

Capital Improvements Plan Provincetown Municipal Airport

Final

December 17, 2011

Appendices



Federal Aviation Administration
Massachusetts DOT Aeronautics Division
Provincetown Airport Commission

Date:

APPENDICES

- 1. Wetland Reports and Documents**
- 2. Wildlife and Rare Species Habitat Assessment Reports**
- 3. NPDES Plans**
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APPENDIX 1
Wetland Reports and Documents

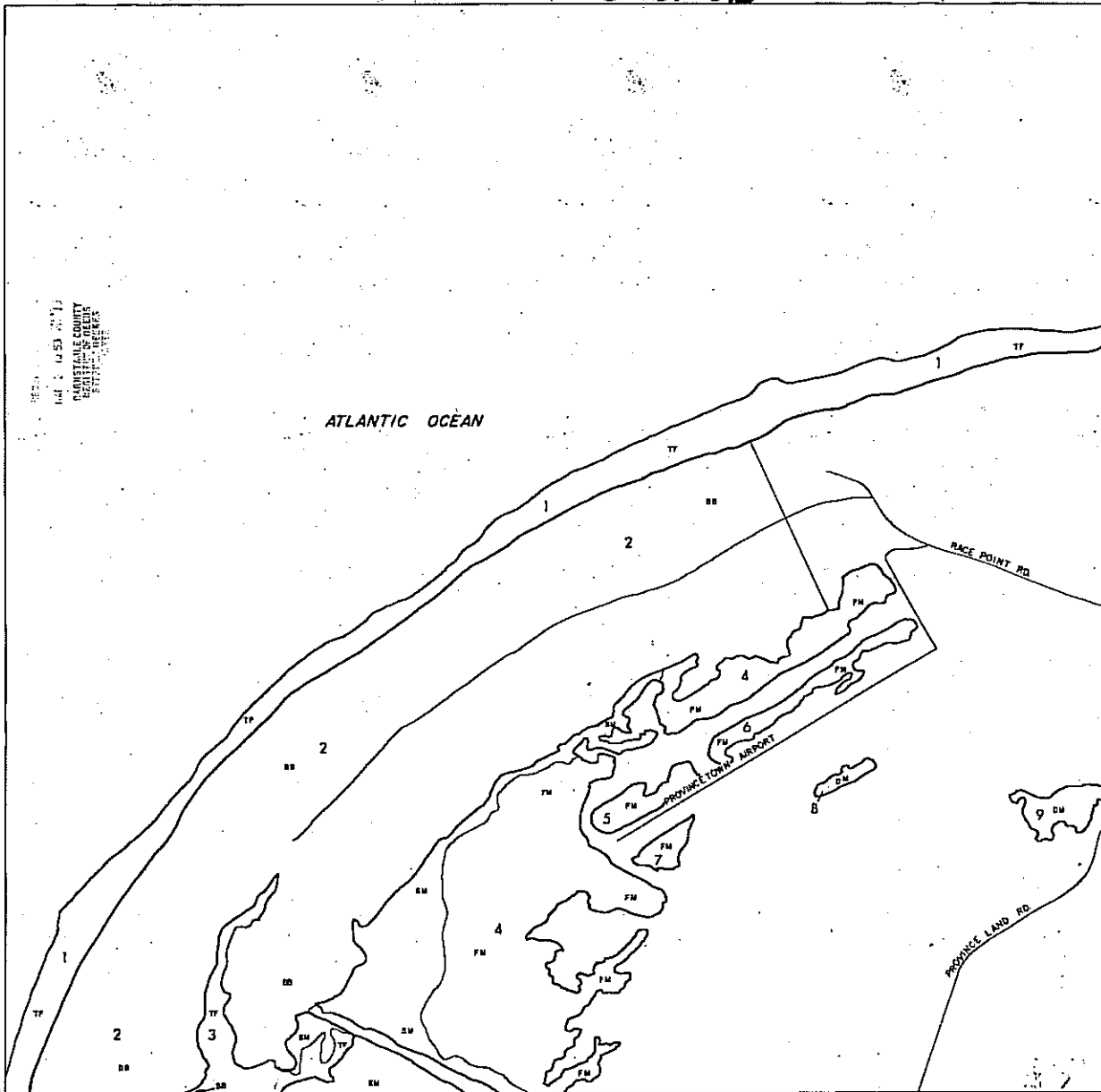
1. DEP Wetland Restriction Map, 1977
2. Summary of wetland Resource Areas, Horsley Witten Group, April 2007

Appendix 1.1 DEP Wetland Restriction Map, 1977

322-23

SHEET NO. 094/39

095 40



COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

SCALE 1:7200
0 600 1200 1800 2400 FEET
1" = 800'

AREA (S) OF RESTRICTION UNDER
G.L. c.130 s.105
G.L. c.131 s.40A

LEGEND					
TIDAL FLAT	TF	FRESH MARSH	FM	SEASONALLY FLOODED FLAT	FF
BARRIER BEACH	BB	DEEP FRESH MARSH	DM	CULTIVATED CRANBERRY BOG	CB
SALT MARSH	SM	SHRUB SWAMP	SS	POND	P
		WOODED SWAMP	WS	STREAM	
		DAM	D	NATURAL BANK	
				POLITICAL BOUNDARY	

SHEET NO. 094/39
COUNTY BARNSTABLE
MUNICIPALITY PROVINCETOWN
WETLAND AREA (S) 1-9 INCL.
HEARING DATE JULY 11, 1977
APPROVAL DATE DEC. 1, 1977 C.131-41
APPROVAL DATE NOV. 3, 1977 C.130-1

ADOPTED AND APPROVED
Rudolf E. Kennell
COMMISSIONER
DEPT. OF ENVIRONMENTAL MANAGEMENT

Appendix 1.2 Summary of Wetland Resource Areas, Horsley Witten Group, April 2007

Horsley Witten Group

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Summary of Wetland Resource Areas

Provincetown Municipal Airport
Provincetown, Massachusetts

April 2007



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**Summary of Wetland Resource Areas
Provincetown Municipal Airport
Provincetown, Massachusetts**

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1. INTRODUCTION AND BACKGROUND

The Provincetown Airport Commission recently filed an Environmental Notification Form (ENF) under the *Massachusetts Environmental Policy Act* (M.G.L. c. 30 §§ 61 through 62H, inclusive, or MEPA). The ENF was based on the Provincetown Municipal Airport's 2005 Master Plan. The Master Plan was the initial step toward developing a Capital Improvement Project (CIP) program for the Airport facilities. An integral component of this planning process involves identifying the existing conditions and facility needs, while also identifying various alternatives to meeting those needs. The various improvement projects, as well as alternative project footprints, were outlined in the ENF.

The surveyed wetlands presented in the ENF were supplemented with available DEP wetlands data from MassGIS. The Certificate of the Secretary of the Executive Office of Environmental Affairs (EOEA) on the ENF (EOEA No.13789; May 26, 2006) specifically requested that the Airport definitively quantify the potential impacts for each of the proposed projects and the alternative footprints, which necessitated additional field surveys. As a result, additional wetland delineations have been completed since the ENF.

Wetland resource areas, including isolated and bordering vegetated wetlands that are protected and regulated under the *Massachusetts Wetlands Protection Act* (M.G.L. Ch. 131 § 40), its implementing Regulations (310 CMR 10.00), the Federal *Clean Water Act* (33 U.S.C. 1251, *et seq.*), the Town of Provincetown *Wetlands Protection Bylaw* (Chapter 12 of the Provincetown General Bylaws), and/or the Cape Cod Commission (CCC) Regional Policy Plan (RPP), were reviewed and approved by the Provincetown Conservation Commission under an Order of Resource Area Delineation ("Order") issued January 25, 2007. Figure 6 depicts the approved wetland areas.

Identification and delineation of all wetland areas is important to future permitting, thus additional wetland areas were identified and delineated within the Airport lease area that extend beyond the jurisdiction of State and local statutes due to their diminutive size. While shown on the existing conditions plans and discussed in the following narrative, the Airport Commission did not specifically seek State or local approval of those wetland boundaries. For clarification, these small isolated areas are identified in the table of Wetland Resource Areas at the end of this narrative. Please note that only those wetlands that occur within or near the various CIP footprints (and alternatives) have been delineated.

Additionally, the Army Corps of Engineers (ACOE), who participated in the site walk for the Abbreviated Notice of Resource Area Delineation (ANRAD), issued a separate Preliminary Jurisdictional Determination (NAE-2006-4281) 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 summary of all wetland resource areas delineated at the Airport is provided below, including a general site description, a general regulatory overview, broad descriptions of the various types of wetland resource areas encountered, a discussion of field methodologies, and a description of each wetland area encountered within or near any identified CIP project footprint. This *Summary of Wetland Resource Areas* report incorporates all information previously reported in the *Wetland Resource Area Report* (HW, October 2005) referenced in the ENF, as well as the information presented in the ANRAD report (HW, December 2006) that was submitted to the Provincetown Conservation Commission and the Massachusetts Department of Environmental Protection (DEP).

2. GENERAL SITE CHARACTERISTICS

The Airport is situated within the bounds of the Cape Cod National Seashore (CCNS), occupying approximately 322 acres of land (Figures 1 and 2). Race Point Road and the Coast Guard Station at Race Point are located to the immediate northeast. Areas within the Airport lease area that are maintained for Airport operations include a terminal and other buildings, a paved runway and taxiways, auto parking, and navigation equipment. Additional areas are mowed to maintain various aviation safety areas and navigational surfaces. In general, the areas at the Airport that are not actively maintained as part of Airport operations are either wetland/palustrine habitats or coastal dune habitats.

The Airport contains diverse wetland resource areas, including isolated freshwater wetland areas, Bordering Vegetated Wetlands (BVW), salt marsh, and a coastal dune system. Portions of the Airport are located in the coastal floodzone. Wetland habitats present typically demonstrate physical and biological characteristics of a Coastal Interdunal Marsh/Swale, as described in the *Classification of the Natural Communities of Massachusetts* (Swain and Kearsley, 2001; “the *Classification*”). Dune habitats observed at the Airport can be classified as either Maritime Dune, Maritime Shrubland, or Maritime Pitch Pine on Dunes as described in the *Classification* depending on their individual characteristics.

3. REGULATORY OVERVIEW

Wetland Resource Areas found within the Airport lease area are subject to jurisdiction pursuant to the *Massachusetts Wetlands Protection Act*, the *Federal Clean Water Act*, the *Provincetown Wetlands Protection Bylaw*, and the CCC RPP and implementing regulations. Any activity proposed within a jurisdictional wetland or within 100 feet of certain wetland areas will require review and permitting by Federal, State, regional, and/or local regulatory authorities. A brief description of the jurisdictional definitions is provided below. Specific descriptions of individual wetland resource areas are provided in the following section.

3.1 Freshwater Wetlands

3.1.1 Bordering Vegetated Wetland

BVWs are defined under Massachusetts Wetlands Protection Act Regulations at 310 CMR 10.55(2)(a) as “freshwater wetlands that border on creeks, rivers, streams, ponds and lakes. The types of freshwater wetlands are wet meadows, marshes, swamps and bogs. Bordering Vegetated Wetlands are areas where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants. The boundary of Bordering Vegetated Wetland is defined at 310 CMR 10.55 (2)(c) as the line within which 50% or more of the vegetational community consists of wetland indicator plants and saturated or inundated conditions exist.” Freshwater wetlands meeting this definition are also regulated as waters of the United States under Section 404 of the *Federal Clean Water Act* (see below), and as freshwater wetlands under the *Provincetown Wetlands Protection Bylaw* (Chapter 12).

3.1.2 Isolated Vegetated Wetlands

Isolated Vegetated Wetlands are regulated under Section 404 of the *Federal Clean Water Act*, as well as under the *Provincetown Wetlands Protection Bylaw* and the CCC RPP.

Freshwater wetlands are defined by the Army Corps of Engineers (Federal Register 1982) and the U.S. Environmental Protection Agency (Federal Register 1980) as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under

normal circumstances so support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”

Chapter 12 of the Provincetown General Bylaws regulates Isolated Vegetated Wetlands, defined as “*any area where surface or ground water or ice at or near the surface of the ground and greater than 500 square ft. which supports a plant community (cover) comprised of 50% or greater of wetland species, or which in the judgment of the Commission supports a significant community of wetland vegetation.*”

Vegetated Wetlands: A Vegetated Wetland is defined by the Provincetown Conservation Commission Bylaws as “*any area of at least 300 square feet where surface or groundwater, or ice, at or near the surface of the ground support a plant community dominated (at least 50 percent) by wetland species or have created hydric soils.*” The local wetlands bylaw specifically defines bogs and marshes as follows.

- **Bog:** A Bog is defined by the Provincetown Conservation Commission Bylaw as “*a freshwater wetland characterized by peat accumulation usually dominated by moss. Receives only direct precipitation; characterized by acid water, low alkalinity, and low nutrients.*”
- **Marsh:** A Marsh is defined by the Provincetown Conservation Commission Bylaw as “*a freshwater or coastal wetland permanently or periodically inundated characterized by nutrient-rich water.*”

Unvegetated Wetlands: An Unvegetated Wetland is defined by the Provincetown Conservation Commission Bylaw as “*coastal areas, such as flats and unvegetated intertidal areas; coastal and freshwater beaches, dunes, and banks; and land subject to flooding. Also, inland areas subject to flooding which do not support wetland vegetation or contain hydric soils, but which store at least 1/8 acre feet of water to an average depth of six inches at least once a year, or the statistical equivalent, and land areas two feet or less vertically above the high water mark of any lake or pond defined by Chapter 12 of the General By-Laws of Provincetown; regulations promulgated by the Provincetown Conservation Commission or 310 CMR. Does not include swimming pools, artificially lined ponds or pools, wastewater lagoons, or stormwater runoff basins, the construction of which may be regulated but do not themselves constitute regulated areas.*”

The CCC RPP regulates impacts to all wetlands greater than 500 square feet whether they border water bodies or not, as well as the associated 100-foot buffer zone.

3.1.3 Isolated Land Subject to Flooding

Isolated wetlands are regulated under the Massachusetts Wetlands Protection Act only if they meet a volumetric criteria as specified under the Regulations at 310 CMR 10.57(2)(b). Isolated Land Subject to Flooding (ILSF) is defined at 310 CMR 10.57(2)(b)1 as “*an isolated depression or closed basin without an inlet or an outlet. It is an area which at least once a year confines standing water to a volume of at least ¼ acre-feet and to an average depth of at least six inches.*” Chapter 12 also regulates ILSF under the definition of “Unvegetated Wetlands” (see above).

3.2 Coastal Resource Areas

3.2.1 Coastal Flood Zone

Land Subject to Coastal Storm Flowage (LSCSF) is defined in the Massachusetts Wetlands Protection Act Regulations at 310 CMR 10.04 as “*land subject to any inundation caused by coastal storms up to and including that caused by the 100-year storm, surge of record or storm of record, which ever is greater.*”

The Airport is situated within a low-lying area between parallel dune ridges. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (Community Panel 255218 00001 C), this low area is within the 100-year flood zone (Zone A2, elevation 10 feet above sea level, and Zone A4, elevation 11 feet above sea level; shown as zone AE on Figure 3). The Airport facility and the immediate surrounding area are therefore located within LSCSF, a jurisdictional resource area under the *Massachusetts Wetlands Protection Act* and the local wetlands bylaw. Small pockets of Flood Zone B (X500; Areas between the 100-year flood and the 500-year flood) are located within the A flood zone. The extreme tip of the runway approach lights is located within the velocity Zone V4 (VE, elevation 13 feet above sea level). The surrounding elevated dune system is located within areas of minimal flooding. The 100-year flood zone includes flood zones A and V, but not B or C.

3.2.2 Coastal Dune and Barrier Beach

Coastal Dune is defined in the *Massachusetts Wetlands Protection Act* Regulations at 310 CMR 10.28(2) as “*any natural hill, mound or ridge of sediment landward of a coastal beach deposited by wind action or storm overwash. Coastal dune also means sediment deposited by artificial means and serving the purpose of storm damage prevention or flood control.*”

The *Massachusetts Wetlands Protection Act* Regulations at 310 CMR 10.29 defines Barrier Beach as “*a narrow low-lying strip of land generally consisting of coastal beaches and coastal dunes extending roughly parallel to the trend of the coast. A barrier beach is separated from the mainland by a narrow body of fresh, brackish, or saline water or a marsh system.*”

The coastal dune habitats located to the north and northwest of the Airport occur within the boundaries of the Race Point barrier beach system and consist of both primary and secondary dune habitats. There are no primary dunes located within the Airport lease area. The coastal dune habitats located to the southeast of the Airport are secondary coastal dune habitats that are not within the barrier beach system.

3.2.3 Salt Marsh

The Regulations at 310 CMR 10.28(2) define a salt marsh as “*a coastal wetland that extends landward up to the highest high tide line, that is, the highest spring tide of the year, and is characterized by plants that are well adapted to or prefer living in, saline soils. Dominant plants within salt marshes are salt meadow cord grass (*Spartina patens*) and/or salt marsh cord grass (*Spartina alterniflora*). A salt marsh may contain tidal creeks, ditches and pools.*”

The Hatches Harbor salt marsh system represents an area of former salt marsh that developed brackish to freshwater characteristics over time due to the construction of the Hatches Harbor dike in 1930. The dike was constructed in an attempt to eradicate the problem of a flourishing mosquito population. However, the resultant near monoculture of common reed, and severe reduction of wildlife habitat values prompted the Hatches Harbor Salt Marsh Restoration Project, initiated by National Park Service (NPS) in 1998. Subsequent improvements to the tidal flushing in this area have begun to restore brackish and freshwater wetlands to salt marsh that is contiguous with undisturbed salt marsh areas located seaward of the dike.

The lands on and in the vicinity of the Airport support a barrier beach marsh system. This marsh system consists predominantly of isolated wetland habitats of various sizes that are forested, shrub-dominant, herbaceous, or some combination of these plant community habitat types. Figure 4 depicts wetland resource areas identified by MassGIS and regulated by the State.

4. SOILS CLASSIFICATION AND GEOLOGIC CHARACTERISTICS

The Natural Resources Conservation Service (NRCS) has mapped the Airport as consisting of four primary soil types (Figure 5). Soils are typically very deep and consist of loose, coarse sands according to information obtained from the Barnstable County Soil Survey (Fletcher, 1993). A brief description of the soil types is provided below.

- The marshy BVW located southwest of the Airport facilities and north of the Hatches Harbor dike is mapped as **Berryland mucky loamy coarse sand**, 0 to 2 percent slopes (BmA). This very poorly drained, hydric soil is found in depressions, swales, and low areas adjacent to streams and ponds on outwash plains and in areas of glacial lake deposits. Elsewhere, isolated wetland areas are mapped as **Pipestone loamy coarse sand**, 0 to 3 percent slopes (PeA). This poorly drained soil type is found in depressions, at the base of swales, and low areas bordering streams, ponds, and swamps.
- The dune complexes are mapped as either **Hooksan sand, rolling** (HoC), **Hooksan sand, hilly** (HoD), or **Hooksan –Dune land complex, hilly** (HxC). These excessively drained sandy soils along the vegetated dunes are distinguished primarily by the range of slope.
- **Deerfield loamy fine sand**, 0 to 5 percent slopes (DeA). This well-drained soil type is found in depressions, swales, and low areas adjacent to streams and ponds on outwash plains and in areas of glacial lake deposits. This soil type is found at the southeastern corner of the Airport. Small areas of other hydric soil types are included within mapped areas of this soil.
- **Udipsamments, smoothed** (Ud). This map unit consists of nearly level soils in areas that have been excavated or filled during construction. Commonly rectangular in shape, these areas are generally associated with roads, highways, schools, housing developments, or athletic fields.

The geologic characteristics of the Airport, combined with a fluctuating, seasonally 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 during storm events also contributes to saturated soil and inundated land conditions. Inundated and/or saturated soil conditions favor the establishment of a hydrophyte-dominant plant communities and the deposition of organic material, which are typical of wetland habitats.

5. WETLAND DELINEATION METHODOLOGY

HW field biologists conducted field surveys and wetland delineations in August and September 2004 to support the Airport's master planning effort. At that time, HW identified and delineated 14 wetland areas, Wetlands A through N, each corresponding to an established series of sequentially numbered wetland boundary flag stations. These surveyed wetland areas are shown on Figure 6.

HW resumed field surveys in the summer and fall of 2006 (approximately August through early December), delineating and field surveying an additional 51 wetland areas that correspond to the approximate footprints of the CIP projects described in the ENF. HW assigned a two letter code to these wetland areas to distinguish these wetlands from those identified in the ENF. In some instances, wetland area boundaries that were previously partially established were expanded upon during the second round of field work.

To facilitate our field efforts, the Airport Lease Line was survey-located and marked in the field at 50- or 100-foot intervals with labeled wooden stakes. Wetland areas along the lease line were delineated in

approximately four series: AA through AM [excluding AH]; BA through BC; CA through CV; and DA through DM. These wetland areas range in size from only a few hundred square feet to expansive wetland areas associated with the Hatches Harbor salt marsh system. As stated above, some of the two letter code wetland boundaries are contiguous with and expand upon previously identified (i.e., single letter code) wetland areas. Each wetland was marked using sequentially-numbered pink wire “pin” flags and/or pink flagging tape. All recently established wetland areas were field-surveyed using a hand-held GPS (global positioning system) with sub-meter accuracy (i.e., within a 3-foot radius).

HW made all wetland boundary determinations in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual (Technical Report Y-87-1) and the DEP handbook entitled *Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act* (March 1995) with consideration given to the local *Provincetown Wetlands Protection Bylaw* and the implementing regulations. The State and Federal methodologies for determining the limits of a jurisdictional wetland generally require the use of three parameters of vegetation, hydrology, and soils. The local wetlands bylaw determines the boundary of BVWs and Isolated Vegetated Wetlands that are greater than 500 square feet, by the presence of a plant community of 50% or greater of wetland species, and “soil hydrology may provide secondary criteria where necessary.” HW completed *DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Forms* within representative wetland areas, which are included within the Appendices to this document.

Each wetland area observed and delineated (partially or entirely) was classified according to the *Classification of Wetland and Deepwater Habitats of the United States* (Cowardin, et al., 1979) with respect to plant community cover types and water regime. As an example, shrub-dominant interdunal wetland marsh, which is the predominant type of wetland habitat at the Airport, is classified as palustrine scrub-shrub (or PSS) with a non-tidal, seasonally- or temporarily-flooded water regime.

6. OVERVIEW OF WETLAND AREAS

The Airport exhibits a low and flat topography and the fluctuating groundwater table elevations are relatively close to the ground surface. The wetland areas range in size from isolated areas of less than a few hundred square feet, to extensive wetland areas associated with and connected directly to the Hatches Harbor wetland system.

The Coastal Interdunal Marsh/Swale community type appears to be one of the predominant, if not the predominant, type of wetland habitat existing at the site. According to the *Classification* (Swain and Kearsley, 2001), this community type is a “*graminoid [grass-like species]- or shrub-dominant coastal community occurring in shallow basins (swales) between sand dunes.*” *With respect to environmental setting, “Interdunal swales are low, shallow depressions that form between sand dunes along the coast. They occur as part of a dune system, and the best examples are complexes of numerous swales. Soils generally have a thin, about one centimeter, organic layer over coarse sand. The water regime ranges from seasonally flooded to permanently inundated.”*

Within this Coastal Interdunal Marsh/Swale community type, HW generally encountered three basic variations: a graminoid-dominated palustrine emergent marsh (PEM), a shrub-dominated palustrine shrub swamp (PSS), and a palustrine forested swamp (PFO). Emergent marshes and shrub swamps were generally encountered north of the Airport facilities and in low-lying areas to the immediate south and west of the runway, where the wetlands are either connected to the Hatches Harbor wetland system, or else are part of the Airport-managed areas where vegetation is maintained at lower heights for Airport safety purposes. Dominant vegetation within the emergent marshes includes woolgrass (*Scirpus*

cyperinus), twig rush (*Cladium mariscoides*), black grass (*Juncus gerardii*), and soft rush (*Juncus effusus*).

Vegetation within shrub swamp communities encountered included bayberry (*Myrica pensylvanica*), willow (*Salix* spp.), winterberry (*Ilex verticillata*), arrowwood (*Viburnum dentatum*), shadbush (*Amelanchier canadensis*), Virginia rose (*Rosa virginiana*), and poison ivy (*Toxicodendron radicans*) with a diversity of herbaceous species including Joe-Pye weed (*Eupatorium* spp.), various goldenrods (*Solidago* spp.), various asters (*Aster* spp.), and ferns in more open areas within the outer dunes closest to the ocean. Within more inland areas dominant wetland vegetation includes highbush blueberry (*Vaccinium corymbosum*), swamp azalea (*Rhododendron viscosum*), and dwarf huckleberry (*Gaylussacia dumosa*) among large patches of American cranberry (*Vaccinium macrocarpon*) interspersed with clumps of woolgrass, ferns, and sphagnum moss (*Sphagnum* spp.).

