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	High	High	High	High	High	Low		Low
	MARINE AREAS																	
	2745-T	aerial	E2RS2N	NA	0.0	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low		Low
	2765-1	aerial	E2RS2N	NA	6.37	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low		Low
	2800-1	aerial	E2RS2N	NA	0.00	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low		Low
	2985-1	aerial	E2RS2N	NA	0.00	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low		Low
	3000-1	aerial	E2RS2N	NA	0.00	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low		Low
	3300-1	aerial	E2RS2N	NA	0.00	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low		Low
	3580-1	aerial	E2RS2N	NA	0.00	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low		High
	2735-2	7/27/2003	E2BB1P	1.87	1.59	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	Moderate-High	Moderate-Low	High	High	Low	Low		Low
	AQUATIC BEDS (VEGETATED SHALLOWS)/ OPEN WATER																	
	3615-1	7/27/2003	POWH	2.22	0.00	High to Moderate	High to Moderate	Low	Moderate-High	High	Moderate-High	Moderate-Low	High	Moderate-Low	Low	Low		High
	3615-2	7/27/2003	POWH	0.42	0.00	Low	High to Moderate	Low	Moderate-High	High	Moderate-High	Moderate-High	Low	Low	Low	Low		Low
	3615-3	aerial	POWH	0.03	0.00	Low	High to Moderate	Low	Moderate-High	High	Moderate-High	Moderate-High	Low	Low	Low	Low		Low

Notes: E2RS2N, E2US1N, and E2BB1N/P provide minimal hydrologic functions.
Sawmill Cove Ferry Terminal (370-T; E2RS2N): Impacted acreage by Alternatives 3, 4B and 4D = 1.9 acres
July 2003 Station Number+T = ferry terminal location.
See Section 3.0 of *Appendix O Technical Report* for a description of Cowardin Classification and the NWI coding system.
Katzehin Ferry Terminal required subtidal fill of 2.74 acres for breakwater
NA - The total acreage of a given marine intertidal area is a function of the beach slope and beach length. Because of the continuous nature of these marine types (i.e., rocky shores, beach bars, and unconsolidated shores), and the variability of seaward slope distances, delineation of these marine intertidal boundaries was only conducted in the vicinity of potential impacts

Very High, High, or High to Moderate
Moderate-High
Moderate
Moderate-Low
Low or Very Low

FIGURES

This section provides the following updated versions of 11 figures that were originally presented in the 2004 *Wetlands Technical Report*. Figures 1 through 11, respectively, are updated versions of Figures 3 through 9 and Figures 17 and 18 in the 2004 technical report.

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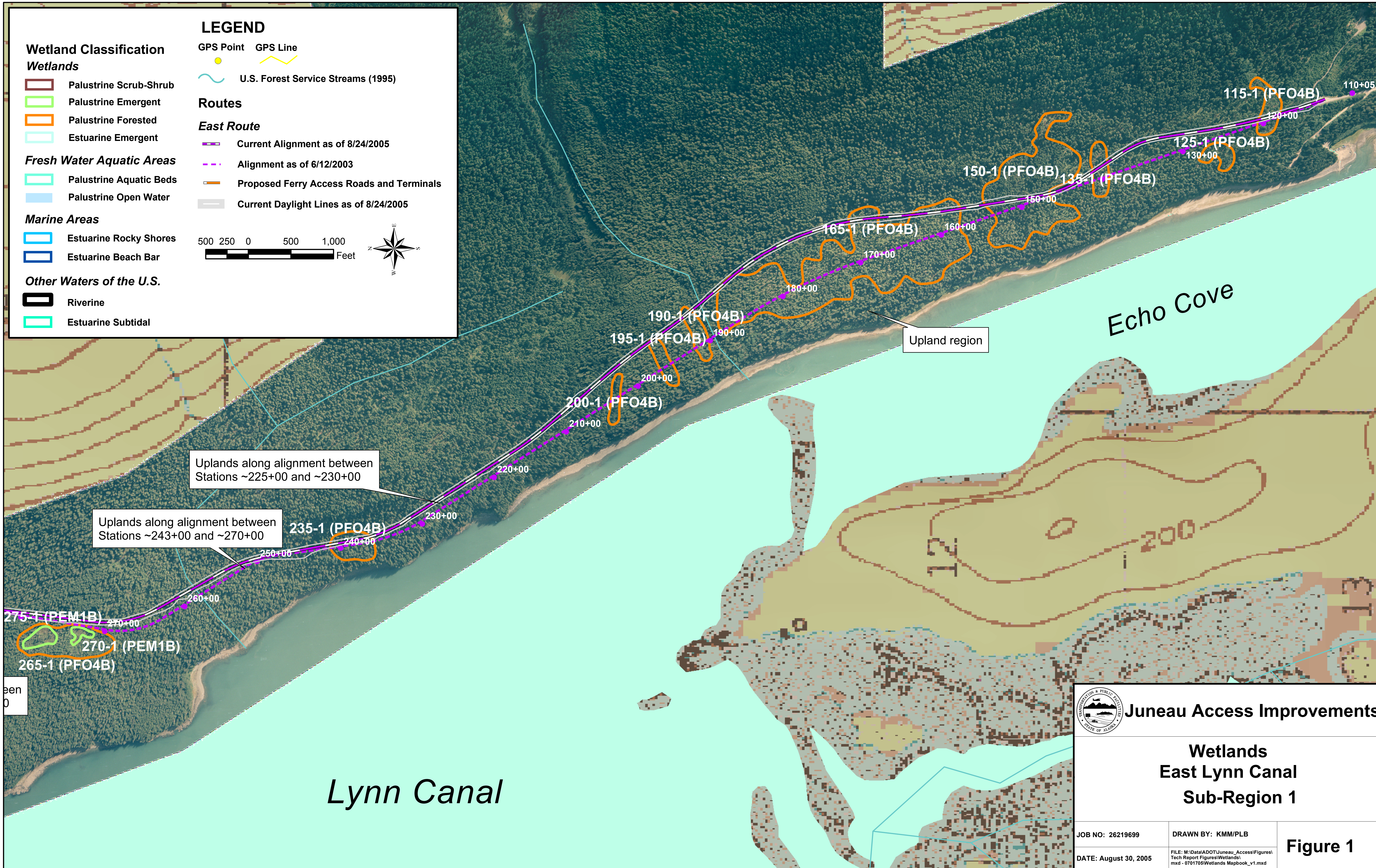

LEGEND
Wetland Classification
Wetlands
Palustrine Scrub-Shrub
Palustrine Emergent
Palustrine Forested
Estuarine Emergent
Fresh Water Aquatic Areas
Palustrine Aquatic Beds
Palustrine Open Water
Marine Areas
Estuarine Rocky Shores
Estuarine Beach Bar
Other Waters of the U.S.
Riverine
Estuarine Subtidal
GPS Point
GPS Line
U.S. Forest Service Streams (1995)
Routes
East Route
Current Alignment as of 8/24/2005
Alignment as of 6/12/2003
Proposed Ferry Access Roads and Terminals
Current Daylight Lines as of 8/24/2005
500 250 0 500 1,000
Feet
115-1 (PFO4B)
110+05.94
120+00
125-1 (PFO4B)
130+00
150-1 (PFO4B)
135-1 (PFO4B)
150+00
165-1 (PFO4B)
160+00
170+00
180+00
190-1 (PFO4B)
190+00
195-1 (PFO4B)
200+00
200-1 (PFO4B)
210+00
220+00
230+00
240+00
235-1 (PFO4B)
250+00
260+00
270+00
275-1 (PEM1B)
270-1 (PEM1B)
265-1 (PFO4B)
Upland region
Uplands along alignment between Stations ~225+00 and ~230+00
Uplands along alignment between Stations ~243+00 and ~270+00
Echo Cove
Lynn Canal
200
12
13
Juneau Access Improvements
Wetlands
East Lynn Canal
Sub-Region 1
JOB NO: 26219699
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DATE: August 30, 2005
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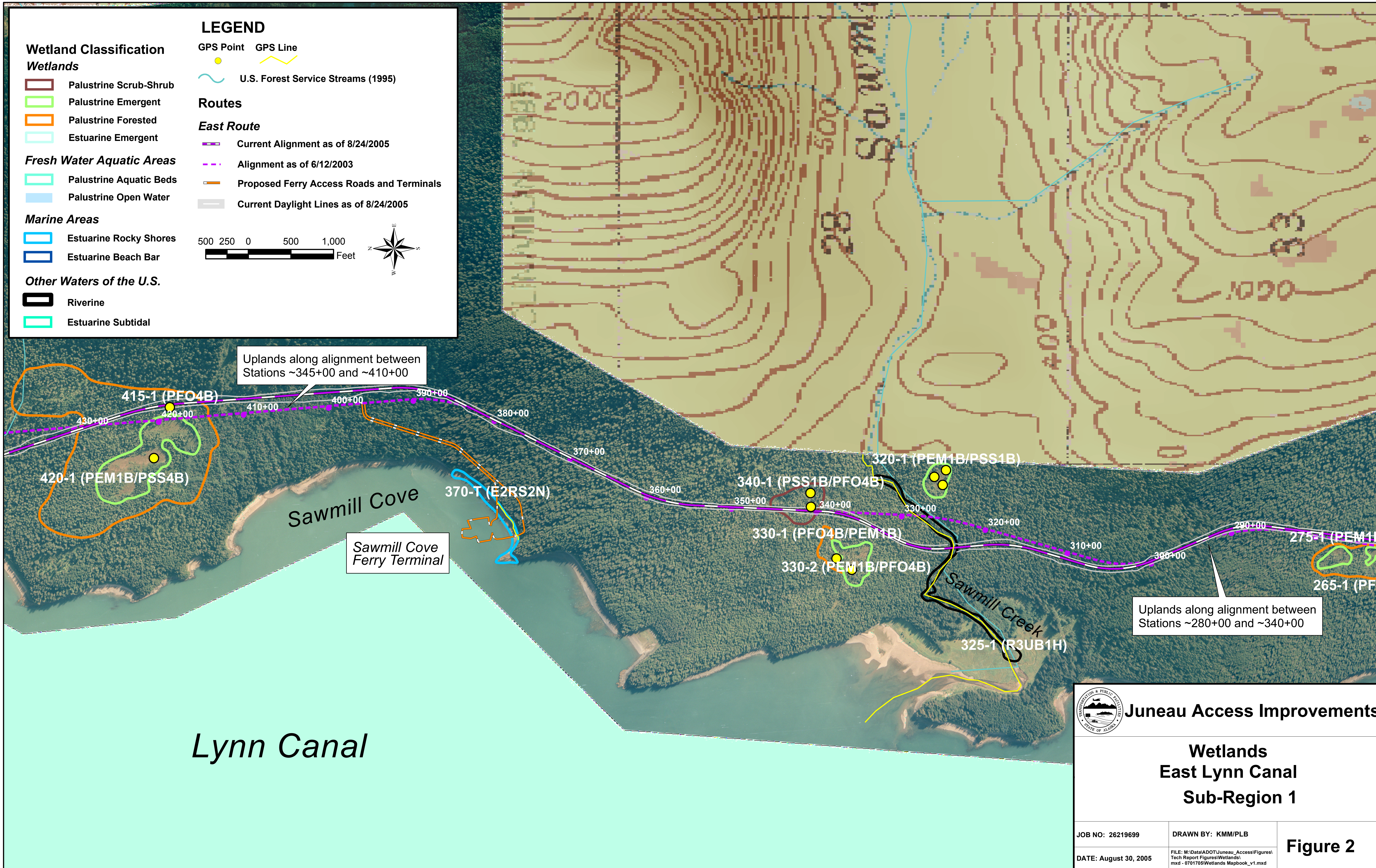
Figure 1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Wetland Classification
Wetlands
Palustrine Scrub-Shrub
Palustrine Emergent
Palustrine Forested
Estuarine Emergent
Fresh Water Aquatic Areas
Palustrine Aquatic Beds
Palustrine Open Water
Marine Areas
Estuarine Rocky Shores
Estuarine Beach Bar
Other Waters of the U.S.
Riverine
Estuarine Subtidal
GPS Point
GPS Line
U.S. Forest Service Streams (1995)
Routes
East Route
Current Alignment as of 8/24/2005
Alignment as of 6/12/2003
Proposed Ferry Access Roads and Terminals
Current Daylight Lines as of 8/24/2005
500 250 0 500 1,000
Feet
Uplands along alignment between Stations ~345+00 and ~410+00
415-1 (PFO4B)
420-1 (PEM1B/PSS4B)
430+00
420+00
410+00
400+00
390+00
380+00
370+00
360+00
350+00
340+00
330+00
320+00
310+00
300+00
290+00
370-T (E2RS2N)
Sawmill Cove
Sawmill Cove Ferry Terminal
320-1 (PEM1B/PSS1B)
340-1 (PSS1B/PFO4B)
330-1 (PFO4B/PEM1B)
330-2 (PEM1B/PFO4B)
Sawmill Creek
325-1 (R3UB1H)
275-1 (PEM1B)
265-1 (PFO
Uplands along alignment between Stations ~280+00 and ~340+00
Lynn Canal
Juneau Access Improvements
Wetlands
East Lynn Canal
Sub-Region 1
JOB NO: 26219699
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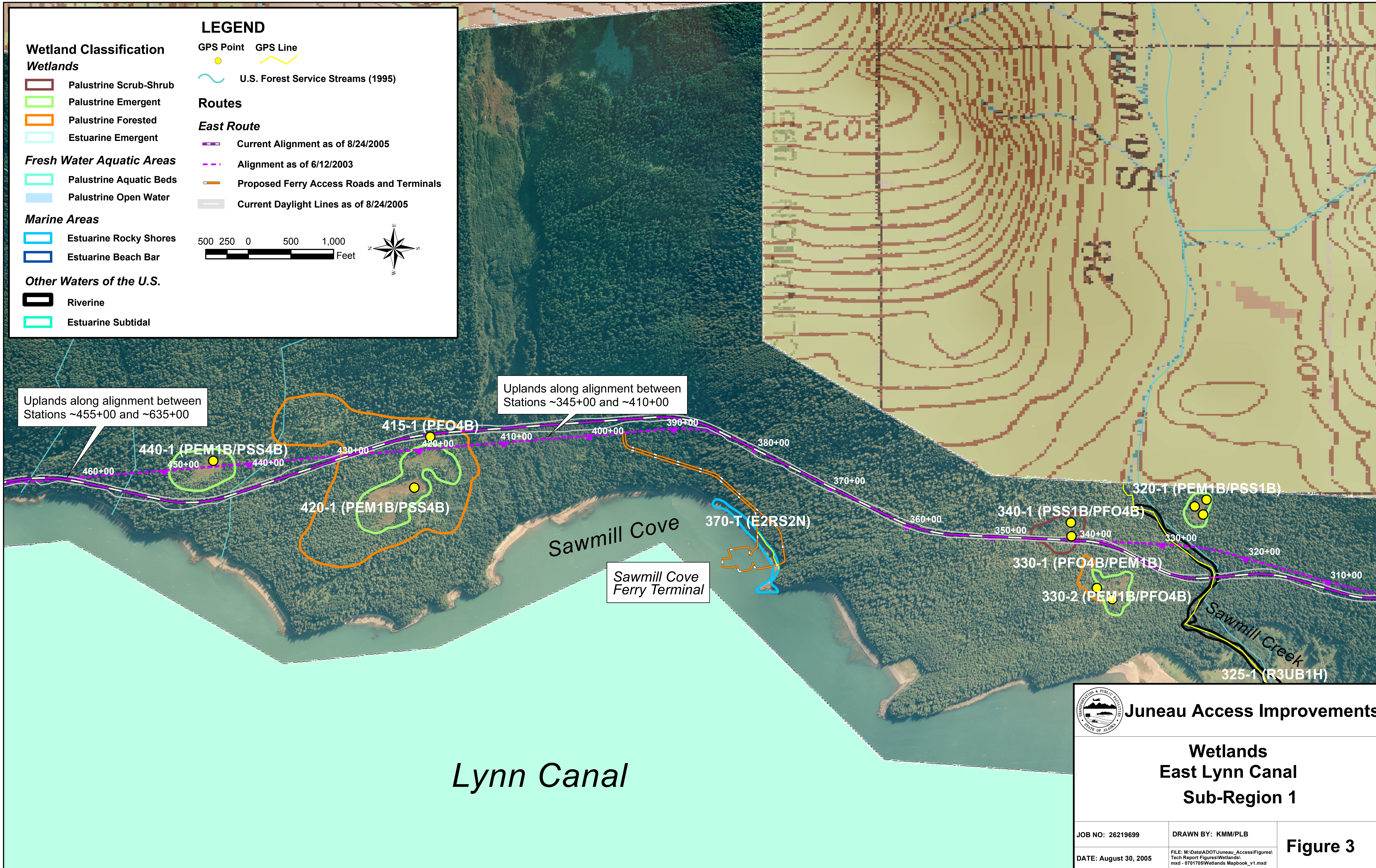
Figure 2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Wetland Classification
Wetlands
Palustrine Scrub-Shrub
Palustrine Emergent
Palustrine Forested
Estuarine Emergent
Fresh Water Aquatic Areas
Palustrine Aquatic Beds
Palustrine Open Water
Marine Areas
Estuarine Rocky Shores
Estuarine Beach Bar
Other Waters of the U.S.
Riverine
Estuarine Subtidal
GPS Point
GPS Line
U.S. Forest Service Streams (1995)
Routes
East Route
Current Alignment as of 8/24/2005
Alignment as of 6/12/2003
Proposed Ferry Access Roads and Terminals
Current Daylight Lines as of 8/24/2005
500 250 0 500 1,000
Feet
Uplands along alignment between Stations ~455+00 and ~635+00
Uplands along alignment between Stations ~345+00 and ~410+00
415-1 (PFO4B)
440-1 (PEM1B/PSS4B)
420-1 (PEM1B/PSS4B)
370-T (E2RS2N)
320-1 (PEM1B/PSS1B)
340-1 (PSS1B/PFO4B)
330-1 (PFO4B/PEM1B)
330-2 (PEM1B/PFO4B)
325-1 (R3UB1H)
460+00
450+00
440+00
430+00
420+00
410+00
400+00
390+00
380+00
370+00
360+00
350+00
340+00
330+00
320+00
310+00
Sawmill Cove
Sawmill Cove Ferry Terminal
Sawmill Creek
Lynn Canal
Juneau Access Improvements
Wetlands
East Lynn Canal
Sub-Region 1
JOB NO: 26219699
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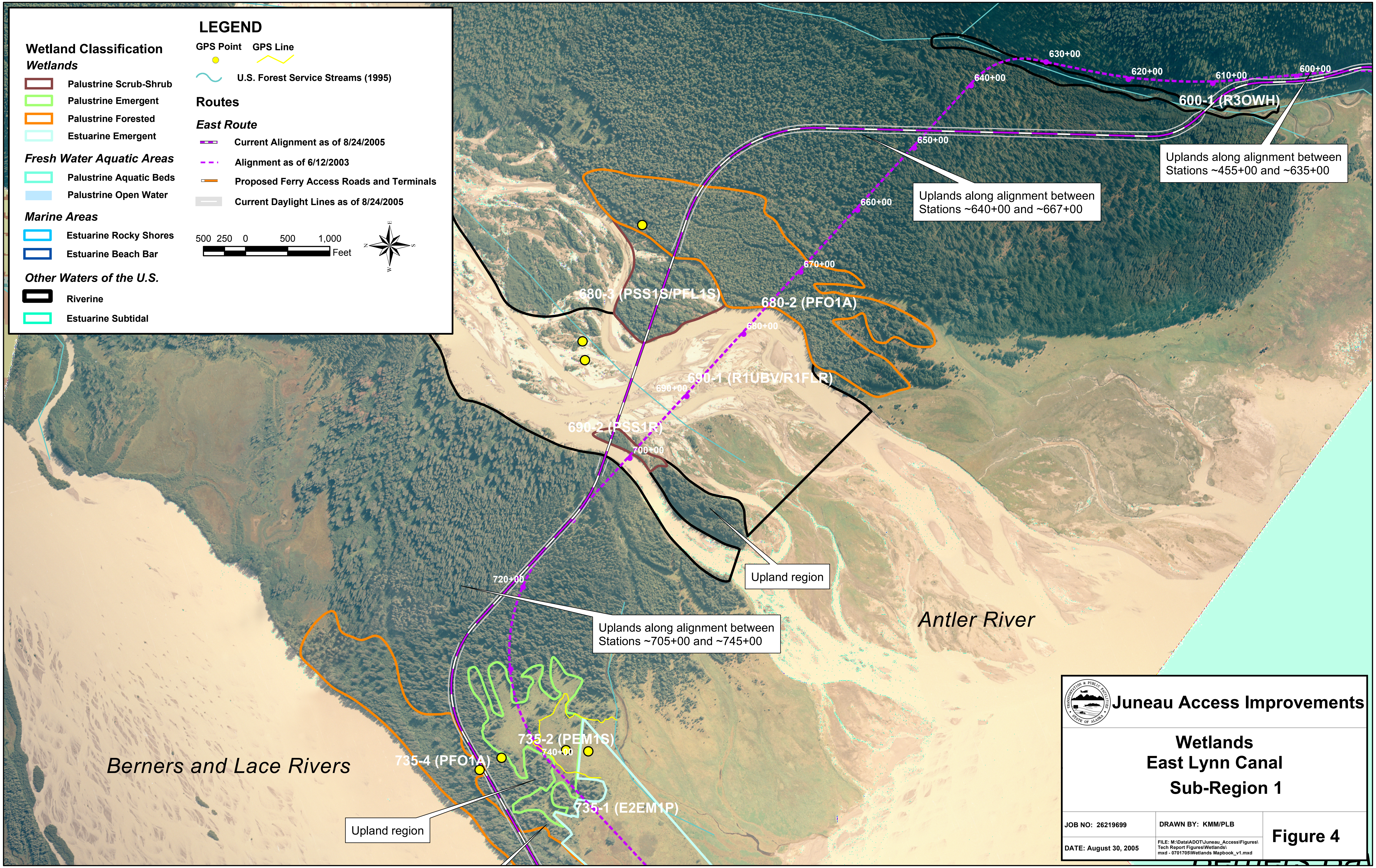
DATE: August 30, 2005
Figure 3



LEGEND
Wetland Classification
Wetlands
Palustrine Scrub-Shrub
Palustrine Emergent
Palustrine Forested
Estuarine Emergent
Fresh Water Aquatic Areas
Palustrine Aquatic Beds
Palustrine Open Water
Marine Areas
Estuarine Rocky Shores
Estuarine Beach Bar
Other Waters of the U.S.
Riverine
Estuarine Subtidal
GPS Point
GPS Line
U.S. Forest Service Streams (1995)
Routes
East Route
Current Alignment as of 8/24/2005
Alignment as of 6/12/2003
Proposed Ferry Access Roads and Terminals
Current Daylight Lines as of 8/24/2005
500 250 0 500 1,000
Feet
600+00
610+00
620+00
630+00
640+00
650+00
660+00
670+00
680+00
690+00
700+00
720+00
740+00
600-1 (R3OWH)
680-3 (PSS1S/PFL1S)
680-2 (PFO1A)
690-1 (R1UBV/R1FLR)
690-2 (PSS1R)
735-2 (PEM1S)
735-4 (PFO1A)
735-1 (E2EM1P)
Uplands along alignment between Stations ~455+00 and ~635+00
Uplands along alignment between Stations ~640+00 and ~667+00
Uplands along alignment between Stations ~705+00 and ~745+00
Upland region
Upland region
Antler River
Berners and Lace Rivers
Juneau Access Improvements
Wetlands
East Lynn Canal
Sub-Region 1
JOB NO: 26219699
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DATE: August 30, 2005
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Figure 4

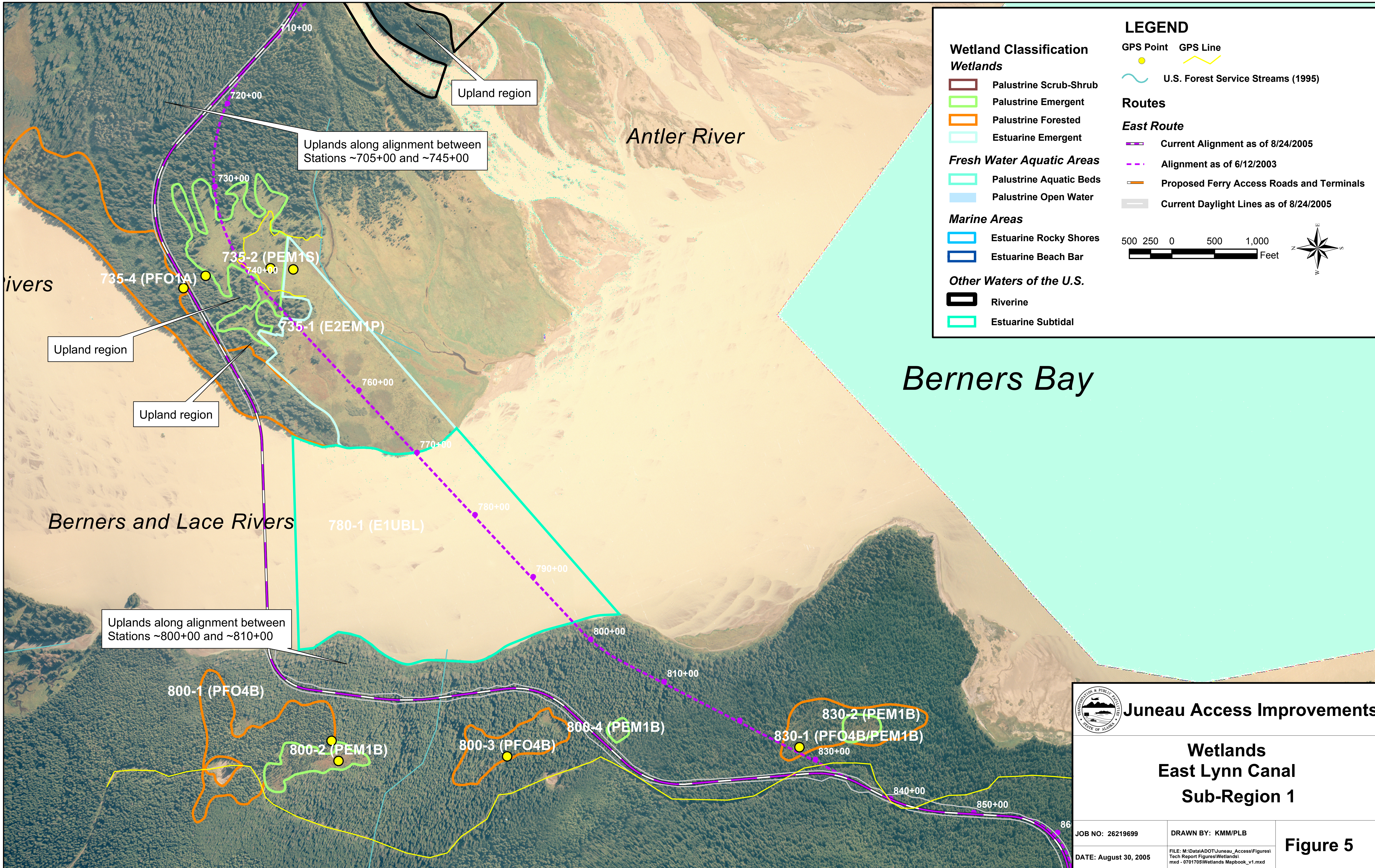
LEGEND
Wetland Classification
Wetlands
Palustrine Scrub-Shrub
Palustrine Emergent
Palustrine Forested
Estuarine Emergent
Fresh Water Aquatic Areas
Palustrine Aquatic Beds
Palustrine Open Water
Marine Areas
Estuarine Rocky Shores
Estuarine Beach Bar
Other Waters of the U.S.
Riverine
Estuarine Subtidal
GPS Point
GPS Line
U.S. Forest Service Streams (1995)
Routes
East Route
Current Alignment as of 8/24/2005
Alignment as of 6/12/2003
Proposed Ferry Access Roads and Terminals
Current Daylight Lines as of 8/24/2005
500 250 0 500 1,000
Feet
Antler River
Berners Bay
Berners and Lace Rivers
Upland region
Uplands along alignment between Stations ~705+00 and ~745+00
Uplands along alignment between Stations ~800+00 and ~810+00
735-1 (E2EM1P)
735-2 (PEM1S)
735-4 (PFO1A)
780-1 (E1UBL)
800-1 (PFO4B)
800-2 (PEM1B)
800-3 (PFO4B)
800-4 (PEM1B)
830-1 (PFO4B/PEM1B)
830-2 (PEM1B)
710+00
720+00
730+00
740+00
760+00
770+00
780+00
790+00
800+00
810+00
830+00
840+00
850+00
Juneau Access Improvements
Wetlands
East Lynn Canal
Sub-Region 1
JOB NO: 26219699
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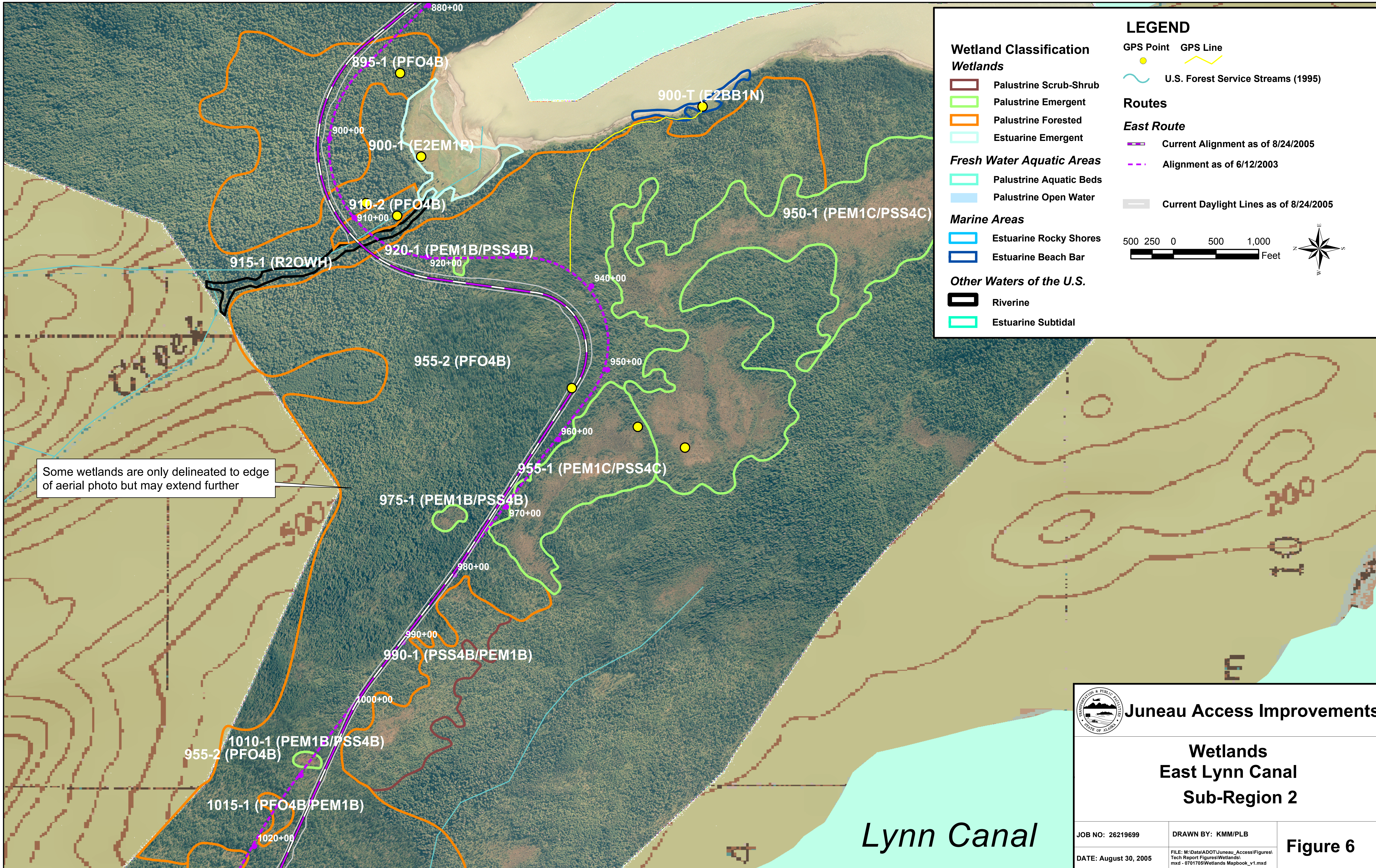
Figure 5



Juneau Access Improvements

Wetlands
East Lynn Canal
Sub-Region 2

JOB NO: 26219699	DRAWN BY: KMM/PLB	Figure 6
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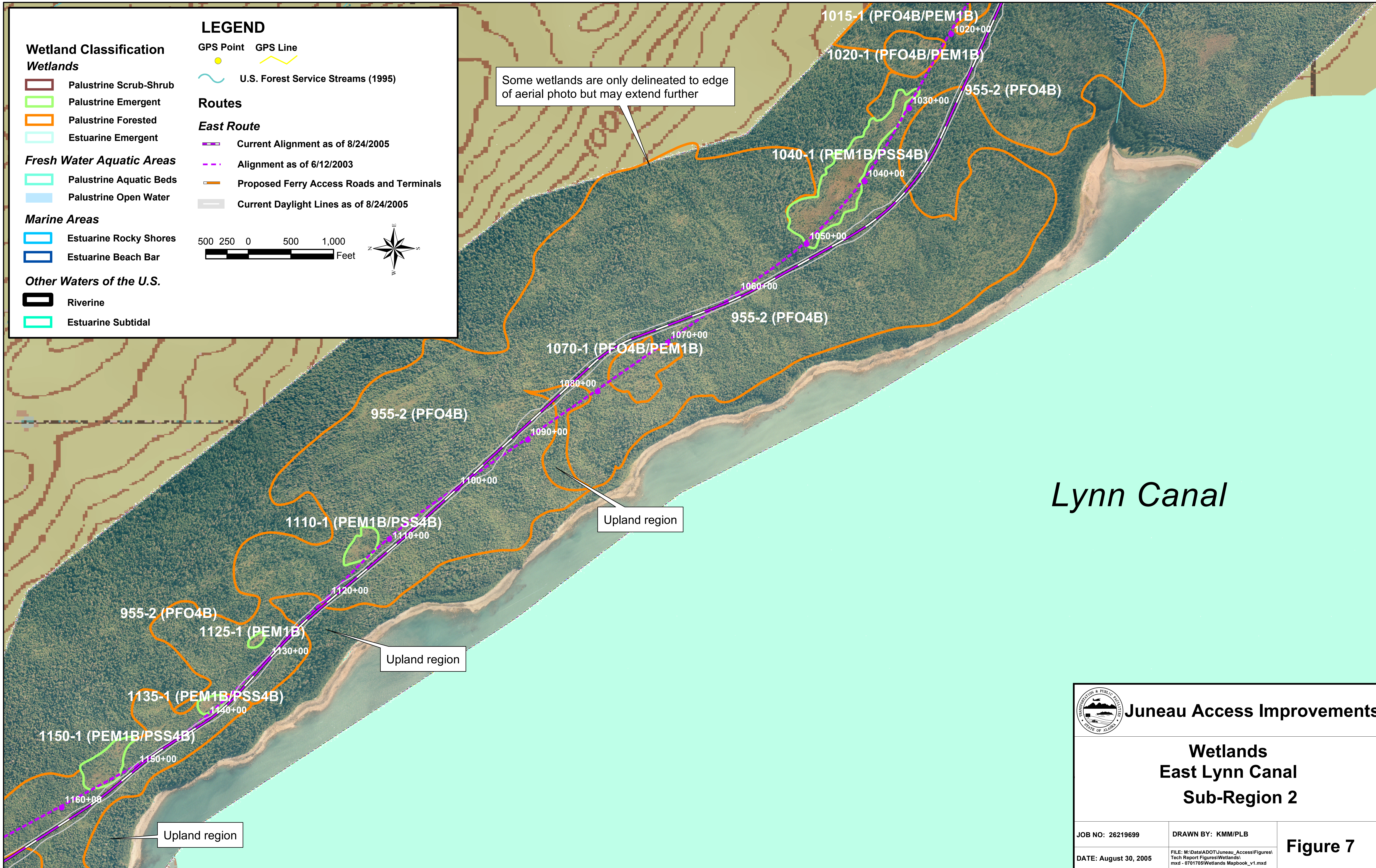
LEGEND
Wetland Classification
Wetlands
Palustrine Scrub-Shrub
Palustrine Emergent
Palustrine Forested
Estuarine Emergent
Fresh Water Aquatic Areas
Palustrine Aquatic Beds
Palustrine Open Water
Marine Areas
Estuarine Rocky Shores
Estuarine Beach Bar
Other Waters of the U.S.
Riverine
Estuarine Subtidal
GPS Point
GPS Line
U.S. Forest Service Streams (1995)
Routes
East Route
Current Alignment as of 8/24/2005
Alignment as of 6/12/2003
Proposed Ferry Access Roads and Terminals
Current Daylight Lines as of 8/24/2005
500 250 0 500 1,000
Feet
1015-1 (PFO4B/PEM1B)
1020+00
1020-1 (PFO4B/PEM1B)
Some wetlands are only delineated to edge of aerial photo but may extend further
955-2 (PFO4B)
1030+00
1040-1 (PEM1B/PSS4B)
1040+00
1050+00
1060+00
955-2 (PFO4B)
1070+00
1070-1 (PFO4B/PEM1B)
1080+00
955-2 (PFO4B)
1090+00
1100+00
Lynn Canal
Upland region
1110-1 (PEM1B/PSS4B)
1110+00
1120+00
955-2 (PFO4B)
1125-1 (PEM1B)
1130+00
Upland region
1135-1 (PEM1B/PSS4B)
1140+00
1150-1 (PEM1B/PSS4B)
1150+00
1160+00
Upland region
Juneau Access Improvements
Wetlands
East Lynn Canal
Sub-Region 2
JOB NO: 26219699
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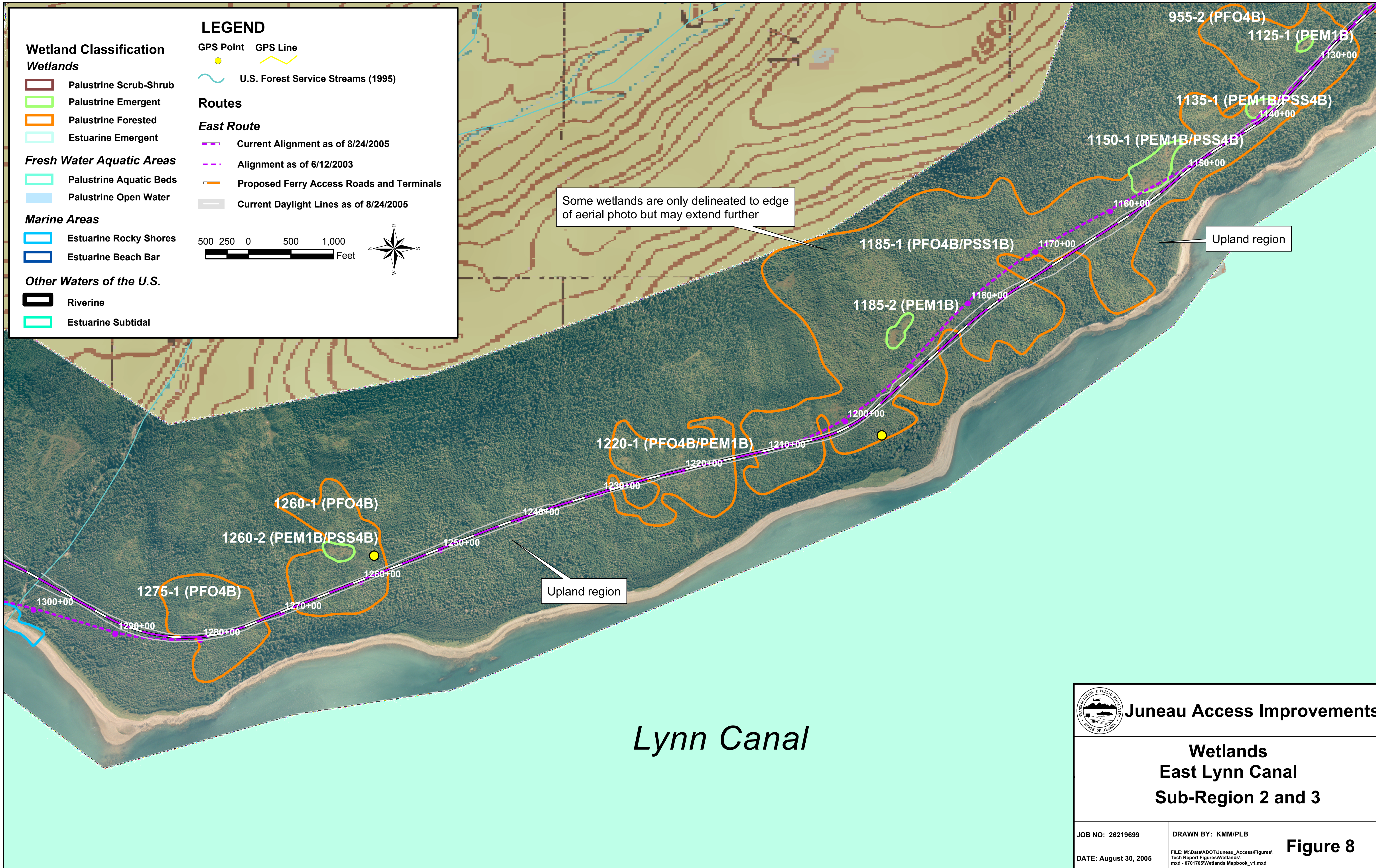
Figure 7


LEGEND
Wetland Classification
Wetlands
Palustrine Scrub-Shrub
Palustrine Emergent
Palustrine Forested
Estuarine Emergent
Fresh Water Aquatic Areas
Palustrine Aquatic Beds
Palustrine Open Water
Marine Areas
Estuarine Rocky Shores
Estuarine Beach Bar
Other Waters of the U.S.
Riverine
Estuarine Subtidal
GPS Point
GPS Line
U.S. Forest Service Streams (1995)
Routes
East Route
Current Alignment as of 8/24/2005
Alignment as of 6/12/2003
Proposed Ferry Access Roads and Terminals
Current Daylight Lines as of 8/24/2005
500 250 0 500 1,000
Feet
Some wetlands are only delineated to edge of aerial photo but may extend further
955-2 (PFO4B)
1125-1 (PEM1B)
1135-1 (PEM1B/PSS4B)
1150-1 (PEM1B/PSS4B)
1185-1 (PFO4B/PSS1B)
1185-2 (PEM1B)
1220-1 (PFO4B/PEM1B)
1260-1 (PFO4B)
1260-2 (PEM1B/PSS4B)
1275-1 (PFO4B)
Upland region
Upland region
1130+00
1140+00
1150+00
1160+00
1170+00
1180+00
1200+00
1210+00
1220+00
1230+00
1240+00
1250+00
1260+00
1270+00
1280+00
1290+00
1300+00
Lynn Canal
Juneau Access Improvements
Wetlands
East Lynn Canal
Sub-Region 2 and 3
JOB NO: 26219699
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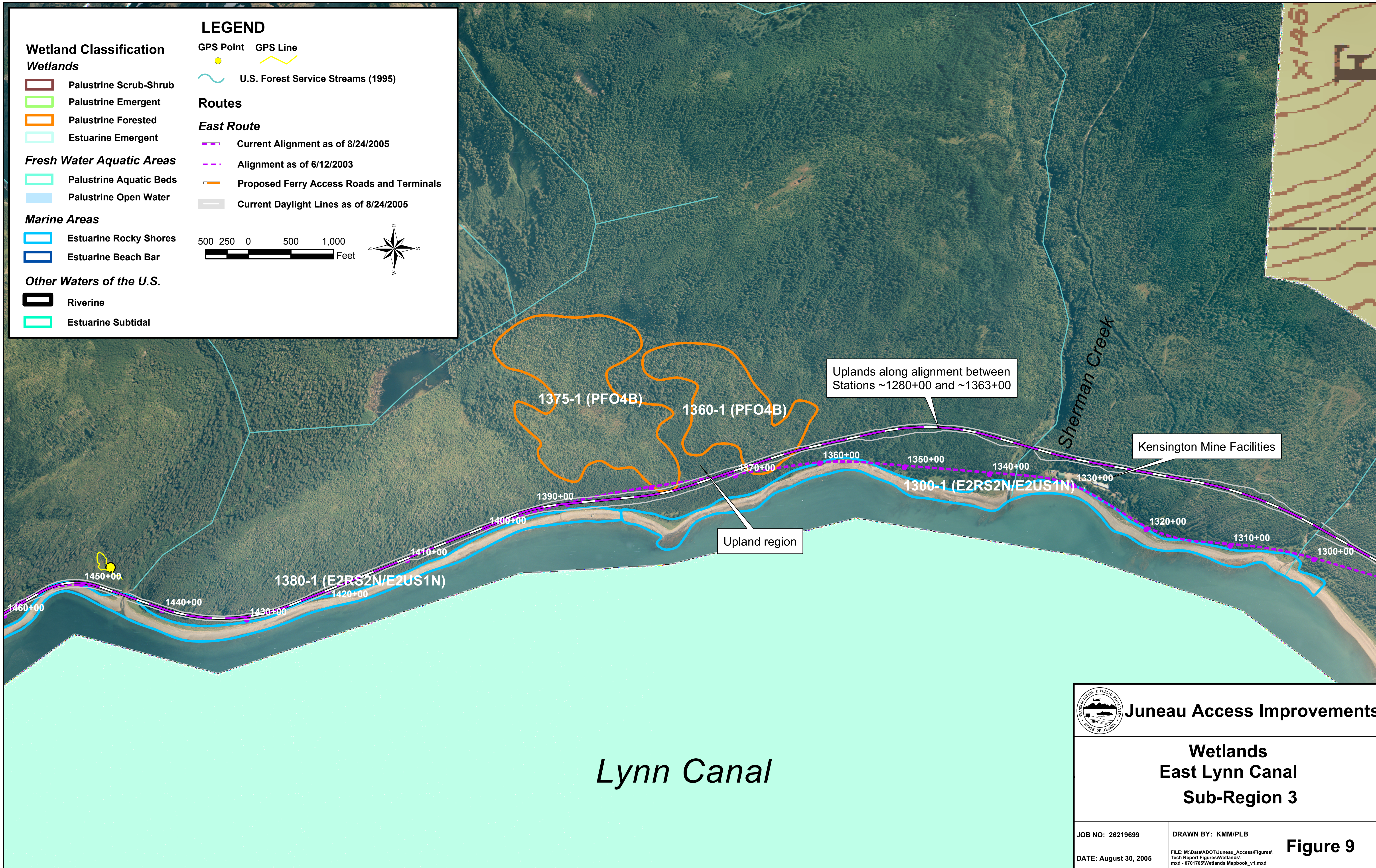
DATE: August 30, 2005
Figure 8



