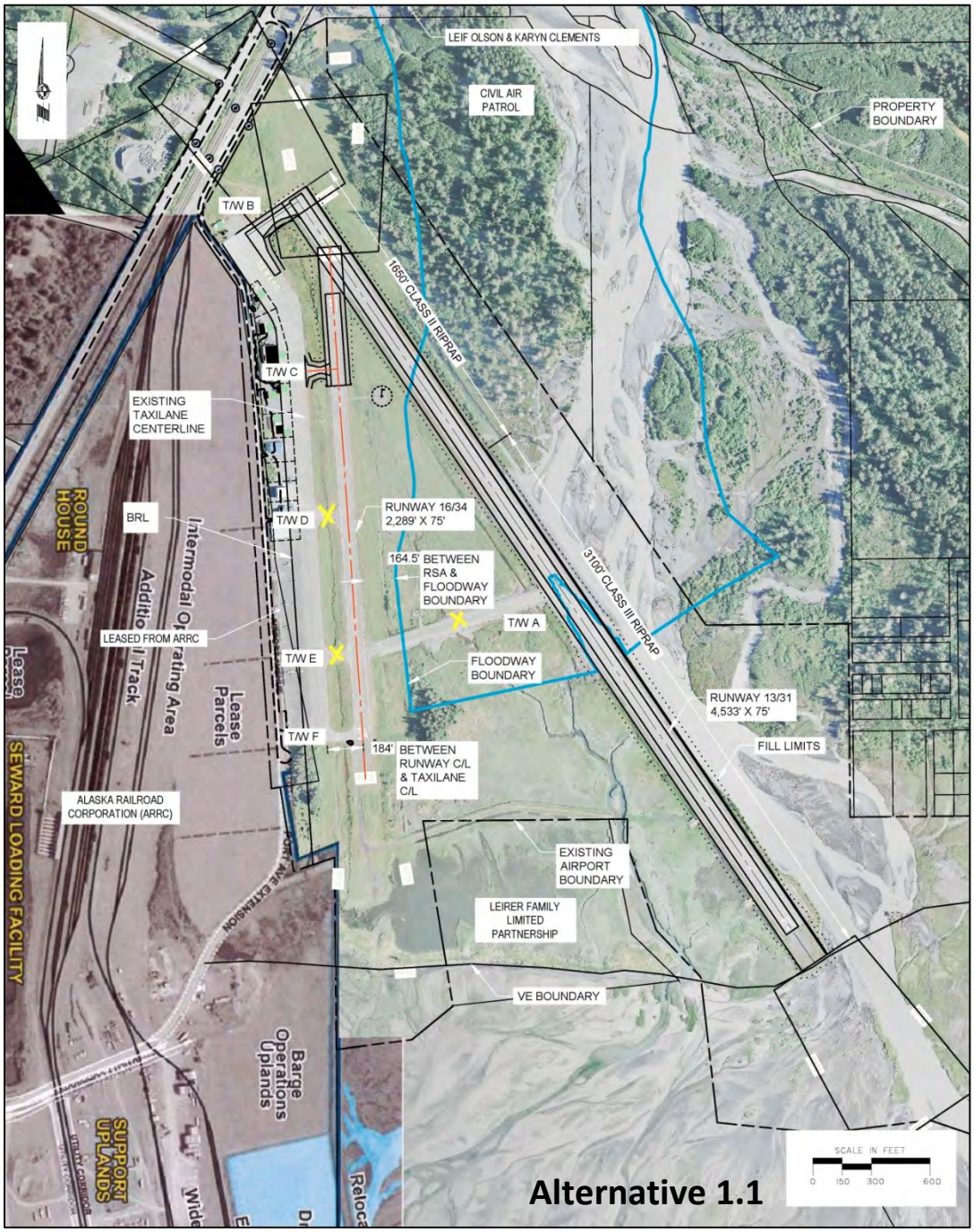
APPENDIX B

ALTERNATIVES DROPPED FROM FURTHER CONSIDERATION

APPENDIX B

Alternatives Dropped from Further Consideration

Alternatives Dropped from Further Consideration are described in Section 4.1 of this Environmental Assessment (EA). A description of preliminary alternatives dropped during the scoping phase of the project can be found in the Scoping Report (available at http://www.dot.alaska.gov/creg/sewardairport/documents.shtml). This appendix provides further explanation for the elimination of Alternative 1.1 as described in Section 4.1.1 of this EA.



Alternative 1.1 would reconstruct and raise Runway 13-31 above the 100-year flood level with 2 feet of freeboard (per Executive Order, dated January 30, 2015). The existing runway would remain at its current length of 4,533 feet. Riprap would have been installed within the Resurrection River to protect Runway 13-31. Taxiways B and C would have been reconstructed to match into Runway 13-31 raised profile and entrance Taxiways A, D, and E would have been reconfigured or eliminated to comply with new FAA guidance.

Runway 13-31 is located adjacent to the Resurrection River. Modeling, using 2 feet of freeboard above the 100-year flood level, showed up to a 4-foot increase in the base flood elevation (BFE) over portions of the upstream floodplain. The runway embankment was raised over 6 feet in some areas with an overall average rise of 4.4 feet. This additional fill would result in a backing up of floodwaters onto an additional 159 acres of private, state, and native allotments along the Resurrection River as compared to the No Build option or Alternative 2.2 (Alternative 2.2 would increase flooding on 22 acres, while reducing flooding on another 44 acres). Higher floodwater velocities produced by the river could result in increased erosion and scour over time of the proposed reinforced embankment.

Since this option produces fill into the regulatory floodway, a modification to the effective Flood Insurance Rate Map (FIRM) and Floodway Map would be required. The associated Letter of Map Revision (LOMR) would require extensive hydraulic analysis, would need to meet regulatory requirements, and will require mitigation for affected property owners. This would increase the cost of the project as well as the ultimate timeline for completion. The existing runway is currently under weight restrictions, due to past flood damage, limiting the type of aircraft that can access the airport.

Executive Order 11988 "requires federal agencies to avoid to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of the 100-year floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative". Alternative 1.1 maintains the portion of the existing airport which lies within the regulatory floodway (sections of Runway 13-31 and Taxiway A). The location of Runway 13-31 to the Resurrection River puts the runway at a greater risk of overtopping during a major flood event, even after it is raised. At the very least, future maintenance and operation costs associated with higher than expected flood levels would be a burden. The airport's use for emergency services is crucial during flood events which could also impair highway travel.

To raise and reinforce Runway 13-31 would require placing riprap below the ordinary high water mark of the Resurrection River. This has implications for fish habitat within the river as well as navigability concerns for this braided river channel. These potential impacts would require further analysis if this alternative were carried forward into the EA.

DOT Order 5650 states "that DOT agencies should ensure that proper consideration is given to avoid and mitigate adverse floodplain impacts in agency actions…." Alternative 1.1 has a much greater impact to the floodplain than the No Build or Alternative 2.2.

Taken together, these considerations qualify the floodplain impacts associated with Alternative 1.1 as a significant encroachment on the floodplain, as defined in the following excerpt from Section 14.2.1.1 of the 1015.1F Desk Reference:

> *As defined in DOT Order 5650.2, significant encroachment is an encroachment in a floodplain that results in one or more of the following construction or flood-related*

> *impacts: 1) considerable probability of loss of human life, 2) likely future damage associated with the encroachment that could be substantial in cost or extent, including interruption of service on or loss of a vital transportation facility, and 3) a notable adverse impact on "natural and beneficial floodplain values."*

This guidance states that an alternative with a significant floodplain encroachment should not be selected if a practicable alternative exists. Alternative 2.2 does not qualify as a significant floodplain encroachment and would also allow for the eventual breaching of Runway 13-31, thereby restoring part of the original floodplain.

Furthermore, FAA Order 1050.1F provides the following Significance Threshold for Floodplains:

> *The action would cause notable adverse impacts on natural and beneficial floodplain values. Natural and beneficial floodplain values are defined in Paragraph 4.k of DOT Order 5650.2, Floodplain Management and Protection.*

Proposed actions that would result in impacts at or above these defined Significance Thresholds require preparation of an EIS.

DOT Order 5650.2, paragraph 4.k states that natural and beneficial floodplain values include, but are not limited to: natural moderation of floods, water quality maintenance, groundwater recharge, fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, and forestry. The 1050.1F Desk Reference also references factors to consider when assessing impacts on a floodplain's natural and beneficial values. Most notably, "would the proposed action or alternative(s) cause flow alterations that would result in unacceptable upstream or downstream flooding?"

The selection of Alternative 1.1 as the proposed action could therefore result in the need to prepare an EIS for this project as the potential floodplain impacts meet or exceed the Significance Threshold set for floodplains.

APPENDIX C

ENVIRONMENTAL IMPACT CATEGORIES: NON-ISSUES

Appendix C

Environmental Impact Categories: Non-issues

The following categories have been determined to be non-issues for this project. These categories do not warrant discussion because there is no potential for impact.

1. Air Quality
2. Climate
3. Coastal Resources
4. Department of Transportation Act: Section 4(f)
5. Farmlands
6. Visual Effects
7. Groundwater
8. Wild and Scenic Rivers

1. Air Quality

FAA Order 1050.1F sets the significance threshold for air quality as whether, "the action would cause pollutant concentrations to exceed one or more of the National Ambient Air Quality Standards (NAAQS), as established by the Environmental Protection Agency under the Clean Air Act, for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations. The EPA designates those areas not in attainment of the NAAQS as "nonattainment areas". A review of the EPA's list of Nonattainment Areas for All Criteria Pollutants and the ADEC Division of Air Quality's Non-Point Mobile Source Program websites indicate that the Seward Airport does not fall within a nonattainment area. According to the FAA's *Airport Environmental Handbook*, no air quality analysis is needed if the annual levels of activity at a commercial service airport area are fewer than 1.3 million passengers and fewer than 180,000 operations, or if it is a general aviation airport with fewer than 180,000 annual operations forecast. Current activity at Seward and activity forecasted in the Scoping Report are well below 180,000 operations; therefore no air quality analysis was necessary during the AMP process. The proposed action will not cause an increase in aviation activity and therefore will have no potential for impacting air quality permanently. An Erosion and Sediment Control Plan will be developed for this project which will detail measures to reduce temporary air quality impacts due to construction such as watering for dust control and covering truck loads and stockpiles.

2. Climate

Via the Trump administration's Executive Order titled "Presidential Executive Order on Promoting Energy Independence and Economic Growth" the Trump administration stated:

(c) The Council on Environmental Quality shall rescind its final guidance entitled "Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews," which is referred to in "Notice of Availability," 81 Fed. Reg. 51866 (August 5, 2016).

3. Coastal Resources

The Alaska Coastal Management Program (ACMP) expired by operation of Alaska Statutes 44.66.020 and 44.66.030 on June 30, 2011. As a result, the ACMP was withdrawn from the National Coastal Management Program on July 1, 2011, and Alaska no longer has a Coastal Zone Management Act (CZMA) program. Because a federally approved coastal management program must be administered by a state agency, no other entity may develop or implement a federally approved coastal management program for the state.

As of July 1, 2011, the CZMA Federal consistency provision no longer applies in Alaska. Federal agencies no longer provide Consistency Determinations or Negative Determinations to the State of Alaska CZMA pursuant to 16 U.S.C. 1456(c)(1) and (2), and 15 CFR part 930, subpart C. Persons or applicant agencies for Federal authorizations or funding no longer provide Consistency Certifications to the State of Alaska CZMA pursuant to 16 U.S.C. 1456(c)(3)(A), (B) and (d), and 15 CFR part 930, subparts D, E and F.

4. Department of Transportation Act: Section 4(f)

Based on a review of state and federal agency protected areas in Alaska and City of Seward park locations, the proposed project would not affect any publicly owned park, recreation area, or significant historic site. No legislatively designated special areas, such as state game refugees, sanctuaries, or critical habitat areas are located in the project vicinity.

5. Farmlands

No prime or unique farmlands or farmlands of statewide importance have been designated in Alaska. No farmland or soil of local importance has been identified in the project area (https://www.nrcs.usda.gov/wps/portal/nrcs/detail/ak/soils/surveys/?cid=nrcs142p2_035988).

6. Visual Effects

New lighting is proposed as part of this project. This will consist of adding lights to the new runway 16-34 while removing those on runway 13-31. Therefore no significant change to the amount of light emanating from the airport is anticipated as a result of this project. The proposed action will alter the location of Runway 16-34 but the overall visual characteristics of the existing airport will not be significantly altered.

7. Groundwater

A review of the ADEC Drinking Water Protection Mapper on December 15, 2016 revealed many groundwater sources and associated drinking water protection areas established along the project corridor. The proposes action is not anticipated to impact local aquifers or established drinking water sources.

8. Wild and Scenic Rivers

No Wild and Scenic Rivers are located near the project area (https://www.rivers.gov/alaska.php).

APPENDIX D

BIOLOGICAL RESOURCES

Appendix D. Birds of Conservation Concern (BCC) and Bird Species of Conservation Need (SCN)/ Greatest Conservation Need (SGCN) Documented at the Seward Airport

Bird species were documented in the project area through the U.S. Fish and Wildlife Service (USFWS) IPaC (USFWS 2017), eBird (eBird 2017), and resident observations (Griswold 2017), as presented in this appendix.

These birds were then compared with the USFWS 2008 Birds of Conservation Concern (BCC) lists for areas that include Seward (Bird Conservation Regions (BCRs) 4 and 5), Alaska (USFWS Region 7), and the U.S. (National BCCs) (USFWS 2008)). Documented bird species were also compared with the Species of Conservation Need (SCN) and Species of Greatest Conservation Need (SGCN) listed in the 2015 Alaska Wildlife Action Plan (WAP) for the southcentral bioregion (ADF&G 2015).