Forested wetlands (PFO) are located primarily to the south of the runway beyond the managed areas. HW considered all areas conforming to a pitch pine (*Pinus rigida*), cranberry, and highbush blueberry-dominant, forested wetland habitat type (also referred to here as “cranberry-pine swales”) to be a local variant of the shrub-dominant Coastal Interdunal Marsh/Swale, where pitch pine appears to have become well adapted to seasonally wet conditions, and was considered to be a local wetland indicator species.

6.1 Descriptions of Isolated Wetland Areas

Below we provide a brief description of the vegetative and soil characteristics of each wetland area identified and delineated, beginning with those areas delineated prior to the development of the Master Plan (i.e., those wetlands delineated in 2004 and 2005), followed by areas delineated more recently (i.e., in 2006), and any updated information regarding the initial wetland delineation efforts. Wetland areas with similar characteristics have been grouped together within these descriptions as appropriate. These areas are presented on the enclosed *December 2006 Wetland Resource Area Map* prepared by HW (Figure 6). Table 1 summarizes the wetland areas, their jurisdictional status, and the functions and values of each area.

6.1.1 Wetland A

Wetland A is an isolated wetland habitat nearest the northern corner of the Airport terminal and hangar building and adjacent to the terminal parking lot. Dominant canopy species include willow and pitch pine. Plant community species including winterberry, red maple (*Acer rubrum*), meadowsweet (*Spiraea latifolia*), quaking aspen (*Populus tremula*), bayberry, poison ivy, and chokeberry (*Aronia* sp.) comprise the relatively dense shrub-dominant understory of this wetland plant community. Wetland A is a scrub-shrub/forested palustrine habitat (PSS/PFO) with a non-tidal seasonally- or temporarily-flooded water regime. While inundation within this wetland was not directly observed, indicators of past surface water inundation, specifically blackened leaves, were observed.

6.1.2 Wetland B

Wetland B is an isolated wetland habitat located to the southeast of the Airport terminal and hangar building. A gravel path traversing this wetland serves as access to the localizing transmitter. This wetland is characteristic of a Coastal Interdunal Marsh community and can also be classified as a scrub-shrub/emergent palustrine habitat (PSS/PEM). Plant species frequently observed within this wetland included American cranberry, highbush blueberry, dangleberry, meadowsweet, winterberry, pitch pine, and willow. Herbaceous plant species including various sedges (*Carex* spp.), rushes (*Juncus* spp.), and some common reed (*Phragmites australis*) were also frequently encountered. Wetland B likely has a

non-tidal seasonally- or temporarily-flooded water regime. While inundation within Wetland B was not directly observed, hydrologic indicators such as water marks were observed on the trunks of mature shrubs, indicating that this wetland had recently experienced inundation.

6.1.3 Wetlands D, E, G, and L

Wetlands D, E, G, and L are examples of the Coastal Interdunal Marsh community and can be further classified as isolated forested (PFO) and scrub-shrub palustrine (PSS) habitats. These delineated areas and other similar areas identified by MassGIS, form a wetland mosaic within the extensive pitch pine-forested habitats to the southeast of the runway. While pitch pine is the dominant tree species in these wetland areas, the typical plant community in the understory is composed primarily of highbush blueberry, American cranberry, and woolgrass. While inundation within these isolated wetlands was not directly observed, indicators of surface inundation, specifically blackened leaves and watermarks on the trunks and stems of mature woody vegetation, were observed. These non-tidal wetland habitats likely experience a seasonally- or temporarily-flooded water regime. According to the soil survey, these wetland areas are mapped within Pipestone loamy coarse sands (0-3% slopes), Deerfield loamy fine sands (0-5% slopes), and Hooksan sands, rolling map units.

While Wetlands D and G are fully contained within the pitch pine-forested dune habitat, portions of both Wetland E and Wetland L extend beyond the limit of the pitch pine forest and into the runway vegetative maintenance areas. This maintenance is necessary for safety purposes to remove woody vegetation above a certain height. In these areas, a combination of graminoid- and shrub-dominant plant communities exist. Graminoid refers to grass and grass-like plants such as sedges and rushes. Shrub species including highbush blueberry, winterberry, chokeberry, arrowwood, and bayberry are common. Herbaceous vegetation in these areas consists primarily of sedges and rushes as well as an abundance of American cranberry. Areas adjacent to these wetland areas that are at slightly higher ground elevation are low-profile coastal dune habitats dominated by a coastal heath community including scrub oak (*Quercus ilicifolia*), beach plum (*Prunus maritima*), bearberry (*Arctostaphylos uva-ursi*), American beachgrass (*Ammophila breviligulata*), bayberry, poison ivy, common hairgrass (*Deschampsia flexuosa*), and various lichens.

6.1.4 Wetlands F, M, and N

Wetlands F, M, and N, each isolated wetlands, are emergent marsh palustrine (PEM) habitats that likely have temporarily-flooded water regimes. Located to the east of the Airport runway, these freshwater wetlands are relatively small and are located in close proximity to one another. Herbaceous plant species including various sedges (*Carex* spp.) and rushes (*Juncus* spp.) comprise the plant community in Wetland F, while Wetlands M and N support American cranberry as well as sedges and rushes. Wetland N may be non-jurisdictional because of its small size. 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, beach plum, bearberry, bayberry, and common hairgrass. These wetlands are non-tidal and probably have a seasonally- or temporarily-flooded water regime.

6.1.5 Wetlands H and I

Wetlands H and I are isolated scrub-shrub palustrine habitats (PSS) confined by the runway and taxiway. Plant community members consist primarily of red chokeberry (*Aronia arbutifolia*), winterberry, meadowsweet, steplebush (*Spiraea tomentosa*), highbush blueberry, American cranberry, bayberry, and poison ivy. Commonly observed plant species at and upslope of the wetland margin include winged

sumac (*Rhus copallinum*), bayberry, and little bluestem (*Schizachyrium scoparius*). These wetlands are non-tidal and probably have a seasonally- or temporarily-flooded water regime.

6.1.6 Wetland K

Wetland K is a Coastal Interdunal Marsh community supporting a characteristic freshwater emergent marsh habitat (PEM). While American cranberry provides nearly 100 percent cover, other species including wide-leaf cattail (*Typha latifolia*), soft rush, St. John's-wort (*Hypericum* sp.), and other graminoids are also relatively abundant. Two separate, relatively small common reed communities were observed within Wetland K. The boundary of this wetland includes a portion of the pitch pine-forested (PFO) interdunal marsh habitat. This non-tidal wetland likely experiences a seasonally- or temporarily-flooded water regime. Measurable inundation was observed in Wetland K, which makes this wetland unique as compared to other observed wetland habitats at the Airport in which no inundation was directly observed at any time during the field observation period. The soil survey depicts this wetland as lying within the Pipestone loamy coarse sands (0-3% slopes) map unit.

6.1.7 Wetlands AA, AB, AC, AD, AG, and AJ

Wetlands AA and **AB** are each small isolated wetlands consisting of clumps of woolgrass, twig rush, soft rush, and black grass. **Wetlands AC** and **AD** are also small isolated wetlands with a slightly greater vegetative diversity, including clumps of woolgrass, pilewort (*Erechtites hieracifolia*), and slender-leaf goldenrod (*Euthamia tenuifolia*) interspersed with patches of bayberry and willow (*Salix* sp.). Each of these wetlands is located along the outer Airport lease line. **Wetland AG** is a larger isolated wetland that extends well beyond the northern lease line. The vegetation within this wetland includes bayberry, twig-rush, woolgrass, black grass, and hyssop-leaved boneset. **Wetland AJ** is a very small, linear wetland, located adjacent to AI. The vegetation is limited to black grass and twig-rush, with obvious surficial indicators of hydrology (soil staining), indicating a seasonally- or temporarily-flooded water regime.

6.1.8 Wetland AE

Wetland AE is a somewhat larger isolated wetland that meanders along the northern lease line. This densely vegetated wetland consists of a large, central patch of common reed with clumps of willow, woolgrass, Gray's Flatsedge (*Cyperus grayii*), hyssop-leaved boneset (*Eupatorium hyssopifolium*), bayberry, pilewort, and black grass.

6.1.9 Wetland AF

Wetland AF is an isolated wetland consisting of large clumps of willow dominating the wetland interior with large clumps and patches of American cranberry, bayberry, hyssop-leaved boneset, slender-leaf goldenrod, common reed, poison ivy, twig-rush, black grass, and woolgrass. Scattered pitch pine seedlings were observed within the wetland interior.

6.1.10 Wetland AI

Wetland AI is an isolated wetland containing a small island of coastal dune within its interior. The vegetation is dominated by bayberry and poison ivy, both species extending beyond the boundary of the wetland itself. Additional vegetation includes willow, twig-rush, woolgrass, black grass, and patches of hyssop-leaved boneset.

6.1.11 Wetland AK

Wetland AK is a larger isolated wetland which displays two different types of vegetative communities: the western half of the wetland is dominated by willow (*Salix* sp.) and dwarf huckleberry with the remaining areas dominated by Virginia rose, bayberry, poison ivy, spotted Joe-Pye weed, meadowsweet, woolgrass, twig-rush, and steeplebush. Individual winterberry, arrowwood, and shadbush were observed in the eastern half of this wetland.

6.1.12 Wetland AL

Wetland AL is also a large isolated wetland consisting of large clumps of pussy willow and winterberry. There is a dense low shrub community of Virginia rose, bayberry, and poison ivy interspersed with clumps and patches of woolgrass, marsh fern (*Thelypteris palustris*), twig-rush, and black grass. Dense patches of American cranberry were observed in the wetland interior. A small stand of poplar seedlings (*Populus* sp.) was observed in the southeast corner of this wetland.

6.1.13 Wetland AM

Wetland AM is a smaller isolated wetland in the northern corner of the Airport lease area. This densely vegetated wetland is dominated by clumps and patches of American cranberry along with bayberry, winterberry, woolgrass, slender-leaf goldenrod, twig-rush, poison ivy, reed canary-grass, sea myrtle (*Baccharis halimifolia*), Virginia rose, marsh St. Johns wort (*Triadenum virginicum*), and New England aster (*Aster novae-angliae*).

6.1.14 Wetlands BA, BC, CA, CB, CD, CE, CG, CH, CI, CO, CP, CQ, and DB

Wetland areas described below generally are larger isolated areas consisting of transitional shrub swamp to forested swamp communities (PSS/PFO) found largely east and south of the Airport facilities. Frequently, these areas contain small “islands” of coastal dune within interior portions.

Wetland BA is an isolated wetland located in the southeastern corner of the Airport lease area. The vegetation in this transitional shrub-swamp/forested swamp wetland includes woolgrass, twig-rush, American cranberry, English plantain (*Plantago lanceolata*), black grass, and highbush blueberry, with scattered pitch pine throughout.

Wetland BC also consists of a transitional shrub swamp/forested swamp with small patches 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. Wetland BC is an extensive wetland with a meandering wetland boundary encompassing a large portion of the southeastern corner of the Airport lease area. Four coastal dune islands were located within the interior of Wetland BC. Wetland BC is contiguous with Wetlands F and G, which were previously identified by HW in 2004/2005.

Wetland CA is an isolated wetland with a vegetative community including pitch pine, dwarf huckleberry, American cranberry, twig-rush, woolgrass, and patches of sphagnum moss. As this area extends well off-site, only a portion of this area was delineated.

Wetland CB is a large isolated wetland located in close proximity to Wetlands BB and BC. The vegetation within this forested wetland includes an overstory of pitch pine with occasional swamp tupelo

(*Nyssa sylvatica*), clumps of woolgrass, twig-rush, black grass, bayberry, patches of American cranberry, and occasional clumps of American beachgrass along the wetland periphery.

Wetland CD is a larger isolated wetland consisting of a transitional shrub swamp/forested swamp includes a canopy of pitch pine with highbush blueberry and scattered gray birch (*Betula populifolia*), patches of American cranberry and sphagnum moss, woolgrass, black grass, and twig-rush.

Wetland CE is a large isolated wetland with a vegetative community similar to that found within Wetlands CC and CD with the addition of clumps and patches of inkberry (*Ilex glabra*).

Wetland CG is an extensive isolated wetland located along the lease line that extends well beyond this boundary. The vegetation within this wetland includes expansive patches of American cranberry, patches and clumps of sphagnum moss, twig-rush, black grass, fireweed (*Epilobium angustifolium*), and woolgrass. Shrub species encountered include sweet pepperbush (*Clethra alnifolia*) and highbush blueberry, with a canopy of pitch pine and swamp tupelo.

Wetland CH is a large open isolated wetland that was delineated in several non-contiguous flagging series due to its proximity to the Airport lease corner. Several linear-shaped islands of coastal dune were encountered within the interior of this wetland area. The vegetation of this wetland includes expansive areas of American cranberry interspersed with clumps and patches of sheep laurel (*Kalmia angustifolia*), highbush blueberry, individual pitch pine (in forested portions of this wetland), dwarf huckleberry, patches of sphagnum moss, twig-rush, woolgrass, and small entanglements of common greenbrier (*Smilax rotundifolia*).

Wetland CI is an isolated wetland that was only partially delineated due to its location along the lease line. Vegetation in this wetland includes pitch pine, woolgrass, black grass, twig-rush, winterberry, American cranberry, and highbush blueberry.

Wetland CO is an expansive linear wetland containing several upland islands of secondary coastal dune habitat. The vegetation of this transitional shrub swamp/forested wetland includes a pitch pine canopy with a diverse shrub community of swamp azalea (*Rhododendron viscosum*), bayberry, sheep laurel, and highbush blueberry. Additional vegetation consists of soft rush, sphagnum moss, common greenbrier, royal fern, cinnamon fern, twig-rush, black grass, poison ivy, and dense scattered patches of American cranberry.

Wetland CP is an isolated wetland containing a large upland island of coastal dune within its interior. The vegetation of this wetland is forested with a canopy of pitch pine including highbush blueberry, bayberry, swamp dewberry (*Rubus hispidus*), American cranberry, black grass, soft rush, woolgrass, broom sedge (*Andropogon virginicus*), twig-rush, dwarf huckleberry, New England aster, scattered common reed, occasional black cherry (*Prunus serotina*), slender-leaf goldenrod, and poison ivy.

Wetland CQ is a smaller isolated wetland consisting of bayberry, twig-rush, black grass, woolgrass, swamp dewberry, and poison ivy with a pitch pine overstory.

Wetland DB is an expansive wetland that incorporates several small islands of secondary dune. Vegetation of this transitional forested wetland includes a canopy of pitch pine, with dense carpets of American cranberry, scattered woolgrass, black grass, twig-rush, and sphagnum moss.

6.1.15 Wetlands BB, CC, CJ, CK, CL, CN, CR, DA, DC, DD/E, DE, DF, DG, DH, DI, and DM

Several smaller isolated wetlands were also encountered south and east of the Airport facilities. These areas, often with developing emergent marsh communities (PEM), are generally sparsely vegetated, and occasionally support a sparse canopy of pitch pine (i.e., PFO) but lacking a definite shrub community.

Wetland BB is a small isolated wetland located immediately adjacent to Wetland BC, separated by a small dune ridge. The vegetation within this small wetland is limited to twig-rush and black grass and surficial indicators of hydrology.

Wetland CC is an isolated, forested wetland consisting of pitch pine with twig-rush, highbush blueberry, swamp tupelo, black grass, patches of sphagnum moss, and an occasional scrub oak (*Quercus ilicifolia*).

Wetland CJ is a very small triangular isolated wetland with a vegetative community limited to black grass and twig-rush. **Wetland CK** is a somewhat larger isolated wetland with a similar vegetative composition along the exterior and an interior canopy of pitch pine.

Wetland CL is a small isolated wetland, and the only wetland located among the secondary dune system in the southern “tail” of the Airport lease area. As with Wetland CK, the vegetation within this wetland is limited to pitch pine and black grass, along with obvious surficial indicators of hydrology (soil staining).

Wetland CN is a small isolated wetland comprised of clumps of black grass with surficial evidence of hydrology (soil staining) and subsurface hydric soils.

Wetland CR is a small isolated wetland consisting of an open emergent marsh community dominated by woolgrass, twig-rush, and black grass.

Wetland DA is an isolated wetland with a pitch pine canopy. The vegetative community is limited to clumps and patches of woolgrass, black grass, and sphagnum moss.

Wetland DC is a small isolated wetland that is relatively “deep” as compared to most of the more shallow depressions found within the Airport with an estimated depth of approximately 2 to 3 feet at the lowest point. This area contains small patches of sphagnum moss surrounded by surficial evidence of seasonal hydrology. A canopy of pitch pine surrounds this isolated depression.

Wetland DD/E is a larger isolated wetland area that constitutes an extension of Wetland E. The dominant vegetation along this section includes American cranberry, black grass, and twig-rush with a pitch pine canopy.

Wetlands DF, DG, and DM are all small isolated wetlands with a plant community of black grass, twig-rush, and occasional woolgrass beneath a pitch pine canopy. **Wetland DI** is a small isolated wetland with a similar vegetative community as found within **Wetlands DF** and **DH**, with the addition of dense patches of American cranberry. Vegetation within **Wetland DG** is limited to twig-rush, pitch pine, and a single bayberry shrub.

Wetland DJ is a smaller isolated wetland located just north of Wetland DI. The vegetative community is comprised of pitch pine, black grass, and twig-rush. **Wetlands DK** and **DL** are also isolated wetlands located along the eastern edge of the Airport lease line with similar vegetative communities as Wetland DJ.

6.1.16 Wetlands CF, CM, CU, CV, and DE

Wetlands described below are generally shrub swamps (PSS) with a somewhat greater species diversity than the smaller isolated wetlands encountered.

Wetland CF is an isolated shrub swamp with a vegetative community dominated by highbush blueberry along with clumps and patches of black grass, sphagnum moss, and cinnamon fern (*Osmunda cinnamomea*).

Wetland CM is an isolated wetland located just off-site of the southernmost lease corner. Vegetation within this shrub swamp included large patches of American cranberry, with clumps and patches of sphagnum moss, woolgrass, dwarf huckleberry, sheep laurel, highbush blueberry, bayberry, poison ivy, inkberry, and twig-rush. A large patch of common reed and scattered pitch pine cover the wetland periphery.

Wetland CU is a small isolated wetland comprised of scattered individuals of woolgrass, bayberry, slender-leaf goldenrod, and swamp dewberry vines.

Wetland CV is another small isolated shrub swamp wetland encompassing clumps and patches of woolgrass, twig-rush, and slender-leaf goldenrod, with scattered bayberry and swamp dewberry vines.

Wetland DE is an isolated wetland with a similar vegetative community as found within Wetland DD/E with the additional of highbush blueberry and bayberry in the shrub layer.

6.2 Bordering Vegetated Wetland (Wetlands C, J, CS, and CT/J)

Wetland areas described below are freshwater wetlands contiguous with the larger Hatches Harbor wetland system.

6.2.1 Wetlands C and J

Wetlands C and J are BVWs due to their direct connections to the Hatches Harbor tidal wetland system. The easternmost portions of both wetland areas are characteristic of the Coastal Interdunal Marsh community and can be further classified as scrub-shrub palustrine habitats (PSS) with areas of palustrine emergent marsh (PEM) interspersed. Commonly observed plant species included winterberry, arrowwood, meadowsweet, blue-joint (*Calamagrostis canadensis*), American cranberry, and rose (*Rosa* spp.). Lesser amounts of purple loosestrife (*Lythrum salicaria*) (a non-native species), wide-leaf cattail (*Typha latifolia*), and woolgrass were also observed within these interdunal swales. In addition, there are significantly large communities of common reed within Wetland C, particularly to the north of the taxiway. The eastern corner of Wetland C nearest the Airport terminal and parking lot is a forested palustrine habitat (PFO) supporting a mature community of willow trees. The easternmost portions of these wetlands are non-tidal and probably have a seasonally- or temporarily-flooded water regime.

The westernmost portions of both wetlands are common reed-dominant emergent marshes (PEM), likely have a ground water table at or near the surface for most of the year, and likely experience an irregularly flooded tidal water regime. The soil survey indicates that the Berryland mucky loamy coarse sand (0-2% slopes) and Pipestone loamy coarse sand (0-3% slopes) are the two soil types that comprise these wetland areas.

6.2.2 Wetland CS

Wetland CS represents a portion of the larger BVW along Hatches Harbor. The vegetation within this wetland area is comprised of woolgrass, bayberry, twig-rush, black grass, and occasional pitch pine.

6.2.3 Wetland CT/J

Wetland CT/J is also a BVW associated with the Hatches Harbor wetland system. Flagging stations represent the southwestern boundary of Wetland J, which abuts managed areas near the approach to the Runway 7 end. While the wetland boundary is representative of a freshwater wetland (BVW), the vegetative community transitions from freshwater to brackish to saline, and contains a large diversity of wetland indicator species. Species encountered include black grass, slender-leaf goldenrod, St. John's wort, marsh fern, twig-rush, swamp dewberry, American cranberry, poison ivy, and common greenbrier. Interior sections contain a large area dominated by common reed, while the upper edge of the brackish community is comprised of several shrub species, including highbush blueberry, bayberry, winterberry, meadowsweet, and scattered eastern red cedar (*Juniperus virginiana*).

6.3 Updated and Amended Isolated Freshwater Wetland Descriptions

Throughout the descriptions of the isolated wetlands delineated in 2006, HW references wetland areas delineated prior to the development of the Master Plan (i.e., areas delineated in 2004 and 2005 under a more limited assessment area), in particular Wetlands F, G, E, K, and L. Below is a discussion of modifications or expansions to these areas.

Wetlands K and L. Portions of Wetlands K and L that had had been delineated for the purposes of the ENF and were previously identified as two separate isolated wetlands. Once revisited for the purposes of supporting DEIR, HW determined that these two areas constitute a single larger isolated wetland, interrupted by small ridges of secondary coastal dune. HW identified and delineated several of these dune ridges as they relate to various CIP project footprints, but did not delineate all of these dune areas.

Wetlands F and G. Wetlands F and G, previously delineated in part for the purposes of the ENF, were incorporated within the larger Wetland BC. As a result, the designations for Wetlands F and G were eliminated from the updated plans (see Figure 6).

Wetland E. As described above, Wetland E is hydrologically connected to the area labeled as Wetland DD. As a result, the designation on the site plans is Wetland E/DD.

6.4 Salt Marsh

Salt Marsh associated with the Hatches Harbor wetland system is found along the base of a secondary dune ridge running approximately perpendicular to the Lease Line in the northwestern part of the Airport. HW delineated a segment of this salt marsh as it relates to the Lease Line, where previously freshwater vegetation has begun to die back (due to tidal flushing). In this area, HW observed dead or dying shrubs of bayberry, sumac (*Rhus* sp.), rugosa rose, and highbush blueberry, among developing patches of saltmarsh cordgrass (*Spartina patens*). A small ridge of dune was also identified in this area. This area and its immediate surroundings have not taken on the full distinctions of a salt marsh. The Hatches Harbor Salt Marsh Restoration Project is relatively recent, as compared to the geologic development of the entire wetland system, but it is clear that this area is characteristic of a salt marsh. This portion of developing salt marsh is contiguous with Wetland areas CT and J.

7. WETLANDS FUNCTIONS AND VALUES

Freshwater wetlands contribute to the protection of groundwater supply, public and private water supplies, storm damage prevention and flood storage control, water quality, protection of fisheries and preservation of wildlife habitat, and in some instances preservation of rare species habitat. The majority of the wetlands delineated at the Airport provide many of the same functions and values, depending on location and cover type. 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 certain wetlands contribute to the protection of wildlife habitat by providing food, shelter, migratory and overwintering areas, 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 rare species.

A summary of the potential functions and values of the delineated wetland areas is provided in Table 1. Further discussion of the wildlife habitat values of these areas is provided in a separate *Summary of Natural Resources and Rare Species Habitat Assessments* report (HW, April 2007).

Table 1. Summary of jurisdictional wetland areas delineated at the Provincetown Municipal Airport, Provincetown, Massachusetts.

WETLAND AREA	CLASSIFICATION	JURISDICTION ¹	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	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

¹ Note: the jurisdictional status of Isolated Land Subject to Flooding (ILSF) under the State Regulations at 310 CMR 10.57(2)(b) has not yet been determined.

Table 1 (cont.)