LEGEND
Wetland Classification
Wetlands
Palustrine Scrub-Shrub
Palustrine Emergent
Palustrine Forested
Estuarine Emergent
Fresh Water Aquatic Areas
Palustrine Aquatic Beds
Palustrine Open Water
Marine Areas
Estuarine Rocky Shores
Estuarine Beach Bar
Other Waters of the U.S.
Riverine
Estuarine Subtidal
GPS Point
GPS Line
U.S. Forest Service Streams (1995)
Routes
East Route
Current Alignment as of 8/24/2005
Alignment as of 6/12/2003
Proposed Ferry Access Roads and Terminals
Current Daylight Lines as of 8/24/2005
500 250 0 500 1,000
Feet
1375-1 (PFO4B)
1360-1 (PFO4B)
Uplands along alignment between Stations ~1280+00 and ~1363+00
Sherman Creek
Kensington Mine Facilities
1300-1 (E2RS2N/E2US1N)
1380-1 (E2RS2N/E2US1N)
Upland region
1460+00
1450+00
1440+00
1430+00
1420+00
1410+00
1400+00
1390+00
1370+00
1360+00
1350+00
1340+00
1330+00
1320+00
1310+00
1300+00
Lynn Canal
Juneau Access Improvements
Wetlands
East Lynn Canal
Sub-Region 3
JOB NO: 26219699
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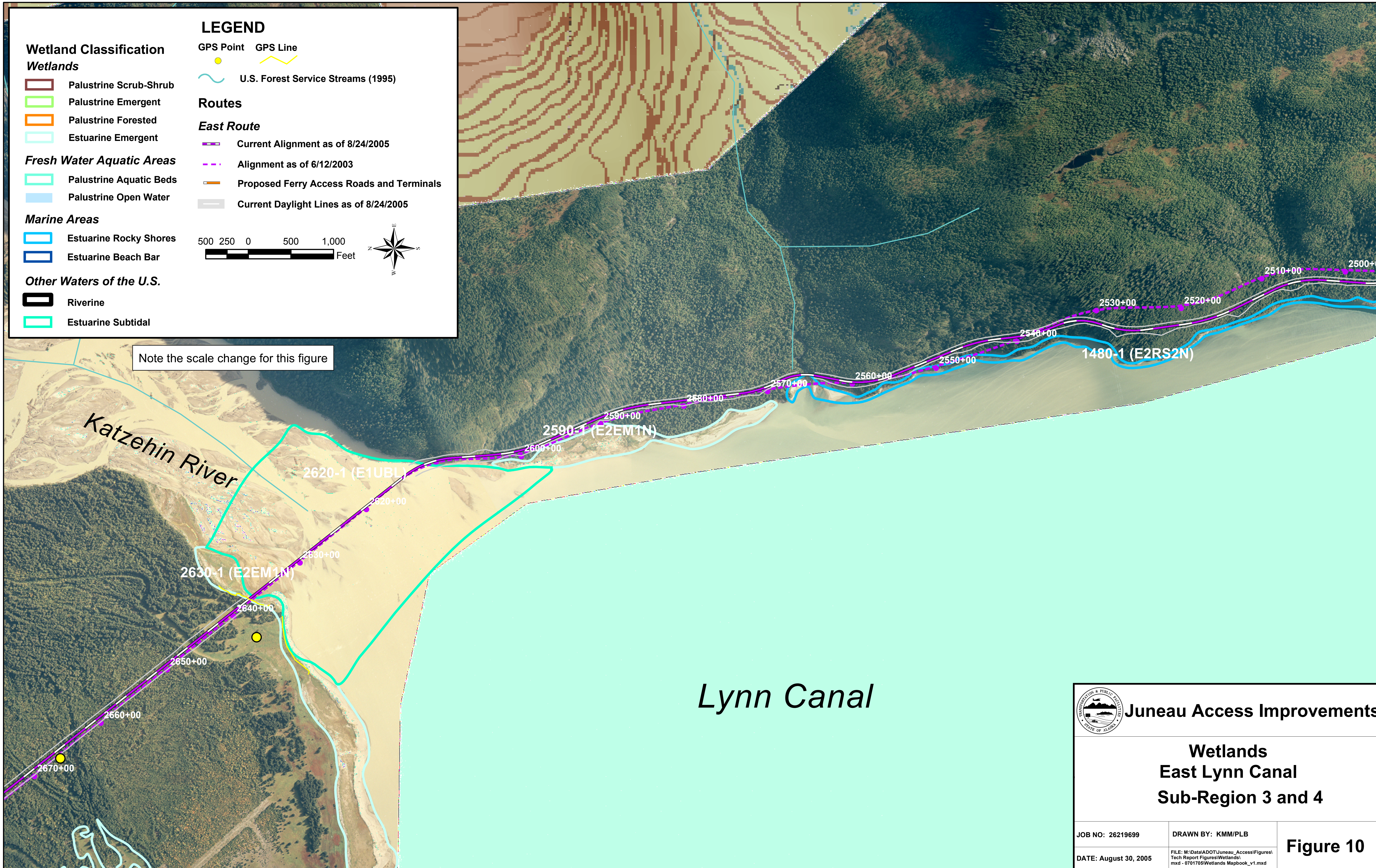
DATE: August 30, 2005
Figure 9



Juneau Access Improvements

Wetlands
East Lynn Canal
Sub-Region 3 and 4

JOB NO: 26219699	DRAWN BY: KMM/PLB	Figure 10
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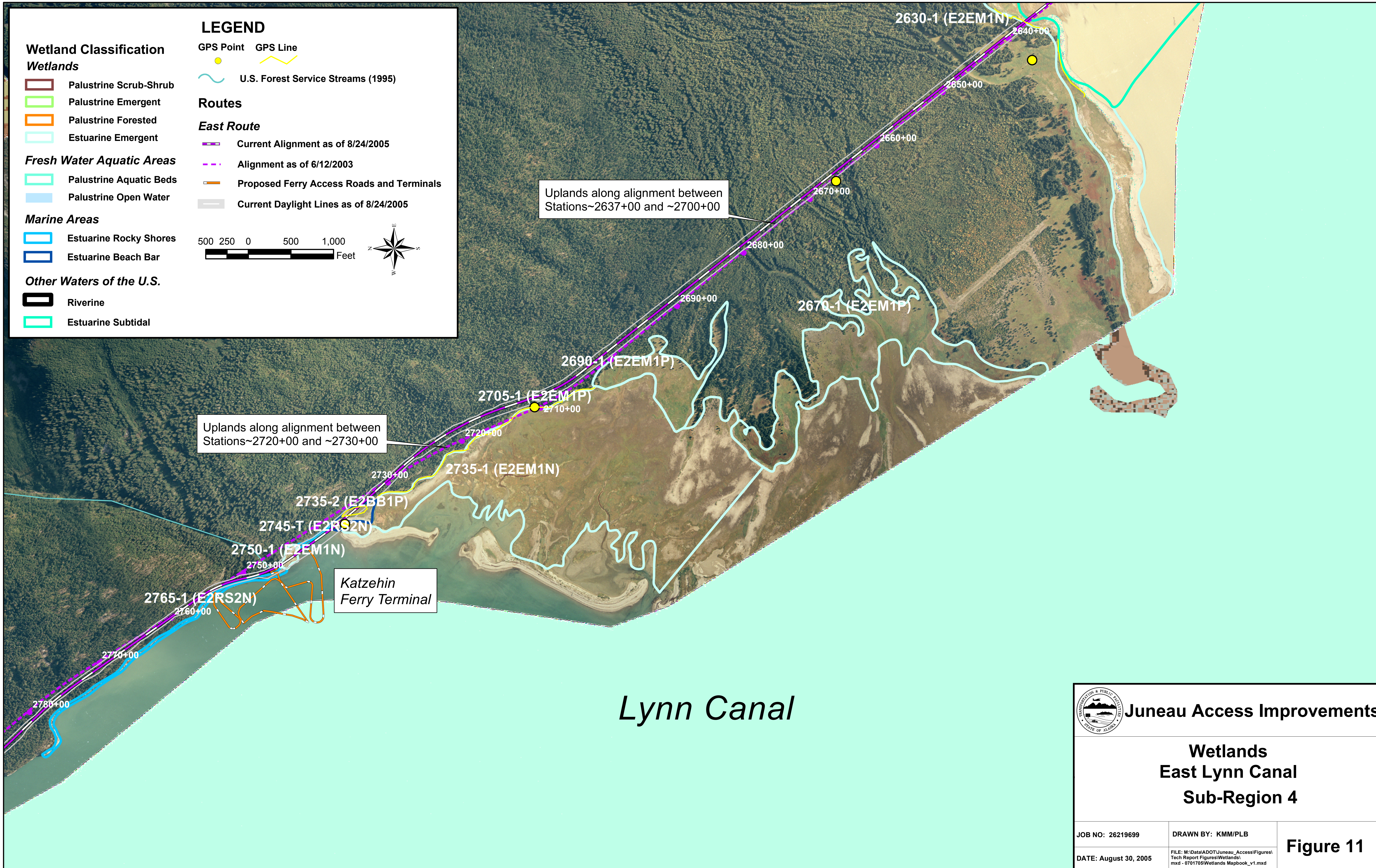

LEGEND
Wetland Classification
Wetlands
Palustrine Scrub-Shrub
Palustrine Emergent
Palustrine Forested
Estuarine Emergent
Fresh Water Aquatic Areas
Palustrine Aquatic Beds
Palustrine Open Water
Marine Areas
Estuarine Rocky Shores
Estuarine Beach Bar
Other Waters of the U.S.
Riverine
Estuarine Subtidal
GPS Point
GPS Line
U.S. Forest Service Streams (1995)
Routes
East Route
Current Alignment as of 8/24/2005
Alignment as of 6/12/2003
Proposed Ferry Access Roads and Terminals
Current Daylight Lines as of 8/24/2005
500 250 0 500 1,000
Feet
2630-1 (E2EM1N)
2640+00
2650+00
2660+00
2670+00
2680+00
2690+00
2670-1 (E2EM1P)
Uplands along alignment between Stations~2637+00 and ~2700+00
2690-1 (E2EM1P)
2705-1 (E2EM1P)
2710+00
2720+00
Uplands along alignment between Stations~2720+00 and ~2730+00
2730+00
2735-1 (E2EM1N)
2735-2 (E2BB1P)
2745-T (E2RS2N)
2750-1 (E2EM1N)
2750+00
Katzehin Ferry Terminal
2765-1 (E2RS2N)
2760+00
2770+00
2780+00
Lynn Canal
Juneau Access Improvements
Wetlands
East Lynn Canal
Sub-Region 4
JOB NO: 26219699
DRAWN BY: KMM/PLB
DATE: August 30, 2005
FILE: M:\Data\ADOT\Juneau_Access\Figures\Tech Report Figures\Wetlands\mxd - 0701705\Wetlands Mapbook_v1.mxd
Figure 11

Addendum to Appendix P

Anadromous and Resident Fish Streams Technical Report

Prepared by

URS Corporation
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Anchorage, Alaska 99503

DECEMBER 2005

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TABLES

FIGURES

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ERRATA SHEET

ANADROMOUS AND RESIDENT FISH STREAMS TECHNICAL REPORT

1. Page 4-1, Section 4.2, 1st paragraph, 2nd sentence. Correction: “Three of the anadromous rivers, the Antler, Berners/Lace, and Katzehin rivers would require multi-span bridges with in-stream piers.”

2. Page 4-2, Section 4.2, 1st paragraph, 5th sentence. Correction: “The areas where the Antler and Berners/Lace Rivers would be crossed are within an area where eulachon spawn.”

3. Page 4-3, Section 4.3, 1st paragraph, 2nd sentence. Correction: "As with Alternative 2, the Katzehin River would require a multi-span bridge with in-stream piers, and the remaining four anadromous streams would be crossed with single-span bridges with no in-stream piers.”

4. Page 4-4, Section 4.6, 1st paragraph, 2nd sentence. Correction: “Alternative 3 would cross 10 streams on the west side and one stream on the east side.”

5. Page 4-7, Table 4-2, West Lynn Canal Stream Crossings by Structure. Correction to 1st column, 4th row: “4W, 4AW, 14W, 15W, 19W (Ludaseska Creek).”

6. Figure 3-1, title correction: “Streams in the Project Area”

7. Figure 3-1, stream 51E name correction: “Dayebas Creek”

8. Figure 3-1, stream 6E classification correction: Class IIA, not a dry channel. (This correction has been made on the revised Figure 3-1 that is provided as Figure 1 in the September 2005 Addendum to the *Anadromous and Resident Fish Streams Technical Report*.)

9. Figure 3-1, streams 7E, 8E, and 9E corrections: The stream identified as 8E is a dry channel, with no stream number. The stream labeled 7E is actually 8E. Stream 9E has only one outlet, not two. (These corrections have been made on Figure 1, which is provided in the October 2005 Addendum to the *Anadromous and Resident Fish Streams Technical Report*.)

Note: The Alaska Department of Transportation and Public Facilities (DOT&PF) has committed to crossing anadromous streams, other than those requiring multi-span bridges, with a single span above the creek, resulting in no in-stream piers. For multi-span bridges, the approximate minimum pier spacing would be 130 feet.

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1.0 INTRODUCTION

This addendum describes impacts to anadromous and resident fish resources resulting from the changes made to the Alternative 2B alignment, bridge crossings, National Marine Fisheries' (NMFS) conservation recommendations for Alternative 2B, and updates of anadromous stream classifications in response to the Alaska Department of Natural Resources (ADNR) Office of Habitat Management and Permitting (OHMP) comments on the Supplemental Draft EIS and *Appendix P Anadromous and Resident Fish Technical Report*. The information and alternatives analyses presented in the October 2004 *Anadromous and Resident Fish Streams Technical Report* remain valid unless new information is presented in this addendum.

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2.0 AFFECTED ENVIRONMENT

2.1 East Lynn Canal

In response to comments provided by the ADNR OHMP in 2005, descriptions of Sturgill's (#59E) and Pullen (#60E) creeks, located in the Skagway area, have been added to Attachment A. Tables 3-1 and 3-2 also have been updated to include these creeks. Neither Pullen nor Sturgill's creek was observed during the 1994 Field Study. Pullen Creek supports anadromous fish habitat, increasing the total number of Class I streams along the east side of Lynn Canal to 14. Only 13 were identified in the 2004 *Anadromous and Resident Fish Streams Technical Report*. Sturgill's Creek is a Class II stream. The supplemental and expanded Attachment A text, including a more extensive description of Dewey Creek (#58E), and new Tables 3-1 and 3-2 are provided in this addendum.

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3.0 ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

3.1 Alternative 2B – East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway

Because of the August 2005 realignment, the text describing impacts to anadromous fish streams from Alternative 2B that was provided in the 2004 technical report has been revised. The following discussion on multi-span bridges replaces that included in Section 4.4 of the *Appendix P Anadromous and Resident Fish Technical Report*:

Alternative 2B would cross nine anadromous fish streams, including, Sawmill Creek (5E), 10AE, Antler River (11E), Berners/Lace rivers (12/13E), Slate Creek (14E), Sweeny Creek (16E), Sherman Creek (17E), 18E, and Katzehin River (46E). The Katzehin, Antler, and Berners/Lace rivers would require multi-span bridges with in-stream piers. Typical construction techniques for multi-span structures include the erection of falsework to provide a platform for equipment, thereby eliminating the need for active equipment in the river bottom. Impacts within the river, however, could occur due to noise and vibration generated during pile driving and increased turbidity (at the crossing and downstream) as the falsework is erected. The August 2005 realignment of Alternative 2B changed the Antler River crossing to have less in-stream piers and to avoid eulachon spawning habitat. This realignment results in fewer in-water bridge piers and requires no bridge piers in the northern channel, which is documented as having a high density of eulachon spawning. The Lace River crossing has been moved 700 feet upstream to further avoid vegetated intertidal habitat. This would lengthen the bridge at Lace River by 300 feet; the new alignment would continue to traverse primarily uplands and avoid bald eagle trees and Johnson Creek. Refer to the updated Table 4-1, provided later in this addendum, for a summary of East Lynn Canal streams and proposed crossing structures.

Construction of all river crossings with in stream piers would not occur between March 15 through June 15 to avoid impacts to outgoing salmonids and spawning eulachon. There would be some direct disturbance of anadromous and resident fish at and downstream of the Katzehin, Berners/Lace, and Antler river crossings during multi-span bridge construction; however, these rivers are braided with many channels, and not all channels would be impacted at the same time (i.e., bridge construction would either occur from one side of the river to the other or from both sides to the middle). Once in place, the piers would not impede fish movement within the rivers. There would be short-term increases in turbidity during construction of all three multi-span bridges; however, it is not expected that the increases would be noticeable relative to the ambient turbidity in the Antler, Berners/Lace, and Katzehin rivers. Airborne dust is not likely to occur during in-water construction.

Runoff during construction and from the completed highway could potentially contain sediments, heavy metals, salts, organic molecules, ozone, and nutrients. However, none of these components are expected to be sufficiently concentrated to cause direct mortality or disturbance of anadromous and resident fish. Impacts of runoff on fish habitat are discussed in Appendix N, 2004 *Essential Fish Habitat Assessment*, and the 2005 addendum to the assessment.

No direct effects on anadromous fish streams would result from construction of the Katzehin Ferry Terminal due to its distance from the Katzehin River and other anadromous streams. The design of the breakwaters for the Katzehin Ferry Terminal would include either fish passage gaps or large box culverts to ensure proper fish passage. In addition, an in-water construction window of June 16 through March 14 would be established for terminal construction to protect migrating anadromous and/or resident species.

While the Antler and Lace river crossings would avoid any in-water fill, the Katzehin River intertidal area crossing would involve 113,106 square feet (2.6 acres) of fill below the high tide line for construction of the south approach including alignment adjustments to avoid eagle nest trees and steep terrain. The north bank of the river would be clear spanned and have no fill. The south bank is a steep bluff with silty deposits below. Discussions with resource agencies indicated avoidance of impacts to fish and wildlife habitat on the north side would be more critical and that placing fill on the south bank would be environmentally less damaging. Details concerning impacts of ferry terminal construction and operations on fish habitat are discussed in the 2004 *Essential Fish Habitat Assessment* (Appendix N), and the 2005 addendum to the assessment.

TABLES

This section provides tables to replace the tables of the same number presented in the 2004 *Anadromous and Resident Fish Streams Technical Report:*

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Table 3-1
Types of Streams within Lynn Canal

	East Lynn Canal	West Lynn Canal
Class I Confirmed or Apparent Anadromous Fish Streams (Fish Observed)	5E, 10AE, 11E, 12E, 13E, 13AE, 14E, 15E, 16E, 17E, 18E, 46E, 47E, 60E	1W, 2W, 3W, 4BW, 5W, 7W, 8W, 9W, 9AW, 10W, 17BW, 22W
Class IIA Streams with Potential Fish Habitat or Fish Observed	6E, 8E, 9E, 58E, 59E	6W, 16W, 17W, 20W
Class IIB Streams with Poor Quality Fish Habitat (No Fish Observed)	1E, 2E, 3E, 7E, 43E, 44E, 45E	4W, 4AW, 14W, 15W, 19W
Class III Very Steep Stream or Waterfall (No Fish Observed)	10E, 19E-25E, 28E-33E, 37E, 39E, 40E, 48E, 50AE, 51E, 53E, 55E, 57E	8AW, 11W, 12W, 13W, 14AW, 18W

Notes: Refer to area map for the location of the streams by stream numbers.
The following streams shown on Figure 1 were either not found or were dry channels during the 1994 Field Study: 4E, 26E, 27E, 34E, 35E, 36E, 38E, 41E, 42E, 50E, 54E, 55AE, 56E, 17AW, and 21W. Streams 59E and 60E were not observed during the 1994 Field Study.

Table 3-2
Anadromous Fish Streams,
East Lynn Canal Project Area

Anadromous Stream	Fish Species Inventory	
Stream Number and Name	Catalog[1]	1994 Field Observations
5E Sawmill Creek	Chum and pink salmon, Dolly Varden	Pink salmon
10AE Unnamed	(Stream not listed as of 2002)	Coho[2] and pink[2] salmon
11E Antler River	Coho and chum salmon, eulachon	Coho smolt
12E Lace River	Coho salmon, eulachon	Coho salmon
13E Berners River	Coho salmon, eulachon	Coho salmon
13AE Johnson Creek	Coho, chum, and pink salmon	Coho, chum, and pink salmon
14E Slate Creek	Chum salmon (coho and pink salmon not listed as of 1998)	Coho[2] and pink[2] salmon
15E Unnamed	(Stream not listed as of 2002)	Coho[2] and pink[2] salmon
16E Sweeny Creek	Pink salmon	Pink salmon
17E Sherman Creek	Pink salmon	Pink salmon
18E Unnamed	Sockeye salmon (pink salmon not listed as of 2002)	Pink[2] salmon
46E Katzehin River	Coho and chum salmon, Dolly Varden (pink salmon not listed as of 1998)	Coho and pink[2] salmon
47E Side channel of Katzehin River	(Stream not listed as of 2002)	None observed
60E Pullen Creek	Coho, pink, and Chinook salmon, Dolly Varden	Not observed during the Juneau Access 1994 Stream Survey

Notes: [1]Includes updates to catalog (1998/2002)
[2]Submitted to ADF&G to be cataloged for species found in streams during the Juneau Access 1994 Stream Survey.

Table 4-1
Stream Crossings By Structure

Stream Number[1]	Class	Maximum Stream Width (Feet)[2]	Proposed Crossing Structure
5E Sawmill Creek	I	20	Single-span bridge
9E	IIA	15	Single span bridge
10AE	I	25	Single-span bridge
11E Antler River	I	500	Multi-span bridge
12E/13E Berners/Lace River	I	400	Multi-span bridge
13AE Johnson Creek	I	10	Not crossed under current (2005) alignment
14E Slate Creek	I	20	Single-span bridge
15E	I	20	Not crossed under current (2005) alignment
16E Sherman Creek	I	15	Single-span bridge
17E Sherman Creek	I	15	Single-span bridge
18E	I	10	Single-span bridge
43E, 44E, 45E	IIB	Varies	Single-span bridge
46E Katzehin River	I	±2800 (including tidal channels)	Multi-span bridge
47E, (Pullen Creek) 60E[3]	I	Varies	Not crossed under current (2005) alignment
6E, 8E	IIA	Varies	Culvert
1E, 2E, 3E, 7E	IIB	Varies	Culvert
59E Sturgill's Creek	IIA	Varies	Not crossed under current (2005) alignment
10E, 19E, 20E, 21E, 22E, 23E, 24E, 25E, 26E, 27E, 28E, 29E, 30E, 31E, 32E, 33E, 34E, 35E, 36E, (Yeldagalga Creek) 37E, 38E, 39E, 40E, 41E, 42E	III (or dry at time of survey)	Varies	Culvert
48E, 49E, 50E, (Dayebas Creek) 51E, 52E, 53E, 54E, 55E, 56E, (Kasidaya Creek) 57E, (Dewey Creek) 58E	III (or dry at time of survey)	Varies	Not crossed under current (2005) alignment

Notes: [1]Source: 1994 Anadromous Fish Stream and Habitat Report
[2]Width taken from the Anadromous Fish Stream and Habitat Report, Attachment A, 1994 Fishery Habitat Field Surveys.
[3]Streams 59E and 60E were not surveyed during the 1994 Fishery Habitat Field Surveys.

FIGURES

This section presents Figure 1, “Streams in the Project Area.” The figure is a revised version of Figure 3-1 that was originally provided in the 2004 technical report. Below is a listing of revisions included in Figure 1:

- Stream 6E: Stream 6E is correctly depicted as a Class IIA stream and not as a dry channel, as was the case in the October 2004 Figure 3-1.
- Stream 7E: Stream 7E is correctly depicted as being south of its location on the October 2004 Figure 3-1, as was originally depicted on the 1997 DEIS figure.
- Stream 8E: In the October 2004 Figure 3-1, stream 8E appeared to be an outlet of Stream 9E. In the revised Figure 1, stream 8E has been correctly identified as located south of stream 9E at the location labeled stream 7E in the October 2004 Figure 3-1.
- Stream 9E: The configuration of stream 9E has been revised. In the October 2004 Figure 3-1, stream 9E appeared to have two forked outlets; however, if there are two outlets, one outlet is currently dry. The revised stream configuration, presented in Figure 1, now matches the 1997 DEIS figure.
- Sturgill’s (#59E) and Pullen (#60E) creeks have been added to Figure 1.

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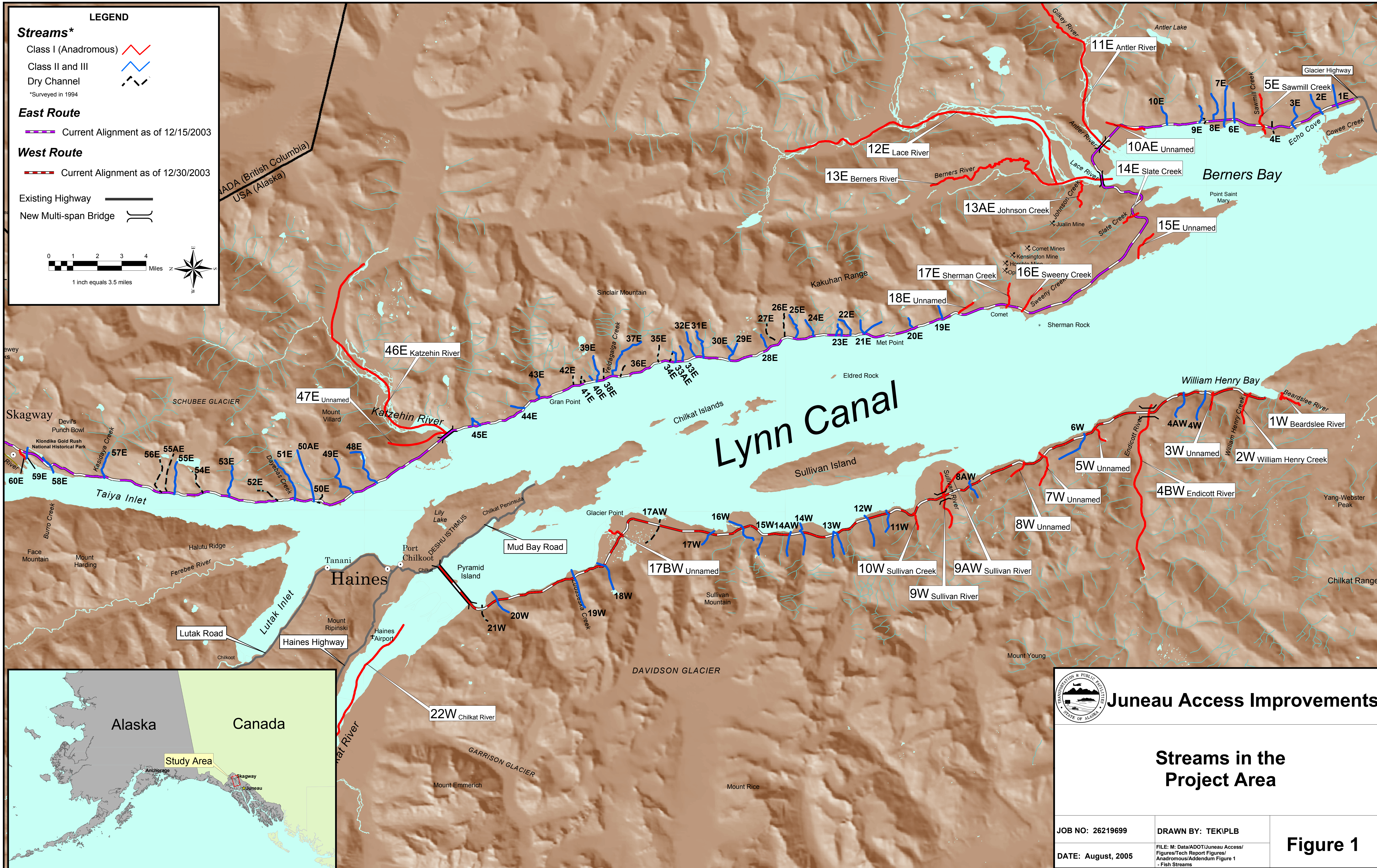

LEGEND
Streams*
Class I (Anadromous)
Class II and III
Dry Channel
*Surveyed in 1994
East Route
Current Alignment as of 12/15/2003
West Route
Current Alignment as of 12/30/2003
Existing Highway
New Multi-span Bridge
0 1 2 3 4 Miles
1 inch equals 3.5 miles
CANADA (British Columbia)
USA (Alaska)
Lynn Canal
Berners Bay
William Henry Bay
Taiya Inlet
Lutak Inlet
Skagway
Haines
Sullivan Island
Chilkat Islands
Chilkat Peninsula
Pyramid Island
Eldred Rock
Sherman Rock
Point Saint Mary
Kakuhan Range
Chilkat Range
Sinclair Mountain
SCHUBEE GLACIER
DAVIDSON GLACIER
GARRISON GLACIER
Mount Emmerich
Mount Rice
Mount Young
Sullivan Mountain
Mount Ripinski
Mount Villard
Mount Harding
Face Mountain
Yang-Webster Peak
Halutu Ridge
Devils Punch Bowl
Klondike Gold Rush National Historical Park
Antler Lake
Glacier Highway
Echo Cove
Cowee Creek
Gran Point
Met Point
Comet
Glacier Point
Lily Lake
DESHU ISTHMUS
Port Chilkoot
Tanani
Chilkoot
Haines Airport
Jualin Mine
Comet Mines
Kensington Mine
Mud Bay Road
Lutak Road
Haines Highway
1E
2E
3E
4E
5E Sawmill Creek
6E
7E
8E
9E
10E
10AE Unnamed
11E Antler River
12E Lace River
13E Berners River
13AE Johnson Creek
14E Slate Creek
15E Unnamed
16E Sweeny Creek
17E Sherman Creek
18E Unnamed
19E
20E
21E
22E
23E
24E
25E
26E
27E
28E
29E
30E
31E
32E
33E
33AE
34E
35E
36E
37E
38E
39E
40E
41E
42E
43E
44E
45E
46E Katzehin River
47E Unnamed
48E
49E
50E
50AE
51E
52E
53E
54E
55E
55AE
56E
57E
58E
59E
60E
1W Beardslee River
2W William Henry Creek
3W Unnamed
4W
4AW
4BW Endicott River
5W Unnamed
6W
7W Unnamed
8W Unnamed
8AW
9W Sullivan River
9AW Sullivan River
10W Sullivan Creek
11W
12W
13W
14W
14AW
15W
16W
17W
17AW
17BW Unnamed
18W
19W
20W
21W
22W Chilkat River
Gilkey River
Antler River
Lace River
Berners River
Sawmill Creek
Johnson Creek
Slate Creek
Sweeny Creek
Katzehin River
Kasidaya Creek
Dayebas Creek
Yeldagalga Creek
Beardslee River
William Henry Creek
Endicott River
Sullivan River
Burro Creek
Ferebee River
Chilkat River
Alaska
Canada
Study Area
Anchorage
Skagway
Juneau
Juneau Access Improvements
Streams in the Project Area
JOB NO: 26219699
DRAWN BY: TEK\PLB
DATE: August, 2005
FILE: M: Data/ADOT/Juneau Access/Figures/Tech Report Figures/Anadromous/Addendum Figure 1 - Fish Streams
Figure 1

ATTACHMENT A

Dewey and Pullen creeks were not identified or described in the 2004 *Anadromous and Resident Fish Streams Technical Report*. Descriptions of these creeks are presented in this section as a supplement to "Attachment A: Stream Narratives." The Sturgill's Creek description is revised to reflect that ADF&G identified it as a Class II stream in 2003.

Table A-1, provided in this addendum, is an updated version of Table A-1 in the 2004 technical report.

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Table A-1
Juneau Access Stream Data

Stream	Class	Catalog #	Fish Species	Fish Observed or Traps Set in 1994	Planned Crossing Structure
Sawmill Creek 5E	I	115-20-10520	Chum and pink salmon, and Dolly Varden	Adult pink salmon were observed; no traps set.	Single-span bridge
Unnamed 10AE	I	Submitted	Coho and pink salmon	Spawning pink salmon observed; traps set; coho smolt caught.	Single-span bridge
Antler River 11E	I	115-20-10300	Coho and chum salmon	Unidentified smolt observed in side slough; traps set; no fish caught.	Multi-span bridge
Lace River 12E	I	115-20-10200	Coho salmon	Coho smolt observed in side slough; no traps set.	Multi-span bridge
Johnson Creek 13AE	I	115-20-10070	Coho, pink, and chum salmon	Rearing coho and spawning pink and chum salmon observed; no traps set.	Not crossed under current alignment
Slate Creek 14E	I	115-20-10030	Chum salmon (submitted for coho and pink salmon)	Spawning chum and pink salmon observed; traps set; coho smolt caught.	Single-span bridge
Unnamed 15E	I	Submitted	Submitted for coho and pink salmon	Spawning pink salmon observed; traps set; coho smolt caught.	Not crossed under current alignment
Sweeny Creek 16E	I	115-31-10350	Pink salmon	Spawning pink salmon observed at the mouth of the stream; no traps set.	Single-span bridge
Sherman Creek 17E	I	115-31-10330	Pink salmon	Spawning pink salmon observed; no traps set.	Single-span bridge
Unnamed 18E	I	115-31-10300	Sockeye salmon (submitted for pink salmon)	Spawning pink salmon observed; no traps set.	Single-span bridge
Katzehin River 46E/Side Channel 47E	I	115-34-10700	Coho and chum salmon, and Dolly Varden (submitted for pink salmon)	Spawning pink salmon and coho smolt observed; traps set; coho smolt caught.	47E is not crossed under current alignment; runs through floodplain of 46E
Berners River 13E	I	115-20-10100	Coho salmon	Coho smolt observed in side channel; no traps set.	Not crossed under current alignment
Pullen Creek 60E	I	115-34-10310	Coho, pink, and chinook salmon, Dolly Varden	Stream not observed during 1994 Field Study	Not crossed under current alignment
9E	IIA	N/A	Potential fish habitat	No fish observed; no traps set.	Single-span bridge due to topographical constraints
6E, 8E	IIA	N/A	Potential fish habitat	No fish observed; traps set at 8E; no fish caught.	Culverts

Table A-1 (continued)
Juneau Access Stream Data

Stream	Class	Catalog #	Fish Species	Fish Observed or Traps Set in 1994	Planned Crossing Structure
Sturgill's Creek 58E	IIA	N/A	Brook trout and Dolly Varden	Stream not surveyed during the 1994 Field Study	Not crossed under current (2005) alignment
Dewey Creek 59E	IIA	N/A	Brook trout and Dolly Varden	Stream not surveyed during the 1994 Field Study	Not crossed under current (2005) alignment
4E	N/A	N/A	Not located during survey	N/A	N/A
43E, 44E, 45E	IIB	N/A	N/A (high velocity, boulder cobble substrate)	No fish observed; no traps set.	Single-span bridges due to topographical constraints
1E, 2E, 3E, 7E	IIB	N/A	N/A (no fish, poor habitat or waterfall)	No fish observed; no traps set.	Culverts
10E, 19E-42E	III	N/A	N/A (waterfall, dry channels, or otherwise poor habitat)	No fish observed; no traps set.	Culverts
48E-57E (Includes Yeldagalga, Dayebas, and Kasidaya creeks)	III	N/A	N/A (waterfall, dry channels, or otherwise poor habitat)	No fish observed; no traps set.	Not crossed under current (2005) alignment
Berners Bay	N/A	N/A	Eulachon spawning habitat; extends into Johnson Creek, Antler and Berners/Lace rivers	N/A	N/A
Unnamed	N/A	115-34-10310	Coho, chum, and pink salmon; Dolly Varden	**NEW**. Parallels coastline/north portion of highway to Skagway. Outside of highway alignment.	N/A
Unnamed	N/A	115-34-10310-2018	Coho salmon and Dolly Varden	**NEW**. Short stream, between 115-34-10310 and coast / highway. Upper Taiya Inlet. Outside of highway alignment.	N/A
Takhin River	N/A	115-32-10300	Coho salmon, cutthroat trout, and Dolly Varden	**NEW**. Skagway A2. Across from Haska Creek, appears to have branches that are bisected by proposed highway alignment.	N/A
Haska Creek	N/A	115-32-10290	Coho and pink salmon	**NEW**. North of bridge to Haines. Bridge construction may affect influx of fish.	N/A
South Kicking Horse River	N/A	115-32-10280	Coho and sockeye salmon	**NEW**. North of bridge to Haines. Bridge construction may affect influx of fish.	N/A

Table A-1 (continued)
Juneau Access Stream Data

Stream	Class	Catalog #	Fish Species	Fish Observed or Traps Set in 1994	Planned Crossing Structure
Unnamed	N/A	115-32-10230	Coho salmon and Dolly Varden	**NEW**. South of bridge to Haines. Bridge construction may affect influx of fish.	N/A
Unnamed	N/A	115-32-10240	Coho salmon and cutthroat trout	**NEW**. South of bridge to Haines. Bridge construction may affect influx of fish.	N/A
Unnamed	N/A	115-32-10260	Coho and king salmon, cutthroat trout, and Dolly Varden	**NEW**. Slightly north of bridge to Haines. Bridge construction may affect influx of fish.	N/A
Auke Nu Creek	N/A	111-50-10350	Pink salmon	In area of existing Auke Bay Ferry Terminal.	N/A
Waydelich Creek	N/A	111-50-10370	Pink and chum salmon	In area of existing Auke Bay Ferry Terminal.	N/A
Bay Creek	N/A	111-50-10390	Coho and pink salmon	In area of existing Auke Bay Ferry Terminal.	N/A
Auke Creek	N/A	111-50-10420	Silver, coho, pink, and chum salmon; steelhead and cutthroat trout; and Dolly Varden	In area of existing Auke Bay Ferry Terminal.	N/A
Beardslee River 1W	I	115-10-10650	Coho, pink, and chum salmon; Dolly Varden	Anadromous fish were observed during 1994 survey; no traps set.	None, ferry terminal access road does not cross this river
William Henry Creek 2W	I	115-10-10680	Pink and chum salmon (submitted for pink salmon in 1994)	Pink salmon were observed; no traps set.	Single-span bridge
Unnamed 3W	I	Submitted	Submitted for pink salmon	Pink salmon were observed; no traps set.	Single-span bridge
Endicott River 4BW	I	115-10-10800	Coho and chum salmon, and Dolly Varden (submitted for pink salmon)	Traps set; coho smolt caught. Sculpin and spawning pink salmon observed.	Multi-span bridge
Unnamed 5W	I	N/A	Dolly Varden found in previous ADF&G surveys	No fish observed; no traps set.	Single-span bridge
Unnamed 7W	I	Submitted	Submitted for pink salmon	Pink salmon and sculpins observed; no traps set.	Single-span bridge
Unnamed 8W	I	115-31-10380	Pink and chum salmon	No fish observed; no traps set.	Single-span bridge

Table A-1 (continued)
Juneau Access Stream Data

Stream	Class	Catalog #	Fish Species	Fish Observed or Traps Set in 1994	Planned Crossing Structure
Sullivan River 9W	I	115-31-10430	Chum salmon and Dolly Varden (submitted for pink salmon)	Spawning pink salmon observed; no traps set.	Multi-span bridge
9AW (small branch of Sullivan River)	I	N/A	Unidentified smolt observed – possibly coho salmon	Pink salmon and possibly coho observed; no traps set.	Multi-span bridge (part of Sullivan River bridge; see above)
10W	I	115-31-10450	Chum and pink salmon (Submitted for coho and pink salmon)	Pink salmon and coho smolt observed; fish traps set but no fish caught.	Single-span bridge
Unnamed 17BW	I	115-32-10010	Coho salmon and Dolly Varden	No fish observed; no fish traps set.	Single-span bridge
Chilkat River 22W	I	115-32-10250	King, coho, pink, chum, and sockeye salmon; steelhead and cutthroat trout; Dolly Varden; and whitefish	Not surveyed; no traps set.	Multi-span bridge
6W, 16W, 17W, 20W	IIA	N/A	Potential fish habitat	No fish observed; no traps set.	Single-span bridges due to topographical constraints
4W, 4AW, 14W, 15W, 19W	IIB	N/A	N/A (waterfall, high velocity or no flow)	No fish observed; no traps set.	Single-span bridges due to topographical constraints
8W, 17AW, 11W, 12W, 13W, 14AW, 18W, 21W	III	N/A	N/A (waterfalls or dry streams)	No fish observed; no traps set.	Culverts or bridges depending on topography

Notes: Classes (assigned from 1994 survey):
I – confirmed anadromous fish stream
IIA – streams with potential fish habitat
IIB – streams with poor quality fish habitat
III – very steep stream or waterfall
Dry streams – not classified

STREAM NARRATIVES

STREAM #58E – CLASS IIA   STURGILL'S CREEK

Location: LAT N 59° 25' 18.4" / LONG W 135° 20' 19.3"   SKAGWAY B1

Description of stream 58E provided in the 2004 technical report and based on observations recording during the 1994 Field Survey: This steep, low-velocity stream originates from Lower Dewey Lake. It travels around a knoll and between rock walls before emptying into Taiya Inlet. A trail parallels this creek and provides access from Skagway starting at Lower Dewey Lake and travels down to the mouth of the creek. At the mouth of the creek is Sturgill's Landing, a historical sawmill site. Picnic tables, an outhouse, and fire pits are found here, which the USDA Forest Service maintains for public use.

Sturgill's Creek flows from Dewey Lake towards Sturgill's Landing at the marine outlet. On August 4, 2003, the ADF&G documented brook trout and Dolly Varden in Sturgill's Creek. Brook trout were documented above and Dolly Varden below a presumed barrier to anadromous fish passage.

STREAM 59E – CLASS III   DEWEY CREEK

This stream was not observed during the 1994 Field Study.

Dewey Creek originates from Upper Dewey Lake, and flows into the north end of Lower Dewey Lake, and discharges at the northeast corner of the City of Skagway's waterfront through the existing Dewey Lakes hydroelectric project pipelines (tailrace) into Pullen Creek. The hydroelectric project has been in operation since it was built in the early 1900s. At the confluence of Dewey Creek with Lower Dewey Lake, Dewey Creek provides spawning habitat for resident fish in the lake. Dewey Creek is shown on most maps, including USGS quad maps, as both the inlet and outlet of a small lake (now known as the "reservoir") northwest of Lower Dewey Lake. The hydroelectric project, starting in the early 1900s, dammed the outlet of this lake, diverting all flow down the ravine to Skagway in flume pipelines. A second dam at the south end of Lower Dewey Lake diverts water from the lake into the reservoir and flume pipelines. Both dams have overflow spillway, but approximately 30 years ago a lower spillway was built adjacent to the southern dam and diverts any overflow to Sturgill's Creek.

