

Appendix B

# **Wetland, Vegetation, and Wildlife Report and Wetland Avoidance and Minimization Analysis**

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# **Wetland, Vegetation, and Wildlife Report**

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# Talkeetna Airport Improvements

## Wetland, Vegetation, and Wildlife Report

AKSAS Project No. 54660

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# Contents

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<b>Summary .....</b>	<b>1</b>
<b>1.0 Introduction.....</b>	<b>4</b>
1.1 Project Location .....	4
1.2 Project Description .....	4
<b>2.0 Background Information.....</b>	<b>5</b>
2.1 General Site Conditions.....	5
2.2 Previously Mapped Wetlands .....	5
2.3 Wildlife and Fish Use.....	7
<b>3.0 Methods.....</b>	<b>8</b>
3.1 Pre-Field Data Collection .....	8
3.2 Vegetation Community Classification and Mapping.....	8
3.3 Wetland Delineation and Survey .....	9
3.4 Wildlife Habitat Analysis .....	10
<b>4.0 Results and Discussion .....</b>	<b>10</b>
4.1 Vegetation Community Classification .....	10
4.2 Wetland Habitats.....	10
4.3 Upland Habitats .....	16
4.4 Habitat Evaluation .....	17
<b>5.0 Impact Analysis .....</b>	<b>18</b>
5.1 Wetland Habitat Impacts .....	18
5.2 Upland Habitat Impacts .....	18
<b>6.0 References .....</b>	<b>20</b>

## Appendices

- A Field Data Forms
- B Wetland Functional Assessment

## Tables

1 U. S. Fish and Wildlife Service Wetland Indicator Status.....	9
2 Vegetation Communities by Vierek Classification System .....	11
3 Wetland Summary .....	12

## Figures

1 Project Location Map .....	2
2 Existing Airport Facilities and Study Area Limits.....	3
3 Proposed Action - 2008 .....	6
4 Vegetation Classification Map.....	12
5 Wetlands Map.....	13
6 Wetland Impacts with the Proposed Action.....	19

## Summary

The objective of this report is to determine the extent of jurisdictional waters of the United States (including wetlands), identify and classify vegetation communities, and assess wildlife habitat conditions within the extent of the Proposed Action associated with the Talkeetna Airport Improvements (Figure 1). This study was limited to the areas north and west of the airport runway (Figure 2), which encompasses areas on airport property that could be affected by the Proposed Action. Wetland, vegetation, and wildlife studies for areas east and south of the airport runway were conducted by others (B&B Environmental, 1994; USKH, 2000), and information from those studies is included in this report.

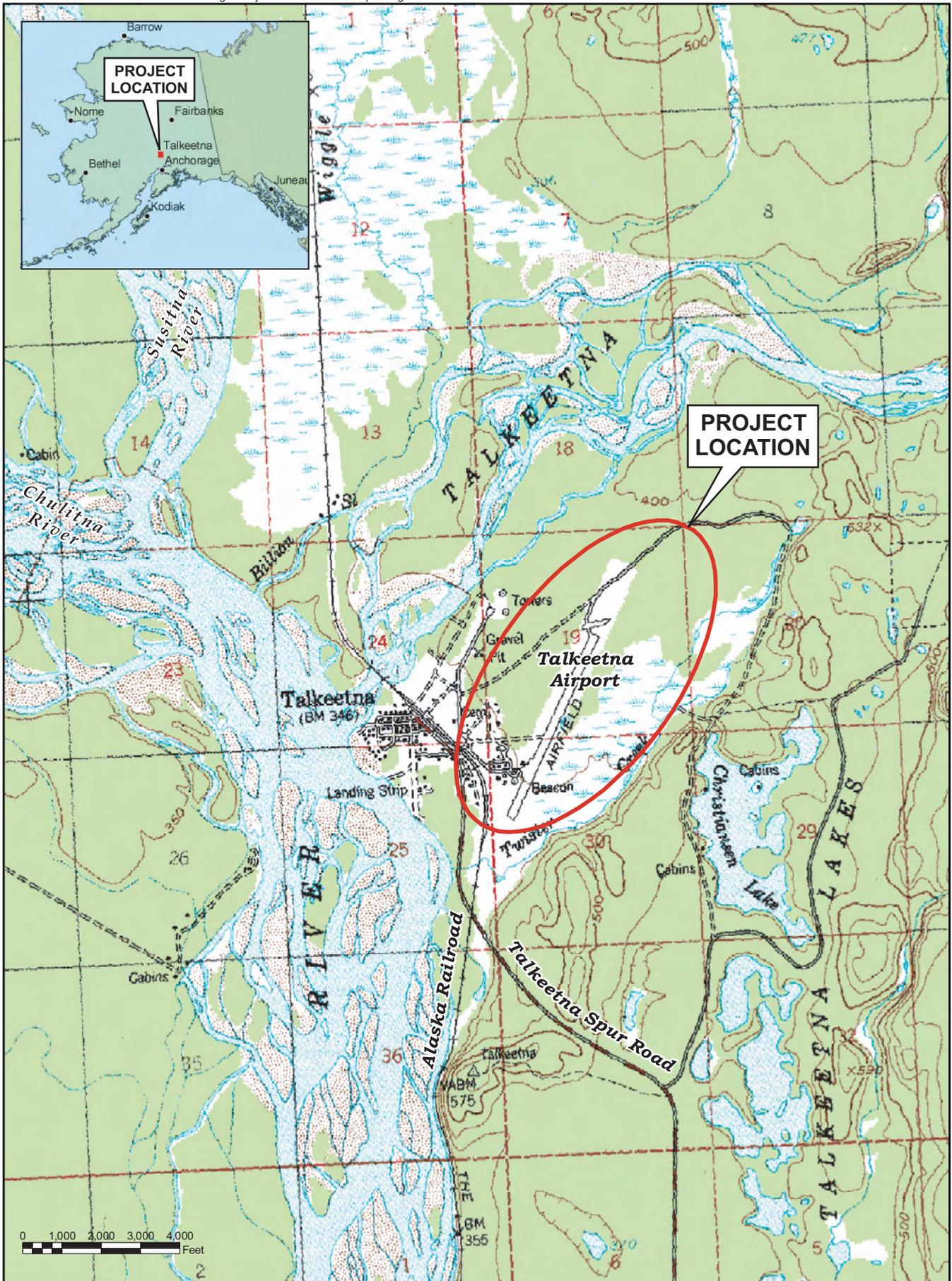
This report is provided to support a determination by the U.S. Army Corps of Engineers (Corps) on the limit of jurisdictional waters of the United States (including wetlands) in areas that could be affected as part of the Proposed Action. The determinations were based on the definition of waters of the United States and on criteria set forth in the 1987 *Corps of Engineers Wetland Delineation Manual*. This report has also been prepared to supplement the Talkeetna Airport Environmental Assessment (EA) and permitting under Section 404 of the Clean Water Act.

Seven wetlands were delineated on the airport site. Each exhibited the three parameters characteristic of a wetland (i.e., hydric soils, hydrophytic vegetation, and wetland hydrology). They include palustrine forested, scrub-shrub, and emergent habitats. Many of these wetlands appear to be linear remnant channels and are surrounded by upland forest. The tree canopy in these areas is typically dominated by black spruce (*Picea mariana*) and paper birch.

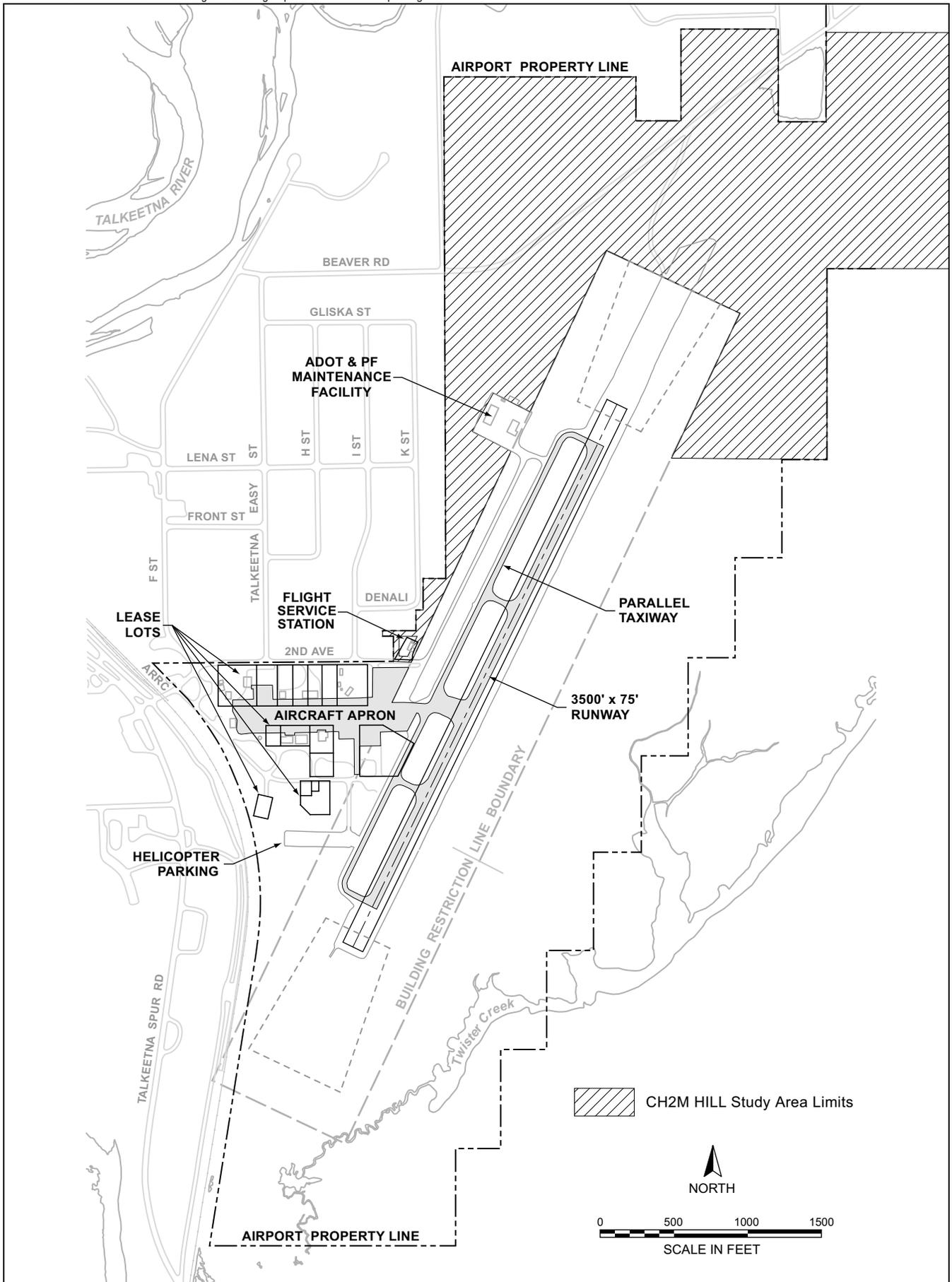
A large wetland complex consisting of forested and emergent wetland habitats is associated with Twister Creek on the eastern side of the airport and was previously mapped by others (B&B Environmental, 1994).

The design for the Proposed Action avoids and minimizes impacts to wetlands to the maximum extent practicable. The Proposed Action would result in 0.48 acre of unavoidable wetland impact. This fill would occur in an emergent wetland along the western side of the existing runway. No streams or other water bodies occur within the construction limits of the Proposed Action. No Essential Fish Habitat, including Twister Creek and its associated wetlands, would be affected by the project.

Undeveloped upland habitat on the Talkeetna Airport property is primarily vegetated by black spruce and paper birch. Small areas of low quality scrub-shrub and herbaceous upland habitat also occur. Approximately 44 acres of upland vegetation would be cleared to construct the Talkeetna Airport improvements.



Source: USGS Topographical Map, Talkeetna B-1  
Scale: 1:63,360  
Date: July 30, 2004



Talkeetna Airport Improvements, Phase II  
Wetland, Vegetation, and Wildlife Report

**Figure 2**  
**Existing Airport Facilities**  
**and Study Area Limits**

## 1.0 Introduction

The objective of this report is to determine the extent of jurisdictional waters of the United States (including wetlands), identify and classify vegetation communities, and assess wildlife habitat conditions within the extent of the Proposed Action associated with the Talkeetna Airport Improvements (Figure 1). This study was limited to the areas north and west of the airport runway (Figure 2), which encompasses areas on airport property that could be affected by the Proposed Action. Wetland, vegetation, and wildlife studies for areas east and south of the airport runway were conducted by others (B&B Environmental, 1994; USKH, 2000), and information from those studies is included in this report.

### 1.1 Project Location

The community of Talkeetna and Talkeetna Airport are located within the Susitna River Basin physiographic region, bounded on the west and north by the Alaska Range, on the east by the Talkeetna Mountains, and on the south by Cook Inlet. The community of Talkeetna is situated at the confluence of the Susitna and Talkeetna Rivers (Figure 1). Talkeetna Airport is located southeast of the town core (Sec. 19 and 30, T26N, R4W, Seward Meridian). The lowland region surrounding Talkeetna Airport has interspersed upland habitats and extensive riverine and palustrine wetlands associated with the floodplains of the Susitna River and Twister Creek.