WETLAND AREA	CLASSIFICATION	JURISDICTION	FUNCTIONS AND VALUES
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/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 J	PSS/PEM	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)

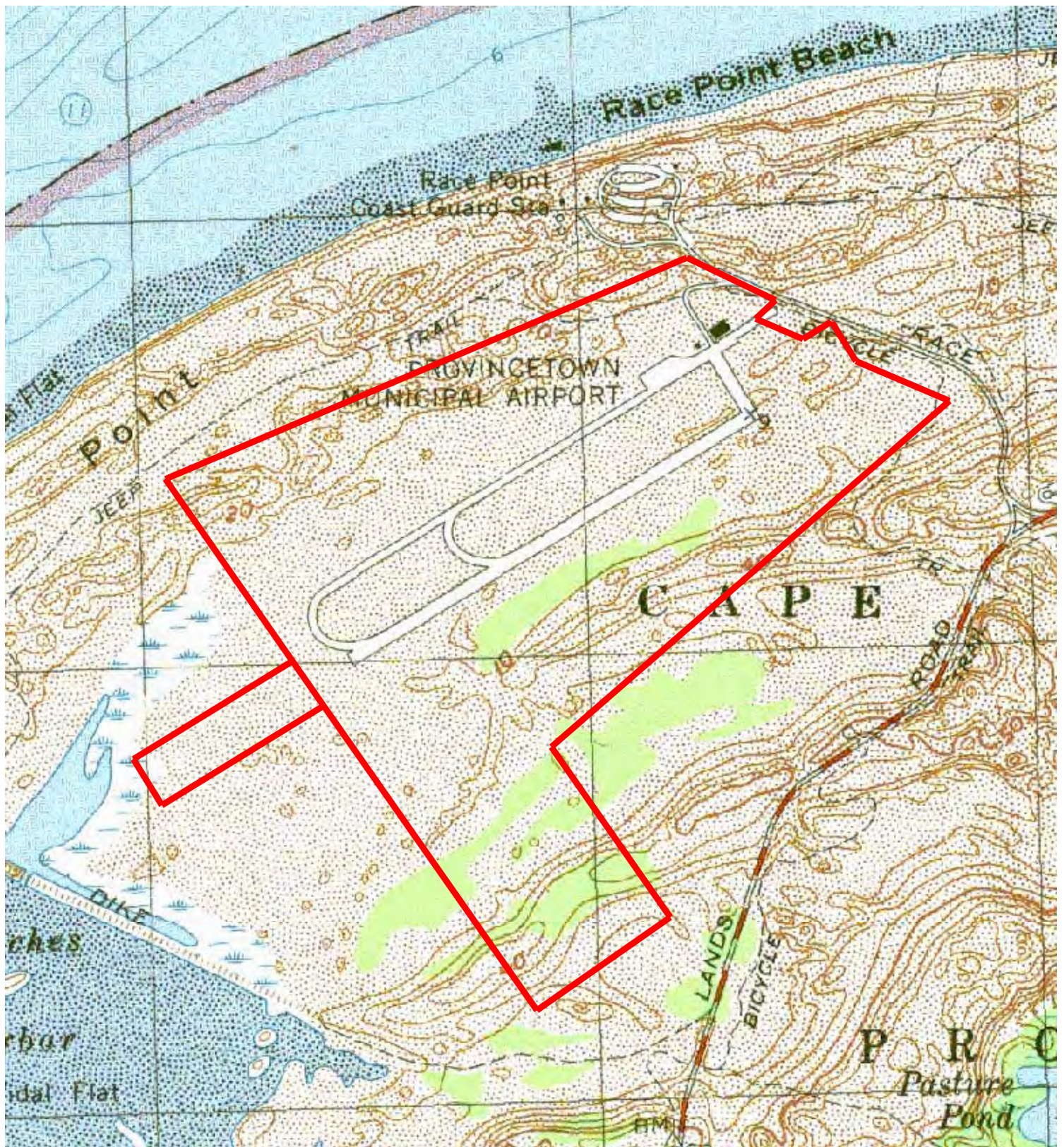
PSS Palustrine Scrub-Shrub wetland
 PFO Palustrine Forested habitat
 PEM Palustrine Emergent Marsh
 EEM Estuarine Emergent Marsh

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

8. REFERENCES

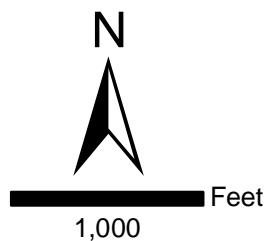
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Legend

— Airport Lease Line

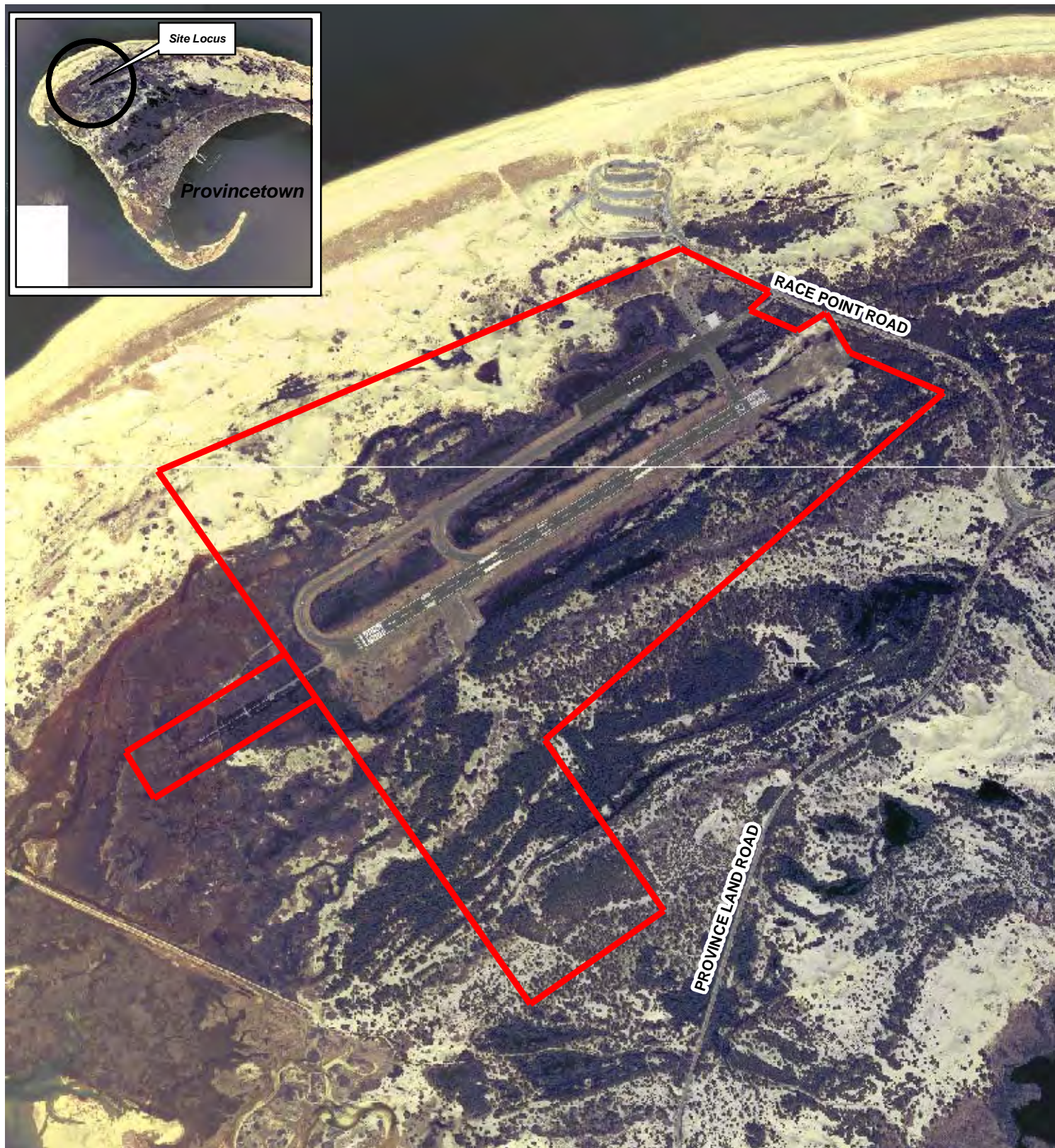
*Data Source: MassGIS, Commonwealth of Massachusetts EOE



Horsley Witten Group
 phone: 508-833-8800
www.horsleywitten.com

USGS Locus
 Provincetown Municipal Airport
 Provincetown, MA

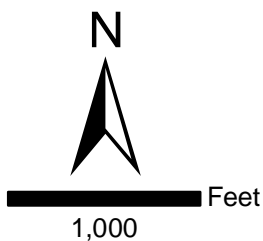
Figure 1



Legend

 Airport Lease Line

*Data Source: MassGIS, Commonwealth of Massachusetts EOE

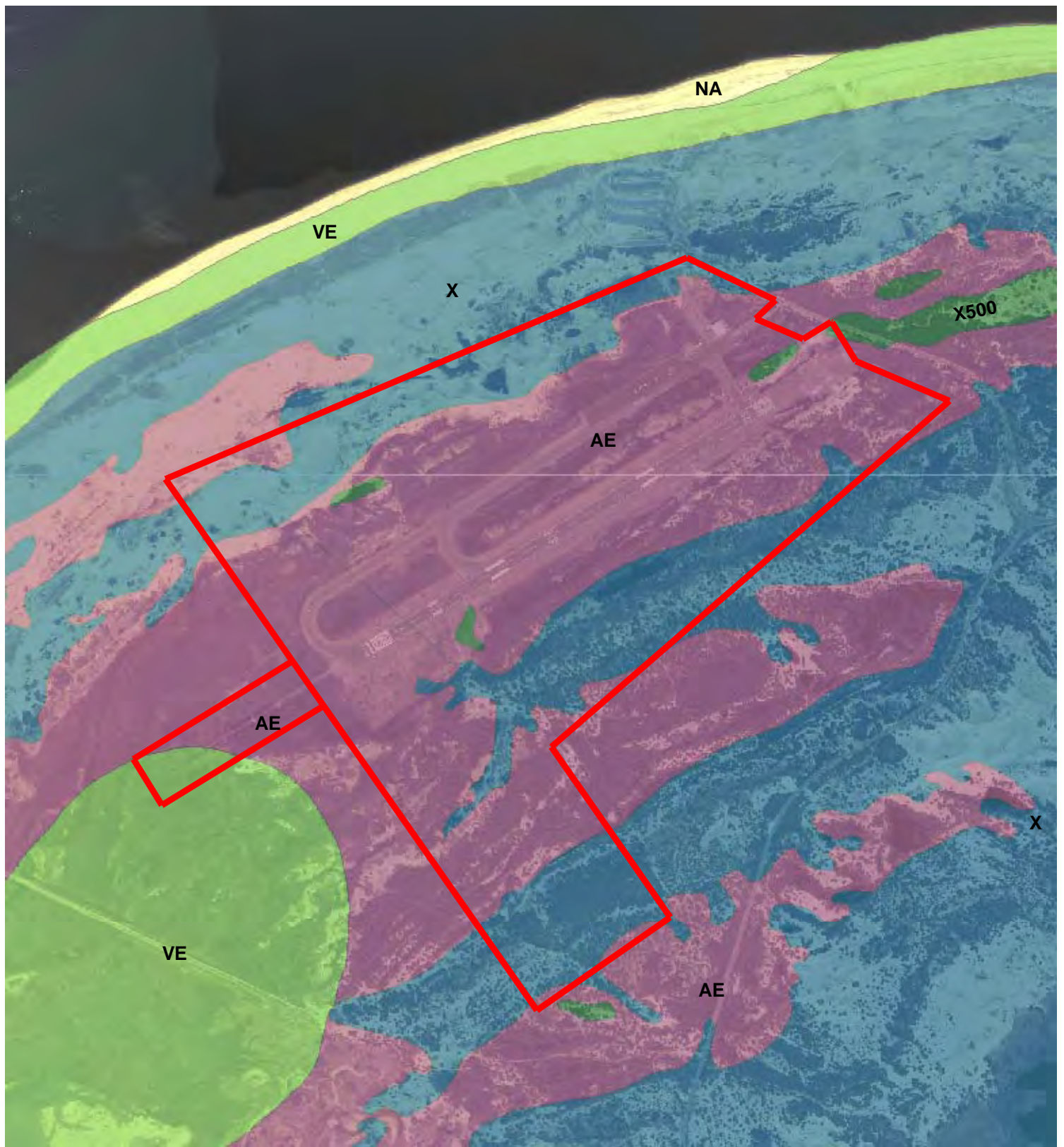


Horsley Witten Group
phone: 508-833-8800
www.horsleywitten.com



Aerial Photo
Provincetown Municipal Airport
Provincetown, MA

Figure 2



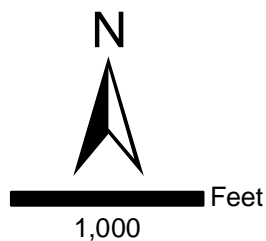
Legend

*Data Source: MassGIS, Commonwealth of Massachusetts EOE

— Airport Lease Line

FEMA Flood Zones

 A	 AO	 VE
 AE	 D	 X
 AH	 UNDES	 X500
 ANI	 V	NA = Not Available

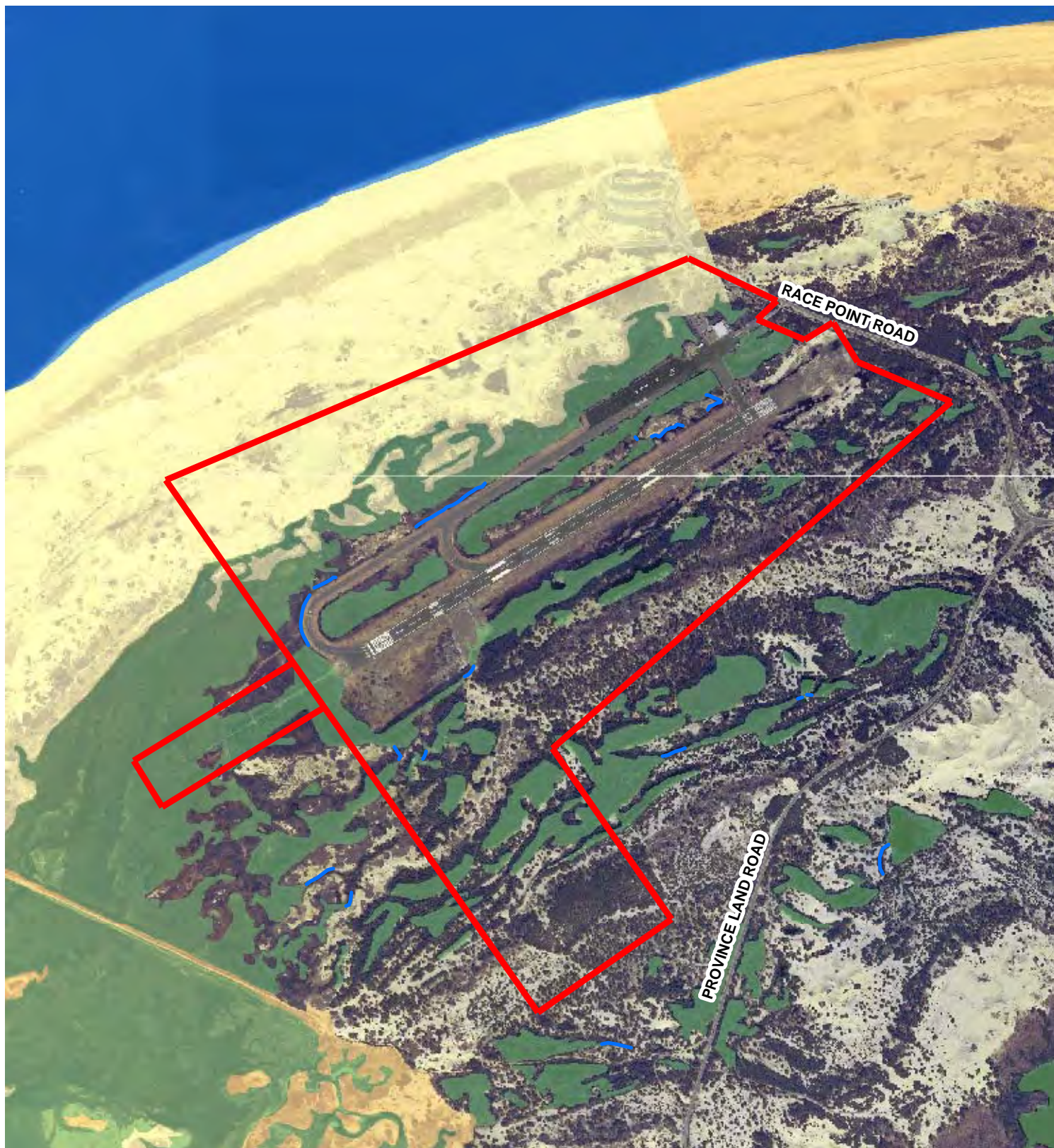


Horsley Witten Group
phone: 508-833-8800
www.horsleywitten.com



FEMA Flood Zones
Provincetown Municipal Airport
Provincetown, MA

Figure 3



Legend

*Data Source: MassGIS, Commonwealth of Massachusetts EOE


 Airport Lease Line

 Streams

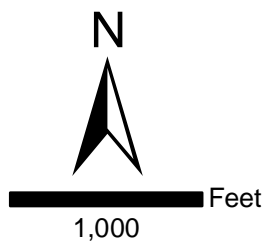
DEP Wetlands

 Barrier Beach

 Surface Water

 Coastal Bank, Bluff, Dune, Beach or Sea Cliff

 Wetlands

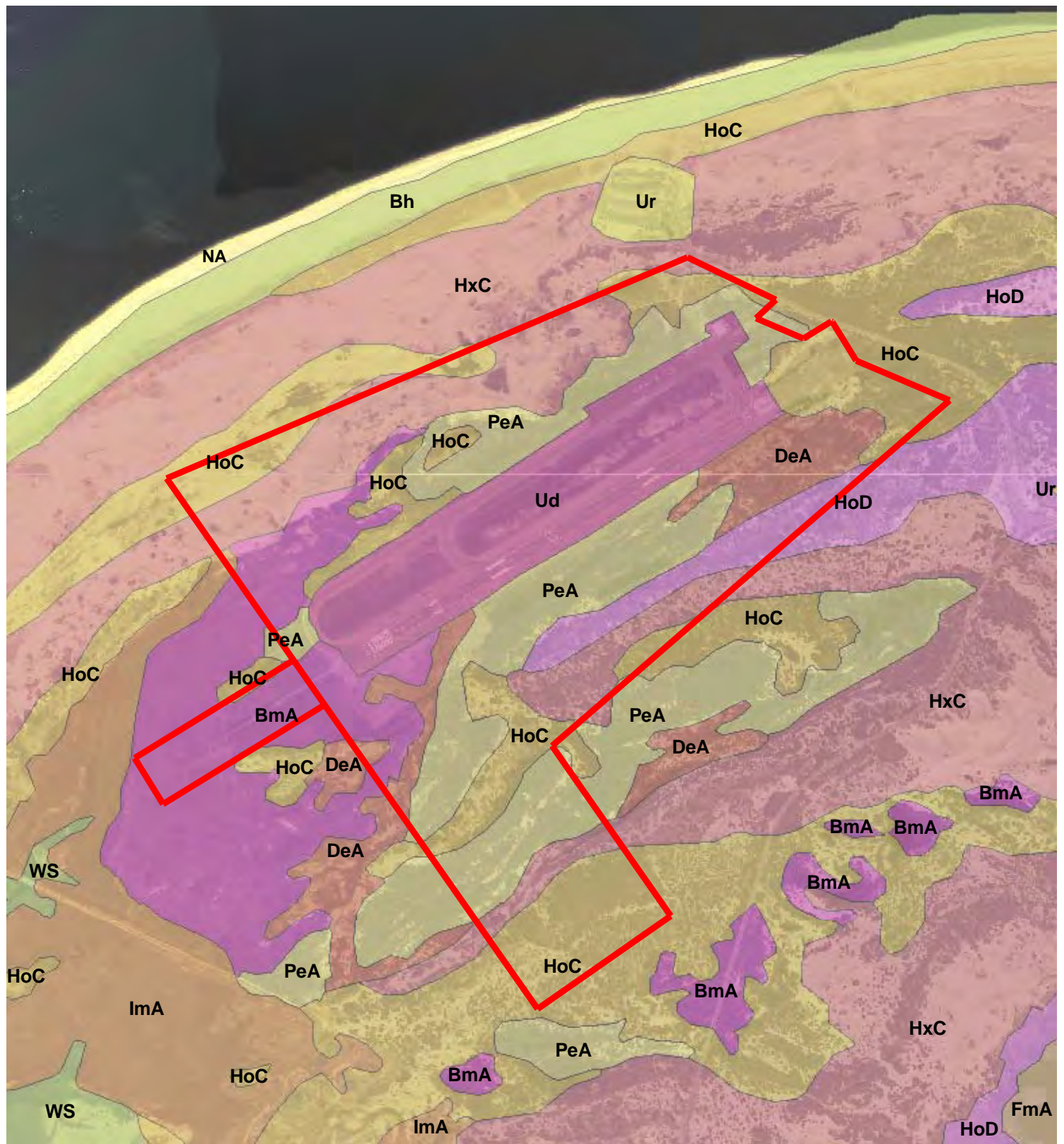


Horsley Witten Group
phone: 508-833-8800
www.horsleywitten.com



DEP Wetlands & Streams
Provincetown Municipal Airport
Provincetown, MA

Figure 4















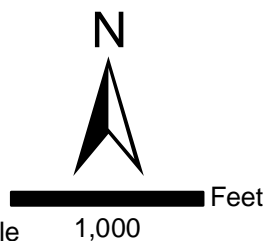
Legend

*Data Source: MassGIS, Commonwealth of Massachusetts EOE

— Airport Lease Line

Soils

	Bh		FmA		HxC		Ur
	BmA		FsA		ImA		W
	DeA		HoC		PeA		WS
	Dm		HoD		Ud	NA = Not Available	

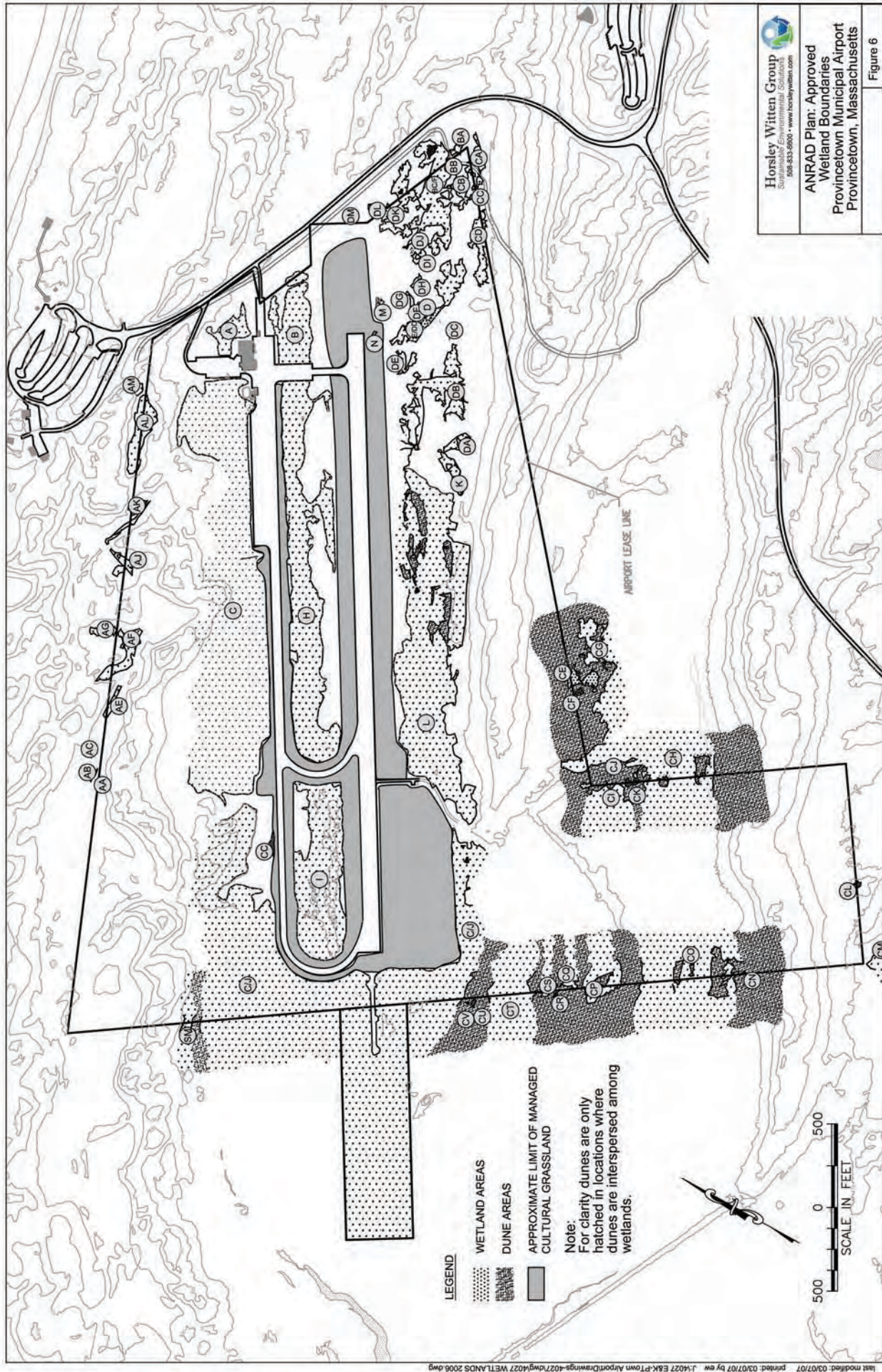


Horsley Witten Group
phone: 508-833-8800
www.horsleywitten.com



Soils
Provincetown Municipal Airport
Provincetown, MA

Figure 5



Horsley Witten Group
Sustainable Environmental Solutions
508-833-9600 • www.horsleywitten.com

ANRAD Plan: Approved
Wetland Boundaries
Provincetown Municipal Airport
Provincetown, Massachusetts

Figure 6

APPENDICES

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Forms

Order of Resource Area Delineation (issued January 25, 2007)

U.S. Army Corps of Engineers Jurisdictional Determination

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: _____ Prepared by: HOBLEY WITTEN Project location: PROVINCETOWN DEP File #: _____

GLOP, INC. MUNICIPAL AIRPORT

Check all that apply:

- ☐ Vegetation alone presumed adequate to delineate BVW; fill out Section I only
☒ Vegetation and other indicators of hydrology used to delineate BVW boundary; fill out Sections I and II
☐ Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: E1-WET Transect Number: TE-1 Date of Delineation: 11 AUG 2004

A. Sample Layer and Plant Species (by common/scientific name)	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. NWI Wetland Indicator
<u>TREES</u> (species abundance determined through DBH measurements and basal area calc's):				
pitch pine <i>Pinus rigida</i>	85.5	100.0	YES	FACU
<u>SAPLINGS</u> (species abundance determined by estimating aerial cover class):				
no species of sapling size observed within limits of this vegetation community sampling plot				
<u>SHRUBS</u> (species abundance determined by estimating aerial cover class):				
Northern bayberry <i>Myrica pensylvanica</i>	20.5	50.0	YES	FAC
highbush blueberry <i>Vaccinium corymbosum</i>	20.5	50.0	YES	FACW

GROUND COVER (species abundance determined by estimating aerial cover class):

wool grass <i>Scirpus cyperinus</i>	5.0	5.5	NO	FACW+
large cranberry <i>Vaccinium macrocarpon</i>	85.5	94.5	YES	OBL

MOSSES & LIVERWORTS (species abundance determined by estimating aerial cover class):

no mosses or liverworts observed within limits of this vegetation community sampling plot

CLIMBING WOODY VINES (species abundance determined by estimating aerial cover class):

no climbing woody vines observed within limits of this vegetation community sampling plot

HW established this soil profile and plant community observation transect in a location along the boundary of Wetland E.