BCCs and SCN and SGCN Bird Species Documented at the Seward Airport

Bird Species	Documentation/ Observation Source	BCC Listing			WAP Listing	
		BCR Region	*USFWS Region*	*Nat'l. BCC*	*SCN*	*SGCN*
Greater White-fronted Goose (*Anser albifrons frontalis)*	eBird	*None*[1]			SCN	SGCN
Pacific Black Brant (*Branta bernicula nigricans)*	eBird	*None*			SCN	SGCN
Cackling Goose (*Branta hutchinsii minima)*	eBird	*None*			SCN	SGCN
Dusky Canada Goose (*Branta canadensis occidentalis)*	eBird	*None*			SCN	SGCN
Trumpeter Swan (*Cygnus buccinator)*	eBird	*None*			SCN	SGCN
King Eider (*Somateria spectablis)*	eBird	*None*			SCN	SGCN
Common Eider (*Somateria mollissima)*	eBird	*None*			SCN	SGCN
Pacific Black Scoter (*Melanitta americana)*	eBird	*None*			SCN	SGCN
Long-tailed Duck (*Clangula hyemalis)*	eBird	*None*			SCN	SGCN
Rufous Hummingbird (*selasphorus rufus)*	USFWS IPaC; ebird	*None*	Region 7	National	SCN	SGCN
Sandhill Crane (*Grus canadensis)*	eBird	*None*			SCN	SGCN
Black Oystercatcher (*Haematopus bachmani)*	USFWS IPaC; ebird	*None*	Region 7	National	SCN	SGCN
Black-bellied Plover (*Pluvialis squatarola)*	eBird	*None*			SCN	SGCN
American Golden-Plover (*Pluvialis dominica)*	eBird	*None*			SCN	SGCN
Upland Sandpiper (*Bartramia longicauda)*	Griswold	Region 4	*None*	National	*None*	
Whimbrel (*Numenius phaeopus)*	Griswold; ebird	Regions 4, 5	Region 7	National	SCN	SGCN
Hudsonian Godwit (*Limosa haemastica)*	Griswold; ebird	4, 5	Region 7	National	SCN	SGCN
Bar-tailed Godwit (*Limosa lapponica)*	Griswold	*None*	Region 7	National	SCN	*None*
Marbled Godwit *(Limosa fedoa)*	USFWS IPaC	Region 5	Region 7	National	SCN	SGCN
Black Turnstone (*Arenaria melanocephala)*	eBird	*None*			SCN	SGCN
Red Knot (*Calidris canutus roselaari)*	eBird	*None*	Region 7	National	SCN	SGCN

[1]Not listed within a region/list that includes Seward, Alaska.

Bird Species	Documentation/ Observation Source	BCC Listing			WAP Listing	
		BCR Region	***USFWS Region***	***Nat'l. BCC***	***SCN***	***SGCN***
Surfbird (*Calidris virgate)*	eBird	*None*			SCN	SGCN
Dunlin (*Calidris alpine)*	Griswold	*None*	Region 7	National	SCN	SGCN
Rock Sandpiper (*Calidris ptilocnemis ptilocnemis)*	USFWS IPaC; Griswold	Region 4	Region 7	National	SCN	SGCN
Pectoral Sandpiper (*Calidris melanotos)*	eBird	*None*			SCN	SGCN
Semipalmated Sandpiper (*Calidris pusilla)*	Griswold; ebird	*None*		National	SCN	SGCN
Western Sandpiper (*Calidris mauri)*	eBird	*None*			SCN	SGCN
Short-billed Dowitcher (*Limnodromus griseus)*	USFWS IPaC; ebird; Griswold	Regions 4, 5	Region 7	National	SCN	SGCN
Long-billed Dowitcher (*Limnodromus scolopaceus)*	eBird	*None*			SCN	SGCN
Spotted Sandpiper (*Actitus macularius)*	eBird	*None*			SCN	SGCN
Solitary Sandpiper (*Tringa solitaria)*	Griswold; ebird	Regions 4, 5	Region 7	National	SCN	SGCN
Wandering Tattler (*Tringa incana)*	eBird	*None*			SCN	SGCN
Lesser Yellowlegs (*Tringa flavipes)*	USFWS IPaC; ebird; Griswold	*None*	Region 7	National	SCN	SGCN
Common Murre (*Uria aalge inornata)*	eBird	*None*			SCN	SGCN
Pigeon Guillemot (*Cepphus columba columba)*	eBird	*None*			SCN	SGCN
Marbled Murrelet (*Brachyramphus marmoratus)*	USFWS IPaC; ebird	*None*	Region 7	National	SCN	SGCN
Kittlitz's Murrelet (*Brachyramphus brevirostris)*	USFWS IPaC; ebird	*None*	Region 7	National	SCN	SGCN
Cassin's Auklet (*Ptychoramphus aleuticus aleuticus*)	eBird	*None*			SCN	SGCN
Horned Puffin (*Fratercula corniculata)*	eBird	*None*			SCN	SGCN
Tufted Puffin (*Fratercula cirrhata)*	eBird	*None*			SCN	SGCN
Black-legged Kittiwake (*Rissa tridactyla)*	eBird	*None*			SCN	SGCN
Mew Gull (*Larus canus brachyrhynchus)*	eBird	*None*			SCN	SGCN
Herring Gull (*Larus smithsonianus)*	eBird	*None*			SCN	SGCN
Glaucous-winged Gull (*Larus glaucescens)*	eBird	*None*			SCN	SGCN
Aleutian Tern (*Onychoprion aleuticus)*	eBird	*None*	Region 7	National	SCN	SGCN
Caspian Tern (*Hydroprogne caspia)*	Griswold	Region 5	*None*		*None*	
Arctic Tern (*Sterna paradisaea)*	Griswold; ebird	Region 5	Region 7	*None*	SCN	SGCN
Red-throated Loon (*Gavia stellate)*	eBird	*None*			SCN	SGCN
Yellow-billed Loon (*Gavia adamsii)*	eBird	*None*	Region 7	National	SCN	SGCN
Fork-tailed Storm-Petrel (*Oceanodroma furcata furcate)*	eBird	*None*			SCN	SGCN
Red-faced Cormorant (*Phalacrocorax urile)*	eBird	*None*	Region 7	*None*	SCN	SGCN
Pelagic Cormorant (*Phalacrocorax pelagicus pelagicus)*	USFWS IPaC; ebird	*None*	Region 7	*None*	SCN	SGCN
Bald Eagle (*Haliaeetus leucocephalus)*	USFWS IPaC; ebird; Griswold	Region 5	*None*	National	SCN	SGCN
Northern Harrier (*Circus cyaneus)*	eBird	*None*			SCN	SGCN
Northern Goshawk *(Accipiter gentilis)*	Griswold	Region 5	Region 7	*None*	*None*	
Rough-legged Hawk (*Buteo lagopus)*	eBird	*None*			SCN	SGCN
Golden Eagle (*Aquila chrysaetos canadensis)*	eBird	*None*			SCN	SGCN
Short-eared Owl (*Asio flammeus)*	USFWS IPaC; ebird; Griswold	*None*		National	SCN	SGCN
Belted Kingfisher (*Megaceryle alcyon)*	eBird	*None*			SCN	SGCN

Bird Species	Documentation/ Observation Source	BCC Listing			WAP Listing	
		BCR Region	***USFWS Region***	***Nat'l. BCC***	***SCN***	***SGCN***
Peregrine Falcon (*Falco peregrinus)*[2]	Griswold	Regions 4, 5	Region 7	National	SCN	SGCN
Olive-sided Flycatcher (*Contopus cooperi)*	USFWS IPaC	*None*	Region 7	National	*None*	
Alder Flycatcher (*Empidonax alnorum)*	eBird	*None*			SCN	SGCN
Northern Shrike (*Lanius excubitor)*	eBird	*None*			SCN	SGCN
Steller's Jay (*Cyanocitta stelleri)*	eBird	*None*			SCN	SGCN
Common Raven (*Corvus corax kamtschaticus)*	eBird	*None*			SCN	SGCN
Bank Swallow (*Riparia riparia)*	eBird	*None*			SCN	SGCN
Barn Swallow (*Hirundo rustica)*	eBird	*None*			SCN	SGCN
Black-capped Chickadee (*Poecile atricapillus)*	eBird; Griswold	*None*			SCN	SGCN
Chestnut-backed Chickadee (*Poecile rufescens)*	eBird	*None*			SCN	SGCN
Boreal Chickadee (*Poecile hudsonicus)*	eBird	*None*			SCN	SGCN
Brown Creeper (*Certhia americana alascensis)*	eBird	*None*			SCN	SGCN
Golden-crowned Kinglet (*Regulus satrapa)*	eBird	*None*			SCN	SGCN
Ruby-crowned Kinglet (*Regulus calendula grinnelli)*	eBird	*None*			SCN	SGCN
Varied Thrush (*Ixoreus naevius)*	eBird	*None*			SCN	SGCN
Bohemian Waxwing (*Bombycilla garrulous)*	eBird	*None*			SCN	SGCN
American Pipit (*Anthus rubescens)*	eBird	*None*			SCN	SGCN
Pine Grosbeak (*Pinicola enucleator flammula)*	eBird	*None*			SCN	SGCN
White-winged Crossbill (*Loxia leucoptera)*	eBird	*None*			SCN	SGCN
Common Redpoll (*Acanthis flammea)*	eBird	*None*			SCN	SGCN
Pine Siskin (*Spinus pinus)*	eBird	*None*			SCN	SGCN
Lapland Longspur (*Calcarius lapponicus alascensis)*	eBird	*None*			SCN	SGCN
Smith's Longspur (*Calcarius pictus)*	Griswold	Region 4	Region 7	National	*None*	
Snow Bunting (*Plectrophenax nivalis nivalis)*	eBird	*None*			SCN	SGCN
McKay's Bunting (*Plectrophenax hyperboreus)*	Griswold; ebird	*None*	Region 7	National	SCN	SGCN
Orange-crowned Warbler (*Oreothlypis celata)*	eBird	*None*			SCN	SGCN
Townsend's Warbler (*Setophaga townsendi)*	eBird	*None*			SCN	SGCN
Wilson's Warbler (*Cardellina pusilla pileolata)*	eBird	*None*			SCN	SGCN
American Tree Sparrow (*Spizella arborea)*	eBird	*None*			SCN	*None*
Savannah Sparrow (*Passerculus sandwichensis)*	eBird	*None*			SCN	SGCN
Fox Sparrow (*Passerella iliaca)*	USFWS IPaC; ebird	*None*			SCN	SGCN
Song Sparrow (*Melospiza melodia)*	eBird; Griswold	*None*			SCN	SGCN
Lincoln's Sparrow (*Melospiza lincolnii)*	eBird	*None*			SCN	SGCN
White-crowned Sparrow (*Zonotrichia leucophrys)*	eBird	*None*			SCN	SGCN
Dark-eyed Junco (*Junco hyemalis oreganus)*	eBird	*None*			SCN	SGCN
Rusty Blackbird (*Euphagus carolinus)*	Griswold; ebird	Region 4	Region 7	National	SCN	SGCN

[2]The Peregrine Falcon was delisted from the Endangered Species Act and Migratory Bird Treaty Act.

APPENDIX E

WETLANDS

Seward Airport Improvements Project
(Project No. Z548570000)

Wetlands Delineation and Field Check Update and Report

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2004 Wetlands Delineation

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DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
P.O. BOX 6898
ELMENDORF AFB, ALASKA 99506-0898

REPLY TO ATTENTION OF:

SEP 13 2006

Date: 9,14,06
Proj. #56525

Preliminary Design & Environmental	PAPER	PDF
Section Chief		
Project Manager		X
Env. Coordinator	(1)	
Env. Team Leader		X
Env. Analyst		
Project File	(2)	
Central File	X	

Regulatory Branch
POA-1989-672-9

Mr. Dan Golden
Alaska Department of Transportation and Public Facilities
P.O. Box 196900
Anchorage, Alaska 99519-6900

Dear Mr. Golden:

This is in response to your request that we review the preliminary wetlands delineation prepared for your proposed improvements to the Seward Airport. The wetlands delineation was conducted by ABR, Inc. during the summer of 2004 and is detailed in their "Preliminary Wetlands Assessment for Proposed Seward Airport Improvements Draft Report" dated August 2005. The airport is located within sections 34 and 35, T. 1 N., R. 1 W., Seward Meridian; latitude 60.1309° N., longitude 149.4193° W.; USGS Quad Seward A-7.

Based on our review of the Draft Report, we concur with your preliminary delineation and mapping of the wetlands that occur on the airport property. Therefore, Department of the Army (DA) authorization may be required if you propose to place dredged and/or fill material into waters of the U.S., including wetlands and/or perform work in navigable waters of the U.S.

Section 404 of the Clean Water Act requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including wetlands (33 U.S.C. 1344). The Corps defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Section 10 of the Rivers and Harbors Act of 1899 requires that a DA permit be obtained for structures or work in or affecting navigable waters of the U.S. (33 U.S.C. 403). Section 10 waters are those waters subject to the ebb and flow of the tide shoreward to the mean high water mark, and/or other waters identified by the Alaska District.

Please note that our concurrence applies only to the wetlands delineation portion of the Draft Report. At this time, we have made no determination as to the suitability of the functional assessment portion of the report.

Please be aware that land clearing operations involving vegetation removal in wetlands with mechanized equipment and other soil disturbances are considered placement of fill material under our jurisdiction.

Nothing in this letter excuses you from compliance with other Federal, State, or local statutes, ordinances, or regulations.

You may contact me at (907) 753-2712, toll free from within Alaska at (800) 478-2712, by email at don.p.kuhle@poa02.usace.army.mil, or by mail at the letterhead address, ATTN: CEPOA-CO-R-S, if you have any questions. Additional information about our Regulatory Program is available on our web site at www.poa.usace.army.mil/reg.

Sincerely,

for Gilbert Lenz Phillips

Don P. Kuhle
Project Manager

DRAFT REPORT

PRELIMINARY WETLANDS ASSESSMENT FOR PROPOSED SEWARD AIRPORT IMPROVEMENTS

ERIK R. PULLMAN
AND
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PREPARED FOR

DOWL ENGINEERS
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PRELIMINARY WETLANDS ASSESSMENT FOR PROPOSED SEWARD AIRPORT IMPROVEMENTS

Draft Report

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August 2005


Printed on recycled paper.

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INTRODUCTION

A wetlands delineation and functional assessment for the Seward Airport was requested in support of airport expansion needs. A full survey of the area was completed in 1995 by Shannon & Wilson and ABR, Inc. (Shannon & Wilson 1996). ABR, Inc. was requested by DOWL Engineers to assess the adequacy of existing information and make revisions accordingly. During the 10 years since the previous survey significant changes have been made to the landscape, including urban development and clearing, riparian changes due to at least two floods on the Resurrection River, and tidal changes. A new field survey was conducted and the area was remapped using new photography.

STUDY AREA

The study area consists of the existing runway and areas immediately surrounding the runway, a proposed taxiway, tie-down area, and access road. The Seward Airport is bounded on the east side by Resurrection River, on the north and west by the town of Seward Alaska, on the south by Resurrection Bay.

