Provincetown Municipal Airport
Provincetown, MA

Capital Improvements Plan

Application for Water Quality Certification

with Request for Variance

Submitted by:

Provincetown Airport Commission

August 2015

Prepared by:

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Application for Water Quality Certification with Variance Request

Provincetown Municipal Airport Capital Improvement Plan
176 Race Point Road, Provincetown, MA

Document Organization

Part 1 **Application Forms and Attachments**

Part 2 **Project Narrative and Request for Variance**

Part 3 **Plans and Graphics**

Project Locus Maps and Figures
Project Plans (11x17 and 24x36 formats – MassDEP only)

Part 4 **Attachments**

Note: All Attachments are provided with the WQC Application in electronic form on a CD. Paper copies are available upon request.

Attachment 1	Final Environmental Impact Report/Environmental Assessment (FEIR/EA) and Appendices (including FAA and MassDOT guidance documents)
Attachment 2	MEPA Certificates for FEIR/EA and DEIR
Attachment 3	Project Plans
Attachment 4	Fence Impact Areas (north and south) – PowerPoint presentation (March 2010)
Attachment 5	Stormwater Management Plan (May 2015)
Attachment 6	Order of Resource Area Delineation (January 2007)
Attachment 7	Preliminary Jurisdictional Determination (ACOE; January 2007)
Attachment 8	Order of Conditions issued August 3, 2015
Attachment 9	Coastal Dune Technical Narrative (March 2015)
Attachment 10	MESA Project Review & Draft Rare Species Protection Plans
Attachment 11	Summary of Wetland Resource Areas (April 2007)
Attachment 12	Summary of Natural Resources and Rare Species Habitat Assessments (April 2007)
Attachment 13	Wetland Descriptions and Observations of Habitat Suitability Relative to the Eastern Spadefoot (Scaphiopus h. holbrookii), Provincetown Municipal Airport (July 2009)
Attachment 14	Draft Invasive Species Management Plan
Attachment 15	ILF Fact Sheet and Instrument
Attachment 16	Historic and Tribal Correspondence

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Part 1 Application Forms and Attachments

- WQC Application Form BRP WW 10
- Transmittal Form (X266607)
- Public Notification – Environmental Monitor
- Certified List of Abutters

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Part 2 Project Narrative

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Application for Water Quality Certification with Variance Request

Provincetown Municipal Airport Capital Improvement Plan
Provincetown, MA

Table of Contents

1.0 INTRODUCTION, BACKGROUND, AND PROJECT OVERVIEW 1

1.1 Introduction 1
1.2 Capital Improvements Plan Projects 1
1.3 CIP Project Overview 3
1.3.1 Westerly Taxiway System Improvements 3
1.3.2 Relocate East End Taxiway 4
1.3.3 Install Taxiway Lighting and Construct Electric Vault 4
1.3.4 Repair Sightseeing Shack 5
1.3.5 Improve Access Road to Approach Light System 5
1.3.6 Construct Service Access Roads 5
1.3.7 Install a Perimeter Safety/Security Fence 6
1.3.8 Expand Auto Parking – Phase I 8
1.3.9 Expand Terminal Building 9
1.3.10 Expand Turf Apron 9
1.4 Projects with Wetland Resource Area Impacts 14
1.5 Required Permitting and Review 14
1.5.1 Required Permitting 14
1.5.2 Permitting History 16
1.6 Project Schedule and Environmental Permitting Phasing 18

2.0 GENERAL SITE DESCRIPTION 21

2.1 Airport Facilities 21
2.1.1 Landside Facilities 21
2.1.2 Airside Facilities 21
2.2 Overview of Natural Environment 22
2.3 Freshwater Wetlands 23
2.4 Coastal Dunes 25
2.5 Cultural Grasslands 26
2.6 Coastal Floodplain 27
2.6.1 FEMA Designation 27
2.6.2 Floodplain Background 27
2.7 State-Listed Rare Species Habitat 28
2.7.1 Eastern Box Turtle 29
2.7.2 Eastern Spadefoot 29
2.7.3 Vesper Sparrow 29
2.8 Federally-listed Species 30

Table of Contents (cont.)

3.0 PROJECT PURPOSE AND NEED 31

3.1.1 Acts of Congress 31
3.1.2 Laws and Regulations 32
3.1.3 Airport Operations Safety Design Standards and Guidelines 33
3.1.4 Airport Security Design Standards and Guidelines 33
3.1.5 Airport Waivers 34
3.1.6 Airport Operational Safety and Security CIP Projects with Wetland Impacts 35

3.2 Westerly Taxiway (TW) System Improvements 35
3.3 Relocate the East End TW 38
3.4 Improve Access Road to Approach Lights (MALSF) 39
3.5 Construct Service Access Roads to the Weather Station (AWOS) 40
3.6 Install Perimeter Safety/Security Fence 41

4.0 ALTERNATIVES ANALYSIS 44

4.1 Introduction 45
4.2 Westerly Taxiway System Improvements 45
4.2.1 No Action 46
4.2.2 Westerly TW System Improvements (Proposed Action and Preferred Alternative) 46
4.2.3 Environmentally Preferred Alternative 47
4.2.4 Alternatives Considered But Rejected 49
4.3 East End TW Relocation 49
4.3.1 No Action 49
4.3.2 East End TW Relocation (Proposed Action and Preferred Alternative) 50
4.3.3 Environmentally Preferred Alternative 50
4.3.4 Alternatives Considered But Rejected 50
4.4 Access Road to MALSF Approach Lights 51
4.4.1 No Action 51
4.4.2 Construct Turn-Around (Proposed Action and Preferred Alternative) 51
4.4.3 Environmentally Preferred Alternative 51
4.4.4 Alternatives Considered But Rejected 51
4.5 Service Access Road to the Weather Station (AWOS) 52
4.5.1 No Action 52
4.5.2 Service Access Road to AWOS ("Alternative 2") (Proposed Action and Preferred Alternative) 53
4.5.3 Environmentally Preferred Alternative 53
4.5.4 Alternatives Considered But Rejected 53
4.6 Perimeter Safety/Security Fence 54
4.6.1 No Action 55
4.6.2 Perimeter Safety / Security Fence Concept 6 (Proposed Action and Preferred Alternative) 55
4.6.3 Perimeter Safety / Security Fence Concept 4 56
4.6.4 Perimeter Safety / Security Fence Concept 1 56
4.6.5 Environmentally Preferred Alternative 56
4.6.6 Alternatives Considered But Rejected 57

Table of Contents (cont.)

5.0 AFFECTED RESOURCES 61

5.1 Isolated Freshwater Wetlands 61
5.2 Bordering Vegetated Wetlands 65
5.3 Fence Considerations 68
5.4 Functions and Values of Affected Wetlands 68

6.0 MITIGATION MEASURES 72

6.1 Wetland Mitigation – Restoration and Replacement 73
6.1.1 Wetland Restoration Overview 73
6.1.2 Wetland Restoration Process 74
6.1.3 Wetland Restoration Methodology 75
6.2 Coastal Dune Mitigation 79
6.3 Cultural Grassland Mitigation Methodology 81
6.4 Invasive Species Integrated Management Plan and Resource Enhancement 81
6.5 In-Lieu Fee program 82
6.6 Stormwater Management 83
6.6.1 Existing Conditions 83
6.6.2 Proposed Conditions 84
6.7 Erosion and Sedimentation Control 85
6.8 Rare Species Protection Plans 85
6.9 Construction Management Plan 85
6.10 Vegetation Management Plan 86

7.0 REQUEST FOR VARIANCE 88

7.1 Introduction 88
7.2 ORW Designation 88
7.3 Project Purpose and Need 89
7.4 Project Alternatives 89
7.5 Proposed Mitigation 89
7.6 Variance Request 89

List of Figures

Figure 1 Overview of CIP Project Elements
Figure 2 West End Taxiway
Figure 3 East End Taxiway
Figure 4 AWOS and LES Access Roads
Figure 5 Proposed Fence (Concept 6)
Figure 6 Map of Delineated Wetlands and Coastal Dunes
Figure 7 USGS Topographic Map
Figure 8 Aerial Photograph
Figure 9 Landside Facilities
Figure 10 Airside Facilities
Figure 11 Barrier Beach Limits
Figure 12 FEMA Flood Zones
Figure 13 National Flood Insurance Program, Flood Insurance Rate Maps
Figure 14 Natural Heritage and Endangered Species Program Mapping
Figure 15 Eastern Spadefoot Habitat
Figure 16 Fence Impacts
Figure 17 Vegetation Management Plan
Figure 18 Areas of Wetland Enhancement

List of Tables

Table 1. Breakdown of Fence Impacts by Resource Area and Vegetation Cover Associated with Vegetation Cutting 8
Table 2. Breakdown of Proposed Resource Impacts and Proposed Mitigation Measures for Preferred Alternatives for CIP Projects 11
Table 3. Summary of Wetland Impacts 14
Table 4. Project Permits and Reviews 18
Table 5. Anticipated Construction Phasing 19
Table 6. Summary of Project Purpose and Need for CIP Project Elements Requiring a Water Quality Certification Variance 35
Table 7. Summary of Regulations Pertaining to CIP Safety Projects 43
Table 8. Summary of Impervious Surface Reduction at Provincetown Municipal Airport 48
Table 9. Direct and indirect wetland impacts by resource area and individual wetland area 66
Table 10. Breakdown of Fence Impacts by Resource Area and Vegetation Cover 68
Table 11. Summary of Jurisdictional Wetland Areas Delineated at the Provincetown Municipal Airport, Provincetown, Massachusetts. 70
Table 12. Summary of Proposed Mitigation Measures 72

List of Photos

Photo 1. Provincetown Municipal Airport is located between two major coastal dune ridges. 23
Photo 2. Example of transitional wet meadow/scrub shrub swamp community within managed areas at Airport 24
Photo 3. Example of forested wetland at Airport dominated by pitch pine with an understory of American cranberry 24
Photo 4. Example of low-lying secondary coastal dune habitat within airfield 25
Photo 5. Example of managed grasslands along Airport taxiways and runway 26
Photo 6. View of Hatches Harbor dike facing northeast 28
Photo 7. Eastern portions of Wetland B adjacent to existing gravel path. The proposed fence would traverse a portion of the gravel area to reduce resource area impacts 61
Photo 8. Wetland H is located between Runway 7-25 and Taxiways B, C, and A, and is managed regularly to maintain safe conditions within the airfield 62
Photo 9. Wetland CC is located north of Taxiway A, also within areas maintained for airport safety 63
Photo 10. Wetland BC/F depicting varying habitats within this extensive wetland 64
Photo 11. Open portions of Wetland DB/F/G dominated by American cranberry and herbaceous vegetation 64
Photo 12. Wetland L near the managed areas of the Airport. 65
Photo 13. Various vegetation communities represented by Wetland C/J/FK 65
Photo 14. Example of a bioretention area constructed within a coastal dune setting 84

List of Frequently Used Abbreviations in this Document

ACOE	U.S. Army Corps of Engineers
AWOS	Automated Weather Observing System
BVW	Bordering Vegetated Wetland
CCNS	Cape Cod National Seashore
CCC	Cape Cod Commission
CIP	Capital Improvements Project
DRI	Decision of Regional Impact
EA	Environmental Assessment
FEIR	Final Environmental Impact Report
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
GA	General Aviation
HW	Horsley Witten Group, Inc.
ILS	Instrument Landing System
ILSF	Isolated Land Subject to Flooding
IVW	Isolated Vegetated Wetland
LES	Localizer Equipment Shelter
LSCSF	Land Subject to Coastal Storm Flowage
MassDEP	Massachusetts Department of Environmental Protection
MassDOT	Massachusetts Department of Transportation – Aeronautics Division
MALSF	Medium Intensity Approach Light System with sequenced Flashing lights
MEPA	Massachusetts Environmental Policy Act
MESA	Massachusetts Endangered Species Act
NEPA	National Environmental Policy Act
NHESP	Massachusetts Natural Heritage and Endangered Species Program
NPS	National Park Service
PCC	Provincetown Conservation Commission
PEM	Palustrine Emergent Marsh
PFO	Palustrine Forested
PSS	Palustrine Scrub-Shrub
PVC	Provincetown Municipal Airport
RSA	Runway Safety Area
RW	Runway
TSA	Transportation Security Administration
TW	Taxiway
WOUS	Waters of the United States
WQC	Water Quality Certification

Application for Water Quality Certification with Variance Request

PROJECT NARRATIVE

Provincetown Municipal Airport Capital Improvement Plan
Provincetown, MA

1.0 INTRODUCTION, BACKGROUND, AND PROJECT OVERVIEW

1.1 Introduction

The Provincetown Municipal Airport Commission proposes a Capital Improvements Plan (CIP) Project of safety and facility improvements at the Provincetown Municipal Airport (Airport). All of the proposed CIP Project elements were identified through a master planning process. Implementation of the CIP Project will fulfill the mission of the Airport to operate a safe, secure, and reliable airport.

This application for an Individual Water Quality Certification includes a Request for a Variance because all wetlands in the Cape Cod National Seashore are designated as Outstanding Resource Waters pursuant to the Massachusetts Surface Water Quality Standards at 314 CMR 4.06. This application incorporates information originally presented in the Final Environmental Impact Report/Environmental Assessment and Section 4(f) Evaluation (FEIR/EA) prepared under the Massachusetts Environmental Policy Act (MEPA) and National Environmental Policy Act (NEPA), addresses comments received from the various regulatory agencies and stakeholders, and has been prepared in conformance with Section 27 of the Massachusetts Clean Water Act (M.G.L. C.21 §§ 26 through 53) and the Water Quality Certification (WQC) regulations at 314 CMR 9.00.

The focus of this narrative is on the proposed CIP project elements that will result in impacts to wetland resources, and with the exception of the brief introduction presented in Section 1, only provides details of those projects affecting wetland resources. Additional background on the full CIP Project is provided in the various Attachments, and specifically within the FEIR/EA Attachment 1.

1.2 Capital Improvements Plan Projects

The Airport proposes the implementation of twelve CIP projects (collectively referred to herein as “the Project”). The purpose of these projects is to enhance Airport safety and security and to enhance the efficiency of the Airport to more fully meet current and anticipated needs. Nine of the twelve proposed projects will provide operational safety and security improvements that will bring the Airport into compliance with current Federal Aviation Administration (FAA), Massachusetts Department of Transportation – Aeronautics Division (MassDOT), and

Transportation Security Administration (TSA) safety and security design standards for an airport of this type.

The CIP Project elements described in the above-referenced EA/FEIR included 12 elements as listed below. Those projects with impacts to wetland resource areas are underlined and discussed in Section 1.4. An overview figure of all 12 CIP project elements is provided as Figure 1.[1]

Of these, the Airport Commission seeks to permit eleven of the twelve CIP project elements this year, deferring the terminal building expansion and associated parking lot grading to a future review and permitting process. These will not require WQC because they do not have wetland impacts. Recent changes to the floodzone elevations coupled with the FAA's policy regarding new construction within the Airport's secure airspace have resulted in the need for the project team to reevaluate and/or redesign the elevation of the terminal building. Those Project elements that are underlined involve impacts to wetlands.

1. Construct Westerly Taxiway System Improvements (Realign West End, Mid Connector, and a portion of the parallel Taxiways);
2. Relocate East End Taxiway;
3. Reconstruct Terminal Apron (completed DEP File No. 058-0440);
4. Reconstruct Easterly End of Partial Parallel Taxiway (completed DEP File No. 058-0506);
5. Install Taxiway Lighting and Construct Electric Vault;
6. Repair Sightseeing Shack;
7. Improve Access Road to Approach Light System;
8. Construct Service Access Roads to Localizer Equipment Shelter (LES) and to the Automated Weather Observation Station (AWOS);
9. Install a Perimeter Safety/Security Fence;
10. Expand Auto Parking;
11. Expand Terminal Building; and
12. Expand Turf Apron.

In addition, as noted above, two of the projects (#s 3 and 4) that occurred in the same footprint, were authorized following the issuance of the MEPA Certificate for the Draft Environmental Impact Report (DEIR) (see Attachment 2), were permitted through the Provincetown Conservation Commission and the Massachusetts Natural Heritage and Endangered Species Program (NHESP), and have since been constructed. The Conservation Commission has issued a Certificate of Compliance (COC) for each of these Project elements.

[1] Figure 1 is taken from the FEIR/EA; slight adjustments to the overall configurations and details of the Project elements have been made during project design for permitting, but are essentially the same as previously presented.

1.3 CIP Project Overview

The purpose of these proposed CIP project elements is to provide necessary operational safety and security upgrades at the Airport to comply with current FAA, TSA, and MassDOT regulations and standards, as well as maintain an efficient airport facility to meet current and projected aviation transportation needs. This section describes each proposed Project element, briefly describes the alternatives considered for each project element and how the preferred alternative was selected[2], and describes resource area impacts. Table 2 at the end of this section provides a comprehensive breakdown of wetland resource area impacts incurred by the proposed improvements, by project element, and specific to each affected resource area type. This table also provides a breakdown of proposed mitigation for each project element.

The project elements are shown in concept on aerial photos in Figures 2 through 5. Details of the proposed CIP Project are presented within the enclosed "Town of Provincetown Massachusetts Permitting Plans (Not for Construction), Provincetown Municipal Airport (AIP No. 3-25-0043-36-2013), Capital Improvement Plan," prepared by Jacobs Engineering Inc. and Horsley Witten Group, Inc., dated May 2015 (Sheets 1 through 15); Attachment 3.

Below we provide a brief overview of each of the CIP Project elements.

1.3.1 Westerly Taxiway System Improvements

The Westerly Taxiway System Improvements consist of the following:

- Relocate the West End Taxiway (TW D),
- Realign and reconstruct the westerly end of the parallel taxiway (TW A) with a run-up pad, and
- Realign the Mid Connector Taxiway (TW C).

TW D is currently within the approach to RW 7 and intersects RW 7 in a parallel configuration rather than at a right angle. This puts taxiing planes within the runway approach and, limits pilot view of the runway prior to take-off. Without a tower at the Airport, pilots rely on visual and radio contact. The western end of TW D will be relocated and narrowed to intersect at a ninety-degree angle with the end of Runway 7. The westerly end of the parallel taxiway (TW A) will be realigned, narrowed and will include a run-up pad. The Mid Connector Taxiway (TW C) will be reconstructed in approximately the same alignment at a narrower width with standard right angle intersection with the runway.

Alternatives considered were minimal, as the proposed configuration of the relocated taxiways is largely dictated by runway approach safety standards. The No Action alternative would not meet the project purpose and need for maintaining safe conditions at the Airport.

[2] A detailed alternatives analysis was presented in the FEIR/EA, and for brevity is not presented again in this narrative. An electronic copy of the FEIR/EA is provided as Attachment 1.

Alterations to wetlands and coastal dune have been minimized to the extent practicable. Calculations[3] of project impacts include 29,191 SF of Wetland I (isolated wetland) and 274 SF of Wetland C/J/FK (BVW). Alterations to low-lying coastal dunes[4] are calculated at 5,567 SF. Removal of the existing paved surfaces provides opportunities for on-site wetland restoration and creation of coastal dunes. A discussion of the proposed mitigation measures is provided in the mitigation section of this document (Section 6).

1.3.2 Relocate East End Taxiway

The East End Taxiway project consists of shifting the east end taxiway (TW B) approximately 200 feet to the east so that it connects at the end of Runway 25. Unlike the other two taxiway entrances, TW B has the standard design of a ninety-degree intersection; however, it does not connect with the end of Runway 25. As a result, pilots are required to "back-taxi" prior to takeoff at Runway 25, creating the potential for collisions between back-taxiing aircraft and landing aircraft. Relocation of TW B is designed to address this safety issue. As with the taxiway improvements at the western end, alternatives considered for this project included only the No Action alternative and the proposed project that is designed in accordance with current FAA standards for airport safety.

The East End TW project element will alter approximately 28,110 SF of Wetland Area B and 4,781 SF of coastal dunes. As with the Westerly Taxiway System Improvements, removal of the existing pavement provides an opportunity to restore wetland and dune habitat.

1.3.3 Install Taxiway Lighting and Construct Electric Vault

Currently, there is no lighting along the taxiways. The installation of Taxiway Lighting and the construction of the Electric Vault are designed to improve operational safety on the taxiways during nighttime operations, as well as during inclement weather conditions, and to upgrade the reliability of the power supply to the taxiway and runway lighting systems.

The taxiway edge lights and lighted signs will be installed 10 feet off the edge of the pavement within cultural grasslands that are currently mowed as part of Airport operations. Electric equipment currently housed within the Sightseeing Shack will be upgraded to current electric codes and housed within a new vault adjacent to the Sightseeing Shack. The new electric vault will be a 10 x 10 foot structure, approximately 10 feet tall and similar in appearance to the existing utility buildings for the localizer and the glide slope equipment. An approximately four-foot wide gravel area will be constructed around the vault with a paved walkway to the service door. The vault will be located adjacent to the Sightseeing Shack.

The two primary alternatives analyzed for this Project element include the No Action alternative and the selected alternative as presented. Implementation of the No Action would not meet the project purpose of improving safety conditions along the taxiway. The proposed

[3] Project impacts and mitigation areas were calculated using AutoCAD.
[4] See also Technical Narrative dated March 2015 included as Attachment 9.

action will address the current safety hazards along the taxiways. Alternatives to the electric cable installation were also considered, and the selected method will result in the least disruption to the grassland habitat.

Minimal alterations to the mowed grasslands along the taxiway will be restored in kind following installation of the lights and the electric cable (using the cable plowing method). Construction timing and other construction mitigation measures will minimize rare species habitat impacts. The net result of all grassland impacts will result in no net change to the overall amount of grassland habitat at the Airport.

1.3.4 Repair Sightseeing Shack

Repairs to the Sightseeing Shack consist of repairs to the building once the electrical equipment is removed. The structure will remain within the existing footprint and will not be enlarged. During the MEPA review process the Massachusetts Historical Commission (MHC) determined that it is not an historically significant structure (see Appendices associated with Attachment 1).

Work will occur entirely within the footprint of the existing Sightseeing Shack and will not impact nearby natural resource areas.

1.3.5 Improve Access Road to Approach Light System

Improvements to the access road to the Approach Light System (MALSF) consist of construction of a T-shaped area 25 feet long and 10 feet wide that will provide adequate space for a vehicle to safely reverse direction, as well as minor upgrades to the existing gravel access road. The current design of the Access Road to the MALSF Approach Lights presents hazards to FAA service vehicles. At present, vehicles are required to back up 400 feet along the existing narrow gravel embankment, a difficult maneuver, in part due to the lack of shoulders on the path, and particularly during inclement conditions. FAA design standards for access roads to FAA owned and operated facilities have specific pavement requirements for the roads, including that the first 300 feet will be paved and will use some existing paved area.

Several alternatives to this project element were considered, including the No Action alternative as well as various alternative configurations, each designed to improve the safety conditions for service vehicles. As with other No Action alternatives, this was rejected as it did not meet the purpose and need for addressing safety issues.

This project element will result in 238 SF of impact to Wetland C/J/FK (BVW). Wetland mitigation is provided as discussed in Section 6.

1.3.6 Construct Service Access Roads

FAA maintenance trucks currently access the Localizer Equipment Shelter (LES) and the Weather Station (AWOS) as necessary, traversing areas of low-lying dunes with no formal access point or direction, as there are currently no access roadways to either structure and FAA

maintenance vehicles requiring access to these structures have become stuck in the soft sediments.