### 1.2 Project Description

The purpose of the project is to enhance safety; satisfy current and forecast demand for airport facilities; and improve the efficiency of airport operations. The Proposed Action consists of projects prioritized by Alaska Department of Transportation and Public Facilities (ADOT&PF) to meet current and forecast demand through 2008, as identified in the Talkeetna Airport Master Plan (USKH, 2001). Other projects recommended for implementation by 2015 in the Master Plan will be assessed for cumulative impacts but are not considered part of the Proposed Action. Any future need to implement these projects would be the subject of a separate environmental review and permitting process. The following improvements comprise the Proposed Action and would be built and operational by 2008:

- Construct new apron with eight additional lease lots for use by commercial and general aviation (GA) tenants of the airport to satisfy existing and forecast demand.
- Construct new GA and transient aircraft parking aprons because the existing and forecast demand for aircraft parking spaces exceeds available apron space.
- Construct 84 automobile parking spaces because the existing and forecast demand for automobile parking exceeds available parking spaces.
- Relocate the existing helicopter parking and establish a designated heliport in compliance with Federal Aviation Administration (FAA) design standards to separate fixed wing and rotary aircraft, thus enhancing airport safety.

- Install perimeter security fencing around portions of the airport to minimize trespass incursions by pedestrians and animals, and to segregate aircraft operational areas from public areas to enhance public and airport safety.
- Provide an access road from Second Avenue to the new lease lots and GA apron and the new heliport. Pave existing access road to the existing apron and lease lots to improve maintenance and operations to decrease dust and improve drainage.
- Provide a pedestrian safety path to enhance public and airport safety.

The Proposed Action is shown in Figure 3.

## 2.0 Background Information

### 2.1 General Site Conditions

The lowland region surrounding the 670-acre Talkeetna Airport consists of a mosaic of upland habitats and extensive riverine and palustrine wetlands associated with the floodplains of the Talkeetna and Susitna Rivers and Twister Creek. Birch and spruce forest cover most of the undeveloped portions of the airport property. A large wetland system is associated with Twister Creek on the eastern side of the airport. Small linear wetlands occur in remnant stream channels elsewhere on the site.

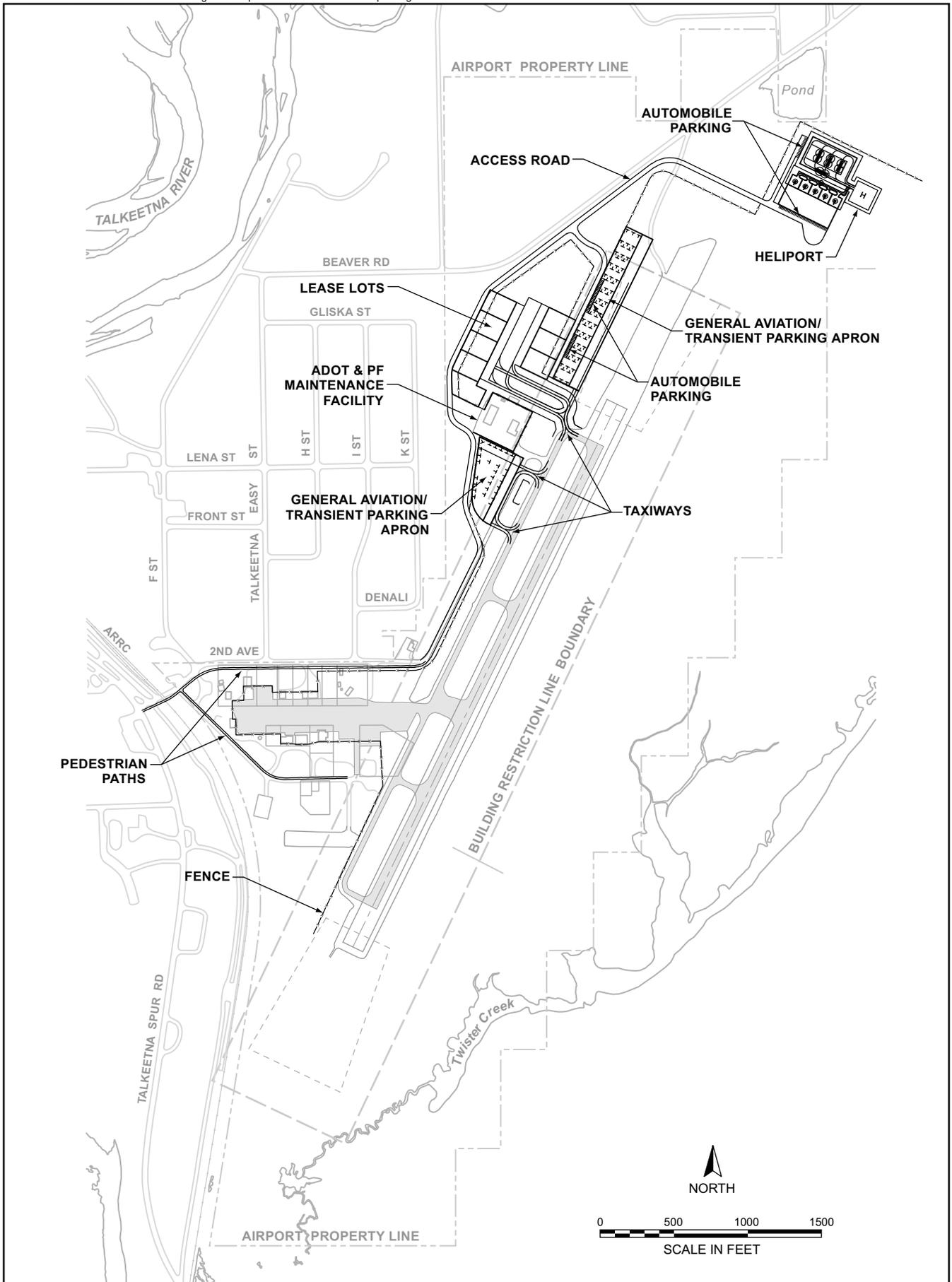
The airport is located adjacent to Twister Creek and in the floodplain of the Talkeetna and Susitna Rivers. Portions of the airport property and adjacent subdivision developments are located within the 100-year floodplain.

The surface topography in the project area is mostly flat (0 to 8 percent slopes). Undeveloped portions of the project area contain shallow surface channels that appear to have been incised from historic flooding and drainage of the surrounding rivers. Many of these channels have been confined by development or natural processes and no longer convey surface water runoff to the Talkeetna River.

Soil survey data were not available for the project area. Field observations of soil morphology indicate that soil drainage conditions in the project area range between poorly drained and well drained. Soil textures consist largely of sandy clay loams, sandy loams, and loamy sands. The variations in soils textures are consistent with soils formed by alluvial processes, as is expected in a floodplain.

### 2.2 Previously Mapped Wetlands

Wetlands to the east and south of the existing runway were delineated and mapped by B&B Environmental, Inc. in 1994. The 1994 wetland delineation and mapping was based on review of existing information, aerial photo interpretation, and a site reconnaissance. Riverine wetlands identified include Twister Creek, which runs along the eastern boundary of the airport property. Both unvegetated and vegetated sand and gravel bars occur within the creek. Willow and grasses are the dominant vegetative species on the vegetated bars. A palustrine open water wetland occurs in an abandoned gravel pit at the north end of the airport.



Talkeetna Airport Improvements, Phase II | Figure 3  
Wetland, Vegetation, and Wildlife Report | Proposed Action – 2008

A long palustrine emergent wetland was identified along the eastern edge of the runway. It is characterized by standing water and emergent vegetation such as cotton grass, sedges, and horsetail. This wetland appears to have formed in a depression during excavation of fill for the existing runway. South of the runway is an area of seasonally flooded emergent wetland sedges and grasses, and a saturated scrub-shrub wetland vegetated with willow, blueberry, and grasses.

To the southeast of the existing runway is an area of saturated mixed evergreen/shrub forest wetland that is associated with Twister Creek. Dwarf birch trees are growing along the margins of this area, and as well as black spruce, alder, blueberry, sedges, labrador tea, and sphagnum moss. This wetland type is widespread along Twister Creek.

These wetlands were not redelineated for this report because they are not within the footprint for potential impacts from the Proposed Action.

## **2.3 Wildlife and Fish Use**

### **2.3.1 Mammals**

Terrestrial mammals that occur in the vicinity of the Talkeetna Airport include moose, grizzly bear, brown bear, wolf, coyote, and red fox. Smaller mammals that occur in the region are beaver, lynx, marten, mink, muskrat, river otter, weasel, porcupine, snowshoe hare, and red squirrel. Caribou do not occur in the vicinity of Talkeetna Airport.

Moose are the most conspicuous large mammal in the area, particularly during the winter when they browse on dense patches of willow in open wetlands and riparian areas. The airport is located within a recognized winter concentration area for moose. Rutting concentration areas for moose occur east of Talkeetna along the floodplains of the Talkeetna and Sheep Rivers, and a moose calving concentration area is present east and south of Talkeetna (USKH, 2000).

Grizzly and black bear may be present along the banks of the Talkeetna and Susitna Rivers and the lower portion of Twister Creek when they are in search of salmon during the summer. Black bear are occasionally observed in the vicinity of the Talkeetna Airport during the summer. Beaver are present along the floodplain of Twister Creek where they construct and maintain beaver ponds in wetland areas south of the existing runway (USKH, 2000).

### **2.3.2 Birds**

Birds that occur in the area include waterfowl, geese, raptors, passerines, spruce grouse, and willow ptarmigan. ADOT&PF conducted a bald eagle survey in the project vicinity in Spring 2003. No eagle nests were identified within 1 mile of the airport, but three nests were identified between 1 and 5 miles of the airport. Only one of these three nests was active in 2003.

Although the Talkeetna Airport is not documented as a known concentration area for spring or fall waterfowl staging, nesting, or molting, geese occasionally rest and stage in open areas surrounding the Talkeetna Airport during spring (USKH, 2000). Ducks inhabit the pond at the north end of the runway.

### 2.3.3 Fish

The National Marine Fisheries Service considers all waters that support anadromous fish to be essential fish habitat (EFH). The Magnuson-Stevens Fishery Conservation and Management Act defines EFH as “waters necessary to fish for spawning, breeding, feeding, or growth to maturity.”

Twister Creek parallels the existing airport runway to the east and flows to the Susitna River. A search of the Alaska Department of Fish and Game (ADF&G) *Catalog of Waters Important to Spawning, Rearing or Migration of Anadromous Fishes* found that the following streams within the project area support anadromous fish:

- Talkeetna River, catalog # 247-41-10200-2370
- Susitna River, catalog # 247-41-10200
- Twister Creek, catalog # 247-41-10200-2362

The Susitna River provides spawning and rearing habitat for five species of pacific salmon: Chinook, coho, chum, sockeye, and pink salmon. The river is used by salmon as a migration route to Cook Inlet. Resident fish in the Susitna River drainage include lake trout, rainbow trout, arctic grayling, burbot, Dolly Varden, and round whitefish. The Talkeetna River is also an important fish stream containing both anadromous and resident species.

Based on communication with ADF&G staff (Davis, 2003), adult and juvenile coho, Chinook, and sockeye salmon have been observed and captured in the main channel of Twister Creek. ADOT&PF conducted a fish habitat survey in July 2003 that identified high densities of rearing coho, as well as stickleback and rainbow trout, in a tributary to Twister Creek that runs south of the airport runway. It is likely that wetlands associated with Twister Creek at the south end of the airport are used as rearing habitat for juvenile coho, and should be considered as EFH. According to ADF&G, Twister Creek and associated wetlands may also provide rearing habitat for juvenile sockeye and Chinook salmon.

## 3.0 Methods

### 3.1 Pre-Field Data Collection

Prior to conducting the on-site wetland analysis, the following information compiled by others for the site was collected and reviewed:

- *Talkeetna Airport Wetlands Assessment* (B&B Environmental, 1994)
- Aerial photography
- *Environmental Assessment: Talkeetna Airport* (USKH, 2000)

This information was overlaid on the project site map to identify potential wetland areas and other vegetation communities requiring detailed field investigation.

### 3.2 Vegetation Community Classification and Mapping

Vegetation communities on the airport property were classified using the Alaska Vegetation Classification handbook (Vioreck et al., 1992). Mapping entailed visually estimating the percent cover of dominant growth forms, then assigning uniform areas to Vioreck vegetation classes. Vioreck units were mapped using aerial photo interpretation and field notes.

### 3.3 Wetland Delineation and Survey

CH2M HILL biologists conducted a wetland delineation in September and October, 2003, using methods of the *Corps of Engineers Wetlands Delineation Manual* (Department of the Army Environmental Laboratory, 1987). Wetlands to the north and west of the airport runway that could potentially be affected by the Proposed Action were identified and delineated. The wetland boundaries were delineated in the field by observing plant communities, evaluating soil conditions, and observing standing water and/or saturated soils. Wetlands were delineated with red-and-white striped flagging numbered alpha-numerically. The delineated wetland boundaries were simultaneously surveyed using a sub-meter accuracy, handheld GPS unit.

Observations of vegetation, soils, and hydrology at representative sample plots (upland and wetland) were documented on field data forms (Appendix A). Orange flagging marked numerically ("DP-#") was used to mark sample plots where site-specific soils, vegetation, and hydrology data were collected and recorded. Habitat identified as wetland was classified in the field using the Cowardin classification system (Cowardin et al., 1979).

#### 3.3.1 Wetland Vegetation

The presence of wetland vegetation was determined according to information found in the *National List of Plant Species that Occur in Wetlands: National Summary for Region 9* (Reed, 1988) and the *Supplement to National List of Plant Species that Occur in Wetlands: Northwest (Region 9)* (USFWS, 1995). These sources assign wetland and non-wetland plants to a range of classifications, based on the prevalence of their occurrence in either wetland or upland areas. A plant's classification is referred to as its "indicator status" (i.e., whether it indicates the presence of wetlands).

In each sample plot, dominant plant species were determined for each vegetative stratum: herb, woody vine, shrub, and tree. Percent cover of most species in a plot was estimated, and the indicator status recorded. Dominant species were assigned based on at least 20 percent cover within a stratum. Plots where *more than 50 percent* of the dominant species were facultative, facultative wetland, or obligate wetland species were considered to have hydrophytic vegetation (Table 1) and, therefore, to meet the wetland vegetation criterion.