Plant community was typical of the pitch pine / cranberry-dominant interdunal forested swale habitats common at this site.

*Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: 3

Number of dominant non-wetland indicator plants: 1

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? (yes) no

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability, ANRAD, or Notice of Intent.

Section II. Indicators of Hydric Soils & Hydrology

Hydric Soil Interpretation (WETLAND HABITAT)

1. Soil Survey

Is there a published soil survey for this site? YES no
title/date: Barnstable County - 1993
map number: 1
soil type mapped: Pipestone Loamy Crs Sand
0 - 3 percent slopes
hydric soil inclusions: Pipestone is a listed hydric.
Berryland and Walpole are listed
Are field observations consistent with soil survey descrip? YES no
Remarks:

2. Soil Morphology (Soil Profile Description)

Horiz/Layer	Depth	Texture	Matrix Color	Redoximorphic Features
-------------	-------	---------	--------------	------------------------

ORGANIC MATERIAL ACCUMULATION ON
SOIL SURFACE
w/ ORGANIC STREAKING IN SOIL MATRIX
IMMEDIATELY BELOW,
AND
w/ REDOX CONCENTRATIONS w/in 12"
(DISTINCT, REDDISH-BROWN, 10-15%)

Remarks:

3. Other:

Conclusion: Is soil hydric? (yes) no

Other Indicators of Wetland Hydrology: (check/describe all that apply)

☒ Site inundated: OBSERVED IN SPRING 05

☐ Depth to free water in observation hole: _____

☐ Depth to saturation in observation hole: _____

☐ Water marks: _____

☐ Drift lines: _____

☐ Sediment deposits: _____

☐ Drainage patterns in BVW: _____

☐ Oxidized rhizospheres: _____

☒ Water-stained/blackened leaves: _____

☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other): _____

☐ Other: _____

Plant Community and Hydrology Conclusion

	yes	no
Number of wetland indicator plants \geq 10	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Number of non-wetland indicator plants		

Wetland hydrology:
hydric soil present ☒ ☐

other wetland hydrology indicators ☒ ☐

Sample location is in a BVW ☒ ☐

Submit this form with the Request for Determination of Applicability or Notice of Intent.

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant:

Prepared by: HORSLEY WITTEN Project location: PEWINGETOWN DEP File #:

Check all that apply:

- ☐ Vegetation alone presumed adequate to delineate BVW: fill out Section I only
☒ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
☐ Method other than dominance test used (attach additional information)

Group, Inc.

Municipal Airport

Section I. Vegetation Observation Plot Number: 61-0PL Transect Number: TE-1 Date of Delineation: 11 AUG 2004

A. Sample Layer and Plant Species (by common/scientific name)	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. NWI Wetland Indicator
TREES (species abundance determined through DBH measurements and basal area calc's):				
pitch pine <i>Pinus rigida</i>	85.5	100.0	YES	FACU
SAPLINGS (species abundance determined by estimating aerial cover class):				
no species of sapling size observed within limits of this vegetation community sampling plot				
SHRUBS (species abundance determined by estimating aerial cover class):				
Northern bayberry <i>Myrica pensylvanica</i>	20.5	28.5	YES	FAC
pitch pine <i>Pinus rigida</i>	20.5	28.5	YES	FACU
scrub oak <i>Quercus ilicifolia</i>	20.5	28.5	YES	UPL
highbush blueberry <i>Vaccinium corymbosum</i>	10.5	14.6	NO	FACN-
GROUND COVER (species abundance determined by estimating aerial cover class):				
bearberry <i>Arctostaphylos uva-ursi</i>	63.0	68.5	YES	UPL
common hairgrass <i>Deschampsia flexuosa</i>	10.0	10.9	NO	UPL
American beachgrass <i>Ammophila brevifolium</i>	10.0	10.9	NO	UPL
lowbush blueberry <i>Vaccinium angustifolium</i>	3.0	3.3	NO	UPL
starflower <i>Trientalis borealis</i>	3.0	3.3	NO	FAC
bracken fern <i>Pteridium aquilinum</i>	3.0	3.3	NO	FACU
MOSESSES & LIVERWORTS (species abundance determined by estimating aerial cover class):				
no mosses or liverworts observed within limits of this vegetation community sampling plot				
CLIMBING WOODY VINES (species abundance determined by estimating aerial cover class):				
no climbing woody vines observed within limits of this vegetation community sampling plot				

HW established this soil profile and plant community observation transect in a location along the boundary of Wetland E. This plant community was typical of the dune habitats adjacent to the pitch pine / cranberry-dominant interdunal forested swale habitats common at this site.

*Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: |

Number of dominant non-wetland indicator plants: 4

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? yes (no)

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability, ANRAD, or Notice of Intent.

Section II. Indicators of Hydric Soils & Hydrology

Hydric Soil Interpretation (UPLAND AREA)

1. Soil Survey

Is there a published soil survey for this site? YES no
title/date: Barnstable County - 1993
map number: 1
soil type mapped: Deerfield Loamy Fine Sand
hydric soil inclusions: Pipestone is listed
0-5 percent slopes

Are field observations consistent with soil survey descrip? YES no
Remarks:

2. Soil Morphology (Soil Profile Description)

Horiz/Layer	Depth	Texture	Matrix	Color	Redoximorphic Features
-------------	-------	---------	--------	-------	------------------------

TYPICAL DUNE HABITAT SOIL PROFILE.
NO ORGANIC ACCUMULATION.
NO REDOX FEATURES.

Remarks:

3. Other:

Conclusion: Is soil hydric? yes (no)

Other Indicators of Wetland Hydrology: (check/describe all that apply)

- ☐ Site inundated: _____
- ☐ Depth to free water in observation hole: _____
- ☐ Depth to saturation in observation hole: _____
- ☐ Water marks: _____
- ☐ Drift lines: _____
- ☐ Sediment deposits: _____
- ☐ Drainage patterns in BVW: _____
- ☐ Oxidized rhizospheres: _____
- ☐ Water-stained/blackened leaves: _____
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other): _____
- ☐ Other: _____

Plant Community and Hydrology Conclusion		yes	no
Number of wetland indicator plants \geq number of non-wetland indicator plants		[]	[✓]
Wetland hydrology: hydric soil present		[]	[✓]
other wetland hydrology indicators		[]	[✓]
Sample location is in a BVW		[]	[✓]

Submit this form with the Request for Determination of Applicability or Notice of Intent.

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: _____ Prepared by: HUBERT WITTEN Project location: PROVINCETOWN DEP File #: _____

GRAD, INC. MUNICIPAL AIRPORT

Check all that apply:

- ☐ Vegetation alone presumed adequate to delineate BVW; fill out Section I only
☒ Vegetation and other indicators of hydrology used to delineate BVW boundary; fill out Sections I and II
☐ Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: A1-WET Transect Number: TA-1 Date of Delineation: 8-10-04

A. Sample Layer and Plant Species (by common/scientific name)	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. NWI Wetland Indicator
--	-------------------------------------	-------------------------	----------------------------------	--------------------------

TREES (species abundance determined through DBH measurements and basal area calc's):

Bebb willow	<i>Salix bebbiana</i>	85.5	100.0	YES	FACW
-------------	-----------------------	------	-------	-----	------

SAPLINGS (species abundance determined by estimating aerial cover class):

no species of sapling size observed within limits of this vegetation community sampling plot

SHRUBS (species abundance determined by estimating aerial cover class):

Northern bayberry	<i>Myrica pensylvanica</i>	3.0	5.5	NO	FAC
Bebb willow	<i>Salix bebbiana</i>	10.5	19.1	YES	FACW
trembling aspen	<i>Populus tremula</i>	10.5	19.1	YES	FACU
winterberry	<i>Ilex verticillata</i>	20.5	37.3	YES	FACW+
dwarf huckleberry	<i>Gaylussacia dumosa</i>	10.5	19.1	YES	FAC

GROUND COVER (species abundance determined by estimating aerial cover class):

broad-leaf meadowsweet	<i>Spiraea latifolia</i>	38.0	33.3	YES	FAC+
poison ivy	<i>Toxicodendron radicans</i>	38.0	33.3	YES	FAC
dwarf huckleberry	<i>Gaylussacia dumosa</i>	38.0	33.3	YES	FAC

MOSESSES & LIVERWORTS (species abundance determined by estimating aerial cover class):

no mosses or liverworts observed within limits of this vegetation community sampling plot

CLIMBING WOODY VINES (species abundance determined by estimating aerial cover class):

poison ivy	<i>Toxicodendron radicans</i>	5.0	100.0	YES
------------	-------------------------------	-----	-------	-----

HW established this soil profile and plant community observation transect in a location between flag stations A-41 and A-42.

*Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: 7

Number of dominant non-wetland indicator plants: 1

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? (yes) no

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability, ANRAD, or Notice of Intent.

Section II. Indicators of Hydric Soils & Hydrology

Hydric Soil Interpretation (WETLAND HABITAT)

1. Soil Survey

Is there a published soil survey for this site? YES no
title/date: Barnstable County - 1993
map number: 1
soil type mapped: Pipestone Loamy Crs Sand
0 - 3 percent slopes
hydric soil inclusions: Pipestone is a listed hydric.
Berryland and Walpole are listed
Are field observations consistent with soil survey descrip? YES no
Remarks:

2. Soil Morphology (Soil Profile Description)

Horiz/Layer	Depth	Texture	Matrix Color	Redoximorphic Features
-------------	-------	---------	--------------	------------------------

APPROX' 4 INCHES OF ORGANIC MATERIAL
AT/ON SOIL SURFACE.
WITH ORGANIC STREAKING IN MEDIUM
SAND SOIL MATRIX IMMEDIATELY
BELOW SURFACE ORGANICS

Remarks:

3. Other:

Conclusion: Is soil hydric? (yes) no

Other Indicators of Wetland Hydrology: (check/describe all that apply)

- ☐ Site inundated: _____
- ☐ Depth to free water in observation hole: _____
- ☐ Depth to saturation in observation hole: _____
- ☒ Water marks: ON TRUNKS / STEMS OF WOODY PLANTS
- ☐ Drift lines: _____
- ☐ Sediment deposits: _____
- ☐ Drainage patterns in BVW: _____
- ☐ Oxidized rhizospheres: _____
- ☒ Water-stained/blackened leaves: _____
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other): _____
- ☐ Other: _____

Plant Community and Hydrology Conclusion		
	yes [✓]	no []
Number of wetland indicator plants \geq number of non-wetland indicator plants		
Wetland hydrology: hydric soil present	[✓]	[]
other wetland hydrology indicators	[✓]	[]
Sample location is in a BVW	[✓]	[]

Submit this form with the Request for Determination of Applicability or Notice of Intent.

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: _____ Prepared by: HILSEY WITTENBERG Project location: PROVINCETOWN MUNICIPAL Airport DEP File #: _____

Check all that apply:

- ☐ Vegetation alone presumed adequate to delineate BVW; fill out Section I only
☒ Vegetation and other indicators of hydrology used to delineate BVW boundary; fill out Sections I and II
☐ Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: A1 - UPL Transect Number: T A - 1 Date of Delineation: 8-10-04

A. Sample Layer and Plant Species (by common/scientific name)	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. NWI Wetland Indicator
--	-------------------------------------	-------------------------	----------------------------------	--------------------------

TREES (species abundance determined through DBH measurements and basal area calc's):

pitch pine	<i>Pinus rigida</i>	28.3	43.8	YES	FACU
Bebb willow	<i>Salix bebbiana</i>	36.3	56.2	YES	FACW

SAPLINGS (species abundance determined by estimating aerial cover class):

no species of sapling size observed within limits of this vegetation community sampling plot

SHRUBS (species abundance determined by estimating aerial cover class):

Northern bayberry	<i>Myrica pensylvanica</i>	20.5	55.4	YES	FAC
beach plum	<i>Prunus maritima</i>	10.5	28.4	YES	UPL
trembling aspen	<i>Populus tremula</i>	3.0	8.1	NO	FACU
lowbush blueberry	<i>Vaccinium angustifolium</i>	3.0	8.1	NO	UPL
pitch pine	<i>Pinus rigida</i>	T	0.0	NO	FACU

GROUND COVER (species abundance determined by estimating aerial cover class):

bearberry	<i>Arctostaphylos uva-ursi</i>	20.5	43.6	YES	UPL
poverty grass	<i>Danthonia spicata</i>	20.5	43.6	YES	UPL
common hairgrass	<i>Deschampsia flexuosa</i>	3.0	6.4	NO	UPL
little bluestem	<i>Schizachyrium scoparium</i>	3.0	6.4	NO	FACU

MOSESSES & LIVERWORTS (species abundance determined by estimating aerial cover class):

no mosses or liverworts observed within limits of this vegetation community sampling plot

CLIMBING WOODY VINES (species abundance determined by estimating aerial cover class):

no climbing woody vines observed within limits of this vegetation community sampling plot

HW established this soil profile and plant community observation transect in a location between flag stations A-41 and A-42.

*Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: 2

Number of dominant non-wetland indicator plants: 4

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? yes ☐ no ☒

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability, ANRAD, or Notice of Intent.

Section II. Indicators of Hydric Soils & Hydrology

Hydric Soil Interpretation (UPLAND AREA)

1. Soil Survey

Is there a published soil survey for this site? YES no
title/date: Barnstable County - 1993
map number: 1
soil type mapped: Hooksan Sand, Rolling

hydric soil inclusions: None listed by survey
Are field observations consistent with soil survey descrip? YES no
Remarks:

2. Soil Morphology (Soil Profile Description)

Horiz/Layer Depth Texture Matrix Color Redoximorphic Features

NO ORGANIC MATERIAL ACCUMULATION
OR STREAKING.
TYPICAL LOOSE, DRY MEDIUM SAND.

Remarks:

3. Other:

Conclusion: Is soil hydric? yes (no)

Other Indicators of Wetland Hydrology: (check/describe all that apply)
[] Site inundated:
[] Depth to free water in observation hole:
[] Depth to saturation in observation hole:
[] Water marks:
[] Drift lines:
[] Sediment deposits:
[] Drainage patterns in BWV:
[] Oxidized rhizospheres:
[] Water-stained/blackened leaves:
[] Recorded data (stream, lake, or tidal gauge; aerial photo; other):
[] Other:

Plant Community and Hydrology Conclusion		
	yes []	no []
Number of wetland indicator plants =/ > number of non-wetland indicator plants		[]
Wetland hydrology:		
hydric soil present	[]	[]
other wetland hydrology indicators	[]	[]
Sample location is in a BWV	[]	[]

Submit this form with the Request for Determination of Applicability or Notice of Intent.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

DEP File Number:

WPA Form 4B – Order of Resource Area Delineation

058-0425

Provided by DEP

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

A. General Information

Important:
When filling out
forms on the
computer, use
only the tab
key to move
your cursor -
do not use the
return key.



From:

Provincetown
Conservation Commission

This Issuance is for (check one):

- ☒ Order of Resource Area Delineation
☐ Amended Order of Resource Area Delineation

To: Applicant:

Provincetown Airport Commission
Name
P.O BOX 657 (176 Race Point Road)
Mailing Address
Provincetown MA 02657
City/Town State Zip Code

Property Owner (if different from applicant):

George E. Price, Jr., Superintendent (NPS)
Name
99 Marconi Site Road
Mailing Address
Wellfleet MA 02667
City/Town State Zip Code

1. Project Location:

176 Race Point Road
Street Address
01-8
Assessors Map/Plat Number

Provincetown
City/Town
631
Parcel /Lot Number

2. Title and Date (or Revised Date if applicable) of Final Plans and Other Documents:

Wetland Resource Area Map December 2006, Project # 4027A	12/22/2006
Title	Date
Abbreviated Notice of Resource Area Delineation DEP # 058-0425	12/29/2006
Title	Date
Title	Date

3. Dates:

December 29, 2006	January 23, 2007	January 25, 2007
Date Notice of Intent Filed	Date Public Hearing Closed	Date of Issuance



WPA Form 4B – Order of Resource Area Delineation

058-0425

Provided by DEP

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B. Order of Delineation

The Conservation Commission has determined the following (check whichever is applicable):

☒ **Accurate:** The boundaries described on the referenced plan(s) above and in the Abbreviated Notice of Resource Area Delineation are accurately drawn for the following resource area(s):

☒ Bordering Vegetated Wetlands

☒ Other Resource Area(s), specifically:

isolated vegetated wetland, vegetated wetlands, unvegetated wetlands, isolated land subject to flooding, coastal flood zone, coastal dune and barrier beach, salt marsh.

☐ **Modified:** The boundaries described on the plan(s) referenced above, as modified by the Conservation Commission from the plans contained in the Abbreviated Notice of Resource Area Delineation, are accurately drawn from the following resource area(s):

☐ Bordering Vegetated Wetlands

☐ Other Resource Area(s), specifically:

☐ **Inaccurate:** The boundaries described on the referenced plan(s) and in the Abbreviated Notice of Resource Area Delineation were found to be inaccurate and cannot be confirmed for the following resource area(s):

☐ Bordering Vegetated Wetlands

☐ Other Resource Area(s), specifically:

The boundaries were determined to be inaccurate because:



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

DEP File Number:

WPA Form 4B – Order of Resource Area Delineation

058-0425
Provided by DEP

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B. Order of Delineation (cont.)

This Order of Resource Area Delineation determines the boundaries of those resource areas noted above and is binding as to all decisions rendered pursuant to the Massachusetts Wetlands Protection Act (M.G.L. c.131, § 40) and its regulations (310 CMR 10.00) regarding such boundaries. This Order does not, however, determine the boundaries of any resource area or Buffer Zone to any resource area not specifically noted above, regardless of whether such boundaries are contained on the plans attached to this Order or to the Abbreviated Notice of Resource Area Delineation.

This Order must be signed by a majority of the Conservation Commission. The Order must be sent by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate DEP Regional Office (see Appendix A)

Signatures:

[Handwritten signatures of three Conservation Commission members]

This Order is valid for three years from the date of issuance.

This Order is issued to the applicant and the property owner (if different) as follows:

☐ by hand delivery on

☒ by certified mail, return receipt requested on

Date

Date

1/25/07

C. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate DEP Regional Office (see Appendix A) to issue a Superseding Order of Resource Area Delineation. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Appendix E: Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act, (M.G.L. c. 131, § 40) and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal bylaw or ordinance, and not on the Massachusetts Wetlands Protection Act or regulations, the Department of Environmental Protection has no appellate jurisdiction.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

DEP Regional Addresses

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Mail transmittal forms and DEP payments, payable to:

Commonwealth of Massachusetts
Department of Environmental Protection
Box 4062
Boston, MA 02211

DEP Western Region
436 Dwight Street
Suite 402
Springfield, MA 01103
Phone: 413-784-1100
Fax: 413-784-1149

Adams	Colrain	Hampden	Monroe	Pittsfield	Tyringham
Agawam	Conway	Hancock	Montague	Plainfield	Wales
Alford	Cummington	Hatfield	Monterey	Richmond	Ware
Amherst	Dalton	Hawley	Montgomery	Rowe	Warwick
Ashfield	Deerfield	Heath	Monson	Russell	Washington
Becket	Easthampton	Hinsdale	Mount Washington	Sandisfield	Wendell
Belchertown	East Longmeadow	Holland	New Ashford	Savoy	Westfield
Bernardston	Egremont	Holyoke	New Marlborough	Sheffield	Westhampton
Blandford	Erving	Huntington	New Salem	Shelburne	West Springfield
Brimfield	Florida	Lanesborough	North Adams	Shutesbury	West Stockbridge
Buckland	Gill	Lee	Northampton	Southampton	Whately
Charlemont	Goshen	Lenox	Northfield	South Hadley	Wilbraham
Cheshire	Granby	Leverett	Orange	Southwick	Williamsburg
Chester	Granville	Leyden	Otis	Springfield	Williamstown
Chesterfield	Great Barrington	Longmeadow	Palmer	Stockbridge	Windsor
Chicopee	Greenfield	Ludlow	Pelham	Sunderland	Worthington
Clarksburg	Hadley	Middlefield	Peru	Tolland	

DEP Central Region
627 Main Street
Worcester, MA 01605
Phone: 508-792-7650
Fax: 508-792-7621
TDD: 508-767-2788

Acton	Charlton	Hopkinton	Millbury	Rutland	Uxbridge
Ashburnham	Clinton	Hubbardston	Milville	Shirley	Warren
Ashby	Douglas	Hudson	New Braintree	Shrewsbury	Webster
Athol	Dudley	Holliston	Northborough	Southborough	Westborough
Auburn	Dunstable	Lancaster	Northbridge	Southbridge	West Boylston
Ayer	East Brookfield	Leicester	North Brookfield	Spencer	West Brookfield
Barre	Fitchburg	Leominster	Oakham	Sterling	Westford
Bellingham	Gardner	Littleton	Oxford	Stow	Westminster
Berlin	Grafton	Lunenburg	Paxton	Sturbridge	Winchendon
Blackstone	Groton	Marlborough	Pepperell	Sutton	Worcester
Bolton	Harvard	Maynard	Petersham	Templeton	
Boxborough	Hardwick	Medway	Phillipston	Townsend	
Boylston	Holden	Mendon	Princeton	Tyngsborough	
Brookfield	Hopedale	Milford	Royalston	Upton	

DEP Southeast Region
20 Riverside Drive
Lakeville, MA 02347
Phone: 508-946-2700
Fax: 508-947-6557
TDD: 508-946-2795

Abington	Dartmouth	Freetown	Mattapoisett	Provincetown	Tisbury
Acushnet	Dennis	Gay Head	Middleborough	Raynham	Truro
Attleboro	Dighton	Gosnold	Nantucket	Rehoboth	Wareham
Avon	Duxbury	Halifax	New Bedford	Rochester	Wellfleet
Barnstable	Eastham	Hanover	North Attleborough	Rockland	West Bridgewater
Berkley	East Bridgewater	Hanson	Norton	Sandwich	Westport
Bourne	Easton	Harwich	Norwell	Scituate	West Tisbury
Brewster	Edgartown	Kingston	Oak Bluffs	Seekonk	Whitman
Bridgewater	Fairhaven	Lakeville	Orleans	Sharon	Wrentham
Brockton	Fall River	Mansfield	Pembroke	Somerset	Yarmouth
Carver	Falmouth	Marion	Plainville	Stoughton	
Chatham	Foxborough	Marshfield	Plymouth	Swansea	
Chilmark	Franklin	Mashpee	Plympton	Taunton	

DEP Northeast Region
1 Winter Street
Boston, MA 02108
Phone: 617-654-6500
Fax: 617-556-1049
TDD: 617-574-6868

Amesbury	Chelmsford	Hingham	Merrimac	Quincy	Wakefield
Andover	Chelsea	Holbrook	Methuen	Randolph	Walpole
Arlington	Cohasset	Hull	Middleton	Reading	Waltham
Ashland	Concord	Ipswich	Millis	Revere	Watertown
Bedford	Danvers	Lawrence	Milton	Rockport	Wayland
Belmont	Dedham	Lexington	Nahant	Rowley	Wellesley
Beverly	Dover	Lincoln	Natick	Salem	Wenham
Billerica	Dracut	Lowell	Needham	Salisbury	West Newbury
Boston	Essex	Lynn	Newbury	Saugus	Weston
Boxford	Everett	Lynnfield	Newburyport	Sherborn	Westwood
Braintree	Framingham	Malden	Newton	Somerville	Weymouth
Brookline	Georgetown	Manchester-By-The-Sea	Norfolk	Stoneham	Wilmington
Burlington	Gloucester	Marblehead	North Andover	Sudbury	Winchester
Cambridge	Groveland	Medfield	North Reading	Swampscott	Winthrop
Canton	Hamilton	Medford	Norwood	Tewksbury	Woburn
Carlisle	Haverhill	Melrose	Peabody	Topsfield	



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
Request for Departmental Action Fee Transmittal Form
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

A. Request Information

Important:
When filling out
forms on the
computer, use
only the tab
key to move
your cursor -
do not use the
return key.