The Seward Airport is located in south-central Alaska on Resurrection Bay at the western end of Prince William Sound. The climate is considered maritime with high annual precipitation, cool summers, and mild winters. Summer temperatures range from 44°F to 63°F and winter temperatures range from 18°F to 46°F. Mean tidal range is 8.3 feet (Shannon & Wilson 1996). The plant communities in the area include well-developed coastal needleleaf forests, riverine mixed forests, lowland marshes, salt and mud flats, and various shrub communities.

METHODS

WETLANDS MAPPING

Wetland types were classified and mapped using true-color aerial photography flown in September 2004 at a nominal scale of 1:1200. The entire study area was remapped in 2005 with the 1995 mapping layer used as background reference.

Wetlands were delineated based on color photo-signature, plant canopy, terrain breaks, and hydrological indicators, such as drainage patterns and surface water connections. Boundaries were mapped digitally on-screen with *ArcGIS* software, using imagery described above. For each

map polygon a National Wetlands Inventory (NWI) wetland type was determined. Wetland coding followed Cowardin et al. (1979).

Boundary delineation was performed at a scale of 1:2000. Minimum mapping areas were approximately 500 m^2 (0.1 acres) for waterbodies and aquatic habitats with emergent vegetation, and 1000 m^2 (0.2 acres) for other habitats. The map projection used in all mapping and GIS analyses was Alaska State Plane, zone 4, NAD83 (feet).

FIELD SURVEY

Since the field survey conducted by ABR in 1995 significant changes to the landscape have occurred due to land management activities, at least two major floods on the Resurrection River (1995, 1997), and tidal changes. Sections of the project area were resurveyed for wetlands in October 2004. Wetland determinations were completed at 10 sites and vegetation verification was done at 1 site.

Wetland determinations were made using the three-parameter approach described in the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987). Digital photographs also were taken of each site and of soils where applicable (Appendix A). At each determination site, a U.S. Army Corp of Engineers (USACE) routine wetland determination data sheet was completed to document vegetation, soils, and hydrology (Appendix B).

At each of the 10 wetland determination sites, we recorded dominant plant species for each vegetation layer (tree, shrub, or herbaceous) and visually estimated percent live cover for each dominant species. The wetland status of the vegetation at each field site was determined by visually estimating the percent live cover and determining the wetland indicator status of dominant plants. Wetland indicator status of a plant was determined by referring to the *National List of Plant Species that Occur in Wetlands: Alaska (Region A)* (Reed 1988). Taxonomic nomenclature for most plant species followed *Flora of Alaska and Neighboring Territories* (Hultén 1968). For willows, we used *Alaska Trees and Shrubs* (Viereck and Little 1972).

At each wetland determination site, a soil pit at least 18 inches deep was dug to examine soils for hydric soil indicators. Hydric soils typically have low matrix chroma (gley features), mottles (redoximorphic features), or thick organic deposits (histosols). The soil profile was described and key characteristics including color and presence of mottles or oxidized root channels were

recorded. Soil colors were determined using *Munsell Soil Color Charts* (2000), following standard guidelines for wetland determinations (USACE 1987).

Wetland hydrologic indicators also were assessed at each site, including the presence of standing water, soil saturation within 12 inches of the surface, and/or evidence suggesting episodes of past inundation such as watermarks, drift lines, or surficial water-borne sediment deposits on vegetation.

At the vegetation verification site (Appendix B), we visually estimated percent live cover of dominant and associated plant species and assigned a wetland/upland class and a Level IV vegetation class (Viereck et. al. 1992) to the stand. Vegetation verification plots provide additional field data to assist in the wildlife habitat classifications and the photointerpretation of wetlands and vegetation types. At all field survey sites, any evidence of wildlife use (browsed vegetation, scat piles, trails and dens etc.) also was noted.

WETLAND FUNCTIONAL ASSESMENT

The functional importance of wetlands in the study area was evaluated using criteria outlined in the *Literature Review and Evaluation Rationale* of the Wetland Evaluation Technique (Adamus et al. 1991). The field data were recorded on forms adapted from the *Rapid Procedure for Assessing Wetland Functional Capacity* (Magee 1998). This procedure is based on the Hydrogeomorphic (HGM) Classification System (Brinson 1993), but provides a template that allows for a more rapid assessment of the many functions that wetlands (depending on type) can perform. HGM models have not been developed for all of the wetlands found in study area, so we used this modified approach so that all wetlands would be evaluated using the same method. The relative importance of 10 processes or attributes, encompassing hydrological, water quality, ecological, and social functions of wetlands in the project area were qualitatively ranked into categories of low, medium, and high importance. Many of these attributes are not exclusive to wetlands in the area.

Most wetland functional assessment rankings were based on landscape position, wetland size, relative abundance, and current knowledge of the study area. Additional information used in the evaluation included local topography, signs of animal use, and plant community structure. To simplify the number of wetland types evaluated, wetlands that are similar in function and vegetation structure were grouped into broader categories.

HYDROLOGY

Hydrology functions were determined from the topographic relation of the wetland surface to the local water table. For basins, the presence of an inlet or outlet (or both) was determined from aerial photography. Three specific processes were considered.

Ground water discharge—Movement (vertical or lateral) of water from the subsurface to the surface.

Ground water recharge—Downward movement of water from a wetland into the subsurface.

Erosion control and flow regulation—Various mechanisms that slow or impede the movement of water downslope and thus reduce its erosive force and moderate local stream flows.

WATER QUALITY

Water quality functions are wetland processes that can remove sediments, nutrients, and anthropogenic contaminants from the water while contributing important material to the invertebrate food web. Three general processes are considered.

Sediment/toxicant retention—A combination of physical and biological processes that result in the reduction of suspended sediment of water moving across or through a wetland.

Nutrient retention—Biological processes that result in the incorporation of dissolved nutrients (mainly N and P) into plant tissue and organic sediments. Also includes the process of denitrification in wetland soils.

Production export—The movement of relatively large amounts of organic material derived from primary production to adjacent areas. This process can include a wide range of secondary production exports such as insect emergence.

ECOLOGY

Ecological values are based on the relative ability of a wetland to support animal populations and provide local habitat diversity. Three general characteristics of a wetland are considered.

Aquatic habitat—The potential of a wetland to support a viable fish or invertebrate population.

Wildlife habitat—The potential of a wetland to support wetland-dependent birds; other locally abundant animals such as moose will be considered.

Regional ecological diversity—An index to how much a given wetland contributes to the overall landscape diversity of the watershed within which it is located. Wetland types that are regionally rare receive higher scores.

SOCIAL

Social values considered for this analysis include subsistence and recreational uses. These values include the importance of a wetland for hunting and gathering activities (e.g., fishing, waterfowl and mammal hunting, berry picking, and firewood and edible plant gathering), and transportation (boating or winter travel).

RESULTS AND DISCUSSION

WETLANDS

A total of 21 NWI wetland types were identified within the Seward Airport study area. To summarize and discuss the results, these 21 types were aggregated into 12 wetland habitats that shared similar vegetation and wetland functions (Table 1, Figure 1). The 338.7 acre study area is composed of 69.3% wetlands. The most common wetland habitat is Lowland Sedge-Shrub/Land Management Areas (107.6 acres, 31.8%), followed by Coastal Barrens (37.5 acres, 11.1%) and Salt Marsh (28.5 acres, 8.4%). Aside from the Resurrection River (R2UBH) which accounts for 6.3% of the study area, other habitats account for less than 5% each of the total mapped area.

Lowland Sedge-Shrub/Land Management Areas are cleared areas where the former undisturbed habitat has been cleared or filled for the airport. This habitat class is composed of two shrubby NWI wetland types (PSS1/EM1B, PEM1/SS1B) and one emergent vegetation class (PEM1B). Common emergent vegetation consists of invasive graminoid species such as bluejoint (*Calamagrostis canadensis*), polar grass (*Arctagrostis latifolia*), tufted hair grass (*Deschampsia caespitosa*) and glaucous bluegrass (*Poa glauca*). Shrubs are of low height because of repeated cutting and include American green alder (*Alnus crispa*), pacific red elder (*Sambucus racemosa*) and diamond-leaf willow (*Salix pulchra*). Coastal Barrens include sand or gravel beaches (E2US2N), mud tidal flats (E2US3N), subtidal flooded ponds (E1UBL), and salt-killed meadows bordering tidal streams (R1SB7R). These types generally consist of unconsolidated mud, silts, sands, or gravels or occasionally salt-killed emergent vegetation. Salt Marshes occur adjacent to the mud tidal flats, they support emergent vegetation and the hydrologic regime is either regularly

or irregularly flooded (E2EM1N, E2EM1P, respectively) due to tides. No Salt Marsh areas were sampled for dominant vegetation in the 2004 survey but Shannon & Wilson (1996) lists Lyngby's sedge (*Carex lyngbyei*), several flowered sedge (*C. plurifora*) and sea arrow-grass (*Triglochin maritimum*) as dominants in those wetland types. The remainder of the 12 aggregated habitats include 4 unvegetated types (Rivers, Streams, Ponds, and Riverbars) and 5 undisturbed types (Riverine Broadleaf Forest, Riverine Tall Scrub, Tall Shrub Riverbar, Lowland Sedge Meadow, and Lowland Tall Scrub) (Table 1).

Uplands within the study area were divided into Uplands and Pavement/Fill. The Uplands were un-cleared areas of mixed or needleleaf forest where the dominant tree and shrub species are Sitka spruce (*Picea sitchensis*), black cottonwood (*Populus trichocarpa*) and American green alder (*Alnus crispa*). Pavement/Fill uplands are all airport-related developments.

Soils throughout the area have little or no organic matter accumulation at the surface and consist mainly of riverine and marine silts, sands, and gravels. At the time of the 2004 field survey the area had received large amounts of precipitation, which affected the hydrology observations in many cases. Many of the soils pits were either inundated or saturated above 12 inches and they may not display these characteristics throughout the growing season.

WETLAND FUNCTIONAL ASSESSMENT

Wetland habitats within the Seward Airport study area can be split into three major systems, riverine, lowland, and coastal. Most wetland habitats within these systems are commonly found throughout Alaska. However, on a local scale, the Resurrection River system (riverine habitat types) was rated as moderately important ecological diversity because Seward is located in a rugged mountainous area with relatively few well-developed floodplain systems. Although this area is not within a permafrost zone, the cooler climate limits the groundwater recharge and discharge functions except in the riverine system. Riverine wetland habitats were rated high for groundwater discharge due to permeable soils, high flood frequency, and wetland system (riverine). Discharge ratings are low for all wetland habitats in the study area. Functional ratings for erosion control/flow regulation and sediment/toxicant retention are rated as moderate to high in the some of the riverine and lowland wetland habitats. Vegetated types, Riverine Tall Scrub, Riverine Broadleaf Forest, and Riverine Needleleaf Forest, were rated high for erosion control because taller, shrubby or forested types have greater capacity to absorb flood waters and increase

frictional drag. Lowland depression types, such as Ponds and Lowland Sedge Meadow, were rated moderate because they may serve as containment for some flood waters. Moderate values for erosion control were assigned to the forested and shrubby riverine types because of their potential to increase drag and to anchor shorelines. All habitat types within the study area were rated low in the areas of nutrient retention and production export because no highly productive systems occur upstream from the study area (Table 2).

Rivers, Streams, and Coastal Barrens are considered moderate to high value for the aquatic habitat function. The Resurrection River is known to have rearing and spawning habitat for coho and sockeye salmon (*Onchorynchus kisutch* and *O. nerka*). Chum and pink salmon (*O. keta* and *O. gorbuscha*) use two small streams within the airport property (Shannon & Wilson 1996). Because Coastal Barrens encompasses some marine aquatic wetland types it is rated as moderate for anadromous fish habitat. Coastal Barrens and Salt Marsh receive a high wildlife habitat value because of use by shorebirds, waterfowl, and bald eagles (*Haliaeetus leucocephalus*). Moose (*Alces alces*) also use the coastal and lowland areas within the study area. Subsistence and recreation are rated high for the River wetland habitat because of use by boaters and fishermen. Other wetland habitats in the study area receive low functional values due to the proximity to the airport (Table 2).

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Table 1. Acreages and percentages of National Wetland Inventory classes and aggregate wetland habitat types in the Seward Airport proposed development area, Alaska, 2004.

NWI Codes [a]	Wetland Habitat	Acres	% of Study Area
PUBH	Pond	2.7	0.8
R2UBH	River	21.2	6.3
R2UB3H	Stream	0.5	0.2
R2US5A, R2USA	Riverbar	14.3	4.2
PFO1/SS1A	Riverine Broadleaf Forest	11.8	3.5
PSS1/EM1A, PEM1/SS1A, PSS1A	Tall Shrub Riverbar	5.7	1.7
PSS1C	Riverine Tall Scrub	3.0	0.9
E2US2N, E2US3N, R1SB7R, E1UBL	Coastal Barrens	37.5	11.1
E2EM1N, E2EM1P	Salt Marsh	28.5	8.4
PEM1H	Lowland Sedge Meadow	1.5	0.4
PSS1B	Lowland Tall Scrub	0.5	0.1
PEM1/SS1B, PEM1B, PSS1/EM1B	Lowland Sedge-Shrub/Land Management Areas	107.6	31.8
Total Wetlands		**234.8**	**69.3**
U	Uplands	27.7	8.2
U (URBAN)	Pavement/Fill	76.2	22.5
Total		**338.7**	**100.0**

[a] NWI = National Wetland Inventory.

Table 2. Ranking of functions and values of wetland types in the Seward airport proposed development area, Alaska, 2004.