**TABLE 1**  
U.S. Fish and Wildlife Service Wetland Indicator Status

Classification	Percent Occurrence in Wetlands
Obligate Wetland (OBL)	More than 99
Facultative Wetland (FACW)	67 to 99
Facultative (FAC)	34 to 66
Facultative Upland (FACU)	1 to 33
Obligate Upland (UPL)	Less than 1
No Indicator (NI)	Insufficient data to determine indicator status

Source: Reed (1988).

#### 3.3.2 Soils

Data on soil texture and color, presence of mottles and/or concretions, organic matter content, moisture content, and presence of oxidized root zones were recorded. Using Munsell®

color charts, soil matrix and mottle colors (hue, value, and chroma) were determined immediately below the A horizon, or within the surface (10 inches) if no A horizon boundary occurred before that depth. Munsell® soil colors are reported in the wetland descriptions in Section 4 in parentheses following the soil color description. Soils with low chromas (i.e., a chroma of two with mottles present; a chroma of one or less independent of mottles) or soils with high organic accumulations in the upper horizon (i.e., muck or peat layers or heavy organic staining) indicate the presence of wetland or hydric soils and, therefore, meet the wetland soils criterion.

### **3.3.3 Hydrology**

Visual observations of soil saturation, surface inundation, visible drainage patterns, debris/sediment deposits, and surface scour were recorded. Depth to water in unlined boreholes was measured after allowing sufficient time for water to accumulate. If any of these and other characteristics were observed, wetland hydrology was considered to exist.

### **3.3.4 Wetland Functional Assessment**

In addition to wetland border delineation, CH2M HILL assessed wetlands for their capacity to perform and deliver various wetland functions. Wetland environments deliver a variety of services to their surrounding landscape. These functions include flood flow alteration, sediment removal, nutrient and toxicant removal, erosion control and streambank stabilization, organic matter production and export, and habitat, among others. A wetland function assessment was completed for the delineated wetlands using the Wetland Characterization Tool for Linear Projects (Null et al., 2000). Wetland function assessment forms are presented in Appendix B.

## **3.4 Wildlife Habitat Analysis**

Qualitative wildlife habitat descriptions were developed from review of previous wildlife documentation and on-site observations made during the wetland delineation.

# **4.0 Results and Discussion**

## **4.1 Vegetation Community Classification**

The lowland region surrounding the Talkeetna Airport is a mosaic of upland habitats and wetland habitats associated with the floodplains of the Susitna River and Twister Creek. Specific vegetation communities in the study area were classified using the Viereck classification system (Table 2). The distribution of these communities is shown in Figure 4.

## **4.2 Wetland Habitats**

The results of the 2003 wetland delineation are shown in Figure 5, along with wetlands identified in the 1994 wetland assessment conducted by B&B Environmental, Inc. Seven wetland areas were identified in the study area. Characteristics of these seven wetland areas

are presented in Table 3. The description of each wetland area includes a description of the vegetation, soils, hydrology, and functions. Field data forms are presented in Appendix A. The results of the functional assessment are presented in Appendix B.

**TABLE 2**  
Vegetation Communities by Viereck Classification System<sup>a</sup>

Level 1	Level 2	Level 3	Level 4	Mapping Code
I. Forest	B. Broadleaf forest	3. Broadleaf woodland	a. Paper birch	IB3a
		C. Mixed forest	1. Closed (60-100% canopy)	a. Spruce-paper birch
			2. Open (25-60% canopy)	a. Spruce-paper birch
II. Scrub	A. Dwarf Tree	2. Open (25-60% canopy)	a. Black spruce	IIA2a <sup>b</sup>
		3. Woodland (10-25% canopy)	a. Black spruce	IIA3a <sup>b</sup>
	Betel scrub	2. Open (25-75% canopy)	a. Willow	IIB2a
			b. Alder	IIB2b
III. Herbaceous	A. Graminoid herbaceous	2. Mesic graminoid herbaceous		IIIA2 <sup>b</sup>
			a. Bluejoint meadow	IIIA2a
			b. Bluejoint herb	IIIA2b
		3. Wet graminoid herbaceous		IIIA3 <sup>b</sup>
			a. Wet sedge meadow	IIIA3a <sup>b</sup>
			f. Subarctic lowland sedge wet meadow	IIIA3f

<sup>a</sup>Viereck et al. (1992)

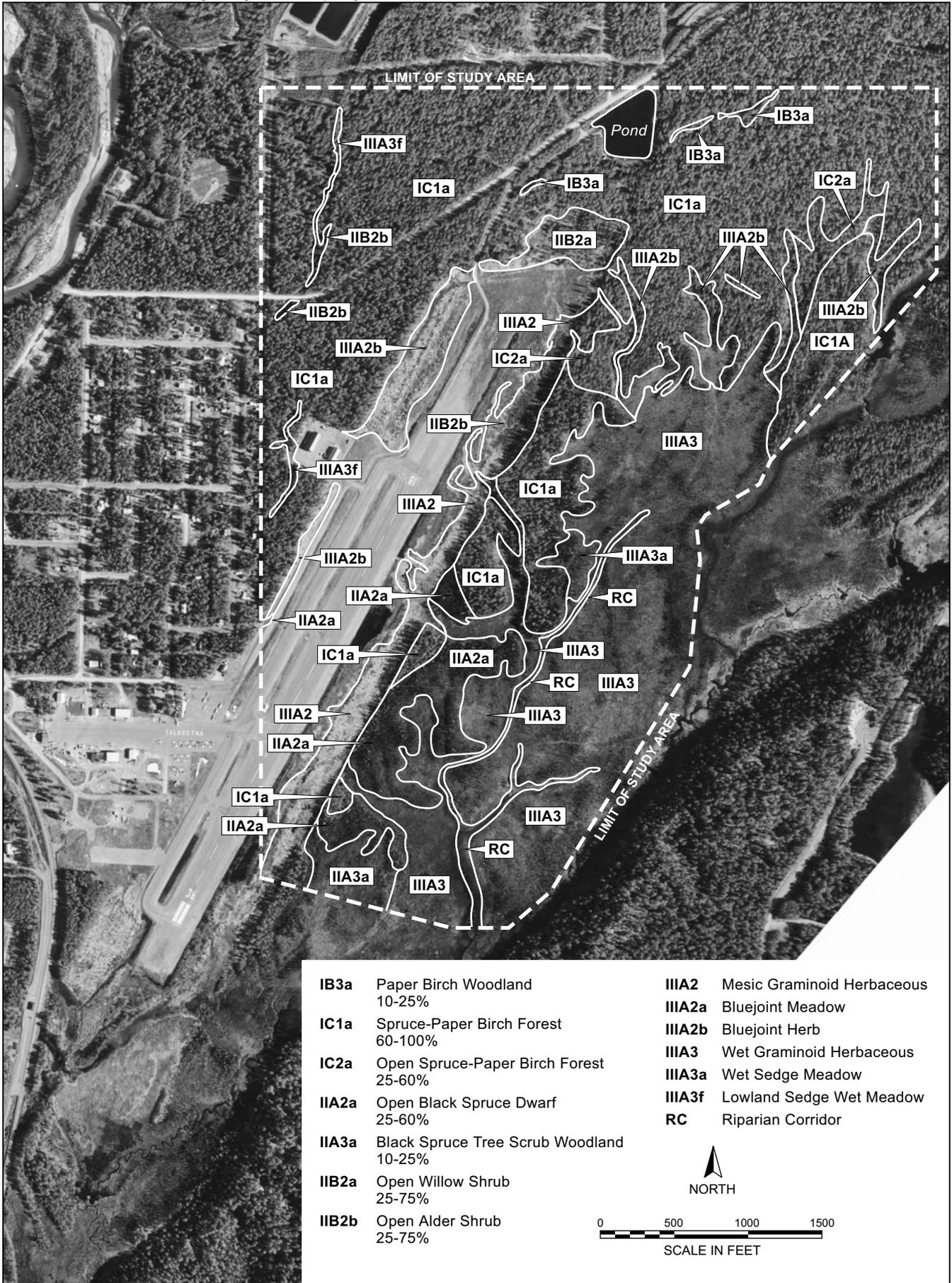
<sup>b</sup>Vegetation classification is based on data from B&B Environmental, Inc.(1994)

**TABLE 3**  
Wetland Summary

Wetland ID	Cowardin Code	Cowardin Classification <sup>a</sup>	Adjacent Water Course	Acreage
A/B <sup>b</sup>	PEM2	Palustrine emergent, persistent	Twister Creek	>10
	PFO	Palustrine Forested		
C <sup>b</sup>	PFO1	Palustrine forested, broad-leaved deciduous	Twister Creek	0.9
D	PFO1	Palustrine forested, broad-leaved deciduous	No Surface Connection	0.1
E	PEM2	Palustrine emergent, persistent	No Surface Connection	0.6
F	PSS1	Palustrine scrub/shrub, broad-leaved deciduous	No Surface Connection	0.1
G	PEM2	Palustrine emergent, persistent	No Surface Connection	0.2
I <sup>b</sup>	PEM2	Palustrine emergent, persistent	No Surface Connection	1.0
	PSS1	Palustrine scrub/shrub, broad leaved deciduous		

<sup>a</sup>Cowardin et al. (1979)

<sup>b</sup>Wetland not surveyed beyond project boundaries, total wetland area undetermined.



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Wetland, Vegetation, and Wildlife Report

**Figure 4  
Vegetation Classification  
Map**



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Wetland, Vegetation, and Wildlife Report

Figure 5  
Wetlands Map

The wetlands delineated are palustrine, which describes “...all non-tidal wetlands dominated by trees, shrubs, persistent emergent vegetation, emergent mosses, or lichens...” (Cowardin et al., 1979). Palustrine wetlands are further divided into classes and subclasses based on characteristics of their substrate, dominant vegetation, and flooding regime.

During the delineation field work, normal environmental conditions were present in the study area, and the growing season was well advanced.

#### 4.2.1 Palustrine Forested Wetlands

**General Description.** Palustrine forested wetlands (PFO1) are defined as all non-tidal wetlands dominated by woody vegetation 20 feet tall or taller (Cowardin et al., 1979). The subclass (1) indicates that the wetlands contain predominantly deciduous and broad-leaved trees. This wetland habitat is evident throughout the study area, particularly intermixed within upland forested communities. Many of the forested wetlands appear to be linear remnant river channels. This wetland type is present as an inclusion habitat in Wetland A/B and dominant in Wetlands C and D. Viereck classifications observed in this survey and classified as PFO1 wetlands included Closed spruce-paper birch forest (IC1a), Open spruce-paper birch forest (IC2a), and Paper birch woodland (IB3a).

**Vegetation.** Vegetation in PFO1 wetlands are typically dominated by black spruce (*Picea mariana*, FACW), paper birch (*Betula papyrifera*, FACU), Sitka alder (*Alnus sinuata*, FAC), bluejoint reedgrass (*Calamagrostis canadensis*, FAC), and beaked sedge (*Carex rostrata*, OBL).

**Soils.** Soils observed in PFO1 wetlands typically consist of grayish brown (10YR 3/2) sandy clay loam in the A horizon (4 to 7 inches below ground surface [bgs]). The B horizon (7 to 18 inches bgs) are typically very dark gray (7.5YR 3/0) loamy sand.

**Hydrology.** The sources of hydrology for the PFO1 wetlands are primarily provided by precipitation and shallow seasonal groundwater from the adjacent drainage area. Saturated soils and inundation observed at the ground surface were the primary indicators of hydrology. Other hydrologic indicators included evidence of standing water (water marks), which likely were created by extended periods of inundation in the wetland. Several areas of the PFO1 wetlands remain saturated throughout the year, which is enough to support stands of beaked sedge.

**Wetland Functions.** Wetland C is a depressional outflow PFO1 wetland that is likely connected to Twister Creek. Wetland C provides a high potential for production and export of organic matter, sediment removal, nutrient and toxicant removal, and general habitat. The wetland also provides a moderate potential for flood flow alteration and native plant richness. Wetland C is considered to have a low potential for providing all other functions.

Wetland D is a PFO1 wetland that provides moderate potential for sediment removal, nutrient and toxicant removal, and general wildlife habitat. However, these functions are limited due to the lack of a direct surface water connection. Wetland D is considered to have a low potential (or is not likely to have any potential) to provide all other functions.

Wetlands C and D are part of a larger forested corridor that provides natural passage for wetland-associated wildlife. See Appendix B for wetland functional assessment forms.

#### 4.2.2 Palustrine Scrub-Shrub Wetlands

**General Description.** Palustrine scrub-shrub wetlands (PSS1) are defined as all non-tidal wetlands dominated by woody vegetation less than 20 feet tall. Vegetation includes true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions (Cowardin et al., 1979). The subclass "1" indicates that these scrub-shrub wetlands are predominantly deciduous and broad-leaved trees or shrubs. Wetland F and a portion of Wetland I are depressional PSS1 wetlands surrounded by upland forest habitat. Wetland F was likely an extension of Wetland I before being disconnected by construction of Beaver Street (Figure 5). Viereck classifications observed in this survey and classified as PSS1 wetlands include Open shrub alder, 25 to 75 percent canopy (IIB2b).

**Vegetation.** Vegetation in PSS1 wetlands is typically dominated by red alder (*Alnus sinuata*, FAC), bluejoint reedgrass, and lady fern (*Athyrium filix-femina*, FAC). Other vegetation includes paper birch and highbush cranberry (*Viburnum edule*, FACU). Adjacent upland vegetation is typically dominated by paper birch, white spruce (*Picea glauca*, FACU), devil's club (*Oplopanax horridus*, FAC), common horsetail (*Equisetum arvense*, FAC), and highbush cranberry.