The two service access roads will be constructed opposite each other and perpendicular to the (reconfigured) East End TW B. The roadways will be approximately 10 feet wide and banked by one-foot grass shoulders on each side and will also involve small turn-around areas. These narrow access roads will be constructed largely of gravel, and as with the access road for the MALSF, the first 300 feet of these access roadways will be paved to prevent stones and gravel from being tracked onto the runway and taxiway, which can create a safety hazard.

Several alternative configurations and designs were analyzed for each of the Service Access Roads, including the No Action alternative. Ultimately, the design and configuration were driven by FAA safety standards. The No Action alternatives would not meet the project purpose and need for improving safety conditions.

Construction of the access road to the AWOS will necessitate alterations to low-lying coastal dunes (6,595 SF) and 335 SF of wetland alteration within Wetland H. The LES access road will require alterations to 4,768 SF of low-lying coastal dune habitat. Proposed mitigation measures, including construction and timing measures, and compensatory mitigation for the loss of natural resources is part of the design of this alternative.

1.3.7 Install a Perimeter Safety/Security Fence

The perimeter fence is proposed to protect more of the perimeter of the Airport and to deter hazardous wildlife, especially deer, as well as minimize unauthorized access. The proposed fence alignment ("Concept 6") consists of 11,700 linear feet (LF) of fencing, nine feet high. A four-foot wide path on either side of the fence (e.g., an 8-foot wide swath of vegetation) will be maintained as open areas with only low shrubs, to allow for inspection and maintenance of the fence. These areas will be either brush hogged or trimmed, but will not be graded; no perimeter road is proposed.

The proposed fence alignment will almost completely enclose currently unsecured areas, and will connect with the existing sections of fence adjacent to the Cape Cod National Seashore (CCNS) bike path and the Snow Removal Equipment (SRE) building. This will identify the active airfield and safety areas, which comprise approximately 113 acres out of the 331-acre lease area. The western-most end around the ILS system adjacent to Hatches Harbor will not be enclosed.

In consultation with NHESP, the fence design will incorporate gaps that are 6 inches high along the bottom every 100 feet to allow for the movement of Eastern Box Turtles, minimizing impacts to the movements of this state-listed rare species.

For the purposes of assessing the potential impacts associated with the safety/security fence, impacts to wetland resource areas (freshwater wetlands and coastal dunes) have been identified as falling into one of three general categories: direct or indirect Impacts and

Negligible or secondary impacts for mitigation purposes. These categories are based upon discussions with MassDEP and other regulatory agencies specific to characterizing impacts associated with the installation and maintenance of the safety/security fence. Agreement was also reached on what would be considered negligible impacts.

- Direct Impacts. The term Direct Impact identifies alterations which would involve permanent fill (e.g., from fence posts). Direct impacts also include areas of vegetation management that would significantly alter the plant community within the clear areas along the fence such that the wetland plant community would be permanently changed. For instance, vegetation management where the wetland plant community would be appreciably altered from an existing forested community (PFO) or a dense shrub community (PSS) to one that is permanently maintained as a low-growing plant community (PEM) has been included as a direct impact. However, it is anticipated that these areas will continue to function as wetlands with similar functions and values. For the purposes of distinguishing the two types of alteration, these areas have been broken out separately (see Tables 2 and 9).
- Indirect Impacts. Indirect impacts would not significantly alter the wetlands or dunes and would not impair the ability of these resource areas to continue to provide the same and values as those provided by these areas prior to disturbance. An example of indirect impacts may be associated with the long-term maintenance of low growing shrub community, but still maintaining a shrub swamp community.
- Negligible Impacts. Areas of minimal, if any, vegetation cutting and maintenance would not be considered an impact. For example, where the fence alignment would traverse existing low-growing plant communities, this area would not be included as an impact (but for the impacts associated with the fence posts, which have been accounted for as Direct Impacts). In addition, vegetation management practices that would necessitate the cutting of *Phragmites* within the wetland along the fence alignment would be considered a negligible impact. *Phragmites* is currently cut by the Airport in the Instrument Landing System (ILS) area and the plant is also cut by other agencies for mosquito control or drainage.

The proposed fence will result in unavoidable impacts to resource areas, including direct alterations of 1,664 SF of BVW (512 SF direct fill for fence posts; 1,152 SF vegetation cutting), 23,656 SF of isolated freshwater wetlands (452 SF direct fill for fence posts; 23,204 SF vegetation cutting), as well as 8,060 SF of coastal dune (direct fill and cutting). Long-term maintenance of a low-growing shrub or herbaceous plant community within a four-foot wide strip on either side of the fence (i.e., an eight-foot wide strip) will indirectly impact 9,728 SF of BVW, 31,576 SF of isolated freshwater wetlands, and 24,028 SF of coastal dunes. Table 1 summarizes the various direct and indirect impacts with additional detail provided on Tables 2 and 9; Figure 16 provides a visual depiction of these areas. In addition, the Project Team previously prepared a visual presentation of the impacted areas based upon the preferred alternative ("Concept 6"), which is included as Attachment 4.

Table 1. Breakdown of Fence Impacts by Resource Area and Vegetation Cover Associated with Vegetation Cutting

FENCE IMPACTS BY VEGETATION COVER					
	BVW	**IVW**	**Coastal Dunes**	**Grassland**	**Gravel**
Vegetation Community Type:	Area (SF)				
Open Dune or Open Herbaceous	(2,812)	(3,744)	(22,234)	(1,852)	(708)
Low shrubs (PEM/PSS)	(952)	(208)	(1,704)	--	--
Dense Shrubs (PSS)	--	5,926	2,108	--	--
Pitch Pine w/o understory (PFO)	1,152	16,550	5,216	--	--
Dense Pitch Pine & Shrubs (PFO)	--	728	664	--	--
Phragmites	(5,208)	--	--	--	--
TOTAL TO BE CUT*:	**1,152**	**23,204**	**8,060**	(1,852)	(708)
INDIRECT/SECONDARY	9,728	31,576	24,208		
Phragmites (to be cut)	5,208	--			

**Note areas of Open Dune or Open Herbaceous vegetation or Low-growing Shrubs (in parentheses) are not anticipated to be directly impacted by the fence, as these areas would not need to be cut to maintain a clear area along the fence.*

1.3.8 Expand Auto Parking – Phase I

The expansion of the auto parking area is proposed to meet existing and projected parking needs assessed during the CIP master planning. Phase I of the parking lot expansion (the only portion proposed for permitting at this time) will involve the construction of 28 additional spaces adjacent to the existing parking lot and reconstruction of a portion of the deteriorating Airport Road. The proposed parking area will be constructed with a permeable paved drive aisle (or equivalent) and gravel paver parking spaces. These pervious surfaces will allow for infiltration and groundwater recharge. In addition, a bioretention system with two forebays will provide stormwater management and water quality treatment for larger storms that do not infiltrate directly through the porous pavement system and will serve as backup to the porous pavement system. A brief discussion of the proposed Stormwater Management is provided below in Section 6.6. Additional details are provided in the attached Stormwater Report (Attachment 5) and on the project plans. In addition, the Airport will provide landscape buffers to screen the new parking areas.

Alternatives to the Phase I parking lot design and configuration were analyzed, including the No Action alternative. Phase I is designed to address the current parking demand[5] Only after additional parking studies are conducted and subsequently reviewed and approved by National Park Service (NPS) and Cape Cod Commission (CCC) staff, would a second phase go forward.. As presented in the MEPA/NEPA documents, the phases were intended to be permitted separately

[5] Phase II as described in the FEIR/EA has been deferred until additional analysis.

so that each phase could be evaluated independently, but to allow for an understanding of the entire project.

Phase I of the proposed parking lot expansion will result in alterations to approximately 15,100 SF of coastal dunes. Graded areas and the proposed bioretention cells will be vegetated with native dune plantings to minimize the visual impacts and help blend the stormwater structure into the surrounding dune area. An example of such design is depicted in Photo 1.

1.3.9 Expand Terminal Building

As noted, the terminal building Project element has been deferred to allow for a reevaluation and/or redesign of the previously presented terminal building design. The preferred alternative would not have any impacts to wetlands or coastal dunes.

1.3.10 Expand Turf Apron

The existing turf apron is not able to accommodate all parking aircraft outside of the Taxiway Object Free Area (TOFA) during the peak season. The turf apron expansion will be situated between the two existing turf apron parking areas adjacent to the parallel TW (Taxiway A). The area will be reinforced to support light, single-engine general aviation (GA) aircraft.

Approximately 16,780 SF of existing managed cultural grassland habitat will be temporarily impacted during construction, and will be restored to managed grassland habitat.

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Table 2. Breakdown of Proposed Resource Impacts and Proposed Mitigation Measures for Preferred Alternatives for CIP Projects

ISOLATED FRESHWATER WETLANDS				
DIRECT FILL IMPACTS			**PROPOSED MITIGATION**	
PROJECT	**IMPACT AREA**	**FUNCTIONS AND VALUES**	**DESCRIPTION OF PROPOSED MITIGATION**	**AREA OF PROPOSED MITIGATION**
Westerly TW System Improvements	29,191 SF / 0.67 ac (Wetland I)	flood storage/flood control; groundwater and water quality; wildlife habitat	Wetland Restoration (Areas A & C)	80,000 SF (1.84 ac)
Relocate East End TW	28,110 SF / 0.65 ac (Wetland B)	flood storage/flood control; groundwater and water quality; wildlife habitat; rare species breeding habitat (ES)		
Construct Service Access Road AWOS Road	335 SF / 0.01 ac (Wetland H)			
Install Perimeter Fence	452 SF / 0.01 ac (various)	[various]		
TOTAL DIRECT FILL	**58,088 SF / 1.33 ac**	--		
SECONDARY IMPACTS (Change in Vegetative Community)			PROPOSED MITIGATION	
Install Perimeter Fence	5,926 SF / 0.12 ac (PSS)	flood storage/flood control; groundwater and water quality; wildlife habitat; potential rare species breeding habitat; avoids prime ES breeding habitat	Invasive Species Management (Wetlands B, H, and I)	616,350 SF (14.2 ac)
	728 SF / 0.02 ac (PFO, shrub understory)			
	16,550 SF / 0.38 ac (PFO, open understory)			
TOTAL CUTTING IMPACTS	**23,204 SF / 0.53 ac**	--		
INDIRECT IMPACTS			PROPOSED MITIGATION	
Install Perimeter Fence	31,576 SF / 0.72 ac (PEM/low-growing PSS)	flood storage/flood control; groundwater and water quality; wildlife habitat; potential rare species breeding habitat	Invasive Species Management (Wetlands B, H, and I)	616,350 SF (14.2 ac)
TOTAL INDIRECT IMPACTS	31,576 SF / 0.72 ac	--		

For permitting purposes, direct fence impacts within BVW have been calculated based upon direct fill for the fence posts and conversion of forested and dense shrub areas to low growing communities as a result of long-term vegetation management. Additional impacts to 5,208 SF of a *Phragmites australis* monoculture will be mitigated through a program of invasive species management.

EBT = Eastern Box Turtle Habitat
ES(B) = Eastern Spadefoot Toad Breeding Habitat
ES(N) = Eastern Spadefoot Toad Non-Breeding Habitat
VS = Vesper Sparrow Habitat

Table 2 (cont.). Breakdown of Proposed Resource Impacts and Proposed Mitigation Measures for Preferred Alternatives for CIP Projects

BORDERING VEGETATED WETLANDS (Wetland C/J/FK)				
DIRECT FILL IMPACTS			**PROPOSED MITIGATION**	
PROJECT	**IMPACT AREA**	**FUNCTIONS AND VALUES**	**DESCRIPTION OF PROPOSED MITIGATION**	**AREA OF PROPOSED MITIGATION (SF)**
Westerly TW System Improvements	274 SF / 0.01 ac	flood storage/flood control; groundwater and water quality; wildlife habitat	Wetland Restoration (Area C)	5,000 SF / 0.11 ac
Improve Access Road to Approach Lights (MALSF)	238 SF / 0.01 ac	flood storage/flood control; groundwater and water quality; wildlife habitat; rare species habitat (EBT)		
TOTAL DIRECT FILL	**512 SF / 0.01 ac**	--		
DIRECT IMPACTS (VEGETATION CUTTING)			PROPOSED MITIGATION	
Install Perimeter Fence	1,152 SF / 0.03 ac			
TOTAL DIRECT IMPACTS	**1,664 SF / 0.03 ac**	--		
SECONDARY / INDIRECT IMPACTS			PROPOSED MITIGATION	
Install Perimeter Fence	5,208 SF / 0.12 ac (*Phragmites*)	flood storage/flood control; groundwater and water quality; wildlife habitat	Invasive Species Management (Wetlands B, H, and I)	616,350 SF / 14.2 ac
TOTAL INDIRECT IMPACTS	**9,728 SF / 0.22 ac**			

For permitting purposes, direct fence impacts within BVW have been calculated based upon direct fill for the fence posts and conversion of forested and dense shrub areas to low growing communities as a result of long-term vegetation management. Indirect impacts include areas that may not be cut initially, but occur within the cleared access way. Additional impacts to 5,208 SF of a *Phragmites australis* monoculture will be mitigated through a program of invasive species management.

EBT = Eastern Box Turtle Habitat
ES(B) = Eastern Spadefoot Toad Breeding Habitat
ES(N) = Eastern Spadefoot Toad Non-Breeding Habitat
VS = Vesper Sparrow Habitat

Table 2 (cont.). Breakdown of Proposed Resource Impacts and Proposed Mitigation Measures for Preferred Alternatives for CIP Projects

COASTAL DUNE				
DIRECT IMPACTS			**PROPOSED MITIGATION**	
PROJECT	**IMPACT AREA**	**FUNCTIONS AND VALUES**	**DESCRIPTION OF PROPOSED MITIGATION**	**AREA OF PROPOSED MITIGATION**
Westerly TW System Improvements	5,567 SF / 0.13 ac	wildlife habitat; rare species habitat (EBT, ES(N))	Dune Creation Areas A & C	36,000 SF (0.83 ac)
Construct LES Service Access Road	4,768 SF/ 0.11 ac			
Construct AWOS Service Access Road	6,595 SF/ 0.15 ac			
Expand Auto Parking (Phase 1)	7,315 SF / 0.17 ac			
TOTAL DIRECT FILL	**44,871 SF / 1.03 ac**			
Install Perimeter Fence	2,180 SF / 0.05 ac dense shrubs	wildlife habitat; rare species habitat (EBT, ES(N))	Invasive Species Management	TBA
	664 SF / 0.02 ac forested – open understory			
	5,216 SF / 0.12 ac forested – shrubs			
TOTAL DIRECT IMPACTS	**8,060 SF / 0.19 ac**			
INDIRECT IMPACTS			**PROPOSED MITIGATION**	
Install Perimeter Fence	24,028 SF / 0.55 ac	wildlife habitat; rare species habitat (EBT, ES(N))	Invasive Species Management	TBA
TOTAL INDIRECT IMPACTS	**24,028 SF / 0.55 ac**			

For permitting purposes, direct fence impacts within coastal dunes have been calculated based upon direct fill for the fence posts and conversion of forested and dense shrub areas to low growing communities as a result of long-term vegetation management.

EBT = Eastern Box Turtle Habitat
ES(B) = Eastern Spadefoot Toad Breeding Habitat
ES(N) = Eastern Spadefoot Toad Non-Breeding Habitat
VS = Vesper Sparrow Habitat

1.4 Projects with Wetland Resource Area Impacts

Five of the project elements will result in unavoidable impacts to freshwater wetlands, both Bordering Vegetated Wetland (BVW) and Isolated Vegetated Wetlands (IVW), and are the focus of this Application for Water Quality Certification (WQC) and Variance Request:

- Construct Westerly Taxiway System Improvements (CIP #1);
- Relocate East End Taxiway (CIP #2);
- Improve Access Road to Approach Light System (CIP #7);
- Construct Service Access Roads to the AWOS (CIP #8); and
- Install Perimeter Safety/Security Fence (CIP #9).

Impacts from implementation of the individual project elements are broken down in Table 3, below.

Table 3. Summary of Wetland Impacts

Project Element	Wetland Impacts (BVW + IVW)	
	(SF)	(acres)
West End Taxiway System	29,465	0.68
East End Taxiway	28,110	0.65
MALSF Access Road	238	0.01
Access Road to AWOS	335	0.01
Perimeter Fence		
Direct Impacts (Fill)	58,600	1.35
Direct Impacts (Vegetation Cutting)	24,356	0.56
TOTAL DIRECT IMPACTS*	**82,956**	**1.90**
Indirect impacts	41,304	0.95

A total of 1.90 acres of direct wetland alteration will occur as a result of the CIP Project. Additional discussion of the affected resources is provided in Section 5.

1.5 Required Permitting and Review

1.5.1 Required Permitting

The CIP Project will require several state, regional, and federal permits prior to construction. The Airport seeks to permit eleven of the originally presented twelve CIP project elements this year, five of which will require WQC with a Variance. An overview of the required permitting and current status of environmental permitting for the CIP project is provided below. Table 4 summarizes the CIP Project permitting status.

- *Federal Clean Water Act*

Five of the project elements will result in alterations to freshwater wetlands. A 401 Water Quality Certification (WQC) with Variance is required from the MA Department of Environmental Protection in accordance with the provisions of M.G.L. c.21, §§ 26-53, Section 401 of the Federal Clean Water Act (33 U.S.C. §1251 et seq.), and the implementing regulations at (314 CMR 9.00). WQC is required because the proposed work will cumulatively alter greater than 5,000 square feet of Bordering Vegetated Wetland (BVW) and Isolated Vegetated Wetlands (IVW). A Variance under the provisions at 314 CMR 9.06(8) is also required as all wetlands within the CCNS are designated Outstanding Resource Waters (ORWs).

In addition, an Individual Permit is required from the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act for impacts to waters of the United Stated of greater than one acre. An approved Mitigation Plan is required as part of the Corps permit.

- *Massachusetts Wetlands Protection Act*

An Order of Conditions (OOC) is required under the Massachusetts Wetlands Protection Act for impacts to wetland resource areas.

- *Provincetown Wetlands By-Law*

A separate OOC is required under the Town of Provincetown Wetlands Protection Bylaw (Chapter 12 of the Provincetown General Bylaws) at the conclusion of the DRI review process per CCC regulations.

- *Massachusetts Coastal Zone Management Federal Consistency*

As the Airport is located within the Massachusetts coastal zone, the CIP Project is required to undergo consistency review under Section 307 of the Federal Coastal Zone Management (CZM) Act of 1972. This requires that the Corps provide a consistency statement and receive concurrence from the Massachusetts CZM prior to issuance of the Individual Permit.

- *Massachusetts Endangered Species Act*

Pursuant to the Massachusetts *Endangered Species Act* (M.G.L. Ch. 131A; MESA), a MESA Project Review from the (NHESP is required for activities within *Estimated Habitat of Rare Wildlife* and *Priority Habitat of Rare Species*.

- Cape Cod Commission Regional Policy Plan

The Airport Commission must also seek a Decision from the Cape Cod Commission (CCC) for a Development of Regional Impact (DRI), and must meet the Minimum Performance Standards (MPS) under the Regional Policy Plan (RPP). Certain components of the CIP Project will require

a Hardship Exemption from certain MPSs pertaining to wetlands and wildlife habitat. The Applicant also seeks to have the CCC invoke its flexibility clause where appropriate.

1.5.2 Permitting History

- MEPA / NEPA Review

The proposed Project recently completed environmental review through the Massachusetts Environmental Policy Act, M.G.L. c. 30 §§ 61 through 62H, inclusive (MEPA), and the Secretary of the Executive Office of Energy and Environmental Affairs (EEA) issued a Certificate on the FEIR/EA on February 17, 2012, allowing the Project to move forward with environmental permitting (EEA No. 13789) (see Attachment 2).

The FEIR/EA was a joint document, prepared to be consistent with the National Environmental Policy Act (42 U.S.C. 4321-4347 or NEPA). Statements of Findings (SOFs) were also submitted by the FAA regarding two Executive Orders: E.O. 11990 (Wetland Protection) and E.O. 11988 (Floodplain Management). FAA issued its Finding of No Significant Impact (FONSI) based upon a review of these documents on May 24, 2012; NPS issued its FONSI on April 9, 2014. These documents are included in the appendices to Attachment 1.

- Previous Environmental Permitting through MA DEP

In 1999, a Final Environmental Impact Statement (FEIS)/FEIR/Section 4(f) Statement was prepared for the previously proposed Airport Improvements Program that included improvements to the runway safety areas, navigational system, terminal building, and other facilities (EOEA No. 9386). These projects were implemented between 2001 and 2003. Extensive coordination between the NPS and the FAA took place regarding preconditions to any proposed expansion of the runway. The Agreement established a future process that would need to be followed to analyze the potential for impacts of a runway expansion. The full text of that agreement (Attachment 1), the FAA ROD (November 16, 2000), the NPS ROD (November 28, 2001), and the letter from NPS to FAA (February 21, 2001) are provided in the FEIR/EA appendices (Appendix 5). No runway extension was approved at that time and no runway extension is proposed at this time.

- Wetland Boundary Confirmation

The wetland resources at the Airport were field delineated and survey-located by wetland scientists at the Horsley Witten Group, Inc. (HW), subcontractors of the Airport. It should be noted that only those wetland areas in close proximity to the proposed project elements and/or their alternative locations have been delineated within the 331-acre Airport site, each identified with an alphabetical designation. The location of wetlands outside of the assessment areas were obtained through Massachusetts Geographic Information Services (MassGIS). An Abbreviated Notice of Resource Area Delineation (ANRAD) was submitted to the Provincetown Conservation Commission and the Massachusetts Department of Environmental Protection

(DEP) by HW. The delineated wetland boundaries indicated on Figure 6 have been approved by the Conservation Commission to the extent of their jurisdiction (DEP File No. SE-058-0425) through an Order of resoruce Area Delineation (ORAD). The ORAD was issued on January 2007, and was renewed for a three-year period until January 25, 2013, and is extended through *Chapter 240 of the Acts of 2010* and the 2012 Economic Development Act until January 2017 (Attachment 6).

The Airport has also obtained a Preliminary Jurisdictional Determination (JD) from the U.S. Army Corps of Engineers (Corps), which does not expire (Attachment 7).

- Orders of Conditions Issued to Date

The Provincetown Conservation Commission issued an Order of Conditions (OOC) approving the CIP Project (excepting the terminal building) on August 3, 2015 (DEP File No. 058-0535). This OOC was issued under the Massachusetts *Wetlands Protection Act* only (Attachment 8). The OOC includes findings and conditions consistent with Attachment 9.

As noted above, two of the CIP Project elements have been permitted and constructed as per the July 18, 2007 Certificate issued on the NPC/DEIR/EA; approved under both the Massachusetts Wetlands Protection Act and the local bylaw, including reconstruction of the Terminal Apron (DEP File No. 058-0440); and reconstruction of the Easterly End of Taxiway (DEP File No. 058-0506). These projects have been constructed and the Provincetown Conservation Commission has issued COCs for each.

- MESA Project Review

The Airport Commission completed its MESA Project Review in August 2014, and has received a conditional “no take” determination from NHESP requiring the development and implementation of project-specific rare species protection plans. The Airport will continue to work with NHESP to ensure protection of rare species habitat. A copy of the NHESP letter and draft copies of rare species protection plans that provide the framework for the project-specific plans is provided in Attachment 10.