STREAM #60E – CLASS I   PULLEN CREEK

This stream was not observed during the 1994 Field Study.

Pullen Creek is a Class I stream, ADF&G catalog #115-34-10310. Pullen Creek provides habitat for coho spawning and rearing, pink spawning, Chinook presence, and Dolly Varden spawning and rearing. Chinook salmon are enhanced through the Jerry Myers Hatchery located on Pullen Creek. Upper Pullen Creek consists of two branches, one flowing from the White Pass and Yukon Route railroad yard along the length of the east side of the City, and one flowing from the Jerry Myers hatchery vicinity. Pullen Creek originates from the springs at the base of the steep mountainside at the north end of Skagway, on the east side of the Skagway River valley. Dewey Creek enters Pullen Creek through the Dewey Lakes hydroelectrical project tailrace, and Pullen Creek discharges at the city waterfront adjacent to the State of Alaska ferry terminal. Humans have modified the stream since the late 1890s for various purposes, including stream restoration and enhancement and fish introductions (Draft License Application, Dewey Lakes Hydroelectric Project, 2/18/2005).

Addendum to Appendix Q

Wildlife Technical Report

Prepared by

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OCTOBER 2005

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TABLES

FIGURES

1.0 INTRODUCTION

Appendix Q, *Wildlife Technical Report* was completed in October 2004 and released for public review as part of the Supplemental Draft EIS in January 2005. Since then, the preferred alternative has been changed from Alternative 2 to Alternative 2B, and the highway alignment for Alternative 2B has been adjusted.

This addendum describes the changes to the project alternatives and presents changes to analyses of impacts to wildlife and wildlife habitat based on these revisions, public comments, and coordination with cooperating agencies. This addendum incorporates requested information from the Alaska Department of Natural Resources (ADNR) Office of Habitat Management and Permitting (OHMP) regarding old growth forest reserves and analysis of additional information regarding habitat fragmentation of terrestrial mammals, avalanche control measure impacts to mountain goats, discussion on impacts to wolverines, martens, wolves, moose, and amphibians, and an update to the habitat ranges of moose, wolverine, and Sitka black tailed deer. Additional clarification regarding the role of the Federal Subsistence Board, Board of Fisheries, and Board of Game authorities has also been included.

A clarification regarding Executive Order 13786 regarding the Migratory Bird Treaty Act and construction avoidance actions are included in Section 4.1.3 of this addendum and replace discussion included in the October 2004 *Appendix Q Wildlife Technical Report*

The information and alternatives analyses presented in the October 2004 *Appendix Q Wildlife Technical Report* remain valid unless new information is presented in this addendum.

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2.0 STUDIES AND COORDINATION

Agency comments requested clarification of the Federal Subsistence Board, Board of Fisheries and Board of Game authority over the fishery and wildlife resources in the project area. The following is a description of their role in regulating subsistence, and commercial, sport and personal use fishing and hunting.

A number of federal, state, and local agencies have jurisdiction over land management and resource development activities that may affect wildlife habitat. Since most of the project areas are on federal lands, the Federal Subsistence Board would regulate and monitor the harvest of fish and wildlife for subsistence purposes. The Federal Subsistence Board determines which subsistence wildlife species are open to harvest, the areas and communities that are eligible to hunt, as well as harvest limits and seasons, the harvest methods and other harvest regulations. The Board consists of the Alaska Regional Directors from the National Park Service, U.S. Fish and Wildlife Service (USFWS), Bureau of Land Management, Bureau of Indian Affairs and the U.S. Forest Service (USFS).

The Board of Fisheries and the Board of Game are Alaska's regulatory authorities that pass regulations to conserve and develop the fishery and wildlife resources of Alaska. This involves setting seasons, bag limits, methods and means for the state's subsistence, commercial, sport, guided sport and personal use fishing, hunting and trapping. The Alaska Department of Fish and Game (ADF&G) monitors the resources along Lynn Canal and makes recommendations to the Board of Fisheries and Board of Game to adjust fish and game regulations, as necessary, to protect those resources from over-utilization. ADF&G has the authority to limit harvest by issuing emergency orders closing seasons.

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3.0 AFFECTED ENVIRONMENT

The following subsections are additional discussion to be included Sections 3.1.1 and 3.3.3 of the *Appendix Q Wildlife Technical Report* included in the Supplemental Draft EIS.

3.1 Wildlife Habitats

Although the alternative alignments have changed, the general descriptions of old-growth forest, beach fringe, estuary fringe, alpine and subalpine, and wetland habitats presented in the 1997 and the 2004 *Appendix Q Wildlife Technical Report* remain valid. Wetland impacts have been reduced due to alignment changes in Alternative 2B (Figures 1 through 5). Agency comments requested information regarding old-growth forest reserves within the project study area. Section 2.1.1 describes the large, medium, and small old-growth reserves according to the Tongass National Forest Land and Resource Management Plan (TLMP) criteria, as well as the old-growth forest within the alignments for Alternative 2B and Alternative 3.

3.1.1 Old-Growth Forest

The land on both sides of Lynn Canal in the vicinity of project alternatives supports some large areas of high volume old-growth forest, as well as intermittent small areas of high and low volume old-growth forest (See TLMP for further delineation). Old-growth forest in the project area was defined as forest over 150 years old with an average diameter-at-breast-height greater than 9 inches, and timber volume greater than 8,000 board feet (BF) per acre. Old-growth and other forests consist of the following coniferous forest plant series: western hemlock, western hemlock-yellow cedar, Sitka spruce, mixed conifer, mountain hemlock, and Sitka spruce-black cottonwood. The TLMP contains a conservation strategy to maintain a forest-wide system of old-growth forest habitat, identifying a forest-wide system of large, medium, and small old-growth reserves. According to the TLMP criteria, the old-growth reserve system must meet minimum size, spacing, and composition requirements, as follows:

- **Large old-growth reserves** – A large reserve must be 40,000 acres; 20,000 of those acres must be productive old-growth forest (over 8,000 BF per acre). At least 10,000 acres of the productive old-growth forest should be in the high volume class (over 20,000 BF per acre).
- **Medium old-growth reserves** – A medium reserve is 10,000 acres; 5,000 of those acres must be productive old-growth forest. At least 2,500 acres should be in the high volume class.
- **Small old-growth reserves** – Small reserves are required in all value comparison units (VCUs) of the Tongass National Forest. Small reserves must be at least 16 percent of the VCU area, and at least 50 percent of that area must be productive old-growth forest. Each reserve should contain at least 800 acres of old-growth forest, but must contain a minimum of 400 acres of productive old-growth forest.

Evaluating any modification of mapped reserves must include consideration of Non-Development Land Use Designations (LUDs) that maintain the integrity of the old-growth forest ecosystem and contribute to a forest-wide system of reserves. Where the Non-Development LUDs do not fulfill size, spacing, and composition criteria of old-growth habitat reserves, it would be necessary to add or modify old-growth reserves to meet the criteria. The Tongass National Forest LUDs are shown in Figure 6.

There are six intermittent small blocks of high volume old-growth forest at or near the shore between Point Saint Mary and the Katzehin River (Alternative 2B). Two of the small intermittent blocks of high volume old-growth forest are within one mapped small old-growth reserve in the areas of Comet to Met Point (VCU 190), and four intermittent blocks of high volume old-growth are in the mapped small old-growth reserve in VCU 200. There are also several intermittent small blocks of low volume old-growth forest near the shoreline.

There are six small intermittent blocks of high volume old-growth forest on the west side of Lynn Canal in the vicinity of Alternative 3: one between William Henry Bay and Endicott River, four south of Sullivan River delta, and one opposite the middle of Sullivan Island. There are also several intermittent small and large blocks of low volume old- growth near the shoreline.

3.2 Species Accounts

Although the alternative alignments have changed, the general descriptions of the 27 species analyzed as presented in the 1997 and 2004 *Wildlife Technical Reports* remain valid. However, habitat figures for the following terrestrial mammals were updated to include habitat down to high-tide line: Alexander Archipelago Wolf and black bear (Figure 7); mountain goat, brown bear, and marten (Figure 8). Additionally, agency comments requested data regarding marten density in the project area. The information in Section 3.2.1.1 is used to supplement the October 2004 *Appendix Q Wildlife Technical Report*.

3.2.1 Mammals

3.2.1.1 Marten (*Martes americana*)

In the project study area, marten primarily occur in high volume old-growth forest habitat (Figure 8). On the east side of the Lynn Canal, this habitat is limited to the old-growth stands in the Berners Bay and Katzehin River areas (Schumacher, personal communication, 2005) and extends from the upper elevation extent of the forest to tidewater (N. Barten, personal communication, 2005). The narrow bands of forest habitat between Berners Bay and the Katzehin River and the Katzehin River and Skagway may be used as travel corridors by marten (N. Barten, personal communication, 2005). The west side of the Lynn Canal has a greater density of old-growth forest habitat, and is likely to have a greater abundance of marten (Schumacher, personal communication, 2005). A marten trapping survey conducted on the Homeshore Road system on the northern side of Icy Strait, in an area having similar old-growth habitat to that of the west side of the Lynn Canal, yielded 34 marten per 40,000 acres (Schumacher, personal communication, 2005), which suggests marten population densities are generally low in southeast Alaska.

4.0 ENVIRONMENTAL IMPACTS

Most of the discussions of impacts to wildlife and wildlife habitat presented in the October 2004 *Appendix Q Wildlife Technical Report* for Alternatives 2B, 3, 4B and 4D remain valid. However, because of the changes in alignments there are revisions to the number of acres of impacted wildlife habitat from these alignments. The revised acres of impacted wildlife habitat are presented in Table 1.

As requested from public and agency comments, impacts to old-growth reserves, as well the use of beach and estuary habitats by wolves, and how the build alternatives could impact the use of this habitat by wolves are discussed in Section 4.1. Additional information regarding the impacts of habitat fragmentation on bear, mountain goat, and marten is included in Section 4.2 (Alternative 2B). This information updates that presented in Sections 4.2.1 and 4.2.2 of the October 2004 *Appendix Q Wildlife Technical Report* presented in the Supplemental Draft EIS.

4.1 Impacts Common to All Build Alternatives

4.1.1 Overall Habitat Loss

The direct loss of different habitat types within the cut and fill limits of the highway alignment and the footprint of new ferry terminals were calculated using USFS Geographic Information System (GIS) data. These numbers have been updated based on the current alternative alignments. The results for all alternatives and all habitat types are presented in Table 1.

4.1.2 Terrestrial Mammals

Habitat Loss and Effects of Maintenance and Vehicle Traffic

The proposed highway would fragment wolf habitat; however, habitat fragmentation by itself is not likely to impact the regional wolf population (Person, personal communication, 2005). Wolves will move to beach and estuary habitats to prey on fish and marine mammals, and therefore would cross the highway or use it as a pathway to access these areas (Person, personal communication, 2005). There is no data to suggest that the highway would impact this movement (Person, personal communication, 2005). Hunting pressure as a result of increased access is more likely to impact wolves than fragmentation of habitat (Person, personal communication, 2005).

4.1.3 Terrestrial and Marine Birds

The Supplemental Draft EIS incorrectly stated that clearing activities would be avoided during nesting season in areas used by migratory birds to comply with the Migratory Bird Treaty Act (MTBA) (Section 4.1.2.5 of October 2004 *Wildlife Technical Report*). Clearing constraints are revised to be consistent with Executive Order (EO) 13186, which directs federal agencies to avoid or minimize to the extent practicable, adverse impacts to migratory bird resources. In keeping with this EO, preconstruction nest surveys would be conducted for the Queen Charlotte goshawk and trumpeter swans; this is consistent with USFS TLMP management policies. This clarification applies to Sections 4.2.2.3, 4.2.2.5, 4.2.3.3, 4.2.3.5, 4.2.4.3, 4.2.4.5, 4.2.5.3, 4.2.5.5, 4.2.6.3, and 4.2.6.5 of the 2004 *Wildlife Technical Report*.

Table 1
Wildlife Habitat Lost by Alternative (Acres[1,2])

Habitat Type	Alternative 2B	Alternative 3	Alternatives 4A & 4C	Alternatives 4B & 4D
Coastal Fringe Habitat[2,3]				
Beach Fringe	304	219	0	9
Estuary Fringe	71	110	0	32
SUBTOTAL	**375**	**329**	**0**	**41**
Terrestrial Habitat[2]				
Old-Growth Forest	286	286	0	25
Other Forest	128	95	0	0
Meadow/Muskeg and Shrub	13	14	0	2
Rock	1	0	0	0
SUBTOTAL	**428**	**395**	**0**	**27**
Wetlands[2]				
Forested	69	22	0	1
Scrub-shrub	1	1	0	1
Emergent	<1	2	0	0
Salt Marsh	0	2	0	0
SUBTOTAL	**70**	**27**	**0**	**2**
Marine Areas				
Beach Bars	2	5	0	0
Rocky Shores	30	7	0	2
Intertidal/ Subtidal[4]	36	13	1	2
SUBTOTAL	**68**	**25**	**1**	**4**

Notes: [1]Rounded to nearest acre
[2]There is overlap between categories. Terrestrial habitat provides the total for all habitat classifications. The other classifications are subtotals with some overlap.
[3]This area consists of project facilities located with approximately 500 feet of saltwater and include all types of terrestrial and wetland habitats as well as rocky shores and beach bars.
[4]Includes fill and dredge for ferry terminals and highway construction but not sidecasted shot rock.

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

4.2.1 Overall Habitat Loss

As described in Table 1, Alternative 2B would result in a loss of 304 acres of beachfront habitat and 71 acres of estuary fringe. This change from the 2005 *Supplemental Draft EIS* is due to alignment changes. These changes were implemented to reduce impacts to wetland habitats.

Alternative 2B would result in the permanent loss of 428 acres of terrestrial habitat (Table 1). Of this total, approximately 286 acres is classified as old-growth forest. A total of 128 acres of other forest, consisting of small trees or lower tree density, would be lost with Alternative 2B.

Loss of non-forested habitat includes 13 acres of shrub, open meadow, and muskeg communities along major rivers.

Approximately 70 acres of wetlands would also be lost, 69.4 acres of which would be forested wetlands and are included in the old-growth forest category totals (Table 1). Other wetlands filled under Alternative 2B would include 0.7 acre of palustrine scrub-shrub wetlands and 0.2 acre of estuarine emergent wetlands. Wetlands lost as a result of Alternative 2B would occur primarily between Slate Creek and Sherman Point on the east side of Lynn Canal (Figures 2 and 3).

A total of 32 acres of intertidal/subtidal areas would be lost with Alternative 2B, including approximately 2 acres of beach bar and 30 acres of rocky shore habitat. This loss would occur at the Katzehin ferry terminal and locations where the highway comes to the shoreline north of Sherman Point.

4.2.2 Old-Growth Forest

Alternative 2B would result in the loss of 286 acres of old-growth forest, most of which is in the Tongass National Forest. As discussed in Section 3.1.1, the TLMP establishes an old-growth reserve system to manage this important habitat for many terrestrial species. Alternative 2B would impact three mapped small old-growth reserves established under the reserve system:

- **VCU 160** – Alternative 2B would run through a mapped small old-growth reserve in VCU 160 in the Slate Cove area. There is a concentration of blocks of high volume old-growth and a larger amount of low volume old-growth. Within the reserve, Alternative 2B would run through the high volume old-growth forest. The reserve covers 1,454 acres. Alternative 2B would reduce the entire small mapped reserve by about 29.8 acres, and the highway corridor would separate the reserve into two areas. The remaining inland reserve area would be 930.6 acres, and the remaining reserve area on the shoreward side would be 493.6 acres. Alternative 2B would reduce the VCU 160 mapped small old-growth reserve by 2 percent.
- **VCU 200** – Alternative 2B would intersect one mapped small old-growth reserve in VCU 200, located at the south end of Point Saint Mary peninsula adjacent to VCU 160. This reserve consists of much land that is not old-growth, and most of the old-growth forest is medium volume forest. The reserve contains four intermittent small blocks of high volume old-growth near the south tip of the peninsula. Within the VCU 200 reserve, Alternative 2B would run through low volume old-growth and does not affect the high volume old-growth forest blocks in the reserve. The reserve contains 3,306.2 acres. Alternative 2B would reduce the entire small reserve mapped by about 18 acres, and the highway corridor would separate the reserve into two areas. The remaining inland area would be 456.0 acres; the remaining shoreward area would be 2,832.2 acres. Alternative 2B would reduce the VCU 200 mapped small old-growth reserve by 0.5 percent.
- **VCU 190** – Alternative 2B would cross this mapped small old-growth reserve from north of Comet to approximately Met Point. This reserve consists of much land that is not old-growth, and some medium volume old-growth forest. There are two intermittent blocks of high volume old-growth located inland. In the reserve, Alternative 2B would run through medium volume old-growth forest. The reserve covers 1,462.0 acres. Alternative 2B would reduce the size of the reserve by about 20.4 acres, and the highway corridor would separate the reserve into two areas. The remaining inland reserve area would be 1,408.4 acres; the shoreward reserve would be 33.2 acres.

Alternative 2B would reduce the VCU 190 mapped small old-growth reserve by 1.4 percent.

In addition to the mapped old-growth reserves, Alternative 2B would go through old-growth forested areas within lands designated as Non-Development LUDs that are presumed to function as medium and/or large old-growth reserves. The lands within all of these LUDs contain stands of old-growth forest, some of which are high volume, and others are low volume. Alternative 2B would reduce the size of the old-growth forest stands in all VCUs, as well as create a separation of some old-growth forest areas into downslope and upslope areas. Alternative 2B would remove approximately 286 of 76,279 acres of old-growth forest along the east side of Lynn Canal (USFS, 2003). The USFS in consultation with ADF&G and USFWS would adjust the boundaries of affected old-growth reserves if Alternative 2B were implemented.

4.2.3 Terrestrial Mammals

Habitat Loss and Effects of Maintenance and Vehicle Traffic

Salmon spawning is limited to the lower reaches of Sawmill Creek because of a waterfall near the mouth. The proposed highway would be located above this waterfall and avoid the salmon spawning habitat; however, the highway as a potential barrier could prevent bear from feeding on the spawning salmon. Black bears are known to feed on salmon at the Sawmill Creek estuary, below the highway alignment. The 110-foot-long crossing of Sawmill Creek would be in an area where the stream is 15 feet wide, thereby maintaining a terrestrial corridor along the stream bank for bears to cross under the highway.

In the project study area, mountain goats occur throughout the steep mountain habitat and upper forested slopes on both sides of Lynn Canal (Figure 8). Although goats seldom wander far from steep slopes or cliffs, they are often forced into old-growth forests at low elevations during the winter. Goats may use lower elevations along the proposed highway alignment (Alternative 2B) between Comet and Slate Cove to avoid deep snow conditions (ABR Inc., 2000). However, this is not high quality winter habitat for goats because it lacks forest cover. Using GIS, fragmentation of winter goat habitat was calculated as that from the cut and fill limit to the coastline. Roughly 448 acres of winter goat habitat from Katzehin River to Independence Creek would be fragmented and 693 acres from Antler River to Echo Cove. Fragmentation of this habitat is not likely to impact the areas mountain goat population.

The mature forest habitat along the shoreline potentially serves as a movement corridor for marten between high-density forest areas in Berners Bay, to the Katzehin River drainage. A highway would reduce the size of this corridor of fringe habitat that may potentially reduce movement of marten between these areas (N. Barten and T. Schumacher, personal communication, 2005).

4.3 Alternative 3 – West Lynn Canal Highway

4.3.1 Overall Habitat Loss

Under Alternative 3, approximately 395 acres of terrestrial habitat would be lost, including 286 acres of old-growth forest and 95 acres of other forest. A total of 14 acres of non-forest habitat would be lost in the vicinity of the major rivers crossed by Alternative 3, including shrub-scrub, meadows, and muskeg. The loss of this terrestrial habitat represents about 0.5 percent of the 74,470 acres of old-growth forest in the Wildlife Analysis Areas (WAAs) affected by the West Lynn Canal Highway alignment.

Approximately 27 acres of wetlands would also be lost, 22 acres of which would be forested wetlands and are included in the old-growth forest category totals (Table 1). Other wetlands filled under Alternative 3 would include 2.3 acres of palustrine emergent wetlands, 0.7 acre of palustrine scrub-shrub wetlands, and 1.5 acres of estuarine emergent wetlands. Of the total wetland impact resulting from Alternative 3, 1.2 acres of forested wetlands and 0.7 acre of palustrine scrub-shrub wetlands would be on the east side of Lynn Canal between Echo Cove and the Sawmill Cove terminal. Of the 21 acres of wetlands lost with Alternative 3 between William Henry Bay and Davidson Glacier, most are located just north of the Sullivan River (Figures 1 through 5).

Alternative 3 would result in the loss of 5 acres of beach bar and 7 acres of rocky shore habitat. This loss would occur at the Sawmill Cove and William Henry Bay ferry terminals and at locations where the highway comes to the shoreline between William Henry Bay and Haines.

4.3.2 Old-Growth Forest

Alternative 3 would result in the loss of 286 acres of old-growth forest, much of which is in the Tongass National Forest. As discussed in Section 2.1.1, the TMLP establishes an old-growth reserve system to manage this important habitat for many terrestrial species. Alternative 3 would not impact any mapped old-growth reserves (Figure 6). Alternative 3 would go through old-growth forested areas within lands designated as Non-Development LUDs that are presumed to function as medium and/or large old-growth reserves. The lands within all of these LUDs contain stands of old-growth forest, some of which are high volume, and others are low volume. Alternative 3 would reduce the size of the old-growth forest stands in all VCUs, as well as create a separation of some old-growth forest areas into downslope and upslope areas. Continued coordination with USFS will be necessary to determine impacts to old-growth reserves.

4.3.3 Terrestrial mammals

Habitat loss and effects of maintenance vehicle traffic

As stated in Section 3.2.3, goats, periodically, wander into old-growth forest at low elevations during winter. Goats may use areas along the Alternative 3 alignment to avoid deep snow conditions. Figure 8 depicts predicted areas where goats may forage. Using GIS, fragmentation of winter goat habitat was calculated as that from the cut and fill limit to the coastline. Roughly 1,750 acres of winter goat habitat from Pyramid Harbor to William Henry Bay would be fragmented. Fragmentation of this habitat is not likely to impact the area's mountain goat population.

4.4 Alternatives 4B and 4D

4.4.1 Overall Habitat Loss

Alternatives 4B and 4D would result in the loss of 27 acres of terrestrial habitat including 25 acres of old-growth forest habitat and 2 acres of grassland/meadow habitat. Approximately 91 percent of this habitat is located in the coastal fringe. Approximately 2 acres of wetlands would also be lost.

4.4.2 Old-Growth Forest

Alternatives 4B and 4D would result in the loss of 25 acres of old-growth forest, much of which is in the Tongass National Forest. As discussed in Section 2.1.1, the TMLP establishes an old-growth reserve system to manage this important habitat for many terrestrial species. Alternatives 4B and 4D would not impact any mapped old-growth reserves. The highway segment for these alternatives would go through old-growth forested areas within lands designated as Non-Development LUDs that are presumed to function as medium and/or large old-growth reserves. The lands within all of these LUDs contain stands of old-growth forest, some of which are high volume, and others are low volume. Alternatives 4B and 4D would reduce the size of the old-growth forest stands in all VCUs, as well as create a separation of some old-growth forest areas into downslope and upslope areas. These alternatives would remove approximately 25 of 76,279 acres of old-growth forest along the east side of Lynn Canal (USFS, 2003). Continued coordination with USFS will be necessary to determine impacts to old-growth reserves.

5.0 MITIGATION MEASURES

The Department of Transportation and Public Facilities (DOT&PF) has committed to implementing the following revised wildlife mitigation measures as part of the Juneau Access Improvements Project:

5.1 Amphibians

1. The East Lynn Canal Highway alignment has been moved completely out of palustrine emergent wetlands to avoid potential impacts to amphibian breeding areas. Preconstruction survey of the alignment in wetland areas would be conducted to confirm that no amphibian ponds were missed during wetland mapping.
2. The potential for habitat damage from unauthorized off road vehicles (ORVs) could also impact amphibians in wetland areas. DOT&PF has revised the East Lynn Canal Highway alignment in the Berners Bay area to make access to estuarine emergent wetlands more difficult. The alignment has been moved completely out of palustrine emergent wetlands to avoid potential impacts to amphibians. These changes would also reduce access to easily ORV-traversed wetlands used by amphibians.

5.2 Birds

1. Nesting surveys for trumpeter swan and Queen Charlotte goshawk would be conducted prior to construction in appropriate habitats to avoid disturbing nesting activities during this period.
2. Refer to the Addendum to *Appendix R*, *Bald Eagle Technical Report* for detail regarding bald eagle mitigation measures.

5.3 Marine Mammals

1. Pile driving at the Katzehin Ferry Terminal and multi-span bridge construction sites would be done with vibratory hammers to reduce the intensity of the sound generated.
2. Trained observers would monitor for the presence of marine mammals and construction would be halted if any animals come within 200 meters of the activity.
3. Refer to the Addendum to *Appendix S*, *Steller Sea Lion Technical Report*, for details regarding Steller sea lion mitigation measures.

5.4 Terrestrial Mammals

1. Planning for any camps necessary during construction of the project would include BMPs for handling food, trash, and other potential wildlife attractants to reduce impacts.
2. Bridges across streams would be designed to also function as wildlife underpasses; wildlife underpasses would be located at the two identified major brown bear migration corridors in the isthmus between the Antler and Lace rivers.
3. DOT&PF would coordinate with ADF&G to avoid construction during the months of January through April to the extent practicable at locations that goat monitoring identifies as important for pregnant nannies.
4. DOT&PF recognizes the need for detailed wildlife population and habitat use data in order to revise management of these populations to reflect habitat loss and change in use, loss due to vehicle collisions, and hunting, both legal and illegal. DOT&PF commits to funding detailed population studies, with animal collaring, for goats, moose, brown bears, and

wolverine, as mitigation for indirect impacts to wildlife. In order to coordinate with goat studies conducted under the Kensington Gold Project, the goat study commenced in 2005.

5. Pre-construction wolf den surveys would be conducted within 600 feet of the project construction limits in any areas that consultation with the resource agencies identify as having high potential for wolf dens. Further agency consultation would occur if wolf dens were identified to determine appropriate measures to minimize impacts.

5.5 Terrestrial Habitat

1. Only certified seed mixtures would be used to seed exposed soils.
2. Soil from outside the project boundaries would not be imported to the project site. Any soil within the project boundaries identified as containing invasive species would not be transported to other areas of the project.
3. Construction equipment would be steam cleaned prior to use on the project.

6.0 LIST OF PREPARERS

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FIGURES

Eight figures, listed below, are provided in this addendum to clarify or illustrate information regarding wetlands classifications, LUDs, wildlife habitat, and habitat fragmentation beyond what was provided in Appendix O, the 2004 W*ildlife Technical Report*. Many of these figures are updated versions of figures originally presented in the 2004 technical report. Figures 1 through 5 are replacement figures for Figures 4-1 through 4-5. Figures 7 and 8 are updated versions of Figures 3-2 and 3-1.

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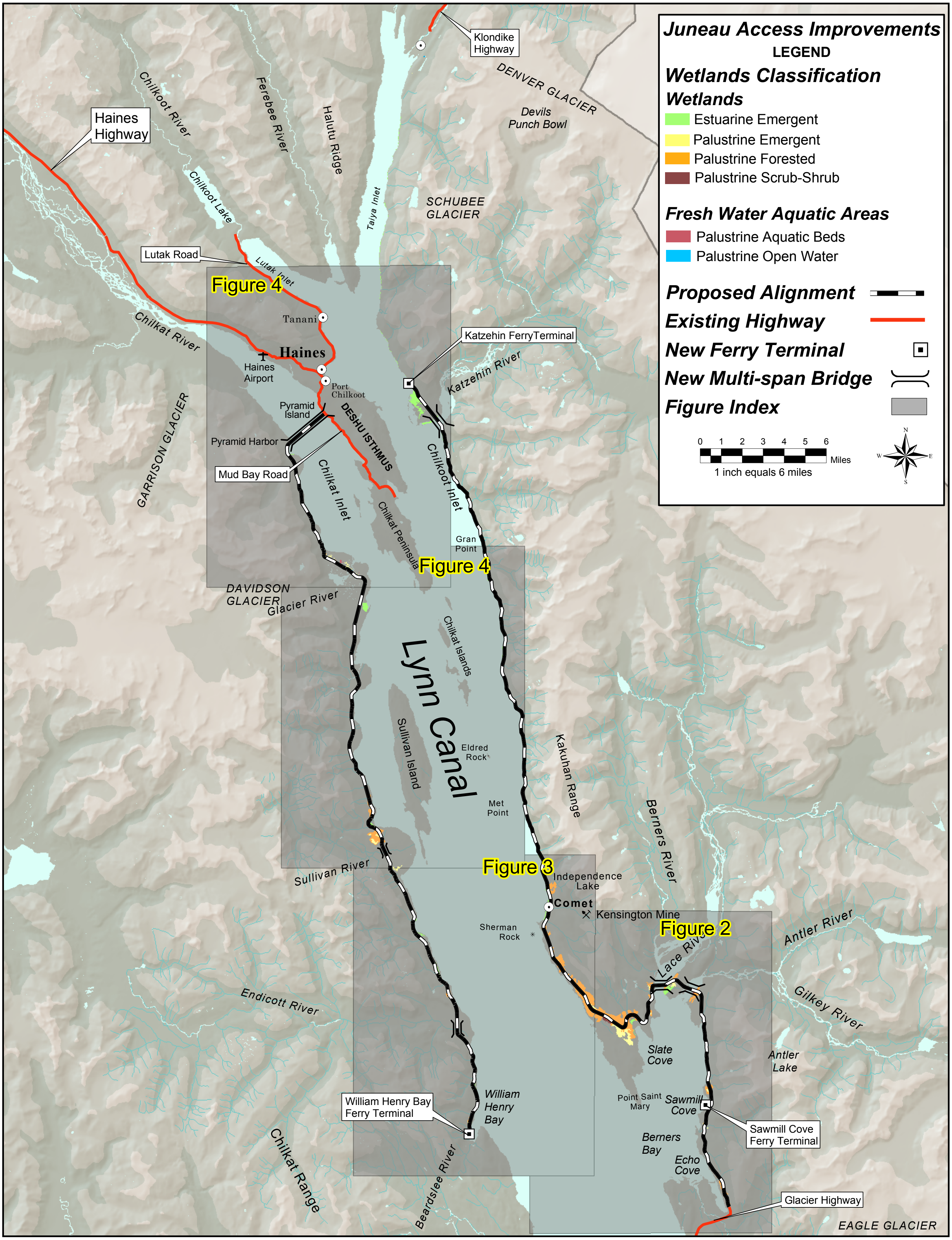

Figure 1
Wetlands Classifications Figure Index

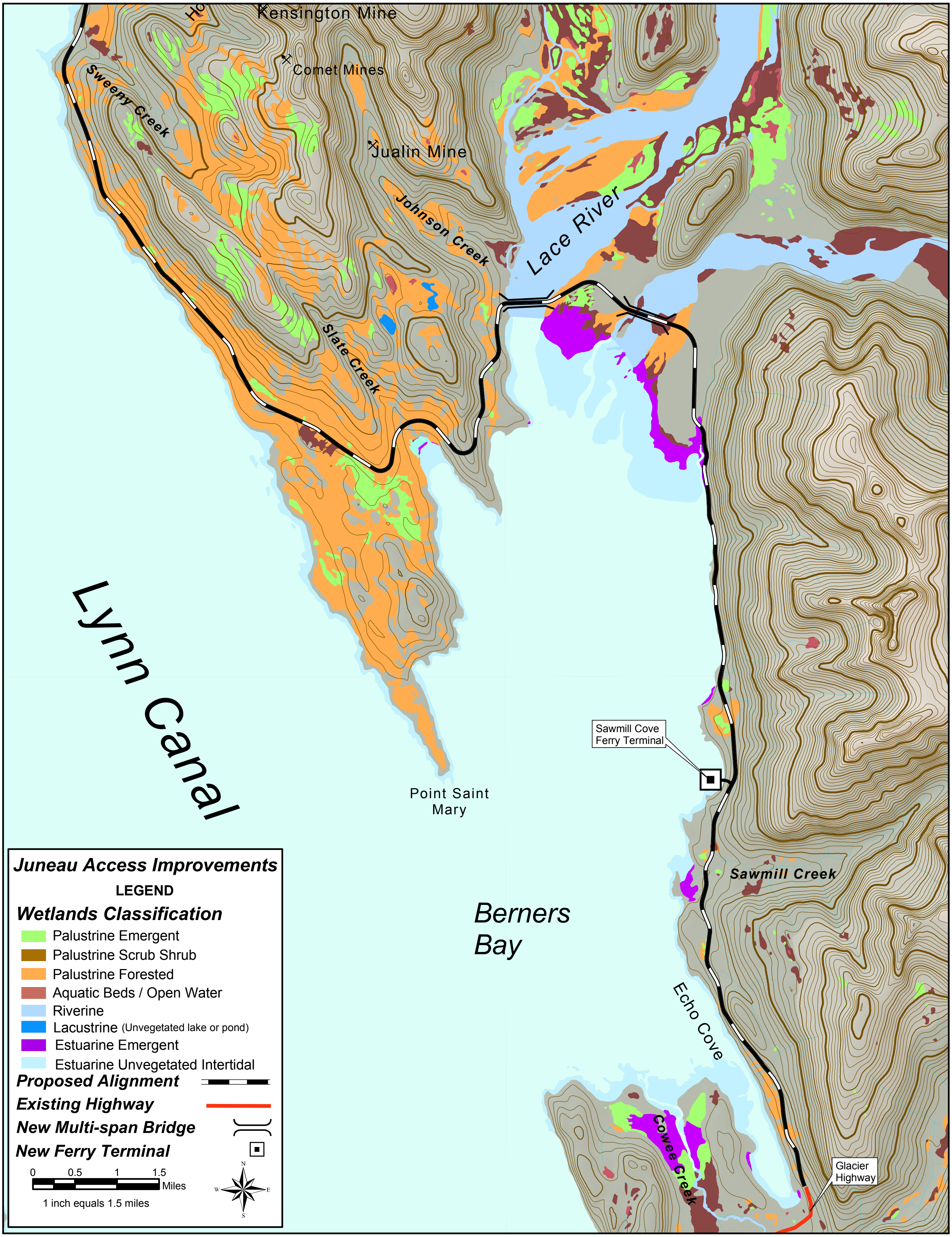

Figure 2
Wetlands Classifications for Berners Bay Area

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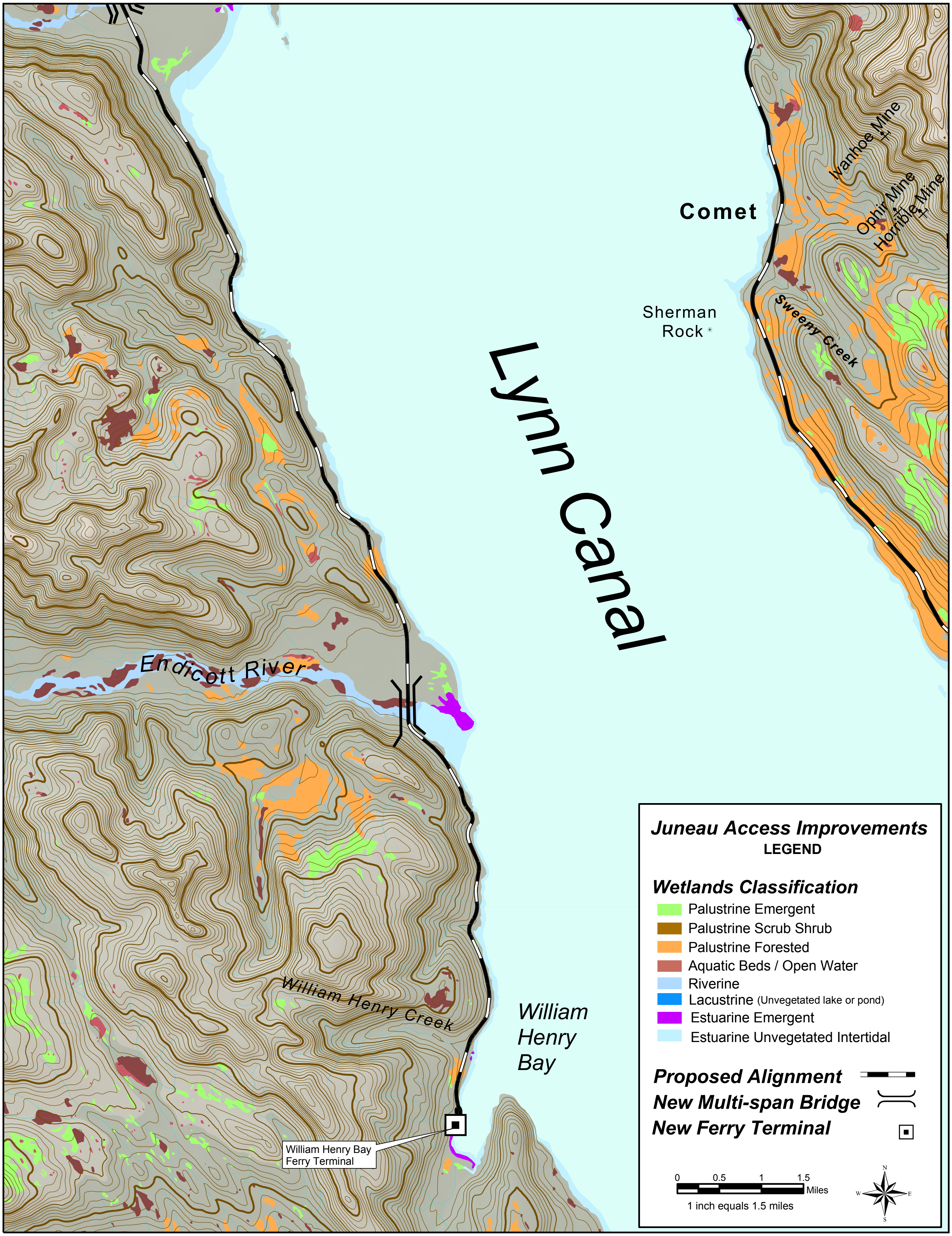

Figure 3
Wetlands Classifications for William Henry Bay Area and Comet Area

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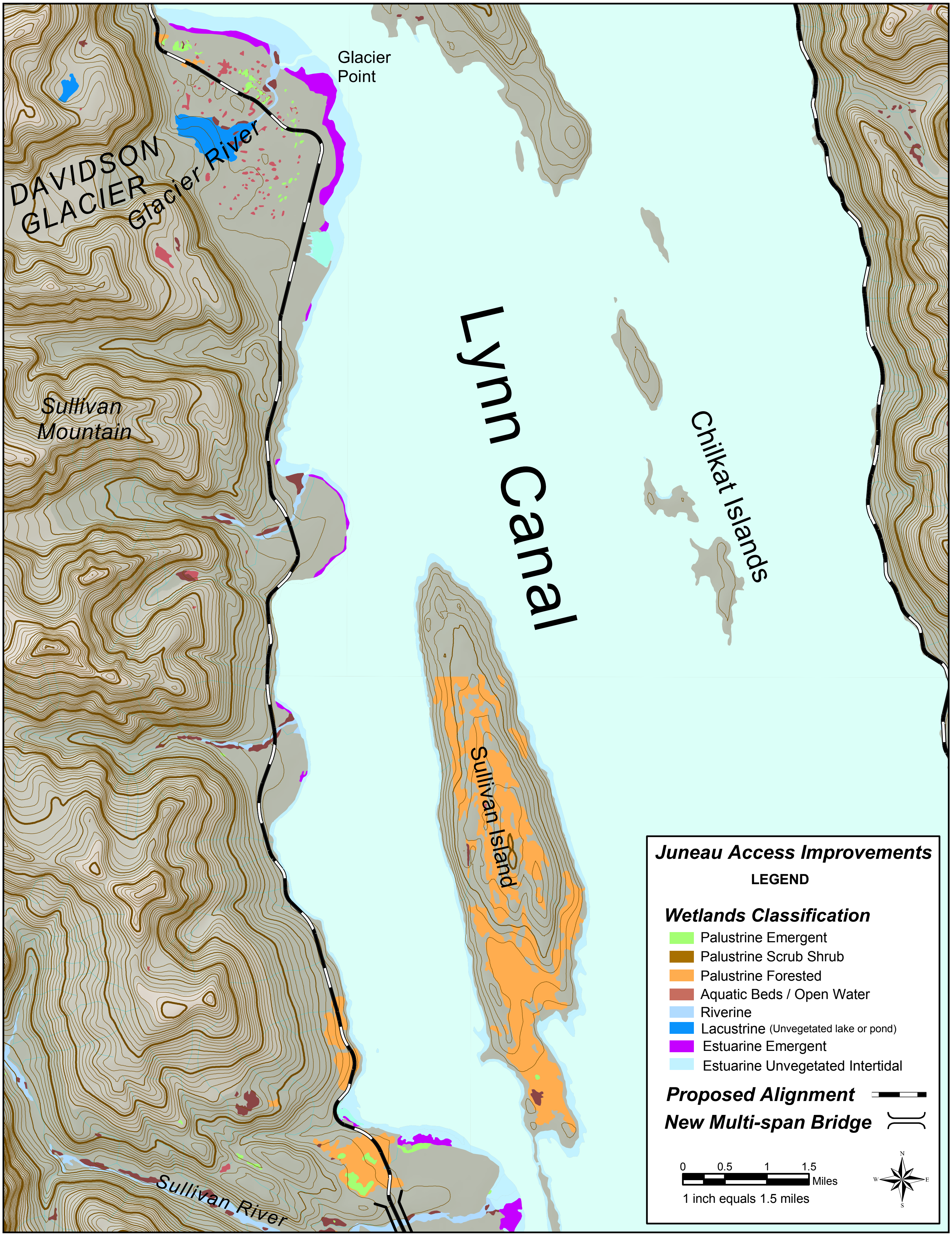

Figure 4
Wetlands Classifications for Sullivan River Area

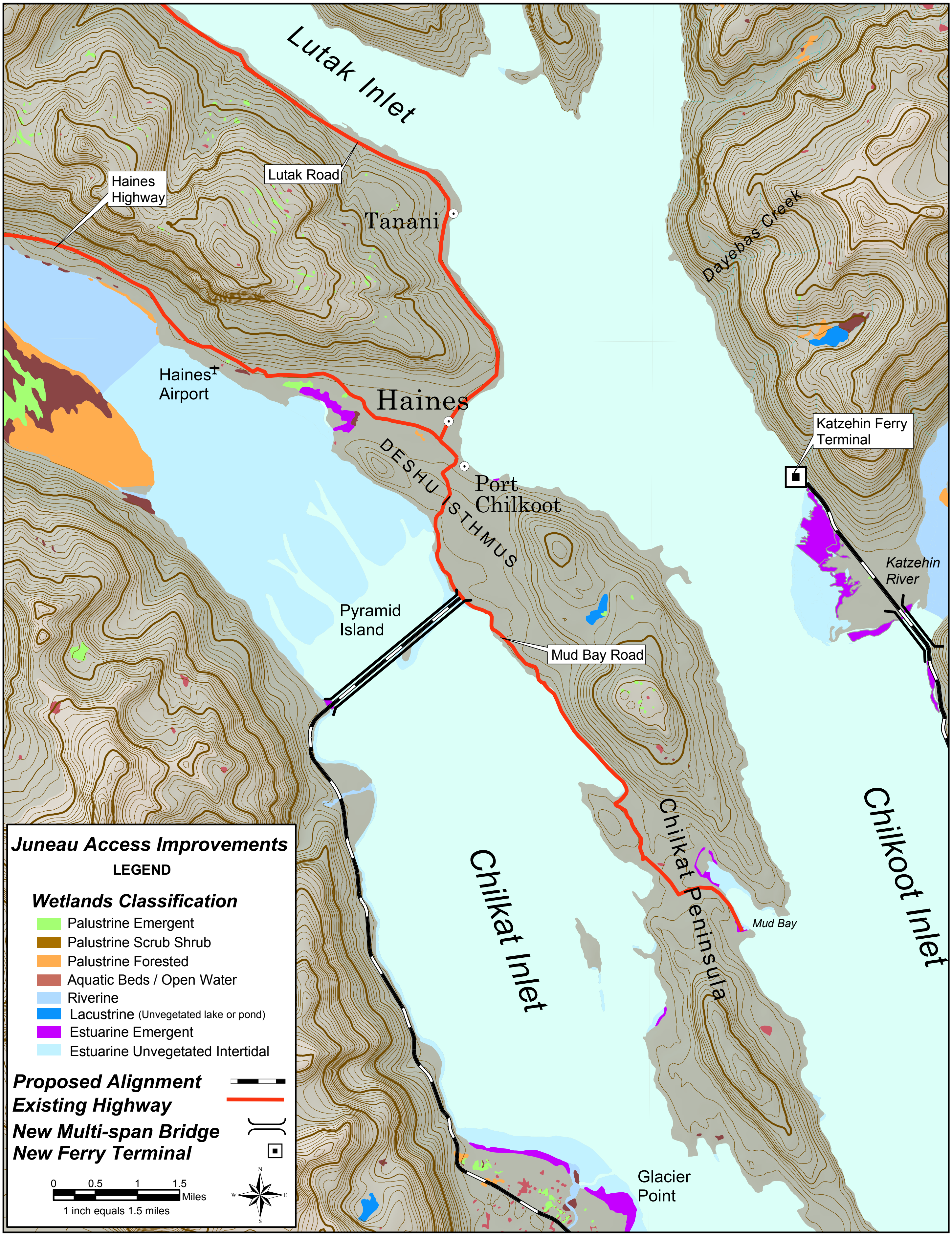

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Figure 5
Wetlands Classifications for Haines Area