**Soils.** Typical PSS1 soils observed in the A horizon (4 to 12 inches bgs) are very dark gray (7.5 YR 3/0) silt loam. The B horizon (12+ inches bgs) are dark yellowish brown (10 YR 4/5) sandy loam. Soils in these wetlands typically have 2 to 4 inches of fibric peat in the surface horizon.

**Hydrology.** The sources of hydrology to the PSS1 wetlands are primarily provided by precipitation and shallow seasonal groundwater from the adjacent drainage area. Saturated soils and water marks observed at the ground surface were the primary indicators of hydrology. Other hydrologic indicators include water-stained leaves, which likely were created by extended periods of inundation in the wetland.

**Wetland Functions.** The PSS1 wetlands provide moderate potential for sediment removal, nutrient and toxicant removal, and habitat for wetland-associated birds. However, these functions are limited because of the lack of a direct surface water connection. PSS1 wetlands are considered to have a low potential for providing all other functions. See Appendix B for wetland functional assessment forms.

#### 4.2.3 Palustrine Emergent

**General Description.** Palustrine emergent wetlands (PEM2) are defined as non-tidal wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens that are present for most of the growing season in most years (Cowardin et al., 1979). The persistent subclass (2) indicates the wetland is dominated by species that normally remain standing at least until the beginning of the next growing season. This wetland type is evident throughout the airport study area (Wetlands A/B, E, G, and I). Viereck classifications observed in this survey and classified as PEM2 wetlands include Bluejoint meadow (IIIA2a), Bluejoint herb (IIIA2b), and Lowland sedge wet meadow (IIIA3f).

**Vegetation.** Vegetation in the PEM2 areas is typically dominated by beaked sedge and bluejoint reedgrass. Black spruce, diamond willow (*Salix pulchra*, FAC), and paper birch were observed. Adjacent upland vegetation is typically dominated by paper birch, white spruce, devil's club, highbush cranberry, and common horsetail.

**Soils.** Typical PEM2 soils observed in the A horizon (0 to 4 inches bgs) are very dark gray (10YR 2/2) silt loam without mottles. The B horizons (4 to 18 inches bgs) are dark yellowish brown (10 YR 3/1) sandy loam.

**Hydrology.** The sources of hydrology for the PEM2 wetlands are primarily precipitation and shallow seasonal groundwater from the adjacent drainage area. Saturated soils in the upper 12 inches and water marks observed at the ground surface are the primary indicators of hydrology. Other hydrologic indicators include water-stained leaves, which were likely created by extended periods of inundation in the wetland.

**Wetland Functions.** Wetland A/B is part of a larger wetland complex associated with Twister Creek. This PEM2 wetland provides a high potential for production and export of organic matter, sediment removal, nutrient and toxicant removal, and general habitat. The wetland also provides a moderate potential for flood flow alteration and native plant richness. Wetland A/B is considered to have a low potential for providing all other functions. The dense emergent vegetation in the wetland likely improves water quality that might be affected by runoff from adjacent land uses. Wetland A/B is part of a larger riparian corridor that provides natural passage for wetland-associated fish and wildlife, including salmonids.

PEM2 Wetlands E, G, and I are small depressional wetlands that do not have a direct surface water connection. These wetlands have moderate potential for sediment removal, nutrient and toxicant removal, and general wildlife habitat.

### 4.3 Upland Habitats

The upland habitat surrounding the Talkeetna Airport is primarily forested, with some areas of scrub-shrub and herbaceous meadow. Specific upland vegetation communities in the study area include:

- **Forested uplands** (IC1a- Closed spruce-paper birch forest). Consists of a mix of paper birch and spruce overstory and prickly rose, devil's club, and high bush cranberry understory.
- **Scrub-shrub uplands** (IIB2a- Open tall shrub). Consists of 25 to 75 percent cover of tall willow shrubs.
- **Herbaceous uplands** (IIIA2b- Bluejoint herb). Dominated by bluejoint reedgrass and fireweed species.

#### 4.3.1 Forested Uplands

**General description.** The dominant upland vegetation in the study area is closed mixed spruce-birch communities (IC1a). This type of forested habitat is common on the level to gently rolling floodplains and low river terraces of the Susitna River watershed. It is locally mixed with fresh sedge marsh communities, particularly located to the south of the study area and associated with Twister Creek.

**Vegetation.** Forested upland vegetation is typically dominated by paper birch, white spruce, devil's club, early blueberry (*Vaccinium ovalifolium*, UPL), and highbush cranberry.

**Soils.** Soils observed in the A horizon (1 to 5 inches bgs) in forested uplands are typically dark olive brown (5YR 3/4). The B horizons (5 to 18 inches bgs) are dark yellowish brown

(10 YR 4/6) sandy clay loam. Typically these soils are well drained and exhibit no hydric indicators.

#### 4.3.2 Scrub-Shrub Uplands

**General description.** Past clearing activity at the north end of the Talkeetna Airport runway has enabled different vegetative communities to colonize. Areas impacted 10 to 15 years prior to this survey appear to be dominated by tall willow shrubs (>5 feet tall) and various alder and birch species.

**Vegetation.** Vegetation in scrub-shrub uplands is typically dominated by willow (*Salix spp.*), bluejoint reedgrass, and lady fern. Other vegetation includes paper birch, highbush cranberry, and, to some extent, alders.

**Soils.** Soils observed in adjacent uplands typically have dark grayish brown (10YR 3/3) sandy loam A horizons (0 to 6 inches bgs). The B horizons (6 to 18 inches bgs) are dark yellowish brown (10 YR 3/6) sandy loam.

#### 4.3.3 Herbaceous Uplands

**General description.** Recent disturbance at the northwest end of the Talkeetna Airport runway has enabled different vegetative communities to colonize. Areas impacted within 1 to 5 years prior to this survey appear to be dominated by bluejoint/herb communities.

**Vegetation.** Vegetation in herbaceous uplands is typically dominated by bluejoint reedgrass and fireweed (*Epilobium angustifolium*, FACU).

**Soils.** Soils observed are typically dark grayish brown (10YR 3/3) sandy loam in the A horizon (0 to 6 inches bgs). The B horizons (6 to 18 inches bgs) are dark yellowish brown (10 YR 3/6) sandy loam.

### 4.4 Habitat Evaluation

Forested and scrub-shrub uplands and wetlands provide browse and cover habitat for moose throughout the year. Moose prefer habitat that includes spruce and willow in the overstory (Ballard et al., 1991), which is typical of much of the wetland and upland forested and scrub-shrub habitat around Talkeetna Airport. At the time of the survey, moose scat, tracks, and evidence of browse activity were observed in the wetlands and surrounding uplands.

Many passerines and raptors in Alaska use forested upland habitat for one or more portions of their life cycle. No evidence of passerines or raptors using this habitat was observed at the time of the survey. Grizzly bear, black bear, wolf, coyote, red fox, beaver, lynx, marten, mink, muskrat, river otter, weasel, porcupine, snowshoe hare, and red squirrel are documented (USKH, 2000) as inhabiting the area around the Talkeetna Airport. Due to the presence of various berry-producing plants found in the forested and scrub-shrub upland habitat described above, these habitats most likely provide favorable forage and cover habitat for these mammal species, with the exception of beaver and river otter. The proximity of these habitats to the Twister Creek riparian corridor make them higher-quality habitat than if the habitats were isolated. At the time of the survey, bear scat and tracks were observed in the uplands adjacent to wetlands in the study area.

Emergent wetlands and herbaceous uplands adjacent to the airport runway may provide forage for some species, but are likely not used because of the disturbance by adjacent airport activity.

## 5.0 Impact Analysis

### 5.1 Wetland Habitat Impacts

The Proposed Action would avoid and minimize impacts to wetlands to the maximum extent practicable. Facility locations have been placed to take advantage of existing upland areas and have been configured to avoid wetlands, where possible.

Nevertheless, the Proposed Action would result in 0.48 acre of wetland fill; 0.42 acre of the fill would be associated with construction of the access road, and 0.06 acre with the lease lots (Figure 6). This fill would occur in an emergent wetland (Wetland E) along the western side of the existing runway. This wetland occurs in remnant, abandoned stream channels, is not associated with Twister Creek, and is of relatively low value in wetland function.

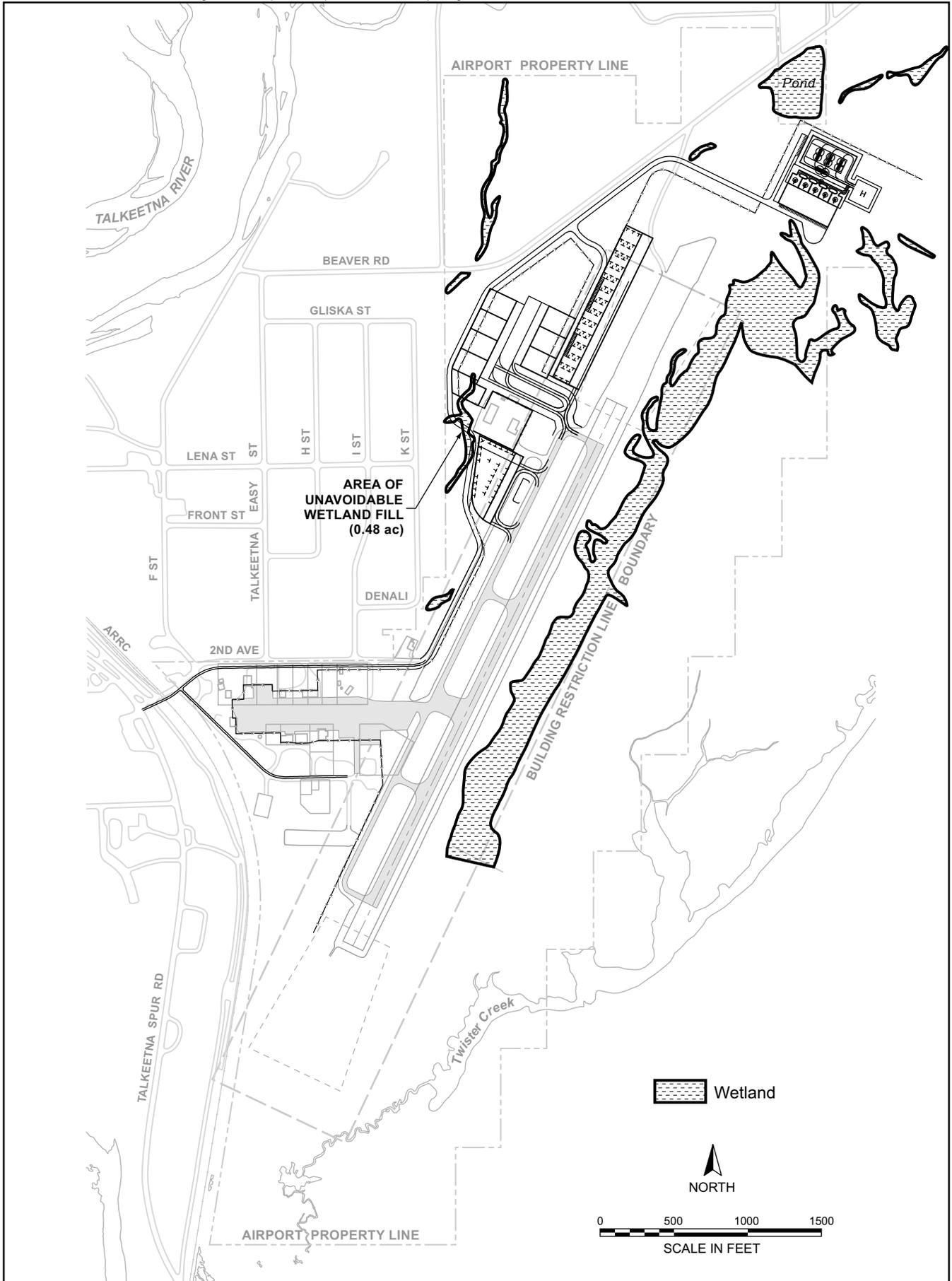
No streams or other water bodies occur within the construction limits of the Proposed Action. No EFH, including Twister Creek and its associated wetlands, would be affected by the Proposed Action. Runoff from impervious surfaces would sheet-flow through upland vegetation before entering Twister Creek.

Wetland impact minimization efforts during construction would include the following:

- Using best management practices (BMPs) throughout project construction
- Prohibiting storage of all machinery, materials, stockpiled soils, and construction activities in wetlands and shoreline areas
- Maintaining existing wetland hydrology during construction as much as practical

### 5.2 Upland Habitat Impacts

Approximately 44 acres of upland vegetation would be cleared to construct the Talkeetna Airport improvements. Most of this vegetation is upland forest habitat. Wildlife that uses this habitat would be permanently displaced, and wildlife in adjacent habitat would be disturbed during project construction. An increase in edge habitat would occur along the margins of the disturbed area. The Proposed Action would not have a measurable effect on the surrounding forest habitat on a regional scale because the upland forest habitat that occurs on the airport property is common and abundant in the Talkeetna vicinity.