	Wetland Habitat Type											
	Pond	River	Stream	Riverbar	Riverine Broadleaf Forest	Tall Shrub Riverbar	Riverine Tall Scrub	Coastal Barrens	Salt Marsh	Lowland Sedge Meadow	Lowland Tall Scrub	Lowland Sedge-Shrub/Land Management Areas
	Wetland Type											
	PUBH	R2UBH	R2UB3H	R2US5A, R2USA	PFO1/SS1A	PEM1/SS1A, PSS1/EM1A, PSS1A	PSS1C	E1UBL, E2US2N, E2US3N, R1SB7R	E2EM1N, E2EM1P	PEM1H	PSS1B	PEM1/SS1B, PSS1/EM1B, PEM1B,
Functions and Values												
Groundwater Discharge	Low	High	High	High	High	High	High	Low	Low	Low	Low	Low
Groundwater Recharge	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Erosion Control/Flow Regulation	Moderate	Low	Low	Low	High	High	High	Low	Low	Moderate	Low	Low
Sediment/Toxicant Retention	Low	Low	Low	Moderate	Moderate	Moderate	Moderate	Low	Low	Low	Low	Low
Nutrient Retention	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Production Export	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Aquatic Habitat	Low	High	High	Low	Low	Low	Low	Moderate	Low	Low	Low	Low
Wildlife Habitat	Low	Low	Low	High	High	Low	Low	High	High	Moderate	Moderate	Low
Regional Ecological Diversity	Low	Moderate	Low	Moderate	Moderate	Moderate	Low	Low	Low	Low	Low	Low
Subsistence/Recreation Use	Low	High	Moderate	Low	Low	Low	Low	Low	Low	Low	Low	Low

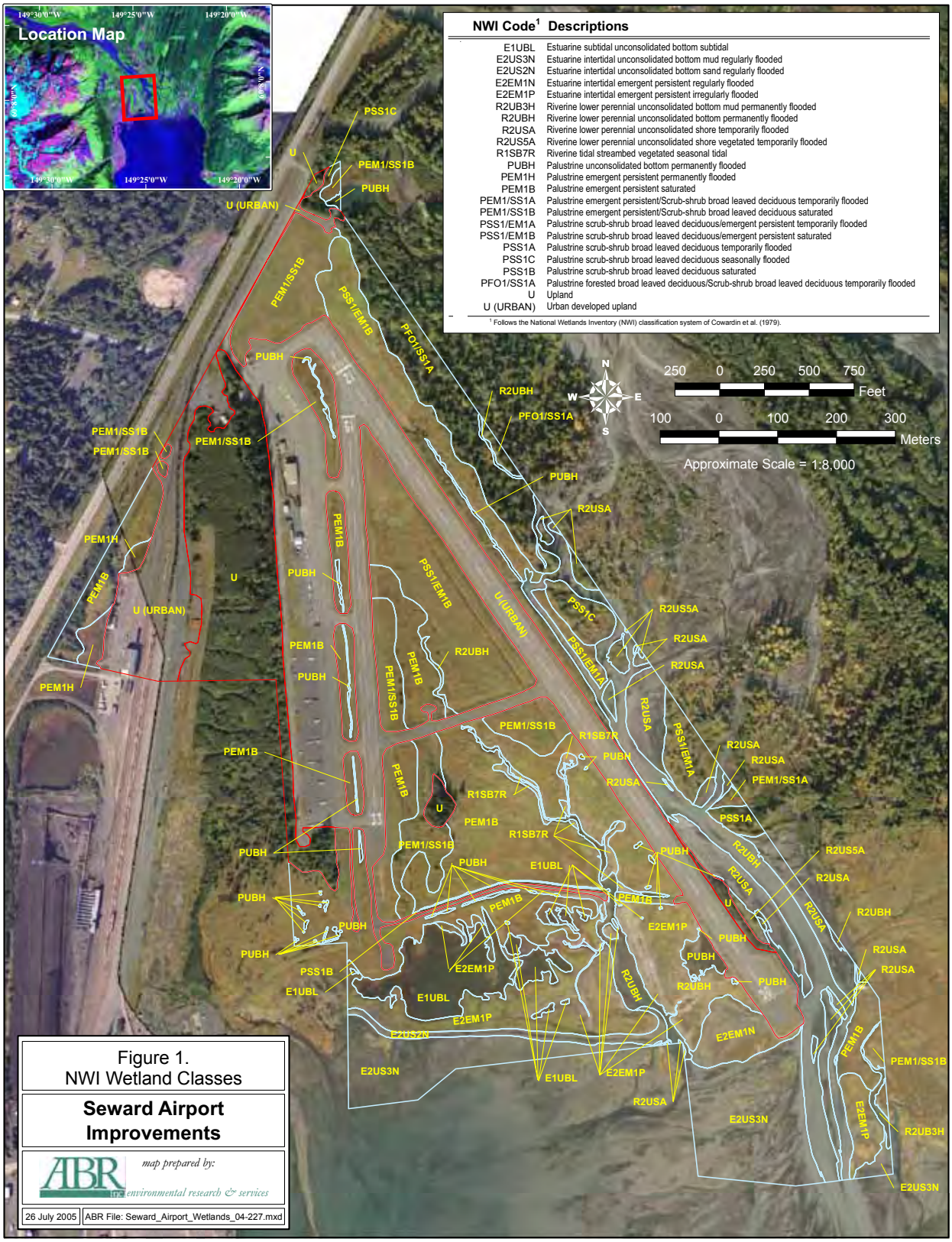

Figure 1. NWI wetland classes.

APPENDIX A: PHOTOGRAPHIC LOG OF FIELD SURVEY SITES.

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SW01: Lowland Sedge Meadow
NWI Class: PEM1H

Hydrology: Innundated
Soils: No soil photo available

SW02: Lowland Sedge Shrub/Land Management
NWI Class: PEM1B

Hydrology: Saturated
Soils: No soil photo available

SW03: Open Broadleaf Forest
NWI Class: Upland

Hydrology: Saturated
Soils: Silt and gravel

SW04: Open Needleleaf Forest
NWI Class: Upland

Hydrology: Saturated
Soils: Silt and Sand.

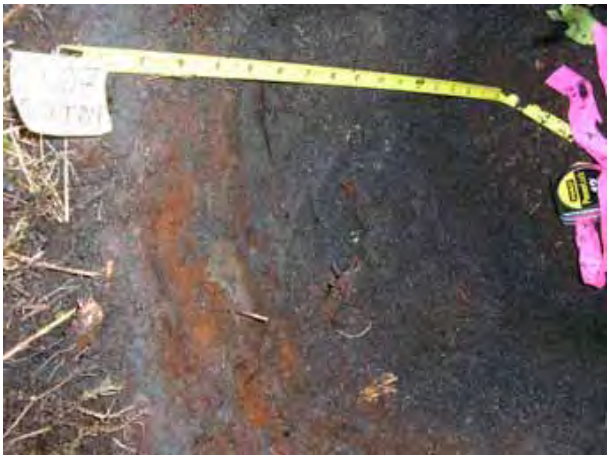
SW05: Lowland Sedge Shrub/Land Management
NWI Class: PEM1B

Hydrology: Saturated
Soils: Silt loam.

SW06: Lowland Sedge Shrub/Land Management
NWI Class: PEM1/SS1B

Hydrology: Saturated
Soils: Gravelly sandy loam

SW07: Open Needleleaf Forest
NWI Class: Upland



Hydrology: Saturated
Soils: Silt and Sand

SW08: Tall Closed Alder Shrub
NWI Class: Upland

Hydrology: Saturated
Soils: Unconsolidated Sand

SW09: Lowland Sedge Shrub/Land Managment
NWI Class: PSS1/EM1B

Hydrology: Saturated
Soils: Silt with gravel

SW10: Lowland Sedge Shrub/Land Management
NWI Class: PEM1/SS1B

Hydrology: Saturated
Soils: Loam with 20% rocks

SV01: Subarctic Lowland Bog
NWI Class: PEM1/SS1H

Hydrology: Innundated
Soils: No soil photo available

APPENDIX B: WETLAND DETERMINATION AND VEGETATION VERIFICATION FIELD DATA FORMS.

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SW01

DATA FORM
ROUTINE WETLAND DETERMINATION
(Adapted from 1987 COE Wetlands Delineation Manual form)

Project/Site: ~~SWE~~ Seward Airport	Date: 5 OCT 09
Applicant/Owner: ADOT	County:
Investigator: ABR, Inc. CBH	State: AK

Do Normal Circumstances exist on the site?	(Yes)	No	NWI Class: PEM1H
Is the site significantly disturbed (Atypical Situation)?	Yes	(No)	Photo No: York 10:24
Is the area a potential Problem Area? (If needed, explain on reverse.)	Yes	(No)	Plot ID: SW01

VEGETATION

Dominant Plant Species (%Cover)	Stratum	Indicator	Associated Plant Species	Stratum	Indicator
1. EQUPLU 30	H	OBL	09. CALCAN 5	H	FAC
2. CARAQU 25	H	OBL	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of dominant Species that OBL, FACW or FAC (excluding FAC). 100%

Level IV Veg Class:

HYDROLOGY

___Recorded Data (Describe in Remarks):
- _____Stream, Lake , or Tide Gauge
- _____Aerial Photographs
- _____Other

___No Recorded Data Available

Field Observations:
- Depth of Surface Water: 12-30 (in)
- Depth of Free Water in Pit: n/a (in)
- Depth to Saturated Soil/~~Permafrost~~: inundated (in)
- Depth to seasonal frost: unknown (in)

Wetland Hydrology Indicators:

Primary Indicators:
- ✓Inundated
- ___Saturated in Upper 12 inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- ___Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 inches
- ___Water-Stained Leaves
- ___Local Soil survey data
- ___FAC Neutral Test
- ___Other (Explain in Remarks)

Remarks:

60.12996
149.42853
WGS 84

No soil pit required.

SW02

DATA FORM
ROUTINE WETLAND DETERMINATION
(Adapted from 1987 COE Wetlands Delineation Manual form)

Project/Site: Seward Airport			Date: 5 OCT 04
Applicant/Owner: ADOT			County:
Investigator: ABR, Inc. CSH			State: AK
Do Normal Circumstances exist on the site?	(Yes)	No	NWI Class: PEMIB/E
Is the site significantly disturbed (Atypical Situation)?	Yes	(No)	Photo No: York 10:37
Is the area a potential Problem Area? (If needed, explain on reverse.)	Yes	(No)	Plot ID: SW02

VEGETATION

Dominant Plant Species (%Cover)	Stratum	Indicator	Associated Plant Species	Stratum	Indicator
1. CALCAN 40	H	FAC	09. ANGLUC 4	H	
2.			10. EQUFLU 5	H	
3.			11. EQUARV 5	H	
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of dominant Species that OBL, FACW or FAC (excluding FAC). _____

Level IV Veg Class: Hgmbh

HYDROLOGY

___Recorded Data (Describe in Remarks):
- _____Stream, Lake , or Tide Gauge
- _____Aerial Photographs
- _____Other

___No Recorded Data Available

Field Observations:
- Depth of Surface Water: 0-15 (in)
- Depth of Free Water in Pit: n/a (in)
- Depth to Saturated Soil/~~Permafrost~~: surface (in)
- Depth to seasonal frost: unknown (in)

Wetland Hydrology Indicators:

Primary Indicators:
- (✓) Inundated
- ✓ Saturated in Upper 12 inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- ___Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 inches
- ___Water-Stained Leaves
- ___Local Soil survey data
- ___FAC Neutral Test
- ___Other (Explain in Remarks)

Remarks:
Standing water may be partially due to recent heavy rains and lack of transpiration. Area is low-lying between road and developed railyard.

60.13108
149.42798 WGS 84

SW03

DATA FORM
ROUTINE WETLAND DETERMINATION
(Adapted from 1987 COE Wetlands Delineation Manual form)

Project/Site: Seward Airport	Date: 5 OCT 04
Applicant/Owner: ADOT	County:
Investigator: ABR, Inc. CBH	State: AK
Do Normal Circumstances exist on the site? (Yes) No	NWI Class: U
Is the site significantly disturbed (Atypical Situation)? Yes (No)	Photo No: York 11 44
Is the area a potential Problem Area? Yes (No)	Plot ID: SW03
(If needed, explain on reverse.)	

VEGETATION

Dominant Plant Species (%Cover)		Stratum	Indicator
1. PICSIT	15	T	FACU
2. POPTRI	10	T	FACU
3. =ALNCRI	20	S	FAC
4. ECHHOR	15	S	FACW
5.			
6.			
7. ATHFIL	15	H	FAC
8.			

odoparax horridus

Associated Plant Species		Stratum	Indicator
09. ARUSYL	<1	H	
10. EQUPRA	1	H	
11. ANGLUC	<1	H	
12. SAMRAC	2	S	
13. SALALA	3	S	
14. ~~POPTRE~~	~~10~~		
15. VIBEDU	10		
16. CALCAN	5		
EPIANG	5		

Percent of dominant Species that OBL, FACW or FAC (excluding FAC). 2/5 = 40% (0)

Level IV Veg Class: Fmosb

TOTAL T 25
S 45
H 27

HYDROLOGY

___Recorded Data (Describe in Remarks):
- _____Stream, Lake , or Tide Gauge
- _____Aerial Photographs
- _____Other

___No Recorded Data Available

Field Observations:

Depth of Surface Water:	none	(in)
Depth of Free Water in Pit:	10.5	(in)
Depth to Saturated Soil/Permafrost:	4	(in)+
Depth to seasonal frost	>14	(in)

Wetland Hydrology Indicators:
Primary Indicators:
- ___Inundated
- ✓Saturated in Upper 12 inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- ___Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 inches
- ___Water-Stained Leaves
- ___Local Soil survey data
- ___FAC Neutral Test
- ___Other (Explain in Remarks)

Remarks:
Recent heavy rains affecting hydrology indicators.

SW03

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Taxonomy (Subgroup): _____ Field Observations
Confirm mapped Group? Yes No

Profile Description:

Depth (in)	Horizon	Matrix Color (Munsoil Moist)	Mottle Colors (Munsoil Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-.5	Oi				
.5-4		2.5Y 3/1	10YR 3/1	C/F	Si
4-8	C1	2.5Y 4/2			very gravelly Si
8-13	C2	n/a	n/a		gravels

Hydric Soil Indicators

- ____ Histosol
- ____ Histic Epipedon
- ____ Sulfidic Odor
- ____ Aquic Moisture Regime
- ____ Reducing Conditions
- ____ Gleyed or Low-Chroma Colors*
- ____ Concretions
- ____ High Organic Content in Surface Layer in Sandy soils
- ____ Organic Streaking in Sandy Soils
- ____ Listed on Local Hydric Soils List
- ____ Listed on National Hydric Soils List
- ____ Other (Explain in Remarks)

*(Chroma ≤ 2 with mottles, ≤1 without mottles)

Remarks:
Marginal 3.5 inches with chroma ≤ 1 w/ mottles

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	(No)	Is this Sampling Point within a Wetland? Yes (No)
Wetland Hydrology Present?	(Yes)	No	
Hydric Soils Present?	Yes	(No)	

Remarks:

GEOGRAPHIC INFORMATION

GPS Location: 60.13344 149.42358 WGS 84 (circle one) NAD83 NAD27

Air Photo ID: _____ Location is approximate but still in type.

Cow moose w/ 2 calves made appearance, quite close.