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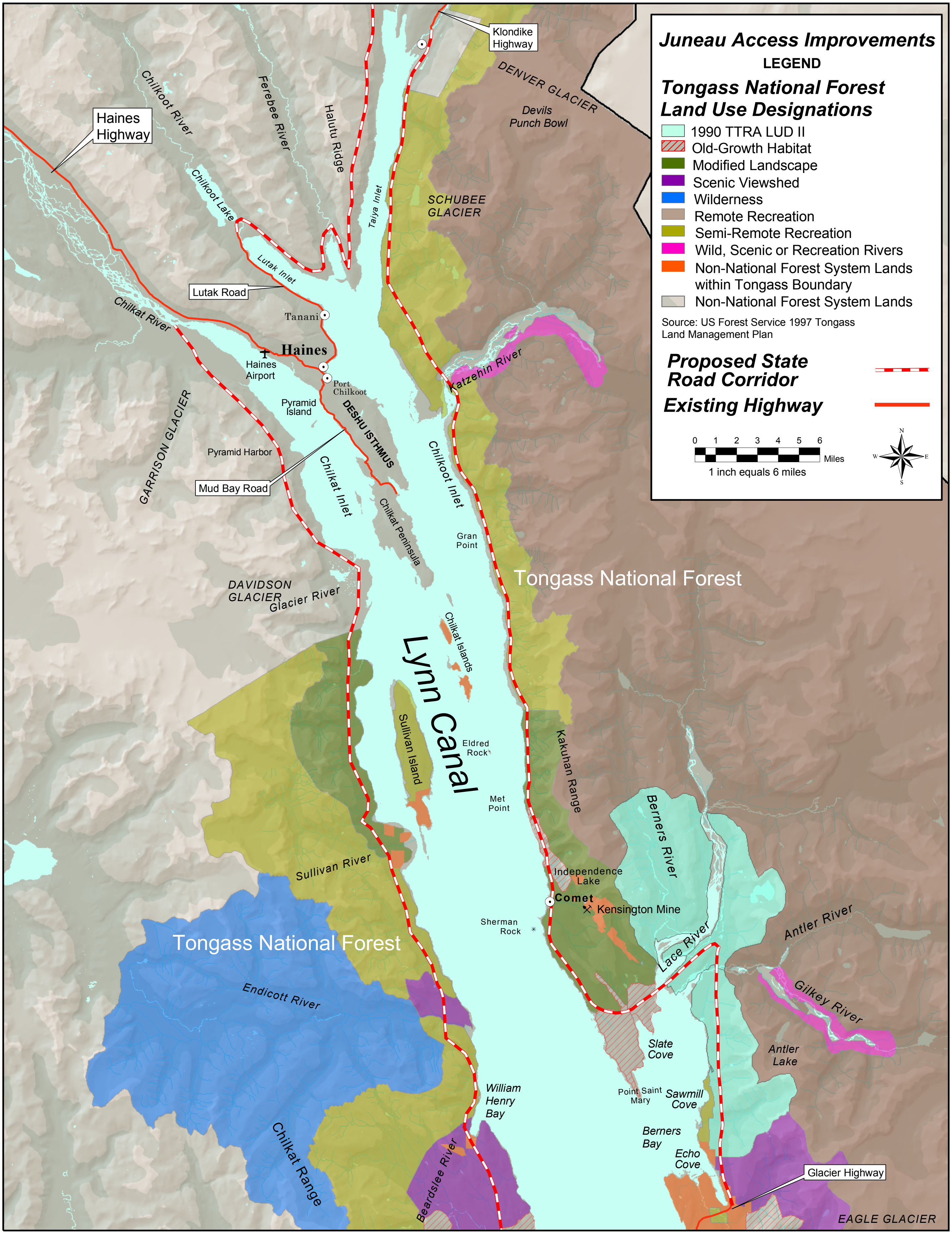

Figure 6
Tongass Land Management Plan Land Use Designations

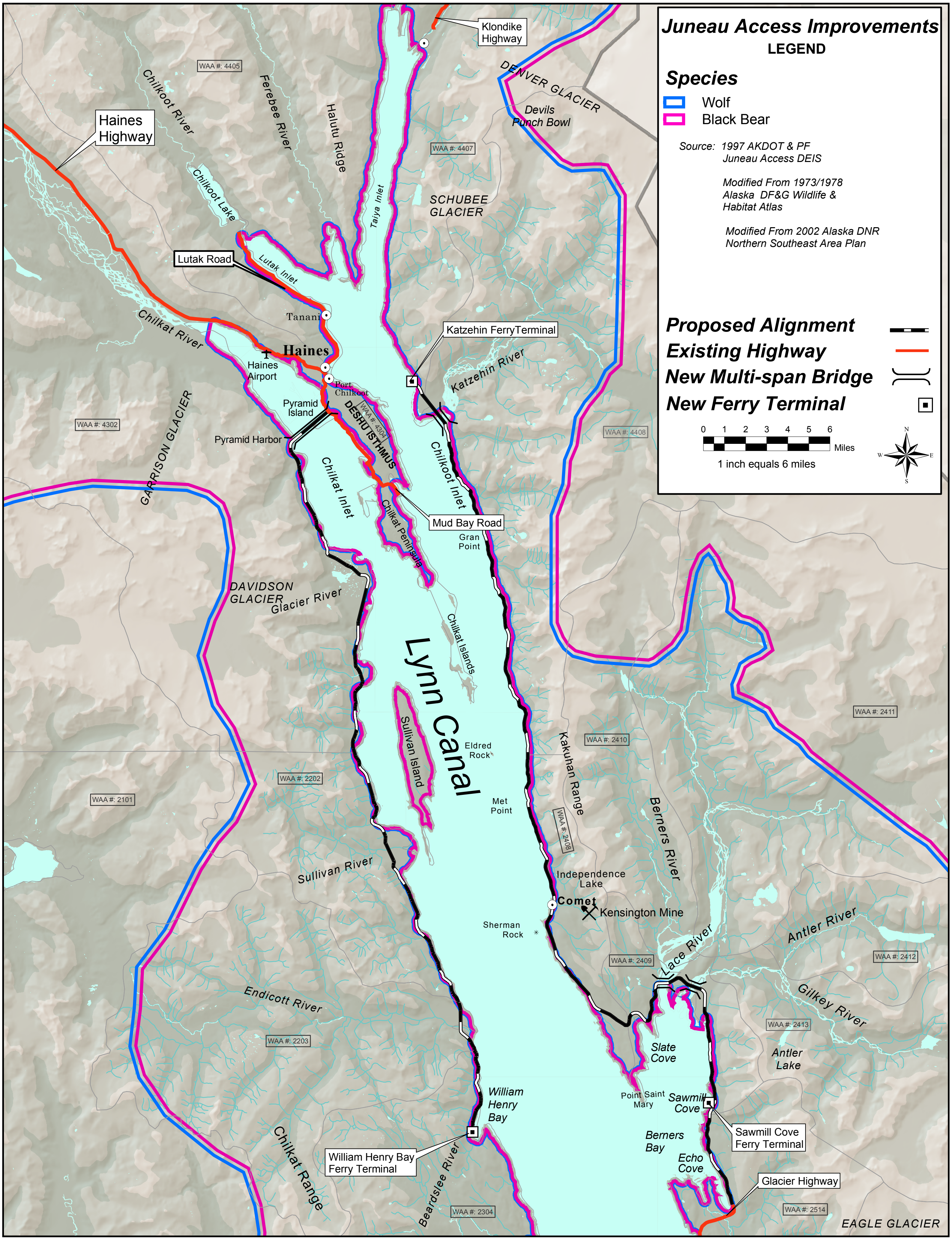

Figure 7
Wolf and Black Bear Habitat in Lynn Canal

M:\Data\ADOT\Juneau_Access\Figures\Tech Report Figures\Wildlife\Addendum Figure 8_mountain_goat_brown_bear_marten.mxd

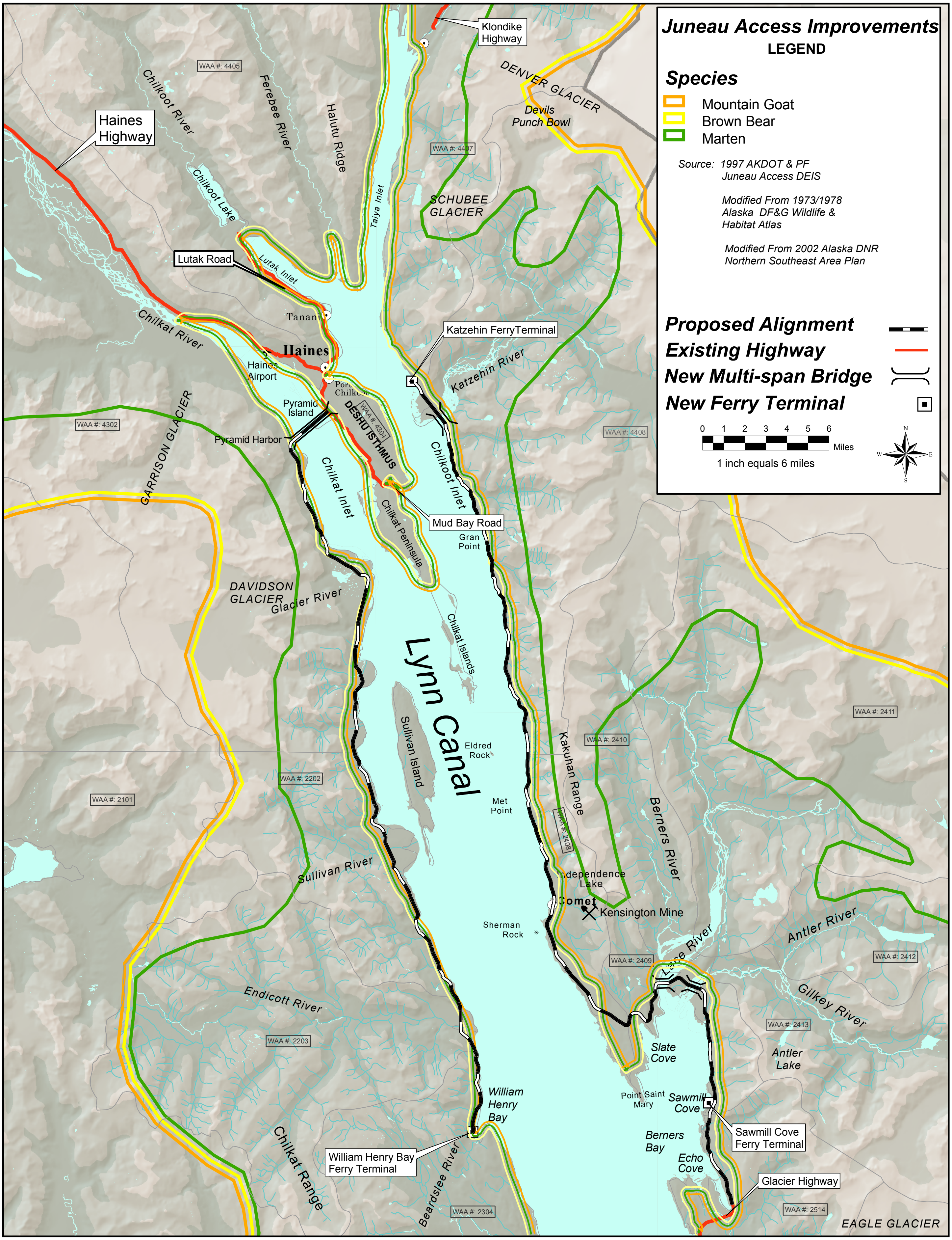

Figure 8
Mountain Goat, Brown Bear and Marten Habitat in Lynn Canal

Addendum to Appendix R

Bald Eagle Technical Report

Prepared by

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OCTOBER 2005

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TABLES

FIGURES

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1.0 STUDIES AND COORDINATION

This technical report addendum includes supplemental survey data collected by the U.S. Fish and Wildlife Service (USFWS) in fall of 2004 and summer of 2005. The results of these surveys were included in the preparation of the new August 2005 highway alignment for Alternative 2B. This information is an update to that presented in the *Appendix R Bald Eagle Technical Report* included with the Supplemental Draft EIS.

In the summer of 2004, USFWS conducted a bald eagle survey on the east and west sides of Lynn Canal (USFWS, 2005). Ninety-two nest sites were surveyed on the east side of Lynn Canal, of which 35 were considered active and 17 were considered successful nests (49 percent of active nests were successful). On the west side of Lynn Canal, 50 nest sites were surveyed, of which 26 were considered active and 16 were considered successful nests (62 percent of active nests were successful). This survey revealed 5 new nests on the west side of Lynn Canal, all outside the 330-foot buffer area of Alternative 3. One of the nests detected within the 300-foot buffer area during the 2003 survey is now gone. Three nests are within 125 feet of the centerline of the Alternative 3 alignment (refer to Table 1).

In summer of 2005, USFWS conducted a bald eagle survey along the east side of Lynn Canal. Ninety-eight nests were surveyed during this time, of which 45 were considered active and 22 were considered successful nests (49 percent of active nests were successful). The survey identified 8 new nests within the project area. Three are outside the 330-foot buffer area for Alternative 2B, including 1 north of the alignment in Taiya Inlet. Five are within 125 feet of the centerline of the Alternative 2B alignment (USFWS, 2005). None of the nests are within the 300-foot buffer for Alternatives 4B and 4D (refer to Table 1).

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2.0 ENVIRONMENTAL CONSEQUENCES

This addendum updates Sections 4.2, 4.6, and 4.8 of the *Bald Eagle Technical Report* (Appendix R).

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

Proximity of construction activities to eagle nests – For Alternative 2B, 49 out of 92 nests (53 percent) could not be reasonably avoided by more than 330 feet. Of these 49 nests, 3 are within 31 to 90 feet of the proposed slope limits, 20 are within 91 to 180 feet, and 8 are within 181 to 300 feet (Table 1). Figures 1 through 5 include bald eagle nest tree locations from the 2004 and 2005 surveys on the east side of Lynn Canal.

2.2 Alternative 3 – West Lynn Canal Highway

Proximity of construction activities to eagle nests – Fifty bald eagle nest sites were recorded within 0.5 mile of the highway alignment for this alternative during USFWS surveys in 2004. This total includes 10 nests on the east side of Lynn Canal between Echo Cove and Sawmill Cove. Of the total nests surveyed in 2004, 52 percent were found to be active (Table 1). After adjusting the highway alignment and ferry terminal locations to avoid nest sites to the extent feasible, a total of 24 nests (48 percent) remained within 330 feet of the slope limits, all of which are on the west side of Lynn Canal. Of these 24 nests, none are within 31 to 90 feet of the slope limits, 8 are within 91 to 180 feet, and 8 are within 181 to 300 feet (Table 1). Figures 1 and 6 through 8 include bald eagle nest tree locations for west Lynn Canal.

2.3 Alternatives 4B and 4D – FVF/Conventional Hull shuttle from Berners Bay

Proximity of construction activities to eagle nests – Construction of the highway between Echo Cove and Sawmill Cove would pass 10 bald eagle nests, none of which are within 330 feet of the construction limits for the highway (Table 1). The ferry terminal and associated facilities at Sawmill Cove would be at least 1,000 feet away from the nearest nest, (FWS#31), located to the northeast of the facility.

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3.0 MITIGATION MEASURES

The Department of Transportation and Public Facilities (DOT&PF) has committed to implementing the following revised bald eagle mitigation measures as part of the Juneau Access Improvements Project.

1. On-the-ground nest surveys would be conducted before clearing takes place to confirm the location of trees with eagle nests. Construction activities in the vicinity of bald eagle nests would be coordinated with the USFWS to determine the need for alignment changes, blasting plan changes, or other measures to avoid impacts to eagles.
2. No construction would occur within 330 feet of an eagle nest, and no blasting would occur within 0.5 mile of an eagle nest unless the USFWS approves a plan to ensure nest selection is not affected, during the March 1 to May 31 nest selection period. If a nest were active, no construction or blasting would occur within these distances until after August 31, unless the USFWS approves a plan to avoid impacts while operations continue.
3. In areas where clearing occurs to within 100 feet of a nest tree, DOT&PF and USFWS would jointly assess the potential for windthrow and stabilize the tree or adjacent trees with cables and or log bracing, if determined necessary.
4. During construction, DOT&PF and USFWS would assess the sufficiency of natural screening between the highway and any eagle nests below the elevation of the road within the 330-foot zone. Additional screening would be developed if necessary.
5. DOT&PF would continue to fund USFWS aerial surveys for a period of five years to assess the impact, if any, of the project on the Lynn Canal bald eagle population.

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4.0 REFERENCES

United States Fish and Wildlife Service (USFWS). 2005. Lynn Canal Bald Eagle Survey data collected by Mike Jacobson for 2004 and 2005, personal communication, August 18, 2005.

TABLES

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Table 1
Bald Eagle Productivity,
Lynn Canal Juneau Access Improvements Project

East Lynn Canal

	1994	1997	1998	1999	2000	2001	2002	2003	2004	2005	Mean
Nest sites surveyed	(78)	76[a] (71)[b]	76[a] (71)[b]	82	88	83	82	94	92	98	85.7
Active nests	(38)	20[a] (18)[b] (25%)	26[a] (24)[b] (34%)	28 (34%)	38 (43%)	35 (42%)	46 (56%)	37 (39%)	35 (38%)	45 (46%)	34.4 (40%)
Successful nests		4[a] (3)[b] (4%)	8[a] (7)[b] (10%)	14 (17%)	17 (19%)	22 (26%)	18 (22%)	20 (21%)	17 (19%)	22 (22%)	15.8 (18%)
Active nests successful		17%	29%	50%	45%	63%	39%	54%	49%	49%	44%
Young/active nest		0.22	0.29	0.57	0.53	0.91	0.54	0.78	0.60	0.64	0.56
Young/successful nest		1.33	1.00	1.14	1.18	1.45	1.39	1.40	1.24	1.32	1.27

Notes: [a]Adjusted for 15 kilometers of shoreline, which was not surveyed that year
[b]Actual count of area

West Lynn Canal

	1994	2003	2004
Nest sites surveyed	43	53	50
Active nests	NA	22 (42%)	26 (52%)
Successful nests	18 (42%)	10 (19%)	16 (32%)
Active nests successful	NA	45%	62%
Young/active nest	NA	0.64	0.69
Young/successful nest	1.39-1.72	1.40	1.13

Note: NA = Data not available

Table 2
Number of Bald Eagle Nests Within 0.5 Mile and Distance to Proposed Alignments, Juneau Access Improvements Project

Distance from Highway Limits[2]	No Action	East Lynn Canal (05)	West Lynn Canal (04)	Alaska Marine Highway System Improvements			
	Alt. 1	Alt. 2B	Alt. 3	Alt. 4A	Alt. 4B	Alt. 4C	Alt. 4D
330 ft - 0.5 mile	-	43	26	-	10	-	10
301 - 330 ft	-	1	3	-	0	-	0
271 - 300 ft	-	1	2	-	0	-	0
241 - 270 ft	-	3	3	-	0	-	0
211 - 240 ft	-	2	1	-	0	-	0
181 - 210 ft	-	2	2	-	0	-	0
151 - 180 ft	-	5	5	-	0	-	0
121 - 150 ft	-	14	2	-	0	-	0
91 - 120 ft	-	1	1	-	0	-	0
61 - 90 ft	-	3	0	-	0	-	0
31 - 60 ft	-	0	0	-	0	-	0
1 - 30 ft	-	0	0	-	0	-	0
Total nests < 330 ft	-	49	24	-	0	-	0
Total Nests	-	92	50	-	10	-	10

Notes: [1] Alignments as of 24 August 2005 for east side, 31 December 2003 west side
[2] Clearing and cut/fill limits are considered the extent of construction activity
Dash (-) indicates not applicable
Nest location data from Mike Jacobson, USFWS, Raptor Management, Juneau, AK

FIGURES

Figures 1 through 8 of Appendix R, the *Bald Eagle Technical Report*, have been updated with the results of the 2004 and 2005 USFWS survey, and in consideration of the new Alternative 2B alignment. The updated versions of these figures, listed below, are provided herein.

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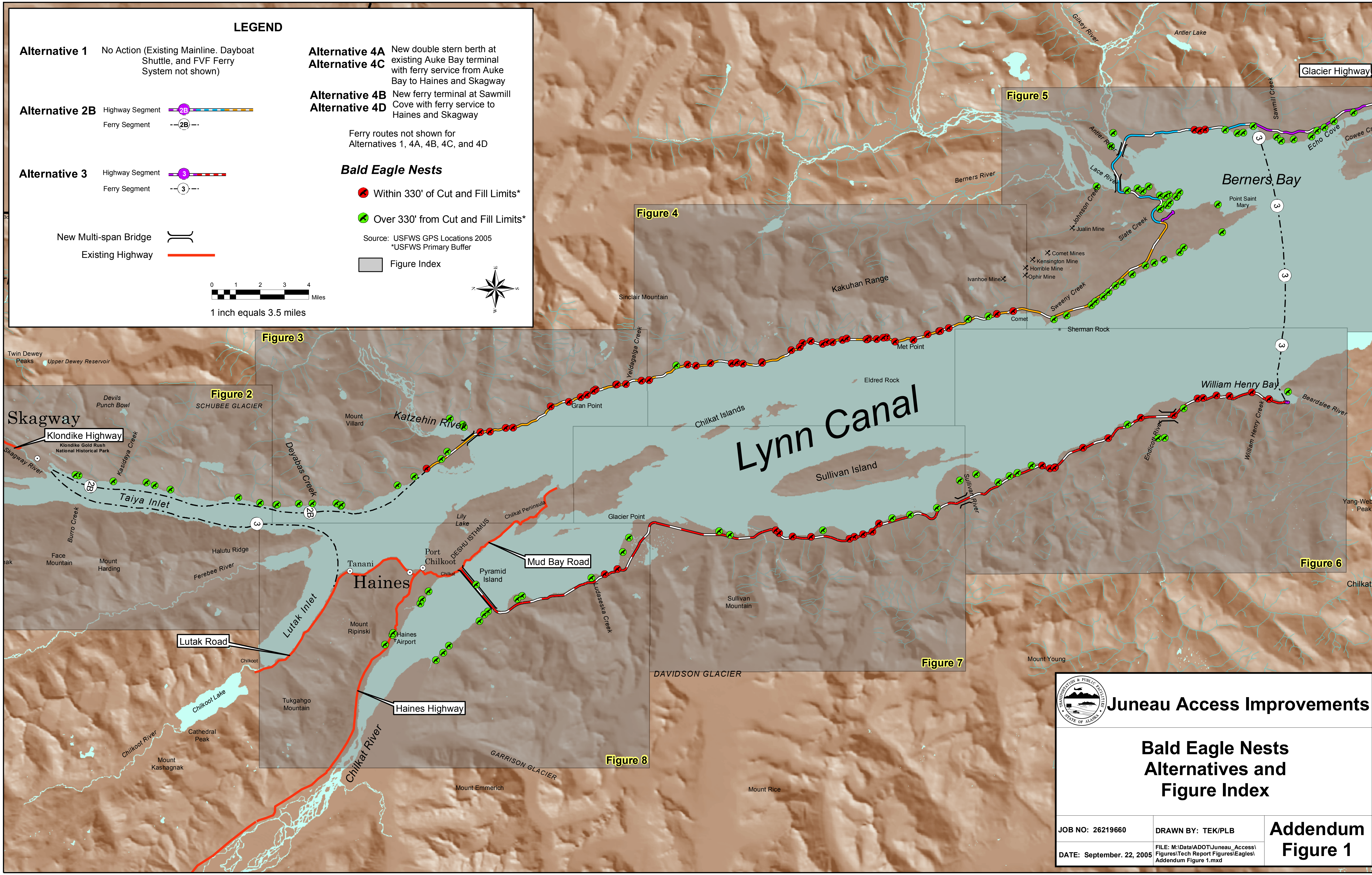
LEGEND
Alternative 1
No Action (Existing Mainline. Dayboat Shuttle, and FVF Ferry System not shown)
Alternative 2B
Highway Segment
Ferry Segment
Alternative 3
Highway Segment
Ferry Segment
New Multi-span Bridge
Existing Highway
Alternative 4A
Alternative 4C
New double stern berth at existing Auke Bay terminal with ferry service from Auke Bay to Haines and Skagway
Alternative 4B
Alternative 4D
New ferry terminal at Sawmill Cove with ferry service to Haines and Skagway
Ferry routes not shown for Alternatives 1, 4A, 4B, 4C, and 4D
Bald Eagle Nests
Within 330' of Cut and Fill Limits*
Over 330' from Cut and Fill Limits*
Source: USFWS GPS Locations 2005
*USFWS Primary Buffer
Figure Index
0 1 2 3 4 Miles
1 inch equals 3.5 miles
Figure 2
Figure 3
Figure 4
Figure 5
Figure 6
Figure 7
Figure 8
Skagway
Klondike Highway
Klondike Gold Rush National Historical Park
Glacier Highway
Lutak Road
Haines Highway
Mud Bay Road
Lynn Canal
Berners Bay
Taiya Inlet
Lutak Inlet
Haines
Tanani
Port Chilkoot
Chilkat River
Chilkoot Lake
Chilkoot River
Sullivan Island
Chilkat Islands
Chilkat Peninsula
Pyramid Island
Haines Airport
Eldred Rock
Met Point
Comet
Sherman Rock
Gran Point
Glacier Point
William Henry Bay
Point Saint Mary
Echo Cove
Cowee Creek
Sawmill Creek
Antler Lake
Antler River
Lace River
Berners River
Gilkey River
Johnson Creek
Slate Creek
Sweeny Creek
Jualin Mine
Comet Mines
Kensington Mine
Horrible Mine
Ophir Mine
Ivanhoe Mine
Kakuhan Range
Sinclair Mountain
Katzehin River
Yeldagalga Creek
Dayebas Creek
Kasidaya Creek
Skagway River
Burro Creek
Ferebee River
Halutu Ridge
Face Mountain
Mount Harding
Mount Villard
Devils Punch Bowl
SCHUBEE GLACIER
Twin Dewey Peaks
Upper Dewey Reservoir
Lily Lake
DESHU ISTHMUS
Mount Ripinski
Tukgahgo Mountain
Cathedral Peak
Mount Kashagnak
Mount Emmerich
GARRISON GLACIER
DAVIDSON GLACIER
Ludaseska Creek
Sullivan Mountain
Sullivan River
Mount Rice
Mount Young
Endicott River
William Henry Creek
Beardslee River
Yang-Webster Peak
Juneau Access Improvements
Bald Eagle Nests Alternatives and Figure Index
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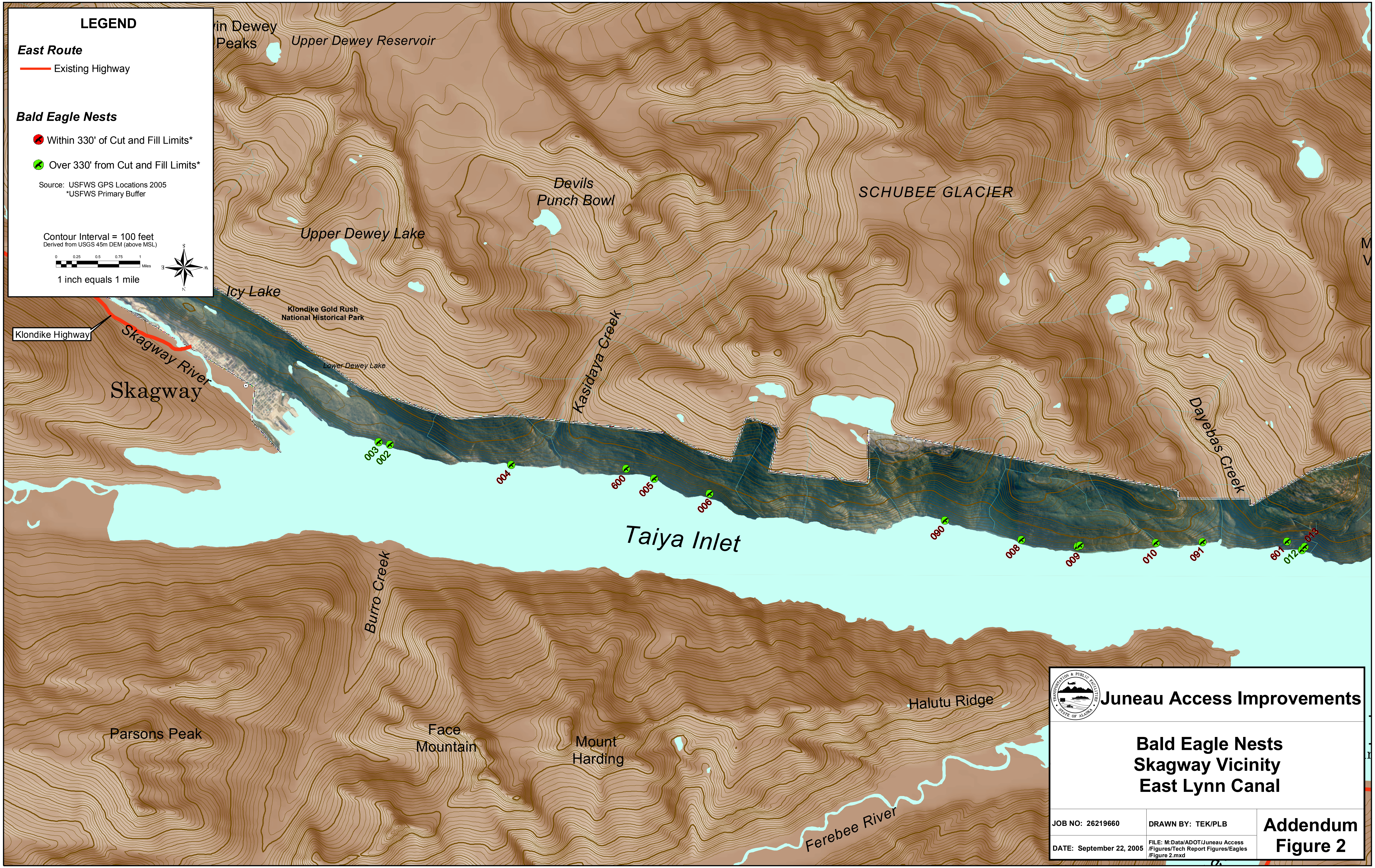
Addendum Figure 1



LEGEND
East Route
Existing Highway
Bald Eagle Nests
Within 330' of Cut and Fill Limits*
Over 330' from Cut and Fill Limits*
Source: USFWS GPS Locations 2005
*USFWS Primary Buffer
Contour Interval = 100 feet
Derived from USGS 45m DEM (above MSL)
1 inch equals 1 mile
Upper Dewey Reservoir
Devils Punch Bowl
SCHUBEE GLACIER
Upper Dewey Lake
Icy Lake
Klondike Gold Rush National Historical Park
Klondike Highway
Skagway River
Skagway
Lower Dewey Lake
Kasidaya Creek
Dayebas Creek
Taiya Inlet
003
002
004
600
005
006
090
008
009
010
091
601
012
013
Burro Creek
Halutu Ridge
Parsons Peak
Face Mountain
Mount Harding
Ferebee River
Juneau Access Improvements
Bald Eagle Nests
Skagway Vicinity
East Lynn Canal
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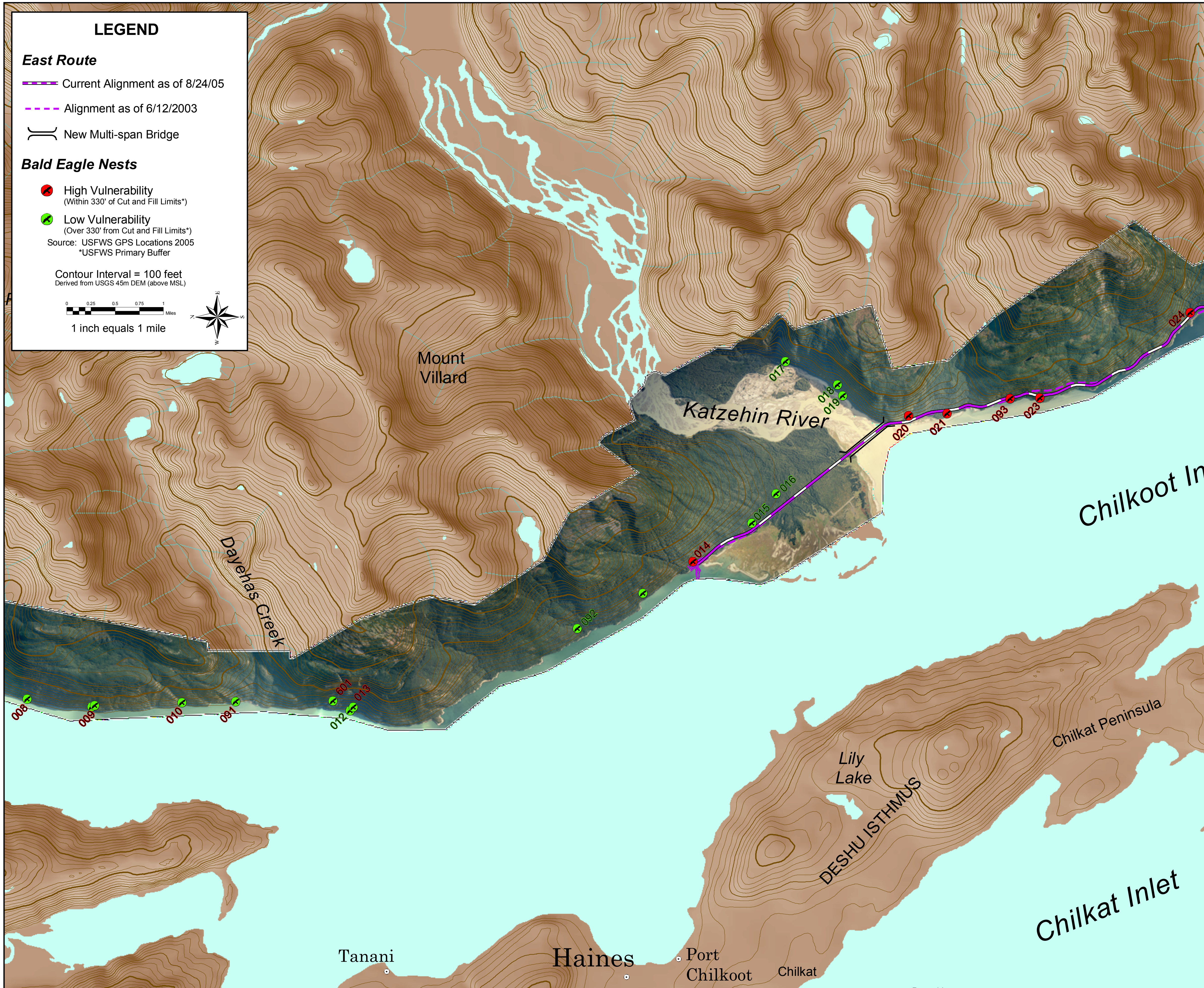
Figure 2



Bald Eagle Nests
Katzehin River Vicinity
East Lynn Canal

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East Route
Current Alignment as of 8/24/2005
Alignment as of 6/12/2003
Bald Eagle Nests
Within 330' of Cut and Fill Limits*
Over 330' from Cut and Fill Limits*
Source: USFWS GPS Locations 2005
*USFWS Primary Buffer
Contour Interval = 100 feet
Derived from USGS 45m DEM (above MSL)
0 0.25 0.5 0.75 1 Miles
1 inch equals 1 mile
Sinclair Mountain
Kakuhan Range
Yeldagalga Creek
Comet
Eldred Rock
Chilkat Islands
Lynn Canal
028
030
031
607
608
032
033
034
094
036
096
095
098
125
124
123
099
100
102
101
103
612
104
105
106
107
108
109
110
112
111
113
114
115
Juneau Access Improvements
Bald Eagle Nests
Eldred Rock Vicinity
East Lynn Canal
JOB NO: 26219660
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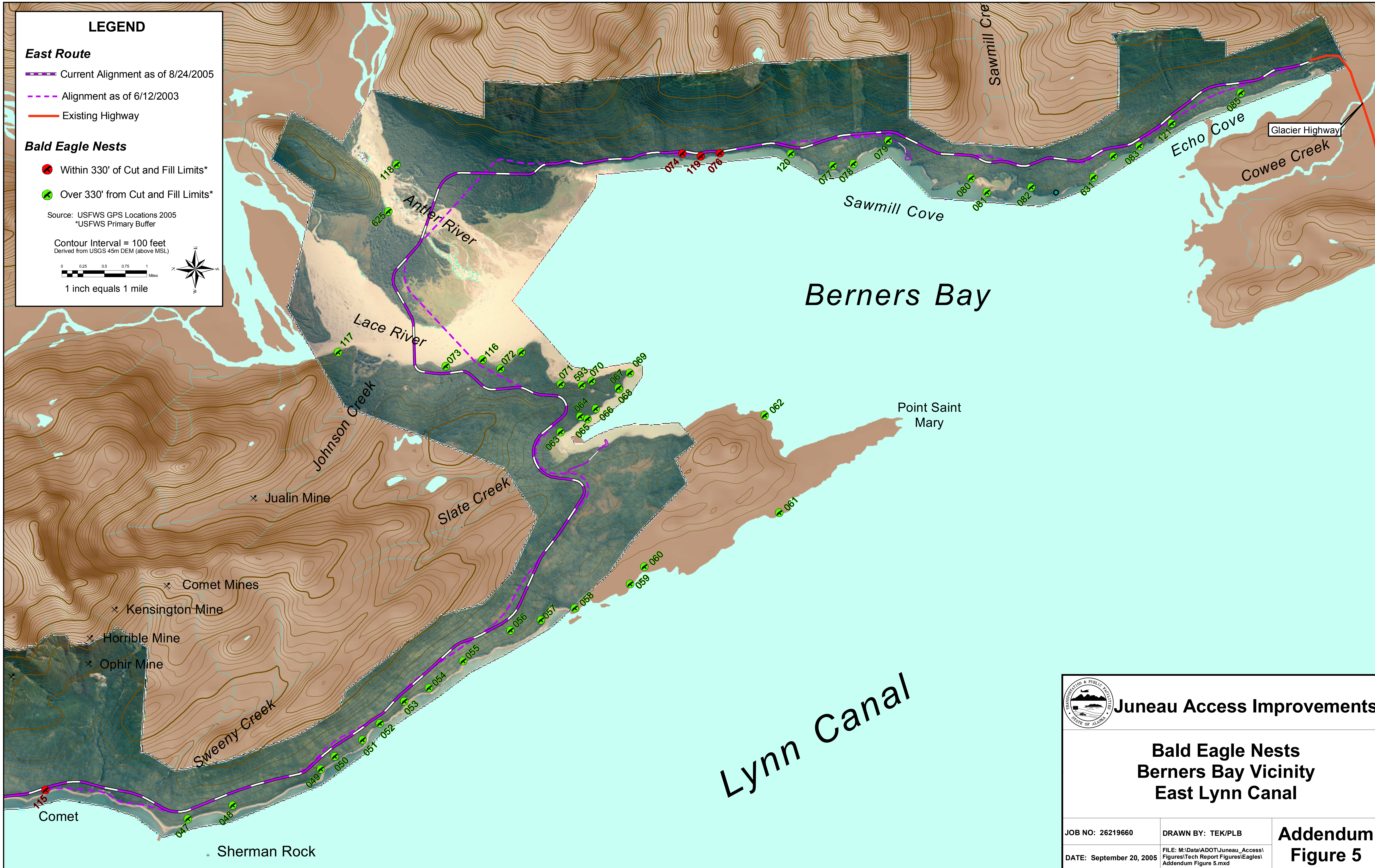
Figure 4


LEGEND
East Route
Current Alignment as of 8/24/2005
Alignment as of 6/12/2003
Existing Highway
Bald Eagle Nests
Within 330' of Cut and Fill Limits*
Over 330' from Cut and Fill Limits*
Source: USFWS GPS Locations 2005
*USFWS Primary Buffer
Contour Interval = 100 feet
Derived from USGS 45m DEM (above MSL)
1 inch equals 1 mile
Berners Bay
Lynn Canal
Antler River
Lace River
Johnson Creek
Slate Creek
Sweeny Creek
Sawmill Creek
Sawmill Cove
Echo Cove
Cowee Creek
Glacier Highway
Point Saint Mary
Jualin Mine
Comet Mines
Kensington Mine
Horrible Mine
Ophir Mine
Comet
Sherman Rock
Juneau Access Improvements
Bald Eagle Nests
Berners Bay Vicinity
East Lynn Canal
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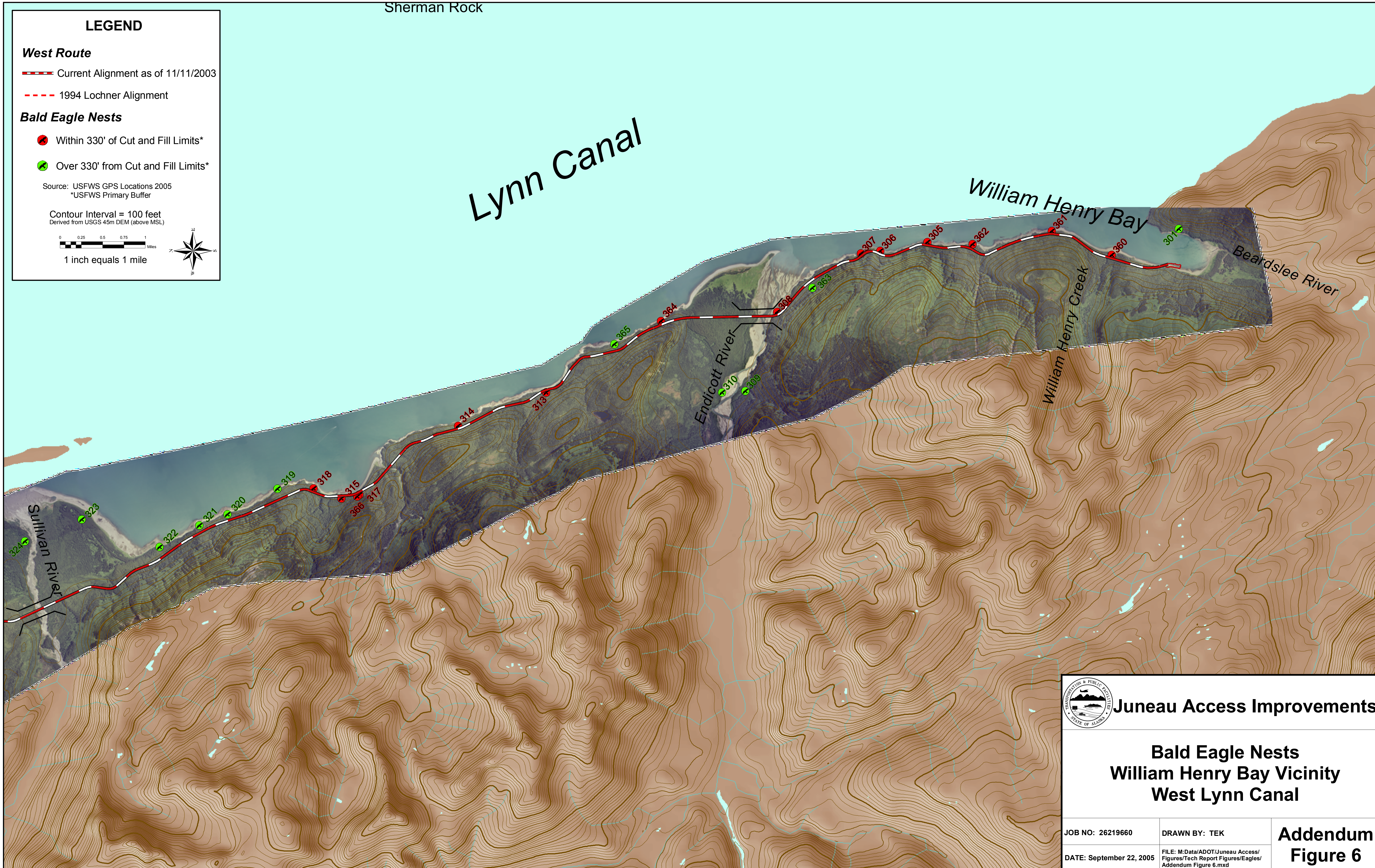