Talkeetna Airport Improvements, Phase II  
Wetland, Vegetation, and Wildlife Report

**Figure 6**  
**Wetland Impacts with the**  
**Proposed Action**

## 6.0 References

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APPENDIX A

# Field Data Forms

## Field Data Form Log

Sample Plot ID	Wetland	Upland
DP-01	√- Wetland A	
DP-02		√
DP-03	√- Wetland B	
DP-04		√
DP-05	√- Wetland C	
DP-06	√- Wetland D	
DP-07		√
DP-08	√- Wetland E	
DP-09		√
DP-10	√- Wetland F	
DP-11		√
DP-12	√- Wetland G	
DP-13		√
DP-17	√- Wetland I	
DP-18		√

# WETLAND DETERMINATION FORM

Project #: 167651- Talkeetna Airport EA  
 Client/Owner: Alaska Department of Transportation  
 Investigator: B. DeRosa/ C. Love  
 Do normal circumstances exist on the site? Y  
 Is it an atypical situation? N  
 Is the area a potential problem area? N

Date: 10/21/2003  
 State: Alaska  
 County: Talkeetna  
 Township, Range, Section: \_\_\_\_\_  
 Plant Community: PEM  
 Sample Plot: DP-1

## VEGETATION

<b>Tree stratum</b>				<b>Herbaceous stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status	Total Cover: X% (20% = Y)	% Cover	Dom.	Indicator status
<i>Betula papyrifera</i>	15		FAC	<i>Calamagrostis canadensis</i>	20	X	FAC
<i>Picea glauca</i>	10		FACU	<i>Equisetum arvense</i>	30	X	FAC
<b>Shrub stratum</b>							
Total Cover: X% (20% = Y)	% Cover	Dom.	Status				
<i>Oplopanax horridus</i>	40	X	FAC				
<i>Viburnum edule</i>	20	X	FACU				

% of dominant species that are OBL, FACW, or FAC (excluding FAC-): 3 of 4 = 75.0 %

Comments:

## SOILS

Mapped Unit Name: Not Available      Matches Profile? \_\_\_\_\_  
 Taxonomy: \_\_\_\_\_      Drainage Class: \_\_\_\_\_

Depth	Matrix Color	Mottle Color	Mottle Abundance, Size, Contrast	Soil Texture
0-3	7.5yr3/2			Sandy Loam
3-18	7.5yr4/1	4/N	Few/Medium/Dark	Sandy Loam

Histol       Reducing conditions (test)       Gleyed  
 Histic epipedon       High organic content surface layer       Organic streaking  
 Sulfidic odor       Redox concentrations (w/in 10")       Organic pan  
 Probable aquic moisture regime       Concretions (w/in 3", >2mm)       On hydric soils list

Comments: Both horizons saturated

## HYDROLOGY

Depth of surface water: <u>0</u> Depth to free water in pit: <u>1"</u> Depth to saturated soil: <u>0</u>	<b>Primary Indicators:</b> <input type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in upper 12 in. <input type="checkbox"/> Water marks <input type="checkbox"/> Drift lines <input type="checkbox"/> Sediment deposits <input type="checkbox"/> Drainage patterns in wetlands	<b>Secondary Indicators:</b> <input type="checkbox"/> Oxidized rhizospheres in upper 12 in. <input type="checkbox"/> Water-stained leaves <input type="checkbox"/> Local soil survey data <input type="checkbox"/> FAC neutral test <input type="checkbox"/> Other
--	---	---

Comments:

## WETLAND DETERMINATION

Hydrophytic Vegetation? Yes  
 Hydric Soils? Yes  
 Wetland Hydrology? Yes

Is this sample plot within a wetland? Yes

Comments: Alternative E site, Wetland A

# WETLAND DETERMINATION FORM

Project #: 167651- Talkeetna Airport EA  
 Client/Owner: Alaska Department of Transportation  
 Investigator: B. DeRosa/ C. Love  
 Do normal circumstances exist on the site? Y  
 Is it an atypical situation? N  
 Is the area a potential problem area? N

Date: 10/21/2003  
 State: Alaska  
 County: Talkeetna  
 Township, Range, Section: \_\_\_\_\_  
 Plant Community: upland forest  
 Sample Plot: DP-2

## VEGETATION

<b>Tree stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Betula papyrifera</i>	40	X	FAC
<i>Picea glauca</i>	30	X	FACU
<b>Shrub stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Viburnum edule</i>	40	X	FACU
<i>Rosa acicularis</i>	20	X	FACU

<b>Herbaceous stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Indicator status
<i>Calamagrostis canadensis</i>	20	X	FAC
<i>Epilobium angustifolium</i>	5		FACU

% of dominant species that are OBL, FACW, or FAC (excluding FAC-): 3 of 4 = 75.0 %

Comments:

## SOILS

Mapped Unit Name: Not Available  
 Taxonomy: \_\_\_\_\_

Matches Profile? \_\_\_\_\_  
 Drainage Class: \_\_\_\_\_

Depth	Matrix Color	Mottle Color	Mottle Abundance, Size, Contrast	Soil Texture
0-4	10 YR 3/2	None		loam
4-12	10 YR 3/4	None		sandy loam

_____ Histol	_____ Reducing conditions (test)	_____ Gleyed
_____ Histic epipedon	_____ High organic content surface layer	_____ Organic streaking
_____ Sulfidic odor	_____ Redox concentrations (w/in 10")	_____ Organic pan
_____ Probable aquic moisture regime	_____ Concretions (w/in 3", >2mm)	_____ On hydric soils list

Comments: No hydric soil indicators observed.

## HYDROLOGY

Depth of surface water: NE<12 in  
 Depth to free water in pit: NE<12 in  
 Depth to saturated soil: NE<12 in

Primary Indicators:		Secondary Indicators:	
_____	Inundated	_____	Oxidized rhizospheres in upper 12 in.
_____	Saturated in upper 12 in.	_____	Water-stained leaves
_____	Water marks	_____	Local soil survey data
_____	Drift lines	_____	FAC neutral test
_____	Sediment deposits	_____	Other
_____	Drainage patterns in wetlands	_____	

Comments: No hydrology indicators observed.

## WETLAND DETERMINATION

Hydrophytic Vegetation? No  
 Hydric Soils? No  
 Wetland Hydrology? No

Is this sample plot within a wetland? No

Comments: Alternative E site, Wetland A and B upland data point.

# WETLAND DETERMINATION FORM

Project #: 167651- Talkeetna Airport EA  
 Client/Owner: Alaska Department of Transportation  
 Investigator: B. DeRosa/ C. Love  
 Do normal circumstances exist on the site? Y  
 Is it an atypical situation? N  
 Is the area a potential problem area? N

Date: 10/21/2003  
 State: Alaska  
 County: Talkeetna  
 Township, Range, Section: \_\_\_\_\_  
 Plant Community: PEM  
 Sample Plot: DP-3

## VEGETATION

<b>Tree stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Betula papyrifera</i>	10	X	FAC
<i>Picea mariana</i>	5		FACW
<b>Shrub stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Salix lutea</i>	10	X	OBL

<b>Herbaceous stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Indicator status
<i>Calamagrostis canadensis</i>	70	X	FAC
<i>Carex rostrata</i>	20		OBL

% of dominant species that are OBL, FACW, or FAC (excluding FAC-): 3 of 3 = 100.0 %

Comments:

## SOILS

Mapped Unit Name: Not Available      Matches Profile? \_\_\_\_\_  
 Taxonomy: \_\_\_\_\_      Drainage Class: \_\_\_\_\_

Depth	Matrix Color	Mottle Color	Mottle Abundance, Size, Contrast	Soil Texture
0-5				Fibric Peat Oi
5_10	10yr4/2			Sandy Loam
10_18	4/5BG			Sandy Loam

Histol       Reducing conditions (test)       Gleyed  
 Histic epipedon       High organic content surface layer       Organic streaking  
 Sulfidic odor       Redox concentrations (w/in 10")       Organic pan  
 Probable aquic moisture regime       Concretions (w/in 3", >2mm)       On hydric soils list

Comments: Saturated w/ Highly oxidized root canals

## HYDROLOGY

Depth of surface water: <u>0</u> Depth to free water in pit: <u>3"</u> Depth to saturated soil: <u>0</u>	Primary Indicators:		Secondary Indicators:	
		Inundated		Oxidized rhizospheres in upper 12 in.
	X	Saturated in upper 12 in.	X	
		Water marks		Water-stained leaves
		Drift lines		Local soil survey data
		Sediment deposits		FAC neutral test
		Drainage patterns in wetlands		Other

Comments:

## WETLAND DETERMINATION

Hydrophytic Vegetation? Yes  
 Hydric Soils? Yes  
 Wetland Hydrology? Yes

Is this sample plot within a wetland? Yes

Comments: Wetland B data point.

# WETLAND DETERMINATION FORM

Project #: 167651- Talkeetna Airport EA  
 Client/Owner: Alaska Department of Transportation  
 Investigator: B. DeRosa/ C. Love  
 Do normal circumstances exist on the site? Y  
 Is it an atypical situation? N  
 Is the area a potential problem area? N

Date: 10/21/2003  
 State: Alaska  
 County: Talkeetna  
 Township, Range, Section: \_\_\_\_\_  
 Plant Community: upland forest  
 Sample Plot: DP-4

## VEGETATION

<b>Tree stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Betula papyrifera</i>	30	X	FAC
<i>Picea glauca</i>	10		FACU
<b>Shrub stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Viburnum edule</i>	90	X	FACU
<i>Oplopanax horridus</i>	10		FAC

<b>Herbaceous stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Indicator status
<i>Calamagrostis canadensis</i>	10		FAC
<i>Equisetum arvense</i>	20	X	FAC

% of dominant species that are OBL, FACW, or FAC (excluding FAC-): 2 of 3 = 66.7 %

Comments:

## SOILS

Mapped Unit Name: Not Available Matches Profile? \_\_\_\_\_  
 Taxonomy: \_\_\_\_\_ Drainage Class: \_\_\_\_\_

Depth	Matrix Color	Mottle Color	Mottle Abundance, Size, Contrast	Soil Texture
0-4	10 YR 4/3			sandy loam
4-18	10 YR 4/5			loam

_____ Histol	_____ Reducing conditions (test)	_____ Gleyed
_____ Histic epipedon	_____ High organic content surface layer	_____ Organic streaking
_____ Sulfidic odor	_____ Redox concentrations (w/in 10")	_____ Organic pan
_____ Probable aquic moisture regime	_____ Concretions (w/in 3", >2mm)	_____ On hydric soils list

Comments: No hydric soil indicators observed.

## HYDROLOGY

Depth of surface water: <u>NE&lt; 18 in</u> Depth to free water in pit: <u>NE&lt; 18 in</u> Depth to saturated soil: <u>NE&lt; 18 in</u>	Primary Indicators:		Secondary Indicators:	
	_____ Inundated	_____ Saturated in upper 12 in.	_____ Oxidized rhizospheres in upper 12 in.	_____ Water-stained leaves
	_____ Water marks	_____ Drift lines	_____ Local soil survey data	_____ FAC neutral test
	_____ Sediment deposits	_____ Drainage patterns in wetlands	_____ Other	

Comments: No hydrology indicators observed.

## WETLAND DETERMINATION

Hydrophytic Vegetation? Yes  
 Hydric Soils? No  
 Wetland Hydrology? No  
 Is this sample plot within a wetland? NO

Comments: Alternative E site, upland data point for Wetland B.



# WETLAND DETERMINATION FORM

Project #: 167651- Talkeetna Airport EA  
 Client/Owner: Alaska Department of Transportation  
 Investigator: B. DeRosa/ C. Love  
 Do normal circumstances exist on the site? Y  
 Is it an atypical situation? N  
 Is the area a potential problem area? N

Date: 10/21/2003  
 State: Alaska  
 County: Talkeetna  
 Township, Range, Section: \_\_\_\_\_  
 Plant Community: PFO  
 Sample Plot: DP-6

## VEGETATION

<b>Tree stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Betula papyrifera</i>	25	X	FAC
<i>Picea glauca</i>	5	X	FACU
<b>Shrub stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Salix lutea</i>	50		OBL

<b>Herbaceous stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Indicator status
<i>Calamagrostis canadensis</i>	80		FAC

% of dominant species that are OBL, FACW, or FAC (excluding FAC-): 2 of 3 = 66.7 %

Comments:

## SOILS

Mapped Unit Name: Not Available Taxonomy: \_\_\_\_\_  
 Matches Profile? \_\_\_\_\_ Drainage Class: \_\_\_\_\_

Depth	Matrix Color	Mottle Color	Mottle Abundance, Size, Contrast	Soil Texture
0-4				Fibric Peat Oi
4-8	10yr3/2			Sandy Loam
8-18	5/10y			Sandy Loam

_____ Histol	_____ Reducing conditions (test)	_____ x Gleyed
_____ Histic epipedon	_____ x High organic content surface layer	_____ Organic streaking
_____ Sulfidic odor	_____ Redox concentrations (w/in 10")	_____ Organic pan
_____ Probable aquic moisture regime	_____ Concretions (w/in 3", >2mm)	_____ On hydric soils list

Comments:

## HYDROLOGY

Depth of surface water: <u>0</u> Depth to free water in pit: <u>0</u> Depth to saturated soil: <u>0</u>	Primary Indicators:		Secondary Indicators:	
		Inundated		Oxidized rhizospheres in upper 12 in.
	x	Saturated in upper 12 in.		Water-stained leaves
		Water marks		Local soil survey data
		Drift lines		FAC neutral test
		Sediment deposits		Other
		Drainage patterns in wetlands		

Comments: All horizons saturated.

## WETLAND DETERMINATION

Hydrophytic Vegetation? Yes  
 Hydric Soils? Yes  
 Wetland Hydrology? Yes  
 Is this sample plot within a wetland? YES

Comments: Wetland D data point. Wetland appears to drain towards lacustrine wetland around pond.