Table 4. Project Permits and Reviews

Review / Permit	Issuing Authority / Reviewing Agency	Action / Status
MEPA	MEPA Unit, Executive Office of Energy and Environmental Affairs (EEA No. 13789)	FEIR Certificate issued 02/17/12
NEPA	FAA and NPS	FAA FONSI issued 05/24/12 NPS FONSI issued 04/09/14
National Historic Preservation Act, Section 106	Massachusetts Historical Commission (MHC RC.9962)	Completed 04/02/07
ANRAD	Provincetown Conservation Commission MassDEP File No. 058-0425	ORAD issued 01/25/07; valid through 01/25/17
Section 404 Clean Water Act, Preliminary Jurisdictional Determination (PJD)	ACOE (NAE-2006-4281)	PJD issued 01/08/07
Section 404 Clean Water Act	ACOE (NAE-2006-4281)	Application submitted
CZM Federal Consistency Certification	MA Office of Coastal Zone Management	Pending
401 WQC with Variance	MassDEP (Trans. X266607)	Application submitted
DRI	Cape Cod Commission	Application submitted
OOC under Massachusetts Wetlands Protection Act	Provincetown Conservation Commission: MassDEP File No. 058-0440 MassDEP File No. 058-0506 MassDEP File No. 058-0535	OOC issued 04/01/08; COC OOC issued 04/17/12;COC OOC issued 08/03/15
OOC pursuant to Provincetown Wetlands Bylaw	Provincetown Conservation Commission	Application pending
MESA Project Review	NHESP (04-15716)	Issued 08/08/14
National Pollutant Discharge Elimination System General Permit for Construction (NPDES)	U.S. Environmental Protection Agency	Application by contractor prior to construction

1.6 Project Schedule and Environmental Permitting Phasing

The CIP projects would be constructed over the period of the next ten years. Table 5 provides the construction phasing for the projects. Permitting for the projects would be structured to allow individual projects, or groups of projects, to go forward as funding is available. However, all of the CIP project elements are presented in this document to provide the environmental resource agencies an understanding of the overall potential for impacts and to avoid the segmentation of project review.

Table 5. Anticipated Construction Phasing

CIP Project Element	Construction Year
1. Reconstruct Terminal Apron (*Completed; DEP File No. 058-0440*)	Fall 2008
2. Westerly Taxiway System Improvements	2016-2017
3. Reconstruct Easterly End of Partial Parallel TW (*Permitted; DEP File No. 058-0506*)	Fall 2012
4. Relocate East End TW 5. Install TW Lighting and Construct Electric Vault 6. Sightseeing Shack Improvements	2017
7.Improve Access Road to Approach Lights (MALSF)	2016-2017
8. Construct Service Access Roads to AWOS and LES	2017
9. Install Perimeter Safety/Security Fence	2018
10. Expand Auto Parking	2019
11. Expand Terminal Building	TBD
12. Expand Turf Apron	2016-2017

Source: Airport Management Review and Consultant Estimations

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2.0 GENERAL SITE DESCRIPTION

2.1 Airport Facilities

The Provincetown Municipal Airport is a primary service, public-use airport with scheduled passenger service to and from Logan International Airport in Boston, Massachusetts. Located in Provincetown, Massachusetts, and situated on the northern tip of Cape Cod, the Airport is confined within the bounds of the CCNS, sited on approximately 331 acres of federally-owned land administered by the NPS. Constructed in the 1940s, The Airport consists of developed airside and landside areas that are maintained for airport facilities and operations, as well as undeveloped areas that consist of coastal dunes, freshwater wetlands, and grasslands (Figures 7 and 8).

2.1.1 Landside Facilities

Landside facilities include a terminal building, aircraft hangar, an aircraft rescue and firefighting/snow removal equipment garage (ARFF/SRE), ground support facilities, the former administration building referred to as the Sightseeing Shack, and two auto parking areas. Photo 2 depicts the location of the Airport's landside facilities. Figure 9 depicts the location of the Airport's landside facilities.

2.1.2 Airside Facilities

Figure 10 depicts the location of the Airport's airside facilities. Airside facilities include a single runway (Runway 7-25), a taxiway system, aircraft parking aprons (ramps), an approach lighting system (Medium Intensity Approach Light System with Flashing lights or MALSF), navigational aids, and an Automated Weather Observation Station (AWOS). Runway 7-25, first paved in 1948, is currently 3,500 feet long and 100 feet wide with paved runway safety areas (RSAs). The taxiway system provides aircraft with direct routes between the terminal area and the runway, and include a partial parallel taxiway (Taxiway A) and three entrance taxiways: West-End (Taxiway D), Mid-Connector (Taxiway C), and East End Taxiways (Taxiway B). Aircraft parking aprons include both paved and turf aprons to accommodate both commercial service and GA aircraft.

The Instrument Landing System (ILS) consists of a glide slope antenna, the glide slope critical area (a flat area maintained to bounce radio signals), a localizer antenna and its critical area, and an approach lighting system (MALSF) and its critical area. The Airport also has an on-field weather instrumentation (AWOS), located between Runway 7-25 and the parallel taxiway. Photo 1 depicts the locations of the airside facilities.

The terminal building is an approximately 4,800 square foot (SF) single story wooden structure, which provides passenger facilities, TSA screening areas, and a conference room. The Airport has a paved/gravel parking lot which provides 62-parking spaces for passengers and visitors, and a separate, 20-space employee gravel parking area located east of the terminal area.

The single hangar, which is attached to the passenger terminal building, is a 6,000 SF steel-framed structure that houses a large central bay for aircraft storage. The ARFF/SRE garage is approximately 40 feet wide by 80 feet long located on the east end of the terminal ramp, adjacent to the employee parking lot. The garage houses the ARFF vehicle and some SRE equipment.

Constructed in approximately 1948, the Sightseeing Shack is thought to be the original administration building, although it is no longer used for passenger waiting space. Currently this structure includes airfield navigational aid electrical equipment, a Remote Communications Outlet (RCO) for radio signal repeater equipment, and the airfield electric lighting vault, as well as a small bathroom (now out of service).

There is one 10,000-gallon below ground tank housed immediately east of the Sightseeing Shack. The fuel tank is a double steel-walled underground storage tank (UST) with a leak detection monitoring system.

Finally, there are small sections of security fencing located at the east end of Runway 7-25, around the terminal apron and around the fueling station.

2.2 Overview of Natural Environment

The Airport is surrounded by natural communities unique to this part of Cape Cod. Wetland Resource Areas found within the Airport lease area include freshwater Isolated Vegetated Wetlands (IVW) and Bordering Vegetated Wetlands (BVW), the coastal floodzone or Land Subject to Coastal Storm Flowage (LSCSF), and Coastal Dunes. These resource areas are subject to regulation pursuant to the Federal Clean Water Act (33 U.S.C. 1251, et seq.), the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131 § 40), and/or the Provincetown Wetlands Protection Bylaw (Chapter 12), as well as the Cape Cod Commission's (CCC) Regional Policy Plan. A general description of the wetland resource areas encountered at the Airport is provided below. Figure 6 depicts the limits of the approved resource areas. The Army Corps of Engineers (ACOE) issued a separate Preliminary Jurisdictional Determination (NAE-2006-4281; Attachment 7) indicating that "*there appear to be 'waters of the United States' and/or 'navigable waters of the United States' on the project site*," which would be regulated under the Federal *Clean Water Act*.

A brief summary of wetland resource areas delineated at the Airport is provided below, including broad descriptions of the various types of wetland resource areas encountered. A Summary of Wetland Resource Areas report prepared by HW (April 2007) and Summary of Natural Resources and Rare Species Habitat Assessments (April 2007) (Attachments 11 and 12) provide additional detail regarding wetland resource areas and the habitat at the Airport. Please note that only those wetlands that occur within or near the various CIP footprints (and alternatives) have been delineated and are subsequently included within the summary report.

2.3 Freshwater Wetlands

The majority of the wetland areas encountered at the Airport are IVW that are part of a larger interdunal swale system (Photo 1). Freshwater wetland habitats at the Airport generally fall into three different types based upon vegetative cover: those dominated by grass and herbaceous species (Palustrine Emergent Wetlands or PEM); shrub-dominated wetlands (Palustrine Scrub-Shrub Wetland or PSS); and freshwater forested wetlands (Palustrine Forested Wetland or PFO), dominated by pitch pine (*Pinus rigida*). The site's geologic characteristics, combined with a fluctuating seasonal high groundwater table, result in seasonal saturation of the upper portion of the soil profile for significantly long periods of time during early portions of the growing season. Rainfall received during storm events also contributes to saturated soil and inundated land conditions. Inundated and/or saturated soil conditions favor the establishment of hydrophyte-dominant plant communities and the deposition of organic material, which are typical of wetland habitats. These isolated wetlands, ranging in size from a few hundred square feet to several acres in size, are associated with coastal interdunal swales, and are often separated from each other by low to moderate dune ridges closer to the airfield, and extensive higher dune ridges, oriented approximately parallel to the Airport runway, further out from the airfield. Isolated PSS wetlands also occur within the existing airfield, located between the existing taxiways and the runway, and are separated from paved surfaces by managed grassland communities of varying width.

Photo 1. Provincetown Municipal Airport is located between two major coastal dune ridges. Photo credit Bill Richardson.

Shrub-dominant interdunal wetlands (PSS), which are the predominant type of wetland habitat at the Airport, have a non-tidal, seasonally or temporarily flooded water regime. The relatively dense shrub communities include plant species such as winterberry (*Ilex verticillata*), dwarf huckleberry (*Gaylussacia dumosa*), meadowsweet (*Spiraea latifolia*), highbush blueberry (*Vaccinium corymbosum*), northern bayberry (*Morella pensylvanica*), red chokeberry (*Aronia* spp.), and often dense mats of American cranberry (*Vaccinium macrocarpon*).

Photo 2. Example of transitional wet meadow/scrub shrub swamp community within managed areas at Airport: Wetland I with coastal dune ridge in background (northern aspect). Photo credit Horsley Witten Group.

Herbaceous plants observed frequently among the Airport wetlands include sphagnum moss (*Sphagnum* spp.), various sedges (*Carex* spp.), rushes (*Juncus* spp.), cinnamon fern (*Osmunda cinnamomea*), royal fern (*O. regalis*), and sensitive fern (*Onoclea sensibilis*), common reed (*Phragmites australis*), cattail (*Typha* sp.), woolgrass (*Scirpus cyperinus*), and various goldenrods (*Solidago* spp.). Photo 2 is an example of a shrub-dominant interdunal wetland.

Photo 3. Example of forested wetland at Airport dominated by pitch pine with an understory of American cranberry. Photo credit Horsley Witten Group.

Within the forested area between the runway and the steeply sloping coastal dune habitat to the southeast of the Airport managed areas, there is an extensive mosaic of additional interdunal forested wetland swales. Within these freshwater wetlands, pitch pine (*Pinus rigida*) has adapted to the seasonally saturated conditions and is considered a local wetland indicator species (Photo 3).

In the far western reaches of the Airport, there is a larger wetland system (Wetland C/J/FK) that is regulated as BVW under the Massachusetts Wetlands Protection Act. This wetland transitions along a salinity gradient from a freshwater system (PEM-PSS-PFO) to a brackish system (primarily PEM, trending toward Estuarine Emergent Marsh or EEM) as groundwater seeps are met with the tidal influence of

the Hatches Harbor estuarine system. Brackish and freshwater portions of this wetland system are dominated by a non-native invasive species, common reed. Efforts to control and manage this invasive plant community were implemented in the early 2000s through the Hatches Harbor Restoration Project, and areas of *Phragmites* die-back with an emerging salt marsh community can be observed along the landward-reaches of the restored salt water regime influence.

All wetlands within the CCNS are designated as Outstanding Resource Waters (ORWs). Additional discussion regarding the ORW status is provided in Section 7.

2.4 Coastal Dunes

Surrounding the wetland areas and in an approximate parallel configuration to the shoreline and the Airport runway, are a series of coastal dunes. These dune habitats range from developing mounds of sands occupied by American beachgrass (*Ammophila breviligulata*) or other grass and herbaceous species, to extensive forested dune ridges that are stabilized with mature vegetation, including trees and shrubs.

The coastal dune habitats located along the lease line to the northwest of the airfield are mapped within the boundaries of the Race Point Barrier Beach (Figure 11). Although the barrier beach system includes both primary and secondary dune habitats, there are no primary

Photo 4. Example of low-lying secondary coastal dune habitat within airfield. Airport terminal and hangar visible in background. Photo credit Horsley Witten Group.

dunes located within the Airport lease area. Dunes north of the Airport are generally vegetated with American beachgrass and common hairgrass (*Deschampsia flexuosa*) in open exposed areas. Occasionally, seaward-facing slopes (both primary and secondary dunes) are completely devoid of vegetation. Topography among these dunes varies widely from nearly flat to steeply sloping.

Coastal dune habitats located to the southeast of the airfield are secondary coastal dune habitats that are not within the barrier beach system. While the topography among these secondary dunes is equally varied, the more stable substrate of these areas supports a greater diversity of vegetative species, including trees and shrubs. It is in these areas that communities of Maritime Pitch Pine on Dunes and Maritime Shrubland occur to varying degrees.

Secondary coastal dunes located within the immediate area surrounding the Airport runway/taxiway system dunes found within the Airport Area generally exhibit low topographic relief (e.g., one to three feet above the elevation of adjacent wetlands and/or Airport infrastructure), and are often interspersed with low-lying wetland areas. These dunes are generally stable as a result of often dense vegetative cover, and are not actively migrating. Woody vegetation, such as pitch pine or oak, within these dunes is maintained by the Airport within active areas, and as a result, the community generally consists of low-growing shrubs, such as golden heather (*Hudsonia ericoides*) and bearberry (*Arctostaphylos uva-ursi*), low-growing bunch-forming grasses, low-growing herbaceous species, intermingled with patches of lichen. Occasional bare patches of sand also occur within these low-lying dunes (Photo 4). These dunes are also typically bounded by managed facilities, structures, and mowed grassland safety areas (referred to as Cultural Grasslands) that flank the runway and taxiways, and instrument landing system. Coastal dune areas are also depicted on Figure 6.

2.5 Cultural Grasslands

Cultural Grassland habitat, at the Airport includes primarily Cultural Grassland with incipient (or developing) Sandplain Grassland, and/or Sandplain Heathland. Cultural Grasslands result from the Airport's active mowing of the airfield's operational safety areas, in compliance with FAA regulations, and occur adjacent to the taxiway and runway (see Photo 5 and Figure 6). These areas are mowed frequently to maintain runway and taxiway safety areas as well as clear surfaces for navigational instrumentation.

Photo 5. Example of managed grasslands along Airport taxiways and runway (foreground). Photo credit Jacobs.

2.6 Coastal Floodplain

2.6.1 FEMA Designation

The Airport facilities are situated within a low-lying area between parallel dune ridges. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (Community Panels FM25001C0103J and FM25001C0104J; July 2014), the Airport is located in the 100-year coastal floodzone/floodplain (Land Subject to Coastal Storm Flowage or LSCSF) (Figures 12 and 13). The majority of the Airport is located within Zone AE, elevation 12 feet above mean sea level, NAVD 88. Some of the supports for the approach lights, which extend westerly beyond the Runway 25 End, lie within Zone AE, elevation 13 feet above mean sea level NAVD 88. The limit of the Velocity Zone or "VE" (elevation 14 feet above mean sea level NAVD 88), an area of 100-year coastal flood with velocity (wave action), is confined to areas seaward of the Hatches Harbor dike to the west of the Airport. The Limit of Moderate Wave Action is located only at the far western end of the MALSF lighting system.

The surrounding elevated dune system is located within areas of minimal flooding (Zone X), defined as "areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood."

A more robust discussion of the natural resources found at the Airport is provided in Attachments 11 and 12.

2.6.2 Floodplain Background

In 1930, a dike was constructed across the Hatches Harbor salt marsh in an attempt to control salt marsh mosquitoes (Photo 6). Due to the dike restriction, approximately half of the 200 acres of salt marsh floodplain (base flood elevation 12 feet NAVD 88) became isolated from tidal flow. The Airport was constructed in the 1940s on land that was filled in behind the dike. The presence of the Hatches Harbor dike has likely influenced the ebb and flow of tides in this area. As this is a coastal floodplain, rising tide levels will inundate only those low-lying areas that are able to receive floodwaters. Within the Airport Area, this flooding is somewhat attenuated by the presence of the Hatches Harbor dike.

Photo 6. View of Hatches Harbor dike facing northeast. Photo credit Jacobs.

The Hatches Harbor Restoration Project was implemented in the late 1990s by the NPS in partnership with the Town of Provincetown to restore up to 90 acres of salt marsh behind the dike. During the winter of 1998-99, new culverts with adjustable tide gates were installed in the dike to gradually allow tidal flow into the marsh with the overall objective of restoring native salt marsh functions and values to the tidally restricted wetlands to the extent possible without compromising safety at the Airport. This project was previously approved by MassDEP.

2.7 State-Listed Rare Species Habitat

The Massachusetts Natural Heritage Atlas (13th Edition, October 1, 2008) maps the entire Airport lease area within both *Estimated Habitat of Rare Wildlife and Certified Vernal Pools* (EH 79) and *Priority Habitat of Rare Species* (PH 15) (Figure 14).

Currently, the Airport supports habitat for three State-listed rare species: Eastern Box Turtle (*Terrapene carolina*), Eastern Spadefoot (*Scaphiopus h. holbrookii*), and Vesper Sparrow (*Pooecetes gramineus*). To support the preparation of the MEPA/NEPA reviews and permit applications, HW field biologists performed species-specific surveys between 2004 and 2005, and again in 2008, in addition to general wildlife habitat assessments (e.g., Natural Resources Inventories) performed by HW staff between 2004 and 2006, with additional data gathered in 2007 and 2008 (Attachment 12).

Habitats encountered were evaluated for their ability to provide suitable habitat for rare species. The presence of each of these species is documented at the Airport, either through HW's surveys or through past records held by NPS. At the direction of the Massachusetts Natural Heritage and Endangered Species Program (NHESP), HW conducted additional species-specific surveys for Eastern Spadefoot Toad to further refine potential habitat areas (Attachment 13).

A brief discussion of the habitat requirements for each of these species and the location of potential habitat is provided below; NHESP Fact Sheets for these species are attached. The Airport submitted a MESA Project Review with NHESP in 2014, and has received a conditional

approval, provided species specific and project-specific rare species protection plans are provided, approved by NHESP, and implemented prior to construction Attachment 10). The Airport will continue to work with NHESP during permitting.

2.7.1 Eastern Box Turtle

The Eastern Box Turtle is a Massachusetts Species of Special Concern. This small terrestrial turtle uses a relatively wide range of habitats, including woodlands, field edges, thickets, and wetlands. Optimal habitats on Cape Cod include pine barrens and oak thickets, where box turtles are associated with cranberry-dominated swales. This species would be considered a generalist species in the context of habitat preference, and potential habitat for this species is found throughout the Airport lease area. A single individual Eastern Box Turtle was observed during an on-site meeting in June 2007. Suitable habitat for this species is present, particularly in areas within the southern portions of the Airport, where foraging habitat and abundant food sources are found within close proximity to open areas of sand suitable for nesting habitat. Pitch-pine dominated habitats, including the cranberry-pine swales, as well as the lower slopes of the pitch pine and oak-dominant dune habitats provide potential habitat for Eastern Box Turtles.

2.7.2 Eastern Spadefoot

The Eastern Spadefoot (toad) is a Massachusetts Threatened Species. Reported habitat for this medium-sized toad species includes dry sandy or loose soils in areas of sparse shrub growth of open forest areas with adjacent shallow, temporary pools that provide breeding habitat. Portions of the Airport provide suitable habitat features for this species, particularly south and southeast of the Airport runway and presence of this species has been observed at the Airport by NPS biologists. HW field biologists conducted an in-depth habitat suitability study in the spring of 2008 to identify prime and potential breeding habitat for this species at the Airport. HW worked in conjunction with Brad Timm, Ph.D., an Eastern Spadefoot specialist, to complete the field surveys, the results of which are depicted on Figure 15.

2.7.3 Vesper Sparrow

The Vesper Sparrow is also designated as a Threatened Species in Massachusetts. This small sparrow is reported to inhabit open areas (cultivated fields, grasslands, fallow fields, and pastures), as well as Sandplain Heathlands. Potential habitat for the Vesper Sparrow occurs within the managed Cultural Grasslands adjacent to the Airport runway, taxiway, and runway approach areas and the immediately adjacent maintained shrub thickets, as well as throughout the open grassy dune habitats to the north and west of the Airport. Regular mowing of the Cultural Grasslands as part of routine Airport maintenance, in part, provides suitable habitat for this species.

2.8 Federally-listed Species

There are no federally listed or proposed endangered or threatened species that have been identified at the Airport. The beaches north and west of the Airport are known to support nesting populations of the federally-threatened Piping Plover (*Charadrius melodus*). Piping Plovers are closely monitored by the NPS . They nest and forage primarily along the shoreline and, at lower densities, within the dunes and cobble fields south of the shoreline and adjacent to the Pole Line Route sand road. Plovers in these more interior areas frequently forage in the Hatches Harbor system. However, Piping Plovers have not been known to nest or forage in or adjacent to the Airport.

3.0 PROJECT PURPOSE AND NEED

The purpose of the CIP project elements that are the subject of the WQC and Variance Request is to enhance Airport safety and security. These projects are needed to provide operational safety and security improvements at Provincetown Municipal Airport that comply with current FAA, Massachusetts Department of Transportation (MassDOT) Aeronautics Division, and TSA safety and security design standards. The use of these standards is mandatory for airport projects receiving Federal grant-in-aid assistance. It is the policy of the Airports Division of the FAA New England regional office that airport improvement projects must comply with the national airport design standards.

The CIP projects are needed because:

- Certain airfield facilities do not meet current safety and security standards.
- The Airport's existing parking and terminal facilities cannot efficiently meet current and projected demand.

The specific purpose and need for each of the CIP project elements requiring a WQC and Variance WQC is provided below. Overview of Airport Safety and Security Design Standards

The following discussion is based on information obtained from FAA, MassDOT, and TSA. Additional information was obtained from staff at the FAA New England Regional Office, Planning Branch, and Safety & Standards Branch. Applicable portions of regulations and design standards are included in the appendices to Attachment 1.

The primary mission of the FAA is safety. As stated in FAA Order 5100.38C, Airport Improvement Program Handbook: "The highest aviation priority of the United states is the safe and secure operation of the airport and airway system." The authority to regulate the aviation system, and the extensive design standards are discussed below.

3.1.1 Acts of Congress

Safety

The Federal Aviation Administration has been given the authority to regulate civil aviation by several acts of Congress. Starting with the Air Commerce Act of 1926, the new aeronautics branch of the Department of Commerce assumed responsibility for aviation oversight and concentrated on safety rulemaking and certification of pilots and aircraft. It also took over operation of the nation's system of lighted airways from the Post Office Department. The Civil Aeronautics Act of 1938 transferred responsibilities to a new independent agency, the Civil Aeronautics Authority. The Federal Aviation Act of 1958 created a new independent body, the Federal Aviation Agency, with broader authority to combat aviation hazards. In 1966 Congress authorized the Department of Transportation and the Agency became the Federal Aviation Administration.

The Airport and Airway Development Act of 1970 made FAA responsible for safety certification of airports served by air carriers. The Airport and Airway Improvement Act of 1982 established the Airport Improvement Program (AIP). The AIP provides grants to public agencies for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS). The NPIAS is comprised of all commercial service airports, all reliever airports, and selected general aviation airports.