LEGEND
West Route
Current Alignment as of 11/11/2003
1994 Lochner Alignment
Bald Eagle Nests
Within 330' of Cut and Fill Limits*
Over 330' from Cut and Fill Limits*
Source: USFWS GPS Locations 2005
*USFWS Primary Buffer
Contour Interval = 100 feet
Derived from USGS 45m DEM (above MSL)
0 0.25 0.5 0.75 1
Miles
1 inch equals 1 mile
Sherman Rock
Lynn Canal
William Henry Bay
Beardslee River
William Henry Creek
Endicott River
Sullivan River
301
360
361
362
305
306
307
363
308
364
365
310
309
313
314
318
315
317
366
319
320
321
322
323
324
Juneau Access Improvements
Bald Eagle Nests
William Henry Bay Vicinity
West Lynn Canal
JOB NO: 26219660
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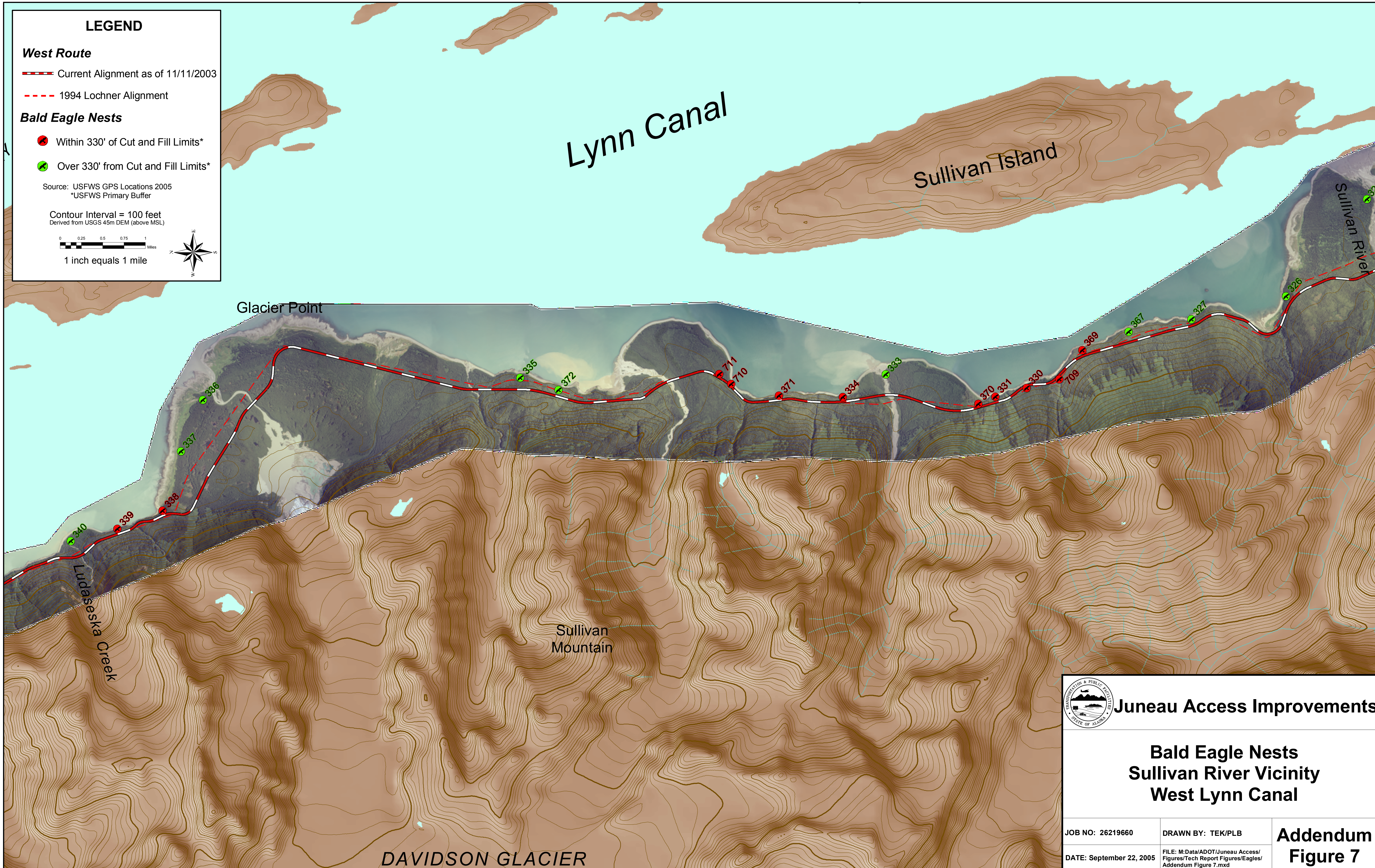
Figure 6



LEGEND
West Route
Current Alignment as of 11/11/2003
1994 Lochner Alignment
Bald Eagle Nests
Within 330' of Cut and Fill Limits*
Over 330' from Cut and Fill Limits*
Source: USFWS GPS Locations 2005
*USFWS Primary Buffer
Contour Interval = 100 feet
Derived from USGS 45m DEM (above MSL)
0 0.25 0.5 0.75 1 Miles
1 inch equals 1 mile
Lynn Canal
Sullivan Island
Glacier Point
Sullivan River
Ludaseska Creek
Sullivan Mountain
DAVIDSON GLACIER
324
326
327
367
369
709
330
331
370
333
334
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710
711
372
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Juneau Access Improvements
Bald Eagle Nests
Sullivan River Vicinity
West Lynn Canal
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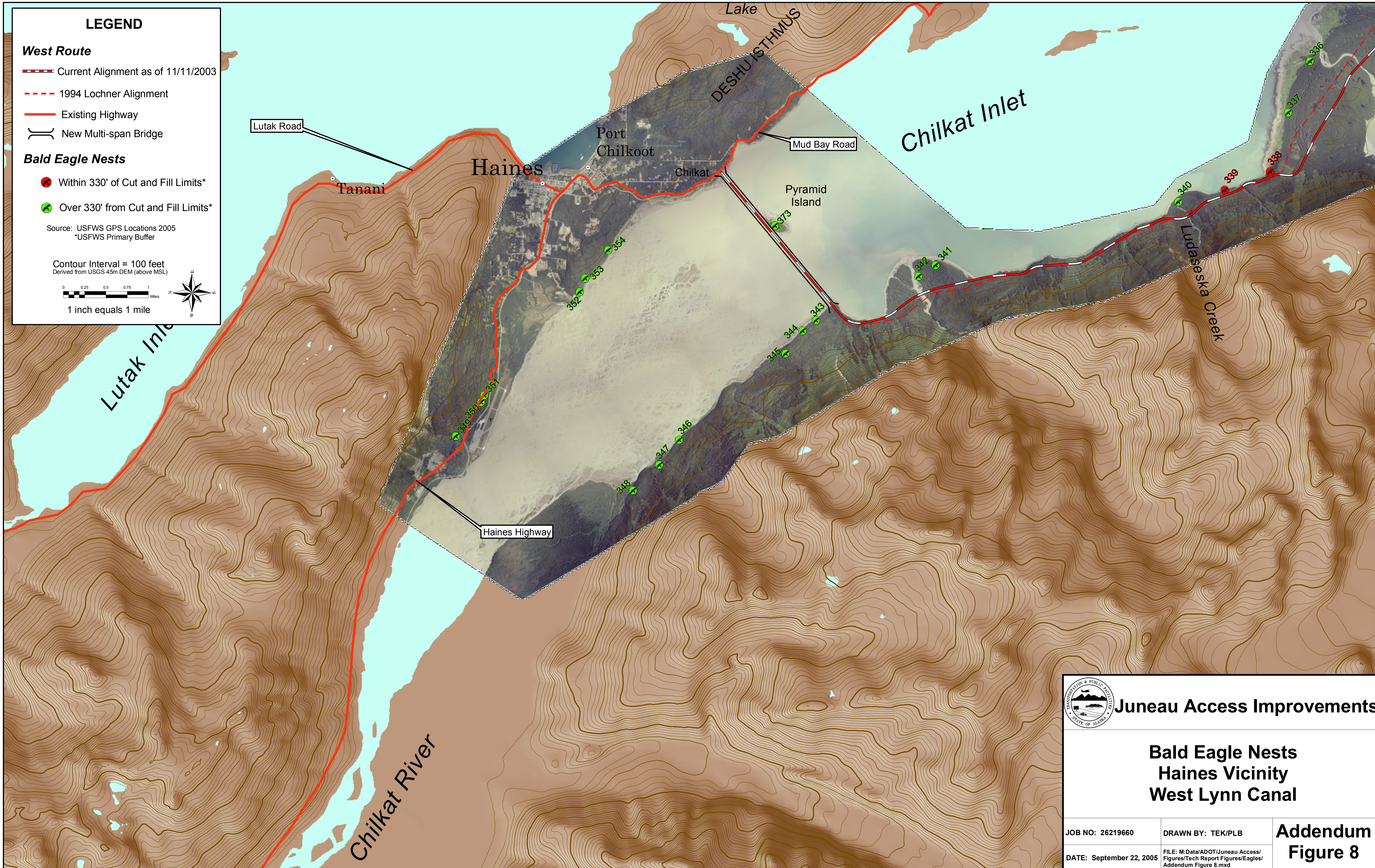
LEGEND
West Route
Current Alignment as of 11/11/2003
1994 Lochner Alignment
Existing Highway
New Multi-span Bridge
Bald Eagle Nests
Within 330' of Cut and Fill Limits*
Over 330' from Cut and Fill Limits*
Source: USFWS GPS Locations 2005
*USFWS Primary Buffer
Contour Interval = 100 feet
Derived from USGS 45m DEM (above MSL)
1 inch equals 1 mile
Lake
DESHU ISTHMUS
Chilkat Inlet
Lutak Road
Mud Bay Road
Port Chilkoot
Haines
Tanani
Chilkat
Pyramid Island
Lutak Inlet
Ludaseska Creek
Haines Highway
Chilkat River
336
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Juneau Access Improvements
Bald Eagle Nests
Haines Vicinity
West Lynn Canal
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Addendum Figure 8

Addendum to Appendix S

Steller Sea Lion Technical Report

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OCTOBER 2005

TABLE OF CONTENTS

TABLES

ATTACHMENTS

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1.0 INTRODUCTION

This addendum reflects the revised Biological Assessment completed by the Federal Highway Administration (FHWA) dated July 2005, additional information provided by the Kensington Gold Project Biological Opinion prepared by the National Marine Fisheries Service (NMFS) in 2005, and the Section 7 consultation between NMFS and the FHWA (NMFS, 2005c). Data collected from the Gran Point Steller sea lion haulout cameras from January 1, 2005, through September 30, 2005, have also been reviewed and included.

Studies and Coordination - Following publication of the 2004 *Appendix S Steller Sea Lion Technical Report*, complete 2004 and January through September 2005 video camera results for the haulout at Gran Point have been reviewed. Table 1 includes a complete summary of Stellar sea lion occurrences at the haulout. The video data indicate that sea lions occupied the haulout for all but 12 days during 2004. The longest absence of sea lions from the haulout was between August 7th to mid-day on August 14th. Results for 2005 indicate sea lions absent for 47 days between January 1st and September 30th. Steller sea lions were absent from the haulout for 21 days in a row from July 30 through August 19. On four other occasions, sea lions were absent three to five days consecutively.

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2.0 AFFECTED ENVIRONMENT

Discussions provided below are meant to supplement the Affected Environment (Section 3) of *Appendix S Steller Sea Lion Technical Report.* This technical report addendum includes evaluation and incorporation of additional data not included in the original technical report.

2.1 Distribution within Lynn Canal

Steller sea lions have also been observed to haul out in the spring on a small offshore rock on the eastern shore of the mouth of Slate Creek Cove and near Cove Point in Berners Bay. There is little information on the use of these haulout sites, although juveniles and adults have been observed there during the peak of eulachon and herring spawning in April and May. There are no documented Steller sea lion haulouts on the Katzehin Flats, although Steller sea lions have been seen foraging in this area. Harbor seals, however, are known to haul out in the flats (NMFS, 2005a).

2.2 Western Population

Steller sea lions were listed as threatened in 1990 under the Endangered Species Act (ESA). In 1997 the population was divided into two groups, the western and eastern. Following a population analysis, a continued rate of population decline in the western population resulted in this stock being listed as endangered. The eastern population remains listed as threatened (NMFS, 2005a).

Steller sea lions can be found from the North Pacific, northern Japan, north to the Bering Sea, across the Gulf of Alaska, and than south along the North American coastline extending as far as southern California. The division of eastern and western populations is both genetic and a geographical distinction; sea lions that range east of Cape Suckling (50 miles southeast of Cordova, Alaska) are the eastern stock and sea lions that generally range west of Cape Suckling are counted in the western population. There are approximately 31,000 sea lions in the eastern population, with about half occurring in southeast Alaska. The western population has an estimated 35,000 animals (NMFS, 2005a).

Since the completion of the 1998 Biological Assessment, sea lions from the western population have been documented within the project area. Sea lions branded as part of the western population have been observed at the Gran Point haulout and Little Island near Berners Bay. Five individual animals from the western population were sited. There is no critical habitat for the western Steller sea lion population within the Juneau Access Improvements Project area (NMFS, 2005a). Though few in numbers, the occurrence of some sea lions from the endangered western stock indicates some degree of crossover between the two populations (Department of Transportation and Public Facilities [DOT&PF], 2005b).

2.3 Feeding Behavior

Steller sea lions are generalists, feeding on seasonally abundant prey throughout the year. They feed predominately on species that aggregate in schools or for spawning. Prey varies seasonally and geographically. Principal prey species include walleye Pollock (*Theragra chalcogramma*), Atka mackerel (*Pleurogrammus monopterygius*), Pacific salmon (*Onchorhyncus* sp.), Pacific cod (*Gadus macrocephalus*), flatfishes, rockfishes, Pacific herring (*Clupea harengus*), sand lance, skates, squid, and octopus (Calkins, 1998; Sinclair and Zeppelin, 2002; Trites and Donnelly, 2003). Seasonal prey are also important in local areas, such as the seasonal occurrence of spawning eulachon and Pacific herring in Berners Bay that supports up to 7-10 percent of the southeast Steller sea lion population for about three weeks in April (Sigler et al., 2004; Marston et al., 2002; Womble et al., 2005).

The spring eulachon run in Berners Bay is an energy-rich food source for Steller sea lions. Sea lions feeding on this species for three weeks may increase their energy intake by 91 percent compared to a normal diet. The energy rich food source is an important seasonal energy source for all sea lions, especially for lactating females that require more energy to support lactation (Kastelein and Weltz, 1990; Sigler et al., 2004).

Large schools of adult eulachon congregate in the northern section of Berners Bay to begin their annual spawning run into the Antler and Lace rivers. The eulachon typically move into the deep trench outside Berners Bay in early to mid-March, prior to migration and aggregate at depths of 40 to 150 meters, which coincides with the depths at which Steller sea lions forage (Loughlin et al., 2003). These schools provide a predictable nutrient rich food source for Steller sea lions (Sigler et al., 2004; Marston et al., 2002; Womble et al., 2005). Spawning runs begin in late April to early May. Because the fish schools are dense and behave predictably they are good targets for cooperative feeding by sea lions.

Steller sea lions are present year-round in Berners Bay; however, the greatest numbers are observed for three to four weeks in April and May when they feed on spawning runs of eulachon and herring (Gende et al., 2001; Marston et al., 2002; Sigler et al., 2004; Womble et al., 2005). Sigler et al. (2004) estimated that nearly 2,200 Steller sea lions (almost 10 percent of the southeast Alaska Steller sea lion population) utilize this area to feed on the high-energy food sources. Although the availability of prey is brief, the abundance and energy content is so great that it likely is important to the energy budget of sea lions because sea lions can store energy in blubber for up to five or six weeks after consumption (NMFS, 2005a).

Steller sea lions have been observed feeding cooperatively in Berners Bay in areas where prey species concentrate. Large groups of several hundred sea lions have been seen moving synchronously toward the bay. All individuals porpoised for several seconds before diving simultaneously and remaining submerged for up to nine minutes. The sea lions reemerged simultaneously in a different location then again porpoised before diving and reemerging simultaneously (Gende et al., 2001; Marston et al., 2002; Sigler et al., 2004). The cooperative feeding behavior involves visual and vocal cues and may help concentrate the prey. Increased noise levels in the vicinity of construction or vessel traffic may make cooperative feeding for sea lions less successful by masking vocal cues. Vessels may disturb Steller sea lions while they are in the water feeding. Their typical response is to dive and resurface some distance away from the vessel. If the animals are forced to dive out of synchrony because of vessel approach, it may compromise their success at capturing prey.

3.0 ENVIRONMENTAL IMPACTS

3.1 Alternative 2B (Preferred): East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway

Information from the NMFS 2005 Kensington Gold Project Biological Opinion and the revised FHWA July 2005 Biological Assessment are included here as additions to the sections "Environmental Impacts," Section 4.2, 4.4, 4.6, and 4.7 of the Supplemental Draft EIS *Steller Sea Lion Technical Report*. Text discussing potential water quality impacts due to construction, operation, and maintenance of the project alternatives has also been included in response to public and agency comments.

3.1.1 Construction, Maintenance, and Operation

The East Lynn Canal Highway has the potential to impact Steller sea lions both during construction and from subsequent maintenance and operations activities. Specific mitigation measures will be taken to avoid or minimize these impacts.

Activities that could impact sea lions include noise and visual aspects of helicopter surveying, construction and use of barge landings, in-water fill placement, pile driving, dredging, blasting, excavation, and earth moving.

Helicopters used during construction, including surveying activities, would be required to avoid operating within a 3,000-foot radius of Steller sea lion haulouts while the haulouts are occupied. No temporary barge landings would be constructed within this radius, and no in-water fill placement would occur for highway construction within 3,000 feet of the haulout.

Analysis, as presented in the 2004 technical report, indicates that most construction noise generated at distances greater than 1,000 feet may not be detectable above the background noise levels at the haulouts. Rock drilling and excavating generally produce sounds levels of 85 to 90 average-weighted decibels (dBA) at a distance of 50 feet from the source. The rock bluffs, trees, and earth would shield the haulouts from sounds from construction point sources, resulting in a decrease of 11 dBA for every doubling of distance. A sound level of 88 dBA 50 feet from the source would produce a sound level of 44 dBA at a distance of 800 feet. The 1998 assessment estimated the background noise level at Gran Point on a calm day at 47 dBA, based on recordings at similar locations. This estimate was corroborated by sound measurements recorded in 2003 at additional, similar locations. Construction noise at a level of 44 dBA would not be likely to be noticeable against the estimated background noise level at the haulout.

Using the above analysis of potential noise impacts, no construction activities that generate noise levels above 45 dBA at the haulouts would occur within 1,000 feet of the Gran Point and Met Point haulouts while sea lions are present. Heavy construction (rock drilling, blasting and shot rock removal) within a 1,000-foot radius of Gran Point is expected to occur for approximately one month. Table 1 shows 46 days from January 2003 through December 2003 with no sea lions present. The partial year of January through December 31, 2004, had only 7 days with no sea lions present. The phased construction due to the presence of sea lions at or in the vicinity of the haulouts would not affect the overall projected construction schedule of four years.

Analysis of potential vibration disturbance from blasting within the Gran Point critical habitat area and within 3,000 feet of the Met Point haulout presented in the 1998 assessment is still relevant. Preshearing the rock face and using smaller charges can reduce the ground vibrations at the haulouts. The contractor would be required to monitor blasting effects when blasting within 3,000 feet of either haulout and avoid vibrations greater than 0.05 inches per second (ips) at the haulout while it is occupied. These measures would keep blasting effects well below 0.1 ips, the estimated vibration threshold for sea lion disturbance.

Blasting produces sound as well as vibration. Typical sound energy levels generated by construction blasting are equivalent to 95 dBA at 665 feet for 50-pound charges per delay (FHWA, 1991). As with vibration, the sound energy level can be controlled by using lower weight charges per delay. The contractor would be required to monitor blasting noise and avoid noise energy levels greater than 45 dBA at the haulout when blasting within 3,000 feet of either site.

Based on available information, the noise levels produced by construction would fall below those thought to result in physiological damage to Steller sea lions (NMFS, 2005b). Monitors will be in place to observe the Steller sea lions and halt construction activities if a disturbance at a haulout occurs.

Maintenance and operation activities that could impact sea lions include noise and visual aspects of highway traffic, highway maintenance, and avalanche control. Land access to the haulout areas could create an indirect impact of increased human disturbance of resting sea lions.

Operation and maintenance of the highway would not likely result in disturbance of either haulout. The highway alignment within 3,000 feet of each haulout would be designed to prevent access to either site and maintain a visual barrier between the highway and haulouts.

Projected peak traffic noise levels for the year 2038 are 65 dBA at the centerline of the highway, and would attenuate to 32 dBA at a distance of 280 feet (see Appendix L, the 2004 *Noise Technical Report*). The highway would be approximately 320 feet from the Gran Point haulout and 400 feet from the Met Point haulout at its closest point. Most traffic noise would be unlikely to exceed the estimated background noise level.

Average peak-hour noise level is a tool for gauging potential noise levels over time. Over time, average peak-hour noise levels are unlikely to disturb Steller sea lions. A small number of peak noise levels are likely to disturb Steller sea lions. The frequency of these events will determine the level of disturbance.

Normal winter and summer maintenance activities, such as snow removal, sanding, brush cutting, crack sealing, and culvert clean out, would not produce noise levels higher than those predicted from the 30-year peak hour traffic.

Steller sea lions may react to loud or unfamiliar sounds by diving into the water from land or by submerging when they are in the water. Generally, they return to their previous behavior within an hour or so after the disturbance. However, their tolerance for this kind of disturbance will depend on its continuity. Steller sea lions may abandon a haulout for longer periods of time if a disturbance continues. (NMFS, 2005a)

3.1.2 Avalanche Control Measures

Winter operation would require infrequent detonation of unstable snow in the three avalanche starting zones within the 3,000-foot radius around the Gran Point and Met Point haulout sites (see Appendix J, the 2004 *Snow Avalanche Report*). DOT&PF's preferred avalanche control option on the east side of Lynn Canal is helicopter delivery of explosive charges by hand out an open door. The next choice of delivery is 105-millimeter (mm) howitzer placement, and the third choice is blaster box-fired mortar rounds. For detonation by helicopter, the helicopter approach would be made from the closest point outside the 3,000-foot radius. The avalanche paths close to the haulouts are expected to require detonation release with a helicopter-dropped explosive charge at a frequency of once every 10 years at each path.

Gran Point is between two identified avalanche paths, LC030 and LC031, and is close to nearby paths LC025 through LC029. LC030 is at elevation 1,500 feet, approximately 1,810 feet southeast of the Gran Point haulout. The slope distance from the haulout is 2,350 feet. LC031 is at elevation 650 feet, approximately 2,880 feet to the northeast, a slope distance of 2,950 feet. Both are small avalanche paths; one is on an old landslide scar and the other is in a narrow gully. Each avalanche starting zone is estimated to require a helicopter-dropped 50-pound explosive charge once every 10 years, which would result in two explosive discharges within the critical habitat area during a 10-year period. A 50-pound charge typically creates a momentary peak airblast sound level of 95 dBA at 665 feet (FHWA, 1991). This would result in a noise of about 73 to 75 dBA at Gran Point from either of the slide areas.

Met Point is near avalanche path LC004. For Met Point, the closest paths are not identified for blaster box emplacement and presumably would be targeted when necessary by helicopter (see page 16, the East Lynn Canal Mitigation Options in *Appendix J, the Snow Avalanche Report*).

The starting zone of avalanche LC004, 2,600 feet to the northeast of the Met Point haulout, is at elevation 1,000 feet. Slope distance to the haulout is 2,860 feet. LC004 is a small avalanche path consisting of open scrub forest and a small gully. This avalanche path is expected to require detonation release with a helicopter-dropped explosive charge at a frequency of once every 10 years. The explosive charge would be a 50-pound bag of ammonium nitrate and fuel oil (ANFO). A 50-pound charge dropped from a helicopter normally penetrates the snow a few feet, with the blast sound muffled by the snow surrounding the charge.

The noise from avalanche detonation would be noticeable both at the Gran Point and Met Point haulouts. It is possible that it could startle some sea lions enough for them to leave the haulout. However, since this noise would not be repetitive, it is likely that sea lions would return to the haulout within a few hours. The noise and vibration created by the resulting avalanche would be no different than the naturally occurring avalanche that would eventually happen.

The Alternative 2B alignment has been adjusted between Slate Cove and Sherman Point to avoid emergent wetlands, moved approximately 700 feet upstream on the Lace River to avoid intertidal habitat, and moved further upstream on the Antler River to bypass important eulachon habitat. These realignments reduce the potential for indirect effects to Steller sea lion prey resources in Berners Bay by the construction, operation and maintenance of the East Lynn Canal Highway.

3.1.3 Steller Sea Lion Haulout Sites

Alternative 2B would be constructed near the Gran Point and Met Point haulouts; however, construction would not physically alter the haulouts themselves. Construction activities would not take place within 3,000 feet of the haulouts when they are occupied by sea lions. It is also unlikely that construction would occur in the vicinity of both haulouts at the same time. The highway alignment within 3,000 feet of Gran and Met points would be designed to maintain a visual barrier between the adjacent highway and haulouts by a combination of through cuts, retaining walls, and screening structures. Sea lions would not be visible from the road, and would not see vehicles or their headlights on the nearby road.

There is also a Steller sea lion haulout site at Point Saint Mary. Noise from Alternative 2B at Point Saint Mary, Slate Cove near Cove Point are not likely to be heard above ambient background levels because of the distance between the haulout site and the proposed highway. Highway noise levels at these two seasonal haulouts are not expected to exceed background levels. There are no documented Steller sea lion haulouts on the Katzehin Flats, although Steller sea lions have been seen foraging in this area. Harbor seals are known to haul out in the flats (NMFS, 2005a).

3.2 Alternative 3: West Lynn Canal Highway

The West Lynn Canal Highway has the potential to impact Steller sea lions during both construction and subsequent maintenance and operation activities. Specific mitigation measures would be taken to avoid or minimize these impacts if Alternative 3 was implemented.

The marine portion of the alignment consists of ferry service from William Henry Bay to Sawmill Cove in Berners Bay. The known sea lion haulouts on this segment of the alignment are at Point Saint Mary, at the mouth of Berners Bay, and seasonally at Slate Cove on the north side of the bay. Foraging habitat for sea lions exists in both William Henry Bay and Berners Bay, and in Lynn Canal. The feeding behavior discussed in Section 2.1 would apply to activities of sea lions in Berners Bay. Indirect impacts would result from diminished prey resources from ferry terminal construction or vessel disturbance.

3.2.1 Construction, Maintenance, and Operation

Construction activities for Alternative 3 that could impact Steller sea lions include noise and visual aspects of construction and use of barge landings, in-water fill placement, pile driving, and dredging. The intensity and frequencies of underwater noise generated by these activities would depend on a number of geomorphic and water variables. Placement of fill at the ferry terminal site is not expected to generate substantial in-water noise, as this activity is generally done from shore during low tides. Dredging would take place between October 1st and March 1st when there are no spawning activities of prey species in the project area. Dredging is not typically a source of loud noise. Driving of 18 to 30-inch-diameter piles would be done with vibratory hammers to the extent possible to reduce the intensity of sound generated. Pile driving would generally take place between June 16 and March 14 (to avoid impacts to fish), after peak prey spawning season. Trained observers would monitor for the presence of marine mammals and construction would be halted if any animals come within 200 meters of the activity. By employing these mitigation measures, project construction would not be likely to result in substantial impacts to Steller sea lions.

Construction of the ferry terminal in Sawmill Cove in Berners Bay would result in a short-term increase in turbidity near the construction site. This turbidity could result in the loss of the eggs of some prey species, such as Pacific herring and sculpin, at the terminal site. Timing of in-water construction to avoid the spawning and egg maturation period would minimize or reduce this impact. Increased turbidity could also result in the loss of some benthic organisms. These impacts would not have population-level effects on any benthic species or prey species in Lynn Canal. Docks may also provide increased shelter or cover for both juvenile fish and their predators.

The footprint of the terminal would impact a small percentage of the along-shore herring spawning habitat. The impact on intertidal and subtidal marine habitat due to ferry terminal construction would alter habitat usage in the disturbed area. This loss of eggs and larvae would not likely affect the population of this species and the small amount of habitat loss would not measurably affect other fish populations in the Berners Bay area.

3.2.2 Steller Sea Lion and Vessel Interactions

The potential for sea lion collisions with ferries traveling from Berners Bay to William Henry Bay are considered minimal. Although it is possible for a Steller sea lion, particularly a juvenile, to be harmed by a collision with a vessel, they are generally very agile and successfully avoid encounters when in the water. There have been no reports of any sea lion mortalities due to the operation of the ferries currently in use along the Alaska Marine Highway System (AMHS) routes. Collisions with vessels are not believed to be a significant source of mortality of Steller sea lions.

A study of Steller sea lions at a haulout in Glacier Bay National Park found that the proximity and behavior of approaching marine vessels affected the activity rate of these animals (Mathews, 1997). Vessels that maintained a slow, steady course and kept the engines on seemed to disturb sea lions less than vessels with erratic course or speed. This study may indicate that private vessels, which are more maneuverable and whose operators may be less aware of protection rules, might disturb Steller sea lions more than larger commercial vessels (National Park Service [NPS], 2003). Because the ferry traffic associated with Alternative 3 would be relatively slow and consistent in both direction and speed, it is expected that sea lions at Point Saint Mary would habituate to these vessels in the same way they have habituated to other marine vessels, including ferries that currently pass the Gran Point and Met Point haulouts.

3.2.3 Operation Effects on Prey Resources

The ferry route for Alternative 3 crosses areas where large schools of eulachon and herring are known to aggregate in Berners Bay prior to spawning in March and April. Individual adult herring and eulachon are likely to be exposed to vessel activities repeatedly throughout the spring months as the schools stage along the shoreline in preparation for spawning (NMFS, 2005a). Individuals of other prey species in and around the marine terminals are also likely to be exposed to disturbance from boat noise, boat wakes, or changes in water quality and habitat. Noise from vessel operation could result in behavioral disturbance of fish as well as increased risk of exposure to hydrocarbon contamination. Vessel traffic and noise, and changes in nearshore habitat may alter the behavior of adult and juvenile fish.

Indirect effects to Steller sea lions could result from ferry operations at the two ferry terminals under Alternative 3. Turbidity could be increased over ambient conditions at the ferry terminal for short periods of time by ferries maneuvering into and out of the terminal. Short-term turbidity and propeller or water jet scour could affect some Pacific herring eggs and larvae in the immediate vicinity of the Sawmill Cove Ferry Terminal. Terminal structures and vessel traffic may alter shoreline migration patterns, shifting the fish into areas where predation risks are greater. Vessel fuel leakage, contaminant spills, and pollutant runoff have the potential to impair water quality, particularly in terminal areas, where vessel activity is concentrated. This may decrease the probability of survival of individual eggs and larvae, increase short-term alteration of behavior of juvenile and adult fish, and reduce energy budgets during critical pre-spawning aggregations (NMFS, 2005a).

The operation of ferry service between Berners Bay and William Henry Bay has the potential to impact individuals of the prey species Steller sea lions feed on. However, because the prey in Berners Bay is primarily a seasonal resource, sea lions may compensate for a change in the prey base in Berners Bay by utilizing other nearby foraging areas in southeast Alaska. The increasing eastern population of Steller sea lions in southeast Alaska suggests that there is prey available for this species throughout the foraging range (NMFS, 2005a).

3.3 Alternatives 4A and 4C: Marine Alternatives – Auke Bay

Alternatives 4A and 4C have the potential to impact Steller sea lions during maintenance and operation activities. Specific mitigation measures will be taken to avoid or minimize these impacts.

Impacts to Steller sea lions from the marine vessels are most likely to be grouped into two categories: a) injuries or disturbance from vessel operation and b) potentially diminished prey resources from ferry terminal construction or vessel disturbance.

3.3.1 Construction, Maintenance, and Operation

Reconstruction of the Auke Bay terminal would require the removal of pilings, replacement of pilings, and placement of some fill in the bay. The impact on intertidal and subtidal marine habitat due to terminal construction would alter habitat usage in the disturbed area. The footprint of the terminal would impact a small percentage of the along-shore herring spawning habitat. This loss of habitat would not likely affect the population of this species and the small amount of habitat loss would not measurably affect other fish populations in the area. This loss would not result in a measurable reduction in any benthic or fish populations in the project area or Auke Bay.

Reconstruction of the ferry terminal would result in a short-term increase in turbidity near the construction sites. Timing of in-water construction to avoid the spawning and egg maturation period would minimize or reduce this impact. Increased turbidity could result in the loss of some benthic organisms. These impacts would not have population-level effects on any benthic species, fish, or crab species in Lynn Canal.

3.3.2 Steller Sea Lion and Vessel Interactions

The potential for sea lion and ferry collisions are considered minimal. Although it is possible for a Steller sea lion, particularly a juvenile, to be harmed by a collision with a vessel, they are generally very agile and successfully avoid encounters when in the water. Because Alternative 4A would use FVF vessels, there is a slightly increased chance of a vessel collision with a sea lion. There have been no reports of any sea lion mortalities due to the current operation of the ferries along the AMHS routes. Collisions with vessels are not believed to be a significant source of mortality of Steller sea lions.

A study of Steller sea lions at a haulout in Glacier Bay National Park found that the proximity and behavior of approaching marine vessels affected the activity rate of these animals (Mathews, 1997). Vessels that maintained a slow, steady course and kept the engines on seemed to disturb sea lions less than vessels with erratic course or speed. This study may indicate that private vessels, which are more maneuverable and whose operators may be less aware of protection rules, might disturb Steller sea lions more than larger commercial vessels (NPS, 2003). Because the ferry traffic associated with Alternative 4C would be relatively slow and consistent in both direction and speed, it is expected that sea lions would habituate to these vessels in the same way they have habituated to other marine vessels, including ferries that currently pass the Gran Point and Met Point haulouts.

Vessel traffic and noise and changes in nearshore habitat may alter the behavior of adult and juvenile fish. Vessel fuel leakage, contaminant spills, and pollutant runoff may impair water quality, particularly in areas where vessel activity is concentrated.

3.4 Alternatives 4B and 4D: Marine Alternatives – Berners Bay

Alternatives 4B and 4D have the potential to impact Steller sea lions during maintenance and operation activities. Specific mitigation measures will be taken to avoid or minimize these impacts.

The known Steller sea lion haulouts along Alternatives 4B and 4D are located at Point Saint Mary, at the mouth of Berners Bay, and seasonally at Slate Cove on the north side of the bay. Foraging habitat for sea lions exists in Lynn Canal and Berners Bay.

Direct impacts to Steller sea lions from the marine vessels are likely to be a result of injuries or disturbance from vessel operation. Indirect impacts would result from diminished prey resources from ferry terminal construction or vessel disturbance.

3.4.1 Construction, Maintenance, and Operation

Construction activities that could impact sea lions include noise and visual aspects of construction and use of barge landings, in-water fill placement, pile driving, and dredging. The intensity and frequencies of underwater noise generated by these activities would depend on a number of geomorphic and water variables. Placement of fill at the ferry terminal site is not expected to generate large in-water noise, as this activity is generally done from shore during low tides. Dredging would take place between October 1st and March 1st when there are no spawning activities of prey species in the project area. Dredging is not typically a source of loud noise. Driving of 18 to 30-inch diameter piles would be done with vibratory hammers to the extent possible to reduce the intensity of sound generated. Pile driving would generally take place between June 16 and March 14 (to avoid impacts to fish), after peak prey spawning season. Trained observers would monitor for the presence of marine mammals and construction would be halted if any animals come within 200 meters of the activity. By employing these mitigation measures, project construction would not be likely to result in substantial impacts to Steller sea lions.

Construction of a ferry terminal would result in a short-term increase in turbidity near the construction site. This turbidity could result in the loss of the Pacific herring eggs at the terminal site. Timing of in-water construction to avoid the spawning and egg maturation period would minimize or reduce this impact. Increased turbidity could also result in the loss of some benthic organisms. These impacts would not have population-level effects on any benthic species or prey species in Lynn Canal. Docks may also provide increased shelter or cover for both juvenile fish and their predators.

The footprint of the terminal would impact a small percentage of the along-shore herring spawning habitat. The impact on intertidal and subtidal marine habitat due to ferry terminal construction would alter habitat usage in the disturbed area. This loss of eggs and larvae would not likely affect the population of this species and the small amount of habitat loss would not measurably affect other fish populations in the Berners Bay area.

3.4.2 Steller Sea Lion and Vessel Interactions

The potential for sea lion and ferry collisions are considered minimal. Although it is possible for a Steller sea lion, particularly a juvenile, to be harmed by a collision with a vessel, they are generally very agile and successfully avoid encounters when in the water. Because Alternative 4B would use fast vehicle ferry (FVF) vessels, there is a slightly increased chance of a vessel collision with a sea lion. There have been no reports of any sea lion mortalities due to the current operation of the ferries along the AMHS. Collisions with vessels are not believed to be a significant source of mortality of Steller sea lions.

A study of Steller sea lions at a haulout in Glacier Bay National Park found that the proximity and behavior of approaching marine vessels affected the activity rate of these animals (Mathews, 1997). Vessels that maintained a slow, steady course and kept the engines on seemed to disturb sea lions less than vessels with erratic course or speed. This study may indicate that private vessels, which are more maneuverable and whose operators may be less aware of protection rules, might disturb Steller sea lions more than larger commercial vessels (NPS, 2003). Because the ferry traffic associated with Alternative 4D would be relatively slow and consistent in both direction and speed, it is expected that sea lions at Point Saint Mary would habituate to these vessels in the same way they have habituated to marine vessels including ferries that currently pass the Gran Point and Met Point haulouts.

3.4.3 Operation Effects on Prey Resources

The ferry route for Alternatives 4B and 4D crosses areas where large schools of eulachon and herring are known to aggregate in Berners Bay prior to spawning in March and April. Individual adult herring and eulachon are likely to be exposed to vessel activities repeatedly throughout the spring months as the schools stage along the shoreline in preparation for spawning (NMFS 2005a). Individuals of other prey species in and around the marine terminals are also likely to be exposed to disturbance from boat noise, boat wakes, or changes in water quality and habitat. Noise from vessel operation could result in behavioral disturbance of fish as well as increased risk of exposure to hydrocarbon contamination. Vessel traffic and noise, and changes in nearshore habitat may alter the behavior of adult and juvenile fish.

Under Alternatives 4B and 4D turbidity could be increased over ambient conditions at the ferry terminal for short periods of time by ferries maneuvering into and out of the terminal. Short-term turbidity and propeller or water jet scour could affect some Pacific herring eggs and larvae in the immediate vicinity of the Sawmill Cove Ferry Terminal. Terminal structures and vessel traffic may alter shoreline migration patterns, shifting the fish into areas where predation risks are greater. Vessel fuel leakage, contaminant spills, and pollutant runoff have the potential to impair water quality, particularly in terminal areas, where vessel activity is concentrated. This may decrease the probability of survival of individual eggs and larvae, increase short-term alteration of behavior of juvenile and adult fish, and reduce energy budgets during critical pre-spawning aggregations (NMFS, 2005a).

The operation of ferry service into Berners Bay has the potential to impact individuals of the prey species Steller sea lions feed on. However, because the prey in Berners Bay is primarily a seasonal resource, sea lions may compensate for a change in the prey base in Berners Bay by utilizing other nearby foraging areas in southeast Alaska. The increasing eastern population of Steller sea lions in southeast Alaska suggests that there is prey available for this species throughout the foraging range (NMFS, 2005a).

3.5 Section 7 Consultation

DOT&PF, on behalf of FHWA, submitted a revised Biological Assessment in July 2005 in response to comments from NMFS. The revised Biological Assessment concluded that Alternative 2B would not likely affect Steller sea lions or their critical habitat. NMFS concurred with this determination in a letter dated September 27, 2005, with the additional mitigation measures outlined in the letter (Attachment A). The Supplemental Draft EIS included a preliminary determination by FHWA that Alternatives 3 and 4A through 4D are not likely to adversely affect Steller sea lions or their habitat. In written comments on the Supplemental Draft EIS, NMFS indicated they did not concur with this determination for Alternatives 3, 4B and 4D and that formal consultation would be required if one of these alternatives were selected.

4.0 MITIGATION MEASURES

DOT&PF and the Federal Highway Administration (FHWA) have agreed to the following revised measures would be included in the project to avoid potential impacts to humpback whales and Steller sea lions:

1. Pile driving at the Katzehin terminal and the Antler, Lace and Katzehin rivers will be done with vibratory hammers to the extent possible. If vibratory hammers cannot be used, NMFS will be provided with a description of why vibratory hammers cannot be used for review. This will occur prior to the use of other measures.
2. A trained observer will monitor for the presence of marine mammals and pile driving will be halted if any animals come within 200 meters (660 feet) of the activity.
3. No boat launches or structures that enhance boat access will be constructed by DOT&PF as part of the East Lynn Canal Highway. Mechanisms will be instituted to ensure the highway will not result in increased access to East Lynn Canal from the development of boat launches or other improved access opportunities resulting from this project for a length of time beyond construction.
4. As large a buffer as possible of undisturbed vegetation will be retained between the highway and the Gran Point and Met Point haulouts. FHWA will provide NMFS with a detailed description of construction plans within the 3,000-foot critical habitat prior to commencing construction within the zone, including planned vegetation removal. FHWA will provide for an on-site tour of the area as to allow NMFS to approve the construction plan and concur that it is not likely to adversely affect Steller sea lions.
5. No temporary barge landings would be constructed within 3,000 feet of either haulout.
6. Any construction within 3,000 feet of Met or Gran Point would include through-cuts and screening structures as necessary to avoid lines of sight between the highway and the haulouts, and to discourage human access to the haulouts. Prior to construction of cuts or screening structures within the 3,000-foot zone, FHWA will provide NMFS with a construction plan describing the proposed activities and allow for on-site evaluation and comment.
7. No road construction will occur within 3,000 feet of Met or Gran Point if sea lions are present unless approved by NMFS in writing after evaluation of the monitoring and construction plan. Independent observers will be employed to ensure that no sea lions are present during work within 3,000 feet.
8. Met and Gran Point haulouts will be monitored during any construction within 3,000 feet to determine if any disturbance is occurring. Monitoring will include noise level readings as well as sea lion observations. FHWA will provide NMFS a monitoring plan detailing how and when the haulouts will be monitored, the equipment and personnel used, and training to be provided before constructing within the 3,000-foot zone of the haulouts.
9. Any blasting within 3,000 feet of either haulout, if occupied, will be monitored to document that ground vibrations at the haulout are not greater than 0.05 inches per second (ips), and noise levels are not greater than 45 dBA. Blasting at Met Point with monitoring will occur prior to blasting at Gran Point to ensure ground vibrations at the haulout are not greater than 0.5 ips and noise levels remain equal or below 45 dBA. Monitoring results will be presented to NMFS in a report for review before commencing work at Gran Point.
10. During construction, monitors will be on the ground or in boats; aircraft would not operate within 3,000 feet of either haulout if occupied.

11. Helicopter operations during avalanche control will minimize activity within a 3,000-foot radius around the haulouts and helicopters will not fly within 1,000 feet of either haulout.
12. Video monitoring at the Gran Point haulout and aerial/ground monitoring at the Met Point haulout will continue throughout construction and for five years after construction to determine the extent of human access to the haulouts and disturbance of sea lions. If adverse impacts are identified, DOT&PF will consult with NMFS to determine what additional mitigation measures are necessary.

Provided that the preferred alternative is constructed in the manner consistent with the agreed mitigation measures for Steller sea lions (listed above), NMFS concurs that the proposed construction of Alternative 2B is not likely to adversely affect listed species (Steller sea lions) or their critical habitat areas. Additional consultation will be required as part of the mitigation measure and conditional concurrence.