# WETLAND DETERMINATION FORM

Project #: 167651- Talkeetna Airport EA  
 Client/Owner: Alaska Department of Transportation  
 Investigator: B. DeRosa/ C. Love  
 Do normal circumstances exist on the site? Y  
 Is it an atypical situation? N  
 Is the area a potential problem area? N

Date: 10/21/2003  
 State: Alaska  
 County: Talkeetna  
 Township, Range, Section: \_\_\_\_\_  
 Plant Community: upland forest  
 Sample Plot: DP-7

## VEGETATION

<b>Tree stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Betula papyrifera</i>	50	X	FAC
<i>Picea glauca</i>	20	X	FACU
<b>Shrub stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Oplopanax horridus</i>	60	X	FAC
<i>Rosa acicularis</i>	TR		FACU
<i>Betula papyrifera</i>	10		FAC

<b>Herbaceous stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Indicator status
<i>Calamagrostis canadensis</i>	20	X	FAC
<i>Equisetum arvense</i>	10		FAC
<i>Cornus canadensis</i>	20	X	FACU

% of dominant species that are OBL, FACW, or FAC (excluding FAC-): 3 of 5 = 60.0 %

Comments: \_\_\_\_\_

## SOILS

Mapped Unit Name: Not Available Matches Profile? \_\_\_\_\_  
 Taxonomy: \_\_\_\_\_ Drainage Class: \_\_\_\_\_

Depth	Matrix Color	Mottle Color	Mottle Abundance, Size, Contrast	Soil Texture
0-3	10 YR 3/3			silt loam
3-18	10 YR 3/6			silt loam

_____ Histol	_____ Reducing conditions (test)	_____ Gleyed
_____ Histic epipedon	_____ High organic content surface layer	_____ Organic streaking
_____ Sulfidic odor	_____ Redox concentrations (w/in 10")	_____ Organic pan
_____ Probable aquic moisture regime	_____ Concretions (w/in 3", >2mm)	_____ On hydric soils list

Comments: No hydric soil indicators observed.

## HYDROLOGY

Depth of surface water: <u>NE&lt;18 in</u> Depth to free water in pit: <u>NE&lt;18 in</u> Depth to saturated soil: <u>NE&lt;18 in</u>	Primary Indicators:		Secondary Indicators:	
	_____	Inundated	_____	Oxidized rhizospheres in upper 12 in.
	_____	Saturated in upper 12 in.	_____	Water-stained leaves
	_____	Water marks	_____	Local soil survey data
	_____	Drift lines	_____	FAC neutral test
	_____	Sediment deposits	_____	Other
	_____	Drainage patterns in wetlands	_____	

Comments: No hydrology indicators observed.

## WETLAND DETERMINATION

Hydrophytic Vegetation? Yes  
 Hydric Soils? No  
 Wetland Hydrology? No  
 Is this sample plot within a wetland? NO  
 Comments: Upland data point for Wetland D.

# WETLAND DETERMINATION FORM

Project #: 167651- Talkeetna Airport EA  
 Client/Owner: Alaska Department of Transportation  
 Investigator: B. DeRosa/ C. Love  
 Do normal circumstances exist on the site? Y  
 Is it an atypical situation? N  
 Is the area a potential problem area? N

Date: 10/22/2003  
 State: Alaska  
 County: Talkeetna  
 Township, Range, Section: \_\_\_\_\_  
 Plant Community: PEM w/ PFO inclusions  
 Sample Plot: DP-8

## VEGETATION

<b>Tree stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Betula papyrifera</i>	10		FAC
<i>Picea glauca</i>	20	X	FACU
<b>Shrub stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Rosa acicularis</i>	10		FACU
<i>Alnus rubra</i>	30	X	FAC

<b>Herbaceous stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Indicator status
<i>Carex rostrata</i>	50	X	OBL
<i>Calamagrostis canadensis</i>	40	X	FAC

% of dominant species that are OBL, FACW, or FAC (excluding FAC-): 3 of 4 = 75.0 %

Comments:

## SOILS

Mapped Unit Name: Not Available Matches Profile? \_\_\_\_\_  
 Taxonomy: \_\_\_\_\_ Drainage Class: \_\_\_\_\_

Depth	Matrix Color	Mottle Color	Mottle Abundance, Size, Contrast	Soil Texture
0-4				Fibric Peat Oi
4_9	7yr 3/2			Sandy Loam
9_18	4/5B			Sandy Loam

_____ Histol	_____ Reducing conditions (test)	_____ x Gleyed
_____ Histic epipedon	_____ High organic content surface layer	_____ Organic streaking
_____ Sulfidic odor	_____ Redox concentrations (w/in 10")	_____ Organic pan
_____ Probable aquic moisture regime	_____ Concretions (w/in 3", >2mm)	_____ On hydric soils list

Comments:

## HYDROLOGY

Depth of surface water: <u>0</u> Depth to free water in pit: <u>1"</u> Depth to saturated soil: <u>0</u>	Primary Indicators:		Secondary Indicators:	
		Inundated		Oxidized rhizospheres in upper 12 in.
	x	Saturated in upper 12 in.		Water-stained leaves
		Water marks		Local soil survey data
		Drift lines		FAC neutral test
		Sediment deposits		Other
	x	Drainage patterns in wetlands		

Comments:

## WETLAND DETERMINATION

Hydrophytic Vegetation? Yes  
 Hydric Soils? Yes  
 Wetland Hydrology? Yes  
 Is this sample plot within a wetland? YES  
 Comments: Wetland E on West Apron Site.

# WETLAND DETERMINATION FORM

Project #: 167651- Talkeetna Airport EA  
 Client/Owner: Alaska Department of Transportation  
 Investigator: B. DeRosa/ C. Love  
 Do normal circumstances exist on the site? Y  
 Is it an atypical situation? N  
 Is the area a potential problem area? N

Date: 10/22/2003  
 State: Alaska  
 County: Talkeetna  
 Township, Range, Section: \_\_\_\_\_  
 Plant Community: upland forest  
 Sample Plot: DP-9

## VEGETATION

<b>Tree stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Betula papyrifera</i>	40	X	FAC
<i>Picea glauca</i>	20	X	FACU
<b>Shrub stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Rosa acicularis</i>	10		FACU
<i>Viburnum edule</i>	30	X	FACU
<i>Oplopanax horridus</i>	40	X	FAC

<b>Herbaceous stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Indicator status
<i>Calamagrostis canadensis</i>	15		FAC
<i>Equisetum arvense</i>	25	X	FAC
<i>Lycopodium sp.</i>	5		Unk.

% of dominant species that are OBL, FACW, or FAC (excluding FAC-): 3 of 5 = 60.0 %

Comments: \_\_\_\_\_

## SOILS

Mapped Unit Name: Not Available Matches Profile? \_\_\_\_\_  
 Taxonomy: \_\_\_\_\_ Drainage Class: \_\_\_\_\_

Depth	Matrix Color	Mottle Color	Mottle Abundance, Size, Contrast	Soil Texture
0-3	10YR 2/2			silt loam
3-14	10 YR 4/4	10 YR 4/2	few, medium, faint	silt loam

_____ Histol	_____ Reducing conditions (test)	_____ Gleyed
_____ Histic epipedon	_____ High organic content surface layer	_____ Organic streaking
_____ Sulfidic odor	_____ Redox concentrations (w/in 10")	_____ Organic pan
_____ Probable aquic moisture regime	_____ Concretions (w/in 3", >2mm)	_____ On hydric soils list

Comments: \_\_\_\_\_

## HYDROLOGY

Depth of surface water: _____ Depth to free water in pit: _____ Depth to saturated soil: _____	Primary Indicators:		Secondary Indicators:	
	_____	Inundated	_____	Oxidized rhizospheres in upper 12 in.
	_____	Saturated in upper 12 in.	_____	Water-stained leaves
	_____	Water marks	_____	Local soil survey data
	_____	Drift lines	_____	FAC neutral test
	_____	Sediment deposits	_____	Other
	_____	Drainage patterns in wetlands	_____	

Comments: No evidence of hydrology observed.

## WETLAND DETERMINATION

Hydrophytic Vegetation? Yes  
 Hydric Soils? No  
 Wetland Hydrology? No  
 Is this sample plot within a wetland? NO

Comments: Upland data point for Wetland E on north Apron site.

# WETLAND DETERMINATION FORM

Project #: 167651- Talkeetna Airport EA  
 Client/Owner: Alaska Department of Transportation  
 Investigator: B. DeRosa/ C. Love  
 Do normal circumstances exist on the site? Y  
 Is it an atypical situation? N  
 Is the area a potential problem area? N

Date: 10/22/2003  
 State: Alaska  
 County: Talkeetna  
 Township, Range, Section: \_\_\_\_\_  
 Plant Community: PSS  
 Sample Plot: DP-10

## VEGETATION

<b>Tree stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Betula papyrifera</i>	10		FAC
<b>Shrub stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Alnus rubra</i>	50	X	FAC
<i>Viburnum edule</i>	10		FACU

<b>Herbaceous stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Indicator status
<i>Calamagrostis canadensis</i>	80	X	FAC
<i>Athyrium filix-femina</i>	20	X	FAC

% of dominant species that are OBL, FACW, or FAC (excluding FAC-): 3 of 3 = 100.0 %

Comments:

## SOILS

Mapped Unit Name: Not Available      Matches Profile? \_\_\_\_\_  
 Taxonomy: \_\_\_\_\_      Drainage Class: \_\_\_\_\_

Depth	Matrix Color	Mottle Color	Mottle Abundance, Size, Contrast	Soil Texture
0-4				Fibric Peat Oi
4_12	7yr 3/1			Silt Loam
12_18	4/5GY			Sandy Loam

_____ Histol	_____ Reducing conditions (test)	_____ X Gleyed
_____ Histic epipedon	_____ High organic content surface layer	_____ Organic streaking
_____ Sulfidic odor	_____ Redox concentrations (w/in 10")	_____ Organic pan
_____ Probable aquic moisture regime	_____ Concretions (w/in 3", >2mm)	_____ On hydric soils list

Comments:

## HYDROLOGY

Depth of surface water: <u>0</u> Depth to free water in pit: <u>0</u> Depth to saturated soil: <u>0</u>	Primary Indicators:		Secondary Indicators:	
		Inundated		Oxidized rhizospheres in upper 12 in.
	x	Saturated in upper 12 in.		
	x	Water marks	x	Water-stained leaves
		Drift lines		Local soil survey data
		Sediment deposits		FAC neutral test
		Drainage patterns in wetlands		Other

Comments: Matted veg

## WETLAND DETERMINATION

Hydrophytic Vegetation? Yes  
 Hydric Soils? Yes  
 Wetland Hydrology? Yes  
 Is this sample plot within a wetland? YES  
 Comments: Wetland F data point in north Apron site.

# WETLAND DETERMINATION FORM

Project #: 167651- Talkeetna Airport EA  
 Client/Owner: Alaska Department of Transportation  
 Investigator: B. DeRosa/ C. Love  
 Do normal circumstances exist on the site? Y  
 Is it an atypical situation? N  
 Is the area a potential problem area? N

Date: 10/22/2003  
 State: Alaska  
 County: Talkeetna  
 Township, Range, Section: \_\_\_\_\_  
 Plant Community: upland forest  
 Sample Plot: DP-11

## VEGETATION

<b>Tree stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Betula papyrifera</i>	40	X	FAC
<i>Picea glauca</i>	TR		FACU
<b>Shrub stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Viburnum edule</i>	50	X	FACU
<i>Oplopanax horridus</i>	30	X	FAC

<b>Herbaceous stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Indicator status
<i>Calamagrostis canadensis</i>	10		FAC
<i>Equisetum arvense</i>	30	X	FAC
<i>Lycopodium spp.</i>	5		Unk.

% of dominant species that are OBL, FACW, or FAC (excluding FAC-): 3 of 4 = 75.0 %

Comments:

## SOILS

Mapped Unit Name: Not Available Matches Profile? \_\_\_\_\_  
 Taxonomy: \_\_\_\_\_ Drainage Class: \_\_\_\_\_

Depth	Matrix Color	Mottle Color	Mottle Abundance, Size, Contrast	Soil Texture
0-6	10 YR 3/3			sandy loam
6-18	10 YR 3/6			sandy loam

_____ Histol	_____ Reducing conditions (test)	_____ Gleyed
_____ Histic epipedon	_____ High organic content surface layer	_____ Organic streaking
_____ Sulfidic odor	_____ Redox concentrations (w/in 10")	_____ Organic pan
_____ Probable aquic moisture regime	_____ Concretions (w/in 3", >2mm)	_____ On hydric soils list

Comments: No evidence of hydric soil observed.

## HYDROLOGY

Depth of surface water: <u>NE&lt;18 in</u> Depth to free water in pit: <u>NE&lt;18 in</u> Depth to saturated soil: <u>NE&lt;18 in</u>	Primary Indicators:		Secondary Indicators:	
	_____	Inundated	_____	Oxidized rhizospheres in upper 12 in.
	_____	Saturated in upper 12 in.	_____	Water-stained leaves
	_____	Water marks	_____	Local soil survey data
	_____	Drift lines	_____	FAC neutral test
	_____	Sediment deposits	_____	Other
	_____	Drainage patterns in wetlands	_____	

Comments: No evidence of hydrology observed.

## WETLAND DETERMINATION

Hydrophytic Vegetation? Yes  
 Hydric Soils? No  
 Wetland Hydrology? No  
 Is this sample plot within a wetland? NO

Comments: Upland data point for Wetland F on north Apron Site.



# WETLAND DETERMINATION FORM

Project #: 167651- Talkeetna Airport EA  
 Client/Owner: Alaska Department of Transportation  
 Investigator: B. DeRosa/ C. Love  
 Do normal circumstances exist on the site? Y  
 Is it an atypical situation? N  
 Is the area a potential problem area? N

Date: 10/22/2003  
 State: Alaska  
 County: Talkeetna  
 Township, Range, Section: \_\_\_\_\_  
 Plant Community: upland shrub  
 Sample Plot: DP-13

## VEGETATION

<b>Tree stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>na</i>			
<b>Shrub stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Alnus rubra</i>	50	X	FAC

<b>Herbaceous stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Indicator status
<i>Heracleum maximum</i>	20	X	FACU
<i>Calamagrostis canadensis</i>	10		FAC
<i>Epilobium angustifolium</i>	10		FACU
<i>Matteuccia struthigoteris</i>	40	X	FACW

% of dominant species that are OBL, FACW, or FAC (excluding FAC-): 2 of 3 = 66.7 %

Comments:

## SOILS

Mapped Unit Name: Not Available Matches Profile? \_\_\_\_\_  
 Taxonomy: \_\_\_\_\_ Drainage Class: \_\_\_\_\_

Depth	Matrix Color	Mottle Color	Mottle Abundance, Size, Contrast	Soil Texture
0-4	10 YR 3/3			sandy loam
4-18	10 YR 4/3			sand

<input type="checkbox"/> Histol	<input type="checkbox"/> Reducing conditions (test)	<input type="checkbox"/> Gleyed
<input type="checkbox"/> Histic epipedon	<input type="checkbox"/> High organic content surface layer	<input type="checkbox"/> Organic streaking
<input type="checkbox"/> Sulfidic odor	<input type="checkbox"/> Redox concentrations (w/in 10")	<input type="checkbox"/> Organic pan
<input type="checkbox"/> Probable aquic moisture regime	<input type="checkbox"/> Concretions (w/in 3", >2mm)	<input type="checkbox"/> On hydric soils list

Comments: No hydric soil indicators observed.