SW04

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm mapped Group? Yes No

Profile Description:

Depth (in)	Horizon	Matrix Color (Munsoil Moist)	Mottle Colors (Munsoil Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-3	Oi				
3-14		5Y3/1	10YR4/3	C/D	Si with Sa inclusions
14-18	C	5Y2.5/1			sand

Hydric Soil Indicators

- ____ Histosol
- ____ Histic Epipedon
- ____ Sulfidic Odor
- ____ Aquic Moisture Regime
- ✓ Reducing Conditions
- ____ Gleyed or Low-Chroma Colors*
- ____ Concretions
- ____ High Organic Content in Surface Layer in Sandy soils
- ____ Organic Streaking in Sandy Soils
- ____ Listed on Local Hydric Soils List
- ____ Listed on National Hydric Soils List
- ____ Other (Explain in Remarks)

*(Chroma ≤ 2 with mottles, ≤1 without mottles)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

Is this Sampling Point within a Wetland? Yes (No)

Remarks:

GEOGRAPHIC INFORMATION

GPS Location: 60.12680 149.42218 WGS 84 (circle one) NAD83 NAD27

Air Photo ID: _____

SW04

DATA FORM
ROUTINE WETLAND DETERMINATION
(Adapted from 1987 COE Wetlands Delineation Manual form)

Project/Site: Seward Airport	Date: 5 Oct 04
Applicant/Owner: ADOT	County:
Investigator: ABR, Inc. CBH	State: AK

Do Normal Circumstances exist on the site?	(Yes)	No	NWI Class: U
Is the site significantly disturbed (Atypical Situation)?	Yes	(No)	Photo No: York 12:37, 12:39
Is the area a potential Problem Area? (If needed, explain on reverse.)	Yes	(No)	Plot ID: SW04

VEGETATION

Dominant Plant Species (%Cover)	Stratum	Indicator	Associated Plant Species	Stratum	Indicator
1. DICSIT 40	T	FACW	09.		
2. ALNCRI 40	S	FAC	10.		
3. = EQUPRA 2	H	(FACW)	11.		
4. CALCAN 1	H	(FAC)	12.		
5. ANGLUC 2	H	(FACW)	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of dominant Species that OBL, FACW or FAC (excluding FAC). 1/2 = 50% (0)

Level IV Veg Class: FMOSW

TOTAL T 40
S 40
*(H 5)
→ total <10%; not considered dominant stratum

HYDROLOGY

___Recorded Data (Describe in Remarks):
- _____Stream, Lake , or Tide Gauge
- _____Aerial Photographs
- _____Other

___No Recorded Data Available

Field Observations:

Depth of Surface Water:	none (in)
Depth of Free Water in Pit:	11 (in)
Depth to Saturated Soil/Permafrost:	5 (in)
Depth to seasonal frost	>18 (in)

Wetland Hydrology Indicators:

Primary Indicators:
- ___Inundated
- ✓Saturated in Upper 12 inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- ___Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 inches
- ___Water-Stained Leaves
- ___Local Soil survey data
- ___FAC Neutral Test
- ___Other (Explain in Remarks)

Remarks:

SW05

DATA FORM
ROUTINE WETLAND DETERMINATION
(Adapted from 1987 COE Wetlands Delineation Manual form)

Project/Site: Seward Airport			Date: 5 OCT 04
Applicant/Owner: ADOT			County:
Investigator: ABR, Inc. CBH			State: AK
Do Normal Circumstances exist on the site?	(Yes)	No	NWI Class: PEMIB
Is the site significantly disturbed (Atypical Situation)?	Yes	(No)	Photo No: York 13:28, 13:29
Is the area a potential Problem Area? (If needed, explain on reverse.)	Yes	(No)	Plot ID: SW05

VEGETATION

Dominant Plant Species (%Cover)	Stratum	Indicator	Associated Plant Species	Stratum	Indicator
1. CALCAN 25	H	FAC	09. ACHMIL <1	H	FACU
2.			10. RUMARC <1	H	FACW
3. CARLEN 15	H	OBL	11. ARCLAT 10	H	FACW
4.			12. EQUPRA 10	H	FACW
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of dominant Species that OBL, FACW or FAC (excluding FAC). 2/2 = 100 (50%)

Level IV Veg Class: HgmSg TOTAL H 61

Few small patches of ALNCRI

HYDROLOGY

___Recorded Data (Describe in Remarks):
- _____Stream, Lake , or Tide Gauge
- _____Aerial Photographs
- _____Other

___No Recorded Data Available

Field Observations:
- Depth of Surface Water: 0-5 (in)
- Depth of Free Water in Pit: 9 (in)
- Depth to Saturated Soil/Permafrost: Surface (in)
- Depth to seasonal frost >18 (in)

Wetland Hydrology Indicators:

Primary Indicators:
- ___Inundated
- ✓Saturated in Upper 12 inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- ___Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 inches
- ___Water-Stained Leaves
- ___Local Soil survey data
- ___FAC Neutral Test
- ___Other (Explain in Remarks)

Remarks:

SW05

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations
Taxonomy (Subgroup): _____ Confirm mapped Group? Yes No

Profile Description:

Depth (in)	Horizon	Matrix Color (Munsoil Moist)	Mottle Colors (Munsoil Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-1	Oi				
1-18	C	2.5Y3/1	10YR3/3	C/D	SiL

Hydric Soil Indicators

- ____ Histosol
- ____ Histic Epipedon
- ____ Sulfidic Odor
- ____ Aquic Moisture Regime
- ____ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors*
- ____ Concretions
- ____ High Organic Content in Surface Layer in Sandy soils
- ____ Organic Streaking in Sandy Soils
- ____ Listed on Local Hydric Soils List
- ____ Listed on National Hydric Soils List
- ____ Other (Explain in Remarks)

*(Chroma ≤ 2 with mottles, ≤1 without mottles)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes)	No	Is this Sampling Point within a Wetland? (Yes) No
Wetland Hydrology Present?	(Yes)	No	
Hydric Soils Present?	(Yes)	No	

Remarks:

GEOGRAPHIC INFORMATION

GPS Location: 60.12775 149.41913 (circle one) WGS 84 NAD83 NAD27

Air Photo ID: _____

SW06

DATA FORM
ROUTINE WETLAND DETERMINATION
(Adapted from 1987 COE Wetlands Delineation Manual form)

Project/Site: Seward Airport
Applicant/Owner: ADOT
Investigator: ABR, Inc. CRH

Date: 5 Oct 04
County:
State: AK

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? Yes (No)
(If needed, explain on reverse.)

NWI Class: PEMI/SS1B
Photo No: York 13:57 (3 photos)
Plot ID: SW06

VEGETATION

Dominant Plant Species (%Cover)	Stratum	Indicator
1. CALCAN 8	H	FAC
2. ARCLAT 15	H	FACW
3. ANGLUC 17	H	FACW
4. ALCRI 5	S	FAC
5. SAMRAC 8	S	FACW
6.		
7.		
8.		

Associated Plant Species		Stratum	Indicator
09. RUMARC	1	H	
10. ARTTIL	<1	H	
11. PLA	1	H	
12. GEU	<1	H	
13. ACHMIL	<1	H	
14. ~~ERIANG~~	1	H	
15.			
16. /			

Percent of dominant Species that OBL, FACW or FAC (excluding FAC). 3/5 = 60% (20%)

TOTAL H45 S13

Level IV Veg Class: Hgmgh

(5 FACs SAMRAC HgmB2) sides slopes
TOP
Wet meadow
upland runway

plantago

HYDROLOGY

___Recorded Data (Describe in Remarks):
_____Stream, Lake , or Tide Gauge
_____Aerial Photographs
_____Other
___No Recorded Data Available

Field Observations:
Depth of Surface Water: none (in)
Depth of Free Water in Pit: none (in)
Depth to Saturated Soil/Permafrost: 8 (in) *
Depth to seasonal frost >18 (in)

Wetland Hydrology Indicators:
Primary Indicators:
___Inundated
__✓Saturated in Upper 12 inches
___Water Marks
___Drift Lines
___Sediment Deposits
___Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
___Oxidized Root Channels in Upper 12 inches
___Water-Stained Leaves
___Local Soil survey data
___FAC Neutral Test
___Other (Explain in Remarks)

Remarks:
* may be abnormally shallow due to recent heavy rains

SW06

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Taxonomy (Subgroup): _____ Field Observations
Confirm mapped Group? Yes No

Profile Description:

Depth (in)	Horizon	Matrix Color (Munsoil Moist)	Mottle Colors (Munsoil Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-9		5Y 2.5/1	10YR 3/3	C/D	Sal
9-18		"	1	M/D	gravelly Sal

Hydric Soil Indicators

- ____ Histosol
- ____ Histic Epipedon
- ____ Sulfidic Odor
- ____ Aquic Moisture Regime
- ____ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors*
- ____ Concretions
- ____ High Organic Content in Surface Layer in Sandy soils
- ____ Organic Streaking in Sandy Soils
- ____ Listed on Local Hydric Soils List
- ____ Listed on National Hydric Soils List
- ____ Other (Explain in Remarks)

*(Chroma ≤ 2 with mottles, ≤1 without mottles)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes)	No	Is this Sampling Point within a Wetland? Yes No
Wetland Hydrology Present?	(Yes)	No	
Hydric Soils Present?	(Yes)	No	

Remarks:

GEOGRAPHIC INFORMATION

GPS Location: 60.12803 149.41859 WGS 84 (circle one) NAD83 NAD27

Air Photo ID: _____

SW07

DATA FORM
ROUTINE WETLAND DETERMINATION
(Adapted from 1987 COE Wetlands Delineation Manual form)

Project/Site: Seward Airport Applicant/Owner: ADOT Investigator: ABR, Inc. CBH	Date: 5 OCT 04 County: State: AK
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation)? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	NWI Class: U Photo No: York 11:33, 11:34 Plot ID: SW07

VEGETATION

Dominant Plant Species (%Cover)	Stratum	Indicator	Associated Plant Species	Stratum	Indicator
1. PICSIT 70	T	FACW	09. ACHMIL <1	H	FACW
2. ALNCRI 10	S	FAC	10. GYMDRY 1	H	
3. ANGLUC 10	H	FACW	11. IRISET tr	H	FAC
4. EQUARV 10	H	FACW	12. CALCAN 5	H	FAC
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of dominant Species that OBL, FACW or FAC (excluding FAC). 1/4 = 25% (0)

Level IV Veg Class: FNCSS

TOTAL T 70
S 10
H 26

HYDROLOGY

___Recorded Data (Describe in Remarks):
- _____Stream, Lake , or Tide Gauge
- _____Aerial Photographs
- _____Other

___No Recorded Data Available

Field Observations:
- Depth of Surface Water: none (in)
- Depth of Free Water in Pit: none (in)
- Depth to Saturated Soil/Permafrost: 3 (in)*
- Depth to seasonal frost >19 (in)

Wetland Hydrology Indicators:
Primary Indicators:
- ___Inundated
- (✓Saturated in Upper 12 inches)
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- ___Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 inches
- ___Water-Stained Leaves
- ___Local Soil survey data
- ___FAC Neutral Test
- ___Other (Explain in Remarks)

Remarks:
Recent heavy rains; Not sure would normally be saturated in upper 12.

SW07

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Taxonomy (Subgroup): _____ Field Observations
Confirm mapped Group? Yes No

Profile Description:

Depth (in)	Horizon	Matrix Color (Munsoil Moist)	Mottle Colors (Munsoil Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-2	O1				
2-6		10YR2/1	5YR3/4	M/P	SiL and SaL, distinct, mixed
6-19		n/a - Sand			coarse block sand & gravel-stones, uncon-solidated

Hydric Soil Indicators

- ____ Histosol
- ____ Histic Epipedon
- ____ Sulfidic Odor
- ____ Aquic Moisture Regime
- ____ Reducing Conditions
- (✓) Gleyed or Low-Chroma Colors*)
- ____ Concretions
- ____ High Organic Content in Surface Layer in Sandy soils
- ____ Organic Streaking in Sandy Soils
- ____ Listed on Local Hydric Soils List
- ____ Listed on National Hydric Soils List
- ____ Other (Explain in Remarks)

*(Chroma ≤ 2 with mottles, ≤1 without mottles)

Remarks:
2-6 Horizon mixed, large bright matrix areas. Pockets of SiL and SaL, about even proportions. marginal - only 4 inches meet low chroma requirement

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	(No)	Is this Sampling Point within a Wetland? Yes (No)
Wetland Hydrology Present?	(Yes)	No	
Hydric Soils Present?	(Yes)	No	

Remarks:

GEOGRAPHIC INFORMATION

GPS Location: 60, 12797 149.41823 (circle one) ~~NAD83~~ ~~NAD27~~ WGS 84

Air Photo ID: _____

SW08

DATA FORM
ROUTINE WETLAND DETERMINATION
(Adapted from 1987 COE Wetlands Delineation Manual form)

Project/Site: Seward Airport	Date: 5 Oct 04
Applicant/Owner: ADOT	County:
Investigator: ABR, Inc. CBH	State: AK
Do Normal Circumstances exist on the site? (Yes) No	NWI Class: L1
Is the site significantly disturbed (Atypical Situation)? Yes (No)	Photo No: York 15:24
Is the area a potential Problem Area? Yes (No)	Plot ID: N SW08
(If needed, explain on reverse.)	