5.0 REFERENCES

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TABLES

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Table 1
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
12/23/02	many sea lions present		
12/24/02	too much snow - no visibility		
12/25/02	Christmas - NS		
12/26/02	NS		
12/27/02	WE - NS		
12/28/02	WE - NS		
12/29/02	NS		
12/30/02	NS		
12/31/02	NS - call to SeeMore		
01/01/03	New Year's Day		
01/02/03	sea lions present - SeeMore working on system		
01/03/03	NS		
01/04/03	WE - NS		
01/05/03	WE - NS		
01/06/03	program locked up - Lane @ SeeMore can see animals present		
01/07/03	program locked up - Lane @ SeeMore can see animals present		
01/08/03	sea lions present - most rocks		
01/09/03	sea lions present - most rocks		
01/10/03	many animals present		
01/11/03	WE - NS		
01/12/03	WE - NS		
01/13/03	sea lions on most rocks		11:00A
01/14/03	sea lions present		9:00A
01/15/03	snow storm - some seal lions present		10:00A
01/16/03	sea lions present	15-20	9:00A
01/17/03	sea lions present	13	2:00A
01/18/03	WE - NS		
01/19/03	WE - NS		
01/20/03	NS		
01/21/03	very windy & rough seas	0	
01/22/03	still very windy - high surf on rocks	0	
01/23/03	high wind, waves	0	
01/24/03	high wind, snow	0	
01/25/03	WE - NS		
01/26/03	WE - NS		
01/27/03	sea lions present	22	
01/28/03	sea lions present	20+	
01/29/03	many sea lions present		
01/30/03	many sea lions @ N. main slab		
01/31/03	many sea lions present		
02/01/03	WE - NS		
02/02/03	WE - Stills	few sea lions	
02/03/03	many sea lions on main slab		
02/04/03	many sea lions on main slab		
02/05/03	many sea lions on main slab seen from camera #1		
02/06/03	many sea lions on main slab seen from camera #1		
02/07/03	many sea lions on main slab seen from camera #1		
02/08/03	WE - Stills	many sea lions	

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
02/09/03	WE - Stills	few sea lions	
02/10/03	sea lions present	20	
02/11/03	sea lions present on main slab		
02/12/03	sea lions present on main slab		
02/13/03	two small groups present @ water		
02/14/03	sea lions present	~ 50	
02/15/03	WE -Stills	many sea lions	
02/16/03	WE - Stills	many sea lions	
02/17/03	WE - Stills	many sea lions	
02/18/03	many sea lions on main slab & small slab		
02/19/03	no sea lions in vicinity - strong northerly wind		
02/20/03	sea lions present - strong N. wind & waves	40+	
02/21/03	sea lions present	~ 30	
02/22/03	WE - Stills	many sea lions	
02/23/03	WE - Stills	many sea lions	
02/24/03	sea lions present on lower rocks - not covered by snow		
02/25/03	sea lions present on lower rocks		
02/26/03	sea lions on all rocks	100+	
02/27/03	Stills	many sea lions	
02/28/03	Stills	many sea lions	
03/01/03	WE - Stills	sea lions present	
03/02/03	WE - Stills	many sea lions	
03/03/03	sea lions on N. part of main slab		
03/04/03	many sea lions on main slab		
03/05/03	Stills	many sea lions	
03/06/03	sea lions on lower N. of main slab - high wind & waves		
03/07/03	sea lions on lower slab		
03/08/03	WE - Stills	few sea lions	
03/09/03	WE - Stills	none	
03/10/03	sea lions on lower slab		
03/11/03	sea lions on lower slab		
03/12/03	sea lions high on main slab		
03/13/03	sea lions high on main slab		
03/14/03	heavy snow - no visibility - high waves		
03/15/03	WE - Stills	many sea lions	
03/16/03	WE - Stills	many sea lions	
03/17/03	many on lower s.slab - more on upper N		
03/18/03	many sea lions on lower & upper main slab		
03/19/03	Stills	many sea lions	
03/20/03	many sea lions on small S rocks & main slab		
03/21/03	Stills	many sea lions	
03/22/03	WE - Stills	many sea lions	
03/23/03	WE - Stills	many sea lions	
03/24/03	many sea lions present		
03/25/03	numerous sea lions present on rocks - about 25 left a rock at the same time & returned to water		
03/26/03	numerous sea lions present on main slab (low & high)		
03/27/03	many sea lions present on main slab (low & high)		
03/28/03	numerous sea lions present on main rock slab		

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
03/29/03	WE - Stills	many sea lions	
03/30/03	WE - Stills	many sea lions	
03/31/03	Stills	many sea lions	
04/01/03	numerous sea lions present on haulout - rough sea conditions		
04/02/03	numerous sea lions on lower & upper rock slab - rough sea conditions		
04/03/03	numerous sea lions on rocks		
04/04/03	Stills	many sea lions	
04/05/03	WE - Stills	many sea lions	
04/06/03	WE - Stills	many sea lions	
04/07/03	numerous sea lions on main rock - some on others		
04/08/03	Stills	many sea lions	
04/09/03	Stills	many sea lions	
04/10/03	Stills	many sea lions	
04/11/03	many on all rocks		
04/12/03	WE - Stills	many sea lions	
04/13/03	WE - Stills	many sea lions	
04/14/03	many on all rocks		
04/15/03	many on all rocks		
04/16/03	many on all rocks		
04/17/03	main rock is loaded with sea lions - also on N. rocks	100+	
04/18/03	many on all rocks		
04/19/03	WE - Stills	many sea lions	
04/20/03	WE - Stills	many sea lions	
04/21/03	Stills	many sea lions	
04/22/03	many on main haulout		
04/23/03	many on main haulout		
04/24/03	many on main haulout & smaller rocks		
04/25/03	many on main haulout & smaller rocks		
04/26/03	WE - Stills	many sea lions	
04/27/03	WE - Stills	many sea lions	
04/28/03	many on main haulout & smaller rocks		
04/29/03	many sea lions on main rock & rocks to the S below camera		
04/30/03	many of sea lions on main rock & rocks to the S below camera		
05/01/03	many sea lions on main rock & rocks to the S below camera		
05/02/03	many sea lions on main rock & rocks to the S below camera		
05/03/03	WE - Stills	many sea lions	
05/04/03	WE - Stills	many sea lions	
05/05/03	many sea lions on S side of main rock and N side	100+	
05/06/03	many on S side of main rock and N side	50+	
05/07/03	system down		
05/08/03	many sea lions on main rock & smaller S	100+	
05/09/03	Stills	many sea lions	
05/10/03	WE - Stills	many sea lions	
05/11/03	WE - Stills - cameras down		
05/12/03	sea lions on main rock & S spots	100+	
05/13/03	many sea lions, large male on main rock	100+	
05/14/03	Stills	many sea lions	
05/15/03	many sea lions on main rock, crowded on rocks below #1 and to south		

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
05/16/03	many sea lions N & S side & smaller S rocks		
05/17/03	WE - Stills - cameras down		
05/18/03	WE - Stills	many sea lions	
05/19/03	many sea lions N & S side & smaller S rocks		
05/20/03	many sea lions N & S side & smaller S rocks		
05/21/03	many sea lions on N side & S small rocks		
05/22/03	many sea lions on S slab, smaller rocks & N slab	100+	
05/23/03	many sea lions everywhere N & S	100+	
05/24/03	WE - Stills	many sea lions	
05/25/03	WE - Stills	many sea lions	
05/26/03	Stills	many sea lions	
05/27/03	many sea lions on both sides of main haulout		
05/28/03	many sea lions on both sides of main haulout		
05/29/03	many females on small S rocks, many on N side of main slab		
05/30/03	Stills	many sea lions	
05/31/03	WE - Stills	many sea lions	
06/01/03	WE - Stills - cameras down		
06/02/03	many sea lions on all rocks	~ 100	
06/03/03	many sea lions on N side & S	~ 100	
06/04/03	many sea lions present	~ 100	
06/05/03	sea lions on main slab and S. slab	~ 100+	
06/06/03	many on main slab & few on side rocks	100-	
06/07/03	WE - Stills	sea lions present	
06/08/03	WE - Stills	sea lions present	
06/09/03	sea lions on S small rocks, S side of main slab N side of main slab	~ 90	
06/10/03	sea lions of S small rocks, S main slab & N main slab	~ 100	
06/11/03	sea lions on S. small rocks & S. mail slab	~ 90	
06/12/03	sea lions S. small rocks & N main rock	~ 110	
06/13/03	Stills	many sea lions	
06/14/03	WE - Stills	many sea lions	
06/15/03	WE - Stills	many sea lions	
06/16/03	sea lions S. side of main slab	100+	
06/17/03	sea lions on small rock, S main rock & N main rock	~ 90	
06/18/03	sea lions on S small rocks & N. main slab	95	
06/19/03	sea lions on S small rock, S main slab & N main slab	90	
06/20/03	sea lions on S. small rocks & S. mail slab	100+	
06/21/03	WE - Stills	many sea lions	
06/22/03	WE - Stills	many sea lions	
06/23/03	sea lions on S main slab, S small rocks, N small rocks & N small rocks	~ 100	
06/24/03	sea lions on S small rocks, N main rock & N small rocks	~ 100	
06/25/03	sea lions on S main slab, S small slab & N main slab	~ 100	
06/26/03	many sea lions	~ 90	
06/27/03	sea lions on S main slab & S small rocks, N main slab, N small rocks and water	100+	
06/28/03	WE - Stills	many sea lions	
06/29/03	WE - Stills	many sea lions	
06/30/03	sea lions on main slab, S small rocks, N small rocks and S main slab	100+	
07/01/03	sea lions on main slab, S small rocks, S small rocks and N main slab	100+	
07/02/03	sea lions on small rocks & S main rock	~ 100	

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
07/03/03	sea lions on S small rocks, S main rock, N main rock & N small rocks	~ 90	
07/04/03	Stills	many sea lions	
07/05/03	WE - Stills	many sea lions	
07/06/03	WE - Stills	many sea lions	
07/07/03	sea lions on main rock, S small rocks, N main rock & water	74	
07/08/03	sea lions on S small rock & S main rock	85+	
07/09/03	sea lions on S main rock & S small rocks	75+	
07/10/03	sea lions on S side rocks	40	
07/11/03	Stills	few sea lions	
07/12/03	WE - Stills	many sea lions	
07/13/03	WE - Stills	many sea lions	
07/14/03	sea lions present	32	
07/15/03	sea lions present	12	
07/16/03		no sea lions	
	Stills	no sea lions	
07/17/03		no sea lions	8:10A
		no sea lions	12:00P
		no sea lions	3:00P
	Stills	no sea lions	
07/18/03		no sea lions	8:15A
		no sea lions	12:00P
	Stills	no sea lions	
07/19/03	Stills	many sea lions	
07/20/03	Stills	few sea lions	
07/21/03		no sea lions	8:20A
		no sea lions	11:50A
	Stills	no sea lions	
07/22/03		no sea lions	8:00A
		no sea lions	12:00P
	Problems with camera connection		12:10P
	Stills	no sea lions	
07/23/03	system down		
	Stills	no sea lions	
07/24/03	Stills	no sea lions	
07/25/03	Stills	no sea lions	
07/26/03	WE - cameras down		
07/26/03	no Stills - cameras down		
07/27/03	WE - cameras down		
	no Stills - cameras down		
07/28/03		no sea lions	12:45P
		no sea lions	3:00P
	Stills	no sea lions	
07/29/03		no sea lions	10:30A
		no sea lions	3:05P
	Stills	no sea lions	
07/30/03		no sea lions	10:45P
		no sea lions	11:50A
		no sea lions	1:30P

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
07/30/03	Stills	no sea lions	
07/31/03		no sea lions	9:00A
	Stills	no sea lions	
08/01/03		no sea lions	3:00P
	Stills	no sea lions	
08/02/03	WE - cameras down		
	no Stills - cameras down		
08/03/03	WE - cameras down		
	no Stills - cameras down		
08/04/03		no sea lions	10:30A
		no sea lions	1:00P
		no sea lions	3:30P
	Stills	no sea lions	
08/05/03		no sea lions	10:30A
		no sea lions	3:00P
	Stills	no sea lions	
08/06/03		no sea lions	12:45P
		no sea lions	2:00P
		no sea lions	3:30P
	Stills	no sea lions	
08/07/03		no sea lions	11:30A
		no sea lions	12:50P
		no sea lions	3:58P
	Stills	no sea lions	
08/08/03		no sea lions	11:00A
		no sea lions	12:50P
		no sea lions	3:30P
	Stills	no sea lions	
08/09/03	WE - Stills	no sea lions	
08/10/03	WE - Stills	no sea lions	
08/11/03		no sea lions	10:30A
		no sea lions	1:30P
		no sea lions	4:05P
08/11/03	Stills	no sea lions	
08/12/03		no sea lions	12:00P
		no sea lions	4:00P
	Stills	no sea lions	
08/13/03		no sea lions	9:15A
		no sea lions	1:45P
	Stills	no sea lions	
08/14/03		no sea lions	9:45A
		no sea lions	3:40P
	Stills	no sea lions	
08/15/03		no sea lions	9:20A
	Stills	no sea lions	
08/16/03	WE -no Stills - cameras down		
08/17/03	WE - Stills	no sea lions	
08/18/03	Only checked picture stills	no sea lions	

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
08/19/03		no sea lions	9:25A
	Stills	no sea lions	
08/20/03		no sea lions	10:00A
	Stills	no sea lions	
8/21/03	Stills	no sea lions	
8/22/03	Stills	no sea lions	
8/23/03	Stills	no sea lions	
8/24/03	Stills	2 sea lions	12:01:02PM
		2 sea lions	12:17:47PM
		3 sea lions	02:17:46PM
		3 sea lions	02:17:49PM
		3 sea lions	04:03:48PM
		3 sea lions	04:17:48PM
		2 sea lions	06:03:44PM
		2 sea lions	06:17:46PM
8/25/03	system down		
	Stills	no sea lions	
8/26/03	system down - called Lane (SWS)		9:00 AM
	system up & down all day		
	Stills	no sea lions	
8/27/03	Stills	2 sea lions	12:01:02 PM
		2 sea lions	12:03:46 PM
		1 sea lion	12:30:11 PM
		1 sea lion	04:01:04 AM
8/28/03		no sea lions	8:45A
	in water N large slab	3 or 4 sea lions	12:03:00 PM
		no sea lions	1:05P
	Stills	no sea lions	
8/29/03		no sea lions	11:00A
		no sea lions	2:58P
	Stills	no sea lions	
8/30/03	Stills	1 sea lion	06:03:47PM
		1 sea lion	06:17:54PM
9/1/03	Stills	1 sea lion	02:01:04PM
		1 sea lion	04:01:02PM
9/2/03		no sea lions	9:10A
		no sea lions	3:40P
	Stills	no sea lions	
9/3/03		2 sea lions	9:54:38A - 10:05:49A
		3 sea lions	12:25:39P
		4 sea lions	12:44:58P
	including the pup "FAITH"	6 sea lions	12:53P
	including the pup "FAITH"	4 sea lions	4:28:53P
		2 sea lions	6:17:50P
	Stills	yes	
9/4/03		no sea lions	9:40A
		no sea lions	11:10A

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
9/4/03		no sea lions	12:30P
		no sea lions	3:30P
	Stills	no sea lions	
9/5/03		no sea lions	9:10A
		no sea lions	10:45A
		no sea lions	1:05P
	Stills	no sea lions	
9/6/03	Stills	no sea lions	
9/7/03	Stills	no sea lions	
9/8/03		no sea lions	8:50A
		no sea lions	2:35P
		no sea lions	4:30P
	Stills	no sea lions	
9/9/03		no sea lions	9:10A
		no sea lions	12:35P
9/9/03	Stills	no sea lions	
9/10/03		no sea lions	9:05A
		no sea lions	12:20P
		no sea lions	4:15P
	Stills	1 sea lion in water	8:56:53A
9/11/03		no sea lions	10:45A
		no sea lions	12:10P
		no sea lions	3:25P
	Stills	no sea lions	
9/12/03		no sea lions	9:00A
		no sea lions	2:36P
	Stills	no sea lions	
9/13/03	Stills	19	
9/14/03	Stills	30+	
9/15/03		50 - 80	8:40A
		50 - 80	1:10P
	Stills	50 - 80	
9/16/03	Sea lions were present all day	100+	8:07A
	sighted sea lion H27		
	Stills	100+	
9/17/03	sighted sea lion H27 &H32	100+	10:00A
	Stills	100+	
9/18/03		100+	9:15A
	Stills	~ 70	
9/19/03	many present all day	100+	9:00A
	called SWS to let them know that camera		
	2 & 3 not coming in clear and camera 3		
	left manual button not working. Talked to		
	Matt & Lane		
9/20/03	Stills	~ 40	
9/21/03	Stills	~ 50	
9/22/03	sighted sea lion F105Y	100+	11:15A
9/23/03		100+	9:00A

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
9/23/03	Stills	100+	
9/24/03		100+	10:15A
		100+	12:15P
	Stills	100+	
9/25/03		100+	11:20A
	Stills	100+	
9/26/03		100+	9:15A
	Stills	100+	
9/27/03	Stills - Camera down part-time	100+	
9/28/03	Stills - Camera down part-time	100+	
9/29/03	Stills - Lane from SWS called & said that		
	AT&T was having problems in Haines so the		
	camera wasn't working most of the day.		
	There were a few Stills with 100+ sea lions.	100+	
9/30/03	camera wasn't working most of the day.	100+	
	Stills	100+	
10/1/03	camera wasn't working most of the day.	100+	
	Stills	100+	
10/2/03		100+	
10/3/03	Stills	~ 50	
10/4/03	Stills	~ 30	
10/5/03	Stills	~ 50	
10/6/03	Stills	~ 20	10:04A
	Stills	~ 30	2:04P
10/7/03	Stills	~ 30	10:04A
10/8/03	Stills	~ 35	
10/9/03		~ 30	9:00A
		~ 50	10:20A
	Stills		
10/10/03		~ 100	10:45A
	Stills	~ 100	
10/11/03	Stills	~ 50	
10/12/03	Stills	100+	
10/13/03		90-100	8:40A
		80-90	4:16P
	Stills	~ 50	
10/14/03		~ 100	9:55A
	Stills	~ 100	
10/15/03	Stills	~ 30	
10/16/03	Stills	60+	
10/17/03	Stills	70+	
10/18/03	Stills	30	
10/19/03	Stills	20	
10/20/03		90+	9:30A
	Stills	60-70	
10/21/03		~ 70	9:35A
	Stills	~ 50	
10/22/03		~ 100	9:25A

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
10/23/03	Stills	25-30	
10/24/03	Stills	~ 50	
10/25/03	Stills	~ 80	
10/26/03	Stills	50-80	
10/27/03	Stills	100+	
10/28/03		100+	9:15A
	Stills	~ 50	
10/29/03	Stills	~ 50	
10/30/03	Stills	100+	
10/31/03		100+	9:30A
		100+	2:00P
	Stills	100+	
11/1/03	Stills	100+	
11/2/03	Stills	100+	
11/3/03		100+	9:20A
11/4/03	cameras down		
	Stills	100+	
11/5/03	cameras down - SeeMore Wildlife installing DSL		
	Stills	100+	
11/6/03	cameras down	100+	
	Stills	100+	
11/7/03		~ 80	
	Stills	100+	
11/8/03	Stills	~ 50	
11/9/03	Stills	30-50	
11/10/03		40-50	3:15P
	Stills	~ 50	
11/11/03	Stills	100+	
11/12/03	Stills	100+	
11/13/03	camera down - talked to Matt @ SWS. He		
	said that the internet was possibly down in		
	Haines		
	Stills	~ 50	
11/14/03		100+	9:10A
	Stills	100+	
11/15/03	Stills	100+	
11/16/03	cameras down		
	Stills -cameras down, no pics		
11/17/03	camera down in morning	15-20	10:30A
		15-20	1:30P
	Stills - some snow	15-20	
11/18/03	Some snow	27	1:15P
	Stills	10	
11/19/03		100+	9:30A
	Stills		
11/20/03	Camera #1 - out of bounds	80-100	9:25A
	Camera #3 - blurry		
	Stills	~ 50	

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
11/21/03	camera down		
	Stills	~ 50	
11/22/03	camera down		
	Stills - snow	~ 20	
11/23/03	camera down		
	Stills	80-100	
11/24/03	snow	~ 50	
11/24/03	Stills	30	
11/25/03		~ 100	9:45A
	Stills	100+	
11/26/03	Stills	40-50	
11/27/03	Stills	20-30	
11/28/03	Stills - snow	~ 25	
11/29/03	Stills - no pictures		
11/30/03	Stills -snow	30	
12/1/03	cameras down		
12/2/03	cameras down		
12/3/03	cameras down		
12/4/03	Stills - cameras down	100+	
12/5/03		100+	1:45P
	Stills	100+	
12/6/03	Stills	100+	
12/7/03	Stills	100+	
12/8/03	Stills - snow	100+	
12/9/03		100+	9:55A
	Stills - snow	100+	
12/10/03		100+	10:30A
12/11/03	cameras down		
12/12/03	cameras down		
12/13/03	cameras down		
12/14/03	cameras down		
12/15/03	cameras down		
12/16/03	cameras down		
12/17/03	cameras down		
12/18/03	cameras down		
12/19/03	cameras down		
12/20/03	cameras down		
12/21/03	cameras down		
12/22/03	cameras down		
12/23/03	cameras down		
12/24/03	cameras down		
12/25/03	cameras down		
12/26/03	cameras down		
12/27/03	cameras down		
12/28/03	cameras down		
12/29/03	cameras down		
12/30/03	cameras down		
12/31/03	cameras down		

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
1/1/04	cameras down		
1/2/04	cameras down		
1/3/04	cameras down		
1/4/04	cameras down		
1/5/04	cameras down		
1/6/04	cameras down		
1/7/04		~ 15	9:10A
1/7/04	Stills	0	
1/8/04		~ 30	11:15A
1/9/04	cameras down		
1/10/04	cameras down		
1/11/04	cameras down		
1/12/04	cameras down		
1/13/04	cameras down		
1/14/04	cameras down		
1/15/04	cameras down		
1/16/04	cameras down		
1/17/04	cameras down		
1/18/04	cameras down		
1/19/04	cameras down		
1/20/04	cameras down		
1/21/04	Stills	30-40	
1/22/04	Stills	100+	
1/23/04	cameras down		
1/24/04	cameras down		
1/25/04	cameras down		
1/26/04	cameras down		
1/27/04		2	10:15A
1/28/04		10	2:30P
1/28/04	Stills (no pics)		
1/29/04		~ 50	9:30A
1/29/04	Stills	~ 30 - 50	
1/30/04	Stills	100+	
1/31/04	no Stills		
2/1/04	no Stills		
2/2/04		100+	1:30P
2/2/04	Stills	100+	
2/3/04		100+	10:30A
2/3/04	Stills	100+	
2/4/04	some in water - snowing hard		10:30A
2/4/04	1 Still - can not see any sea lions		
2/5/04	no stills		
2/6/04	no stills		
2/7/04	5 stills of one area only	few	
2/8/04	no stills		
2/9/04	no stills		
2/10/04	Stills	none	
2/11/04	Stills	25	

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
2/12/04		100+	12:00 noon
	Stills	~ 75	
2/13/04		100+	11:20A
	Stills	100+	
2/14/04	Stills	50-75	
2/15/04	Stills	100	
2/16/04	Stills	100	
2/17/04	Stills	50-75	
2/18/04	Many in water - snowing - middle area (50)	50+	11:00A
	Stills-snow	75	
2/19/04	Stills	some	
2/20/04	Stills	some	
2/21/04	Stills	some	
2/22/04	Stills	none	
2/23/04	no Stills		
2/24/04	Stills	100+	
2/25/04	Stills	~ 80	
2/26/04	Stills	~ 30	
2/27/04	Stills	100+	
2/28/04	Stills	100+	
2/29/04	Stills	100+	
3/1/04	Stills	100+	
3/2/04	Stills	100+	
3/3/04	no Stills		
3/4/04	Stills	~ 50	
3/5/04	Stills	100+	
3/6/04	Stills	~ 60-70	
3/7/04	Stills	100+	
3/8/04	Stills - snow - saw no sea lions	none	
3/9/04	Stills	~ 50	
3/10/04	Stills	~ 50	
3/11/04	Stills	~ 100	
3/12/04	Stills	100+	
3/13/04	Stills	100+	
3/14/04	Stills	100+	
3/15/04	Stills	25-50	
3/16/04		100+	12:00P
	Stills	100+	
3/17/04	Stills	100+	
3/18/04	Stills	~ 100	
3/19/04		100+	10:45A
	Stills	~ 100	
3/20/04	Stills	~ 50 - 70	
3/21/04	no stills	0	
3/22/04	Stills	100+	
3/23/04	No stills	0	
3/24/04	Stills	100+	
3/25/04	Stills	100+	

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
3/26/04	Stills	100+	
3/27/04	Stills	50+	
3/28/04	Stills	5 - 10	
3/29/04	Stills	20 - 50	
3/30/04	Stills	~ 100	
3/31/04	Stills	~ 100+	
4/1/04	Stills	100+	
4/2/04	Stills	100+	
4/3/04	Stills	100+	
4/4/04	Stills	100+	
4/5/04	Stills	100+	
4/6/04	Stills	100+	
4/7/04	Stills - 50-70 on land a many in water	~ 50 - 70	
4/8/04	Many in the water	~ 50 - 60	1:45P
	Stills	50	
4/9/04		~ 10	10:45A
	Stills- a few on land and some in water	10+	
4/10/04	Stills	50 - 80	
4/11/04	Stills	100+	
4/12/04		100+	10:45A
4/13/04	Stills	~ 80	
4/14/04	Stills	100+	
4/15/04	Stills	100+	
4/16/04	Stills	~ 60 - 80	
4/17/04	Stills	~ 80	
4/18/04	Stills	100+	
4/19/04		100+	2:43 P
	Stills	100+	
4/20/04		100+	11:40A
	Stills	100+	
4/21/04		100+	all day
	Stills	100+	
4/22/04		~ 50	9:00A
4/22/04	Stills	~ 50	
4/23/04	Stills	100+	
4/24/04	Stills	~ 80 -100	
4/25/04	Stills	~ 25 - 50	
4/26/04	Stills	100+	
4/27/04	Stills	100+	
4/28/04	Stills	100+	
4/29/04		100+	all day
	Stills	100+	
4/30/04		100+	2:45P
	Stills	100+	
5/1/04	Stills	100+	
5/2/04	Stills	100+	
5/3/04	Stills	100+	
5/4/04	Stills	100+	

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
5/5/04	Stills	100+	
5/6/04	Stills - camera #3 down	100+	
5/7/04	Stills - camera #3 down	100+	
5/8/04	Stills - camera #3 down	100+	
5/9/04	Stills - camera #3 down	100+	
5/10/04		100+	
5/11/04		100+	11:00 A
5/12/04		100+	11:00 A
5/13/04		100+	11:05 AM
5/14/04		100+	9:15 A
5/15/04	Stills	100+	
5/16/04	Stills	50+	
5/17/04		100+	10:30 AM
5/18/04		100+	9:30 AM
5/19/04	Stills	100+	
5/20/04	Stills	100+	
5/21/04	Stills	25	
5/22/04	Stills	100+	
5/23/04	Stills	100+	
5/24/04	Stills	100+	
5/25/04	Stills	100+	
5/26/04	Stills	100+	
5/27/04	Stills	100+	
5/28/04	Stills	100+	
5/29/04	Stills	100+	
5/30/04	Stills	100+	
5/31/04	Stills	100+	
6/1/04	Stills	100+	
6/2/04		100+	2:10 PM
6/3/04		100+	10:00 AM
6/4/04		100+	
6/5/04	Stills	100+	
6/6/04	Stills	100+	
6/7/04	Stills	100+	
6/8/04	Stills	100+	
6/9/04	Stills	100+	
6/10/04	Stills	100+	
6/11/04	Stills	100+	
6/12/04	Stills	100+	
6/13/04	Stills	100+	
6/14/04		100+	11:25 AM
6/15/04		100+	10:00-11:00 AM
6/16/04		100+	
6/17/04		100+	
6/18/04		100+	
6/19/04	Stills	100+	
6/20/04	Stills	100+	
6/21/04	Stills	100+	

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
6/22/04	Stills	60-80	
6/23/04	only a few bulls	100+	2:15 PM
6/24/04	all in water but 6	~ 80	4:25 PM
6/25/04	~ 30 in water, 30 on main slab & 30 S rocks	~ 60	11:00 AM
6/26/04	Stills	100+	10:35 AM
6/27/04	Stills	100+	12:54 PM
6/28/04		100+	11:00 AM
6/29/04	Stills	100+	4:29 PM
6/30/04	Stills	100+	3:49 PM
7/1/04	Stills	100+	12:29 PM
7/2/04		100+	11:30 AM
7/3/04	Stills	100+	12:44 PM
7/4/04	Stills 60+ on land and many in water	60+	12:23 PM
7/5/04	Stills	100+	12:54 PM
7/6/04		100+	10:30 AM
7/7/04	Stills	100+	3:00 PM
7/8/04		100+	11:15 AM
		100+	2:00 PM
7/9/04		100+	11:00 PM
7/10/04	Stills	100+	11:54
7/11/04	Stills	100+	11:00 AM
7/12/04		100+	9:04 AM
		100+	1:30 PM
7/13/04	No large bulls-4 whales- 1 sea lion on s. slab	1	9:16 AM
	Stills	100+	11:06 AM
7/14/04	No large bulls	100+	11:09 AM
		100+	1:10 PM
7/15/04	No large bulls	~ 90	11:15 AM
7/16/04	No large bulls-1 whale	none on main slab	10:36 AM
		100+	3:43 PM
7/17/04	Stills	100+	4:27 PM
		100+	1:29 PM
7/18/04	Stills - many in water	80-100	1:04 PM
		80-100	2:44 PM
7/19/04		~ 50	10:36 AM
		100+	4:08 PM
7/20/04		100+	8:49 PM
		~ 80	1:05 PM
		100+	3:29 PM
7/21/04		100+	10:22 AM
		100+	4:30 PM
7/22/04		80-100	9:00 AM
7/23/04		60-70	8:48 AM
		60-70	1:12 PM
7/24/04	Stills	100+	2:14 PM
7/25/04	Stills	100+	1:00 PM
7/26/04		100+	1:00 PM
7/27/04		100+	9:00 AM

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
7/27/04		100+	2:25 PM
		100+	4:28 PM
7/28/04		80+	9:14 AM
7/29/04	Stills	100+	3:00 PM
7/30/04		100+	12:06 PM
7/31/04	Stills	100+	1:00 PM
8/1/04	Stills	100+	1:00 PM
		100+	3:50 PM
8/2/04		100+	1:10 PM
8/3/04		~ 50 - 70	10:17 AM
		100+	10:32 AM
	Stills - some in water	~ 15	1:25 PM
8/4/04		~ 60	11:15 AM
8/5/04		100+	8:55 AM
		100+	1:00 PM
		100+	2:10 PM
8/6/04	Camera #1 replaced	~ 50	9:40 AM
		~ 9	4:22 PM
8/7/04	Stills	no sea lions	all day
	Stills	no sea lions	all day
8/8/04		no sea lions	all day
8/9/04		no sea lions	
8/10/04		no sea lions	
8/11/04		no sea lions	
8/12/04		no sea lions	
8/13/04		no sea lions	
8/14/04		no sea lions	8:40 AM
		70 - 90	2:30 PM
8/15/04	Stills	50+	
8/16/04		70 - 90	2:00 PM
8/17/04		no sea lions	morning
		5	afternoon
8/18/04		5 - 10	morning & afternoon
8/19/04		no sea lions	9:30 AM
	Stills	2	3:01 PM
8/20/04	Stills	1	2:11 PM
8/21/04	Stills	~ 25	4:00 PM
8/22/04	Stills	50 - 75	1:40 PM
8/23/04		no sea lions	
8/24/04	Stills	1	
8/25/04	Stills	2	
8/26/04	Stills	1	
8/27/04	Stills	20 - 30	
8/28/04	Stills	no sea lions	
8/29/04	Stills	3	
8/30/04	Stills	some in water only	

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
8/31/04	Stills	some in water only	12:52 PM
9/1/04		50 - 70	3:47 PM
9/2/04		100+	
9/3/04		100+	
9/4/04		~ 50	
9/5/04		50 - 70	
9/6/04		50 - 70	
9/7/04		100+	
9/8/04		100+	
9/9/04		100+	
9/10/04	Stills	~ 100	
9/11/04	Stills	~ 100	
9/12/04	Stills	~ 100	
9/13/04		100+	
9/14/04		50 - 60	
9/15/04		100+	
9/16/04		100+	
9/17/04		~ 50	
9/18/04		100+	
9/19/04	No Stills		
9/20/04		50 - 60	
9/21/04		100+	
9/22/04		100+	
9/23/04		100+	
9/24/04		100+	
9/25/04		100+	
9/26/04		100+	
9/27/04		100+	
9/28/04		100+	
9/29/04		100+	
9/30/04		100+	
10/1/04		100+	
10/2/04		100+	
10/3/04		100+	
10/4/04		100+	
10/5/04		100+	
10/6/04		~ 90	
10/7/04		~ 50	
10/8/04		100+	
10/9/04		100+	
10/10/04		100+	
10/11/04		100+	
10/12/04		~ 15	
10/13/04		100+	
10/14/04		100+	
10/15/04		100+	
10/16/04		100+	
10/17/04		100+	

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
10/18/04		100+	
10/19/04		100+	
10/20/04		100+	
10/21/04		50 - 75	
10/22/04		100+	
10/23/04		100+	
10/24/04	snow	~ 50	
10/25/04		100+	
10/26/04		100+	
10/27/04		100+	
10/28/04		100+	
10/29/04		100+	
10/30/04		100+	
10/31/04	no pics - cameras down		
11/1/04		100+	
11/2/04		100+	
11/3/04		~ 20	
11/4/04		100+	
11/5/04		100+	
11/6/04		100+	
11/7/04	snow	100+	
11/8/04		100+	
11/9/04		100+	
11/10/04		100+	
11/11/04		100+	
11/12/04		100+	
11/13/04		50 - 75	
11/14/04		100+	
11/15/04		100+	
11/16/04		100+	
11/17/04		100+	
11/18/04		100+	
11/19/04		100+	
11/20/04		100+	
11/21/04		100+	
11/22/04		75+	
11/23/04		100+	
11/24/04		100+	
11/25/04		~ 80	
11/26/04	cameras not on		
11/27/04	cameras not on		
11/28/04		~ 50	
11/29/04		100+	
11/30/04		100+	
12/1/04		100+	
12/2/04	no camera #1	~ 75	
12/3/04	no camera #1	~ 50	
12/4/04		~ 75	

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
12/5/04		100+	
12/6/04	light snow	100+	
12/7/04		100+	
12/8/04	trouble with cameras out of focus	~ 25	
12/9/04	snow	~ 30	
12/10/04		100+	
12/11/04	snow	100+	
12/12/04		100+	
12/13/04		100+	
12/14/04		100+	
12/15/04		60+	
12/16/04		100+	
12/17/04		100+	
12/18/04		100+	
12/19/04		100+	
12/20/04		100+	
12/21/04		100+	
12/22/04		35	
12/23/04		10	
12/24/04		100+	
12/25/04		~ 5	
12/26/04		100+	
12/27/04	snow	20	
12/28/04	snow	20	
12/29/04	snow	10	
12/30/04		10	
12/31/04		45	
1/1/05		100+	
1/2/05		50 - 75	
1/3/05		20	
1/4/05		100+	
1/5/05		11	
1/6/2005 - 1/7/05	System down	No data	
1/8/05		50 - 60	
1/9/05		100+	
1/10/05		6	
1/11/05		7	
1/12/05		20+	
1/13/05		6	
1/14/05		35	
1/15/05		25	
1/16/05		7	
1/17/2005 - 1/18/05		0	
1/19/05		6	
1/20/05		16+	
1/21/05		7	

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
1/22/2005 - 2/2/05	System down	No data	
2/3/05		0	all day
2/4/05		18	
2/5/05	System down	No data	
2/6/05	System down	No data	
2/7/05		60	
2/8/05		13	
2/9/05		28	
2/10/05		36	
2/11/05		35	
2/12/05		44	
2/13/05		16	
2/14/05		32	
2/15/05	System down	No data	
2/16/05		26	
2/17/05		24	
2/18/05		40	
2/19/05		35	
2/20/05		35	
2/21/05		8	
2/22/05		8	
2/23/05		32	
2/24/05		28	
2/25/05		27	
2/26/05		8	
2/27/05		20	
2/28/05		24	
3/1/05		22	
3/2/05		100+	
3/3/05		42	
3/4/05		30+	
3/5/05		35	
3/6/05		55	
3/7/05		100+	
3/8/05		100+	
3/9/05		100+	
3/10/05		18	
3/11/05		24	
3/12/05		42	
3/13/05		46	
3/14/05		100+	
3/15/05		56	
3/16/05		34	
3/17/05		100+	
3/18/05		45	
3/19/05		36	
3/20/05		32	

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
3/21/05		38	
3/22/05		35	
3/23/05		52	
3/24/05		58	
3/25/05		42	
3/26/05		45	
3/27/05		48	
3/28/05		44	
3/29/05		45	
3/30/05		50+	1:00 PM
3/31/05		50 - 80	
4/1/05		100+	
4/2/05		100+	
4/3/05		70 - 100	
4/4/05		100++	
4/5/05		100++	
4/6/05		100+	
4/7/05		100+	
4/8/05		100+	
4/9/05		80	
4/10/05		100+	
4/11/05		100+	
4/12/05		100+	
4/13/05		100++	
4/14/05		100++	
4/15/05		100++	
4/16/05		100+	
4/17/05		100++	
4/18/05		70	
4/19/05		100+	
4/20/05		100++	
4/21/05		100++	
4/22/05		100++	
4/23/05		100++	
4/24/05		100++	
4/25/05		100+	
4/26/05		100+	
4/27/05		100+	
4/28/05		100+	
4/29/05		100+	
4/30/05		100+	
5/1/05		100+	
5/2/05		100+	
5/3/05		100+	
5/4/05		100+	
5/5/05		100++	
5/6/05		100	
5/7/05		100	

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
5/8/05		100+	
5/9/05		100+	
5/10/05		100+	
5/11/05		100+	
5/12/05		100+	
5/13/05		100+	
5/14/05		100++	
5/15/05		100	
5/16/05		100+	
5/17/05		55	
5/18/05		100+	
5/19/05		100++	
5/20/05		100+	
5/21/05		100+	
5/22/05		100+	
5/23/05		100++	
5/24/05		100+	
5/25/05		100+	
5/26/05		100+	
5/27/05		100+	
5/28/05		100+	
5/29/05		100+	
5/30/05		100+	
5/31/05		100+	
6/1/05		100+	
6/2/05		100+	
6/3/05		100+	
6/4/05		100++	
6/5/05		100++	
6/6/05		100++	
6/7/05		100++	
6/8/05		100+	
6/9/05		32	
6/10/05		100+	
6/11/05		60	
6/12/05		60	
6/13/05		100+	
6/14/05		100+	
6/15/05		100++	
6/16/05		65+	
6/17/05		10 - 15	
6/18/05		100+	
6/19/05		100+	
6/20/05		100+	
6/21/05		100+	
6/22/05		100+	
6/23/05		100+	
6/24/05		100+	

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
6/25/05		42	
6/26/05		35	
6/27/05		100+, 0	am, pm
6/28/05		100+	am
6/29/05		100+	
6/30/05		100+	
7/1/05		100+	
7/2/05		100+	
7/3/05		100+	
7/4/05		100+	
7/5/05		50 - 60	
7/6/05		100+	
7/7/05		70	
7/8/05		38	
7/9/05		36	
7/10/05		45	
7/11/05		80 - 90	am
7/12/05		56	
7/13/05		42	
7/14/05		5	am
7/15/05		2	am
7/16/05 - 7/18/05		0	
7/19/05		0, 1, 1	am, 4:35 pm, 4:58 pm
7/20/05		0, 2	am, pm
7/21/05		0, 10, 0	am, 1:10 pm, 1:25 pm
7/22/05		1	1:49 PM
7/23/05		0	all day
7/24/05		1, 1	12:45 pm, 4:50 pm
7/25/05		2, 2, 2	2:15 pm, 2:22 pm, 2:26 pm
7/26/2005 - 7/28/05		0	
7/29/05		9, 1	2:21 pm, 4:47 pm
7/30/05 - 8/19		0	
8/20/05		1, 1	1:00 pm, 5:20 pm
8/21/05 - 8/26/05		0	
8/27/05 - 8/29/05		0	
8/30/05		1	1:00 PM
8/31/05		0	
9/1/05		1	12:48 PM
9/2/05	System down	No data	
9/3/05		0	

Table 1 (continued)
Gran Point Sea Lion Haulout Monitoring Log
December 23, 2002 – September 30, 2005

Date	Comments	Quantity	Time
9/4/05 - 9/5/05	System down	No data	
9/6/05		0	
9/7/05 - 9/8/05		0	
9/9/05 - 9/10/05		0	
9/11/2005		2, 2, 2, 1	11:13 am, 11:46 am, 1:10 pm, 1:40 pm
9/12/2005		0, 0, 0	8:00 am, 9:00 am, 12:00 pm
9/13/05		2, 3, 8, 0	8:00 am, 1:00 pm, 4:00 pm, 6:00 pm
9/14/05		0, 5, 0	8:00 am, 12:00 pm, 5:00 pm
9/15/05 - 9/16/05		0	
9/17/05		4	
9/18/05		1	
9/19/2005		12	am
9/20/05		7, 0, 3	am, 4:00 pm, 4:30 pm
9/21/2005		0	8:00 am, 4:00 pm
9/22/2005		0, 2, 2	8:00 am, 1:30 pm, 5:00 pm
9/23/05		10, 8	2:00 pm, 4:00 pm
9/24/05	System down	No data	
9/25/05	System down	No data	
9/26/05		6, 11	1:00 pm, 4:00 pm
9/27/05		13, 12	3:00 pm, 4:30 pm
9/28/05		11, 19	8:00 am, 2:00 pm
9/29/05		13, 21	8:00 am, 2:00 pm
9/30/05		23	3:30 PM

Notes: WE = Weekend
NS = No Camera Signal
~ = Approximately
Few = 6 or less present
N = North
S = South

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ATTACHMENT A
SECTION 7 CONSULTATION CORRESPONDENCE

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

Design and Engineering Services – Southeast Region
Preconstruction – Special Projects

6860 GLACIER HIGHWAY
JUNEAU, ALASKA 99801-7999

PHONE: (907) 465-1774
FAX: (907) 465-2016

July 11, 2005

Re: Juneau Access Improvements
Project 71100

James Balsiger, Administrator
Alaska Region
National Marine Fisheries Service
P. O. Box 21668
Juneau. Alaska 99802

Subject: Revised Biological Assessment

Dear Mr. Balsiger:

Thank you for your letter of March 23, 2005 providing an updated list of endangered and/or threatened species in the Juneau Access Improvements project area. As explained in the March 7, 2005 letter from the Federal Highway Administration (FHWA) and the 2005 Supplemental Draft Environmental Impact Statement, the Alaska Department of Transportation and Public Facilities has developed a revised biological assessment for this project. The enclosed revised assessment incorporates your updated list and additional information developed in the time since the original August 13, 1998 biological assessment was submitted to your agency. Per 50 CFR 402.12(g) the revised assessment incorporates the previous assessment by reference, summarizing its information and adding new or replacement information where appropriate.

The conclusion of the revised biological assessment is that the East Lynn Canal Highway (Alternative 2, 2B, 2C) is not likely to adversely affect listed species or adversely modify designated critical habitat. At this time DOT&PF, on behalf of FHWA, requests your concurrence with this determination.

Thank you for your consideration of this request.

Sincerely,

Reuben Yost
Project Manager

cc: Tim Haugh, FHWA

"Providing for the movement of people and goods and the delivery of state services."

25A-T34LH

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

ALASKA DOT & PF
SEP 29 2005
SPECIAL PROJECTS

September 27, 2005

Reuben Yost
State of Alaska
Department of Transportation and Public Facilities
6860 Glacier Highway
Juneau, Alaska 99801-7999

RE: Juneau Access Improvements Project, Revised Biological Assessment for Threatened, and Endangered Species

Dear Mr. Yost:

The National Marine Fisheries Service (NMFS) has reviewed the Federal Highway Administration (FHWA) revised Juneau Access Improvements Project Biological Assessment (BA) dated July 2005. In a letter received on July 11, 2005 you requested concurrence that the proposed action is not likely to adversely affect species listed under the Endangered Species Act (ESA) or their designated critical habitat. These species include endangered humpback whales, threatened eastern distinct population segment (eDPS) of Steller sea lion, the western distinct population segment (wDPS) of Steller sea lion, and designated critical habitat. The BA was forwarded to NMFS by the State of Alaska on behalf of the FHWA.

NMFS has reviewed the submitted project description and evaluation of project effects as well as the incorporated mitigation measures. The following is a description of the likely response of Steller sea lions and humpback whales to the proposed action and additional mitigation measures (conditions). Provided the proposed action is modified consistent with the conditions set forth below, NMFS concurs that the proposed action is not likely to adversely affect listed species or their designated critical habitat.