1. Person or party making request (if appropriate, name the citizen group's representative):

(fee exempt - municipal)

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

Project Location

Mailing Address

City/Town

State

Zip Code

2. Applicant (as shown on Notice of Intent (Form 3), Abbreviated Notice of Resource Area Delineation (Form 4A); or Request for Determination of Applicability (Form 1)):

Name

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

3. DEP File Number:

B. Instructions

1. When the Departmental action request is for (check one):

- ☐ Superseding Order of Conditions (\$100 for individual single family homes with associated structures; \$200 for all other projects)
- ☐ Superseding Determination of Applicability (\$100)
- ☐ Superseding Order of Resource Area Delineation (\$100)

Send this form and check or money order for the appropriate amount, payable to the *Commonwealth of Massachusetts* to:

Department of Environmental Protection
Box 4062
Boston, MA 02211



Massachusetts Department of Environmental Protection

Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B. Instructions (cont.)

2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.
3. Send a **copy** of this form and a **copy** of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP Regional Office.
4. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

JURISDICTIONAL DETERMINATION
U.S. Army Corps of Engineers

Revised 8/13/04

DISTRICT OFFICE: New England District

FILE NUMBER & APPLICANT: Provincetown Airport Commission, NAE-2006-4281

PROJECT LOCATION INFORMATION:

State: Massachusetts

County: Barnstable

Center coordinates of site (latitude/longitude):

Approximate size of area (parcel) reviewed, including uplands: acres.

Name of nearest waterway: Cape Cod Bay

Name of watershed: Cape Cod Bay

JURISDICTIONAL DETERMINATION

Completed: Desktop determination

☐

Date:

Site visit(s)

☒

Date(s): January 8, 2007

Jurisdictional Determination (JD):

☒ Preliminary JD - Based on available information, ☒ *there appear to be* (or) ☐ *there appear to be no* "waters of the United States" and/or "navigable waters of the United States" on the project site. A preliminary JD is not appealable (Reference 33 CFR part 331).

☐ Approved JD – An approved JD is an appealable action (Reference 33 CFR part 331).
Check all that apply:

☐ *There are* "navigable waters of the United States" (as defined by 33 CFR part 329 and associated guidance) within the reviewed area. Approximate size of jurisdictional area: .

☐ *There are* "waters of the United States" (as defined by 33 CFR part 328 and associated guidance) within the reviewed area. Approximate size of jurisdictional area: .

☐ *There are* "isolated, non-navigable, intra-state waters or wetlands" within the reviewed area.

☐ Decision supported by SWANCC/Migratory Bird Rule Information Sheet for Determination of No Jurisdiction.

BASIS OF JURISDICTIONAL DETERMINATION:

A. Waters defined under 33 CFR part 329 as "navigable waters of the United States":

☒ The presence of waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

B. Waters defined under 33 CFR part 328.3(a) as "waters of the United States":

☒ (1) The presence of waters, which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.

☐ (2) The presence of interstate waters including interstate wetlands¹.

☐ (3) The presence of other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate commerce including any such waters (check all that apply):

☐ (i) which are or could be used by interstate or foreign travelers for recreational or other purposes.

☐ (ii) from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.

☐ (iii) which are or could be used for industrial purposes by industries in interstate commerce.

☐ (4) Impoundments of waters otherwise defined as waters of the US.

☒ (5) The presence of a tributary to a water identified in (1) – (4) above.

☐ (6) The presence of territorial seas.

☒ (7) The presence of wetlands adjacent² to other waters of the US, except for those wetlands adjacent to other wetlands.

Rationale for the Basis of Jurisdictional Determination (applies to any boxes checked above). *If the jurisdictional water or wetland is not itself a navigable water of the United States, describe connection(s) to the downstream navigable waters. If B(1) or B(3) is used as the Basis of Jurisdiction, document navigability and/or interstate commerce connection (i.e., discuss site conditions, including why the waterbody is navigable and/or how the destruction of the waterbody could affect interstate or foreign commerce). If B(2, 4, 5 or 6) is used as the Basis of Jurisdiction, document the rationale used to make the determination. If B(7) is used as the Basis of Jurisdiction, document the rationale used to make adjacency determination:*

Lateral Extent of Jurisdiction: (Reference: 33 CFR parts 328 and 329)

- ☐ Ordinary High Water Mark indicated by:
- ☐ clear, natural line impressed on the bank
 - ☐ the presence of litter and debris
 - ☐ changes in the character of soil
 - ☐ destruction of terrestrial vegetation
 - ☐ shelving
 - ☐ other:
- ☒ High Tide Line indicated by:
- ☐ oil or scum line along shore objects
 - ☐ fine shell or debris deposits (foreshore)
 - ☒ physical markings/characteristics
 - ☐ tidal gages
 - ☐ other:
- ☐ Mean High Water Mark indicated by:
- ☐ survey to available datum; ☒ physical markings; ☒ vegetation lines/changes in vegetation types.
- ☒ Wetland boundaries, as shown on the attached wetland delineation map and/or in a delineation report prepared by:

Basis For Not Asserting Jurisdiction:

- ☐ The reviewed area consists entirely of uplands.
- ☐ Unable to confirm the presence of waters in 33 CFR part 328(a)(1, 2, or 4-7).
- ☐ Headquarters declined to approve jurisdiction on the basis of 33 CFR part 328.3(a)(3).
- ☐ The Corps has made a case-specific determination that the following waters present on the site are not Waters of the United States:
- ☐ Waste treatment systems, including treatment ponds or lagoons, pursuant to 33 CFR part 328.3.
 - ☐ Artificially irrigated areas, which would revert to upland if the irrigation ceased.
 - ☐ Artificial lakes and ponds created by excavating and/or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing.
 - ☐ Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating and/or diking dry land to retain water for primarily aesthetic reasons.
 - ☐ Water-filled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States found at 33 CFR 328.3(a).
 - ☐ Isolated, intrastate wetland with no nexus to interstate commerce.
 - ☐ Prior converted cropland, as determined by the Natural Resources Conservation Service. Explain rationale:
 - ☐ Non-tidal drainage or irrigation ditches excavated on dry land. Explain rationale:
 - ☐ Other (explain):

DATA REVIEWED FOR JURISDICTIONAL DETERMINATION (mark all that apply):

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant.
- ☐ Data sheets prepared/submitted by or on behalf of the applicant.
- ☐ This office concurs with the delineation report, dated _____, prepared by (company):
 - ☐ This office does not concur with the delineation report, dated _____, prepared by (company):
- ☐ Data sheets prepared by the Corps.
- ☐ Corps' navigable waters' studies:
- ☐ U.S. Geological Survey Hydrologic Atlas:
 - ☐ U.S. Geological Survey 7.5 Minute Topographic maps:
 - ☐ U.S. Geological Survey 7.5 Minute Historic quadrangles:
 - ☐ U.S. Geological Survey 15 Minute Historic quadrangles:
 - ☐ USDA Natural Resources Conservation Service Soil Survey:
 - ☐ National wetlands inventory maps:
 - ☐ State/Local wetland inventory maps:
 - ☐ FEMA/FIRM maps (Map Name & Date):
 - ☐ 100-year Floodplain Elevation is: _____ (NGVD)
 - ☒ Aerial Photographs (Name & Date):
 - ☐ Other photographs (Date):
 - ☐ Advanced Identification Wetland maps:
 - ☒ Site visit/determination conducted on: January 8, 2007
 - ☐ Applicable/supporting case law:
 - ☐ Other information (please specify):

¹Wetlands are identified and delineated using the methods and criteria established in the Corps Wetland Delineation Manual (87 Manual) (i.e., occurrence of hydrophytic vegetation, hydric soils and wetland hydrology).

²The term "adjacent" means bordering, contiguous, or neighboring. Wetlands separated from other waters of the U.S. by man-made dikes or barriers, natural river berms, beach dunes, and the like are also adjacent.

APPENDIX 2
Wildlife and Rare Species Habitat Assessment Reports

1. Natural Resources Inventory and Rare Species Habitat Assessment Report, Horsley Witten Group, March 2007
2. Wetland Descriptions and Observations of Habitat Suitability Relative to the Eastern Spadefoot, Horsley Witten Group, June 2008, revised July 2009

Appendix 2.1 Natural Resources Inventory and Rare Species Habitat Assessment
Report, Horsley Witten Group, March 2007

Horsley Witten Group

Sustainable Environmental Solutions

90 Route 6A • Sandwich, MA • 02563

Phone - 508-833-6600 • Fax - 508-833-3150 • www.horsleywitten.com



Summary of Natural Resources and Rare Species Habitat Assessments

Provincetown Municipal Airport
Provincetown, Massachusetts

April 2007



Prepared for:

Edwards and Kelcey, Inc.
343 Congress Street, Suite 200
Boston, Massachusetts
02210

**Summary of Natural Resources and Rare Species Habitat Assessments
Provincetown Municipal Airport
Provincetown, Massachusetts**

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Provincetown Municipal Airport
Provincetown, Massachusetts**

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1. INTRODUCTION

The Provincetown Airport Commission recently filed an Environmental Notification Form (ENF; EOEA No. 13789) under the *Massachusetts Environmental Policy Act* (M.G.L. c. 30 §§ 61 through 62H, inclusive, or MEPA). The ENF was based on the Provincetown Municipal Airport (Airport) 2005 Master Plan, the preparation of which is the initial step toward developing a Capital Improvement Project (CIP) program for the Airport facilities.

An integral component of this planning process involves identifying the existing conditions and facility needs, while also identifying various alternatives for meeting those needs. The various improvement projects, as well as alternative project footprints, were outlined in the ENF. Data provided on existing conditions in support of the ENF were based upon initial field surveys performed in 2004 and 2005 in the areas immediately surrounding the Airport facilities, and supplemented with available Massachusetts Department of Environmental Protection (DEP) wetlands data from MassGIS. The initial field surveys were reported in two documents prepared by the Horsley Witten Group, Inc. (HW) in support of the Master Plan: *Wetland Resource Area Report* (October 2005) and *Wildlife Habitat and Rare Species Report* (December 2005). The Certificate of the Secretary of the Executive Office of Environmental Affairs (EOEA) on the ENF (May 26, 2006) specifically requested that the Airport definitively quantify the potential impacts on wetlands, wildlife habitat, and rare species habitat for each of the proposed projects and the alternative footprints, thus necessitating additional field surveys. As a result, additional habitat surveys and wetland delineations were completed in 2006 to support the pending (DEIR).

Wetland resource areas, including isolated and bordering vegetated wetlands that are protected and regulated under the *Massachusetts Wetlands Protection Act* (M.G.L. Ch. 131 § 40), its implementing Regulations (310 CMR 10.00), the Federal *Clean Water Act* (33 U.S.C. 1251, *et seq.*), the Town of Provincetown *Wetlands Protection Bylaw* (Chapter 12 of the Provincetown General Bylaws), and/or the Cape Cod Commission (CCC) Regional Policy Plan (RPP), were reviewed and approved by the Provincetown Conservation Commission under an Order of Resource Area Delineation (“Order”) issued January 25, 2007. Figure 1 depicts the approved wetland areas. A summary of the wetland resource areas is provided as a separate document entitled *Summary of Wetland Resource Areas* (HW, April 2007).

According to the 2006 *Massachusetts Natural Heritage Atlas* (12th Edition), the entire Airport lease area is located within both *Priority Habitat of Rare Species* (PH 1232) and *Estimated Habitat of Rare Wildlife and Certified Vernal Pools* (EH 821) as designated by the Massachusetts Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program (NHESP). As shown in Figure 2, these designated habitats extend well beyond the Airport lease area, including most of Provincetown, and extending throughout Cape Cod and southeastern Massachusetts. Correspondence from NHESP, included in the Appendix, indicates that the Airport property is mapped for four State-listed rare species: Eastern Box Turtle, Eastern Spadefoot, Vesper Sparrow, and Broom Crowberry. NHESP had recommended that rare wildlife and plant surveys be conducted to assess the existing habitats for these species for use in future site planning and to address the Massachusetts *Endangered Species Act* (M.G.L. Ch. 131A) or MESA. Species-specific surveys were conducted in 2005 in accordance with the

protocols established through NHESP (The protocols are provided in the Appendices to this report).

Additional regulatory review relating to the implementation of future projects identified in the ENF will likely include review by NHESP under a MESA Project Review, review by the CCC under its Development of Regional Impact (DRI) review process, and permitting through the Town of Provincetown under local bylaws. These regulatory agencies have specific requirements for evaluating wildlife habitat and/or rare species habitat. HW has prepared this Summary of Natural Resources and Rare Species Habitat Assessments report to supplement and expand upon the earlier *Wildlife Habitat and Rare Species Report* (December 2005) which was prepared to support the 2005 Master Plan and the ENF.

This report provides a description of the natural resources habitats with specific emphasis on the areas where alternatives for Airport facility improvements are being considered. Included within this report are a general description of the Airport property, its general habitat characteristics, a discussion of field methodologies and the results of the wildlife habitat assessments conducted between 2004 and 2006, and further discussion on habitats for rare species. Information within this report is intended to provide a thorough overview of the natural resources and wildlife habitats at the Airport in addition to addressing comments submitted by various agencies in response to the ENF.

2. GENERAL HABITAT CHARACTERISTICS

The Airport lease area occupies approximately 322 acres of land situated within the bounds of the Cape Cod National Seashore (CCNS) at the northern tip of Cape Cod. The Airport lease area consists of developed areas maintained for Airport facilities and operations, as well as undeveloped areas. The undeveloped areas contain diverse wetland and upland habitats, including salt marsh, freshwater wetlands, forested areas, a system of coastal dunes, and open grasslands; portions of the grasslands are managed as part of the airfield. These diverse areas provide a variety of habitats for the local wildlife.

To support the preparation of the ENF and future EIR documents, the habitat assessments focused on the areas where the CIP projects described in the ENF and their identified alternatives would occur. Areas along the taxiway, runway, and approach areas include vegetative communities that are mowed to maintain aviation safety zones and navigational surfaces. Beyond these areas, the vegetative communities are largely undisturbed and uninterrupted, but for a portion of the CCNS bike path that traverses the southeastern corner of the Airport lease area.

Vegetative communities and habitats at the Airport are described in this report based upon the classification system described in the *Classification of the Natural Communities of Massachusetts* (Swain and Kearsley, 2001; hereinafter referred to as “the *Classification*”). The dominant types of vegetative communities encountered at the Airport include Cultural Grassland, Maritime Dune Community, Coastal Interdunal Marsh/Swale with developing areas of Sandplain Grassland and/or Sandplain Heathland, and Estuarine Intertidal Salt Marsh. Descriptions of

these habitat communities and our general observations within each community type are provided below. Additional information regarding the soils classification and geologic characteristics may be found in the *Summary of Wetland Resource Areas* (HW, April 2007), included as a separate document within the DEIR Appendices.

2.1 Cultural Grassland

According to the *Classification*, the Cultural Grassland community is “*a human-created and maintained open community dominated by grasses, normally maintained by mowing.*” This community often occurs at airfields and is “*a grassland community that generally occurs on sand or other droughty, low-nutrient soils.*” In general, the unpaved areas at the Airport that are maintained by mowing or selective cutting for aviation operations are Cultural Grasslands, which may also contain areas of developing Sandplain Grassland and/or Sandplain Heathland (descriptions provided below), and or developing dunes. These areas are immediately adjacent to the Airport runway, the partial parallel TW, and along both sides of the west end entrance taxiway and mid-entrance taxiway that are maintained to provide Airport safety. Cultural Grassland areas at the Airport vary in width from approximately 20-25 feet along either side of the mid-entrance taxiway, to nearly 400 feet wide in the southwestern corner of the airfield between the Runway 7 end and the Glideslope Antenna, as well as southeast of the Runway 25 end. The vegetative community observed in areas of Cultural Grassland is dominated by grass species and various herbaceous species that are mowed an average of three to four times annually.

2.1.1 Sandplain Grassland

Sandplain Grasslands are open communities dominated by grasses with some herbaceous species and small shrubs. According to the *Classification*, this community occurs on “*flat outwash plains with droughty, low nutrient soils. Most occurrences are near the ocean and within the influence of winds and salt spray of storms.*” This habitat type is maintained by fire, salt spray, and mowing. Associated plant species include grasses with patches of shrubs. This vegetative community has great overlap with species found in Sandplain Heathlands (below), but with a greater diversity of vascular plant species. Approximately 29 hectares (72 acres) of the land in proximity of the Airport [not necessarily corresponding to the Airport lease area] are considered grasslands and/or heathlands (Kearney and Cook, 2001).

2.1.2 Sandplain Heathland

The Sandplain Heathland community is described as an “*open, shrub dominated primarily coastal community, sharing many species with Sandplain Grasslands. Heathlands often have sparse clumps of plants with bare soil or lichen cover between the vascular plants.*” This plant community type occurs in poor nutrient, acidic soils, dominated by low-growing woody vegetation. This vegetation includes scrub oak (*Quercus ilicifolia*), black huckleberry (*Gaylussacia baccata*), bearberry (*Arctostaphylos uva-ursi*), and lowbush blueberry (*Vaccinium angustifolium*), with much overlap in species diversity as within Sandplain Grasslands.

2.2 Maritime Dune Community

According to the *Classification*, a Maritime Dune community is “*the classic community of sand dunes, with patches of herbaceous plants interspersed with areas of bare sand and shrubs.*” This community type “*occurs on windswept dunes, within the salt spray zone, often landward of the Beach Strand Community and grading into shrubland or woodlands on the more sheltered back dunes.*” The vegetative composition and structure of the vegetation depends on the dune stability. The Maritime Dune Community observed along the Airport lease line to the north and northwest of the Airport facilities occurs within the boundaries of the Race Point barrier beach system, consisting of both primary and secondary dune habitats, although there are no primary dunes located within the Airport lease area. These dunes are generally vegetated with American beachgrass (*Ammophila breviligulata*) and common hairgrass (*Deschampsia flexuosa*) in open exposed areas. Plant diversity increases on the leeward side of these dunes, where HW field biologists observed open clumps and patches of golden heather (*Hudsonia ericoides*), poison ivy (*Toxicodendron radicans*), beach plum (*Prunus maritima*), and bayberry (*Myrica pensylvanica*). HW observed that frequently, seaward-facing slopes were completely devoid of vegetation. Topography among these dunes varies widely from nearly flat to steeply sloping (e.g., 1:1 slopes or steeper).

The coastal dune habitats located to the southeast of the Airport 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, particularly trees and shrubs. It is in these areas that communities of Maritime Pitch Pine on Dunes and Maritime Shrubland occur to varying degrees. These communities share similar characteristics in terms of the vegetative species composition of other communities, including Pitch Pine (Scrub Oak, Pitch Pine), Oak Forest/Woodland, and Coastal Forest/Woodland communities as described in the *Classification*.

2.3 Coastal Interdunal Marsh/Swale

Among the interdunal swales, sheltered from shifting sands, HW observed various types of freshwater wetland communities. The Coastal Interdunal Marsh/Swale community type appears to be one of the predominant, if not the predominant, type of wetland habitat existing at the site. According to the *Classification*, this community type is a “*graminoid-[grasses or grass-like species such as sedges or rushes] or shrub-dominant coastal community occurring in shallow basins (swales) between sand dunes.*” With respect to environmental setting, “*Interdunal swales are low, shallow depressions that form between sand dunes along the coast. They occur as part of a dune system, and the best examples are complexes of numerous swales. Soils generally have a thin, about one centimeter [0.4 inch], organic layer over coarse sand. The water regime ranges from seasonally flooded to permanently inundated.*” The interdunal swales observed at the Airport range from sparsely vegetated seasonally flooded pools to graminoid or shrub dominated communities to forested communities.

Within this Coastal Interdunal Marsh/Swale community type, HW generally encountered three basic variations: a graminoid-dominated palustrine emergent marsh (PEM), a shrub-dominated

palustrine shrub swamp (PSS), and a palustrine forested swamp (PFO). Emergent marshes and shrub swamps were generally encountered north of the Airport facilities and in low-lying areas to the immediate south and west of the runway, where the wetlands are either connected to the Hatches Harbor wetland system, or else are part of the Airport-managed areas. Dominant vegetation within the emergent marshes includes woolgrass (*Scirpus cyperinus*), twig rush (*Cladium mariscoides*), black grass (*Juncus gerardii*), and soft rush (*Juncus effusus*).

Vegetation encountered within shrub swamp communities included bayberry, willow (*Salix* spp.), winterberry (*Ilex verticillata*), arrowwood (*Viburnum dentatum*), shadbush (*Amelanchier canadensis*), Virginia rose (*Rosa virginiana*), and poison ivy, with a diversity of herbaceous species including Joe-Pye weed (*Eupatorium* spp.), various goldenrods (*Solidago* spp.), various asters (*Aster* spp.), and various ferns. In more inland areas, there are large patches of American cranberry (*Vaccinium macrocarpon*), interspersed with clumps of woolgrass, ferns, and sphagnum moss (*Sphagnum* spp.) among dense clumps and patches of highbush blueberry (*Vaccinium corymbosum*), swamp azalea (*Rhododendron viscosum*), and dwarf huckleberry (*Gaylussacia dumosa*).

Forested wetlands (PFO) are located primarily to the south of the Airport runway beyond the managed areas. HW considered all areas conforming to a pitch pine (*Pinus rigida*), cranberry, and highbush blueberry-dominant, forested wetland habitat type (also referred to here as “cranberry-pine swales”) to be a local variant of the shrub-dominant Coastal Interdunal Marsh/Swale. Pitch pine appears to have become well adapted to seasonally wet conditions, and was considered to be a local wetland-indicator species.

The freshwater wetland communities within the Airport lease area are generally either Bordering Vegetated Wetland (BVW), isolated freshwater wetlands (PFO/PSS), or Coastal Interdunal Marsh/Swales.

2.4 Estuarine Intertidal Salt Marsh

The extreme western end of the Airport lease area extends into the Hatches Harbor salt marsh system, classified as an Estuarine Intertidal Salt Marsh community by Swain and Kearsley (2001). Generally dominated by graminoid species, such as smooth cordgrass (*Spartina alterniflora*) and saltmarsh cordgrass (*Spartina patens*) with occasional shrub species observed along its upper reaches, salt marshes are well known as a productive ecosystem that “provide[s] habitat for various species of wildlife – including migrating and overwintering waterfowl and shorebirds and the young of many species of marine organisms.”

The Hatches Harbor salt marsh system represents an area of former salt marsh that had developed brackish to freshwater characteristics over time due to the construction of the Hatches Harbor dike in 1930. The dike was constructed in an attempt to eradicate the problem of a flourishing mosquito population. However, the resultant near monoculture of common reed, and the severe reduction of wildlife habitat values prompted the Hatches Harbor Salt Marsh Restoration Project, initiated by National Park Service (NPS) in 1998. Subsequent improvements to the tidal flushing in this area have begun to restore brackish and freshwater

wetlands to salt marsh that is contiguous with undisturbed salt marsh areas located seaward of the dike. The resultant community along the upper reaches of this salt marsh is somewhat brackish, and has yet to take on the full distinctions of a salt marsh community.