Security

The FAA became more involved in the field of aviation security during the hijacking epidemic of the 1960s. The Aviation Security Improvement Act of 1990 directed the FAA to develop guidelines for airport design to allow for security enhancement. The Aviation and Transportation Security Act (ATSA), signed into law November 2001, established the Transportation Security Administration (TSA) following the September 11, 2001 terrorist attacks. The TSA was given responsibility for securing all modes of transportation, including aviation. The establishment of the Department of Homeland Security (DHS) in 2002 further defined the responsibilities of TSA. Although the public is most aware of efforts to improve security relative to passenger and baggage screening, another area of aviation security pertains to the perimeters of airport properties. In June 2006, TSA issued Recommended Security Guidelines for Airport Planning, Design, and Construction, which includes guidelines for perimeter security and access points.

3.1.2 Laws and Regulations

The FAA has the statutory authority to issue rules on aviation safety under Title 14 and Title 49 of the United States Code. The United States Code is the codification by subject matter of the general and permanent laws of the United States. It is divided by broad subjects into 50 titles and published by the Office of the Law Revision Counsel of the U.S. House of Representatives.

Safety

Title 14 presents regulations governing the activities of the Department of Transportation and the National Aeronautics and Space Administration in the areas of aeronautics and space, including: aircraft, aviators, airspace, air traffic, certification of air carriers and operations, and airports. Chapter 1 of Title 14 includes the Federal Aviation Administration, Department of Transportation. The following section is relevant to the discussion of the proposed projects at the Airport:

- 14 CFR Part 77 applies to Objects Affecting Navigable Airspace. Part 77 establishes standards for determining obstructions in navigable airspace. These standards are established through imaginary obstacle free surfaces with relation to the airport and each runway.

Security

Regulations relative to airport security can be found at Title 14 CFR Part 107 and Part 121. Part 107 regulates airport security and Part 121 defines the operating regulations for commercial carriers. Title 49 also relates to security at airports. Title 49 presents regulations governing research and special programs administration, railroads, highways, vessel cargo containers, traffic safety, surface transportation, transit administration, and transportation safety. The following section is relevant to the discussion of the proposed projects at the Airport:

- 49 CFR Subchapter C Part 1542 applies to Civil Aviation Security. Part 1542 requires airport operators to adopt and carry out a security program approved by TSA; and
- 49 CFR Part 1544 applies to the security of airport operations.

3.1.3 Airport Operations Safety Design Standards and Guidelines

The FAA publishes documents known as Advisory Circulars (ACs) and Orders, while not regulations, provide accepted operational safety design standards to meet responsibilities pursuant to the regulations. The use of these standards is mandatory for airport projects receiving Federal grant-in-aid assistance. AIP funded projects are required to comply with certain FAA Advisory Circulars (AC). The list of applicable ACs is provided in the appendices to Attachment 1 and can also be found at: www.faa.gov/airports_airtraffic/airports/aip/media/aip_pfc_checklist_fy2007.pdf.

FAA Airport Design Advisory Circular (AC 150/5300-13) includes the design standards for all civilian airports. As stated on the signature page of the Advisory, "For airport projects receiving Federal grant-in-aid assistance, the use of these standards is mandatory." The design standards are important because they establish a uniformity and consistency of design that has been adopted by the FAA to promote the safe movement of aircraft at all airports in the United States. Whenever possible, existing airport facilities are brought to current standards as an adjunct to other projects, such as pavement reconstruction and other improvement projects.

Specific sections of relevant ACs and Orders that apply to the proposed projects are provided later in this section (see Table 3-2).

3.1.4 Airport Security Design Standards and Guidelines

FAA Airport Design Advisory Circular (AC 150/5300-13, Chapter 6, Paragraph 614) includes site requirements for NAVAID facilities and security of those facilities. In June 2001, the FAA issued revised Recommended Security Guidelines pursuant to the Aviation Security Improvement Act of 1990.

In June 2006, TSA issued Recommended Security Guidelines for Airport Planning, Design, and Construction. In Massachusetts, public-use airports are subject to requirements issued by the MassDOT Aeronautics Division Directive Airport Security AD-001a. Each airport is required to prepare an Airport Security Plan in accordance with the Directive and Federal guidelines.

On the local level, the Provincetown Airport Commission applies all the guidance documents to prepare a Security Plan for the Airport that is appropriate for the type of airport operations, secure areas, and other conditions specific to the Airport. The specifics of the PVC Security Plan cannot be discussed in this unclassified document for security reasons. However, the most visible impact has been the mandatory conversion of approximately 1,600 square feet (61%) of the passenger lobby to a TSA restricted area.

3.1.5 Airport Waivers

FAA policy states that all new airport projects receiving AIP funds must be constructed in compliance with the national design standards for airports. Existing facilities such as taxiways, runways and safety areas must be brought up to current design standards as part of any construction project to the fullest extent possible.

Waivers to airport design standards for a specific airport may be granted if there are unique local conditions and an equivalent level of safety can be provided under the waiver. Any waiver of an airspace clearance standard related to new construction, reconstruction, expansion, or upgrade on an airport which receives Federal aid requires special review and FAA approval. The waiver must be fully justified on the basis of need and must provide an equivalent level of safety. These are reviewed on a case by case basis.

FAA issued the Airport a Waiver in 1980 of the standard for the width of the FAR Part 77 primary surface, which is one of several navigable airspace surfaces. The clearing of the Airport's primary surface is 500 feet wide (250 feet off the runway centerline on either side) instead of the standard 1,000 foot width. It was determined that tree clearing to comply with the standard 1,000 foot primary surface would have an adverse impact on the Cape Cod National Seashore (CCNS) that could be avoided while still providing an equivalent level of safety. The Waiver was justified based on the slow approach speed of the DC-3, the small GA aircraft using the Airport at the time, and the installation of the Instrument Landing System (ILS), which would provide an acceptable level of safety at the Airport. Waivers are typically written for the aircraft type using the airport at the time. In 1980, the Waiver was written for safe operations of the DC-3 commuter aircraft and small General Aviation (GA) type aircraft which were the primary aircraft type at the time.

Waivers may be revoked if necessary to safely accommodate any significant changes in aircraft operating at an airport. Although the type of aircraft operating at the Airport has changed, there is no indication that the 1980 Waiver will be revoked. The Waiver is included in the appendices to Attachment 1.

The justification of applying for waivers for the proposed CIP safety projects was evaluated. Measures that would provide an equivalent level of safety for operations on the taxiways would require a control tower which the Airport does not have.

3.1.6 Airport Operational Safety and Security CIP Projects with Wetland Impacts

The purpose and need for the CIP project elements with wetland resource impacts requiring a Variance WQC is discussed below. This includes the following CIP project elements:

(1) Westerly Taxiway System Improvements (Realign West End, Mid Connector, and a portion of the parallel Taxiways);
(2) Relocate East End Taxiway;
(7) Improve Access Road to Approach Light System;
(8) Construct Service Access Roads to the Automated Weather Observation Station (AWOS); and
(9) Install a Perimeter Safety/Security Fence.

A summary of the purpose and need for each of the five CIP project elements with impacts to wetland resources is provided in Table 6 and discussed further below. Impacts to ORW wetlands are provided as a reference; resource area impacts are discussed further in Section 5.

Table 6. Summary of Project Purpose and Need for CIP Project Elements Requiring a Water Quality Certification Variance

CIP Project Element	Purpose	Need
Westerly Taxiway System Improvements (1)	Safety	TW does not comply with current FAA design and safety standards.
Relocate East End Taxiway (2)	Safety	Aircraft are required to back-taxi on active runway
Improve Access Road to Approach Light System (7)	Safety	FAA service vehicles must reverse over 400 feet on narrow embankment.
Construct Service Access Road to AWOS (8)	Safety	Airport does not currently have access roads to this FAA facility per FAA Order 6940.1.
Install a Perimeter Safety/Security Fence (9)	Safety and Security	Airport does not comply with security guidelines for Part 107 airports.

3.2 Westerly Taxiway (TW) System Improvements

ORW Wetland Impact: 29,191 SF of IVW within Wetland I; 274 SF within Wetland C/J/FK
(Total for all three sub-elements = 29,465 SF of freshwater wetlands)

The components of the TW system at the westerly end of Runway 7 are closely interconnected in terms of function and design. For these reasons the West End Connector TW, the westerly end of the Parallel TW, and the Mid Connector TW are included under the heading of Westerly TW System Improvements. The sub elements of the Westerly TW System are discussed separately in terms of purpose and need and for the alternatives analysis. These are combined as one project element in terms of impacts and mitigation because the various components overlap and the entire taxiway system would be constructed together.

A. Relocate the West End Taxiway (TW)

Purpose: Safety

The purpose of relocating the West End Connector TW (West End TW) is to comply with FAA flight operation safety standards. There are three issues with the current alignment:

1. The West End TW is a jug-handle shaped taxiway. The jug-handle configuration was constructed years ago to accommodate the turning radius of the DC-3 airliners that were flown at the time. The DC-3s are no longer in operation. Currently, FAA design standards provide for an L-shaped intersection with a right angle to the runway for operational safety. Such a reconfiguration would generally be programmed when the taxiway pavement needs to be reconstructed.
2. The existing taxiway is located within the Runway 7 approach surface as defined by 14 CFR Part 77. Because of this condition, pilots waiting to depart Runway 7 are required to hold short of the runway, limiting their view of the runway, which makes the taxiing procedure especially hazardous during low visibility and peak operating times.
3. The taxiway intersects parallel to the end of the runway rather than at a right angle to the runway because the runway was shifted east to accommodate FAA required Runway Safety Areas (RSAs) and minimize environmental impacts. This intersection is not in compliance with the current FAA design standards. This increases the risks of runway incursions or collisions on the runway and must be corrected. This is a non-compliant safety issue for the Airport.

The West End TW is within the approach surface as a result of the shift of the runway to the east to accommodate runway safety areas (MEPA Certificate on FEIR EOEA No. 9386, January 14, 2000). At the time the runway was reconstructed with the safety areas, it was not feasible to include the reconstruction of the taxiways. It has always been the intention to correct this design deficiency as funds became available.

Need: Does not meet current FAA safety and design standards.

The West End TW needs to be relocated because it is within the approach surface, it intersects parallel to the end of the runway and it is not at a right angle with the runway so that approaching aircraft are not visible to taxiing planes. The fact that the Airport does not have a control tower adds to the need for a standard design taxiway at the Runway 7 end. This project element is needed because of the existing flight operation safety issues. Additionally, the taxiway pavement is eligible for reconstruction and funding is available. Although the taxiway would be relocated again if the runway were extended, (as noted in the comments on the ENF), it is not anticipated that a need for additional runway length would occur before the Year 2024 planning period and the safety issue must be addressed now.

Reference: 14 CFR Part 77.25(d); AC 150/5300-13 (See Table 3-2 and Appendix A for specific sections)

FAA has indicated that the West End connector taxiway would not qualify for a Waiver and must comply with national design standards when it is constructed.

B. Realign and Reconstruct the Westerly End of the Parallel Taxiway (TW)

Purpose: Safety

The purpose of realigning the parallel TW is to enhance safety by providing a straight alignment between the runway ends and the apron area in accordance with FAA design standards. The current taxiway shifts to the north at the mid-connector taxiway. An additional purpose of reconstructing the taxiway is to replace the section of aging pavement. Pavement is constructed according to FAA specifications, and the pavement is showing signs of deterioration. It is eligible for FAA reconstruction funding.

Need: Shift in taxiway presents an operational safety hazard.

The Parallel TW needs to be realigned and reconstructed because the taxiway centerline shifts twenty feet to the north between the Mid Connector taxiway and the West End taxiway. This shift in the centerline requires the pilot to change speed and direction, which presents a hazardous situation to pilots during nighttime and low visibility conditions. There are periods when fog moves in over the Airport and is trapped by the dunes to the north and south which provide natural barriers so the fog cannot dissipate. This reduces visibility and increases the risk of pilots "missing the turn" in what they expect to be a straight taxiway. The aircraft could potentially hit another parked aircraft or veer off into the wetlands. This hazard is not in compliance with FAA design standards. The shift in centerline resulted from a 1984 project to address non-compliance with an FAA Object Free Area. The taxiway centerline was shifted approximately twenty feet to the south between the mid and east taxiway connectors. The section between the Mid Connector TW and West End TW was not shifted at the time.

It had been suggested in the comments on the Environmental Notification Form (ENF) that installing taxiway edge lights alone could address the operational safety issues. Taxiway edge lights would enhance safety during nighttime conditions, but the hazardous geometry still needs to be brought into compliance with FAA standards to enhance overall safety. This area of the Airport does not have any ambient lighting, as in the vicinity of the Terminal and East End TW area. The realignment also provides the opportunity to remove some pavement along the length of the parallel taxiway as discussed later in the document.

Reference: AC 150/5300-13 (See Table 3-2 and Appendix)

FAA requires parallel taxiways connect to the runway thresholds at ILS airports. FAA policy is that this deficiency in the TW alignment must be corrected in accordance with current design standards when the pavement is reconstructed.

C. Realign the Mid Connector TW

Purpose: Safety

The purpose of realigning the Mid Connector TW is to bring the taxiway into compliance with FAA operational safety design standards. Similar to the West End taxiway, the Mid Connector taxiway is a jug-handle shape that was designed for the old tailwheel-equipped Douglas DC-3 passenger plane. The taxiway does not meet at the current standard right angle with the runway. However, aircraft holding to depart are not located within any clear zones, and the current alignment does not pose any current operational hazards.

Need: Does not meet current FAA safety and design standards.

The Mid Connector taxiway should be realigned because it does not meet current FAA standards and is not at a right angle with the runway. Although FAA has indicated that the mid TW would be acceptable for the short term until the pavement is reconstructed, it would be more cost efficient for design and construction to realign the Mid TW at the same time the parallel taxiway is realigned. For these reasons, the realignment is proposed as part of the Westerly TW System Improvements.

Reference: AC 150/5300-13 (See Table 7 and the appendices to Attachment 1 for specific sections)

FAA requires that this alignment be brought up to current standards when the pavement is reconstructed.

3.3 Relocate the East End TW

ORW Wetland Impact: 28,110 SF of IVW within Wetland B

Purpose: Safety

The East End TW has the standard design of a ninety-degree intersection but does not comply with the design standard to connect with the end of Runway 25. Pilots are required to "back taxi" in order to reach the end of Runway 25 prior to takeoff. This creates the potential for collisions between a back-taxiing aircraft and one that may be landing.

As some have pointed out, this offset is a result of the shift of the runway 200 feet to the east to provide RSAs. The taxiway was in existence at the time, but was not part of the project to construct RSAs. FAA did not require that it be reconstructed at that time and it was not included in the 1999 EIS/EIR.

Need: Aircraft must back-taxi on active runway, creating an operational safety hazard.

This project element will eliminate the need to back-taxi on an active runway, in compliance with FAA operational safety and airfield design standards. The back-taxi maneuver creates a

potential conflict with aircraft on final approach to landing. This operational hazard should be eliminated to be in compliance with FAA's runway Incursion Prevention Program.

Reference: AC 150/5300-13 (See Table 7 and the appendices to Attachment 1)

FAA requires that this intersection be brought up to current standards when the pavement is reconstructed.

3.4 Improve Access Road to Approach Lights (MALSF)

ORW Wetland Impact: 238 SF of BVW within Wetland C/J/FK

Purpose: Safety

The purpose of improving the existing access road to the Runway 7 approach lights is to address an operational safety issue.

Construction of the existing embankment for the access road to the Medium Intensity Approach Light System with Flashers (MALSF) at the Runway 7 end was permitted by the DEP Decision on the Request for a Variance, dated May 18, 2001, and a CCC DRI Decision dated April 13, 2000. A new survey was completed for the final design stage for that project. When the impact area was recalculated with the updated elevation information, a discrepancy was discovered. In order to build the road with shoulders and a turn-around, additional area of Bordering Vegetated Wetland (BVW) would have needed to be filled beyond the amount specified in the Variance. Staff at DEP, the Provincetown Conservation Commission, and the CCC was consulted at the time. A request to amend the Variance was not prepared because of time and legal constraints relative to funding, construction contracts, and runway closures. Therefore, in order to be in compliance with the Variance, the road was constructed on a filled embankment approximately 3 feet above the adjacent wetland area, but without shoulders and without a turn-around area. Permitting agencies reviewed and approved the access road as constructed.

Need: Currently, FAA service vehicles must back up 400 feet on narrow embankment, presenting an operational safety hazard.

Several years of vehicle operations on the access road have confirmed the need for an improvement to the road. Because of the narrow width and lack of a turn-around area, FAA service vehicles must back up for a distance of 400 feet before being able to turn around. Without shoulders, this maneuver has always been difficult because the drivers of the FAA utility vehicles have difficulty seeing the edge of the road, especially in poor weather. Recently a vehicle went off the road onto the side slope. A large crane parked within the runway safety area was required to extricate the van. The runway had to be closed while the crane was on location.

FAA design standards for access roads to FAA owned and operated facilities have specific pavement requirements for the roads when they join a runway or taxiway. FAA Order 6940.1 specifies a paved access road for a minimum of 300 feet if it comes off a runway or taxiway. The pavement minimizes the potential for a vehicle to track stones or other foreign material onto the runway or taxiways, which might damage a plane. Aircraft turbine engines can be damaged from the ingestion of stones or other foreign objects.

At the time the MALSF road was constructed trucks were able to drive on the abandoned runway pavement resulting from the shift in the runway. This pavement will be removed as part of the relocation of the West End TW. The area will be rehabilitated as grassland habitat as part of the proposed mitigation for the CIP projects. Because of that pavement removal, the Airport proposes to pave the first 300 feet of the access road in accordance with FAA Order 6940.1. The access road to the glide slope antenna is currently paved for the entire distance.

Reference: Order 6940.1; AC 150/5300-13 (See Table 7 and the appendices to Attachment 1 for specific sections)

FAA requires that this be brought up to current standards as funds become available.

3.5 Construct Service Access Roads to the Weather Station (AWOS)

ORW Wetland Impact: 335 SF of IVW within Wetland H

Purpose: Safety

The purpose of constructing access roads is to comply with FAA operational standards by providing vehicle access to the airfield equipment. The service access roads would improve maintenance access, especially in inclement weather or emergencies. As explained below, the access roads to the AWOS and LES have always been required, but at the time, construction of road access was put aside in order to complete the critical runway and MALSF improvements.

The Cape Cod Commission (CCC) had previously questioned in its comment letter on the ENF why the LES and AWOS access roads were not identified as a need during the RSA and MALSF approach lights review. The need to relocate the AWOS was not anticipated during the previous design of the RSA and MALSF project element. Therefore, relocating the AWOS was not part of the design or permitting project for the runway and MALSF improvements. The AWOS wind tower has its own clearance requirements; the strict clearance requirements of the AWOS wind tower instrument became apparent after the design and environmental permitting process was completed and the project had advanced to the construction phase. Significant tree clearing would have been necessary to avoid moving the AWOS after the RSA project. To avoid the need to cut additional trees, the AWOS was relocated to the infield between the runway and the taxiway, next to the wind cone and segmented circle. The AWOS field design change was reviewed and approved by DEP, the Provincetown Conservation Commission, and CCC. Because of the constraints of construction contracts, runway closures, and committed

funding, an access road was not included in the submission because it would have required additional design and permitting. Access by road is proposed now because FAA requires compliance with applicable regulations for any new construction at an airport.

Need: Access to AWOS is not in compliance with FAA Order 6940.1.

This CIP project element is needed because current vehicle access to the LES and the AWOS is off the active runway over unpaved surfaces. Equipment used by FAA technicians to service the AWOS (as well as the LES) is heavy and not easily transported by foot. The FAA technicians support a regional network of equipment, driving their utility trucks and vans to each site. Navigational equipment is repaired and replaced during all weather conditions to ensure safe airline operating conditions. Airports with passenger service are priority for immediate equipment repairs.

Reference: Order 6940.1; AC 150/5300-13 (See Table 7 and Attachment 1 appendices)

FAA requires that this be brought up to current standards as funds become available.

3.6 Install Perimeter Safety/Security Fence

ORW Wetland Impact: BVW (Wetland C/J/FK): Direct Impacts 54 SF fill; 1,152 SF cutting; Indirect Impacts 9,728 SF
IVW (Wetlands B, C, BC/F, CC, DB/FG, E/DD, FC, and L): Direct Impacts 452 SF fill; 23,207 SF cutting; Indirect Impacts 31,576 SF

Total Wetland Impacts: Direct Impacts 506 SF fill; 24,356 SF cutting; Indirect Impacts 41,304 SF

Purpose: Safety and Security

The purpose of the perimeter fencing is both safety and security. First, the fencing would improve safety by deterring deer and coyote, as well as hunters and hikers, from encroaching on the airfield's operational area. Additionally, for the safety and security of all users of the CCNS, the perimeter fence is proposed to separate areas designated for airport operations from airport lease areas that are currently used by the public for recreational activities.

Secondly, fencing secures the Airport Operating Area (AOA), the Security Identification Display Area (SIDA), and other security areas from unauthorized access, in compliance with TSA Guidelines. The key concerns and concepts are to restrict access, control the flow of people, provide security screening, separate critical areas, protect areas and assets, and protect aircraft, people and property.

Need: Perimeter fence is needed for operational safety and security.

The Airport currently has fencing at the east end of Runway 25 which is adjacent to the CCNS bike path, and around the terminal apron and the fueling station.

Fencing is also needed to enclose currently unsecured areas and minimize unauthorized access for security. The Airport is a commercial service airport with scheduled flights into Boston Logan International Airport via Cape Air. Since Cape Air flies directly to Logan's secure terminal areas for direct connections to Jet Blue and other passenger airlines as discussed in Section 4, the Cape Air passengers must be pre-screened at Provincetown Airport. This direct connection to Logan means that airfield security at PVC must meet the rigid standards found under FAR Part 107.

Fencing is needed to deter deer and coyote from coming onto the runways and other operating areas. There have been several collisions over the years between aircraft and deer, resulting in damage to the planes and death of the animals. There have also been incidences when coyotes were on the runway and interfered with landing operations.

On limited occasions, hikers and horseback riders have gone down the runway, mistaking it as a paved road. Additionally, since recreational activities at the CCNS include a hunting program for deer, waterfowl, rabbit, and other species, there is a need to identify and limit access to the Airport operating lease area for the safety of all users. Currently, hunting is allowed by NPS regulation up to the edge of the glide slope critical area, which is directly adjacent to the runway. Occasionally, during hunting season, hunters have been observed crossing the runway and two hunting blinds were recently discovered as close as 200 feet from the runway. Despite signs, hunting activity is taking place within the airport operation area. These incidents are considered runway incursions, which increase the risk of accidents and need to be addressed to be in compliance with FAA's Runway Incursion Prevention Program.

Reference: *Recommended Security Guidelines for Airport Planning, Design and Construction*, revised June 15, 2006, TSA; AC 150/5300-13; MassDOT Aeronautics Division Directive AD-001a, November 14, 2001 (See Table 2-1 and Appendix 6 for specific sections)

FAA and the Airport Commission recognize that the Airport is located within a sensitive environment. An alternative that provides for critical sections of fence, along with signage and the use of natural barriers has been evaluated and is discussed in Section 4.

Table 7 below provides the specific references for the FAA, MassDOT, and TSA safety and security design standards. The applicable portions of the referenced documents are provided in Appendix A to Attachment 1.