Response of Steller Sea Lions to Noise Generated by the Proposed Action

The proposed highway will be located within about 300 feet of the Gran Point haulout, well within the 3,000 foot designated critical habitat area. These critical habitat areas were designated as a buffer against disturbance, noise, harassment, and illegal shooting. Presumably, sea lions chose these sites in part because of their proximity to prey resources as well as the protection from predators or other disturbance. Although NMFS concurs with your technical assessment of the potential for noise to be attenuated from the work site to the haulout, we have limited experience with such activities and the likely response by Steller sea lions to human activity in such close proximity to an important haulout.

Man-made noise can cover a wide range of frequencies and level of sound, and the way in which a species responds depends on the frequency range it can hear, the level of sound, and the sound spectrum (Nedwell et al. 2004). Responses to noise include behavioral changes, habituation, temporary hearing impairment, and permanent physical damage to the animal. Noise can also mask biologically important signals such as intraspecific vocalizations among whales or sea lions, or the sounds of predators or prey. The impacts of noise are manifested at the level of the individual, in either short-term or long-term changes in the individual that may or may not be measurable (i.e., obvious gross behavioral changes or undetected physiological changes). Impacts of noise can also be manifested in long-term changes at the level of the population(s) if they reduce the survival or reproduction of many individuals.

A temporary shift in the hearing threshold (Temporary Threshold Shift (TTS)) due to exposure to sounds that exceed the natural threshold, occur when animals are exposed to loud instantaneous sound or to a prolonged sound that exceeds their threshold level. This temporary loss of hearing sensitivity is fully recoverable and is not considered to be an injury because no irreversible cell damage or death is involved. For marine mammals, the level has been set at 180 dB re 1 μPa @ 1m (NMFS 2005). Sounds greater than this level are likely to cause temporary or permanent hearing damage. Permanent Threshold Shift (PTS) is a loss of hearing sensitivity (even in a narrow range of frequencies) that is not fully recoverable. PTS is considered to be an injury because irreversible cell damage is involved. No data for PTS in any marine mammal currently exist, so PTS is generally estimated from the onset of TTS.

NMFS is currently developing acoustic criteria to define levels of noise that negatively affect marine mammals. The lower threshold for behavioral response is currently 160 dB re: 1μ Pa for pulsed received noise and 120 dB re: 1μ Pa for continuous noise (NMFS 2005). The impact of these noise levels will change depending on the frequency of the sound, and the response will be species-specific but also specific to individuals. From experimental studies on pinnipeds, dolphins and beluga whales, it appears that behavior begins to change, sometimes noticeably, at sound exposure levels lower than those causing the onset of TTS (180 dB re 1 μPa @ 1m). It is not clear whether this holds true for all species or all sound types, but for the test species studied, it was not uncommon for them to exhibit aberrant behavior at sound pressure levels at least 12 dB below the levels resulting in TTS onset (Finneran et al. 2002, Kastak et al. 1999).

Increased input of sound into the water column as a result of the proposed action may alter marine mammal behavior. If the noise is above-water, pinnipeds will generally dive and resurface often vocalizing if in water. If the animals are on land they will usually depart from haulouts into the water, swim with their heads above water and vocalize, or dive. If the sound persists, animals may vacate an area until the sound disappears. In-water noise may elicit diving and resurfacing often with vocalizations and departure from the area near the sound source. However, pinnipeds may follow or retreat from vessels depending on the source of the sound (i.e. may follow a fishing boat that is discarding fish or retreat from a fast-moving recreational vessel) (Loughlin 2004). Several studies in

Hawaii noted humpback whale behavioral changes in the presence of vessels. Whales surfaced without exhaling, spent less time at the surface, had longer dive intervals, dove without raising their flukes, reduced their swim speed, and altered their direction (Bauer and Herman 1986, Green and Green 1990). In 1981 and 1982, Baker and Herman (1989) conducted a study of vessel impact on humpback whales in southeast Alaska and concluded that changes in whale behavior were significantly correlated with vessel speed, size, number and proximity. The most sensitive indicators of vessel disturbance in the study were changes in the whales' respiratory behavior and orientation. In 2000, a study assessing humpback whale behavioral response to vessel activity near Juneau, Alaska, reported few cases of whale avoidance behavior in response to boats, but noted greater variability in surface interval timing and in numbers of blows per surfacing when whale watching vessels were present (Peterson 2001). However, based on these findings, the author found it difficult to conclude that existing vessel activity was disrupting the behavioral patterns of humpback whales near Juneau, Alaska.

In-water noise levels thought to elicit a behavioral response from Steller sea lions are >160 dB re 1 μPa for pulsed noise and 120 dB dB re 1 μPa for continuous noise; levels high enough to cause damage to their hearing are >180 dB re 1 μPa (NMFS 2005). Because sea lions are skittish by nature, it is likely that loud, pulsed, frequent or unfamiliar noises, such as blasting or driving pilings, are likely to disrupt resting sea lions or animals foraging near the sound source. Steller sea lions would likely abandon haulouts, or dive if resting or foraging in the water, if disturbed by construction activities. Generally, animals return to their previous behavior within an hour or so of a disturbance (Porter 1997), however they may abandon an area for longer periods of time if the disturbance continues. Because there is a paucity of information on how Steller sea lions react to construction noise, a conservative approach is warranted.

In most of their range, Steller sea lions are exposed to some level of vessel noise and traffic. Steller sea lions may be disturbed from haulout sites, rookeries, or in the water by close approach of vessels or noise. Steller sea lions may respond by retreating into the water if hauled out, vocalizing, and swimming with their heads above water. They continue this behavior until the threat is gone. Land disturbance can cause mortality if it occurs during the breeding season when pups are too young to avoid the stampede of adults to the water. Pups may be crushed or sustain trauma that eventually leads to death. Repeated disturbance of California sea lions from haulouts or rookeries may lead to permanent abandonment of those areas (S. Melin, unpublished data) and it is likely that Steller sea lions may respond in a similar manner.

Steller sea lions, like other coastal pinnipeds, can become habituated to human disturbance such that it no longer causes a response. For example, provided the vessel approaches slowly, tour boats can approach within yards of animals hauled out on the breakwater in Kodiak harbor, Alaska without causing a response. Conversely, anecdotal information indicates that sea lions abandoned the rookery at Cape Sarichef after the construction of a lighthouse in 1904. Many years after the lighthouse has been uninhabited (it was deactivated in 1979), Steller sea lions are again using this site as a haulout. Other observations by NMFS' scientists indicate that animals on some haulouts that experience relatively high amounts of tourist activity, particularly in the summer, seem to show little response to vessel traffic while Steller sea lions further west tend to be agitated much more easily by vessels. Experience in the eastern part of the range (California, Oregon, and Washington) indicates a mixture of responses to longer term human influence in the ecosystem with no clear indication of the potential influence of noise and nearby human presence such as the long term use of a road.

It is possible that some individual Steller sea lions may be affected by the construction activities, primarily above water, and by operational activities of the road. Therefore, provided the additional conditions set forth below are incorporated into the proposed action, then NMFS concurs that the proposed action is not likely to adversely affect Steller sea lions (both eDPS and wDPS) or their critical habitat. Due to concerns that the proposed mitigation measures included in the BA might not be effective in avoiding adverse effects for Steller sea lions or their critical habitat, further mitigation measures are required. This is due primarily to the uncertainty in the expected behavioral responses of Steller sea lions to construction activity and road use especially in areas of critical habitat.

Given the proposed mitigation measures in the BA, NMFS concurs that the proposed action is not likely to adversely affect humpback whales. Any noise or disturbance is likely to be limited in water due to the more transient nature of humpback whale use of this area.

Mitigation Measures and Conditions

The concern about the potential response by Steller sea lions to noise generated by the project are reflected in your mitigation measures which include the use of observers to monitor use at haulouts, avoidance of some construction activities when Steller sea lions are present at haulouts, and other actions to mitigate future disturbance such as the use of screening structures on the road near the haulouts. The additional measures provided below outline a more comprehensive monitoring plan which is intended to validate the expected lack of adverse effects on Steller sea lions and their critical habitat. The plan includes reporting requirements, additional planning responsibilities, and analysis of observations throughout the construction and post-construction phases with approval by NMFS in order to insure that the mitigation measures are effective.

The proposed measures are in essence an adaptive management program that will allow both FHWA and NMFS to move forward with the confidence that the program will avoid adverse impacts for Steller sea lions. The measures are intended to provide positive confirmation that the proposed mitigation measures are indeed effective. The areas of highest concern include the 3,000 foot zone around Gran and Met Point haulouts, as well as the long term indirect effects of building a road (within critical habitat) in such close proximity to these remote haulouts.

Monitoring plan

The FHWA will develop a comprehensive monitoring plan for the project and post-project phases to include five years after the construction phase is completed. This will include a monitoring plan for all of the activities and conditions described below. FHWA will submit this to NMFS before the beginning of the construction phase of the project. FHWA will provide NMFS with an annual report due January 1 of each year which describes the construction activities, monitoring activities, impacts or responses of Steller sea lions, and any further changes to the project. The overall plan will be re-evaluated each year during the annual report. At the end of the monitoring period FHWA will provide a final report summarizing the project, the impacts, and the likely effects on Steller sea lions or their critical habitat expected after the monitoring project ends.

Construction plan within 3,000 feet of each haulout

The BA describes a general construction plan using specific types of equipment over a range of terrain and environmental conditions. For NMFS to evaluate such a project, and insure there would be no adverse effects, much more detailed information on the specifics of the project would need to be provided. At this point in the planning phase, those conditions cannot be determined. Before construction begins within 3,000 feet of Gran Point and Met Point haulouts, FHWA must provide NMFS with a detailed description of construction plans within this zone, including the planned vegetation removal, blasting requirements, through-cuts, and screening structures. Also, before construction activities commence within 3,000 feet, NMFS must be provided with an on-site tour of the area to approve the construction plan and to verify that it is not likely to impact sea lions.

Specific measures in addition to those included in the BA

The following numbered mitigation measures are included in the BA by the FHWA (reprinted here). The additional measures required by NMFS, or "conditions," are described below.

1. Pile driving at the Katzehin terminal and the Antler, Lace and Katzehin rivers will be done with vibratory hammers to the extent possible.

   Condition: If vibratory hammers cannot be used, and before other measures are employed NMFS must be provided with a description of why vibratory hammers cannot be used. NMFS will evaluate those alternative measures.

2. A trained observer will monitor for the presence of marine mammals and pile driving will be halted if any animals come within 200 meters of the activity.

3. No boat launches or structures that enhance boat access will be constructed by DOT&PF as part of the East Lynn Canal Highway.

Condition: The indirect effect of increased access would likely result in disturbance to these haulouts from people approaching to view sea lions, recreational fishing activities, or other related activities such as tourism. Mechanisms must be in place to ensure that the road will not result in increased access to east Lynn Canal through the development of boat launches or other improved access as a result of this project. This limitation must extend beyond the construction phase.

4. As large of a buffer as possible of undisturbed vegetation will be retained between the highway and the Gran Point and Met Point haulouts.

Condition: Before construction within 3,000 feet of Gran Point and Met Point haulouts, FHWA must provide NMFS with a detailed description of construction plans within this zone, including the planned vegetation removal. Also, before construction activities commence within 3,000 feet of the haulout, NMFS must be provided with an on-site tour of the area to approve the construction plan and to concur that it is not likely to adversely affect Steller sea lions.

5. No temporary barge landings would be constructed within 3,000 feet of either haulout.

6. Any construction within 3,000 feet of Met or Gran Point would include through-cuts and screening structures as necessary to avoid lines of sight between the highway and the haulouts, and to discourage human access to the haulouts.

Condition: As described above in the construction phase, the development of screening structures and other mechanisms to avoid human impacts to the haulouts must also be described in the construction plan and be provided to NMFS for comment and evaluation and be described during the on site visit.

7. No road construction will occur within 1,000 feet of Met or Gran Point if sea lions are present unless approved by NMFS. Independent observers will be employed to ensure that no sea lions are present during work within 1,000 feet.

Condition: For Gran Point (critical habitat), no road construction will occur within 3,000 feet while sea lions are present, unless approved by NMFS in writing after evaluation of the monitoring and construction plans.

8. Met and Gran Point haulouts will be monitored during any construction within 3,000 feet to determine if any disturbance is occurring.

Condition: This is to include noise level monitoring as well as sea lion observations. Before any construction occurs within 3,000 feet of either haulout, FHWA must provide to NMFS a monitoring plan which provides the details of how and when the haulouts will be monitored, the equipment and personnel used, and training to be provided. As described above, construction will not occur within 3,000 feet of Gran Point while sea lions are present unless approved by NMFS.

9. Any blasting within 3,000 feet of either haulout, if occupied, will be monitored to document that ground vibrations at the haulout are not greater than 0.05 inches per second, and noise levels are not greater than 45 dBA.

Condition: Before blasting can occur within 3,000 feet of Gran Point, blasting at Met Point shall be monitored and documented to be not greater than 0.05 inches per second, and noise levels are not greater than 45 dBA at the haulout. This report shall be provided to NMFS before blasting can occur within 3,000 feet of Gran Point.

10. During construction, helicopters would not operate within 3,000 feet of either haulout if occupied.

Condition: The determination of occupation will be made by observers or another means other than by aircraft (to be further described in the monitoring plan).

11. Helicopter operations during avalanche control will minimize activity within a 3,000-foot radius around the haulouts.

Condition: In addition helicopter operations shall not be conducted within 1,000 feet around either haulout when occupied.

12. Video monitoring at the Gran Point haulout and aerial/ground monitoring at the Met Point haulout will continue for three years after construction to determine the extent of human access to the haulouts and disturbance of sea lions. If adverse impacts are identified, DOT&PF will consult with NMFS to determine what additional mitigation measures are necessary.

Condition: Video monitoring at the Gran Point haulout and aerial/ground monitoring at the Met Point haulout will occur throughout the construction phase and for five years after construction to determine the extent of human access to the haulouts and disturbance to sea lions. FHWA will provide NMFS with an annual report due Jan. 1, of each year which describes the construction activities, monitoring activities, interactions and impacts to sea lions, and any further mitigation measures necessary to avoid adverse effects.

Conditions and Initiation of Formal Consultation

If these conditions are acceptable to FHWA and are incorporated into the mitigation measures and implemented, NMFS concurs that the proposed action is not likely to adversely affect humpback whales, Steller sea lions, or their critical habitat. We ask that you provide confirmation in writing that the proposed action will be modified consistent with the above conditions.

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption.

Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. No incidental take under the ESA authorization is provided here, and is therefore unlawful. In addition, the Marine Mammal Protection Act (MMPA) specifically prohibits the taking of marine mammals, including harassment, unless the activity is exempted by law or permitted under the Act.

If at any time during the project potential adverse effects are observed such as stampedes, avoidance of the haulout, or other changes in physiology or behavior which might reduce the fitness of the individuals, the FHWA shall immediately initiate consultation under section 7 of the ESA and request an incidental harassment authorization (IHA) under the MMPA. Once formal consultation is initiated, the ESA prohibits any Federal agency from making an irretrievable commitment of resources that may limit future options. This practice insures agency actions do not preclude the formulation or implementation of reasonable and prudent alternatives that avoid jeopardizing the continued existence of endangered or threatened species or destroying or adversely modifying their critical habitat.

Concurrence provided in this document requires the FHWA to accept in written confirmation the additional mitigation measures described here. If you have any further questions or concerns about this consultation or the consultation process in general, please contact Kaja Brix, Protected Resources Division, NMFS at (907) 586-7235.

Sincerely,

Robert D Mecum

for James W. Balsiger
Administrator, Alaska Region

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ATTACHMENT B
THREATENED AND ENDANGERED SPECIES
REVISED BIOLOGICAL OPINION, JULY 2005

Juneau Access Improvements Project
Threatened and Endangered Species
Revised Biological Assessment
July 2005

Introduction

The Alaska Department of Transportation and Public Facilities (DOT&PF) is preparing a Final Environmental Impact Statement (EIS) for the Juneau Access Improvements project on behalf of the Federal Highway Administration (FHWA). The National Marine Fisheries Service (NMFS) lists three species within the project area as threatened or endangered under the Endangered Species Act (ESA) of 1973, and one critical habitat:

- North Pacific humpback whales, *Megaptera novaeangliae*, (endangered)
- Eastern population of Steller sea lions, *Eumetopias jubatus,* (threatened)
- Western population of Steller sea lions, *Eumetopias jubatus,* (endangered)
- Gran Point, on the east side of Lynn Canal south of the Katzehin River, is designated as critical habitat for Steller sea lions.

Gran Point is the only designated critical habitat for Steller sea lions within the project area. No critical habitat has been designated for humpback whales. All three species are also protected under the Marine Mammal Protection Act of 1972.

Project Background

DOT&PF began work on the project EIS in 1994, with NMFS as a Cooperating Agency. Much of the informal consultation with NMFS during development of the Draft EIS focused on potential impacts of the East Lynn Canal Highway (Alternative 2) on the Gran Point critical habitat and the Met Point haulout. In 1997 FHWA released a Draft EIS to the public, which included a Steller Sea Lion Technical Report. On August 13, 1998 DOT&PF sent a biological assessment to NMFS for the East Lynn Canal Highway alternative, the only alternative under consideration with potential to impact these areas. The assessment detailed a combination of mitigation and monitoring measures to avoid adverse effects to sea lions from construction and operation of an East Lynn Canal highway. On August 24, 1998 NMFS concurred that the East Lynn Canal Highway would not likely adversely affect Steller sea lions, provided the DOT&PF proposed mitigation measures and three additional measures recommended by NMFS were implemented.

In January 2000 the State of Alaska identified the East Lynn Canal Highway as its preferred alternative, but most work on the EIS was suspended. In early 2003 the State announced that a Supplemental Draft EIS would be prepared. Additional reasonable alternatives were identified and new technical studies were conducted. The Supplemental Draft EIS was released for public review in January 2005, with Alternative 2, the East Lynn Canal Highway with Katzehin Ferry Terminal, identified as the State's preferred alternative.

This revised biological assessment is for Alternatives 2, 2B, and 2C. Alternative 2B is identical to Alternative 2 with the exception that the highway would end at the Katzehin Ferry Terminal. Alternative 2C would extend the highway to Skagway but would not include a ferry terminal in the Katzehin area. These three alternatives would involve similar impacts to Steller sea lions in the same geographic area as addressed in the 1998 assessment. Therefore the original assessment for Steller sea lions is incorporated by reference, summarized as necessary, with additional information and changes as relevant. The NMFS *Final Biological Opinion on the Kensington Gold Project* has been used as a reference in preparing this revised assessment.

Alternatives 2B and 2C would have similar potential impacts as Alternative 2, as they both traverse the east side of Lynn Canal and include a conventional ferry (or ferries for 2B) in Chilkoot and/or Taiya inlets. In the event that one of these three alternatives is identified as the preferred in the Final EIS, DOT&PF and FHWA believe no further Section 7 consultation would be necessary, as potential impacts would be similar. If Alternative 2A, 3, 4B, or 4D is identified as preferred, a new biological assessment would be necessary, as they all involve a ferry terminal in Berners Bay. Based on NMFS's December 3, 2004 letter regarding the biological assessment for the Kensington Gold Project and March 18, 2005 letter commenting on the Juneau Access Improvements Supplemental Draft EIS, if Alternative 2A, 3, 4B, or 4D is identified as the preferred, formal consultation and preparation of a biological opinion would be required.

Alternatives 2, 2B, 2C Alignment and Construction Details

The basic alignment of the East Lynn Canal Highway has not changed since the 1998 assessment. Based on more accurate survey information, changes have been made in specific areas to reduce impacts and costs. The alignment through the head of Berners Bay has been adjusted to reduce impacts to wetlands, river crossing areas and wildlife. The alignment in the vicinity of Met Point and Gran Point has been adjusted to reduce the number of bridges and other structures required while preventing lines of sight to the haulouts and discouraging beach access. At Met Point, the centerline of the highway would be approximately 400 feet from the haulout at its closest point, leaving a buffer of over 300 feet of forest. At Gran Point, the highway centerline would be approximately 320 feet from the main haulout area, leaving a forest buffer of over 250 feet.

Fill for highway construction and avalanche hazard reduction would impact approximately 22 acres of intertidal and subtidal area at 18 locations. Most of these sites are sediment or cobble beaches; none have been identified as haulout sites for marine mammals. Ferry terminal construction near Katz Point, north of the Katzehin Delta, would impact 8.8 acres of intertidal and subtidal area: 4.3 acres of fill for the terminal area and 4.5 acres of dredging for a ferry mooring basin. This is a shallow sediment covered area with no identified marine mammal use.

The Antler, Lace and Katzehin, major rivers that have prey fish (and marine mammals in the tidally influenced areas), would be crossed with 130 foot spaced spans, with spans supported by four or five 24 to 26-inch diameter piles. The exception to this would be the bridge section across the west channel of the Antler. This channel has the majority of documented eulachon spawning in the crossing vicinity, and would be crossed by a longer bridge section to avoid placing piles in the channel.

Construction of the East Lynn Canal Highway is expected to take a minimum of four years, with the actual timetable dependent on the funding availability. Construction access would be established at several locations in addition to the project termini. The existing landing at Comet would be used, as well as the Katzehin ferry terminal site. Temporary barge landing sites would be established at many of the intertidal fill sites to avoid impacts to other areas. No underwater blasting is anticipated for ferry terminal construction or pile driving. Extensive blasting would be required for highway construction, particularly in the areas from Independence Lake to the Katzehin River and from Low Point to Garb Point on the east side of Taiya Inlet (2 and 2C). The 1998 assessment details the type of blasting anticipated.

Humpback Whales

The humpback whale was listed as endangered under the ESA in 1973. Due to the reduction of the overall population from commercial whaling, the species was in danger of extinction. Prior to the beginning of the twentieth century the humpback whale population was estimated at 15,000. By the time the International Whaling Commission halted commercial whaling of this species in 1965, the population was estimated to be approximately 1,000.

There are three recognized populations of the North Pacific humpback whale: the California/Oregon/Washington/Mexico population, the Western North Pacific population, and the Central North Pacific population. Whales found in Southeast Alaska are part of the Central North Pacific population. The majority of these approximately 4,000 animals are generally found in the vicinity of the Hawaiian Islands in winter and spring where breeding and calving occurs, but migrate to British Columbia and the Gulf of Alaska area for the summer and fall. Approximately one quarter of this population is estimated to be in Southeast Alaska during the summer and fall, with a small subset remaining year round.

Humpback whales in the Central North Pacific population feed in relatively shallow coastal waters near shore. For the whales that spend the summer and fall in northern Southeast Alaska, this includes bays and waterways of the Inside Passage, such as Chatham Strait, Icy Strait, Stephens Passage and Lynn Canal. Prey consists of small schooling fish such as herring, sand lance, and young walleye pollock, as well as schools of krill.

Individual humpback whales and small groups have been observed in Lynn Canal, Chilkoot Inlet and Taiya Inlet throughout the year, with higher numbers present in the summer and fall. The Juneau whale watching excursion boats regularly observe a group of 15 to 20 animals in northern Stephens Passage during the summer tourist season. Humpback whales typically enter Berners Bay during April and May. As many as five individuals have been observed feeding in the bay during the spring eulachon run.

Potential Impacts to Whales

Construction of the East Lynn Canal Highway has the potential to impact humpback whales, primarily during construction of the Katzehin ferry terminal. Placement of fill at the ferry terminal site is not expected to affect humpback whales, as this activity is generally done from shore during low tides. Dredging would take place between October 1st and March 1st when there are few whales in the project area; furthermore, dredging is not typically a source of loud noise. Driving 18 to 30-inch diameter piles would be done with vibratory hammers to the extent possible to reduce the intensity of sound generated. Pile driving generally takes place between mid June and March 1st (to avoid impacts to fish), a period during which some humpbacks may be in the terminal vicinity. A trained observer would monitor for the presence of marine mammals and pile driving would be halted if any animals were within 200 meters of the activity.

Highway construction close to or in the waters of Lynn Canal has less potential to impact humpbacks. Highway construction at or near the water would produce underwater sounds from blasting, rock drilling, rock grinding, fill placement, pile driving for bridges, and side casting. Blasting on land with 20 to 50-pound delayed charges would primarily be a source of vibration through the ground (less than 0.1 ips), creating a very small seismic wave at the land water interface. Fill placement in intertidal areas and side casting would create intermittent sound sources within the water, while drilling and grinding and would be more continuous but removed from the water's edge. Based on typical construction noise levels, these activities would generate noise in the 85 to 95 dBA range near the source on land (USEPA, 1971, Yost, 2003, Yost, 2005). This noise would decrease at least six dB for each doubling of distance to the water. The higher levels noise sources (90 dBA for rock drilling, 95 dBA for rock grinding) are continuous noise sources which would be detected by whales at a distance and could be easily avoided by moving away from rather than closer to the source.

Pile driving for bridges across the Antler, Lace and Katzehin rivers would occur during one of two approximate timing windows: mid June to mid August or early November through February. Although there is a greater likelihood of whales being in the general vicinity during the summer window, overall the potential to impact humpback whales is low due to the shallow depths at the crossings. All three bridges would be in the upper intertidal areas with very gradually increasing depths out to open water. The Katzehin crossing would be in depths ranging from +10 to +15 feet above Lower Low Water; the Antler crossing would be in depths from +13 to +19; the Lace crossing would be in depths from +18 to +22. As with pile driving at the ferry terminal site, a trained observer would monitor for the presence of marine mammals and work would be halted while any animals are within 200 meters of the activity.

Upon completion of the East Lynn Canal Highway, the only potential impact to humpback whales would be the increased vessel traffic in Chilkoot Inlet (and Taiya Inlet under Alternative 2B) associated with shuttle operations from the Katzehin Terminal. The shuttles, initially anticipated to be the MV Aurora, would be conventional monohull vessels traveling at a speed of up to 15 knots. Summer operation (May to September) would consist of up to nine round trips per day to Haines (Alternative 2) and six round trips to Skagway (Alternative 2B) during a 15-hour period. Winter operation would be reduced to six round trips per day to Haines and four to Skagway during a 10-hour period. Under the No Action alternative the Alaska Marine Highway vessel traffic in this area would be approximately five round trips per day in the summer (three between Haines and Skagway and two between Juneau and Haines or Skagway) and three per day in the winter.

There have been no reported whale collisions involving AMHS vessels in Lynn Canal during the 40 years of past operation. Increasing the number of AMHS vessel trips in the northern end of Lynn Canal, while eliminating almost all AMHS vessel trips in southern Lynn Canal (the Haines/Katzehin shuttle would run to Juneau in winter when the road is closed for avalanche control) is not likely to have an effect on humpback whales in the area. In addition to reducing the number of trips in the vicinity of southern Lynn Canal and Berners Bay, the East Lynn Canal Highway alternative would eliminate AMHS fast ferry operations in Lynn Canal.

Steller Sea Lions

The Steller sea lion was listed as threatened under the ESA in 1990, due to an almost two-thirds reduction in their population size over the preceding 30 year period. In 1993 critical habitat was designated to protect identified rookeries and major haulouts. Subsequently the population was divided into the western and eastern populations, with the western population listed as endangered and the eastern population listed as threatened.

Steller sea lion range extends throughout the North Pacific from northern Japan up through the Bering Sea, across the Gulf of Alaska, and down the coast of North America to southern California. The dividing line for the two populations is the vicinity of Cape Suckling, approximately 50 miles southeast of Cordova. The western population is estimated to be approximately 35,000 individuals while the eastern population is estimated to be more than 31,000 animals, with approximately half of these occurring in southeast Alaska. While sea lion counts from the Gulf of Alaska and southern California have been declining, the counts in southeast Alaska have been increasing.

The 1998 DOT&PF assessment addressed only the threatened eastern population of Steller sea lions, as no individuals from the western population were known to occur in the project area. Subsequent to that assessment, branded individuals from the western population have been spotted in the project area, including Gran Point where DOT&PF has a video camera monitoring system. To date only a handful of western branded animals have been sighted; nevertheless this demonstrates there is a small degree of crossover between the two populations.

As described in the 1998 assessment, Steller sea lions in Lynn Canal use several identified haulouts throughout most of the year, including Benjamin Island, Point Saint Mary, Met Point, and Gran Point. A seasonally used tidal rock haulout has recently been identified south of the point of land defining the east side of Slate Cove in Berners Bay. Both Met Point and Gran Point are within the immediate vicinity of the East Lynn Canal Highway as described above. (The highway would be approximately one mile from the Slate Cove haulout and over two miles from the Point Saint Mary haulout.)

Critical Habitat

Gran Point, five miles south of the Katzehin River, is designated as critical habitat for Steller sea lions under 50 CFR 226.202. This regulation identifies Gran Point as a major Steller sea lion haulout in Alaska, and defines the critical habitat as a terrestrial zone extending 3,000 feet landward of the haulout, an aquatic zone extending 3,000 feet seaward, and an air zone that extends 3,000 feet above the terrestrial zone. Sea lions haul out on the large rock slabs in the immediate vicinity of the point as well as smaller rocks to the north and south, particularly when the large slabs are completely occupied. The main slabs extend to a height of approximately 30 feet above Lower Low Water where they steepen and then meet a line of conifer vegetation. Many of the smaller rocks to the north and south are covered by high tides and are therefore isolated from the vegetation line.

DOT&PF has monitored the Gran Point haulout via remote controlled video cameras since December 2002, and has monitored Gran Point (and Met Point) via overflights during July through December 1998 and from December 2003 to the present. (DOT&PF has also reviewed

Met Point aerial photograph data from NMFS Auke Bay Laboratory.) These observations confirm the general trend indicated in the 1998 assessment. Both haulouts are used most heavily in the spring, with more than a hundred animals present at Gran Point on most days. Usage decreases in the first half of summer such that there is considerably less use during the second half of summer. During the latter half of summer there are periods of time (one to five week blocks at Gran, longer at Met) when the haulouts are vacant (see attached Gran Point records). Use of the haulouts increases again by early fall, with more than a hundred animals present at each site by mid September. There are generally fewer animals at the sites during December through March, with no animals present on particularly windy and or snowy days. In general the Gran Point haulout is used more often and more heavily than the Met Point haulout, but the numbers of animals using both haulouts is increasing.

Steller sea lions appear to use the Gran Point haulout as a resting area between feeding forays in Lynn Canal. The fact that use of the haulout grows during the spring when herring and eulachon are available in the Berners Bay area and northern Lynn Canal supports this observation. The gently sloping rocks provide an easily accessed area where large numbers of sea lions can congregate. The rocks provide good lines of sight toward approaches from the water, while the rocky shoreline, dense forest and distance from developed areas makes approach or disturbance from land unlikely. Hauled out sea lions appear to be undisturbed by boats closely approaching the haulout. During the two and a half years of camera monitoring, no mating or pupping has been observed at Gran Point. Both males and females use the haulout; occasional fighting between large males has been observed.

The pattern observed at the haulouts corresponds to the general movement pattern of sea lions in southeast Alaska, where many adults move toward the outer coast, including rookery areas, in early summer. It appears that sea lions return to Lynn Canal from the outer coast in the fall, presumably following available food sources such as salmon. The lower numbers during winter are probably due to reduced prey availability in the vicinity. Growing numbers in the spring parallel the availability of herring and eulachon in Berners Bay and the Katzehin, Chilkat and Chilkoot estuary areas.

Potential Impacts to Steller Sea Lions

As with humpback whales, construction of the East Lynn Canal Highway has the potential to impact Steller sea lions both during construction and subsequent maintenance and operation. Construction activities that could impact sea lions include noise and visual aspects of helicopter surveying, construction and use of barge landings, pile driving, dredging, in-water fill placement, blasting, excavation, and earth moving. Maintenance and operation activities that could impact sea lions include noise and visual aspects of highway traffic, highway maintenance, and avalanche control. Land access to the haulout areas could create an indirect impact of increased human disturbance of resting sea lions.

The analysis of potential vibration disturbance from blasting within the Gran Point critical habitat area and within 3,000 feet of the Met Point haulout presented in the 1998 assessment is still relevant. Preshearing the rock face and using smaller charges can reduce the ground vibrations at the haulouts. Rather than requiring the use of particular charge sizes per delay, the contractor would be required to monitor blasting effects when blasting within 3,000 feet of either haulout and avoid vibrations greater than 0.05 inches per second (ips) at the haulout while it is occupied. This would keep blasting effects well below 0.1 ips, the presumed vibration threshold for sea lion disturbance.

Blasting is a source of sound as well as vibration. Typical sound energy levels (air blast over pressure) generated by construction blasting are in the range of 0.007 pounds per square inch, equivalent to 95 dBA at 665 feet for 50 pound charges per delay (FHWA, 1991). As with vibration, the sound energy level can be controlled by using lower weight charges per delay. The contractor would be required to monitor blasting noise and avoid noise energy levels greater than 45 dBA at the haulout when blasting within 3,000 feet of either site.

Analysis of construction noise indicates that noise generated at distances greater than 1,000 feet would not be detectable above the background noise levels at the haulouts (FHWA, 2005a). Rock drilling and excavating are generally the noisiest construction activities, producing sounds near the source in the 85-90 dBA range. Because the haulouts are below rock bluffs, sounds from construction point sources would be shielded by trees, rock and earth, resulting in a decrease of 11 dBA for every doubling of distance. A sound level of 88 dBA 50 feet from the source would produce a sound level of 44 dBA at a distance of 800 feet. The 1998 assessment estimated the background noise level at Gran Point on a calm day at 47 dBA; based on recordings at similar locations. This estimate was corroborated by sound measurements recorded in 2003 at additional similar locations. Construction noise at a level of 44 dBA would not be detectable against the background noise at the haulout.

Based on the analysis of potential noise impacts, no construction activities that generate noise levels above 45 dBA at the haulouts would occur within 1,000 feet of the Gran and Met Point haulouts while sea lions are present. Heavy construction (rock drilling, blasting and shot rock removal) within a 1,000-foot radius of Gran Point is expected to take approximately one month. Based on the observed periods when the haulout is vacant, this construction may need to be spread over two or three years. Heavy construction within the Met Point 1,000-foot radius would be of shorter duration, as less rock cutting would be required. Construction of the East Lynn Canal Highway would take at least four years, and is expected to take longer given the current funding situation. The need to phase construction in the vicinity of the haulouts would not affect the overall construction schedule.

Helicopters used during construction, including surveying activities, would be required to avoid operating within the 3,000 feet of the haulouts while occupied. No temporary barge landings would be constructed within this radius, and no in-water fill placement would occur for highway construction (see attached plansheets).

Operation and maintenance of the highway would not result in disturbance of either haulout. Projected peak traffic noise levels for 2038 are 65 dBA at centerline of the highway, and would attenuate to 32 dBA at a distance of 280 feet (FHWA, 2005a, b). The highway would be approximately 320 feet from the Gran Point haulout and 400 feet from the Met Point haulout at its closest point. Traffic noise would not be audible above the background noise level.

The highway alignment within 3,000 feet of both haulouts would be designed to prevent access to either site and maintain a visual barrier between the highway and haulouts. This would be accomplished by a combination of through cuts, retaining walls and screening structures (see attached plansheets). Sea lions would not be visible from the road, and would not see vehicles or their headlights. Except where the terrain and/or rock cuts are steep enough to prevent easy access, screening structures or fencing would be installed.

Normal winter and summer maintenance activities such as snow removal, sanding, brush cutting, crack sealing, and culvert clean out would not produce noise levels higher than the predicted 30 year peak hour traffic. Winter operation would also require infrequent detonation of unstable snow in the three avalanche starting zones within the 3,000-foot radius around the two sites (FHWA, 2005c). Detonation would be done by helicopter, with the helicopter approach made from the closest point outside the 3,000-foot radius.

The starting zone of avalanche LC004, 2,600 feet to the northeast of the Met Point haulout, is at elevation 1,000 feet. Slope distance to the haulout is 2,860 feet. LC004 is a small avalanche path consisting of open scrub forest and a small gully. This avalanche path is expected to require detonation release with a helicopter dropped explosive charge at a frequency of once every 10 years. The explosive charge would be a 50-pound bag of ammonium nitrate and fuel oil (ANFO). A charge of this size would create a momentary peak airblast sound level of 95 dBA at 665 feet, 84 dBA at 1,330 feet, and 73 dBA at 2,660 feet if detonated in the air (equivalent to a single handclap at ten feet). A 50-pound charge dropped from a helicopter normally penetrates the snow to a depth of at least a few feet, with the blast sound muffled by the snow surrounding the charge.

There are two avalanche starting zones within the Gran Point critical habitat, LC030 and LC 031. LC030 is at elevation 1,500, approximately 1,810 feet southeast of the Gran Point haulout. The slope distance from the haulout is 2,350 feet. LC031 is at elevation 650, approximately 2,880 feet to the northeast slope distance, a slope distance of 2,950 feet. Both are small avalanche paths; one is on an old landslide scar and the other is in a narrow gully. Each avalanche starting zone is estimated to require a helicopter dropped 50-pound explosive charge once every ten years, which would result in two explosive discharges within the critical habitat area during a ten-year period. As with the Met Point haulout, explosive discharges may be audible at the haulout, but would not be particularly loud. The noise and vibration created by the resulting avalanche would be no different than the naturally occurring avalanche that would eventually happen.

Potential Adverse Modifications to Critical Habitat

Gran Point is a major Steller sea lion haulout, with large numbers of sea lions using the area throughout most of the year. The terrestrial zone, extending 3,000 feet landward, includes additional rocks used by sea lions. The terrestrial areas used by sea lions extend approximately 30 feet above Lower Low Water. Land above this elevation is generally too steep to be accessed by sea lions, and is covered by dense coniferous vegetation.

Potential adverse modifications to this critical habitat from construction and operation of a highway include alteration of the haulout rocks used, alteration of the uplands such that disturbance from land sources can occur, and introduction of harmful substances to the aquatic zone such as trash or runoff.

No alteration of the shoreline would occur within the critical habitat area. Permanent construction would all be behind a buffer of vegetation and screening walls. No temporary access landings would be constructed within the 3,000-foot radius.

A typical highway constructed through the critical habitat terrestrial zone would make land access to the haulout considerably easier than currently exists. The East Lynn Canal Highway would avoid this potential adverse modification by incorporating through cuts and walls throughout the terrestrial zone. These measures combined with the steep terrain between the highway and the shore would make access to the haulout from the highway difficult. No new boat ramps would be constructed as part of the East Lynn Canal Highway, therefore the extent of water access would not change. Video monitoring at the haulout would be continued for at least three years after construction to determine if any unauthorized access occurs. Based on this monitoring DOT&PF would consult with NMFS to determine if additional measures are necessary to further deter access from the highway.

Construction and operation of the East Lynn Canal is unlikely to result in significant pollution of the critical habitat aquatic zone. Best management practices as detailed in the contractor's Stormwater Pollution Prevention Plan would be used to control sediment discharge and prevent oil discharge. Runoff from the highway would be directed away from the haulout to natural drainage channels on either side. Based on water quality studies of similar roadways with equal or higher traffic levels, runoff into salt water would be within state water quality standards (FHWA, 2005d). The physical separation between the highway and the shoreline would prevent most if not all roadside trash and debris from reaching the aquatic zone. Neither sea lions nor prey species would be adversely affected.

Mitigation Measures

The following measures would be included in the project to avoid potential impacts to humpback whales and Steller sea lions:

1. Pile driving at the Katzehin terminal and the Antler, Lace and Katzehin rivers will be done with vibratory hammers to the extent possible.
2. A trained observer will monitor for the presence of marine mammals and pile driving will be halted if any animals come within 200 meters of the activity.
3. No boat launches or structures that enhance boat access will be constructed by DOT&PF as part of the East Lynn Canal Highway.
4. As large as possible buffer of undisturbed vegetation will be retained between the highway and the Gran Point and Met Point haulouts.
5. No temporary barge landings would be constructed within 3,000 feet of either haulout.
6. Any construction within 3,000 feet of Met or Gran Point would include through cuts and screening structures as necessary to avoid lines of sight between the highway and the haulouts, and to discourage human access to the haulouts.
7. No road construction will occur within 1,000 feet of Met or Gran Point if sea lions are present unless approved by the NMFS. Independent observers will be employed to ensure that no sea lions are present during work within 1,000 feet.
8. Met and Gran Point haulouts will be monitored during any construction within 3,000 feet to determine if any disturbance is occurring.

9. Any blasting within 3,000 feet of either haulout, if occupied, will be monitored to document that ground vibrations at the haulout are not greater than 0.05 inches per second, and noise levels are not greater than 45 dBA.
10. During construction helicopters would not operate within 3,000 feet of either haulout if occupied.
11. Helicopter operations during avalanche control will minimize activity within a 3,000-foot radius around the haulouts.
12. Video monitoring at the Gran Point haulout and aerial/ground monitoring at the Met Point haulout will continue for three years after construction to determine the extent of human access to the haulouts and disturbance of sea lions. If adverse impacts are identified, DOT&PF will consult with NMFS to determine what additional mitigation measures are necessary.

Conclusion

Based on the analysis provided and the mitigation measures listed, DOT&PF and FHWA have determined that East Lynn Canal Highway alternatives (2, 2B and 2C), are not likely to adversely affect the endangered North Pacific humpback whale, the endangered western population of Steller sea lions, or the threatened eastern population of Steller sea lions. DOT&PF and FHWA have also determined that Alternatives 2, 2B and 2C would not adversely modify the Gran Point critical habitat.

Attachments

Aerial photograph/plansheets of Met Point and Gran Point
DOT&PF Gran Point Camera Monitoring Records

References

FHWA. 1991. *Rock Blasting and Overbreak Control*. Publication No. FHWA-HI-92-001
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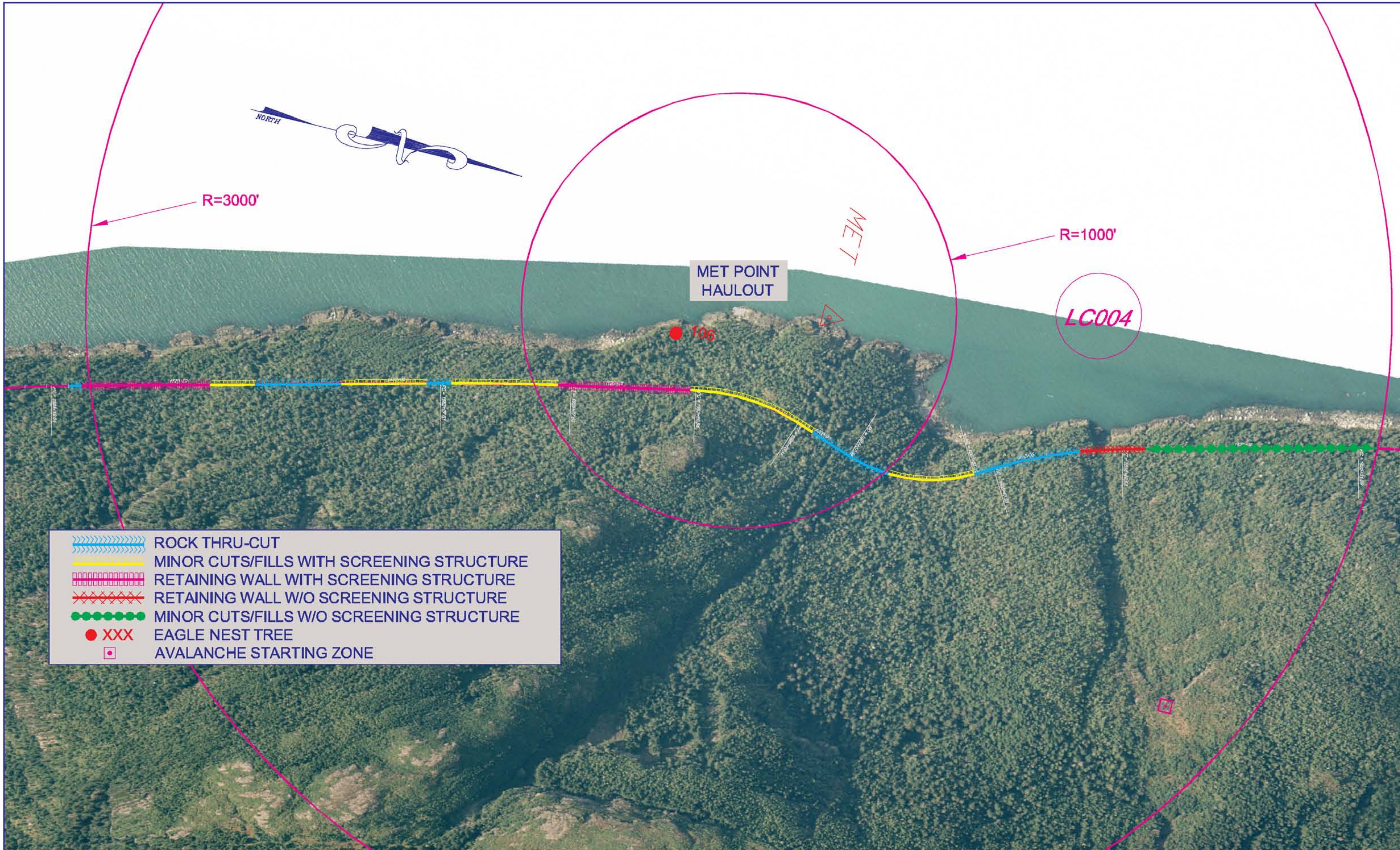
FHWA. 2005c. *Juneau Access Improvements Supplemental Draft EIS*, Appendix J, Snow Avalanche Report.
FHWA. 2005d. *Juneau Access Improvements Supplemental Draft EIS*, Appendix K, Hydrology and Water Quality Report.
United States Environmental Protection Agency (USEPA). 1971. *Noise from Construction Equipment and Operations, Building Equipment and Home Appliances*.
Yost, Reuben. June 23, 2003. Rock grinder (Trencor 20 foot wide Rock Miner) noise levels recorded with Brandee Gerke, NMFS, and Mike Jacobson, USF&WS at Third Avenue construction site in Ketchikan, Alaska.
Yost, Reuben. April 13, 2005. Rock drill (Ingersol Rand Airtrack 3700 and Ingersol Rand 58 Hydraulic) noise levels recorded at Inspiration Point (Glacier Highway) construction site.