The *Summary of Wetland Resource Areas* report (HW, April 2007) discusses in detail each of the wetland resource areas delineated and approved under the Order. A copy of the Order and *Wetland Resource Area Map* (December 2006), are provided in the DEIR Appendix.

3. METHODOLOGY AND APPROACH

3.1 Initial Site Assessments

During the initial assessment period, HW field biologists observed site conditions at the Airport between August 2004, and September 2005, to describe site characteristics related to previously documented and potential use of the various habitats by local wildlife. Fieldwork included the assessment of habitats of locally common plant and animal species, as well as habitats of certain State-listed rare species. A combination of meander surveys and linear walking surveys were performed during the assessment period for the purposes of:

- describing the areas in the vicinity of the Airport;
- documenting wildlife species utilization and the habitats in which these species, both resident and migratory, were observed; and
- identifying structural landscape or other features observed within the wetland resources and adjacent upland resources that are or are likely important to individual species or groups of species.

Initial field investigations focused upon the areas immediately surrounding the airport facilities where any future projects identified under the Airport Master Plan planning process would likely occur. Field biologists visited the site on 14 different dates during the initial assessment period. Fieldwork performed in 2004 was completed in conjunction with initial wetland resource area delineations immediately around the Airport facilities, while the majority of the wildlife surveys (both species-specific and general wildlife inventories) were performed in 2005. Most site visits involved two field biologists observing site conditions over a six- to ten-hour period. Several surveys began at dawn while other surveys began later in the day and extended past dusk. Meander surveys were performed within and along the margins of the various vegetative communities for the purpose of observing and documenting habitat features in accordance with accepted natural resource inventory guidelines. HW recorded all field observations and took numerous photographs documenting the occurrence of various site features and habitat types.

3.2 Rare Species Habitat Survey Methodologies

Previous wildlife studies conducted by others identified the presence of three State-listed species within the airport property: Eastern Spadefoot (*Scaphiopus h. holbrookii*), Northern Harrier (*Circus cyaneus*), and Broom Crowberry (*Corema conradii*) (Fugro/ENSR, 1993). In previous reports describing the habitat characteristics at the Airport, it had been noted that the Piping

Plover (*Charadrius melodus*), a State- and Federally-listed Threatened shorebird, nests and breeds in the “immediate vicinity” of the Airport. Based upon an understanding of the habitat requirements of this species, this would likely occur primarily within the dunes north of the Airport along the CCNS shoreline, and outside of the Airport lease area.

HW contacted NHESP in May 2004 to determine whether their database of State-listed species for this area had been updated since the early 1990s. The most current NHESP database identifies four “*protected rare species that have been found in the vicinity of the [Airport] site*”:

- Eastern Box Turtle (*Terrapene c. carolina*);
- Eastern Spadefoot (*Scaphiopus h. holbrookii*);
- Vesper Sparrow (*Pooecetes gramineus*); and
- Broom Crowberry (*Corema conradii*).

In their correspondence, NHESP recommended that rare wildlife and plant surveys be conducted in accordance with scientifically accepted survey methodologies for each of the four species. Survey protocol methods were developed by HW and approved by NHESP prior to commencement of the habitat surveys. Rare species habitat surveys were conducted in accordance with the approved survey protocols for each of the four State-listed species identified. Copies of the written correspondence with NHESP and the approved protocols are included within the Appendix. Below is a brief description of each species, its general habitat requirements, and the survey methods.

3.2.1 Eastern Box Turtle

The Eastern Box Turtle is a Massachusetts Species of Special Concern. This small terrestrial turtle uses a relatively wide range of terrestrial habitat types, including woodlands, field edges, and thickets (DeGraaf and Rudis, 1983), and has also been found in various wetland habitat types including wet meadows and lowland swamps (Klemens, 1993). NHESP identifies two natural communities with which this species is associated, including Coastal Forest/Woodland and Pitch Pine-Oak Forest (Swain and Kearsley, 2001), although other similar vegetative communities may also provide suitable habitat for this species. Optimal habitats on Cape Cod include pine barrens and oak thickets, where box turtles are associated with cranberry dominated swales. Communities with similar vegetative characteristics to these identified habitats are found within the Airport.

Survey methods included a presence-absence survey for this species, as well as a general characterization of the potential habitat for the Eastern Box Turtle at the Airport. HW performed meander surveys within each habitat type at the site. Field surveys specifically performed to observe this species were done in the early morning and/or during the day immediately following storm events when this species is reported to be most active (Klemens, 1993). Surveys for the Eastern Box Turtle occurred primarily in the spring and fall.

3.2.2 Eastern Spadefoot

The Eastern Spadefoot is a medium-sized toad, protected as a Threatened Species in Massachusetts. Reported habitat for this species includes dry sandy or loose soils in areas of sparse shrub growth of open forest areas (DeGraaf and Rudis, 1983). In addition, this species breeds only in shallow, temporary pools formed after very heavy, warm rains (Martof, 1980). Natural communities with which this species is associated that exist at the Airport include Coastal Interdunal Marsh/Swale, Wet Meadow, and Shrub Swamp.

Surveys for the Eastern Spadefoot included identification of isolated depressions that may temporarily hold water after significant rainfalls, and observation surveys following significant rainfall events from April through September. Target areas included the Coastal Interdunal Marsh/Swales in and immediately surrounding the Airport facilities.

This species emergence from underground burrows and migration to these temporary pools is triggered by heavy rainfall. There were very few evenings during the 2005 field survey period between May 15 and September 1 (the period when this species is most active) when significant precipitation events occurred. HW conducted evening field surveys within several of the inundated isolated wetland areas on two occasions (March 28 and August 31, 2005), during warm evening storm events.

3.2.3 Vesper Sparrow

The Vesper Sparrow is a small sparrow reported to inhabit open areas (cultivated fields, grasslands, fallow fields, and pastures) as well as Sandplain Heathlands. NHESP reports that this species is associated with Cultural Grasslands, which are often maintained open communities dominated by grasses. The Vesper Sparrow is designated as a Threatened Species in Massachusetts.

HW conducted morning and evening absence-presence surveys in 2005 between May 1 and July 31, when this species is most active. Surveys for the Vesper Sparrow and its habitat were concentrated within the managed areas (Cultural Grasslands) adjacent to the airport runway, taxiway, and runway approach. Field surveys included both listening and visual surveys, performed along walking transects. HW established 15 transects spaced approximately 150 meters apart within Cultural Grassland habitat located adjacent to shrub-dominant thickets (Figure 3). At each transect HW recorded all avian species seen or heard during a five-minute interval. A recording of Vesper Sparrow calls was then repeatedly broadcast along the length of each transect.

3.2.4 Broom Crowberry

Broom Crowberry is a low-growing, densely branching evergreen shrub, which inhabits open areas (low shrub communities or sandy flats, as well as dry pitch pine/scrub oak barrens and relic sand dunes). The NHESP-described natural communities with which this species is associated

include Sandplain Heathland and Pitch Pine – Scrub Oak Communities. Broom Crowberry is a Massachusetts Species of Special Concern.

Broom Crowberry was previously reported at the Airport in the managed grassland habitat southwest of the glide slope antennae. HW conducted meander surveys for Broom Crowberry, targeting the area where this species was previously identified and areas of Cultural Grassland habitat and/or Sandplain Grasslands/Sandplain Heathlands, as well as pitch-pine forested areas with associated plant communities.

3.3 Capital Improvement Program Projects and Supplemental Field Assessments

Since the ENF, the CIP projects have been refined slightly, as listed below. The CIP projects include the following:

1. Relocate the West Entrance Taxiway (TW)
2. Realign the Westerly End of the Partial Parallel TW
3. Improve the Access Road to the Approach Lights
4. Install TW Edge lights and Construct an Electric Vault
5. Rehabilitate or Replace the Sightseeing Shack
6. Realign the Mid Entrance TW
7. Relocate the East Entrance TW
8. Reconstruct the Terminal Apron within the Existing Footprint
9. Reconstruct the Easterly End of the Partial Parallel TW within the Existing Footprint
10. Construct Additional Turf Apron
11. Construct Service Access Roads to the Localizer Equipment Shelter and to the Weather Station
12. Install a Perimeter Safety/Security Fence
13. Expand Auto Parking
14. Expand the Terminal Building

Please note that the DEIR combines the relocation of the West Entrance TW, realignment of the Westerly End of the Partial Parallel TW, and realignment of the Mid Entrance TW, and that these three CIP projects are discussed as a whole.

HW field biologists performed continued site observations and assessments at the Airport from August through December 2006 in order to further describe the site characteristics related to the various projects identified in the ENF. As with HW's initial field efforts in 2004 and 2005, a combination of meander surveys and linear walking surveys were performed for the purposes of identifying structural landscape, or other features detected within the wetland resource areas, along with adjacent uplands that are, or are likely important, to an individual species or groups of species. In addition, 2006 field surveys focused upon:

- Identifying and delineating all wetland resource areas in the general vicinity of the identified CIP project alternatives (i.e., within 100 feet of these areas); and
- Describing the general habitat characteristics and documenting wildlife species observations.

Specific to one of the CIP projects, Installation of a Perimeter Safety/Security Fence, the Airport Lease Line, as well as the two interior alternative layouts identified in the ENF that were under consideration were survey-located, and marked at 50- or 100-foot intervals with labeled wooden stakes to facilitate our field efforts. Additional projects located immediately adjacent to existing Airport facilities did not necessitate field staking.

HW concentrated field assessments around the footprints of the CIP projects identified in the ENF, including the provided alternatives, to accurately describe the existing habitat and vegetative communities in these locations. During a verbal conversation with NHESP regarding their ENF comment letter, the NHESP review biologist indicated that additional species-specific surveys were unnecessary to address the NHESP Comments, and that all future field assessments for the four State-listed species should focus upon the site characteristics with respect to their potential to provide habitat for each specific species. As a result, all habitats encountered within the Airport lease area were evaluated for their ability to provide suitable habitat for rare species.

During this phase of the field assessments, field biologists visited the site on 17 separate dates. Most often, habitat assessments were completed in conjunction with wetland resource area delineation fieldwork, as both wetland and upland habitats are likely to be affected by the various CIP projects. As with previous field surveys performed by HW, site assessments generally involved two to three field biologists observing site conditions over a six- to nine-hour period. Most of the 2006 surveys began in the early morning and extended throughout the day, and occasionally extended into dusk. As our focus was on assessing the habitat characteristics, nighttime surveys were not deemed necessary for this phase of the wildlife studies.

4. RESULTS OF GENERAL HABITAT ASSESSMENTS

This discussion of the wildlife habitats survey is organized according to the different natural community types observed at the site. A list of all bird, mammal, amphibian, and reptile species observed at the Airport during these and previous field surveys is provided in this section. Additional details regarding wetland habitats are provided in the *Summary of Wetland Resource Areas* report (HW, April 2007).

4.1 Coastal Interdunal Marsh/Swale Habitat

The Coastal Interdunal Marsh/Swale community is one of the predominant types of wetland habitats existing at the Airport. With respect to habitat functions and values, the *Classification* indicates that “*interdunal swales can function as vernal pool habitat if water remains standing for two to three months and they lack fish; these swales provide important amphibian breeding habitat, particularly for toads, including American, Fowler’s, and spadefoot toads.*” The *Classification* identifies the Eastern Spadefoot as a rare animal species associated with this community type, while HW also notes that this may be an important habitat component for the Eastern Box Turtle.

As noted in the *Classification*, “*Interdunal swales have a high habitat value to birds and mammals for food, cover, and nesting sites.*” In addition to numerous resident and migratory bird species that were observed in or near these wetland habitats during each field visit, Northern black racer (*Coluber c. constrictor*), Fowler’s toad (*Bufo w. fowleri*), and small mammals were frequently encountered. Following the 2006 *Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands*, published by DEP, HW assessed the project areas overall in the context of whether any important habitat features occur at the Airport. HW noted the overall presence or absence of wetland-specific and upland wildlife habitat features and characteristics (Table 1).

Table 1. Presence-absence of habitat features within the Airport assessment areas.

Habitat Feature	Present (Y/N)
Habitat(s) for State-listed animal species	Y
Sphagnum hummocks and pools suitable as for nesting habitat for four-toed salamanders	N
Trees with large cavities (≥ 18 ” tree diameter at cavity entrance)	N
Existing beaver mink or otter beds	N
Areas within 100 feet of existing beaver, mink or otter dens	N
Existing nest trees for birds that traditionally reuse nests	Y
Land containing freshwater mussel beds	N
Wetlands and waterbodies known to contain open water in winter	Y
Potential turtle nesting areas	Y
Vertical sandy banks	N
Depressions that hold standing water with potential to provide vernal pool habitat	Y
Areas surrounding vernal pools	Y
Isolated wetlands greater than 5,000 square feet in surface area	Y

The cranberry-pine swale habitat type is expansive on the southern side of the runway and most often supports cranberry and pitch pine as the predominant species with lesser amounts of highbush blueberry, bayberry, and woolgrass. Sphagnum moss is often abundant in these swales, which remained inundated to varying degrees in the winter, spring, and early summer; and generally dried up in late summer into the fall. These swales are geographically isolated and range in size from only a few square meters to several hundred square meters in area. These swales are seasonally inundated for relatively long periods during the year due to the seasonal rise in the groundwater table.

With respect to valuable structural features and hydrologic regimes comprising this habitat, these cranberry-pine swales are characterized by abundant wildlife habitat cover and fruit-bearing plants. Windfalls and standing dead wood are present in relative abundance, providing suitable foraging and nesting habitat for cavity nesting bird species. Small-diameter, fallen dead wood is plentiful, providing escape cover for amphibians, certain reptiles, and small mammals. Pine needle-litter is relatively thick, and mature pitch pines are generally less than 10 inches at breast-height diameter (DBH). Common resident and migratory avifauna were frequently observed,

along with Eastern ribbon snakes (*Thamnophis s. sauritus*). Coyotes were frequently heard and often observed in the vicinity of these habitats, with one coyote den noted to the east of Wetland L at the margin of the pine-forested area. Evidence of white-tail deer breeding activity (territorial markings such as scrapes and rubs along woody vegetation) was frequently observed throughout wetland areas south of the runway.

4.1.1 Potential Vernal Pool Habitat

In the period between August 2004 and September 2005, and again throughout most of the fall season in 2006, HW observed that all of the isolated wetland areas conforming to the Coastal Interdunal Marsh/Swale community type held some amount of standing water for a period of time during the growing season. This was evident by water stained vegetation along the surface. Observations of standing water in many of the larger wetland areas in late spring of 2005 and again in early January 2007.

HW observed juvenile amphibians (tadpoles) within several of the cranberry-pine swales southeast of the Airport runway when shallow inundation was present in May 2005. Within Wetland B, HW noted the presence of Fowler's Toads through recognition of their distinctive breeding chorus. Although not observed in all of the isolated freshwater wetland areas, evidence of amphibian breeding activity indicates that many of these seasonally inundated wetland areas provide suitable amphibian breeding habitat at least during some years. These pools, as well as the surrounding upland areas (primarily coastal dune habitats) that are considered part of the vernal habitat under the local wetlands bylaw, are important wildlife habitat features found within the Airport lease area.

The current source data available in MassGIS (updated as of January 2007) indicates that there are no certified vernal pools (CVPs) or potential vernal pools (PVPs) within the Airport lease area (see Figure 2). The nearest certified vernal pool is located to the east of the Airport, adjacent to Race Point Road just to the north of this road's intersection with Province Land Road. Two NHESP-designated Potential Vernal Pools are identified by the *Atlas*, northeast and southwest of the Airport lease area.

4.1.2 Persistent Water Regime

All of the geographically isolated freshwater wetland areas, with the exception of a small area within Wetland K, appear to experience dry conditions for some period during mid to late summer and early fall when regional groundwater elevations are at their lowest levels. Due to persisting surface water in the northern corner of Wetland K (PEM/PSS habitat), this wetland resource is highly valuable for wildlife species as a source of fresh water during drier portions of the year.

4.2 Maritime Dune Habitat

The Maritime Dune Habitat community is the predominant unmanaged upland habitat type within the Airport lease area. Stable Maritime Dune communities (i.e., Maritime Pitch Pine on Dunes and Maritime Shrubland), supporting shrubs and trees interspersed with Coastal Interdunal Marsh/Swales, are found at the lowest land elevations. These comprise nearly the entire habitat community south of the Airport runway, outside of, and beyond areas identified as Cultural Grassland and the wetland areas. HW found these Maritime Dune communities to be relatively consistent in vegetative makeup, dominated by pitch pine, with a canopy cover of 40-50%, and understory species limited to various lichens (*Cladonia* spp.) and common hairgrass. In addition, HW observed that these areas were interspersed with open areas of golden heather and lichens with less frequent occurrences of pinweed (*Lechea maritima*), occasional scrub oak, bayberry, and smaller areas of open bare sand. Prostrate branches of the pitch pine provide cover for small mammals and reptiles, and HW frequently observed small cavities or dens among these branches. Occasionally, HW encountered small stands of Virginia pine (*Pinus virginiana*), an introduced species. HW frequently observed small wildlife paths and corridors traversing the dune habitat south of the Airport runway.

A less sheltered Maritime Dune community exists between the Airport facilities and the CCNS shoreline to the north. The dunes in these areas are undulating, varying in topography and vegetative composition, yet are largely uniform in species diversity outside of the wetland areas. Open areas of bare sand, and occasional pebbles, are interspersed with sparsely to moderately vegetated dunes, dominated by American beachgrass, hairgrass, and areas containing clumps and patches of golden heather. Sparsely scattered areas of dense upland vegetation observed primarily along leeward slopes and consisting largely of bayberry, beach plum, and/or poison ivy, are interspersed among the more open dune areas and provide shelter and valuable food source for small mammals and birds.

Coyote activity (in the form of tracks and scat) was observed frequently among the outermost dunes. Broken shells (quahog) among pebbly areas indicate that this area provides some feeding habitat for shorebirds. HW observed flocks of tree swallows (*Tachycineta bicolor*) congregating in the dense vegetation in these outer dune areas. These birds were presumed to be migrating due to the timing of the observations (late fall 2006). For the most part, the outer dune community does not support pitch pine, with the exception of the dunes in the northeastern corner of the Airport lease area (near the Airport parking lot). Interspersed among the outer dunes are several isolated vegetated wetland areas, which provide additional habitat diversity. Descriptions of the plant communities within individual wetland areas are provided in the *Summary of Wetland Resource Areas* report (HW, April 2007). On one occasion in October 2006, HW observed a Northern Harrier in a small stand of pitch pines just south of Wetland AL; observations of this species were previously reported by HW foraging along the airport runway, and by others during past surveys (see HW, December 2005).

With respect to habitat values, the *Classification* indicates that “a variety of seabirds, shorebirds, and song birds nest at the base and sides of dunes and in the interdunal area. The particular species depend upon topography, hydrologic regime, and the amount and type of plant cover.

Vernal pools occur in some dune systems, serving as important feeding and breeding areas for a variety of reptiles and amphibians, invertebrates, and birds and mammals.” A complete list of species observed by HW and/or documented by other field biologists at the Airport is provided in Table 2.

Table 2 includes species observed by HW during field surveys between 2004 and 2005, and continued surveys in 2006. This list is updated from species observed by others between 1991 and 1994 as presented in the October 1999 Final Environmental Impact Statement (FEIS)/ Final Environmental Impact Report (FEIR), Department of Transportation Section 4(f) Statement for the Airport.

Table 2. Recorded and Observed Wildlife Species.

SCIENTIFIC NAME	COMMON NAME	STATUS*
Avian Species		
<i>Gavia immer</i>	Common Loon	MASC
<i>Phalacrocorax auritus</i>	Double-crested Cormorant	--
<i>Ardea herodias</i>	Great Blue Heron	--
<i>Butorides virescens</i>	Green Heron	--
<i>Cathartes aura</i>	Turkey Vulture	--
<i>Anas rubripes</i>	American Black Duck	--
<i>Anas platyrhynchos</i>	Mallard	--
<i>Pandion haliaetus</i>	Osprey	--
<i>Circus cyaneus</i>	Northern Harrier	MAT
<i>Accipiter cooperii</i>	Cooper's Hawk	--
<i>Buteo jamaicensis</i>	Red-tailed Hawk	--
<i>Falco sparverius</i>	American Kestrel	--
<i>Phasianus colchicus</i>	Ring-necked Pheasant	--
<i>Bonasa umbellus</i>	Ruffed Grouse	--
<i>Colinus virginianus</i>	Northern Bobwhite	--
<i>Charadrius vociferus</i>	Killdeer	--
<i>Haematopus palliatus</i>	American Oystercatcher	--
<i>Larus argentatus</i>	Herring Gull	--
<i>Larus marinus</i>	Great Black-backed Gull	--
<i>Sterna hirundo</i>	Common Tern	MASC
<i>Sterna antillarum</i>	Least Tern	MASC
<i>Zenaida macroura</i>	Mourning Dove	--
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	--
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	--
<i>Bubo virginianus</i>	Great Horned Owl	--
<i>Picoides pubescens</i>	Downy Woodpecker	--
<i>Picoides villosus</i>	Hairy Woodpecker	--
<i>Colaptes auratus</i>	Northern Flicker	--
<i>Tyrannus tyrannus</i>	Eastern Kingbird	--
<i>Cyanocitta cristata</i>	Blue Jay	--
<i>Corvus brachyrhynchos</i>	American Crow	--
<i>Eremophila alpestris</i>	Horned Lark	--
<i>Tachycineta bicolor</i>	Tree Swallow	--
<i>Hirundo rustica</i>	Barn Swallow	--
<i>Poecile atricapillus</i>	Black-capped Chickadee	--
<i>Sitta carolinensis</i>	White-breasted Nuthatch	--
<i>Thryothorus ludovicianus</i>	Carolina Wren	--
<i>Turdus migratorius</i>	American Robin	--
<i>Dumetella carolinensis</i>	Gray Catbird	--
<i>Mimus polyglottos</i>	Northern Mockingbird	--
<i>Sturnus vulgaris</i>	European Starling	--
<i>Dendroica petechia</i>	Yellow Warbler	--
<i>Dendroica magnolia</i>	Magnolia Warbler	--

SCIENTIFIC NAME	COMMON NAME	STATUS*
<i>Dendroica coronata</i>	Yellow-rumped Warbler	--
<i>Dendroica virens</i>	Black-throated Green Warbler	--
<i>Dendroica pinus</i>	Pine Warbler	--
<i>Mniotilta varia</i>	Black-and-white Warbler	--
<i>Geothlypis trichas</i>	Common Yellowthroat	--
<i>Pipilo erythrophthalmus</i>	Eastern Towhee	--
<i>Spizella passerina</i>	Chipping Sparrow	--
<i>Pooecetes gramineus</i>	Vesper Sparrow (obs. by others)	MAT
<i>Passerculus sandwichensis</i>	Savannah Sparrow	
<i>Melospiza melodia</i>	Song Sparrow	
<i>Melospiza georgiana</i>	Swamp Sparrow	
<i>Cardinalis cardinalis</i>	Northern Cardinal	--
<i>Dolichonyx oryzivorus</i>	Bobolink	--
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	--
<i>Quiscalus quiscula</i>	Common Grackle	--
<i>Icterus spurius</i>	Orchard Oriole	--
<i>Icterus galbula</i>	Baltimore Oriole	--
<i>Carpodacus purpureus</i>	Purple Finch	
<i>Carpodacus mexicanus</i>	House Finch	
<i>Carduelis tristis</i>	American Goldfinch	--
<i>Passer domesticus</i>	House Sparrow	--
Mammalian Species		
<i>Blarina brevicauda</i>	Northern Short-tailed Shrew	--
<i>Sylvilagus floridanus</i>	Eastern Cottontail	--
<i>Tamiasciurus hudsonicus</i>	Red Squirrel	--
<i>Microtus pennsylvanicus</i>	Meadow Vole	--
<i>Canis latrans</i>	Coyote	--
<i>Vulpes vulpes</i>	Red Fox	--
<i>Procyon lotor</i>	Common Raccoon	--
<i>Mephitis mephitis</i>	Striped Skunk	--
<i>Odocoileus virginianus</i>	White-tailed Deer	--
Reptile and Amphibian Species		
<i>Plethodon cinereus</i>	Eastern Red-backed Salamander	--
<i>Bufo fowleri</i>	Fowler's Toad	--
<i>Pseudacris crucifer</i>	Spring Peeper	--
<i>Coluber constrictor</i>	Eastern Racer	--
<i>Thamnophis sauritus</i>	Eastern Ribbon Snake	--
<i>Thamnophis sirtalis</i>	Common Garter Snake	--

Key

- MAE = Massachusetts Endangered species
MAT = Massachusetts Threatened species
MASC = Massachusetts Species of Special Concern

*Status of Massachusetts' species as designated by the Massachusetts Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program, set forth in 321 CMR 10.00 *et seq.*

5. RARE SPECIES HABITAT ASSESSMENTS

Four State-listed rare species, identified by the NHESP, have been previously documented to occur in the vicinity of the Airport by HW and/or by others. Surveys for these species were performed in accordance with NHESP-approved protocols. Following the verbal directive from NHESP (as noted above in Section 3.3), HW conducted additional field assessments for each of these species, focusing on the habitat potential for each species, rather than presence/absence surveys. The results of the 2005 species-specific surveys as well as the general characteristics of each species are provided in this section, followed by the identification of the communities and areas likely to be significant for providing habitat for each species. Figure 4 depicts the approximate areas of potential habitat within the Airport lease area for each of the four rare species based upon our field observations. Portions of the Airport lease area that were not assessed were supplemented with available source data from MassGIS.