Table 7. Summary of Regulations Pertaining to CIP Safety Projects

CIP Project Element	Regulations
Westerly Taxiway System Improvements (1)	
• West Entrance	14CFR FAR Part 77.25(d) FAA Waiver No. 55 AC 150/5300-13, Appendix 16, Table A16-1A, Note 9 AC 150/5300-13, Paragraph 409 (holding bay) AC 150/5300-13, Paragraph 413 AC 150/5300-13, Paragraph 204
• Mid Connector	AC 150/5300-13, Paragraph 407 AC 150/5300-13, Paragraph 413 AC 150/5300-13, Paragraph 204
• Parallel TW	AC 150/5300-13, Appendix 16, Table A16-1A, Note 9 AC 150/5300-13, Paragraph 204
Relocate East End TW (2)	AC 150/5300-13, Appendix 16, Table A16-1A, Note 9 AC 150/5300-13, Paragraph 413 AC 150/5300-13, Paragraph 204
Improve Access Road to Approach Lights (MALSF)(7)	AC 150/5300-13, Paragraph 310 Order 6940.1
Construct Service Access Road to AWOS (8)	AC 150/5300-13, Paragraph 310 Order 6940.1
Install Perimeter Fence (9)	DHS/TSA June 2006 Guidelines, Part III, Section A http://www.tsa.gov/assets/pdf/airport_security_design_guidelines.pdf AC 150/5300-13, Paragraph 614 MassDOT Aeronautics Directive AD-001a, November 14, 2001

Note: Referenced sections are provided in Appendix A of Attachment 1.

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4.0 ALTERNATIVES ANALYSIS

4.1 Introduction

Five of the CIP project elements require Water Quality Certification (WQC) and a WQC Variance for cumulative impacts to isolated and/or bordering vegetated wetlands that are designated Outstanding Resource Waters (ORWs):

- Construct Westerly Taxiway System Improvements (Realign West End, Mid Connector, and a portion of the parallel Taxiways);
- Relocate East End Taxiway;
- Improve Access Road to Approach Light System;
- Construct Service Access Road to the Automated Weather Observation Station (AWOS); and
- Install a Perimeter Safety/Security Fence.

Alternatives to each of these CIP Project elements include the No Action alternative, the Preferred Alternative (proposed Project), and other alternatives that have been dismissed. In addition, the EA prepared for the NPS required an assessment of the Environmentally Preferred Alternative, which has been included here for consistency. Alternatives for each CIP Project element were presented in graphic form within the FEIR/EA (see figures within FEIR/EA Section 3)(Attachment 1). It should be noted that the Preferred Alternative (proposed Project element) is not always the same as the Environmentally Preferred Alternative, when public safety is taken into consideration.

Impacts to wetland resource areas (BVW and IVW) as well as to other resources (coastal dunes, rare species habitat, etc.) are presented here, even though only impacts to wetlands require WQC; however; impacts and mitigation measures are considered as a whole for the Project and for mitigation. A discussion of these alternatives follows. Please note that only those five CIP Project elements with direct or indirect impacts to ORW wetlands are discussed here.

4.2 Westerly Taxiway System Improvements

This WQC evaluates the potential impact of improving/EA the westerly end of the taxiway system at the Airport. The sub-elements of the Westerly Taxiway System improvements consist of the West End Connector Taxiway (TW D), the Westerly End of Parallel Taxiway (TW A), and the Mid Connector Taxiway (TW C). The two alternatives analyzed are the No Action alternative and an alternative that would construct westerly TW system improvements. The alternatives that have been considered for the project are illustrated on figures provided in the FEIR/EA (Attachment 1).

4.2.1 No Action

The No Action alternative would maintain the West End TW in its current location and does not address the operational safety issues discussed in the Purpose and Need (Section 3). The taxiway would continue to be located within the clear zone in the approach for Runway 7, which creates the potential for collision between a landing aircraft and a plane waiting to takeoff. Aircraft would continue to taxi onto the runway parallel to the runway end and out of visual contact with approaching aircraft. Aircraft would continue to hold short of the runway which limits their view of the runway and other aircraft.

The No Action alternative would maintain the jog in the parallel taxiway, would not replace the pavement which is in poor condition, and would not address the operational safety issues discussed in detail in Section 3. The pavement is over 20 years old and in poor condition. Paved surfaces at airports must be maintained in good condition. Airfield pavement standards estimate a useful lifespan of 20 years, after which pavement is eligible for reconstruction.

The No Action alternative would maintain the existing Mid Connector TW with the non standard "jug-handle" intersection with the runway and the parallel taxiway. It would also not align properly with the proposed relocated West End TW and the proposed realigned westerly end of the parallel TW. No impacts to natural resources would occur with the No Action alternative because there would be no construction or change in current conditions.

4.2.2 Westerly TW System Improvements (Proposed Action and Preferred Alternative)

The sub elements of the Westerly Taxiway System consist of:

A. West End Connector Taxiway
B. Westerly End of Parallel Taxiway
C. Mid Connector Taxiway

The sub elements are discussed individually but will be combined as one project in terms of permitting and construction because the elements would be constructed at the same time.

(A) Relocate West End Taxiway with Standard Right Angle Out of the Runway 7 Approach.

The alternative to relocate the West End TW would address the operational safety issues and would be in compliance with FAA design standards. The taxiway would connect with the end of the runway at a right angle and would be located out of the approach for the runway.

(B) Realign Westerly End of Parallel Taxiway.

This alternative would shift the westerly end of the parallel TW to meet the existing edge of pavement of the easterly portion of the parallel TW. A run-up pad, as required by FAA design standards for new construction, would also be constructed at the end for aircraft to perform required engine and systems checks before takeoff, without blocking the taxiway. The parallel

TW would be reconstructed with a consistent width of 40 feet. Since the pavement width is currently 60 feet, pavement would be removed. Cultural Grassland habitat would be restored in areas of pavement removal.

(C) Realign Mid Connector TW

The alternative to realign the Mid Connector TW would provide a standard 90 degree intersection design. The aging pavement would also be reconstructed to address the hazard of loose pavement causing harm to aircraft and passengers. The project would be constructed within the existing area of pavement and managed Cultural Grassland habitat. Collectively, the three elements of the Preferred Alternative for the Westerly TW System Improvements (shown on Figure 3.1 in Attachment 1) would result in alterations to approximately 29,191 SF of freshwater wetlands, 5,567 SF of coastal dune, and temporary impacts to grassland and rare species habitats for one or more state-listed species. Proposed mitigation measures, as discussed further in Chapter 6, would provide restoration of these habitats and implement construction phase mitigation measures.

4.2.3 Environmentally Preferred Alternative

After review, the Westerly Taxiway System Improvements (Preferred Alternative) is the Environmentally Preferred Alternative. The Preferred Alternative would result in a net reduction in impervious surface (Table 8, below) and includes mitigation to restore areas of wetland and coastal dune impacted by the project. The overall net loss in pavement from all taxiway projects is approximately 34,111 SF (0.78 ac). The current state of the taxiway is a hazard to aviators and passengers, and is a risk to the safety of those traveling to and from the Airport, as Airport operation in this area involves runway activity and airplanes in flight (as opposed to ground operations such as taxiing). Constructed improvements are necessary to address the Part 77 navigable airspace safety and operational issues of the West End TW that is currently within the approach to RW 7. These improvements will restore and maintain operational safety within the Part 77 airspace. Additionally, measures to minimize adverse impacts to wetlands and coastal dunes such as steepened slopes have been incorporated into the design, and construction period mitigation measures such as erosion control and construction timing will be implemented to reduce overall impact. An invasive species management plan is also proposed to preserve an environment that supports the natural diversity found within the CCNS. Permitting agencies will issue permits with the condition that wetland mitigation is monitored and repaired, if not successful. Among the alternatives considered, the West End Taxiway Improvements would ultimately attain the greatest balance between the human population, the operational safety needs for the Airport, and the surrounding natural environment.

Table 8. Summary of Impervious Surface Reduction at Provincetown Municipal Airport

Project Element	Sub Item	New Pavement/ Rooftop (+) (SF)	Removed Pavement (-) (SF)	Pavement to Be Replaced With?	Resource Area(s)	Net	Notes
Existing Parking	62 spaces	**0**	**0**			**0**	
Phase 1 Parking Spaces and Aisles	+28 spaces	N/A	0	N/A	coastal dune	0	new parking lot with gravel pavers & permeable asphalt
Phase 2 Parking Spaces and Aisles	+29 spaces	N/A	0	N/A			Phase 2 to be deferred
Westerly Taxiway Improvements						+ 65,000 SF IVW; +31,000 SF coastal dunes	
run up pad		9,605	0	N/A	coastal dune	9,605	
Taxiway A - easterly end (removed 2012)		0	32,278	cultural grasslands	(buffer zone)	-32,278	
Taxiway A (redeveloped / removed Partial Parallel TW)		21,171	22,991	resource area mitigation; pavement redevelopment; cultural grasslands	IVW; Coastal Dunes	-1,820	
Taxiway C (redeveloped / removed West End TW)		16,148	14,892	pavement redevelopment & cultural grasslands	(buffer zone)	1,256	
Taxiway D (redeveloped / removed west End TW)		21,724	48,116	resource area mitigation; pavement redevelopment; cultural grasslands	IVW	-26,392	
East End Taxiway							
Taxiway B (redeveloped / removed East End TW)		28,767	26,576	resource area mitigation; pavement redevelopment; cultural grasslands	IVW; Coastal Dunes	2,191	
Terminal Apron		**0**	**0**	**N/A**	**(buffer zone)**		
Reconstruction of Easterly End of Partial Parallel TW		**0**	**0**	**N/A**	**(buffer zone)**		
Electrical Vault		**225**	**0**	**N/A**	**(buffer zone)**		
Access Roads							
MALSF Access Road		590	0	N/A	BVW	590	
AWOS Access Roads		7,480	0	N/A	coastal dunes; IVW	7,480	all portions of new access roads considered impervious
LES Service Access Roads		5,032	0	N/A	coastal dunes	5,032	all portions of access roads considered impervious
TOTAL		110,742	144,853			**-34,111**	**Net reduction of 0.78 ac**

4.2.4 Alternatives Considered But Rejected

Existing Footprint Alternative

The alternative that would reconstruct the West End TW within the existing footprint was suggested by others during the ENF comment period as a way to minimize impacts to wetland and grassland habitats. This alternative would provide a standard right angle connection to the runway, but the taxiway would continue to be located within the approach to Runway 7 (as illustrated on Figure 3.1 in Attachment 1). Likewise, the risk of collisions would not be reduced because aircraft would continue to enter parallel to the runway end, rather than perpendicular to the end of the runway. This alternative would have unavoidable impacts to approximately 13,665 SF of freshwater wetlands in Wetlands I and C/J/FK, as well as additional impacts to grassland habitat. The alternative that would reconstruct the existing TW footprint with a standard right angle within the existing footprint has been deemed unsafe and unfeasible because it would not comply with the FAA safety and design standards and it would not address existing operational safety issues. This alternative has been dismissed from further review.

Lights on Existing Parallel TW Alternative

It was suggested in the comments on the ENF that installation of taxiway lights alone along the existing taxiway could address the safety issues relative to the jog in the partial parallel taxiway. Environmental impacts with this alternative would be limited to minor impacts to grassland habitat. However, pilots do not expect to encounter a jog mid-way along a parallel taxiway. Installation of edge lights would not fully eliminate the non-standard hazardous condition of maneuvering the aircraft through an unexpected turn at night and in bad weather conditions, and would not correct the operational safety issues created by the misaligned pavement. This alternative has been dismissed from further review.

4.3 East End TW Relocation

Two alternatives for the East End Taxiway improvements were analyzed within this FEIR/EA, including the No Action alternative and an alternative that would relocate the East End TW to connect with the end of Runway 25. The alternative that were been considered for this CIP project element were illustrated on Figure 3.2 of the FEIR/EA (see Attachment 1).

4.3.1 No Action

The No Action alternative would maintain the 200-foot offset between the end of Runway 25 and East End TW. Aircraft would continue to back-taxi on the active runway maintaining the current unsafe conditions by possibly interfering with landing aircraft. No impacts to natural resources would occur with the No Action alternative because there would be no construction or change in current conditions.

4.3.2 East End TW Relocation (Proposed Action and Preferred Alternative)

The alternative to relocate the East End TW to connect with the end of the runway would be in full compliance with FAA mandated design standards without impacting the terminal apron. There would be a slight curve in the East End TW centerline to avoid aircraft on the terminal apron. This configuration would not present a safety hazard because the terminal apron is well lit with overhead lighting, and planes are moving slowly as they enter the East End TW. Implementation of this alternative would result in alterations to approximately 28,110 SF of freshwater wetlands (Wetland B), and approximately 4,781 SF of coastal dune. It would also be within managed Cultural Grasslands with potential impacts to rare species habitat.

4.3.3 Environmentally Preferred Alternative

Of the alternatives considered for the East End Taxiway, the East End TW Relocation alternative (Preferred Alternative) is the Environmentally Preferred Alternative. While this alternative involves construction, relocating the current configuration of TW B will reduce the safety hazard that the current configuration presents to aviators and passengers traveling to and from the Airport. The Preferred Alternative will address the Part 77 navigable airspace safety and operational issues of the East End TW that currently requires planes to back taxi on the active runway.

As operations within the East End TW involve runway activity and airplanes in flight, the relocation of TW B would restore the necessary level of safety in this area to avoid potential undesirable and unintended consequences, while maintaining the diversity of natural resources at the Airport to the fullest extent possible. The preferred alternative includes mitigation to restore areas of freshwater wetland (and coastal dune) impacted by the relocation of the taxiway.

Overall, the wetland mitigation plan for the CIP Project results in on site restoration, with the addition of invasive species management for several species, which will have a beneficial impact on wetlands at the Airport, and participation in the State's In-Lieu Fee Program, as required for ACOE permitting of this project, which will have a beneficial impact on off-site wetland resources. Measures to minimize adverse impacts to wetlands and coastal dunes such as steepened slopes have been incorporated into the design, and construction period mitigation measures will be implemented such as implementation of a sedimentation and erosion control program and construction timing to reduce overall impacts. An invasive species management plan will also be implemented to preserve an environment that supports the natural diversity found within the CCNS. It is anticipated that permitting agencies will require monitoring and repair or adaptive management, if on-site mitigation is not successful. The East End TW Relocation would ultimately attain the greatest balance between the human population, the need to restore operational safety for the Airport, and the natural environment.

4.3.4 Alternatives Considered But Rejected

No other alternatives were identified.

4.4 Access Road to MALSF Approach Lights

This WQC evaluates the potential impact of improving the access road to the MALSF approach lights. Alternatives considered for this project element are illustrated on Figure 3.4 within Attachment 1.

4.4.1 No Action

The No Action alternative would maintain the existing narrow access road. As a result, vehicles accessing the MALSF for maintenance or repairs would continue to back up for a distance of approximately 400 feet along the narrow access road. The associated safety issues discussed in Section 2 would not be addressed. There would be no environmental impacts associated with the No Action alternative because there would no construction within the wetland resource.

4.4.2 Construct Turn-Around (Proposed Action and Preferred Alternative)

The Preferred Alternative would involve the construction of a turn-around area, such that vehicles would not have to back up the length of the narrow access road. The proposed turn-around area, previously presented as a 30x30 SF area (with a 960 SF wetland alteration) has been further reduced with the permitting design plans to utilize a portion of the existing boardwalk structure to further reduce project impacts to wetlands. The proposed turnaround will include a T-shaped configuration with approximately 238 SF of impact to Wetland C/J/FK (BVW). The material used to construct the turnaround would be structural base material with gravel fill brought to the site. The top finish layer could be obtained from excavated areas on site; however, no material would be excavated from the adjacent wetland area for fill material and any material brought to the site will be from a certified archeological object-free and weed-free source. Proposed compensatory mitigation for lost wetland area would be provided on-site within Mitigation Area B (see project plans). Additional mitigation measures will include construction phase mitigation measures.

4.4.3 Environmentally Preferred Alternative

The No Action alternative has been selected as the Environmentally Preferred Alternative solely because the project does not involve operational safety improvements for aircraft operations within Part 77 navigable surfaces nor will it occur within an existing footprint. Additionally, under the No Action alternative there would be no construction and wetlands would not be altered. The safety and operational issue is ground operation-related and affects vehicles accessing the navigational lighting system. However, this would not address the safety concerns.

4.4.4 Alternatives Considered But Rejected

Installation of Guardrail

Installation of a guardrail along the length of the existing access roadway was considered as an alternative, but was deemed unfeasible because of the vertical penetration into the Runway 7

approach surface. Any objects required to be located within this object free approach area must be frangible (able to be snapped off on impact), which would defeat the function of a guardrail. In addition, the roadway embankments would need to be widened to accommodate the construction of the guardrail without losing width along the roadway, necessitating additional wetland alteration. This alternative has been dismissed from further review.

Acquire a Utility Vehicle

The Airport has considered acquiring a utility vehicle for the purposes of accessing the MALSF equipment for maintenance or repair, suggested by comments during the MEPA review. This alternative would not result in additional environmental impacts. However, this alternative would require FAA personnel to transfer their equipment to a smaller utility vehicle. The Project Team deemed this alternative to be impractical because FAA personnel need access to all equipment in their vehicles during all weather conditions, and could not feasibly transfer all the equipment to a small utility vehicle. The runway is required to be shut down for certain inspection or maintenance procedures, and transferring necessary equipment, which would not all fit within a smaller vehicle at one time, would result in potential unnecessary delays at the Airport. This alternative has been dismissed from further review.

Construct Shoulders

This alternative would widen the entire length of the MALSF access road embankments to construct 2-foot shoulders on each side of the existing access road. This alternative would impact approximately 1,800 SF of Wetland C/J/FK, and would not eliminate the safety hazard of vehicles needing to back up for 400 feet. This alternative has been dismissed from further review.

4.5 Service Access Road to the Weather Station (AWOS)

As these two access roads generally serve the same type of purpose and are located in close proximity to each other, they were presented together in the FEIR/EA (Attachment 1), although alternatives for each road were developed independently. Only the AWOS access road has associated wetland impacts. Two alternatives were analyzed for the Service Access Roads to the AWOS, including the No Action alternative and an alternative that would construct an access road to the AWOS behind the hold line and off the East End TW (previously “Alternative 2”), and several additional alternatives were considered but rejected. Alternatives considered for these projects were illustrated on Figures 3.5, 3.6, and 3.7 within the FEIR/EA (Attachment 1).

4.5.1 No Action

The No Action alternative would retain the lack of defined access routes to the AWOS, which essentially prevents vehicle access to the sites other than within the runway operating area. Although there are a few circumstances when service on the AWOS requires the runway to be shutdown, most inspections and maintenance operations are carried out while the runway is

active. There would be no impacts to wetlands or coastal dunes because the access road would not be constructed.

4.5.2 Service Access Road to AWOS ("Alternative 2") (Proposed Action and Preferred Alternative)

The Preferred Alternatives for this CIP Project element would construct 10-foot wide defined access roadways that would be paved for the first 300 feet off the East End TW in compliance with FAA design standards. The access road to the AWOS would necessitate alterations to coastal dune and wildlife/rare species habitat (6,595 SF) and 335 SF of wetland alteration within Wetland H. Proposed mitigation measures, including construction and timing measures, and compensatory mitigation for the loss of natural resources is part of the design of this alternative.

4.5.3 Environmentally Preferred Alternative

The Environmentally Preferred Alternative for this CIP Project is the No Action alternative because the project does not involve operational safety improvements for aircraft operations within Part 77 navigable surfaces and will not occur within an existing footprint. The No Action alternative would not result in construction, and wetland and coastal dune resources would not be altered. The safety and operational issue pertains to vehicles accessing the weather station. Although the No Action Alternative would not involve construction within wetlands and coastal dunes, this alternative would not address the operational safety issues resulting from the lack of designated access roads to the airfield equipment. The No Action alternative would not eliminate the tracking of foreign materials onto the runway and taxiways, which presents a safety hazard to users at the Airport. The No Action alternative is not the Preferred Alternative. The Preferred Alternative for the project includes measures to minimize adverse impacts to wetlands and coastal dunes such as steepened slopes and a narrower road width. Construction related mitigation measures will be implemented such as erosion control and timing to reduce overall impacts.

4.5.4 Alternatives Considered But Rejected

Pavement Alternatives

The alternative of constructing the roads with permeable pavement was evaluated. Porous pavement is a special type of pavement that allows rain and snowmelt to pass through, reducing runoff. However, these pavements require an intensive maintenance schedule and access for maintenance may result in unnecessary airport delays. Additionally, the pavement can be damaged by freezing and thawing in the northern climates.

Alternative types of pavement that can be colored (e.g., Natural Pave®, a sand-colored pavement, etc.) were also evaluated. These proprietary products have not been tested for durability under airport pavement standards. Because of the maintenance and durability issues, porous and other types of pavement has been dismissed from further review.

Acquire Utility Vehicle

In response to comments received on the NPC/Draft EIR/EA, the Airport has considered the use of an off-road utility vehicle for access to the AWOS. As with the use of a utility vehicle for the MALSF, this alternative has been deemed unfeasible because FAA personnel need access to all equipment in their vehicles and cannot feasibly transfer all the equipment to a smaller utility vehicle. This alternative has been dismissed from further review.

AWOS Alternative 1

Alternative 1 for the AWOS access road connects with the East End TW. The road would be approximately 800 feet long and would be paved in compliance with FAA standards. Alternative 1 would impact approximately 440 SF of Wetland H and impact a small amount of coastal dunes. This alternative would align with the LES Alternative 1, but has been dismissed from further review because a shift (i.e., proposed alternative) in the alignments of both access roadways would reduce wetland impacts.

AWOS Alternative 3

Alternative 3 would connect with the parallel taxiway and, as with all of the alternatives for the access roadways, would be paved for 300 feet. Approximately 3,000 SF of Wetland H would be altered for this alternative, as well as a small amount of cultural grasslands. Because other alignments would have smaller wetland impacts, this alternative was dismissed from further review.

AWOS Alternative 4

Similar to the LES Alternatives 4 and 5, this alignment has a direct connection with the active runway operating area, which would not meet FAA design standards and would not be allowed. This alternative would result in alterations to coastal dune (3,480 SF), a small amount of grassland habitat, and Wetland H (720 SF). This alternative has been dismissed from further review.

AWOS Alternative 5

The L-shaped configuration of this alternative alignment would result in alterations to 9,840 SF of cultural grassland habitat and 720 SF of Wetland H. As with AWOS Alternative 4, this alignment has a direct connection with the active runway operating area (between the runway and the hold line of the taxiway), which would not meet FAA design standards and would not be allowed. This alternative has been dismissed from further review.

4.6 Perimeter Safety/Security Fence

Seven alternatives have been evaluated for the construction of a Perimeter Safety/Security Fence, four of which are carried forward and analyzed for environmental impacts. Three

alternatives were previously considered but rejected. The four alternatives analyzed are the No Action alternative, Concept 6 (Final Preferred Alternative), Concept 4, and Concept 1 (previously identified as the Preferred Alternative in the DEIR/EA). It should be noted that Concept 1 has been dismissed but has been carried forward to the impact analysis because it was previously presented as the preferred alternative in the DEIR and was required to be retained within the alternatives analysis to comply with NPS NEPA procedures. The alternatives that were considered for this CIP Project element are illustrated on Figures 3.8 and 3.9 in the FEIR/EA.

4.6.1 No Action

The No Action alternative would have no direct impacts to the natural resources or habitats at the Airport because clearing for the fence and construction of the fence would not occur. However, the No Action alternative would not address the operational safety and security, visitor safety, and wildlife safety issues discussed in Section 2. The potential for deer and other (non-avian) wildlife to continue to come into conflict with operating aircraft, jeopardizing the safety of passengers and pilots using the Airport, would remain. Further, unauthorized persons would continue to have undeterred access to the currently unsecured airport operating area, and recreational users (including hunters) would remain a potential threat to the health and safety of aircraft operations and those using the Airport facilities. It may also be noted that TSA and MassDOT ban the possession of firearms in aircraft operational areas.