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RECORD OF REVISIONS

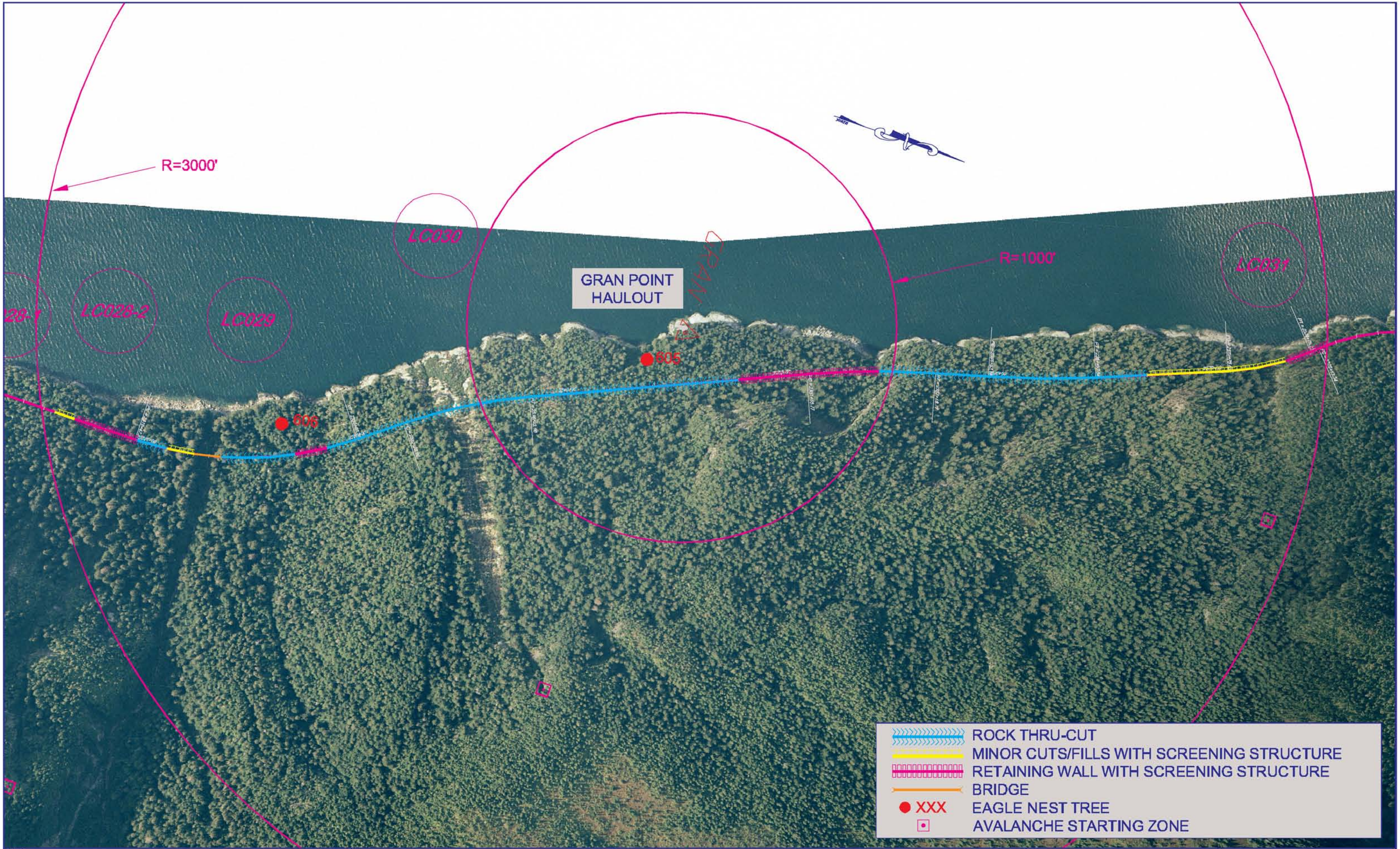
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU — JUNEAU ACCESS PROJECT NO. 71100 — ALASKA

EAST LYNN CANAL
MET POINT SEALION HAULOUT

DESIGNED BY:
DRAWN BY:
CHECKED BY:

PROJECT NO. 71100
DATE: 2005
SHEET 1 OF 2



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RECORD OF REVISIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHEAST REGION DESIGN & CONSTRUCTION

JUNEAU — JUNEAU ACCESS PROJECT NO. 71100 — ALASKA

EAST LYNN CANAL
GRAN POINT SEALION HAULOUT

DESIGNED BY:	PROJECT NO. 71100
DRAWN BY:	DATE: 2005
CHECKED BY:	SHEET 2 OF 2

Juneau Access
Sea Lion Haulout

Gran Point

Sea Lion Monitoring Log
12/23/02-12/31/04

Legend

WE	= Weekend
NS	= No Camera Signal
~	= Approximately
Few	= 6 or less present
N	= North
S	= South

Date	Comments	Quantity	Time
12/23/02	many sea lions present		
12/24/02	too much snow - no visibility		
12/25/02	Christmas - NS		
12/26/02	NS		
12/27/02	WE - NS		
12/28/02	WE - NS		
12/29/02	NS		
12/30/02	NS		
12/31/02	NS - call to SeeMore		
01/01/03	New Year's Day		
01/02/03	sea lions present - SeeMore working on system		
01/03/03	NS		
01/04/03	WE - NS		
01/05/03	WE - NS		
01/06/03	program locked up - Lane @ SeeMore can see animals present		
01/07/03	program locked up - Lane @ SeeMore can see animals present		
01/08/03	sea lions present - most rocks		
01/09/03	sea lions present - most rocks		
01/10/03	many animals present		
01/11/03	WE - NS		
01/12/03	WE - NS		
01/13/03	sea lions on most rocks		11:00A
01/14/03	sea lions present		9:00A
01/15/03	snow storm - some seal lions present		10:00A
01/16/03	sea lions present	15-20	9:00A
01/17/03	sea lions present	13	2:00A
01/18/03	WE - NS		
01/19/03	WE - NS		
01/20/03	NS		
01/21/03	very windy & rough seas	0	
01/22/03	still very windy - high surf on rocks	0	
01/23/03	high wind, waves	0	
01/24/03	high wind, snow	0	
01/25/03	WE - NS		
01/26/03	WE - NS		
01/27/03	sea lions present	22	
01/28/03	sea lions present	20+	
01/29/03	many sea lions present		
01/30/03	many sea lions @ N. main slab		
01/31/03	many sea lions present		
02/01/03	WE - NS		
02/02/03	WE - Stills	few sea lions	
02/03/03	many sea lions on main slab		
02/04/03	many sea lions on main slab		
02/05/03	many sea lions on main slab seen from camera #1		
02/06/03	many sea lions on main slab seen from camera #1		

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Sea Lion Haulout

Gran Point

Sea Lion Monitoring Log
12/23/02-12/31/04

Legend

WE	= Weekend
NS	= No Camera Signal
~	= Approximately
Few	= 6 or less present
N	= North
S	= South

Date	Comments	Quantity	Time
02/07/03	many sea lions on main slab seen from camera #1		
02/08/03	WE - Stills	many sea lions	
02/09/03	WE - Stills	few sea lions	
02/10/03	sea lions present	20	
02/11/03	sea lions present on main slab		
02/12/03	sea lions present on main slab		
02/13/03	two small groups present @ water		
02/14/03	sea lions present	~ 50	
02/15/03	WE -Stills	many sea lions	
02/16/03	WE - Stills	many sea lions	
02/17/03	WE - Stills	many sea lions	
02/18/03	many sea lions on main slab & small slab		
02/19/03	no sea lions in vicinity - strong northernly wind		
02/20/03	sea lions present - strong N. wind & waves	40+	
02/21/03	sea lions present	~ 30	
02/22/03	WE - Stills	many sea lions	
02/23/03	WE - Stills	many sea lions	
02/24/03	sea lions present on lower rocks - not covered by snow		
02/25/03	sea lions present on lower rocks		
02/26/03	sea lions on all rocks	100+	
02/27/03	Stills	many sea lions	
02/28/03	Stills	many sea lions	
03/01/03	WE - Stills	sea lions present	
03/02/03	WE - Stills	many sea lions	
03/03/03	sea lions on N. part of main slab		
03/04/03	many sea lions on main slab		
03/05/03	Stills	many sea lions	
03/06/03	sea lions on lower N. of main slab - high wind & waves		
03/07/03	sea lions on lower slab		
03/08/03	WE - Stills	few sea lions	
03/09/03	WE - Stills	none	
03/10/03	sea lions on lower slab		
03/11/03	sea lions on lower slab		
03/12/03	sea lions high on main slab		
03/13/03	sea lions high on main slab		
03/14/03	heavy snow - no visibility - high waves		
03/15/03	WE - Stills	many sea lions	
03/16/03	WE - Stills	many sea lions	
03/17/03	many on lower s.slab - more on upper N		
03/18/03	many sea lions on lower & upper main slab		
03/19/03	Stills	many sea lions	
03/20/03	many sea lions on small S rocks & main slab		
03/21/03	Stills	many sea lions	
03/22/03	WE - Stills	many sea lions	
03/23/03	WE - Stills	many sea lions	
03/24/03	many sea lions present		

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Sea Lion Haulout

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Sea Lion Monitoring Log
12/23/02-12/31/04

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Date	Comments	Quantity	Time
03/25/03	numerous sea lions present on rocks - about 25 left a rock at the same time & returned to water		
03/26/03	numerous sea lions present on main slab (low & high)		
03/27/03	many sea lions present on main slab (low & high)		
03/28/03	numerous sea lions present on main rock		
03/29/03	WE - Stills	many sea lions	
03/30/03	WE - Stills	many sea lions	
03/31/03	Stills	many sea lions	
04/01/03	numerous sea lions present on haulout - rough sea conditions		
04/02/03	numerous sea lions on lower & upper rock slab - rough sea conditions		
04/03/03	numerous sea lions on rocks		
04/04/03	Stills	many sea lions	
04/05/03	WE - Stills	many sea lions	
04/06/03	WE - Stills	many sea lions	
04/07/03	numerous sea lions on main rock - some on others		
04/08/03	Stills	many sea lions	
04/09/03	Stills	many sea lions	
04/10/03	Stills	many sea lions	
04/11/03	many on all rocks		
04/12/03	WE - Stills	many sea lions	
04/13/03	WE - Stills	many sea lions	
04/14/03	many on all rocks		
04/15/03	many on all rocks		
04/16/03	many on all rocks		
04/17/03	main rock is loaded with sea lions - also on N. rocks	100+	
04/18/03	many on all rocks		
04/19/03	WE - Stills	many sea lions	
04/20/03	WE - Stills	many sea lions	
04/21/03	Stills	many sea lions	
04/22/03	many on main haulout		
04/23/03	many on main haulout		
04/24/03	many on main haulout & smaller rocks		
04/25/03	many on main haulout & smaller rocks		
04/26/03	WE - Stills	many sea lions	
04/27/03	WE - Stills	many sea lions	
04/28/03	many on main haulout & smaller rocks		
04/29/03	many sea lions on main rock & rocks to the S below camera		
04/30/03	many of sea lions on main rock & rocks to the S below camera		
05/01/03	many sea lions on main rock & rocks to the S below camera		
05/02/03	many sea lions on main rock & rocks to the S below camera		
05/03/03	WE - Stills	many sea lions	

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12/23/02-12/31/04

Legend

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Date	Comments	Quantity	Time
05/04/03	WE - Stills	many sea lions	
05/05/03	many sea lions on S side of main rock and N side	100+	
05/06/03	many on S side of main rock and N side	50+	
05/07/03	system down		
05/08/03	many sea lions on main rock & smaller S	100+	
05/09/03	Stills	many sea lions	
05/10/03	WE - Stills	many sea lions	
05/11/03	WE - Stills - cameras down		
05/12/03	sea lions on main rock & S spots	100+	
05/13/03	many sea lions, large male on main rock	100+	
05/14/03	Stills	many sea lions	
05/15/03	many sea lions on main rock, crowded on rocks below #1 and to south		
05/16/03	many sea lions N & S side & smaller S rocks		
05/17/03	WE - Stills - cameras down		
05/18/03	WE - Stills	many sea lions	
05/19/03	many sea lions N & S side & smaller S rocks		
05/20/03	many sea lions N & S side & smaller S rocks		
05/21/03	many sea lions on N side & S small rocks		
05/22/03	many sea lions on S slab, smaller rocks & N slab	100+	
05/23/03	many sea lions everywhere N & S	100+	
05/24/03	WE - Stills	many sea lions	
05/25/03	WE - Stills	many sea lions	
05/26/03	Stills	many sea lions	
05/27/03	many sea lions on both sides of main haulout		
05/28/03	many sea lions on both sides of main haulout		
05/29/03	many females on small S rocks, many on N side of main slab		
05/30/03	Stills	many sea lions	
05/31/03	WE - Stills	many sea lions	
06/01/03	WE - Stills - cameras down		
06/02/03	many sea lions on all rocks	~ 100	
06/03/03	many sea lions on N side & S	~ 100	
06/04/03	many sea lions present	~ 100	
06/05/03	sea lions on main slab and S. slab	~ 100+	
06/06/03	many on main slab & few on side rocks	100-	
06/07/03	WE - Stills	sea lions present	
06/08/03	WE - Stills	sea lions present	
06/09/03	slab N side of main slab	~ 90	
06/10/03	sea lions of S small rocks, S main slab & N main slab	~ 100	

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Sea Lion Monitoring Log
12/23/02-12/31/04

Legend

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S	= South

Date	Comments	Quantity	Time
06/11/03	sea lions on S. small rocks & S. mail slab	~ 90	
06/12/03	sea lions S. small rocks & N main rock	~ 110	
06/13/03	Stills	many sea lions	
06/14/03	WE - Stills	many sea lions	
06/15/03	WE - Stills	many sea lions	
06/16/03	sea lions S. side of main slab	100+	
06/17/03	sea lions on small rock, S main rock & N main rock	~ 90	
06/18/03	sea lions on S small rocks & N. main slab	95	
06/19/03	sea lions on S small rock, S main slab & N main slab	90	
06/20/03	sea lions on S. small rocks & S. mail slab	100+	
06/21/03	WE - Stills	many sea lions	
06/22/03	WE - Stills	many sea lions	
06/23/03	sea lions on S main slab, S small rocks, N small rocks & N small rocks	~ 100	
06/24/03	sea lions on S small rocks, N main rock & N small rocks	~ 100	
06/25/03	sea lions on S main slab, S small slab & N main slab	~ 100	
06/26/03	many sea lions	~ 90	
06/27/03	sea lions on S main slab & S small rocks, N main slab, N small rocks and water	100+	
06/28/03	WE - Stills	many sea lions	
06/29/03	WE - Stills	many sea lions	
06/30/03	sea lions on main slab, S small rocks, N small rocks and S main slab	100+	
07/01/03	sea lions on main slab, S small rocks, S small rocks and N main slab	100+	
07/02/03	sea lions on small rocks & S main rock	~ 100	
07/03/03	sea lions on S small rocks, S main rock, N main rock & N small rocks	~ 90	
07/04/03	Stills	many sea lions	
07/05/03	WE - Stills	many sea lions	
07/06/03	WE - Stills	many sea lions	
07/07/03	sea lions on main rock, S small rocks, N main rock & water	74	
07/08/03	sea liona on S small rock & S main rock	85+	
07/09/03	sea lions on S main rock & S small rocks	75+	
07/10/03	sea lions on S side rocks	40	
07/11/03	Stills	few sea lions	
07/12/03	WE - Stills	many sea lions	
07/13/03	WE - Stills	many sea lions	
07/14/03	sea lions present	32	
07/15/03	sea lions present	12	
07/16/03		no sea lions	

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Sea Lion Monitoring Log
12/23/02-12/31/04

Legend

WE	= Weekend
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~	= Approximately
Few	= 6 or less present
N	= North
S	= South

Date	Comments	Quantity	Time
	Stills	no sea lions	
07/17/03		no sea lions	8:10A
		no sea lions	12:00P
		no sea lions	3:00P
	Stills	no sea lions	
07/18/03		no sea lions	8:15A
		no sea lions	12:00P
	Stills	no sea lions	
07/19/03	Stills	many sea lions	
07/20/03	Stills	few sea lions	
07/21/03		no sea lions	8:20A
		no sea lions	11:50A
	Stills	no sea lions	
07/22/03		no sea lions	8:00A
		no sea lions	12:00P
	Problems with camera connection		12:10P
	Stills	no sea lions	
07/23/03	system down		
	Stills	no sea lions	
07/24/03	Stills	no sea lions	
07/25/03	Stills	no sea lions	
07/26/03	WE - cameras down		
07/26/03	no Stills - cameras down		
07/27/03	WE - cameras down		
	no Stills - cameras down		
07/28/03		no sea lions	12:45P
		no sea lions	3:00P
	Stills	no sea lions	
07/29/03		no sea lions	10:30A
		no sea lions	3:05P
	Stills	no sea lions	
07/30/03		no sea lions	10:45P
		no sea lions	11:50A
		no sea lions	1:30P
	Stills	no sea lions	
07/31/03		no sea lions	9:00A
	Stills	no sea lions	
08/01/03		no sea lions	3:00P
	Stills	no sea lions	
08/02/03	WE - cameras down		
	no Stills - cameras down		
08/03/03	WE - cameras down		
	no Stills - cameras down		
08/04/03		no sea lions	10:30A
		no sea lions	1:00P
		no sea lions	3:30P
	Stills	no sea lions	
08/05/03		no sea lions	10:30A
		no sea lions	3:00P
	Stills	no sea lions	
08/06/03		no sea lions	12:45P
		no sea lions	2:00P

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Sea Lion Haulout

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Sea Lion Monitoring Log
12/23/02-12/31/04

Legend

WE	= Weekend
NS	= No Camera Signal
~	= Approximately
Few	= 6 or less present
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S	= South

Date	Comments	Quantity	Time
		no sea lions	3:30P
	Stills	no sea lions	
08/07/03		no sea lions	11:30A
		no sea lions	12:50P
		no sea lions	3:58P
	Stills	no sea lions	
08/08/03		no sea lions	11:00A
		no sea lions	12:50P
		no sea lions	3:30P
	Stills	no sea lions	
08/09/03	WE - Stills	no sea lions	
08/10/03	WE - Stills	no sea lions	
08/11/03		no sea lions	10:30A
		no sea lions	1:30P
		no sea lions	4:05P
08/11/03	Stills	no sea lions	
08/12/03		no sea lions	12:00P
		no sea lions	4:00P
	Stills	no sea lions	
08/13/03		no sea lions	9:15A
		no sea lions	1:45P
	Stills	no sea lions	
08/14/03		no sea lions	9:45A
		no sea lions	3:40P
	Stills	no sea lions	
08/15/03		no sea lions	9:20A
	Stills	no sea lions	
08/16/03	WE -no Stills - cameras down		
08/17/03	WE - Stills	no sea lions	
08/18/03	Only checked picture stills	no sea lions	
08/19/03		no sea lions	9:25A
	Stills	no sea lions	
08/20/03		no sea lions	10:00A
	Stills	no sea lions	
8/21/03	Stills	no sea lions	
8/22/03	Stills	no sea lions	
8/23/03	Stills	no sea lions	
8/24/03	Stills	2 sealions	12:01:02PM
		2 sealions	12:17:47PM
		3 sealions	02:17:46PM
		3 sealions	02:17:49PM
		3 sealions	04:03:48PM
		3 sealions	04:17:48PM
		2 sealions	06:03:44PM
		2 sealions	06:17:46PM
8/25/03	system down		
	Stills	no sea lions	
8/26/03	system down - called Lane (SWS)		9:00 AM
	system up & down all day		
	Stills	no sea lions	
8/27/03	Stills	2 sealions	12:01:02 PM
		2 sealions	12:03:46 PM

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Sea Lion Haulout

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Sea Lion Monitoring Log
12/23/02-12/31/04

Legend

WE	= Weekend
NS	= No Camera Signal
~	= Approximately
Few	= 6 or less present
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S	= South

Date	Comments	Quantity	Time
		1 sealion	12:30:11 PM
		1 sealion	04:01:04 AM
8/28/03		no sea lions	8:45A
	in water N large slab	3 or 4 sealions	12:03:00 PM
		no sea lions	1:05P
	Stills	no sea lions	
8/29/03		no sea lions	11:00A
		no sea lions	2:58P
	Stills	no sea lions	
8/30/03	Stills	1 sealion	06:03:47PM
		1 sealion	06:17:54PM
9/1/03	Stills	1 sealion	02:01:04PM
		1 sealion	04:01:02PM
9/2/03		no sea lions	9:10A
		no sea lions	3:40P
	Stills	no sea lions	
9/3/03		2 sealions	9:54:38A - 10:05:49A
		3 sealions	12:25:39P
		4 sealions	12:44:58P
	including the pup "FAITH"	6 sealions	12:53P
	including the pup "FAITH"	4 sealions	4:28:53P
		2 sealions	6:17:50P
	Stills	yes	
9/4/03		no sea lions	9:40A
		no sea lions	11:10A
		no sea lions	12:30P
		no sea lions	3:30P
	Stills	no sea lions	
9/5/03		no sea lions	9:10A
		no sea lions	10:45A
		no sea lions	1:05P
	Stills	no sea lions	
9/6/03	Stills	no sea lions	
9/7/03	Stills	no sea lions	
9/8/03		no sea lions	8:50A
		no sea lions	2:35P
		no sea lions	4:30P
	Stills	no sea lions	
9/9/03		no sea lions	9:10A
		no sea lions	12:35P
	Stills	no sea lions	
9/10/03		no sea lions	9:05A
		no sea lions	12:20P
		no sea lions	4:15P
	Stills	1 sea lion in water	8:56:53A
9/11/03		no sea lions	10:45A
		no sea lions	12:10P
		no sea lions	3:25P
	Stills	no sea lions	
9/12/03		no sea lions	9:00A
		no sea lions	2:36P

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12/23/02-12/31/04

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Date	Comments	Quantity	Time
	Stills	no sea lions	
9/13/03	Stills	19	
9/14/03	Stills	30+	
9/15/03		50 - 80	8:40A
		50 - 80	1:10P
	Stills	50 - 80	
9/16/03	Sea lions were present all day	100+	8:07A
	sighted sea lion H27		
	Stills	100+	
9/17/03	sighted sea lion H27 &H32	100+	10:00A
	Stills	100+	
9/18/03		100+	9:15A
	Stills	~ 70	
9/19/03	many present all day	100+	9:00A
	called SWS to let them know that camera		
	2 & 3 not coming in clear and camera 3		
	left manual button not working. Talked to		
	Matt & Lane		
9/20/03	Stills	~ 40	
9/21/03	Stills	~ 50	
9/22/03	sighted sea lion F105Y	100+	11:15A
9/23/03		100+	9:00A
	Stills	100+	
9/24/03		100+	10:15A
		100+	12:15P
	Stills	100+	
9/25/03		100+	11:20A
	Stills	100+	
9/26/03		100+	9:15A
	Stills	100+	
9/27/03	Stills - Camera down part-time	100+	
9/28/03	Stills - Camera down part-time	100+	
9/29/03	Stills - Lane from SWS called & said that		
	AT&T was having problems in Haines so the		
	camera wasn't working most of the day.		
	There was a few Stills with 100+ sea lions.	100+	
9/30/03	camera wasn't working most of the day.	100+	
	Stills	100+	
10/1/03	camera wasn't working most of the day.	100+	
	Stills	100+	
10/2/03		100+	
10/3/03	Stills	~ 50	
10/4/03	Stills	~ 30	
10/5/03	Stills	~ 50	
10/6/03	Stills	~ 20	10:04A
	Stills	~ 30	2:04P

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Sea Lion Monitoring Log
12/23/02-12/31/04

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Date	Comments	Quantity	Time
10/7/03	Stills	~ 30	10:04A
10/8/03	Stills	~ 35	
10/9/03		~ 30	9:00A
		~ 50	10:20A
	Stills		
10/10/03		~ 100	10:45A
	Stills	~ 100	
10/11/03	Stills	~ 50	
10/12/03	Stills	100+	
10/13/03		90-100	8:40A
		80-90	4:16P
	Stills	~ 50	
10/14/03		~ 100	9:55A
	Stills	~ 100	
10/15/03	Stills	~ 30	
10/16/03	Stills	60+	
10/17/03	Stills	70+	
10/18/03	Stills	30	
10/19/03	Stills	20	
10/20/03		90+	9:30A
	Stills	60-70	
10/21/03		~ 70	9:35A
	Stills	~ 50	
10/22/03		~ 100	9:25A
10/23/03	Stills	25-30	
10/24/03	Stills	~ 50	
10/25/03	Stills	~ 80	
10/26/03	Stills	50-80	
10/27/03	Stills	100+	
10/28/03		100+	9:15A
	Stills	~ 50	
10/29/03	Stills	~ 50	
10/30/03	Stills	100+	
10/31/03		100+	9:30A
		100+	2:00P
	Stills	100+	
11/1/03	Stills	100+	

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Date	Comments	Quantity	Time
11/2/03	Stills	100+	
11/3/03		100+	9:20A
11/4/03	cameras down		
	Stills	100+	
11/5/03	cameras down - Seemore Wildlife installing DSL		
	Stills	100+	
11/6/03	cameras down	100+	
	Stills	100+	
11/7/03		~ 80	
	Stills	100+	
11/8/03	Stills	~ 50	
11/9/03	Stills	30-50	
11/10/03		40-50	3:15P
	Stills	~ 50	
11/11/03	Stills	100+	
11/12/03	Stills	100+	
11/13/03	camera down - talked to Matt @ SWS. He		
	said that the internet was possibly down in		
	Haines		
	Stills	~ 50	
11/14/03		100+	9:10A
	Stills	100+	
11/15/03	Stills	100+	
11/16/03	cameras down		
	Stills -cameras down, no pics		
11/17/03	camera down in morning	15-20	10:30A
		15-20	1:30P
	Stills - some snow	15-20	
11/18/03	Some snow	27	1:15P
	Stills	10	
11/19/03		100+	9:30A
	Stills		
11/20/03	Camera #1 - out of bounds	80-100	9:25A
	Camera #3 - blurry		
	Stills	~ 50	
11/21/03	camera down		
	Stills	~ 50	
11/22/03	camera down		
	Stills - snow	~ 20	
11/23/03	camera down		
	Stills	80-100	
11/24/03	snow	~ 50	
	Stills	30	

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~	= Approximately
Few	= 6 or less present
N	= North
S	= South

Date	Comments	Quantity	Time
11/25/03		~ 100	9:45A
	Stills	100+	
11/26/03	Stills	40-50	
11/27/03	Stills	20-30	
11/28/03	Stills - snow	~ 25	
11/29/03	Stills - no pictures		
11/30/03	Stills -snow	30	
12/1/03	cameras down		
12/2/03	cameras down		
12/3/03	cameras down		
12/4/03	Stills - cameras down	100+	
12/5/03		100+	1:45P
	Stills	100+	
12/6/03	Stills	100+	
12/7/03	Stills	100+	
12/8/03	Stills - snow	100+	
12/9/03		100+	9:55A
	Stills - snow	100+	
12/10/03		100+	10:30A
12/11/03	cameras down		
12/12/03	cameras down		
12/13/03	cameras down		
12/14/03	cameras down		
12/15/03	cameras down		
12/16/03	cameras down		
12/17/03	cameras down		
12/18/03	cameras down		
12/19/03	cameras down		
12/20/03	cameras down		
12/21/03	cameras down		
12/22/03	cameras down		
12/23/03	cameras down		
12/24/03	cameras down		
12/25/03	cameras down		
12/26/03	cameras down		
12/27/03	cameras down		
12/28/03	cameras down		
12/29/03	cameras down		
12/30/03	cameras down		
12/31/03	cameras down		
1/1/04	cameras down		
1/2/04	cameras down		
1/3/04	cameras down		
1/4/04	cameras down		
1/5/04	cameras down		
1/6/04	cameras down		
1/7/04		~ 15	9:10A
	Stills	0	
1/8/04		~ 30	11:15A

Juneau Access
Sea Lion Haulout

Gran Point

Sea Lion Monitoring Log
12/23/02-12/31/04

Legend

WE	= Weekend
NS	= No Camera Signal
~	= Approximately
Few	= 6 or less present
N	= North
S	= South

Date	Comments	Quantity	Time
1/9/04	cameras down		
1/10/04	cameras down		
1/11/04	cameras down		
1/12/04	cameras down		
1/13/04	cameras down		
1/14/04	cameras down		
1/15/04	cameras down		
1/16/04	cameras down		
1/17/04	cameras down		
1/18/04	cameras down		
1/19/04	cameras down		
1/20/04	cameras down		
1/21/04	Stills	30-40	
1/22/04	Stills	100+	
1/23/04	cameras down		
1/24/04	cameras down		
1/25/04	cameras down		
1/26/04	cameras down		
1/27/04		2	10:15A
1/28/04		10	2:30P
	Stills (no pics)		
1/29/04		~ 50	9:30A
	Stills	~ 30 - 50	
1/30/04	Stills	100+	
1/31/04	no Stills		
2/1/04	no Stills		
2/2/04		100+	1:30P
	Stills	100+	
2/3/04		100+	10:30A
	Stills	100+	
2/4/04	some in water - snowing hard		10:30A
	1 Still - can not see any sea lions		
2/5/04	no stills		
2/6/04	no stills		
2/7/04	5 stills of one area only	few	
2/8/04	no stills		
2/9/04	no stills		
2/10/04	Stills	none	
2/11/04	Stills	25	
2/12/04		100+	12:00 noon
	Stills	~ 75	
2/13/04		100+	11:20A
	Stills	100+	
2/14/04	Stills	50-75	
2/15/04	Stills	100	
2/16/04	Stills	100	
2/17/04	Stills	50-75	
2/18/04	Many in water - snowing - middle area (50)	50+	11:00A
	Stills-snow	75	

Juneau Access
Sea Lion Haulout

Gran Point

Sea Lion Monitoring Log
12/23/02-12/31/04

Legend

WE	= Weekend
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S	= South

Date	Comments	Quantity	Time
2/19/04	Stills	some	
2/20/04	Stills	some	
2/21/04	Stills	some	
2/22/04	Stills	none	
2/23/04	no Stills		
2/24/04	Stills	100+	
2/25/04	Stills	~ 80	
2/26/04	Stills	~ 30	
2/27/04	Stills	100+	
2/28/04	Stills	100+	
2/29/04	Stills	100+	
3/1/04	Stills	100+	
3/2/04	Stills	100+	
3/3/04	no Stills		
3/4/04	Stills	~ 50	
3/5/04	Stills	100+	
3/6/04	Stills	~ 60-70	
3/7/04	Stills	100+	
3/8/04	Stills - snow - saw no sea lions	none	
3/9/04	Stills	~ 50	
3/10/04	Stills	~ 50	
3/11/04	Stills	~ 100	
3/12/04	Stills	100+	
3/13/04	Stills	100+	
3/14/04	Stills	100+	
3/15/04	Stills	25-50	
3/16/04		100+	12:00P
	Stills	100+	
3/17/04	Stills	100+	
3/18/04	Stills	~ 100	
3/19/04		100+	10:45A
	Stills	~ 100	
3/20/04	Stills	~ 50 - 70	
3/21/04	no stills	0	
3/22/04	Stills	100+	
3/23/04	No stills	0	
3/24/04	Stills	100+	
3/25/04	Stills	100+	
3/26/04	Stills	100+	
3/27/04	Stills	50+	
3/28/04	Stills	5 - 10	
3/29/04	Stills	20 - 50	
3/30/04	Stills	~ 100	

Juneau Access
Sea Lion Haulout

Gran Point

Sea Lion Monitoring Log
12/23/02-12/31/04

Legend

WE	= Weekend
NS	= No Camera Signal
~	= Approximately
Few	= 6 or less present
N	= North
S	= South

Date	Comments	Quantity	Time
3/31/04	Stills	~ 100+	
4/1/04	Stills	100+	
4/2/04	Stills	100+	
4/3/04	Stills	100+	
4/4/04	Stills	100+	
4/5/04	Stills	100+	
4/6/04	Stills	100+	
4/7/04	Stills - 50-70 on land a many in water	~ 50 - 70	
4/8/04	Many in the water	~ 50 - 60	1:45P
	Stills	50	
4/9/04		~ 10	10:45A
	Stills- a few on land and some in water	10+	
4/10/04	Stills	50 - 80	
4/11/04	Stills	100+	
4/12/04		100+	10:45A
4/13/04	Stills	~ 80	
4/14/04	Stills	100+	
4/15/04	Stills	100+	
4/16/04	Stills	~ 60 - 80	
4/17/04	Stills	~ 80	
4/18/04	Stills	100+	
4/19/04		100+	2:43 P
	Stills	100+	
4/20/04		100+	11:40A
	Stills	100+	
4/21/04		100+	all day
	Stills	100+	
4/22/04		~ 50	9:00A
	Stills	~ 50	
4/23/04	Stills	100+	
4/24/04	Stills	~ 80 -100	
4/25/04	Stills	~ 25 - 50	
4/26/04	Stills	100+	
4/27/04	Stills	100+	
4/28/04	Stills	100+	
4/29/04		100+	all day
	Stills	100+	
4/30/04		100+	2:45P
	Stills	100+	
5/1/04	Stills	100+	
5/2/04	Stills	100+	
5/3/04	Stills	100+	

Juneau Access
Sea Lion Haulout

Gran Point

Sea Lion Monitoring Log
12/23/02-12/31/04

Legend

WE	= Weekend
NS	= No Camera Signal
~	= Approximately
Few	= 6 or less present
N	= North
S	= South

Date	Comments	Quantity	Time
5/4/04	Stills	100+	
5/5/04	Stills	100+	
5/6/04	Stills - camera #3 down	100+	
5/7/04	Stills - camera #3 down	100+	
5/8/04	Stills - camera #3 down	100+	
5/9/04	Stills - camera #3 down	100+	
5/10/04		100+	
5/11/04		100+	11:00 A
5/12/04		100+	11:00 A
5/13/04		100+	11:05 AM
5/14/04		100+	9:15 A
5/15/04	Stills	100+	
5/16/04	Stills	50+	
5/17/04		100+	10:30 AM
5/18/04		100+	9:30 AM
5/19/04	Stills	100+	
5/20/04	Stills	100+	
5/21/04	Stills	25	
5/22/04	Stills	100+	
5/23/04	Stills	100+	
5/24/04	Stills	100+	
5/25/04	Stills	100+	
5/26/04	Stills	100+	
5/27/04	Stills	100+	
5/28/04	Stills	100+	
5/29/04	Stills	100+	
5/30/04	Stills	100+	
5/31/04	Stills	100+	
6/1/04	Stills	100+	
6/2/04		100+	2:10 PM
6/3/04		100+	10:00 AM
6/4/04		100+	
6/5/04	Stills	100+	
6/6/04	Stills	100+	
6/7/04	Stills	100+	
6/8/04	Stills	100+	
6/9/04	Stills	100+	
6/10/04	Stills	100+	
6/11/04	Stills	100+	
6/12/04	Stills	100+	
6/13/04	Stills	100+	
6/14/04		100+	11:25 AM
6/15/04		100+	10:00-11:00 AM
6/16/04		100+	
6/17/04		100+	
6/18/04		100+	
6/19/04	Stills	100+	
6/20/04	Stills	100+	
6/21/04	Stills	100+	
6/22/04	Stills	60-80	
6/23/04	only a few bulls	100+	2:15 PM

Juneau Access
Sea Lion Haulout

Gran Point

Sea Lion Monitoring Log
12/23/02-12/31/04

Legend

WE	= Weekend
NS	= No Camera Signal
~	= Approximately
Few	= 6 or less present
N	= North
S	= South

Date	Comments	Quantity	Time
6/24/04	all in water but 6	~ 80	4:25 PM
6/25/04	~ 30 in water, 30 on main slab & 30 S rocks	~ 60	11:00 AM
6/26/04	Stills	100+	10:35 AM
6/27/04	Stills	100+	12:54 PM
6/28/04		100+	11:00 AM
6/29/04	Stills	100+	4:29 PM
6/30/04	Stills	100+	3:49 PM
7/1/04	Stills	100+	12:29 PM
7/2/04		100+	11:30 AM
7/3/04	Stills	100+	12:44 PM
7/4/04	Stills 60+ on land and many in water	60+	12:23 PM
7/5/04	Stills	100+	12:54 PM
7/6/04		100+	10:30 AM
7/7/04	Stills	100+	3:00 PM
7/8/04		100+	11:15 AM
		100+	2:00 PM
7/9/04		100+	11:00 PM
7/10/04	Stills	100+	11:54
7/11/04	Stills	100+	11:00 AM
7/12/04		100+	9:04 AM
		100+	1:30 PM
7/13/04	No large bulls-4 whales- 1 sea lion on s. slab	1	9:16 AM
	Stills	100+	11:06 AM
7/14/04	No large bulls	100+	11:09 AM
		100+	1:10 PM
7/15/04	No large bulls	~ 90	11:15 AM
7/16/04	No large bulls-1 whale	none on main slab	10:36 AM
		100+	3:43 PM
7/17/04	Stills	100+	4:27 PM
		100+	1:29 PM
7/18/04	Stills - many in water	80-100	1:04 PM
		80-100	2:44 PM
7/19/04		~ 50	10:36 AM
		100+	4:08 PM
7/20/04		100+	8:49 PM
		~ 80	1:05 PM
		100+	3:29 PM
7/21/04		100+	10:22 AM
		100+	4:30 PM
7/22/04		80-100	9:00 AM
7/23/04		60-70	8:48 AM
		60-70	1:12 PM
7/24/04	Stills	100+	2:14 PM
7/25/04	Stills	100+	1:00 PM
7/26/04		100+	1:00 PM
7/27/04		100+	9:00 AM
		100+	2:25 PM
		100+	4:28 PM
7/28/04		80+	9:14 AM
7/29/04	Stills	100+	3:00 PM
7/30/04		100+	12:06 PM

Juneau Access
Sea Lion Haulout

Gran Point

Sea Lion Monitoring Log
12/23/02-12/31/04

Legend

WE	= Weekend
NS	= No Camera Signal
~	= Approximately
Few	= 6 or less present
N	= North
S	= South

Date	Comments	Quantity	Time
7/31/04	Stills	100+	1:00 PM
8/1/04	Stills	100+	1:00 PM
		100+	3:50 PM
8/2/04		100+	1:10 PM
8/3/04		~ 50 - 70	10:17 AM
		100+	10:32 AM
	Stills - some in water	~ 15	1:25 PM
8/4/04		~ 60	11:15 AM
8/5/04		100+	8:55 AM
		100+	1:00 PM
		100+	2:10 PM
8/6/04	Camera #1 replaced	~ 50	9:40 AM
		~ 9	4:22 PM
8/7/04	Stills	no sea lions	all day
	Stills	no sea lions	all day
8/8/04		no sea lions	all day
8/9/04		no sea lions	
8/10/04		no sea lions	
8/11/04		no sea lions	
8/12/04		no sea lions	
8/13/04		no sea lions	
8/14/04		no sea lions	8:40 AM
		70 - 90	2:30 PM
8/15/04	Stills	50+	
8/16/04		70 - 90	2:00 PM
8/17/04		no sea lions	morning
		5	afternoon
8/18/04		5 - 10	morning & afternoon
8/19/04		no sea lions	9:30 AM
	Stills	2	3:01 PM
8/20/04	Stills	1	2:11 PM
8/21/04	Stills	~ 25	4:00 PM
8/22/04	Stills	50 - 75	1:40 PM
8/23/04		no sea lions	
8/24/04	Stills	1	
8/25/04	Stills	2	
8/26/04	Stills	1	
8/27/04	Stills	20 - 30	
8/28/04	Stills	no sea lions	
8/29/04	Stills	3	
8/30/04	Stills	some in water only	
8/31/04	Stills	some in water only	12:52 PM
9/1/04		50 - 70	3:47 PM
9/2/04		100+	
9/3/04		100+	
9/4/04		~ 50	
9/5/04		50 - 70	
9/6/04		50 - 70	
9/7/04		100+	
9/8/04		100+	
9/9/04		100+	

Juneau Access
Sea Lion Haulout

Gran Point

Sea Lion Monitoring Log
12/23/02-12/31/04

Legend

WE	= Weekend
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Date	Comments	Quantity	Time
9/10/04	Stills	~ 100	
9/11/04	Stills	~ 100	
9/12/04	Stills	~ 100	
9/13/04		100+	
9/14/04		50 - 60	
9/15/04		100+	
9/16/04		100+	
9/17/04		~ 50	
9/18/04		100+	
9/19/04	No Stills		
9/20/04		50 - 60	
9/21/04		100+	
9/22/04		100+	
9/23/04		100+	
9/24/04		100+	
9/25/04		100+	
9/26/04		100+	
9/27/04		100+	
9/28/04		100+	
9/29/04		100+	
9/30/04		100+	
10/1/04		100+	
10/2/04		100+	
10/3/04		100+	
10/4/04		100+	
10/5/04		100+	
10/6/04		~ 90	
10/7/04		~ 50	
10/8/04		100+	
10/9/04		100+	
10/10/04		100+	
10/11/04		100+	
10/12/04		~ 15	
10/13/04		100+	
10/14/04		100+	
10/15/04		100+	
10/16/04		100+	
10/17/04		100+	
10/18/04		100+	
10/19/04		100+	
10/20/04		100+	
10/21/04		50 - 75	
10/22/04		100+	
10/23/04		100+	
10/24/04	snow	~ 50	
10/25/04		100+	
10/26/04		100+	
10/27/04		100+	
10/28/04		100+	
10/29/04		100+	
10/30/04		100+	
10/31/04	no pics - cameras down		

Juneau Access
Sea Lion Haulout

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Legend

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Date	Comments	Quantity	Time
11/1/04		100+	
11/2/04		100+	
11/3/04		~ 20	
11/4/04		100+	
11/5/04		100+	
11/6/04		100+	
11/7/04	snow	100+	
11/8/04		100+	
11/9/04		100+	
11/10/04		100+	
11/11/04		100+	
11/12/04		100+	
11/13/04		50 - 75	
11/14/04		100+	
11/15/04		100+	
11/16/04		100+	
11/17/04		100+	
11/18/04		100+	
11/19/04		100+	
11/20/04		100+	
11/21/04		100+	
11/22/04		75+	
11/23/04		100+	
11/24/04		100+	
11/25/04		~ 80	
11/26/04	cameras not on		
11/27/04	cameras not on		
11/28/04		~ 50	
11/29/04		100+	
11/30/04		100+	
12/1/04		100+	
12/2/04	no camera #1	~ 75	
12/3/04	no camera #1	~ 50	
12/4/04		~ 75	
12/5/04		100+	
12/6/04	light snow	100+	
12/7/04		100+	
12/8/04	trouble with cameras out of focus	~ 25	
12/9/04	snow	~ 30	
12/10/04		100+	
12/11/04	snow	100+	
12/12/04		100+	
12/13/04		100+	
12/14/04		100+	
12/15/04		60+	
12/16/04		100+	
12/17/04		100+	
12/18/04		100+	
12/19/04		100+	
12/20/04		100+	
12/21/04		100+	
12/22/04		35	

Juneau Access
Sea Lion Haulout

Gran Point

Sea Lion Monitoring Log
12/23/02-12/31/04

Legend

WE	= Weekend
NS	= No Camera Signal
~	= Approximately
Few	= 6 or less present
N	= North
S	= South

Date	Comments	Quantity	Time
12/23/04		10	
12/24/04		100+	
12/25/04		~ 5	
12/26/04		100+	
12/27/04	snow	20	
12/28/04	snow	20	
12/29/04	snow	10	
12/30/04		10	
12/31/04		45	