5.1 Broom Crowberry

HW observed a population of Broom Crowberry located within Cultural Grassland to the southwest and west of the glide slope antenna within approximately 200 to 300 feet of this antenna, verifying previously documented observations of this species within the Airport lease area. The location of approximately 52 clusters of this species were survey-located and are shown on Figure 4. The observed clusters of Broom Crowberry, all of which are located within a few meters of each other, range in size from approximately 0.25 to 1.25 meters in diameter. The NHESP Rare Plant Observation Form is provided in the Appendices to this report.

HW continued to conduct meander surveys for Broom Crowberry in 2006 within areas of potential habitat for this species, including the area near the Glideslope antennae, in additional areas of Cultural Grassland habitat, in developing Sandplain Grasslands/Sandplain Heathlands, and within pitch-pine forested areas along the dunes. HW did not identify any additional occurrences of this species within the project areas.

5.2 Eastern Box Turtle Habitat

HW did not observe Eastern Box Turtles during any of the field assessments between 2004 and 2006. However, suitable habitat for this species is present, particularly in the southern portion of the Airport lease area, classified as Maritime Dune and Coastal Interdunal Marsh/Swale communities, where foraging habitat and abundant food sources are found within close proximity to open areas of sand suitable for nesting habitat. The rare species information provided by NHESP for Eastern Box Turtles states that “*in optimal habitats in Cape Cod pine barrens and oak thickets, the species is generally associated with cranberry dominated swales interspersed with bearberry groundcover, low bush blueberries, and thickets of bracken fern.*” The Eastern Box Turtle would be considered a generalist in the context of habitat preference, and many of these habitat characteristics are found within the Airport lease area, observed primarily in the expansive areas to the south of the Airport runway. All pitch-pine dominated habitats, including the cranberry-pine swales and the lower slopes of the pitch pine and oak dominant dune habitats together are suitable habitat for the Eastern Box Turtle. These areas contain

abundant fruit-bearing shrubs and ericaceous plants, as well as abundant mushrooms, which are considered high-value food sources for the Eastern Box Turtle as well as for many other birds and mammals.

5.3 Eastern Spadefoot Habitat

Eastern Spadefoots were not observed by HW during any site visits. The distinctive breeding call of this animal was also not detected during evening surveys performed in 2005. However, Eastern Spadefoots have been observed by others during nocturnal road surveys conducted along nearby Race Point Road (Patten, et al., 2003). These researchers also positively identified a single Eastern Spadefoot breeding area, consisting of two small temporary ponds on Hatches Harbor Dike Road, located considerably south of the Airport lease area.

The Eastern Spadefoot uses temporary pools of standing water as breeding habitat, and prefers a soil in which it can burrow, consisting of loose, sandy material, with temporarily inundated isolated wetlands nearby (breeding habitat). The emergence of this species from underground burrows and migration to these temporary pools is triggered by heavy rainfall. The evening field visit conducted in August 2005 occurred immediately following a significant storm event, during which approximately four inches of rain fell within a 24-hour period¹. It was anticipated that after such a significant rainfall that most isolated wetlands located in the eastern corner of the Airport, as well as other isolated wetland areas would contain standing water. However, due to the rainfall deficit observed on Cape Cod during the 2005 summer months², and the relatively high porosity of the coarse sandy soils, significant precipitation events occurring over a short period of time during the summer months did not result in temporary pools at the Airport this year. Temporary inundation likely occurs earlier in the season when groundwater elevations are higher. The presence and fluctuation in depth of standing water in the wetlands at this site are likely related primarily to the gradual changes in groundwater elevation on a seasonal basis and not to precipitation events.

Habitat suitability surveys for the Eastern Spadefoot included identification of open, sandy depressions, which may temporarily hold water after significant rainfalls. Target areas included the Coastal Interdunal Marsh/Swales in and immediately surrounding the proposed footprints of the CIP projects, along with the alternative locations where vegetation was sparse, but with plentiful vegetative cover in surrounding areas. Portions of the Airport lease area, particularly in the southeastern corner, provide both of these features and may provide suitable habitat for the Eastern Spadefoot. These suitable habitat features are abundant within the Airport lease area, particularly south of the Airport runway.

5.4 Vesper Sparrow Habitat

HW did not document the presence of any Vesper Sparrows during our 2004-2005 field surveys. Following the survey protocol approved by NHESP and incorporating techniques used successfully by researchers in 1993 (Jones and Vickery, 1995), HW performed field surveys for

¹ Source: Massachusetts Climatological Reports, National Weather Service, 24-hour precipitation amounts.

² Source: Massachusetts Department of Conservation and Recreation <http://www.mass.gov/dcr/waterSupply/rainfall/>

the presence of Vesper Sparrows between mid-May and the end of July in 2005. Three early morning surveys (May 18, June 16, and July 29) and two early evening surveys (June 3 and July 11) were conducted during favorable weather conditions (i.e., no precipitation and light or no wind).

Kearney and Cook (2001) reported that approximately 29 hectares of land at the Provincetown Airport that are considered grasslands and/or heathlands, some or all of which may be classified as Cultural Grassland, with which the State-Threatened Vesper Sparrow is associated (Swain and Kearsley, 2001). The most recently documented observation of the Vesper Sparrow at the Airport that HW is aware of occurred in 2000, when NPS ecologists documented two Vesper Sparrows within the grassland habitat located northeast of the runway. Prior to this, in July of 1996, NPS observers reported “*small flocks of adult males (less than or equal to five individuals)*” observed along the Airport runway shoulders³. Earlier documented observations of this species at the Airport occurred in 1993, during a State-wide grassland bird survey, when seven (7) vocalizing male vesper sparrows were recorded at the airport (Jones and Vickery, 1995).

Kearney and Cook (2001) report that the distribution and abundance of Vesper Sparrows within the CCNS declined from 1995 to 2000. Earlier observations indicate that this species has been decreasing in numbers since the 1930s (Hill, 1965, as reported in Kearney and Cook, 2001). However, based upon the reported Vesper Sparrow observations by others during past surveys at the Airport, available resources including information from the NHESP pertaining specifically to known habitat requirement of this species, observations of associated wildlife (Northern Harrier; see below), and an understanding of existing community types, HW believes that the Cultural Grassland community and adjacent maintained shrub thickets that along the Airport runway, taxiway, and approach areas may provide suitable habitat for Vesper Sparrow, although perhaps not during every breeding season. Regular mowing of these areas as part of routine Airport maintenance, in part, maintains suitable habitat for this species.

5.5 Other State-Listed Species Observed

During their review of protocols for this study, NHESP requested that any observations of the Northern Harrier and the Grasshopper Sparrow (*Ammodramus savannarum*) be recorded. These species, both State-listed Threatened species, are associated with similar, overlapping habitat types as the Vesper Sparrow. While Grasshopper Sparrows were not observed (this species is thought to be extirpated from this part of Cape Cod; Kearney and Cook, 2001), HW observed individual male and female Northern Harriers during 12 of the 14 site visits made between August 2004 and September 2005, and routinely observed individual male and female Northern Harriers during site assessments and land surveys in 2006. Generally, these individuals were observed hunting or foraging along the Cultural Grasslands adjacent to the Airport runway. On one occasion, HW observed a female harrier in the dune area adjacent to Wetland AL.

³ Source: Rare Species Observation Form, submitted to NHESP July 25, 1996; observer K. Jones.

6. CAPITAL IMPROVEMENT PROJECTS AND HABITAT ASSESSMENTS

Based on the habitat assessments presented here, several projects included in the CIP for the Airport have the potential to impact wetlands, wildlife habitat, and/or rare species habitat. The type and amount of impact depends on the alternative ultimately selected for each project element. The DEIR for the CIP will include an alternatives analysis. Table 3 presents a baseline overview of potential impacts, with respect to each project.

Table 3. Estimated potential for environmental impacts to wetland resource areas and rare species habitat for all build alternatives of CIP projects identified in the ENF.

Projects	Potential for Impact to Natural Resource Areas and Rare Species Habitat							
	Cultural Grassland	Maritime Dune Habitat	Coastal Interdunal Marsh/Swale	Freshwater Wetland Habitat	Broom Crowberry	Eastern Box Turtle	Eastern Spadefoot	Vesper Sparrow
West End TW (Alt. 1)	Impact	No Impact	Impact	Impact	No Impact	Potential	Potential	Potential
West Taxiway (Pref. Alt. 2)	Impact	No Impact	Impact	Impact	No Impact	Potential	Potential	Potential
Mid Entrance TW	Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	Potential
East End TW	Impact	No Impact	No Impact	Impact	No Impact	Potential	Potential	Potential
Partial Parallel TW	Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	Potential
Electrical Vault	No Impact	No Impact	Impact	Impact	No Impact	No Impact	No Impact	No Impact
Sightseeing Shack	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Turf Apron Expansion	Impact	No Impact	Impact	Impact	No Impact	No Impact	No Impact	Potential
AWOS Access Rd (Alt. A)	Impact	Impact	Impact	Impact	No Impact	Potential	Potential	Potential
AWOS Access Rd (Alt. B)	Impact	Impact	Impact	Impact	No Impact	Potential	Potential	Potential
AWOS Access Rd (Pref. Alt. C)	No Impact	Impact	Impact	Impact	No Impact	Potential	Potential	No Impact
AWOS Access Rd (Alt. D)	No Impact	Impact	Impact	Impact	No Impact	Potential	Potential	No Impact
Equip Shelter Road (Alt. A)	Impact	Impact	No Impact	No Impact	No Impact	Potential	Potential	Potential
Equip Shelter Road (Pref. Alt. B)	No Impact	Impact	No Impact	No Impact	No Impact	Potential	Potential	No Impact
Equip Shelter Road (Alt. C)	No Impact	Impact	Impact	Impact	No Impact	Potential	Potential	No Impact
Equip Shelter Road (Alt. D)	No Impact	Impact	No Impact	No Impact	No Impact	Potential	Potential	No Impact
Equip Shelter Road (Alt. E)	Impact	Impact	No Impact	No Impact	No Impact	Potential	Potential	Potential
Perimeter Fence (Pref. Alt.)	No Impact	Impact	Impact	Impact	No Impact	Impact	Impact	No Impact
Perimeter Fence (Alt. 2 – 500 ft.)	Impact	Impact	Impact	Impact	Impact	Impact	Impact	Potential
Perimeter Fence (Alt. 3 – 1,000 ft.)	No Impact	Impact	Impact	Impact	No Impact	Impact	Impact	No Impact
Terminal Building-Vertical	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Terminal Building-Horizontal	No Impact	No Impact	No Impact	Impact	No Impact	No Impact	No Impact	No Impact
Parking Area	No Impact	Impact	Potential	Potential	No Impact	Potential	Potential	No Impact

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7. SUMMARY

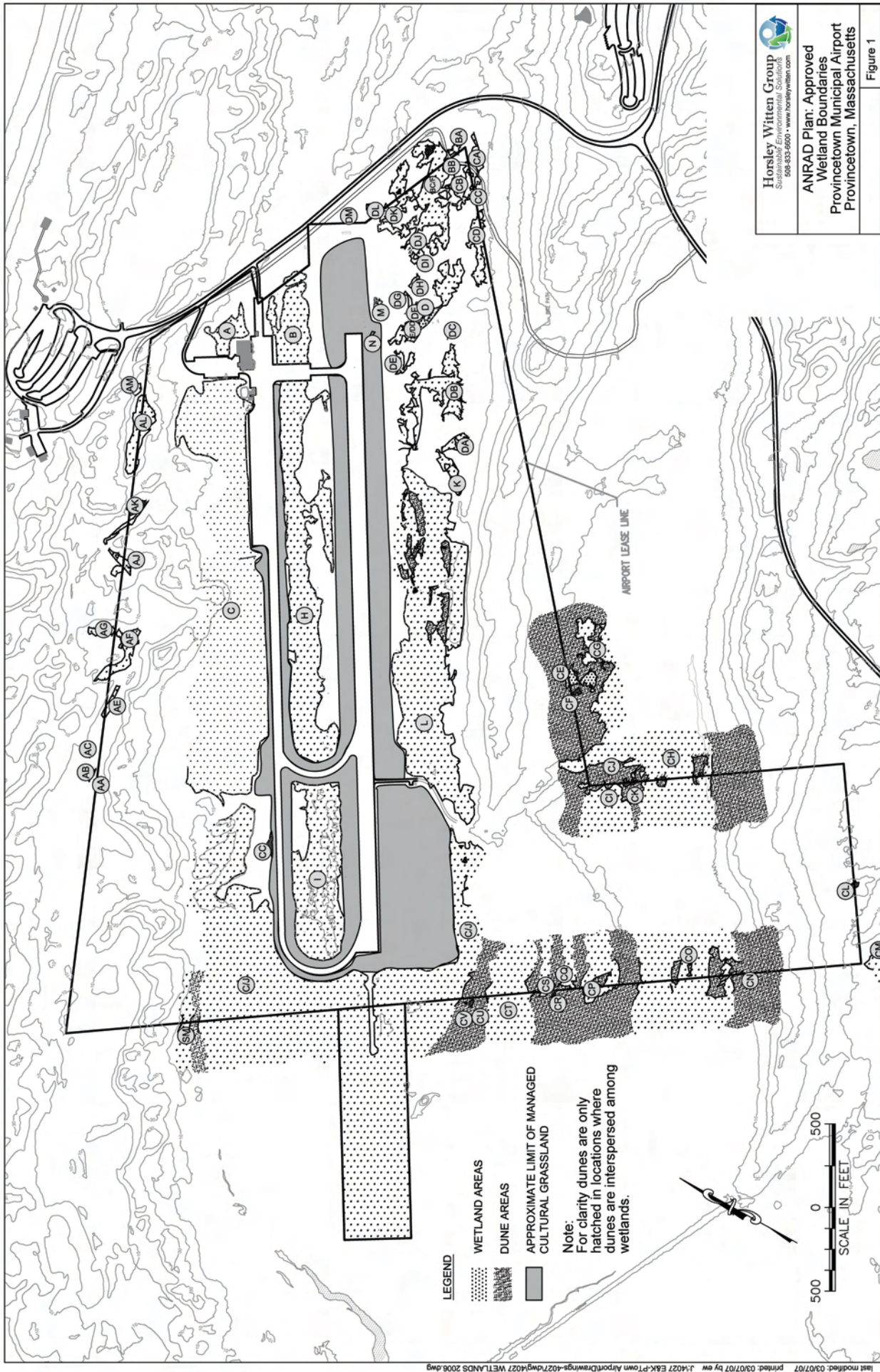
This report constitutes a draft Natural Resources Inventory (NRI) for submission to the CCC, and an initial summary for submittal with a MESA Project Review with NHESP. Data and information submitted with this report are used to support the DEIR.

Within the Airport lease area, HW conducted numerous habitat inventories, concentrated within areas likely to be affected by various alternatives to proposed projects for the CIP which were presented in the ENF. Site assessments were completed between the summer of 2004 and the fall of 2005, and again in the summer-fall seasons in 2006 to evaluate wildlife habitat characteristics and quantify the site's natural resources. As most of the CIP projects will be analyzed with respect to meeting performance standards under applicable local, State, Federal, and/or regional regulations (pertaining to wetland resource areas, wildlife habitat, and habitat of rare plant and animal species), this information is intended to serve as the baseline for evaluation of the CIP projects and development of the alternatives analyses in the EIR. Data here will also serve as the basis for developing appropriate mitigation where it is deemed necessary.

8. REFERENCES

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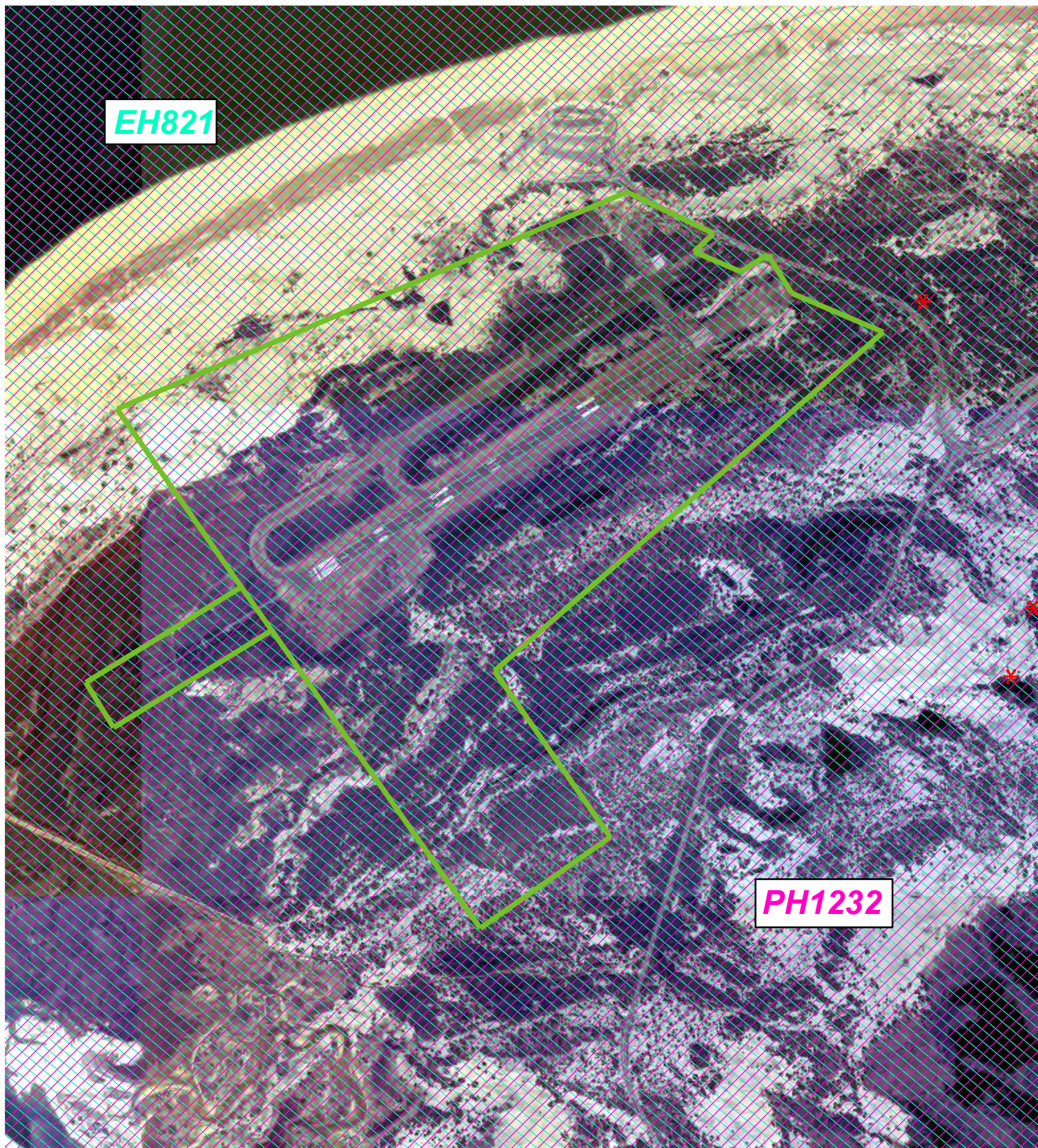
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ANRAD Plan: Approved
Wetland Boundaries
Provincetown Municipal Airport
Provincetown, Massachusetts

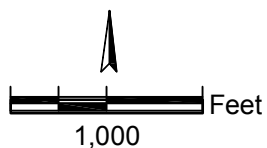
Figure 1



Legend

-  Lease Line
-  NHESP Estimated Habitats of Rare Wildlife
-  NHESP Priority Habitats of Rare Species
-  NHESP Certified Vernal Pools

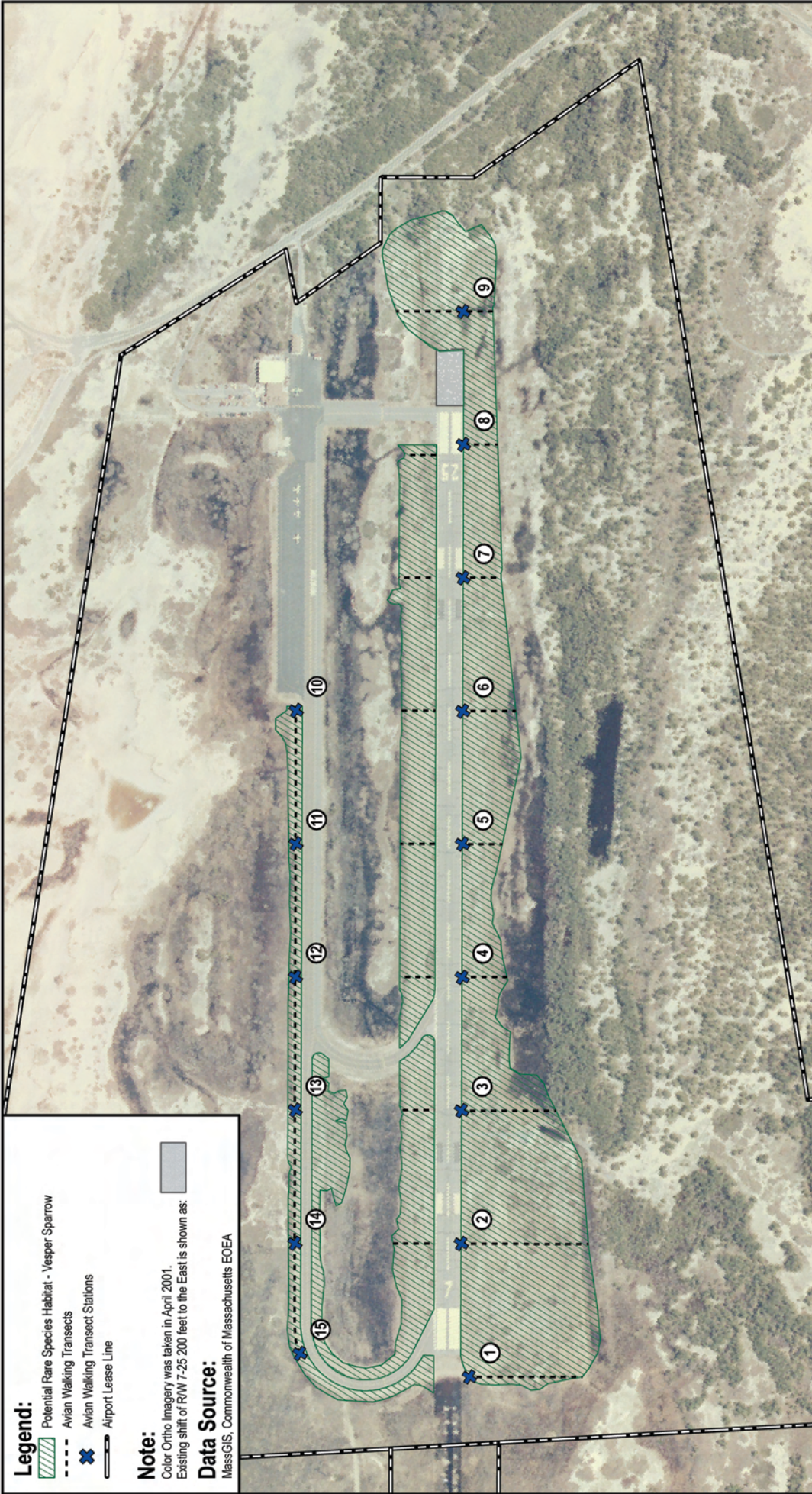
**Source: Certified Vernal Pools - MassGIS, January 2007
Estimated & Priority Habitats - MassGIS, December 2006*