4.6.2 Perimeter Safety / Security Fence Concept 6 (Proposed Action and Preferred Alternative)

Following the alignment shown on Figures 15 and 16, Concept 6 would involve the construction of an 11,700 linear foot (LF), 9-foot high (total) fence. The fence would traverse areas of coastal dune (8,060 SF direct; 24,028 SF indirect impacts) and freshwater BVW wetlands (1,206 SF direct fill; 23,204 direct cutting), and Isolated Vegetated Wetlands (452 SF direct fill; 23,204 SF direct cutting), and directly and indirectly impact wildlife and rare species habitats. Direct impacts to natural resources would involve alterations associated with the installation of fence posts (fill), while direct and indirect alterations would be associated with the creation and maintenance of the proposed 4-foot wide swaths of managed vegetation on each side of the fence, which are required to be clear of trees and tall shrubs that may otherwise jeopardize the fence integrity. These areas would be either brush hogged or trimmed as necessary but would not be graded. The cleared areas would allow for inspection of the fence. This alignment, which is in close proximity to the taxiway on the north side and existing maintained areas to the south, would eliminate the need for construction of patrol roads.

Significant agency coordination and field site work has been completed relative to refining the alignment of the preferred alternative. It is anticipated that the final precise location of the fence would be determined in the field prior to construction as directed by staff of NHESP, NPS, and other permitting agencies, in order to minimize to the fullest extent possible impacts to wetlands, while at the same time preserving a critical buffer to airport facilities. The fence

would connect with the existing sections of fence adjacent to the bike path and the SRE building. Additionally, Concept 6 would eliminate fencing at the west end around the ILS.

Approximately 113 acres would be separated from remaining areas of the CCNS. The majority of the area consists of airport infrastructure (paved runway and taxiways, buildings, parking areas, navigational aids, and managed safety areas). Additionally, the western-most end around the ILS would not be enclosed, thus eliminating direct impacts within tidally-influenced portions of Wetland C/J/FK. In consultation with NHESP, the fence design would also have gaps along the bottom to allow for the movement of Eastern Box Turtles, minimizing impacts to the movements of this state-listed rare species as well as other small animals.

The fence design, topped with barbed wire, would deter deer from jumping the fence. Although deer can jump higher than 9 feet, the angled wire on top makes it difficult for them to judge the height of the fence. Additionally, cleared areas along the fence would allow deer to run along the outside of the fence (rather than jump the fence onto the active airfield if alarmed). Although the Preferred Alternative results in avoidable impacts, proposed mitigation and design modifications have avoided and minimize impacts to the fullest extent feasible.

4.6.3 Perimeter Safety / Security Fence Concept 4

Concept 4 would involve the construction of an approximately 15,400 LF fence of similar design to that of the Preferred Alternative. However, this fence alignment would enclose the approach light system, completely enclosing the Airport facilities. Direct (50 SF Isolated, 540 SF BVW) and indirect (5,670 SF Isolated, 43,080 SF BVW SF) alterations to wetlands as well as alterations to coastal dunes and associated habitats would occur with Concept 4. This concept would meet the project purpose and would not impact Airport operations or protected operational and navigational surfaces and object free areas. However, it would have impacts to tidal flow in Hatches Harbor.

4.6.4 Perimeter Safety / Security Fence Concept 1

The alignment under Concept 1 follows the perimeter of the Airport lease area. The length of the fence would be approximately 24,000 LF and would result in direct (34,067 SF) and indirect (33,800 SF) alterations to wetlands as well as direct (209,845 SF) and indirect (208,200 SF) alterations to coastal dunes and associated habitats, while completely enclosing approximately 317 acres of the 331 acres of the Airport. This alignment would require a 10-foot wide paved or gravel access road to allow for fence maintenance. The alignment would meet the project purpose and would protect Airport operations within airport operational areas and navigational surfaces. However, it would have impacts to tidal flow in Hatches Harbor.

4.6.5 Environmentally Preferred Alternative

Of the alternatives considered for the Perimeter Safety/Security Fence, the No Action alternative has been selected as the Environmentally Preferred Alternative, as the project does not involve operational safety improvements for aircraft operations within Part 77 navigable

surfaces and will not occur within an existing footprint. The No Action alternative would not involve construction and would not alter wetland and coastal dune resources.

Although the No Action alternative would not involve construction within wetlands and other natural resources, this alternative would not address the safety and security issues resulting from the lack of a perimeter fence. While the No Action alternative would not result in any impacts to natural resources, this alternative would continue to risk the health and safety of those at the Airport, possibly resulting in potentially undesirable or unintended consequences, both of which are defining elements of an environmentally preferred alternative per DO-12.

The No Action alternative is not the Preferred Alternative. An extensive analysis was carried out for the safety security fence in order to identify an alternative that would address the security and safety issues while minimizing impacts to wildlife, wetlands, and other natural resources. While the Preferred Alternative would result in impacts to resource areas, significant mitigation measures have been incorporated into the design and alignment of the fence concept to minimize these impacts. Additionally, a construction management plan has been drafted to minimize impacts during construction.

4.6.6 Alternatives Considered But Rejected

The following alternative fence designs have been identified and dismissed:

- Concept 2: Apron Offset North; 500 Foot Primary Surface South
- Concept 3: Apron Offset North; 1,000 Foot Primary Surface South
- Concept 5: Apron Offset North; Wetland Offset South

Concepts 2 and 3 include a fence around the ILS with a 10-foot wide maintained area on the outside of the fence clear of trees and shrubs and a 10-foot wide vehicle travel path on the Airport side of the fence for security inspection patrols. Concept 5 includes a fence around the ILS with a 4-foot wide maintained area on the outside of the fence clear of trees and shrubs and a 10-foot wide vehicle travel path, which would be maintained on the Airport side of the fence for security inspection patrols, except where the fence can be inspected from the GA aprons on the north.

Concept 2: Apron Offset North; 500 Foot Primary Surface South

This fence alignment would be offset approximately 320 feet from the runway centerline on the south side in compliance with the current FAA Waiver, and approximately 10 feet off the back of the aircraft aprons on the north side of the taxiway. The total length of the fence would be approximately 17,000 LF, enclosing approximately 104 acres. The alignment would directly and indirectly impact approximately 4 acres of wetlands (both bordering and isolated) and prime breeding habitat for the Eastern Spadefoot Toad with additional impacts to coastal dunes and associated habitats. In addition, Concept 2 has the potential to impact tidal flow and flood storage capacity since the fence in the vicinity of the ILS may impede normal tidal flow and

flooding during storm events. Concept 2 would meet the project purpose and need, and would be in compliance with the current FAA Waiver. Under the current Waiver, any fence alignment must be at least 63 feet beyond the edge of the FAR Part 77 Primary Surface to accommodate the 7 to 1 Transitional Surfaces that extend upward and out as an obstruction clear area. However, if this Waiver were ever to be revoked in the future, the fence under Concept 2 would have to be removed and relocated. Therefore this alternative has been deemed unfeasible and has been dismissed from further review.

Concept 3: Apron Offset North; 1,000 Foot Offset Primary Surface South

This alignment would have an approximately 500-foot offset from the runway centerline on the south and approximately 10 feet off the back of the aircraft aprons on the north side. The length of the fence would be approximately 17,900 LF, enclosing approximately 128 acres. The alignment would impact approximately 4.5 acres of wetlands (both bordering and isolated) and prime breeding habitat for the Eastern Spadefoot Toad with additional impacts to coastal dunes and Eastern Box Turtle habitat, and would likely have adverse impacts to these rare species. As with Concept 2, Concept 3 has the potential to impact tidal flow and flood storage capacity since the fence would be in the vicinity of the ILS. Maintaining the fence alignment in close proximity to the taxiway would reduce direct, long-term wetland and dune impacts by eliminating the need for a portion of the perimeter roadway. Concept 3 would meet the project purpose and need. However, this alternative has been deemed unfeasible for environmental permitting reasons and has been dismissed from further review.

Concept 5: Apron Offset North; Wetland Offset South

The Concept 5 alternative follows the same alignment on the southern side as Concept 4. On the northern side, however, the fence would be located a minimum of 10-feet behind the aircraft parking aprons. The length of the fence would be approximately 14,000 LF, encompassing 148 acres. Concept 5 would impact approximately 1.5 acres (direct and indirect) of wetlands, and as with Concepts 2 and 3, also would have the potential to impact tidal flow and flood storage capacity in the vicinity of the ILS. While located within wetland areas, the close proximity of the fence to the taxiway would eliminate the need for a perimeter roadway along this stretch of the fence (e.g., as with the northern segments considered in Concepts 2 and 3). It is anticipated that this alignment would only require vegetation management along the fence, minimizing wetland alterations. In addition, portions of these wetlands are currently subject to vegetation management practices to maintain airfield safety.

Similar to Concept 4, Concept 5 is also located at the base of the dune ridge to the south of the runway. Where required, the width for the vehicle path would be approximately 10 feet wide. The width of vegetation clearing would be reduced to 4 feet for the entire perimeter of the fence to further minimize impacts. The 4-foot clearing would be on both sides of the fence where a 10-foot patrol road is not necessary. This alignment provides suitable clearance along the north side of the GA aprons to accommodate spatial considerations for aircraft that are

pushed by hand onto the turf aprons, access to the electric controls on the back of the GA apron light poles, and overall constructability and, as such, meets the purpose and need and fully complies with FAA design standards.

This proposed alignment, while reducing overall wetland impacts, would still result in habitat fragmentation on the south side of the Airport, separating the large aggregate of isolated wetland areas from the adjacent upland areas of coastal dune. Taking the results of the Eastern Spadefoot Toad habitat surveys into consideration, placement of the fence along the toe of the dune ridge had the potential for interfering with breeding activity for this species. Accordingly, it was determined that Concept 5 was not the preferred alternative with respect to the natural resources at the Airport. Concept 5 again requires the construction of patrol roads along most lengths of the fence (except for north of the taxiway) for monitoring, and encloses a portion of the tidally-influenced wetlands within Hatches Harbor. As such, this alternative has been dismissed from further review.

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5.0 AFFECTED RESOURCES

A total of 1.90 acres of freshwater wetlands (BVW and IVW) will be directly impacted (both fill and cutting of vegetation communities) as a result of all proposed project elements. Direct and indirect or temporary impacts associated with construction activities will be mitigated accordingly, so as to achieve no net loss of the functions and values of the affected wetlands as a result of the CIP Project elements. A brief discussion of the individual impacted resources as well as an overview of the various proposed mitigation measures is presented below. Additional details regarding the proposed wetland mitigation plan are provided in Section 6.

5.1 Isolated Freshwater Wetlands

A total of 1.87 acres (81,292 SF) of isolated freshwater wetlands will be altered as a result of CIP Project elements. Indirect impacts to freshwater wetlands include long-term maintenance along the proposed fence totaling 0.72 ac. Impacts to isolated freshwater wetlands will occur within portions of Wetland B, Wetland C, Wetland CC, Wetland H, Wetland I, Wetland DM, Wetland BC/F, Wetland E/DD, Wetland DB/F/G, and Wetland L. Table 9 at the end of this section provides a breakdown of wetland impacts.

- Wetland B is an isolated wetland habitat located to the southeast of the Airport terminal and hangar building. An existing gravel path traverses this wetland east of Taxiway B. This wetland is characteristic of a scrub-shrub/emergent palustrine habitat (PSS/PEM). Plant species documented within Wetland B include American cranberry, highbush blueberry (*Vaccinium corymbosum*), dangleberry (*Gaylussacia frondosa*), meadowsweet (*Spiraea latifolia*), winterberry, pitch pine, willow (*Salix* spp.), various sedges and rushes, and patches of *Phragmites*. Wetland B has a non-tidal seasonally- or temporarily-flooded water regime and the western portions of this wetlands fall within Airport managed areas.

Photo 7. Eastern portions of Wetland B adjacent to existing gravel path. The proposed fence would traverse a portion of the gravel area to reduce resource area impacts. Photo Horsley Witten Group.

- Wetland I is non-tidal and has a seasonally or temporarily-flooded water regime that is confined by the runway and Taxiways A, C, and D, and buffered from impervious surfaces by

managed grasslands. Vegetation within Wetland I is characteristic of a transitional wet meadow/emergent marsh (PEM) shrub swamp (PSS) dominated by chokeberry (*Aronia* spp.), meadowsweet, steeplebush (*Spiraea tomentosa*), dwarf huckleberry, maleberry (*Lyonia ligustrina*), highbush blueberry, American cranberry, northern bayberry, and poison ivy (*Toxicodendron radicans*). Herbaceous species observed within Wetland I include, but are not limited to, woolgrass (*Scirpus cyperinus*), clumps and patches of sensitive fern (*Onoclea sensibilis*), royal fern (*Osmunda regalis*), soft rush (*Juncus effusus*), various goldenrods (*Solidago* spp.), and sphagnum moss (*Sphagnum* spp.). Patches of *Phragmites* and lesser amounts of purple loosestrife (*Lythrum salicaria*) are also present. Vegetation within Wetland I is managed as part of the Airport operations (see Photo 1).

- Wetland H is similar to Wetlands B and I in that it is a transitional wet meadow/scrub-shrub habitat. Wetland H is confined by the runway and Taxiways A, B, and C and physically separated from Wetland B by Taxiway B. The plant community consists primarily of chokeberry, winterberry, meadowsweet, steeplebush, highbush blueberry, American cranberry, bayberry, and poison ivy. Commonly observed plant species along the wetland periphery include winged sumac (*Rhus copallinum*), bayberry, and little bluestem (*Schizachyrium scoparius*). As with Wetlands B and I, this wetland is non-tidal and has a seasonally- or temporarily-flooded water regime, and is also within the Airport managed areas.

Photo 8. Wetland H is located between Runway 7-25 and Taxiways B, C, and A, and is managed regularly to maintain safe conditions within the airfield. Photo Horsley Witten Group.

The following isolated wetlands would be impacted by the fence only. Locations of these wetland areas can be found on Figure 16.

- Wetland C is an expansive, yet isolated, freshwater wetland located north of Taxiway A. The easternmost portions of this wetland area are characteristic of an emergent marsh/scrub-shrub community. Commonly observed plant species included winterberry, arrowwood (*Viburnum dentatum*), meadowsweet, blue-joint (*Calamagrostis canadensis*), American cranberry, and rose (*Rosa* spp.). Lesser amounts of purple loosestrife, wide-leaf cattail, and woolgrass were also observed. Areas closer to Taxiway A are managed as part of the Airports vegetation management program. Eastern portions of Wetland C, closer to the Airport terminal and parking lot and outside of the managed areas are dominated by

taller shrubs, including willow (*Salix* spp.), and are more characteristic of a transitional shrub swamp-forested palustrine habitat (PFO). Wetland C is non-tidal and with a seasonally- or temporarily-flooded water regime.

- Wetland CC is an isolated wetland located north of TW A approximately mid-way between TW C and TW D in the western portion of the Airport. This small wetland is a dense shrub swamp with highbush blueberry, dangleberry, gray birch seedlings birch (*Betula populifolia*), pussy willow, rose, occasional pitch pine seedlings, and American cranberry.

Photo 9. Wetland CC is located north of Taxiway A, also within areas maintained for airport safety. Photo credit Jacobs.

- Wetland DM is a small isolated wetland defined by just four flagging stations. Vegetation within this open marsh is limited to black rush (*Juncus gerardii*) and twig-rush (*Cladium mariscoides*). Wetland DM is an example of a wetland alteration that would be minimal, confined to the installation of fencepost(s), but not requiring vegetation management in order to maintain a clear corridor along the fence.

- Wetland BC/F is an extensive wetland with a meandering wetland boundary marked by over 400 flags and encompassing a large portion of the southeastern corner of the Airport lease area. At least four substantial coastal dune islands were located within the interior of Wetland BC/F. This isolated wetland area consists of a transitional shrub swamp/forested swamp with areas of emergent marsh along the wetland exterior in more open areas that are dominated by twig-rush, black grass, and woolgrass. The vegetative community within the interior consists of a canopy of pitch pine with clumps and patches of highbush blueberry, American cranberry, sphagnum moss, and bayberry. Areas adjacent to these wetland areas that are at slightly higher ground elevations are low-profile coastal dune habitats dominated by American beachgrass, scrub oak (*Quercus ilicifolia*), beach plum (*Prunus maritima*), bearberry, bayberry, and common hairgrass (*Deschampsia flexuosa*). These wetlands are non-tidal and support a seasonally- or temporarily-flooded water regime.

Photo 10. Wetland BC/F depicting varying habitats within this extensive wetland. Photos Horsley Witten Group.

- Wetland E/DD is a large isolated wetland area located in the northeastern portion of the Airport. The dominant vegetation within this open forested community includes American cranberry, black grass, and twig-rush with a pitch pine canopy.

- Wetland DB/F/G is also an expansive wetland that incorporates several small upland islands of secondary coastal dune. Vegetation within this transitional forested wetland included a canopy of pitch pine, with dense carpets of American cranberry, scattered clumps of woolgrass, black grass, twig-rush, and patches of sphagnum moss. Portions of this extensive wetland also support highbush blueberry.

Photo 11. Open portions of Wetland DB/F/G dominated by American cranberry and herbaceous vegetation. Photo Horsley Witten Group.

- Wetland L is an expansive wetland area located to the south/southeast of the runway. Portions of Wetland L extend into the runway vegetation management area and are dominated by a relatively low-growing shrub community. In these areas, a combination of herbaceous and shrub-dominant plant communities exists. Shrub species including highbush blueberry, winterberry, chokeberry, arrowwood, and bayberry are common. Herbaceous vegetation in these areas consists primarily of various sedges and rushes as well as an abundance of American cranberry. Areas more distant from the runway consist of a forested community dominated by pitch pine that forms a wetland mosaic within the extensive pitch pine-forested habitats to the southeast of the runway. The typical plant community in the

understory is composed primarily of highbush blueberry, American cranberry, and woolgrass. This non-tidal wetland experiences a seasonally- or temporarily-flooded water regime.

5.2 Bordering Vegetated Wetlands

Approximately 0.04 acres (1,664 SF) of BVW (Wetland C/J/FK) will be directly altered by three of the CIP Project elements.

- Wetland C/J/FK is a tidally-influenced BVW, and evidence of dieback due to an increase in salinity from the Hatches Harbor project has been observed. Vegetation within Wetland C/J/FK includes winterberry, highbush blueberry, arrowwood, meadowsweet, American cranberry, and Virginia rose (*Rosa virginiana*). Lesser amounts of purple loosestrife, wide-leaf cattail, and woolgrass are also present, along with significantly large communities of common reed to the north and west of the parallel Taxiway.

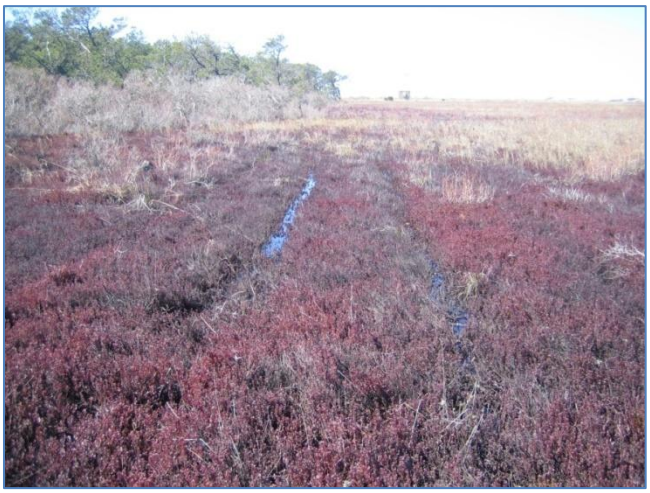

Photo 12. Wetland L near the managed areas of the Airport. Photo Horsley Witten Group.

Photo 13. Various vegetation communities represented by Wetland C/J/FK. General habitat along MALSF where proposed turnaround area is located is dominated by *Phragmites*. Vegetation is managed along approach light system for safety purposes. Photo at left Horsley Witten Group; photo at right Jacobs.

Table 9 Summarizes wetland impacts associate with each of the proposed project elements.

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Table 9. Direct and indirect wetland impacts by resource area and individual wetland area

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5.3 Fence Considerations

Assessment of impacts associated with the proposed fence include a breakdown of the direct impacts (direct fill or change in wetland vegetation type) as well as indirect impacts.

Table 10. Breakdown of Fence Impacts by Resource Area and Vegetation Cover

FENCE IMPACTS BY VEGETATION COVER			
	BVW	**IVW**	**Total Wetlands**
Vegetation Community Type:	Area (SF)	Area (SF)	Area (SF)
Open Dune or Open Herbaceous	(2,812)	(3,744)	--
Low shrubs (PEM/PSS)	(952)	(208)	--
Dense Shrubs (PSS)	--	5,926	5,926
Pitch Pine w/o understory (PFO)	1,152	16,550	17,702
Dense Pitch Pine & Shrubs (PFO)	--	728	728
Phragmites	(5,208)	--	--
TOTAL TO BE CUT*:	**1,152**	**23,204**	**24,356**
Total Area to Be Cut (DIRECT)	1,152	23,204	24,356
INDIRECT/SECONDARY	9,728	31,576	41,304
Phragmites (to be cut)	5,208	--	--

**Note areas of Open Dune or Open Herbaceous vegetation or Low-growing Shrubs (in parentheses) are not anticipated to be directly impacted by the fence, as these areas would not need to be cut to maintain a clear area along the fence.*

5.4 Functions and Values of Affected Wetlands

The affected freshwater wetlands discussed above contribute to the protection of groundwater supply, public and private water supplies, storm damage prevention, flood storage control, water quality, and preservation of wildlife and rare species habitat. The majority of the wetlands delineated at the Airport provide many of the same functions and values, depending on location and the type of vegetation cover. Most, if not all, of the wetland areas contribute to flood storage and flood storage control by retaining stormwater runoff and allowing for slow groundwater recharge. These wetlands also contribute to water quality by removing sediments and attenuating pollutants.

The topography, soil structure, plant community composition and structure, and hydrologic regime of the wetlands contribute to the protection of wildlife habitat by providing food, shelter, migratory, overwintering, and breeding areas for birds, mammals, reptiles, and amphibians. Some of the wetland areas, particularly those within the coastal interdunal marsh/swales, may also provide habitat for Massachusetts' state-listed rare species. Table 11 summarizes the functions and values of all wetland areas delineated at the Airport and approved through an Order of Resource Area Delineation (ORAD); see also Attachment 6.

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Table 11. Summary of Jurisdictional Wetland Areas Delineated at the Provincetown Municipal Airport, Provincetown, Massachusetts.

WETLAND AREA	CLASSIFICATION	JURISDICTION[6]	FUNCTIONS AND VALUES
Salt Marsh	EEM	ACOE, DEP, PCC, CCC	Protection of Marine Fisheries, Wildlife Habitat; Storm Damage Prevention; Groundwater and Water Quality
Wetland AA	PEM	ACOE	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland AB	PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland AC	PEM	ACOE	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland AD	PSS/PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland AE	PSS/PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland AF	PSS/PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland AG	PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland AI	PSS/PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland AJ	PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland AK	PSS/PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality
Wetland AL	PFO/PSS/PEM	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality
Wetland AM	PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland BA	PSS/PEM/PFO	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland BB	PEM	ACOE, PCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland BC	PSS/PEM/PFO	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CA	PSS/PEM/PFO	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CB	PSS/PEM/PFO	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CC	PSS/PEM/PFO	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CD	PSS/PEM/PFO	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CE	PSS/PEM/PFO	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CF	PSS/PEM/PFO	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CG	PSS/PEM/PFO	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CH	PSS/PEM/PFO	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CI	PSS	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CJ	PEM	ACOE	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CK	PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CL	PFO/PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CM	PSS/PEM/PFO	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CN	PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CO	PSS/PEM/PFO	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CP	PFO/PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CQ	PFO/PSS/PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CR	PEM	ACOE	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CS	PFO/PSS/PEM	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CT	PFO/PSS/PEM	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland CU	PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality
Wetland CV	PEM	ACOE	Flood Storage/Flood Control; Groundwater and Water Quality
Wetland DA	PSS/PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland DB/FG	PSS/PEM/PFO	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland DC	PEM	ACOE	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland DD	PSS/PEM/PFO	ACOE, PCC, CCC (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland DE	PSS/PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland DF	PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland DG	PEM	ACOE	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland DH	PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland DI	PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland DJ	PEM	ACOE	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland DK	PSS/PEM/PFO	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland DL	PSS/PEM/PFO	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland DM	PEM	ACOE	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat

[6] Note: the jurisdictional status of Isolated Land Subject to Flooding (ILSF) under the State Regulations at 310 CMR 10.57(2)(b) has not been determined.