VEGETATION

Dominant Plant Species (%Cover)	Stratum	Indicator	Associated Plant Species	Stratum	Indicator
1. ALNCRI 65	S	FAC	09. ANGELIC <1	H	FACW
2. PICSIT 7	S		10. VIBEDU 3	S	
3. = SAMEAC 35	S	FACW	11.		
4. CALCAN 2	H	FAC	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of dominant Species that OBL, FACW or FAC (excluding FAC). 1/2 = 50% (D)

Level IV Veg Class: StCa

TOTAL S 103
H (H 3)

HYDROLOGY

___Recorded Data (Describe in Remarks):
- _____Stream, Lake , or Tide Gauge
- _____Aerial Photographs
- _____Other

___No Recorded Data Available

Field Observations:
- Depth of Surface Water: none (in)
- Depth of Free Water in Pit: none (in)
- Depth to Saturated Soil/Permafrost: (6) (in)*
- Depth to seasonal frost _____(in)

Wetland Hydrology Indicators:
Primary Indicators:
- ___Inundated
- (✓Saturated in Upper 12 inches)*
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- ___Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 inches
- ___Water-Stained Leaves
- ___Local Soil survey data
- ___FAC Neutral Test
- ___Other (Explain in Remarks)

Remarks:
Believe saturation due to recent heavy rains

SW08

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations
Taxonomy (Subgroup): _____ Confirm mapped Group? Yes No

Profile Description:

Depth (in)	Horizon	Matrix Color (Munsoil Moist)	Mottle Colors (Munsoil Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-1	O1				
1-8		5Y2.5/1	10YR3/3	C/D	
8-17		n/a			unconsolidated sand & coarse frags (river-rounded stones)

Hydric Soil Indicators

_____ Histosol
_____ Histic Epipedon
_____ Sulfidic Odor
_____ Aquic Moisture Regime
_____ Reducing Conditions
_____ Gleyed or Low-Chroma Colors*
_____ Concretions
_____ High Organic Content in Surface Layer in Sandy soils
_____ Organic Streaking in Sandy Soils
_____ Listed on Local Hydric Soils List
_____ Listed on National Hydric Soils List
_____ Other (Explain in Remarks)

*(Chroma ≤ 2 with mottles, ≤1 without mottles)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	(No)	Is this Sampling Point within a Wetland? Yes (No)
Wetland Hydrology Present?	(Yes)	No	
Hydric Soils Present?	(Yes)	No	

Remarks:

GEOGRAPHIC INFORMATION

GPS Location: 60.13316 149.42447 WGS84 (circle one) NAD83 NAD27

Air Photo ID: _____

SW09

DATA FORM
ROUTINE WETLAND DETERMINATION
(Adapted from 1987 COE Wetlands Delineation Manual form)

Project/Site: Seward Airport Applicant/Owner: Investigator: ABR, Inc.	Date: 5 Oct 04 County: State: AK
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation)? (Yes) No Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	NWI Class: PSS/EM1B Photo No: York 16:06, 16:07 Plot ID: SW09

VEGETATION

Dominant Plant Species (%Cover)	Stratum	Indicator	Associated Plant Species	Stratum	Indicator
1. ALNCRI 25	H	FAC	09. ANGARC TT	H	
2. DESCAE 20		FAC	10. SALPUL 10		FACW
3. =POAGLA 15		NI	11. SALALA 10		FAC
4.			12. EQUPRA 8		FACW
5. [illegible] 10			13. ACHMIL 5		FACU
6.			14.		
7.			15.		
8.			16.		

Percent of dominant Species that OBL, FACW or FAC (excluding FAC). 2/3 = 66% (0)

Level IV Veg Class: S1oaw

Site has been cleared and perhaps seeded w/ grasses. Thick D. caespitosa, Rglauca.

HYDROLOGY

___Recorded Data (Describe in Remarks):
- _____Stream, Lake , or Tide Gauge
- _____Aerial Photographs
- _____Other

___No Recorded Data Available

Field Observations:
- Depth of Surface Water: none (in)
- Depth of Free Water in Pit: 10 (in)
- Depth to Saturated Soil/Permafrost: Surface (in)
- Depth to seasonal frost >16 (in)

Wetland Hydrology Indicators:

Primary Indicators:
- ___Inundated
- ✓Saturated in Upper 12 inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- ___Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 inches
- ___Water-Stained Leaves
- ___Local Soil survey data
- ___FAC Neutral Test
- ___Other (Explain in Remarks)

Remarks:

SW09

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Taxonomy (Subgroup): _____ Field Observations
Confirm mapped Group? Yes No

Profile Description:

Depth (in)	Horizon	Matrix Color (Munsoil Moist)	Mottle Colors (Munsoil Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-0.5	O				
0.5-16		5Y4/1	10YR4/4	C/D	Si 25% gravel-stone

Hydric Soil Indicators

- ____ Histosol
- ____ Histic Epipedon
- ____ Sulfidic Odor
- ____ Aquic Moisture Regime
- ____ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors*
- ____ Concretions
- ____ High Organic Content in Surface Layer in Sandy soils
- ____ Organic Streaking in Sandy Soils
- ____ Listed on Local Hydric Soils List
- ____ Listed on National Hydric Soils List
- ____ Other (Explain in Remarks)

*(Chroma ≤ 2 with mottles, ≤1 without mottles)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes)	No	Is this Sampling Point within a Wetland? (Yes) No
Wetland Hydrology Present?	(Yes)	No	
Hydric Soils Present?	(Yes)	No	

Remarks:
Safety area adjacent runway, regularly cleared.

GEOGRAPHIC INFORMATION

GPS Location: 60.13505 149.42084 WGS 84 (circle one) NAD83 NAD27

Air Photo ID: _____

SW10

DATA FORM
ROUTINE WETLAND DETERMINATION
(Adapted from 1987 COE Wetlands Delineation Manual form)

Project/Site: Seward Airport Applicant/Owner: ADOT Investigator: ABR, Inc. CBH	Date: 5 OCT 04 County: _____ State: AK
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation)? (Yes) No Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	NWI Class: PEMI/SSIB Photo No: York 16:34 Plot ID: SW10

VEGETATION

Dominant Plant Species (%Cover)	Stratum	Indicator	Associated Plant Species	Stratum	Indicator
1. grass3 POAALP ~~30~~ 25	H	FACW	09. grass4 (HORBRA) 5	H	FACW
2. ~~ECHPAR~~ 10			10.		
3. ACHMIL 15		FACW	11. CEUMAC 10	H	FACW
4. ~~ICISET~~ 5			12. ICISET 5		FAC
5. ~~LUPNOO~~ <1			13. LUPNOO <1		FAC
6. SALPUL 15		FACW	14. PLAMAJ 7		FAC
7. ~~PLAMAJ~~ 7 10			15.		
8.			16.		

Percent of dominant Species that OBL, FACW or FAC (excluding FAC). 1/3 = 33% (33%)

Level IV Veg Class: Hgmgh TOTAL H 77

*End of runways - cleared area. Obvious areas of PSSIB remain. Weedy invasives dominate herbaceous.

~~H~~ Grass 3 collected; keyed to Poa alpigena (Hulten) Grass 4 collected; Hordeum brachyantherum (Hulten)

HYDROLOGY

___Recorded Data (Describe in Remarks):
- _____Stream, Lake , or Tide Gauge
- _____Aerial Photographs
- _____Other

___No Recorded Data Available

Field Observations:
- Depth of Surface Water: none (in)
- Depth of Free Water in Pit: ~~none~~ 8 (in)
- Depth to Saturated Soil/Permafrost: 6 (in)
- Depth to seasonal frost > 18 (in)

Wetland Hydrology Indicators:

Primary Indicators:
- ___Inundated
- ✓Saturated in Upper 12 inches
- ___Water Marks
- ___Drift Lines
- ___Sediment Deposits
- ___Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___Oxidized Root Channels in Upper 12 inches
- ___Water-Stained Leaves
- ___Local Soil survey data
- ___FAC Neutral Test
- ___Other (Explain in Remarks)

Remarks:

SW10

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm mapped Group? Yes No

Profile Description:

Depth (in)	Horizon	Matrix Color (Munsoil Moist)	Mottle Colors (Munsoil Moist)	Mottle Abundance/Contrast	Texture, Concretions Structure, etc.
0-0.5	O1				
0.5-15		5Y2.5/1	2.5YR2.5/4 and 10YR3/3	C/P	20% rocks; L

Hydric Soil Indicators

- ____ Histosol
- ____ Histic Epipedon
- ____ Sulfidic Odor
- ____ Aquic Moisture Regime
- ____ Reducing Conditions
- ✓ Gleyed or Low-Chroma Colors*
- ____ Concretions
- ____ High Organic Content in Surface Layer in Sandy soils
- ____ Organic Streaking in Sandy Soils
- ____ Listed on Local Hydric Soils List
- ____ Listed on National Hydric Soils List
- ____ Other (Explain in Remarks)

*(Chroma ≤ 2 with mottles, ≤1 without mottles)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	(No)	Is this Sampling Point within a Wetland? Yes No
Wetland Hydrology Present?	(Yes)	No	
Hydric Soils Present?	(Yes)	No	

Remarks:

End of runway in cleared area. Pockets of standing water w/ Salix planifolia and Carex spp mixed with grass-herb areas. Many weedy species.

GEOGRAPHIC INFORMATION

GPS Location: 60.13548 149.42242 (WGS 84) (circle one) NAD83 NAD27

Air Photo ID: _____

VEGETATION VERIFICATION FORM

(Rapid Vegetation and Hydrology assessment for photointerpretation)

Project/Site:	Seward Airport	Date:	5 Oct 04
Applicant/Owner:	ADOT	County:	
Investigator:	ARR Inc. CBH	State:	Alaska
Do normal circumstances exist on the site?	N	NWI Class:	PEM1/SS1H
Is the site significantly disturbed (Atypical situation)	Y	Photo No.:	York 11-16
Is the area a potential problem area?	N	Plot ID:	SV01

VEGETATION

Dominant Species (%Cover)		Stratum	Indicator	Associated Plant Species		Stratum	Indicator
1.AGRSCA	10	H	FAC	9.ALNCRI	1	H	
2.EPILAT	10	H	FAC	10.GEUMAC	<1	H	
3.CALCAN	20	H	FAC	11.SALGLA	1	H	
4.				12.EQUPRA	5	H	
5.				13.ANGLUC	7	H	
6.				14.CARAQU	5	H	
7.				15.			
8.				16.			

Percent of dominant species that are OBL, FACW or FAC: 100% (0)

Level IV Veg Class and Notes: Hgmbh- disturbed

HYDROLOGY

Depth of Surface Water: 0-6

Wetland Hydrology Indicators:

Primary Indicators:

- X Innundated
- ___ Water marks
- ___ Drift lines
- ___ Sediment deposits
- ___ Drainage patterns in wetlands

Secondary Indicators:

- ___ Water stained leaves
- ___ Local soil survey data
- ___ FAC neutral test
- ___ Other

Hydrology Notes:

OTHER NOTES: Area was formerly shrub (likely Stcaw, has been cleared. Regrowth dominated by herbaceous, some small shrubs returning. Troughs of standing water. Area probably includes some upland areas transitioning to road berm and developed ares.

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2004 Wetlands Delineation Field Check Update and Report

Prepared September 30, 2016

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FIELD TRIP REPORT

State of Alaska

Department of Transportation and Public Facilities
Central Region Design and Engineering Services
Preliminary Design and Environmental

Date:	September 30, 2016	Time	10:30 am to 1:30 pm
Project Name:	Seward Airport Improvements	Project No:	54857
Noted By	Mark Boydston Environmental Impact Analyst	Present:	Drew von Lindern, Environmental Impact Analyst Mark Boydston, Environmental Impact Analyst
Subject:	2004 Wetlands delineation field check update and report		

On September 30, 2016, from approximately 10:30 am to 1:30 pm, DOT&PF environmental analysts (analysts) conducted a field check for Seward Airport wetlands delineated in 2004 and reported in 2005 (see attached report). The purpose of the field check was to confirm the findings and any changes to the 2004 wetlands delineation for the proposed Seward Airport Improvements project. The proposed project would impact wetlands depending on which alternative becomes the preferred alternative and proposed action.

I. Field methodology

Analysts on this field trip were both qualified to conduct wetlands delineation according to current U.S. Army Corp of Engineers Alaska Region wetlands delineation procedures. The analysts looked at the major wetland and upland areas within the Seward Airport property boundary based on 2004 mapping and updated for wetlands boundary changes using 2014 aerial imagery and ArcGIS 10.3 software (see attached Figures 1 through 3). Analysts did visual checks on existing vegetation comparing field photos taken in 2004 and using the aerial imagery from the 2005 wetlands delineation report. Other than changes to vegetated and unvegetated wetlands islands in the Resurrection River, personnel did not observe any significant changes to vegetation to the 2004 delineated wetlands.

Analysts tested 2004 delineated wetlands for hydrology by using a shovel. Wetness on the shovel indicated depth to saturation. Except for the two PEM1/SS1B wetlands at the north end of the two runways, all other delineated wetland had saturation to the surface or had standing water from 1 to 12 inches.

Analysts did not check hydric soils since as stated above, the majority of wetlands have saturation to the surface or standing water year round (see further discussion below).

II. Field results

A. Wetland boundary changes since 2004

Since 2004, islands and shore wetlands in the Resurrection River to the west of the main runway have changed location, size, and vegetation status. Most wetland islands are now unvegetated compared to 2004 likely from gradual increase in the rate of flood events since 1995 (pers. comm with DOT&PF Central Region hydrologic engineer). For example, flooding overtopped the main runway 11 times in 2010. Also, minor changes to 2004 wetlands boundaries occurred along the mean high tide line where a main estuary is located on the west side and southern end of the main runway (Runway 31).

B. Wetlands vegetation changes since 2004

Other than changes to vegetated and unvegetated wetlands islands in the Resurrection River, personnel did not observe any significant changes to vegetation to the 2004 delineated wetlands.

C. Wetlands hydrology changes since 2004

Except for the two PEM1/SS1B wetlands at the north end of the two runways 9 marked by SW09 and SW10 on the attached Figure 4), all wetlands were saturated to the surface or had standing water from 1 to 12 inches. The PEM1/SS1B wetlands at the north end of the airport had saturation within 10 inches from the surface. These two wetlands areas have been graded to remove obstructions in the runway safety area and direct drainage so the hydrology is probably altered.

D. Hydric soil changes since 2004

According to Western Regional Climate Center data for monthly precipitation records from 1983 through 2014 (see http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ak8377) for the Seward Airport and vicinity, precipitation average and standard deviation precipitation have remained about the same compared to the period from 2004 to 2014 (based on annual amounts). See table below. Therefore, analysts did not dig soil test pits to test for hydric soils because except for the PEM1/SS1B wetlands marked by SW09 and SW10 on the Google map (see attached Figure 4), all other wetlands within the Seward Airport boundary are generally saturated to surface or have standing water throughout the year.

Year range	Average (inches)	Standard Deviation (inches)
1983 - 2014	10.65	6.14
2004 - 2014	11.96	8.90

III. 2004 Wetlands ArcGIS shapefile updating

Before the September 30, 2016 field trip, the analysts re-digitized the 2004 wetlands shapefile boundaries overlaid on 2014 aerial imagery with one-foot resolution. The wetlands that changed the most between 2004 are the island and shoreline wetlands in the Resurrection River along the east side of the main runway. Since floodwaters have overtopped the main runway numerous times since 2004 and the week before this field trip, the Resurrection River shoreline and island wetlands along the main runway are in constant flux from floodwaters and changing braided channels.

A few wetlands boundaries in the estuarine/tidal zone experienced minor changes to their 2004 delineated boundaries. Personnel updated the boundary changes on the 2014 aerial imagery. See attached Figure 1 - 2004 wetlands delineation map, Figure 2 - 2005 wetlands layer on imagery,

and Figure 3 - Wetlands layer update to 2014 imagery for comparison of wetlands boundary changes since the 2004 wetlands delineation.