## HYDROLOGY

Depth of surface water: <u>NE&lt; 18 in</u> Depth to free water in pit: <u>NE&lt; 18 in</u> Depth to saturated soil: <u>NE&lt; 18 in</u>	Primary Indicators:		Secondary Indicators:	
	<input type="checkbox"/>	Inundated	<input type="checkbox"/>	Oxidized rhizospheres in upper 12 in.
	<input type="checkbox"/>	Saturated in upper 12 in.	<input type="checkbox"/>	Water-stained leaves
	<input type="checkbox"/>	Water marks	<input type="checkbox"/>	Local soil survey data
	<input type="checkbox"/>	Drift lines	<input type="checkbox"/>	FAC neutral test
	<input type="checkbox"/>	Sediment deposits	<input type="checkbox"/>	Other
	<input type="checkbox"/>	Drainage patterns in wetlands	<input type="checkbox"/>	

Comments: No evidence of hydrology observed.

## WETLAND DETERMINATION

Hydrophytic Vegetation? Yes  
 Hydric Soils? No  
 Wetland Hydrology? No  
 Is this sample plot within a wetland? NO

Comments: Data point south of railroad tracks.

# WETLAND DETERMINATION FORM

Project #: 167651- Talkeetna Airport EA  
 Client/Owner: Alaska Department of Transportation  
 Investigator: B. DeRosa/ C. Love  
 Do normal circumstances exist on the site? Y  
 Is it an atypical situation? N  
 Is the area a potential problem area? N

Date: 10/23/2003  
 State: Alaska  
 County: Talkeetna  
 Township, Range, Section: \_\_\_\_\_  
 Plant Community: PEM/PFO  
 Sample Plot: DP-17

## VEGETATION

<b>Tree stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Betula papyrifera</i>	10	X	FAC
<b>Shrub stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Alnus crispa</i>	10	X	FAC

<b>Herbaceous stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Indicator status
<i>Carex rostrata</i>	70	X	OBL
<i>Calamagrostis canadensis</i>	20	X	FAC

% of dominant species that are OBL, FACW, or FAC (excluding FAC-): 4 of 4 = 100.0 %

Comments:

## SOILS

Mapped Unit Name: Not Available Matches Profile? \_\_\_\_\_  
 Taxonomy: \_\_\_\_\_ Drainage Class: \_\_\_\_\_

Depth	Matrix Color	Mottle Color	Mottle Abundance, Size, Contrast	Soil Texture
0-7	7.5yr 3/1			Silty Clay Loam
7-18	5/10y			Sandy Loam

_____ Histol	_____ Reducing conditions (test)	_____ x Gleyed
_____ Histic epipedon	_____ High organic content surface layer	_____ Organic streaking
_____ Sulfidic odor	_____ Redox concentrations (w/in 10")	_____ Organic pan
_____ Probable aquic moisture regime	_____ Concretions (w/in 3", >2mm)	_____ On hydric soils list

Comments:

## HYDROLOGY

Depth of surface water: <u>0</u> Depth to free water in pit: <u>2"</u> Depth to saturated soil: <u>0</u>	Primary Indicators:		Secondary Indicators:	
		Inundated		Oxidized rhizospheres in upper 12 in.
	x	Saturated in upper 12 in.		Water-stained leaves
	x	Water marks		Local soil survey data
		Drift lines		FAC neutral test
		Sediment deposits		Other
	x	Drainage patterns in wetlands		

Comments: Inundated < 30' away from Data point

## WETLAND DETERMINATION

Hydrophytic Vegetation? Yes  
 Hydric Soils? Yes  
 Wetland Hydrology? Yes  
 Is this sample plot within a wetland? YES

Comments: Wetland I data point located north of Beaver Road.

# WETLAND DETERMINATION FORM

Project #: 167651- Talkeetna Airport EA  
 Client/Owner: Alaska Department of Transportation  
 Investigator: B. DeRosa/ C. Love  
 Do normal circumstances exist on the site? Y  
 Is it an atypical situation? N  
 Is the area a potential problem area? N

Date: 10/24/2003  
 State: Alaska  
 County: Talkeetna  
 Township, Range, Section: \_\_\_\_\_  
 Plant Community: upland forest  
 Sample Plot: DP-18

## VEGETATION

<b>Tree stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Betula papyrifera</i>	40	X	FAC
<i>Picea glauca</i>	25	X	FACU
<i>Alnus rubra</i>	10		FAC
<b>Shrub stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Status
<i>Viburnum edule</i>	20	X	FACU
<i>Oplopanax horridus</i>	30	X	FAC

<b>Herbaceous stratum</b>			
Total Cover: X% (20% = Y)	% Cover	Dom.	Indicator status
<i>Matteuccia struthigoteris</i>	60	X	FACW
<i>Athyrium filix-femina</i>	10		FAC

% of dominant species that are OBL, FACW, or FAC (excluding FAC-): 3 of 5 = 60.0 %

Comments:

## SOILS

Mapped Unit Name: Not Available Matches Profile? \_\_\_\_\_  
 Taxonomy: \_\_\_\_\_ Drainage Class: \_\_\_\_\_

Depth	Matrix Color	Mottle Color	Mottle Abundance, Size, Contrast	Soil Texture
0-4	10 YR 2/2	none		loam
4-14	10 YR 2/4	none		silt loam

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> Histol                         | <input type="checkbox"/> Reducing conditions (test)         | <input type="checkbox"/> Gleyed               |
| <input type="checkbox"/> Histic epipedon                | <input type="checkbox"/> High organic content surface layer | <input type="checkbox"/> Organic streaking    |
| <input type="checkbox"/> Sulfidic odor                  | <input type="checkbox"/> Redox concentrations (w/in 10")    | <input type="checkbox"/> Organic pan          |
| <input type="checkbox"/> Probable aquic moisture regime | <input type="checkbox"/> Concretions (w/in 3", >2mm)        | <input type="checkbox"/> On hydric soils list |

Comments: No hydric soil indicators observed.

## HYDROLOGY

Depth of surface water: NE<14 in  
 Depth to free water in pit: NE<14 in  
 Depth to saturated soil: NE<14 in

Primary Indicators:		Secondary Indicators:	
<input type="checkbox"/>	Inundated	<input type="checkbox"/>	Oxidized rhizospheres in upper 12 in.
<input type="checkbox"/>	Saturated in upper 12 in.	<input type="checkbox"/>	Water-stained leaves
<input type="checkbox"/>	Water marks	<input type="checkbox"/>	Local soil survey data
<input type="checkbox"/>	Drift lines	<input type="checkbox"/>	FAC neutral test
<input type="checkbox"/>	Sediment deposits	<input type="checkbox"/>	Other
<input type="checkbox"/>	Drainage patterns in wetlands	<input type="checkbox"/>	

Comments: No indicators of hydrology observed.

## WETLAND DETERMINATION

Hydrophytic Vegetation? Yes  
 Hydric Soils? No  
 Wetland Hydrology? No  
 Is this sample plot within a wetland? No

Comments: Upland data point for Wetland I located north of Beaver Road.

APPENDIX B

# Wetland Functional Assessment

WETLAND ID	HGM Classification								
	A	B	C	D	E	F	G	I	
COWARDIN CLASS	PFO1	PEM2	PFO1	PFO1	PEM2	PSS1	PEM2	PEM2	

**Current Functional Attributes**

**Floodflow Alteration**

Upper Watershed?	X	X						
Flat/Retention Area?	X	X	X	X	X	X	X	X
Depressional - Closed?			X	X	X	X	X	X
Constricted Outlet?				X				
Dense Woody Veg?								
Receives floodwater?	X	X	X	X				
Sheet flow - not channelized flow?								
<b>Summary</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>

**Sediment Removal**

Sediment Sources Present?						X	X	X
Slow-moving water or deepwater habitat?	X	X	X					X
Dense herbaceous vegetation?	X	X			X	X	X	X
High vegetation-open water dispersion?	X	X			X			
Ponding of water?	X	X	X	X	X	X	X	X
Sediment Deposits present?			X	X	X			
<b>Summary</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>L</b>	<b>M</b>	<b>M</b>	<b>M</b>	<b>M</b>

**Nutrient and Toxicant Removal**

Nutrient/Toxicants present upgradient?								
Inundated or seasonally flooded?	X	X	X	X	X	X	X	X
Long water detention times?	X	X	X		X	X	X	X
At least 30% herbaceous cover?	X	X	X		X	X	X	X
Fine-grained mineral or organic soils?	X	X	X	X	X	X	X	X
<b>Summary</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>L</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>H</b>

**Erosion Control and Shoreline Stabilization**

(If associated with water course or shoreline only)

Dense vegetation border?								
Herbaceous layer?								
Trees and shrubs present?								
<b>Summary</b>	<b>L</b>							

**Organic Matter Production and Export**

At least 30% dense herbaceous vegetation?	X	X	X		X	X	X	X
Mostly deciduous woody plants?	X	X	X	X	X	X	X	X
High degree of richness (structure, density, species?)	X	X		X	X			
High vegetation-open water interspersions?	X	X			X			
Inundated or regularly flooded?	X	X	X	X	X	X	X	X
Outlet for discharge of organic matter?	X	X	X					

WETLAND ID	<i>HGM Classification</i>								
	<i>Slope</i>	<i>Slope</i>	<i>Depressional, Outflow</i>	<i>Depressional, Closed</i>					
COWARDIN CLASS	A	B	C	D	E	F	G	I	
	PFO1	PEM2	PFO1	PFO1	PEM2	PSS1	PEM2	PEM2	
<b>Summary</b>	<b>H</b>	<b>H</b>	<b>M</b>	<b>M</b>	<b>H</b>	<b>M</b>	<b>M</b>	<b>M</b>	
<b>General Habitat Suitability</b>									
Habitat not fragmented?	X	X	X						
Undeveloped uplands?				X				X	
Is wetland connected to other habitats?	X	X	X	X		X	X	X	
High plant species diversity?	X	X		X	X				
More than one Cowardin class?	X	X	X					X	
Cowardin class interspersion?	X	X	X						
Evidence of wildlife use?	X	X	X	X	X	X	X	X	
<b>Summary</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>M</b>	<b>M</b>	<b>L</b>	<b>L</b>	<b>M</b>	
<b>Aquatic Invertebrate Habitat</b>									
(Permanent or seasonal inundation only)	X	X		X	X	X	X	X	
Various water depths?	X	X			X				
Aquatic bed vegetation present?					X				
Emergent vegetation within ponded area?					X	X	X	X	
Cover within standing water area?	X	X		X	X	X	X	X	
Stream within 1.2 miles?	X	X		X	X			X	
<b>Summary</b>	<b>M</b>	<b>M</b>	<b>L</b>	<b>M</b>	<b>H</b>	<b>M</b>	<b>M</b>	<b>M</b>	
<b>Amphibian Habitat</b>									
(Permanent or seasonal inundation only)									
Thin-stemmed emergent or aquatic veg?									
Wetland buffer < 40% developed?									
Woody debris present?									
Is land < 40% developed land within 0.6 mile?									
Other wetlands nearby?									
<b>Summary</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	
<b>Wetland-Associated Mammal Habitat</b>									
(Permanent or seasonal inundation only)	X	X			X			X	
Emergent Vegetation present?	X	X			X			X	
Dense woody vegetation in wetland or buffer?	X	X			X				
Good interspersion of plant strata?	X	X						X	
Interspersion of OW with and without vegetation?	X	X							
Banks suitable for denning?								X	
Evidence of wildlife use?	X	X			X			X	
<b>Summary</b>	<b>H</b>	<b>H</b>	<b>L</b>	<b>L</b>	<b>M</b>	<b>L</b>	<b>L</b>	<b>H</b>	

WETLAND ID	HGM Classification								
	A	B	C	D	E	F	G	I	
COWARDIN CLASS	PFO1	PEM2	PFO1	PFO1	PEM2	PSS1	PEM2	PEM2	
<b>Wetland-Associated Bird Habitat</b>									
30-50% shallow open water/aquatic bed?	X	X							
Emergent vegetation present?	X	X	X	X	X	X	X	X	
PSS or PFO present?	X	X	X	X	X			X	
Snags?	X	X	X	X	X	X	X	X	
Sand bars/mud flats?			X						
Invertebrates, amphibians, fish present?	X	X	X		X				
Undisturbed grass/shrub/forested buffer?	X	X	X	X	X				
Lands within 0.6 mile undisturbed?	X	X	X		X				
<b>Summary</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>M</b>	<b>H</b>	<b>L</b>	<b>L</b>	<b>M</b>	
<b>General Fish Habitat</b>									
(Must be associated with a fish-bearing water)	X	X							
Perennial or intermittent surface-water connection?	X	X							
Water deep enough not to freeze?									
Fish present?									
Vegetation present for cover, shade, or OM?									
Spawning areas present (gravel beds, aquatic veg)?									
<b>Summary</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	
<b>Native Plant Richness</b>									
Dominant and co-dominant plants are native?	X	X	X	X	X	X	X	Y	
Two or more Cowardin classes?	X	X	X					Y	
Three or more strata of vegetation?	X	X	X	X	X	X	X	Y	
Mature trees?	X	X	X		X				
<b>Summary</b>	<b>H</b>	<b>H</b>	<b>H</b>	<b>M</b>	<b>H</b>	<b>M</b>	<b>M</b>	<b>H</b>	
<b>Educational or Scientific Value</b>									
Documented scientific or educational use?									
Public ownership?	X	X	X	X	X	X	X	X	
Parking at site for school bus?									
<b>Summary</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	<b>L</b>	
<b>Uniqueness and Heritage</b>									
State or federally-listed T&E species?									
Documented critical habitat, high quality ecosystems?									
National Natural Landmark or Natural Heritage site?									
Rare biological, geological, etc. features?									
Functionally significant?									
Part of a bog, estuary, or mature forest?									