Table 11 (cont.)

WETLAND AREA	CLASSIFICATION	JURISDICTION	FUNCTIONS AND VALUES
Wetland EA	PSS	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland EB	PSS/PEM	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland FA	PFO	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland FB	PFO	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland FC	PFO	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland FD	PEM	ACOE	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland FE	PFO	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland FF	PFO	ACOE	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland FH	PEM/PFO	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland FI	PFO	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland FJ	PEM/PFO	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland A	PSS/PFO	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland B	PSS/PEM	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland C	PSS/PEM	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland C/J/FK	PSS/PEM/PFO	ACOE, PCC, CCC (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland D	PFO	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland E	PFO/PSS	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland F	PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland G	PSS	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland H	PSS	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland I	PSS	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland K	PEM	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland L	PFO/PSS	ACOE, PCC, CCC, (DEP)	Flood Storage/Flood Control; Groundwater and Water Quality; Wildlife Habitat
Wetland M	PEM	ACOE, PCC, CCC	Flood Storage/Flood Control; Groundwater and Water Quality
Wetland N	PEM	ACOE	Flood Storage/Flood Control; Groundwater and Water Quality

KEY

Classification (Cowardin, et al., 1979)

PSS Palustrine Scrub-Shrub wetland
PFO Palustrine Forested habitat
PEM Palustrine Emergent Marsh
EEM Estuarine Emergent Marsh

Jurisdiction

DEP Massachusetts *Wetlands Protection Act* (M.G.L. Ch. 131 § 40) and Regulations (310 CMR 10.00)
ACOE Section 404 of the Federal *Clean Water Act* (33 U.S.C. 1251, *et seq*.) (Army Corps of Engineers)
PCC Provincetown *Wetlands Protection Bylaw* (Chapter 12)
CCC Cape Cod Commission Regional Policy Plan

6.0 MITIGATION MEASURES

The following measures are proposed to mitigate for unavoidable impacts to wetland resource areas and protect water quality during and following Project implementation. Descriptions of each are provided below with additional information provided on the project plans.

Table 12. Summary of Proposed Mitigation Measures

- Provide 80,000 SF of on-site IVW wetlands restoration
- Provide 5,000 SF of on-site BVW replication
- Participate in the ACOE In-Lieu Fee Program to provide off-site mitigation
- Manage Invasive Species within Wetlands H and I (IVW)
- Monitor wetlands mitigation areas twice annually for five years
- Remove 34,011 SF of Impervious Area
- Provide stormwater treatment using pervious pavement and bioretention areas for stormwater treatment in the auto parking area
- Create 36,000 SF of Coastal Dune habitat
- Implement Rare Species Protection Plans for construction phases
- Implement an Erosion and Sedimentation Control Plan for construction phases
- Implement a Construction Management Plan
- Continue existing Vegetation Management Plan to benefit rare species habitat

As discussed above, five of the CIP Project elements will result in unavoidable alterations to freshwater wetlands (isolated and/or bordering vegetated wetlands) as well as to coastal dunes and cultural grasslands (e.g., buffer zone habitat). Impacts will also occur within mapped *Estimated Habitat of Rare Wildlife*. The unique environmental setting of the Airport, specifically the abundance and proximity of resource and habitat areas to one another and their overlapping nature, have been considered during project design and avoidance of natural resources has been part of the design criteria. The Airport Project Team has designed all project elements to avoid and minimize impacts to natural resources to the fullest extent practicable in order to preserve and protect the functions and values of the resource areas and habitats, while still addressing the FAA, TSA, and MassDOT safety and security directives. Project impacts are unavoidable, primarily due to the fact that the improvements to the Airport must occur within discrete locations (i.e., the taxiway realignments must occur within a certain portion of the taxiway, rather than in an alternative location outside the vicinity of the airfield), and are held to FAA-safety and security standards.

The CIP projects contribute to the general public good and safety. The Airport has developed a comprehensive and integrated mitigation package through coordination with NPS, ACOE, MassDEP, NHESP, CCC, and the Provincetown Conservation Commission, along with aviation

regulatory entities in order to compensate for direct and indirect impacts to wetlands and other protected resource areas.

Proposed mitigation measures include on-site in-kind wetland restoration and replacement, implementation of an invasive species management plan, construction management including implementation of an erosion and sedimentation control program and rare species protection plans, stormwater management including a net reduction of impervious surface of approximately 0.78 acres (34,111 SF) (see Table 8), and implementation of an integrated vegetation management plan. No additional coastal floodplain will be impacted; there will be a net reduction of existing impervious surface at the Airport, which may provide additional flood storage during a major flooding event. These measures have been developed in order to address the various regulatory requirements for loss of wetland resource areas. As noted, site constraints limit the potential for on-site mitigation such that these are confined to areas of existing pavement that will be removed for the West End and East End Taxiway projects. In addition the presence of invasive species encourages the implementation of an invasive species management program and wetland enhancement program. A discussion of these various mitigation measures follows. Additional details are provided on the site plans and in the Attachments.

6.1 Wetland Mitigation – Restoration and Replacement

Wetland restoration plans have been developed in compliance with several regulations, performance standards, and guidance documents that relate to wetlands, including the Massachusetts Wetlands Protection Act, the Provincetown Wetland Bylaw, Sections 401 and 404 of the Clean Water Act, and the CCC Regional Policy Plan (RPP). Given the environmental constraints at the Airport, on-site wetland mitigation for direct impacts will occur primarily as wetland restoration in areas where existing impervious surfaces and fill will be removed. Indirect impacts, as well as secondary impacts associated with the cutting of vegetation and long-term maintenance of vegetation communities along the fence, will be mitigated through wetland enhancement, the integrated management of discrete populations of *Phragmites* and purple loosestrife, both identified invasive species in Massachusetts. Off-site mitigation will be provided through participation in the State's ILF Program, a requirement of the ACOE permit for this Project.

6.1.1 Wetland Restoration Overview

Relocation of the taxiways and subsequent reduction of the existing paved areas allow for resource area restoration within the approximate footprint of existing developed and paved areas. As proposed, wetland mitigation will result in a total of approximately 1.84 acres (80,000 SF) of restored freshwater wetlands (transitional emergent marsh/shrub swamp) at the Airport in two locations (Mitigation Areas A and C). Mitigation Area A will be located within the curved footprint of the existing West End TW adjacent to portions of Wetland C/J/FK and contiguous with Wetland I, while Mitigation Area C will be located within the footprint of the existing East

End TW, south of the terminal apron and contiguous with Wetland H, as shown on the site plans. A third location, Mitigation Area B, would be located adjacent to the access road to the approach lights, to the southwest of the (abandoned) West End TW. Mitigation Area B would be contiguous with Wetland C/J/FK and would restore or replace approximately 0.11 acres (5,000 SF) of BVW, resulting in a net gain of 0.06 acres (2,888 SF). Each of these areas is highly suitable for wetland restoration due to their proximity to existing wetlands and the existing shallow groundwater table, and will result in a total of 85,000 of restored wetlands at the Airport, to mitigate for direct fill of 58,088 SF of freshwater wetlands (approximately a 1.5:1 ratio), with additional measures designed to address direct cutting of vegetation within wetlands, as discussed further below.

The wetland mitigation methodology is modeled from the Massachusetts Inland Wetland Replication Guidelines (March 2002) prepared by the Massachusetts MassDEP, as well as the performance standards for wetland replacement in accordance with the Massachusetts Wetlands Protection Act regulations at 310 CMR 10.55(4)(b)(1 though 7), the Town of Provincetown Wetlands Bylaw (Chapter 12 of the General By-Laws of Provincetown), and the ACOE's New England District Compensatory Mitigation Guidance and Mitigation Plan Checklist.

Wetland restoration activities will generally involve removal of existing pavement and gravel sub-base, excavation to appropriate sub-grade to intercept existing hydrology, incorporation of pit and mound microtopography to mimic existing conditions within lost wetland areas, re-introduction of native wetland vegetation (salvaged from lost areas and supplemented with native nursery stock), and long-term monitoring to ensure the successful establishment of a wetland plant community. A qualified wetland scientist will oversee wetland restoration efforts.

6.1.2 Wetland Restoration Process

Given the environmental constraints at the Airport, on-site wetland mitigation will occur primarily as wetland restoration in areas where existing impervious surfaces and fill will be removed. The draft wetland mitigation plans have been developed to be in compliance with several regulations, performance standards, and guidance documents that relate to wetlands, including the Massachusetts Wetlands Protection Act, the Provincetown Wetland Bylaw, Section 401 (Water Quality Certification) and Section 404 (Individual Permit) of the Clean Water Act. Additional mitigation measures are included in the mitigation for the CIP projects, including the incorporation of a bioretention system for the auto parking area and management of invasive species within certain areas of natural resources to preserve the water quality and habitat values of these wetland systems.

Wetland restoration proposed at the Airport is described below and shown on Sheets 12-14 of the project plans. On-site mitigation measures represent a balance of freshwater wetland restoration to allow for no net loss of wetlands, as well as addressing the need to mitigate for

impacts to other natural resources (e.g., coastal dunes and rare species habitat). Table 2 in Section 1 summarizes the direct wetland impacts and proposed mitigation measures.

6.1.3 Wetland Restoration Methodology

The following draft mitigation plan for wetland mitigation is developed from the Massachusetts Inland Wetland Replication Guidelines (March 2002) prepared by the Massachusetts DEP, as well as the performance standards for wetland replacement in accordance with the Massachusetts Wetlands Protection Act Regulations at 310 CMR 10.55(4)(b)(1 though 7), the Town of Provincetown Wetlands Bylaw (Chapter 12 of the General By-Laws of Provincetown), and the new federal Compensatory Mitigation Rule, as well as the New England District Compensatory Mitigation Guidance (July 2010)[7].

Wetland restoration activities will generally involve removal of existing pavement and gravel sub-base, excavation to appropriate sub-grade to intercept available hydrology, planting of native wetland vegetation and over-seeding with a native seed mixture to stabilize disturbed soils, and implementation of monitoring plans to ensure the successful establishment of a wetland plant community. A qualified wetland scientist with experience in wetland creation or restoration will oversee all aspects of the wetland restoration efforts. Draft details of these activities are provided below.

Site Preparation, Excavation, and Grading of Mitigation Areas

Prior to the commencement of any mitigation activities, a sedimentation and erosion control barrier, such as silt socks or a combination of staked siltation fencing and strawbales (as prescribed by NHESP), will be installed along the wetland boundary to protect the adjacent areas during earth-moving activities. Following installation of this sedimentation barrier, impervious surfaces (asphalt and gravel sub-base) will be broken apart with heavy equipment, removed, and transported off-site to a suitable disposal facility or else re-used on-site as a sub-base for the projects..

A total of 34,011 Sf of impervious surfaces are proposed for removal associated with several CIP Project elements: implementation of the west end taxiway improvements, including relocation of Taxiway D and reconfiguration of Taxiway C; relocation of the east end taxiway (Taxiway B), and reconstruction of the easterly end of Taxiway A. Adjacent areas of cultural grasslands located between the paved surfaces to be removed and the adjacent wetland areas will also be removed; the underlying sediments may be reused to provide grassed shoulders once the new taxiways have been constructed and paved.

Establishment of Supporting Hydrology

Successful wetland restoration will require sufficient hydrologic conditions, and in keeping with the groundwater-supported, seasonally flooded wetlands on site, the wetland areas will be

[7] A more comprehensive Mitigation Plan formatted to address the Federal Mitigation Rule is also in preparation.

established at an elevation that will allow for soil saturation within one foot of the final elevation during the growing season. These elevations should provide a minimum of 4 to 12 inches of standing water during the winter and spring, as observed within other seasonally flooded wetland areas at the Airport to ensure that the hydrology of the proposed restoration areas will mimic that of the impacted wetlands.

For Mitigation Area A, the approximate elevations of the adjacent wetlands, Wetlands C/J/FK and H, are 4.0 and 6.3 feet on average; for Mitigation Area C, the approximate elevations of the adjacent wetlands, Wetlands H and B, are approximately 6.5 feet. Spot elevations along the existing West-End Taxiway range from 8.1 to 8.4 feet. Spot elevations along the existing East-End Taxiway range from 8.8 to 9.4 feet. The locations selected for the restoration areas are desirable because the areas will not need to be lowered or substantially regraded once the existing pavement and gravel sub-base are removed. Monitoring wells had been installed to observe groundwater elevations within the existing wetland areas, sited as close as possible to the proposed restoration areas (Mitigation Areas A and C). To date, depth to groundwater measurements have been recorded on two separate dates (September 21, 2007, and April 3, 2008). No appreciable difference in groundwater depth was observed among all six wells. Groundwater data suggest that removal of existing impervious materials alone would result in sufficient hydrological conditions within the mitigation areas. Additional measurements will be taken as necessary prior to commencement of restoration activities, and all restoration activities will be closely tied to on-the-ground survey to ensure that appropriate elevations are reached within the restoration areas. Schematic cross sections for Wetland Restoration Areas A and C are shown on the plans.

Wetland Soils

It is anticipated that the original soil profile may be intact beneath the impervious surfaces and grassy areas to be removed, and that only minor grading within the restoration areas would be necessary to obtain elevations that would provide suitable hydrology to support a wetland plant community and to create pit and mound microtopography as exists within the lost wetlands. As such, care will be taken to avoid removal of any original soil materials encountered beneath the impervious surfaces. The rough-graded mitigation areas will be allowed to settle for a minimum of 48 hours prior to introducing plants.

Introduction of Wetland Vegetation in Mitigation Areas

Following removal of fill materials, shrubs and herbaceous groundcover will be planted within the restoration areas. As all construction activities are proposed to occur within the Airport's "off-season" (after Labor Day and before Memorial Day), restoration activities would occur either during the beginning or the latter part of the growing season for Barnstable County (April 26 to October 23; USDA, 2002), depending on the construction timing.

As much as practicable, vegetation within Wetlands I, H, and C/J/FK will be salvaged for re-use in the mitigation areas. This would involve removing large patches of the "lost wetland" with a

front-end loader or other suitable large equipment and introducing these vegetation patches in the mitigation areas, allowing for intact and relatively contiguous patches of established vegetation within the mitigation areas and for greater success in the establishment of the mitigation area plant communities. Based upon HW's recent observations of the proposed areas for impact (April-May 2015), we have conservatively estimated that approximately half of the vegetation within Wetland I (approximately 14,000 SF) could be salvaged for reintroduction within Mitigation Area A (or possibly other mitigation areas as appropriate). However, Wetlands C/J/FK and Wetland B currently support populations of invasive *Phragmites* and may not be suitable for transplantation within the mitigation areas. Conservatively, it has been estimated that 5,000 SF of wetland B vegetation could be reused within the mitigation areas. Salvaging vegetation from these lost areas will need to be field-determined.

Mitigation Sequencing and Introduction of Wetland Vegetation

Ideally, site preparation for the mitigation areas would occur prior to construction of the new taxiways and MALSF turnaround, such that all impervious surfaces and grassy areas would be removed from the restoration areas and the areas would be excavated to the appropriate grade, at which point salvaged vegetation from the lost areas would be excavated and placed directly into the prepared restoration area(s), minimizing the temporal loss of wetlands during construction. If this construction sequencing proves to be impractical, the smallest possible lag time between construction of the new taxiway entrances and the creation of the mitigation areas is desirable (within a week or two). Under this construction scenario, vegetation from the lost areas would be excavated and stockpiled nearby for later re-introduction within the mitigation area(s). Salvaged plant materials would be covered and maintained (watered) in good condition until the restoration areas have been prepared.

Immediately following introduction of salvaged vegetation, additional native plant materials obtained from local nurseries and possessing native genotypes (local genetic stock) would be planted in the mitigation areas to augment the salvaged vegetation. Using local nursery stock will minimize the possibility that plant genotypes from other regions are imported to the area. Augmentation with nursery stock will allow for the immediate establishment of a relatively dense plant community throughout the mitigation area, discouraging encroachment by non-native species. Shrub and herbaceous species obtained from local nurseries will be representative of the existing vegetation communities within the isolated wetlands. Tree species will not be incorporated in the restoration areas because the proposed mitigation areas (as well as the lost areas) occur within obstacle-free areas and need to be maintained by the Airport as low-growing shrub swamp communities.

Proposed shrub species obtained from nursery stock may include arrowwood, highbush blueberry, winterberry, red chokeberry, bayberry, meadowsweet, steeplebush, American cranberry, and Virginia rose, or acceptable equivalent species. Shrubs will be planted in clusters of two to three, placed five to six feet on center, while herbaceous species will be planted in masses, 18 to 24 inches on center. It is anticipated that several hundred nursery-grown shrubs

and herbaceous plants will be needed to achieve the desired plant density within the mitigation areas. The planting distribution of American cranberry will depend upon the hydroperiod of each area. In shallow ephemeral wetlands, the cranberry will be planted at the lowest elevations of the wetland. In deeper, more permanent wetlands, the cranberry will be planted along the periphery. The elevation of the restoration plantings will be similar to the existing plant distribution observed within the wetlands at the Airport.

Planting specifications are provided on the project plans. Proposed plantings are designed to provide a densely vegetated transitional emergent marsh/shrub swamp community in each wetland mitigation area. It is anticipated that the details of the planting specifications will be refined during the permitting phase and in consultation with various regulatory agencies and ecological experts at NPS.

In addition to nursery-grown shrubs and herbaceous species, a wetland seed mix may be used to stabilize soils within the mitigation areas. A commercially available or custom seed mix that contains native grasses and wildflower species similar to those observed within the existing wetland areas will be used. Species contained within the seed mix may include: switchgrass (*Panicum virgatum*), Virginia wild rye (*Elymus virginicus*), creeping red fescue (*Festuca rubra*), fox sedge (*Carex vulpinoidea*), creeping bentgrass (*Agrostis stolonifera*), soft rush (*Juncus effusus*), New England aster (*Aster novae-angliae*), grass-leaved goldenrod (*Euthamia graminifolia*), nodding bur marigold (*Bidens cernua*), green bulrush (*Scirpus atrovirens*), Joe-Pye weed (*Eupatorium maculatum*), boneset (*Eupatorium perfoliatum*), and blue vervain (*Verbena hastata*).

It is anticipated that removal of existing paved areas will expose the underlying seed bank and rootstock which would contain additional species tolerant of the local ecological conditions. The presence of the underlying seed bank is anticipated to further lend to the successful generation of a wetland plant community within the restored wetland areas. However, certain invasive species, specifically purple loosestrife and *Phragmites*, are known to have exceptionally long seed dormancy capabilities, more so than most native species. Thus, exposing the seed bank may allow for the germination and establishment of non-native species over native, slower-growing vegetation. As part of the long-term monitoring of the restoration areas, particular attention will be paid to remove invasive seedlings as soon as detected to manage emerging non-native species and bolster the success of desired native species. Additional details regarding invasive species management are provided in Attachment 14.

Upon completion of the restoration area plantings, siltation fencing will be placed along the upgradient side of the restoration areas. As noted above, efforts will be made to plant the mitigation areas near the beginning or the end of the growing season to reduce the dependency on maintenance (e.g., watering) during the anticipated two to three week grow-in period and to ensure greater plant survival.

Wetland Monitoring Program

A qualified wetland scientist with experience in wetland mitigation will be engaged to ensure compliance with the mitigation plan and to make field adjustments when appropriate. This individual will oversee all aspects of the wetland restoration activities including installation of sedimentation control barriers, removal of impervious surfaces and excavation of sub-base materials, excavation of salvaged plant materials, installation of monitoring wells, revegetation, and implementation of a monitoring plan.

During and immediately following the creation of the mitigation areas, monitoring will occur on a weekly basis to ensure the initial establishment of introduced plantings. Following the grow-in period and in accordance with the regulatory guidance, wetland mitigation areas will be monitored twice annually for a minimum of five growing seasons to determine the relative success of the restored wetlands. Semi-annual site inspections conducted during late spring and late summer will include an assessment of the relative health and integrity of the salvaged vegetation and newly planted individuals, percent cover of vegetation, percent cover of wetland species, general compliance with the performance standards under 310 CMR 10.55(4)(b)(1 through 7), in accordance with the Federal Compensatory Mitigation Guidance and regional supplement.

In addition to the overall assessment of the monitoring areas, additional data regarding the vegetation will be collected within study plots distributed randomly throughout the mitigation areas to provide data to determine the relative success of the wetland plant communities. Data collected from the study plots will be compared to test plots within nearby undisturbed reference wetlands. Specific measures will be taken during construction and monitoring of wetland restoration areas to discourage establishment of invasive species within the newly disturbed soils, as described in Attachment 14. Additional details of the monitoring efforts will be developed during the permitting phase in cooperation with various regulatory agencies.

Written reports detailing the findings of each monitoring event will be submitted on an annual basis for five years to the Provincetown Conservation Commission, MassDEP, ACOE, CCC, and NPS, overseeing the wetland restoration activities. Monitoring reports will provide details on the assessment of the mitigation areas, including any remedial actions recommended or taken during a given year. Photographic documentation taken from established photo points will be incorporated within the monitoring reports.

6.2 Coastal Dune Mitigation

Coastal Dunes will be created by placing mounded sands in areas formerly occupied by impervious surfaces or grasslands followed by revegetation with pioneer species such as American beachgrass to stabilize the sand. Dune habitat will be created with on-site sands

(from areas of proposed projects), supplemented as necessary with sediments compatible with existing aeolian sands at the Airport[8].

Randomly spaced mounds of sand will be placed at elevations one to three feet above the existing grade, representative of the existing mosaic dune habitat encountered among the coastal interdunal swales at the Airport and within the airfield. The alignment and orientation of the created dunes will also be consistent with the configuration of the existing dune systems that currently run in a series of bands from east to west.

Following the placement of sands, these areas will be planted primarily with American beachgrass and supplemented with additional herbaceous material and low-growing shrubs as observed within undisturbed dune areas interspersed among the isolated wetlands at the Airport. When feasible, vegetation within the existing dune habitat to be impacted will be salvaged and transferred to the created dune habitat, providing an existing natural seedbank and rootstock. Proposed species to be planted along the lower elevations of the created dunes include switch grass, beach pea (*Lathyrus japonicus*), beach heath, Virginia rose, and bayberry, or other acceptable equivalents. Planting specifications are provided on the project plans. This assemblage of species observed within other dunes at the Airport, will provide wildlife habitat value, replacing lost habitat due to implementation of the CIP projects. Planting specifications are provided on the site plans.