IV. 2004 Wetlands delineation forms updated to Alaska Region Version 2.0 Wetlands Delineation Form

Mark Boydston updated the 2004 delineation forms to the Alaska Region Version 2.0 Wetlands Delineation Forms that are in accord with the 2006 Alaska Region Supplement. The 2004 delineation used a dominance test for the hydrophytic vegetation test. The updated forms use the prescribed prevalence index. The prevalence index update did not change any of the hydrophytic vegetation tests from the 2004 delineation.

Likewise, wetlands hydrology indicators also did not change updating from the 2004 from to the current form as all wetlands had saturation or high water tables within 12 inches from the surface or standing water. As explained above, since the hydrology regime has remained the same since 2004, 2004 hydric soil tests were used for the updated form. Note soils classified in the 2004 delineation as gleyed also had mottled soil. Mottled soil in the 1987 Manual is now the 2006 Regional Supplement hydric soil Indicator A14 – Alaska Redox.

V. Conclusions

The 2004 wetlands delineation for hydrophytic vegetation, hydric soils and wetlands hydrology remains valid except for changes to island and shoreline wetlands on the Resurrection River on the main runway west side

Attachments:
Figure 1 - Seward Airport 2005 NWI wetlands classes
Figure 2 - 2005 wetlands layer on 2014 imagery
Figure 3 - Wetlands layer update to 2014 imagery
Figure 4 - Google Earth w updated sample point placemarks
Updated 2004 Wetlands delineation forms SW1 - SW10
2005 Wetlands Delineation Report

cc:
Barbara Beaton, Project Manager, Aviation Design, DOT&PF Central Region

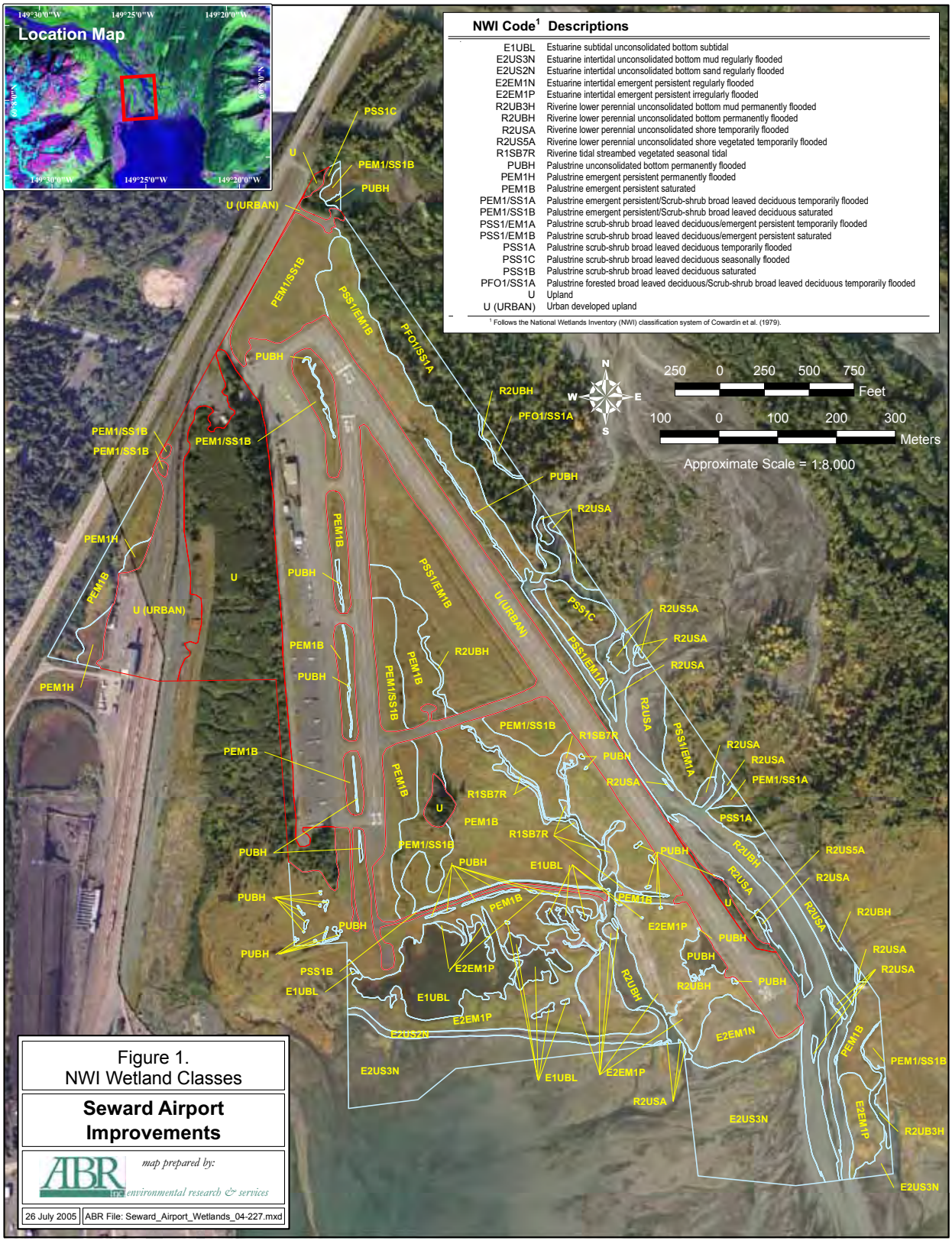
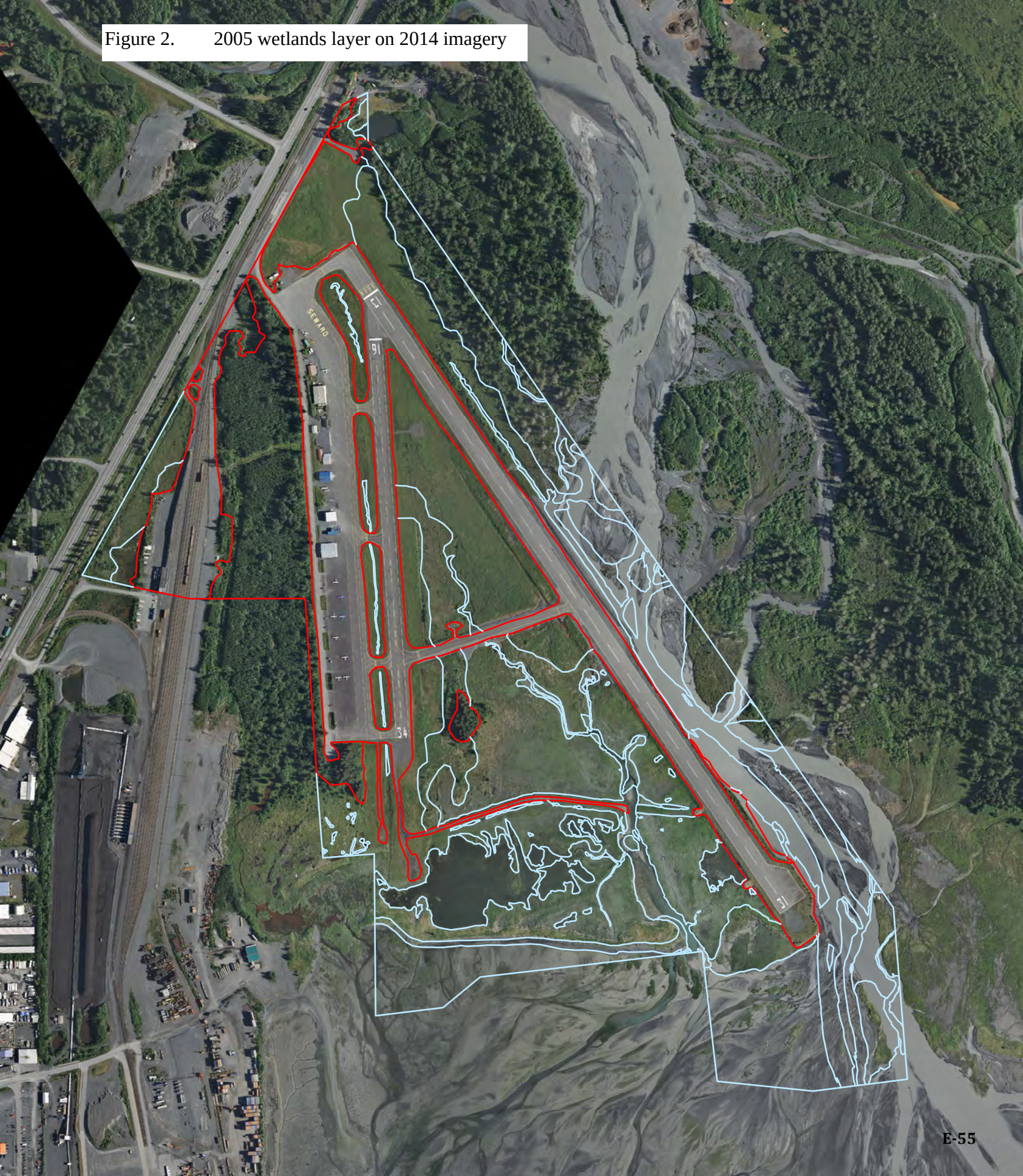
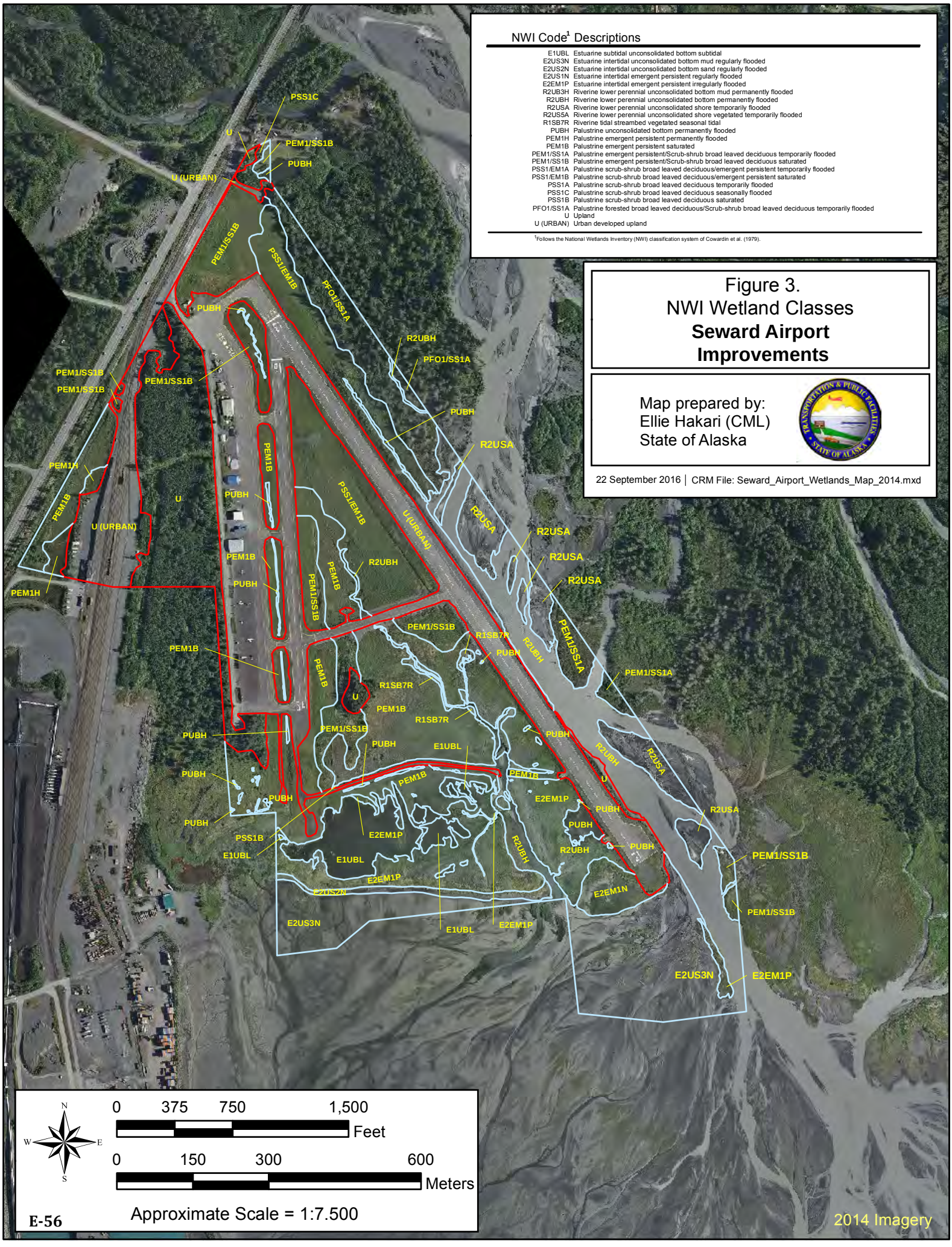


Figure 1. NWI wetland classes.