<i>HGM Classification</i>									
	<i>Slope</i>	<i>Slope</i>	<i>Depressional, Outflow</i>	<i>Depressional, Closed</i>					
<b>WETLAND ID</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>I</b>	
<b>COWARDIN CLASS</b>	PFO1	PEM2	PFO1	PFO1	PEM2	PSS1	PEM2	PEM2	
<b>Summary</b>	L	L	L	L	L	L	L	L	L

**Scoring**

33 percent or less of attributes present: Low functionality (L)  
 Between 34 and 66 percent of attributes present: Moderate functionality (M)  
 67 percent or greater of attributes present: High functionality (H)

# **Wetland Avoidance and Minimization Analysis**



## **Wetland Avoidance and Minimization Analysis**

**Project Name: Talkeetna Airport Improvements**

**Project Number: 54660**

### ***I. Project Scope:*** *Provide a brief description of and reason for the project.*

The purpose of the project is to enhance safety; to satisfy current and forecast demand for airport facilities; and to improve the efficiency of airport operations. The proposed project consists of improvements prioritized by the Alaska Department of Transportation and Public Facilities (ADOT&PF) to meet current and forecast demand through 2008. Other improvements recommended for implementation by 2015 are assessed for cumulative impacts but are not considered part of the Proposed Action. Any future need to implement these projects would be the subject of a separate environmental review, permitting, and other approval process.

The following improvements comprise the Proposed Action and would be built and operational by 2008.

- Construct new apron with eight additional lease lots for use by commercial and general aviation (GA) tenants of the airport to satisfy existing and forecast demand for lease lots.
- Construct new GA and transient aircraft parking aprons to satisfy existing and forecast demand for aircraft parking.
- Construct 84 automobile parking spaces to satisfy existing and forecast demand for automobile parking.
- Relocate the existing helicopter parking and establish a designated heliport in compliance with FAA design standards to separate fixed wing and rotary aircraft, thus enhancing airport safety.
- Install perimeter security fence around portions of the airport to minimize trespass incursions by pedestrians and domestic animals and to segregate aircraft operational areas from public areas to enhance public and airport safety.
- Provide an access road from Second Avenue to the new lease lots and GA apron and the new heliport. Pave the existing access road to the existing apron and lease lots to improve maintenance and operations, decrease dust, and improve drainage.
- Provide a pedestrian safety path to improve public and airport safety.

### ***II. Avoidance Measures:***

*1. Can the proposed project or project components be located in non-wetland area? If not, explain in detail why not. (Refer to preliminary jurisdictional wetland determination.)*

Most of the project components are located in non-wetland area. Potential areas for development on the airport property are constrained by the presence of wetlands, the 100-year floodplain of the Talkeetna and Susitna Rivers, and an abandoned landfill. Project components were located to avoid the 100-year floodplain, construction over the landfills, and high quality wetlands and Essential Fish Habitat (EFH) associated with Twister Creek.

*1.a. If yes, does this non-wetland area provide unique habitat to the area or contain other protected resources (e.g. cultural resources, federally listed or candidate species, bald eagles or other raptors)? Consult with the agency with jurisdiction or expertise if appropriate (e.g. Corps, Service, NOAA Fisheries, ADNR/OHMP).*

Most of the undeveloped, non-wetland area at the airport is located within the 100-year floodplain. Executive Order 11988 Floodplain Management and ADOT&PF policy require encroachment on base floodplains be avoided if there is a practicable alternative. If there is a practicable alternative that meets the project purpose and need and avoids the encroachment, this alternative shall be the Proposed Action. To locate the proposed improvements entirely outside the floodplain, a portion (0.48 acre) of a 0.6 acre depressional emergent wetland would be filled.

*1.b. Are there other project related impacts to the non-wetland areas that are considered substantial (e.g., subsistence use or other socio-economic factors)? Consult with the agency with jurisdiction or expertise if appropriate (e.g. Corps, Service, NOAA Fisheries, ADNR/OHMP).*

An abandoned landfill is located on a portion of the undeveloped airport property outside the 100-year floodplain. To construct project components over the landfill would require excavation and disturbance of potentially contaminated soils. The proposed components were sited to avoid the landfill.

*1.c. Can impacts to active nests of migratory birds be avoided through adherence to construction timing windows (as identified in the USF&WS guidelines "Advisory: Recommended Time Periods for Avoiding Vegetation Clearing in Alaska to protect Migratory Birds")? If not, consult the Service.*

US Fish and Wildlife Service (USF&WS) guidelines for the Talkeetna area recommend that vegetation clearing should not occur between May 1 and July 15 to protect nesting migratory birds that may be on the project site. Vegetation clearing for the proposed project could be completed outside the May 1-July 15 timing window.

*2. In consideration of forecast changes in aircraft used, future airport projects, expected community growth and maintenance considerations, have facilities been sited to avoid wetland impacts? Has this been applied to all individual components of the airport (e.g. the runway, taxiways, aprons, lease lots, navigational aids)?*

The proposed project includes all airport improvements to meet forecast demand, community growth, and maintenance considerations through 2008. The facilities have been sited to avoid wetlands where practicable. Approximated 0.48 acre of wetland would be filled to construct the 2008 improvements. In addition, the layout for additional improvements to meet 2015 forecast demand was also developed to

evaluate potential future wetland impacts. No additional wetlands would be filled to construct the 2015 improvements.

*2.a. Can dimensions of facilities be traded off; i.e., length vs. width of the apron in order to lessen impacts?*

The proposed facilities included in the project are designed to meet FAA and ADOT&PF standards for local airports. The dimensions of the lease lots, heliport, apron, and automobile parking have been designed to avoid most wetlands on the airport property, including all high-quality wetlands associated with Twister Creek. A portion of an access road and a lease lot would encroach on one 0.6 acre wetland. This wetland could not be avoided without encroaching on the 100-year floodplain. Other configurations for the proposed improvements (Alternatives A, B, and C) would impact more total wetland area in two – four individual wetlands.

*2.b. Can the footprint of specific project components be reduced to avoid wetlands i.e., steeper side slopes on support facilities?*

A portion of an access road and a lease lot would be located in wetland. During final design, measures to further reduced wetland will be evaluated. All other facilities have been sited in upland areas.

*2.c. Can facilities be consolidated to avoid impacts?*

Most of the proposed facilities (aprons, lease lots, taxiways, and automobile parking) have been consolidated around the exiting maintenance and operation facility, located on the west side of the existing runway. The proposed heliport and heliport access road would be located north of the runway; however no wetland impacts would result from construction of the heliport and its access road.

*2.d. Have existing roads, pads, runways and other facilities been incorporated into the design of the proposed project to avoid wetland impacts?*

The proposed aprons have been located adjacent to the existing runway to minimize the surface area needed for new taxiways. Access roads have been kept to existing alignments to the extent practicable. The proposed pedestrian safety path is located along an existing road.

*3. Have crossings of fish streams been avoided? (Consult the Anadromous Fish Catalog or contact ADNR/OHMP for information on fish bearing waters.)*

No crossings of fish streams are proposed.

*4. If the Regional Environmental Coordinator has determined that the project may adversely affect Essential Fish Habitat (EFH), list the preliminary EFH conservation measures.*

Twister Creek and some of the wetland area associated with the creek are EFH. No other EFH has been identified in the project area by the NMFS. The proposed project would not adversely affect EFH.

*5. Are bald eagle nest trees at least 330 feet from the project? If not, consult the Service.*

Based on an eagle survey conducted by ADOT&PF in 2003, no eagle nests have been identified within 1 mile of the airport.

*6. Have abandoned pads, roads, runways and other fills associated with the airport project been considered for gravel re-use, rehabilitation, and/or restoration?*

The existing helicopter pad and road to the pad will be abandoned after project construction. However, this facility must remain in operation until the new heliport and other facilities are constructed. Re-use of gravel from these abandoned facilities could be considered for during construction of future improvements.

### **III. Minimization Measures (If the impacts can't be avoided):**

*1. Can the proposed project or project components be located in a lower value wetland area? If not, explain in detail why not. (Refer to appropriate resource mapping or functional value assessment.)*

The proposed project components have been located to avoid high quality wetlands associated with Twister Creek. Wetland impacts have been minimized to 0.48 acre of impact. One 0.6 acre emergent wetland would be affected. It is a depressional wetland with no surface water connections. Because of its small size, single habitat type, and location adjacent to existing airport facilities, this wetland has low to moderate value in sediment, nutrient, and toxics removal, floodflow alteration, and wildlife habitat. All other wetlands on the airport property have been avoided.

*1.a. If yes, would construction affect other protected resources (e.g. cultural resources, federally listed or candidate species, bald eagles or other migratory birds)? Consult with the agency with jurisdiction or expertise if appropriate (e.g. Corps, Service, NOAA Fisheries, ADNR/OHMP, and SHPO).*

See answer to II.1.a above.

*1.b. Are there other project related impacts to this lower value wetland considered substantial (e.g., cultural resources, subsistence use or other socio-economic factors)? Consult with the agency with jurisdiction or expertise if appropriate.*

See answer to II.1.b above.

*2. In consideration of forecast changes in aircraft used, future airport projects, expected community growth and maintenance considerations, have facilities been sited to minimize wetland impacts? Has this been applied to all individual components of the airport (e.g. the runway, taxiways, aprons, lease lots, navigational aids)?*

See answer to II.2 above.

*2.a. Can dimensions of facilities be traded off; i.e., length vs. width of the apron in order to lessen impacts?*

See answer to II.2.a above.

*2.b. Can the footprint of specific project components be reduced to minimize wetlands i.e., steeper side slopes on support facilities?*

See answer to II.2.b above.

2.c. *Can facilities be consolidated to minimize impacts?*

See answer to II.2.c above.

2.d. *Have existing roads, pads, runways and other facilities been incorporated into the design of the proposed project to minimize wetland impacts?*

See answer to II.2.d above.

3. *Have crossings of fish streams been located to minimize impacts to the extent practicable? (Consult the Anadromous Fish Catalog or contact ADNR/OHMP for information on fish bearing waters.)*

No crossing of fish streams is proposed.

3.a. *Has adverse affects to fish spawning habitat been minimized?*

3.b. *Have stream crossing been designed in accordance with the ADOT&PF/ADF&G culver design and construction memorandum?*

4. *If the Regional Environmental Coordinator has determined that the project may adversely affect Essential Fish Habitat (EFH), list the preliminary EFH conservation measures.*

No EFH would be adversely affected.

5. *Have abandoned pads, roads, runways and other fills associated with the airport project been considered for gravel re-use, rehabilitation, and/or restoration?*

See answer to II.6 above.

#### **IV. Material Site Considerations:**

*Contractor supplied and commercial material sites are not subject to an avoidance and minimization review.*

The fill material for the project will be supplied from a permitted, commercial borrow pit, referred to as the Mincher Enterprises property. It is located 3.0 to 3.5 miles from the airport. ADOT&PF has confirmed with the property owner that the site could provide all the fill and aggregate material needed for the Talkeetna Airport improvements.

Should the contractor chose to obtain material from another borrow site or dispose of unsuitable material at another site, ADOT&PF contract language requires the contractor to be responsible for ensuring all required permits and clearances are obtained before construction starts.

1. *Has a material site been identified for the project? If yes, continue, if no go to V.*

Not applicable.

*1.a If a new material site is required, have you considered locating and accessing material an adequate distance from the airport so that it can be reclaimed as wetlands or other wildlife habitat?*

*1.b. Would a new site, located a safe distance from the airport, require a new road, resulting in additional wetland or community use impacts? Are there means to avoid a new access road? Would development of this new site result in more or less wetland impacts than a new or existing material site located closer to the airport?*

*1.c. If a new or existing material site has been selected that would be located a safe distance from the airport and requires minimal additional road building, has a mine reclamation plan been prepared? If located an appropriate distance from the airport can the material site be reclaimed to provide open water habitat such as shallows, islands, and irregular shorelines? (Consult agencies with jurisdiction or special expertise.)*

*1.d. Has geotechnical and hydrological information been collected and used to maximize gravel exploitation while minimizing wetland impacts (e.g., mining deeper, adjusting material site boundaries, and using portions of the pit for temporary stockpiling of materials)?*

*1.e. Has a long-term material site been considered? If so, can a portion of the site be closed and reclaimed at the end of this project?*

#### **V. Additional Material Site Considerations:**

*1. Will project overburden be stockpiled (preferably in uplands) for use as "top soils" or in reclamation of material sites or previously disturbed areas?*

The Mincher Enterprises commercial borrow pit property has also been identified as a disposal area for topsoil and unsuitable material excavated from the airport during construction of the airport improvements.

*2. How will access roads and other fills with the material site be restored upon project completions?*

Not applicable.

*3. Can development of the material site be timed to avoid or minimize effects during spawning, migrations, and nesting periods? (Consult agencies with jurisdiction or special expertise.)*

Not applicable.