In locations where dunes will be created immediately adjacent to restored wetlands, the dune area will be created and planted prior to the creation of the wetland pit and mound microtopography and introduction of plantings to mitigation area and a row of erosion control material (siltation fencing or straw wattles) will be placed at the toe of the newly created dune area to protect the wetland from sedimentation while vegetation becomes established enough to stabilize the created dunes. Once the dunes are stabilized, the siltation barrier will be removed, minor raking and supplemental plantings (if deemed necessary) will be performed.

As with the wetland mitigation areas, a qualified professional will oversee all phases of the dune creation to ensure that all dune creation activities are carried out in accordance with the permitted mitigation plan. This individual will have experience in coastal geomorphology or in dune creation, and will have the discretion to make site-specific adjustments during construction to ensure that the resultant coastal dune will function as designed upon full grow-in. A record of any adjustments would be on file. A monitoring plan similar to that for the wetland restoration areas will be implemented to ensure the successful establishment of the created dune communities. The monitoring plan for the created dune areas will entail annual monitoring and reporting as required by the various regulatory agencies, to occur in conjunction with other monitoring activities, and will include provisions for implementation of corrective measures, if necessary, to ensure the successful establishment of dune habitat.

[8] If additional material is needed, the contract documents will require that the source of the sand be compatible with existing sediments at the Airport and the source will be certified that it does not contain archaeological resources or non-native plant seeds.

6.3 Cultural Grassland Mitigation Methodology

Areas of Cultural Grassland are located along the shoulders of Runway 7-25, and the taxiways with more substantial areas near the glide slope approach (southeast of Runway 7; see Photo 5). Following reconfiguration of the taxiways, these areas will be restored or replaced in kind as shown on the project plans and in Figure 17. Re-establishment of Cultural Grassland will generally involve the reseeding of graded shoulders along each of the reconfigured paved areas and re-seeding with a native seed mix, such as the "New England Coastal Salt Tolerant Grass Mix," or a similar custom seed mix that contains a variety of native grasses that are similar in species or growth form to that which exists currently. Custom seed mixes are commercially available[9] and includes native species similar to those found within the existing Cultural Grasslands at the Airport, including Canada wild rye (*Elymus canadensis*), creeping red fescue (*Festuca rubra*), big bluestem (*Andropogon gerardii*), little bluestem, Indian grass (*Sorghastrum nutans*), side oats grama (*Bouteloua curtipendula*), switch grass, and sand dropseed (*Sporobolus cryptandrus*). The seed mix will be applied at the recommended application rate and will be lightly raked in and covered with a light mulching of seed-free straw to conserve moisture during germination.

Following successful re-establishment of the created grasslands there will be no net loss of cultural grassland or the potential habitat it provides.

6.4 Invasive Species Integrated Management Plan and Resource Enhancement

As noted within the wetland descriptions, both *Phragmites* and purple loosestrife are currently present in some of the wetland areas. In addition, spotted knapweed has been observed within some of the coastal dune areas within the airfield areas and near the parking lot. These species, identified as invasive or likely invasive within the state of Massachusetts, are required to be addressed as part of the DRI Technical Bulletin 01–001: Guidelines for Invasive Plant Species Management Plan as well as part of the overall Mitigation Plan.

Details of the management approach for these invasive species are provided in the Draft Invasive Species Management Plan (Attachment 14), which provides a background on the biology of each species, a discussion of the various methods of management based upon studies conducted by research scientists and land managers throughout the U.S. and worldwide, and identifies the preferred management technique at the Airport. The Plan identifies the most appropriate and preferred method of control for each species that ensures greater success in management, and that also comply with NPS policies on land management and other regulatory agency requirements. The Plan also discusses restoration of the native plant communities.

The proposed wetland enhancement plan is in addition to the invasive species management that is required within areas of wetland restoration. Wetland enhancement activities are

[9] e.g., New England Wetland Plants, Inc. (www.newp.com)

specifically tied to the management of *Phragmites*, within Wetlands H and I, and will involve implementation of the preferred management method, overplanting with native species, and long-term monitoring to track the successful regeneration of native plant communities within wetland areas currently supporting populations of *Phragmites.* Figure 18 depicts previously surveyed locations of existing *Phragmites* populations within the inner airfield.

6.5 In-Lieu Fee program

The full suite of mitigation measures will also include participation in the Corps' ILF Program. The Massachusetts Department of Fish and Game (DFG) is the sponsor of a state-wide program that will provide in-lieu fee compensatory mitigation associated with Corps permits under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899 and the related Federal rule at 33 C.F.R. Part 332 (the Mitigation Rule). The ILF Program allows Corps permittees (e.g., applicants) to make a monetary payment in-lieu of undertaking permittee-required mitigation as compensation for their project impacts to aquatic resources of the U.S. In turn, as the ILF Program sponsor, DFG assumes legal responsibility for implementing the required mitigation. The ILF Program applies aggregated ILF funds to then undertake mitigation projects that permanently protect aquatic resources and upland buffers and/or restore impacted aquatic resources within identified bio-regions across the State of Massachusetts (known as Service Areas). A map of the Service Areas, borrowed from the Corps ILF Fact Sheet, is shown in Photo 14. The Airport is located in the Coastal – Central Sub-area.

DFG will select ILFP mitigation projects through its application of detailed prioritization criteria as outlined in the ILF Program Instrument. Selection criteria include consideration of a potential project's ability to achieve multiple mitigation objectives and its support or compatibility with broader conservation or management initiatives using a watershed planning framework as described in Section X [10] of the ILF Program Instrument (Attachment 15). It is presumed that the Airport's participation in the ILF Program will contribute to the protection of natural resources in the Coastal Central Sub-area in Massachusetts.

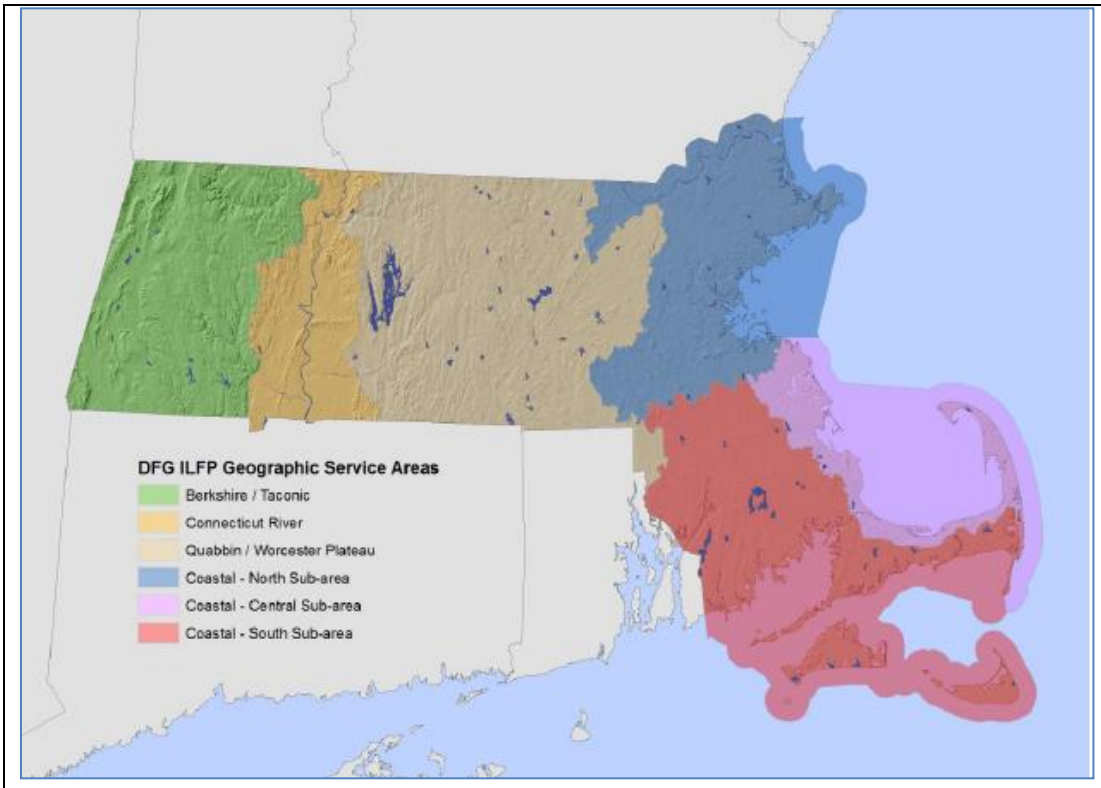

Photo 14. Map of In-Lieu Fee Program Service Areas in Massachusetts. Credit U.S. Army Corps of Engineers

6.6 Stormwater Management

6.6.1 Existing Conditions

Approximately six percent of the 331-acre airport site is paved. Stormwater runoff from the facility is discharged on site through runoff infiltration. The Airport is located within the CCNS, and as such all waters (and wetlands) in and adjacent to the CCNS are designated Outstanding Resource Waters (ORW) pursuant to the regulations at 314 CMR 4.06, Cape Cod Coastal Drainage Area. Stormwater runoff from the runway, taxiways, GA paved apron, and most of the terminal apron drains via sheet flow to surrounding grass areas, and infiltrates to underlying sandy soils. Salt and sand are not applied by the Airport to these paved areas.

Roof drains from the terminal building, hangar, and equipment garage all flow to the ground and either drain off the pavement and infiltrate into the ground or flow into the catch basins. The stormwater drainage system on the terminal apron towards the ARFF/SRE garage consists of two catch basins, associated outfalls, and a trench drain, which drains into the outflow pipe for one of the catch basins. These structures collect sheet flow from small areas of the apron in front of the terminal and ARFF/SRE garage to prevent flooding and/or icing. The catch basins and trench drain have been fitted with a filtration system to intercept petroleum-based pollutants from the stormwater runoff. The filtration system contains adsorbent material that

is an inert blend of minerals known as amorphous alumina silicate, which removes pollutants. There are two automobile parking lots on the Airport property. The main parking lot, located on the north side of the terminal building, has paved traffic aisles with the parking spaces and median unpaved. The median is also equipped with a gravel swale to facilitate drainage. The smaller lot, for employee parking was constructed in a similar manner.

6.6.2 Proposed Conditions

The Phase 1 parking area is designed to meet the Massachusetts Stormwater Management Standards for new development. Stormwater from the proposed expansion of the main parking lot will be managed with porous pavement and a bioretention facility with pre-treatment forebays. The proposed drive aisle will be paved in porous asphalt and the parking stalls will be constructed of a porous gravel paver system. These features have been incorporated to directly infiltrate water where it falls on the pavement surface and temporarily store it in the stone reservoir prior to infiltration to the underlying sandy soils. A bioretention system with two forebays will serve for stormwater management and treatment for larger storms that do not infiltrate directly through the porous pavement system and will serve as backup to the porous pavement system. Runoff that does not infiltrate directly through the porous pavement system will be conveyed via overland flow to forebays and a bioretention cell for treatment. The bioretention system has also been sized to manage runoff from the portion of existing Airport Drive draining to the site.

The bioretention area will be planted with a combination of native species compatible with the surrounding landscape to enable the bioretention area to blend into the surrounding coastal dune area. Species tolerant of occasional inundation, and well drained soils, including but not limited to, bayberry, Virginia rose, switch grass (*Panicum virgatum*), and dwarf huckleberry, will be planted within the bioretention area, with American beachgrass, bearberry, seaside goldenrod (*Solidago sempervirens*), beach heath and little bluestem (*Schizachyrium scoparius*) planted along the side slopes. In addition, landscape plantings will be introduced within the surrounding dune areas to screen the expanded parking area from Park users along Race Point Road and the nearby CCNS bike path. Landscape plantings were also selected to blend into the surrounding dune areas, and include pitch pine, eastern red cedar (*Juniperus virginiana*), sea myrtle, bayberry, beach plum, American beachgrass, and bearberry.

Photo 14. Example of a bioretention area constructed within a coastal dune setting. Sandy Neck Beach Park, Barnstable, MA. Photo credit Horsley Witten Group.

Details of the proposed stormwater management are provided within the project plans (Sheets 9 through 11). Attachment 6 contains the MA Stormwater Checklist, stormwater report, and a discussion of how the project is designed to meet the MA Stormwater Management Standards.

6.7 Erosion and Sedimentation Control

The Airport proposes to implement an Erosion and Sedimentation Control program for each project element to protect adjacent undisturbed resources during and immediately following construction activities. Erosion controls consisting of silt sock will be installed and staked in place prior to commencement of any work associated with a given project element. Erosion controls will serve as the limit of work. Alternative erosion control barriers may be required, such as siltation fencing and/or straw bales, to serve as wildlife diversions in accordance with rare species protection measures, and will be coordinated through NHESP. Erosion control measures will remain in place and maintained in good condition until all disturbed areas are stabilized with vegetation.

6.8 Rare Species Protection Plans

As discussed above in Section 2, the Airport is mapped for three State-listed rare species, whose habitat requirements overlap with the habitat provided within the natural resources at this site. The Airport has undergone a MESA Project Review with NHESP and has been issued a conditional "no take" approval from NHESP. Attachment 10 provides additional information on the rare species habitat, including a copy of the MESA letter, copies of the NHESP Fact Sheets for the three species, and draft Rare Species Protection Plans, which will be further developed and refined in conjunction with NHESP in order to ensure the short- and long-term protection of rare species and their habitats.

6.9 Construction Management Plan

All construction other than paving operations will be conducted during the Airport's off season, approximately after the first week of September (Labor Day) and prior to April 15th to minimize disruption to rare species during their most active times of year. Paving is anticipated to be conducted in the fall, as the availability of asphalt plants is tied to the typical schedule for asphalt plants in the region, which typically do not begin production until mid-April and extend until late November/early December.

A Construction Management Plan for Environmental Compliance will be developed with bid specifications, and will include specifics on construction timing and methodology, as well as additional measures designed to protect the natural resources at the Airport prior to, during, and immediately following construction. Elements to be included within the Construction Management Plan would include the following:

- Construction timing (as discussed);
- Rare Species Protection Plans for each Project element – a draft of these plans is provided, and will be finalized in conjunction with NHESP (Attachment 10);
- Implementation of an Erosion and Sedimentation Control program (see Stormwater Management Report (Attachment 5);
- Construction Methods such as the use of hand equipment, driving of fence posts with an air compressor and elimination of the concrete footing for the posts where feasible, the use of wetland mats ("swamp mats'), designated construction access, stockpile locations, etc.; and
- Oversight by an Environmental Monitor with a schedule for overseeing construction activities and monitoring.

Prior to construction, the Airport anticipates attending pre-construction site walk(s) with regulatory authorities and other appropriate individuals to review construction details. Also anticipated is a pre-construction refinement of the exact location of the proposed fence. These measures are intended to further ensure the protection of natural resources and rare species habitat.

6.10 Vegetation Management Plan

Critical areas for aviation are managed at the Airport with a schedule for mowing and brush hog cutting as shown on Figure 17. At present, grass areas adjacent to the paved surfaces of the runway, taxiways, along the glide slope area and approach areas at the runway ends, and along an approximately 400-foot wide swath of *Phragmites* along the MALSF lights are mowed as needed, typically three to four times annually. Beyond the grass areas, woody vegetation between the taxiways and runway and to the south of the runway is mowed with a brush hog every one to three years to maintain the object-free zone around the critical areas.

The mowing plan was reviewed as requested by NHESP to see if there were any grassland areas outside of the Airport's critical areas that could be mowed on a less-frequent schedule to enhance grassland bird habitat. Given the unique location of the Provincetown Municipal Airport and the small percentage of grassland at the Airport, the mowing schedule under proposed conditions is similar to the current schedule (Figure 17) although some of the areas will have shifted slightly.

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7.0 REQUEST FOR VARIANCE

7.1 Introduction

Five of the CIP project elements will require Water Quality Certification (WQC) pursuant to 314 CMR 9.04(1), 9.04(2), and 9.04(9) for cumulative impacts to isolated and/or bordering vegetated wetlands exceeding 5,000 SF, activity within any Outstanding Resource Water (ORW), and activities requiring an Individual 404 Permit from the Corps, respectively. A WQC Variance is required pursuant to 314 CMR 9.06(3) for alteration of wetland resources that are designated ORWs. The five project elements with ORW impacts include:

- Construct Westerly Taxiway System Improvements;
- Relocate East End Taxiway;
- Improve Access Road to Approach Light System;
- Construct Service Access Road to the AWOS; and
- Install a Perimeter Safety/Security Fence.

7.2 ORW Designation

In accordance with 314 CMR 4.06 (see Table 26 – Cape Cod Coastal Drainage Area), all waters in and adjacent to the Cape Cod National Seashore (CCNS) are designated as ORWs. The Massachusetts Surface Water Quality Standards (M.G.L. c.21, s.27) are used to guide the issuance of surface water quality discharge permits and their subsequent implementation under the 401 Water Quality Certification Program. The Surface Water Quality Standards along with the regulations at 314 CMR 4.04(3)(b) only allow for a new or increase discharge to an ORW if:

> *1. the discharge is determined by the Department to be for the express purpose and intent of maintaining or enhancing the resource for its designated use and an authorization is granted as provided in 314 CMR 4.04(5). The Department's determination to allow a new or increased discharge shall be made in agreement with the federal, state, local or private entity recognized by the Department as having direct control of the water resource or governing water use; or*
>
> *2. the discharge is dredged or fill material for qualifying activities in limited circumstances, after an alternatives analysis which considers the Outstanding Resource Water designation and further minimization of any adverse impacts. Specifically, a discharge of dredged or fill material is allowed only to the limited extent specified in 314 CMR 9.00 and 314 CMR 4.06(1)(d). The Department retains the authority to deny discharges which meet the criteria of 314 CMR 9.00 but will result in substantial adverse impacts to the physical, chemical, or biological integrity of surface waters of the Commonwealth.*

7.3 Project Purpose and Need

As discussed in Section 3, the purpose of these CIP Project elements is to provide operational safety and security improvements at the Provincetown Municipal Airport to comply with current FAA, MassDOT, and TSA safety and security design standards.

7.4 Project Alternatives

Section 4 presents the alternatives considered for the five project elements affecting freshwater wetlands, and presents the preferred alternative to each[10]. The proposed safety upgrades to the Airport infrastructure must logically occur not only at the Airport, but must follow the design guidelines and must be sited in a location that addresses these standards for each Project element. Project element designs for the preferred alternatives have been further refined since the filing of the FEIR/EA (Attachment 1), primarily as a result of grading, to more accurately reflect the wetland impacts associated with each of the Project elements. In general, wetland impacts have been reduced wherever feasible; however, site constraints of airport infrastructure surrounded by wetland resources areas, necessitate wetland alteration to achieve the project purpose and need.

7.5 Proposed Mitigation

As discussed in Section 6, as well as within the Attachments, wetland impacts are mitigated through wetland restoration with specific provisions to manage existing, as well as the potential spread of, non-native invasive plant species, protection of rare species and rare species habitat, and to allow for long-term monitoring to ensure the successful establishment of the restored wetland areas such that they function in a similar manner as those wetlands which will be directly altered through fill. The majority of the proposed wetland restoration will occur within three areas: an area of IVW restoration at the west end (Area A), an area of IVW restoration at the east end (Area C), and within an area of BVW replacement adjacent to the existing BVW at the west end (Area B). These areas will provide for an approximately 1.5:1 mitigation ratio for direct fill. Impacts associated with changes to the vegetation community along the proposed fence are anticipated to continue to provide many of the same functions and values as previously provided. Thus alteration of wetland habitat types associated with the proposed fence and will result in no net loss of wetlands. Additional mitigation measures, including management of invasive species, and to a degree, participation in the State's ILF program (per ACOE requirements) will provide for additional mitigation of cut wetlands.

7.6 Variance Request

The Airport Commission specifically seeks a WQC with a Variance under the provisions at 314 CMR 9.08. All reasonable measures have been proposed to avoid, minimize, and mitigate

[10] A full alternatives analysis for all twelve project elements is presented in the FEIR/EA (see Attachment 1). While the impact numbers were planning level estimates, impacts to resource areas have not varied significantly from those presented here, and would not change the preferred alternative.

adverse effects on the environment, and that implementation of the proposed CIP Project is justified by an overriding public interest for the Airport to provide safe and secure passenger flight service.

The Airport initiated a master planning process in 2005 to identify needed safety and operational improvements for the airfield and facility, which resulted in the CIP Project elements. Implementation of the CIP is designed to fulfill the Airport's mission to operate a safe, secure, and reliable hub service airport receiving scheduled passenger flight service. The unique environmental setting and history of the area have shaped the size and character of the Airport and have been considered during the planning and design of the proposed FAA CIP Project. The CIP Project elements are designed to provide operational safety and security improvements at the Airport that comply with current FAA, MassDOT, and TSA safety and security design standards while minimizing and mitigating impacts to the surrounding natural resources to the greatest extent possible.

The Airport provides commercial airline service from Logan International Airport in Boston, Massachusetts, and is an important and relied upon transportation for residents and business associates of the outer Cape Cod region, as well as an important component for tourists. The Airport also serves as an alternate means of transportation for medical emergencies requiring medical facilities offered by a major city such as Boston. The CIP Project supports these overriding public benefits by improving safety and security for the airport and airline passengers.

While not all of the proposed CIP Project elements necessitate impacts to water resources, the CIP Project elements have been carried forward under a single Project, the overall goals of which will further the interests of providing a safe, secure and reliable airport facility. The need to address prescribed safety and security standards in conjunction with the unique location of the airport infrastructure within environmentally sensitive resource areas and rare species habitat will not allow the Airport to comply with the safety standards without necessary impacts to the surrounding environment, including wetlands. Through an alternatives analysis, the Airport Commission identified the alternative with the least amount of environmental impacts while still addressing the safety and security standards. In some instances, such as with the proposed fence, the Airport Commission has sought to apply site-specific environmental constraints to arrive at the preferred project design. Unavoidable impacts from the CIP have been mitigated to the greatest extent practicable such that the benefits from the CIP outweigh the detriments from the Project. Proposed mitigation measures are designed to address project impacts and preserve the unique environment at the Airport and the functions and values provided by these resource areas.

For these reasons, the Airport Commission believes that a WQC with a Variance is appropriate for the proposed CIP Project, and respectfully requests that a Variance be granted in accordance with the regulations at 314 CMR 9.08.

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Plans and Graphics

Project Locus Maps and Figures
Project Plans (11x17 and 24x36 formats)

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Attachments

Attachment 1	Final Environmental Impact Report/Environmental Assessment (FEIR/EA) and Appendices (including FAA and MassDOT guidance documents)
Attachment 2	MEPA Certificates for FEIR/EA and DEIR
Attachment 3	Project Plans
Attachment 4	Fence Impact Areas (north and south) – PowerPoint presentation (March 2010)
Attachment 5	Stormwater Management Plan (May 2015)
Attachment 6	Order of Resource Area Delineation (January 2007)
Attachment 7	Preliminary Jurisdictional Determination (ACOE; January 2007)
Attachment 8	Order of Conditions issued August 3, 2015
Attachment 9	Coastal Dune Technical Narrative (March 2015)
Attachment 10	MESA Project Review & Draft Rare Species Protection Plans
Attachment 11	Summary of Wetland Resource Areas (April 2007)
Attachment 12	Summary of Natural Resources and Rare Species Habitat Assessments (April 2007)
Attachment 13	Wetland Descriptions and Observations of Habitat Suitability Relative to the Eastern Spadefoot (Scaphiopus h. holbrookii), Provincetown Municipal Airport (July 2009)
Attachment 14	Draft Invasive Species Management Plan
Attachment 15	ILF Fact Sheet and Instrument
Attachment 16	Historic and Tribal Correspondence

Note: All Attachments are provided with the WQC Application in electronic form on CD. Paper copies are available upon request.