Figure 2. 2005 wetlands layer on 2014 imagery




NWI Code[1] Descriptions
E1UBL Estuarine subtidal unconsolidated bottom subtidal
E2US3N Estuarine intertidal unconsolidated bottom mud regularly flooded
E2US2N Estuarine intertidal unconsolidated bottom sand regularly flooded
E2US1N Estuarine intertidal emergent persistent regularly flooded
E2EM1P Estuarine intertidal emergent persistent irregularly flooded
R2UB3H Riverine lower perennial unconsolidated bottom mud permanently flooded
R2UBH Riverine lower perennial unconsolidated bottom permanently flooded
R2USA Riverine lower perennial unconsolidated shore temporarily flooded
R2US5A Riverine lower perennial unconsolidated shore vegetated temporarily flooded
R1SB7R Riverine tidal streambed vegetated seasonal tidal
PUBH Palustrine unconsolidated bottom permanently flooded
PEM1H Palustrine emergent persistent permanently flooded
PEM1B Palustrine emergent persistent saturated
PEM1/SS1A Palustrine emergent persistent/Scrub-shrub broad leaved deciduous temporarily flooded
PEM1/SS1B Palustrine emergent persistent/Scrub-shrub broad leaved deciduous saturated
PSS1/EM1A Palustrine scrub-shrub broad leaved deciduous/emergent persistent temporarily flooded
PSS1/EM1B Palustrine scrub-shrub broad leaved deciduous/emergent persistent saturated
PSS1A Palustrine scrub-shrub broad leaved deciduous temporarily flooded
PSS1C Palustrine scrub-shrub broad leaved deciduous seasonally flooded
PSS1B Palustrine scrub-shrub broad leaved deciduous saturated
PFO1/SS1A Palustrine forested broad leaved deciduous/Scrub-shrub broad leaved deciduous temporarily flooded
U Upland
U (URBAN) Urban developed upland
[1]Follows the National Wetlands Inventory (NWI) classification system of Cowardin et al. (1979).
Figure 3.
NWI Wetland Classes
Seward Airport Improvements
Map prepared by:
Ellie Hakari (CML)
State of Alaska
22 September 2016 | CRM File: Seward_Airport_Wetlands_Map_2014.mxd
N
W
E
S
0 375 750 1,500
Feet
0 150 300 600
Meters
Approximate Scale = 1:7,500
E-56
2014 Imagery

Google earth

feet 2000
meters 800

Seward Airport Improvements

Updated 2004 Wetlands field delineation

Placemarks show 2004 delineation field sample points 1 through 10 which DOT&PF field checked on September 30, 2016

Figure 4

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Seward Airport Borough/City: Kenai Peninsula Sampling Date: 9/30/2016

Applicant/Owner: DOT&PF Sampling Point: SW01

Investigator(s): Mark Boydston & Drew Vonlindern Landform (hillside, terrace, hummocks, etc.): river delta

Local relief (concave, convex, none): none Slope (%): < 1%

Subregion: Lat: 60.12996 Long: -149.42853 Datum: WGS 1984

Soil Map Unit Name: NWI classification: PEM1H

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation mowed, Soil ____, or Hydrology ____ significantly disturbed? Yes Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
50% of total cover: ____ 20% of total cover: ____			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
Total Cover:			
50% of total cover: ____ 20% of total cover: ____			
Herb Stratum			
1. Equisetum palustre	30		FACW
2. Carex aquatilis	25		OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:			
50% of total cover: ____ 20% of total cover: ____			

Plot size (radius, or length x width) ____ % Bare Ground ____

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes ____ (Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	25	x 1 =	25
FACW species	30	x 2 =	60
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	55 (A)		85 (B)

Prevalence Index = B/A = 1.55

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

Visual check on vegetation

SOIL

Sampling Point: SW01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
								soil pit not required

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** ____

Remarks:

No soil test required -

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
✓ High Water Table (A2)
✓ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ____ Depth (inches): less than 12

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): to surface

Wetland Hydrology Present? **Yes** ✓ **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Shovel test

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Seward Airport Borough/City: Kenai Peninsula Sampling Date: 9/30/2016

Applicant/Owner: DOT&PF Sampling Point: SW02

Investigator(s): Mark Boydston & Drew Vonlindern Landform (hillside, terrace, hummocks, etc.): river delta

Local relief (concave, convex, none): none Slope (%): < 1%

Subregion: Lat: 60.1308 Long: -149.42798 Datum: WGS 1984

Soil Map Unit Name: NWI classification: PEM1B

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation mowed, Soil _____, or Hydrology _____ significantly disturbed? Yes Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			

Total Cover: _____

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
6.			

Total Cover: _____

50% of total cover: _____ 20% of total cover: _____

Herb Stratum			
1. Calamogrostis canadensis	40		FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Total Cover: _____

50% of total cover: _____ 20% of total cover: _____

Plot size (radius, or length x width) _____ % Bare Ground _____

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____ (Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	40	x 3 =	120
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	40 (A)		120 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Visual check on vegetation

SOIL

Sampling Point: SW02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
								soil pit not required

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ **No** ____

Remarks:

No soil test included in 2005 wetlands report but location is in location with standing water present throughout the growing season and hydrophyte vegetation present

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ____ Depth (inches): 0-15

Water Table Present? Yes ✓ No ____ Depth (inches): less than 12

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): to surface

Wetland Hydrology Present? Yes ____ **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Shovel test

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Seward Airport Borough/City: Kenai Peninsula Sampling Date: 9/30/2016

Applicant/Owner: DOT&PF Sampling Point: SW03

Investigator(s): Mark Boydston / Drew Vonlinder Landform (hillside, terrace, hummocks, etc.): floodplain

Local relief (concave, convex, none): _____ Slope (%): _____

Subregion: _____ Lat: 60.13349 Long: -149.42358 Datum: WGS 1984

Soil Map Unit Name: _____ NWI classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Picnea sitchensis	15	Y	FACU
2. Populus tremuloides	10	Y	FACU
3. Alnus crispus (viridis)	20	Y	FAC
4. Oplopanax horridus	15	Y	FACU

Total Cover: _____

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
6.			

Total Cover: _____

50% of total cover: _____ 20% of total cover: _____

Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Total Cover: _____

50% of total cover: _____ 20% of total cover: _____

Plot size (radius, or length x width) _____ % Bare Ground _____

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____ (Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	20	x 3 =	60
FACU species	40	x 4 =	160
UPL species		x 5 =	
Column Totals:	60 (A)		220 (B)

Prevalence Index = B/A = 3.7

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: SW03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No ✓

Remarks:

See comments 2004 delineation form - chroma less than or equal to 1

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
✓ High Water Table (A2)
✓ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ____ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): 4

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Shovel test

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Seward Airport Borough/City: Kenai Peninsula Sampling Date: 9/30/2016

Applicant/Owner: DOT&PF Sampling Point: SW04

Investigator(s): Mark Boydston & Drew Vonlindern Landform (hillside, terrace, hummocks, etc.): river delta

Local relief (concave, convex, none): none Slope (%): < 1%

Subregion: Lat: 60.12680 Long: -149.42210 Datum: WGS 1984

Soil Map Unit Name: NWI classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation mowed, Soil ____, or Hydrology ____ significantly disturbed? Yes Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Picea sitchensis	40	Y	FACU
2. Alnus crispus (also viridis)	40	Y	FAC
3.			
4.			

Total Cover: ____

50% of total cover: ____ 20% of total cover: ____

Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
6.			

Total Cover: ____

50% of total cover: ____ 20% of total cover: ____

Herb Stratum			
1. Equisetum palustre	30		FACW
2. Carex aquatilis	25		OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Total Cover: ____

50% of total cover: ____ 20% of total cover: ____

Plot size (radius, or length x width)____ % Bare Ground ____

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes ____ (Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	40	x 3 =	120
FACU species	40	x 4 =	160
UPL species		x 5 =	
Column Totals:	80 (A)		280 (B)

Prevalence Index = B/A = 3.5

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

Visual check on vegetation

SOIL

Sampling Point: SW04

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
								soil pit not required

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ✓ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ____ Depth (inches): less than 12

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): to surface

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Shovel test

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Seward Airport Borough/City: Kenai Peninsula Sampling Date: 9/30/2016

Applicant/Owner: DOT&PF Sampling Point: SW05

Investigator(s): Mark Boydston / Drew Vonlinder Landform (hillside, terrace, hummocks, etc.): floodplain

Local relief (concave, convex, none): _____ Slope (%): _____

Subregion: _____ Lat: 60.12775 Long: -149.41913 Datum: WGS 1984

Soil Map Unit Name: _____ NWI classification: PEM1B

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
50% of total cover: _____	20% of total cover: _____		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
Total Cover:			
50% of total cover: _____	20% of total cover: _____		
Herb Stratum			
1. Calamagrostis canadensis	25	Y	FAC
2. Carex lenticularis	15	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:			
50% of total cover: _____	20% of total cover: _____		

Plot size (radius, or length x width) _____ % Bare Ground _____

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____ (Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species		x 2 =	
FAC species	25	x 3 =	75
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	40 (A)		90 (B)

Prevalence Index = B/A = 2.25

Hydrophytic Vegetation Indicators:

__ Dominance Test is >50%

✓ Prevalence Index is ≤3.0

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: SW05

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ✓ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ____

Remarks:

Soil results from 2004 delineation

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ____ Depth (inches): 0-5

Water Table Present? Yes ____ No ✓ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): surface

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

shovel test

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Seward Airport Borough/City: Kenai Peninsula Sampling Date: 9/30/2016

Applicant/Owner: DOT&PF Sampling Point: SW06

Investigator(s): Mark Boydston / Drew Vonlindern Landform (hillside, terrace, hummocks, etc.): floodplain

Local relief (concave, convex, none): _____ Slope (%): _____

Subregion: _____ Lat: 60.12803 Long: -149.41859 Datum: WGS 1984

Soil Map Unit Name: _____ NWI classification: PEM1/SS1B

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
Total Cover:			
50% of total cover:		20% of total cover:	
Herb Stratum			
1. Calamagrostis canadensis	8		FAC
2. Arctagrostis latifolia	15		FACW
3. Angelica lucida	17		FACU
4. Alnus crispus (also viridis)	5		FAC
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:			
50% of total cover:		20% of total cover:	

Plot size (radius, or length x width) _____ % Bare Ground _____

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____ (Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species 15	x 2 = 30
FAC species 13	x 3 = 39
FACU species 17	x 4 = 68
UPL species _____	x 5 = _____
Column Totals: 45 (A)	137 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: SW06

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ✓ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): _____

Water Table Present? Yes ____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): 8

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Shovel test

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Seward Airport Borough/City: Kenai Peninsula Sampling Date: 9/30/2016

Applicant/Owner: DOT&PF Sampling Point: SW07

Investigator(s): Mark Boydston / Drew Vonlindern Landform (hillside, terrace, hummocks, etc.): floodplain

Local relief (concave, convex, none): _____ Slope (%): _____

Subregion: _____ Lat: 60.12797 Long: -149.41823 Datum: WGS 1984

Soil Map Unit Name: _____ NWI classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Pices sitchensis	70		FACU
2.			
3.			
4.			

Total Cover: _____

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
6.			

Total Cover: _____

50% of total cover: _____ 20% of total cover: _____

Herb Stratum			
1. Alnus viridis (aka crispus)	10		FAC
2. Angelica lucida	10		FACU
3. Equisetum arvense	10		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Total Cover: _____

50% of total cover: _____ 20% of total cover: _____

Plot size (radius, or length x width) _____ % Bare Ground _____

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____ (Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	20	x 3 =	60
FACU species	80	x 4 =	320
UPL species		x 5 =	
Column Totals:	100 (A)		380 (B)

Prevalence Index = B/A = 3.8

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: SW07

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ✓ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ____

Remarks:

2004 soil data notes marginal only 4 inches meets low chroma indicator

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): _____

Water Table Present? Yes ____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): 3

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Recent heavy flooding previous week overtopping main runway with 1 foot water

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Seward Airport Borough/City: Kenai Peninsula Sampling Date: 9/30/2016

Applicant/Owner: DOT&PF Sampling Point: SW08

Investigator(s): Mark Boydston / Drew Vonlindern Landform (hillside, terrace, hummocks, etc.): floodplain

Local relief (concave, convex, none): _____ Slope (%): _____

Subregion: _____ Lat: 60.13316 Long: -149.42447 Datum: WGS 1984

Soil Map Unit Name: _____ NWI classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. Picea sitchensis	7		FAC
2.			
3.			
4.			

Total Cover: _____

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum			
1. Alnus viridis (aka crispus)	65		FAC
2. Sambucus racemosa	35		FACU
3.			
4.			
5.			
6.			

Total Cover: _____

50% of total cover: _____ 20% of total cover: _____

Herb Stratum			
1. Deschampsia caespitosa	20		FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Total Cover: _____

50% of total cover: _____ 20% of total cover: _____

Plot size (radius, or length x width) _____ % Bare Ground _____

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____ (Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species 72	x 3 =	216
FACU species 35	x 4 =	140
UPL species	x 5 =	
Column Totals: 107 (A)		356 (B)

Prevalence Index = B/A = 3.3

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: SW08

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No ✓

Remarks:

Unconsolidated sand - no hydric soil indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): _____

Water Table Present? Yes ____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): 10

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Saturation from recent heavy rain

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Seward Airport Borough/City: Kenai Peninsula Sampling Date: 9/30/2016

Applicant/Owner: DOT&PF Sampling Point: SW09

Investigator(s): Mark Boydston / Drew Vonlindern Landform (hillside, terrace, hummocks, etc.): floodplain

Local relief (concave, convex, none): _____ Slope (%): _____

Subregion: _____ Lat: 60.13305 Long: -149.42084 Datum: WGS 1984

Soil Map Unit Name: _____ NWI classification: PEM1/SS1B

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Yes Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
50% of total cover: _____ 20% of total cover: _____			
Sapling/Shrub Stratum			
1. Alnus viridis (aka crispus)	25		FAC
2. Salix pulchra	10		FACW
3. Salix alaxensis	10		FACW
4. Equisetum pratense	8		FACW
5.			
6.			
Total Cover:			
50% of total cover: _____ 20% of total cover: _____			
Herb Stratum			
1. Deschampsia caespitosa	20		FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:			
50% of total cover: _____ 20% of total cover: _____			

Plot size (radius, or length x width) _____ % Bare Ground _____

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____ (Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species	28	x 2 =	56
FAC species	25	x 3 =	75
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	53 (A)		131 (B)

Prevalence Index = B/A = 2.5

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

DOT&PF airport maintenance regularly clears this area for the Runway Safety Area and has planted native revegetation grasses

SOIL

Sampling Point: SW09

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ✓ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ____ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): surface

Wetland Hydrology Present? Yes ✓ **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Seward Airport Borough/City: Kenai Peninsula Sampling Date: 9/30/2016

Applicant/Owner: DOT&PF Sampling Point: SW10

Investigator(s): Mark Boydston / Drew Vonlinder Landform (hillside, terrace, hummocks, etc.): floodplain

Local relief (concave, convex, none): _____ Slope (%): _____

Subregion: _____ Lat: 60.13548 Long: -149.42242 Datum: WGS 1984

Soil Map Unit Name: _____ NWI classification: PEM1/SS1B

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

VEGETATION – Use scientific names of plants. List all species in the plot.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
50% of total cover: _____ 20% of total cover: _____			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
Total Cover:			
50% of total cover: _____ 20% of total cover: _____			
Herb Stratum			
1. Poa alpina	25		FAC
2. ~~Geum macrophyllum~~	~~10~~		~~FAC~~
3.			
4. Achillea millefolium	15		FACU
5. Salix planifolia subsp pluchra	15		FACW
6.			
7.			
8.			
9.			
10.			
Total Cover:			
50% of total cover: _____ 20% of total cover: _____			

Plot size (radius, or length x width) _____ % Bare Ground _____

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____ (Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species 15	x 2 =	30
FAC species 35	x 3 =	105
FACU species 15	x 4 =	60
UPL species	x 5 =	
Column Totals: 65 (A)		195 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: Runway safety area cleared. Obvious areas of PSS1B remain. Weedy invasives dominate -

SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ✓ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ **No** ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): _____

Water Table Present? Yes ____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Shovel test

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