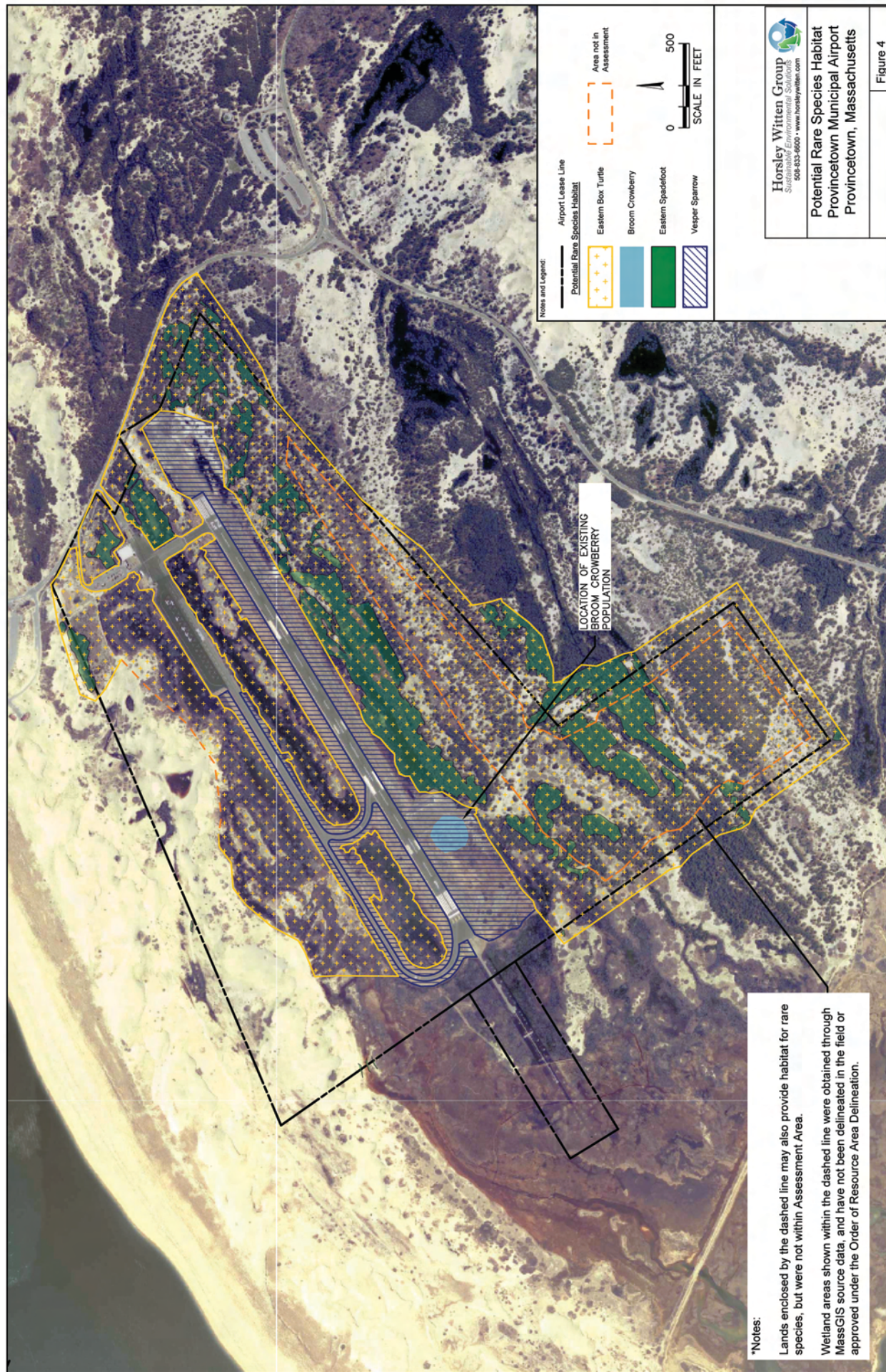
Horsley Witten Group
phone: 508-833-6600
www.horsleywitten.com

Natural Heritage & Endangered
Species Program (NHESP)
Provincetown Municipal Airport
Provincetown, MA

Figure 2



		Edwards Kelcey 343 Congress Street Boston, MA 02210 Tel: 617-242-9222
Walking Transects for Vesper Sparrow Surveys Provincetown Municipal Airport		Prepared For: Horsley Witten Group
Figure 3		



APPENDICES

Correspondence with NHESP
NHESP-Approved Rare Species Habitat Survey Protocols
Rare Plant Observation Form (*Corema conradii*)



MassWildlife

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

JUN 01 2004

HORSLEY & WITTEN, INC.

Wayne F. MacCallum, *Director*

May 26, 2004

Amy Ball
Horsley Witten Group
90 Route 6A
Sandwich, MA 02563

Re: Provincetown Municipal Airport
Provincetown, MA
NHESP File: 04-15716

Dear Ms. Ball

Thank you for contacting the Natural Heritage and Endangered Species Program ("NHESP") of the MA Division of Fisheries & Wildlife for information regarding state-protected rare species in the vicinity of the above referenced site. We have reviewed the site and would like to offer the following comments.

This project site is located entirely within Priority Habitat 1150 and near Estimated Habitat 17 as indicated in the 11th Edition of the Massachusetts Natural Heritage Atlas. Our database indicates that the following protected rare species have been found in the vicinity of the site:

<u>Scientific name</u>	<u>Common Name</u>	<u>Taxonomic Group</u>	<u>State Status</u>
<i>Scaphiopus holbrookii</i>	Eastern Spadefoot	Amphibian	Threatened
<i>Terrapene carolina</i>	Eastern Box Turtle	Reptile	Special Concern
<i>Poocetes gramineus</i>	Vesper Sparrow	Bird	Threatened
<i>Corema conradii</i>	Broom Crowberry	Plant	Special Concern

These species are protected under the Massachusetts Endangered Species Act (M.G.L. c. 131A) and its implementing regulations (321 CMR 10.00). State-listed wildlife are also protected under the state's Wetlands Protection Act (M.G.L. c. 131, s. 40) and its implementing regulations (310 CMR 10.37 and 10.59). Fact sheets for these species can be found on our website <http://www.state.ma.us/dfwele/dfw/nhesp/nhfact.htm>.

This evaluation is based on the most recent information available in the Natural Heritage database, which is constantly being expanded and updated through ongoing research and inventory. Should your site plans change, or new rare species information become available, this evaluation may be reconsidered.

MA Endangered Species Act (G.L. c. 131A)

Using the list of rare species provided above, we recommend that rare wildlife and plant surveys and assessments be conducted by qualified individuals within suitable habitats on and near the site according to

www.masswildlife.org

Division of Fisheries and Wildlife

Field Headquarters, One Rabbit Hill Road, Westborough, MA 01581 (508) 792-7270 Fax (508) 792-7275

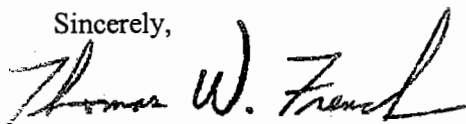
An Agency of the Department of Fisheries, Wildlife & Environmental Law Enforcement

scientifically accepted survey methodologies. Survey methodologies should be approved by NHESP prior to initializing rare species surveys. A Rare Animal/Plant Observation Form, available at our website www.nhesp.org, should be submitted for each species encountered. If during this site evaluation rare species are found on or near the site, then site plans and a project description should be sent to NHESP Environmental Review to determine whether a probable "take" under the MA Endangered Species Act would occur (321 CMR 10.04).

If NHESP determines that the proposed project would "take" a rare species, and the site is greater than two acres, and within a Priority Habitat site, an Environmental Notification Form should be submitted pursuant to the MA Environmental Policy Act regulations (301 CMR 11.03(2)(b)(2)). A Conservation & Management Permit (321 CMR 10.04 (3)(b)) may be required for work in rare species habitat.

If you have any questions regarding this review please call Ellen Shultzabarger, Environmental Review Assistant, at ext. 154.

Sincerely,

A handwritten signature in black ink, appearing to read "Thomas W. French". The signature is fluid and cursive, with the first name "Thomas" written in a larger, more prominent script than the last name "French".

Thomas W. French, Ph.D.
Assistant Director

cc:

Provincetown Conservation Commission

Horsley Witten Group

Sustainable Environmental Solutions



June 29, 2004

90 Route 6A • Sandwich, MA • 02563
Phone - 508-833-6600 • Fax - 508-833-3150 • www.horsleywitten.com

Mr. Jon Regosin, Endangered Species Project Analyst
MA Natural Heritage and Endangered Species Program
Route 135, North Drive
Westborough, MA 01581

**Re: Rare Species Habitat Survey Methodologies
Provincetown Municipal Airport Master Plan Update**

Dear Mr. Regosin:

The Horsley Witten Group (HW) will be performing fieldwork to update all wetland resource area boundary delineations and conduct appropriate wildlife habitat evaluations in conjunction with the Provincetown Municipal Airport Master Plan Update (AMPU). Proposed projects associated with the AMPU will likely occur within Priority Habitat of Rare Species (PH 1150).

We recently requested and obtained information from the Massachusetts Natural Heritage and Endangered Species Program (NHESP) regarding the potential state-listed species at the airport facility. These include:

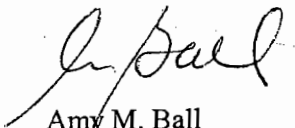
- Eastern Box Turtle (*Terrapene c. carolina*),
- Vesper Sparrow (*Pooecetes gramineus*),
- Broom Crowberry (*Corema conradii*), and
- Eastern Spadefoot (*Scaphiopus h. holbrookii*)

We are anxious to begin field surveys for these species and their habitats as soon as possible this growing season. Our intention is to coordinate closely with NHESP prior to conducting any wildlife habitat evaluations. At Patricia Huckery's suggestion, I am forwarding to you draft descriptions of our proposed field survey methodologies for review and comment.

As the AMPU will involve long-term projects, we anticipate extensive future coordination with the NHESP, as well as the Cape Cod Commission and the Provincetown Conservation Commission, prior to the design phase of any future project. Thank you in advance for your assistance with this matter. Should you have any questions, please do not hesitate to contact me at (508) 833-6600 ext. 123, or Mike Ball at ext. 105. You may reach either of us by email at aball@horsleywitten.com and mball@horsleywitten.com. We look forward to hearing from you.

Sincerely,

HORSLEY WITTEN GROUP


Amy M. Ball
Project Manager – Wetland Scientist

Enclosures (4)

cc: William Richardson, Edwards and Kelcey

J:\4027 E&K-PTown Airport\Correspondence\NHESP rare species\cover letter to NHESP - methodologies.doc
Sandwich Boston Providence

Smart Growth • Integrated Water Management • Wastewater Management • Stormwater Management • Civil & Environmental Engineering • Wetlands Assessment
Hydrogeology & Water Supply • Coastal Management • Site Assessment & Remediation • Land Use Planning • Graphic Services • Education & Outreach





DRAFT

Broom Crowberry (*Corema conradii*)

(Massachusetts Species of Special Concern)

Description

Broom Crowberry is a low-growing, densely branching evergreen shrub with tiny leaves. This species blooms between March and May with inconspicuous reddish purple flowers. Summer growth is characterized by a bright yellow-green coloration, distinguishing this species from similar heather-like plants.

Reported Habitat

This species inhabits open areas (low shrub or moor communities or sandy flats, as well as dry pitch pine/scrub oak barrens and relic sand dunes. Associated species include scrub oak (*Quercus ilicifolia*), pitch pine (*Pinus rigida*), golden heather (*Hudsonia ericoides*), and bearberry (*Arctostaphylos uva-ursi*). The NHESP- described natural communities with which this species is associated include Scrub Oak Shrubland and the Pitch Pine – Scrub Oak Community.

Broom Crowberry was previously recorded at the Provincetown Municipal Airport in the managed grassland habitat southwest of the glide slope antennae. The airport's current environmental consultant has documented additional records of this species within a developing sandplain grassland habitat. All documented occurrences of this species will be incorporated within any future project development.

Methodology for Identification and Mapping of Habitat

Horsley Witten Group will conduct meander surveys for Broom Crowberry, targeting areas of open grassland habitat and/or sandplain grasslands/heathlands with associated plant communities (described above) to search for occurrences of Broom Crowberry located in and immediately adjacent to the airport facility.

The location of any Broom Crowberry communities encountered within the site will be recorded by field measurements (when practical) and by using a GPS unit for potential future mapping. Documentation will include photographs and a description of the habitat occupied, including the associated plant community. A Rare Plant Observation Form will be completed for submission to the Massachusetts Natural Heritage and Endangered Species Program.

References

Swain, Patricia, C., and J.B. Kearsley. Classification of the Natural Communities of Massachusetts. Natural Heritage and Endangered Species Program - Massachusetts Division of Fish and Wildlife, Westborough, Massachusetts, DRAFT July 2000.

Massachusetts Natural Heritage and Endangered Species Program Fact Sheet – Broom Crowberry (1985).



DRAFT

Vesper Sparrow (*Pooecetes gramineus*)

(Massachusetts Threatened Species)

Description

The Vesper Sparrow is a small, short-tailed grayish-brown sparrow with a streaked breast. Unique characteristics include a notched, black tail with white outer tail feathers that are conspicuous during flight.

Reported Habitat

This species is reported to inhabit open areas (cultivated fields, grasslands, fallow fields, and pastures) as well as sandplain heathlands with clump-forming grasses, bare patches, and scattered shrubs or saplings growing in typically dry and well drained soils. This type of habitat serves as nesting habitat, cover, foraging sites, and singing perches for the Vesper Sparrow. The NHESP- described natural community with which this species is associated is Cultural Grassland (formerly described as Sandplain Grassland – Cultural Community), which is often a maintained, open community dominated by grasses, normally maintained by mowing.

Methodology for Identification of Habitat

Meander surveys for the Vesper Sparrow and its habitat will concentrate on managed grassland areas adjacent to airport runways and taxiways, as well as target areas of open grassland habitat within and immediately adjacent to the airport facility.

As this species is known to frequently sing during the early evening hours, habitat assessments will be timed appropriately. Field investigators may solicit territorial singing by playing recorded vocalizations of this species and may attempt to record species response to these recordings.

Any individual Vesper Sparrow encountered will be documented as to location within the site, its activity (nesting, foraging, singing, etc.), and a description of the habitat occupied. Photographs will be taken as obtainable. A Rare Animal Observation Form will be completed for submission to the Massachusetts Natural Heritage and Endangered Species Program. Incidental bird species observed within these areas will also be recorded.

References

Swain, Patricia, C., and J.B. Kearsley. Classification of the Natural Communities of Massachusetts. Natural Heritage and Endangered Species Program - Massachusetts Division of Fish and Wildlife, Westborough, Massachusetts, DRAFT July 2000.

Connecticut Department of Environmental Protection, Wildlife In Connecticut Endangered And Threatened Species Series, Vesper Sparrow (*Pooecetes gramineus*) website.
<http://dep.state.ct.us/burnatr/wildlife/factshts/vesp.htm>

New Jersey Department of Environmental Protection, Endangered Species Program website
www.nj.gov/dep/fgw/ensp/pdf/end-thrtened/vespersparrow.pdf

NatureServ Explorer Fact Sheet on Vesper Sparrow

Ehrlich, P. R., D. S. Dobkin, and D. Wheye. 1988. The birder's handbook: a field guide to the natural history of North American birds. New York: A Fireside Book published by Simon & Schuster, Inc., 785 pp.

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DRAFT

Eastern Spadefoot (*Scaphiopus h. holbrookii*)

(Massachusetts Threatened Species)

Description

The Eastern Spadefoot is a medium-sized, smooth-skinned toad with small, scattered warts. Distinguishing characteristics are a bright golden eye with a vertical pupil and a dorsal pattern of two golden stripes (Klemens, 1993). A spade-like, black horny projection is located on the inner border of the foot. The call is a short, explosive, low-pitched "wank" repeated every two seconds (Martof, 1980).

Reported Habitat

Available literature describing this species reports that spadefoots require dry sandy or loose soils in areas of sparse shrub growth of open forest areas (DeGraaf and Rudis, 1983). In addition, this species breeds only in shallow, temporary pools formed after very heavy, warm rains and may be found in large numbers when rainfall is extensive (Martof, 1980). The NHESP-described natural communities with which this species is associated and that may exist at the subject site include Coastal Interdunal Marsh/Swale, Wet Meadow, and Shrub Swamp.

Methodology for Identification and Mapping of Habitat

Fieldwork to identify suitable habitats for the Eastern Spadefoot will involve location of all isolated depressions within the defined limits of the survey area that may temporarily hold water after significant rainfalls. Once these isolated areas are identified, these areas will be observed during and within five days of following a significant rainfall event in order to observe breeding activity (i.e. mating pairs or vocalizations) or evidence of this activity (i.e., egg masses). At least one evening observation period will be performed in the period between the mid-July and mid-September, when the breeding season is reported to end. We intend to acquire a recording of this species vocalization and use this recording during the evening observation period. The locations of all potential and known breeding habitats will be mapped and any individuals observed will be photographed and the location(s) in which they were observed will be located by GPS. In addition, a Rare Animal Observation Form will be completed for submission to the NHESP.

References

Massachusetts Natural Heritage and Endangered Species Program Fact Sheet – Eastern Spadefoot

Swain, Patricia, C., and J.B. Kearsley. Classification of the Natural Communities of Massachusetts. Natural Heritage and Endangered Species Program - Massachusetts Division of Fish and Wildlife, Westborough, Massachusetts, DRAFT July 2000.

DeGraaf, Richard M. and Rudis, Deborah D. Amphibians and Reptiles of New England, Amherst, Massachusetts: The University of Massachusetts, 1983.

Klemens, Michael W., Amphibians and Reptiles of Connecticut and Adjacent Regions. State Geological and Natural History Survey of Connecticut, Bulletin 12, Connecticut DEP, 1993.

Martof, Bernard S., W. M. Palmer, J. R. Bailey, J. R. Harrison. Amphibians and Reptiles of the Carolinas and Virginia. The University of North Carolina Press, Chapel Hill, 1980.



DRAFT

Eastern Box Turtle (*Terrapene c. carolina*)

(Massachusetts Species of Special Concern)

Description

The Eastern box turtle is a small to medium-sized (4.5 to 8-inch) terrestrial turtle, recognized by its domed, globular carapace with a pattern of orange or yellow markings on a dark brown or black background. Adults have varying amounts of yellow, orange, and pink pigment on the head, neck, throat, and forelimbs (Klemens, 1993).

Reported Habitat

Available literature describing this species reports that this species uses a relatively wide range of terrestrial habitat types, including woodlands, field edges and thickets (DeGraaf and Rudis, 1983). These habitats are generally characterized by sandy, well-drained soils and, despite this species association with terrestrial habitats, they have been found in various wetland habitat types including wet meadows and lowland swamps (Klemens, 1993). The Massachusetts NHESP-described natural communities with which this species is associated include Coastal Forest/Woodland and Pitch Pine-Oak Forest.

Methodology for Identification and Mapping of Habitat

The Horsley Witten Group (HW) will perform meander surveys for the Eastern Box Turtle within each habitat type at the site. The primary habitat types at this site within which searches will predominantly be done will be any coastal forest/woodland or pitch pine-oak forest habitat, and the margins (i.e., "edge areas") between these wooded habitats and any open field or wet meadow habitats encountered. As this species is strictly diurnal, field surveys specifically performed to observe this species will be done in the early morning and/or during the day immediately following thunderstorms when the species is reported to be active (Klemens, 1993). HW will document any box turtle encountered by recording its observed location with a GPS unit (for habitat mapping purposes), its apparent activity (nesting, aestivation, direction of travel, etc.), a description of the habitat in which the individual animal was observed, and any characteristic markings, including evidence of injury to the animal. Photographs of each individual will be collected. A Rare Animal Observation Form will be completed for submission to the Massachusetts Natural Heritage and Endangered Species Program. Any box turtle remains will be documented as well.

References

Massachusetts Natural Heritage and Endangered Species Program Fact Sheet – Eastern Box Turtle

DeGraaf, Richard M. and Rudis, Deborah D. Amphibians and Reptiles of New England, Amherst, Massachusetts: The University of Massachusetts, 1983.

Klemens, Michael W., Amphibians and Reptiles of Connecticut and Adjacent Regions. State Geological and Natural History Survey of Connecticut, Bulletin 12, Connecticut DEP, 1993.

Swain, Patricia, C., and J.B. Kearsley. Classification of the Natural Communities of Massachusetts. Natural Heritage and Endangered Species Program - Massachusetts Division of Fish and Wildlife, Westborough, Massachusetts, DRAFT July 2000.

Horsley Witten Group

Sustainable Environmental Solutions

90 Route 6A • Sandwich, MA • 02563
Tel: 508-833-6600 • Fax: 508-833-3150 • www.horsleywitten.com



Memorandum

TO: Mr. William Richardson, Edwards and Kelcey
FROM: Amy M. Ball
DATE: July 30, 2004
RE: Provincetown Rare Species Habitat Evaluations

Horsley Witten Group has received verbal feedback from Dr. Jon Regosin at the Massachusetts Natural Heritage and Endangered Species Program (NHESP) regarding our proposed field protocols for assessing the potential habitat for the four state-listed species identified at the Provincetown Airport site. Several individuals at NHESP reviewed our proposed protocols and provided us with input. I have incorporated these comments into our revised field protocols (see attached) with a brief summary for each species provided below.

NHESP has requested that we modify our protocols to include the following specifications:

Vesper Sparrow

- Surveys should be conducted between the hours of 5:30-10:00 a.m. and 6:00 to 8:00 p.m. during three (3) evenly spaced surveys between May 1st and July 31st;
- Field conditions should not be windy or rainy;
- Walking transects should be established approximately 150 meters apart within all grassland areas and at the edges of paved areas;
- Surveys should include both listening and visual surveys (broadcasting during surveys, as we had proposed, is not essential, but may be useful);
- Locations of all species observed should be plotted;
- All adults observed carrying food should be indicated; and
- Observers should also note any observations of two other bird species which utilize the same habitat types: the Grasshopper Sparrow (*Ammodramus savannarum*) and the Northern Harrier (*Circus cyaneus*).

Broom Crowberry

- Survey areas should be expanded to include Pitch Pine forested areas as well as sandplain grassland areas;
- Survey protocols should refer to the *NHESP Plant Survey Protocols*, noting precisely when and how the surveys were conducted;
- Reporting should include an overall description of the plant community in which an rare species was observed; and
- Reporting should include a complete list of vascular plants observed during the rare plant survey, including any other rare species encountered.

Spadefoot Toad

- Initial surveys should include a general assessment of isolated wet areas;
- Surveys for actual individuals should be conducted from April through September, when this species is most active; and
- Surveys should be conducted after a storm event; approximately once every three (3) weeks with a focus on the tadpole stage (this species has a three week aquatic larval stage).

Eastern Box Turtle

- Walking transects should be set up, focusing efforts on prime habitat areas:
 - (a) Edges of ecotones
 - (b) Mesic areas
 - (c) Wetland edges;
- Surveys should be conducted after a storm event with an ideal focus on spring and late fall; and
- Shells of all (live) individuals encountered should be carefully notched to assist in general population study efforts.

Essentially, the NHESP has granted us permission to begin this fieldwork, as long as we incorporate their comments and specifications into our protocols. I will be seeking written confirmation from the NHESP to that effect. Note that the NHESP comments regarding the surveys for the Vesper Sparrow, and to a lesser degree for the Eastern Box Turtle and the Spadefoot Toad, will necessitate our continuing rare species survey work into next spring. At this time I am not certain how this would affect the project timeline that was presented to the FAA and MAC. At the very least, we can still document the potential habitat for these species, as our intent is to identify the habitat for the rare animal species, rather than documenting actual individuals, for project planning purposes.

In the interim, we are planning to begin the rare species fieldwork the first to second week in August. We will coordinate with the Airport Manager, Butch Lisenby, regarding security identification for all field personnel involved.

Mr. William Richardson
July 30, 2004
Page 3 of 3

We should discuss our approach to contacting the Cape Cod Commission (CCC) to give them some notice on our fieldwork related to wildlife habitat. I would recommend keeping contact with the CCC informal at this point, particularly since there is no definitive proposal for the upcoming projects. Given the proposed timing for some of our rare species habitat surveys, we would also be able to collect information toward our Natural Resources Inventory (NRI) that is required by the CCC (i.e., early morning and early evening field surveys). However, we would anticipate that the bulk of the NRI fieldwork would occur between September and November, as per their Technical Bulletin guidelines..

cc: Joseph Longo
D. Michael Ball

NHESP-Approved Rare Species Habitat Assessment Protocols

Vesper Sparrow (*Pooecetes gramineus*)

(Massachusetts Threatened Species)

Description

The Vesper Sparrow is a small, short-tailed grayish-brown sparrow with a streaked breast. Unique characteristics include a notched, black tail with white outer tail feathers that are conspicuous during flight.

Reported Habitat

This species is reported to inhabit open areas (cultivated fields, grasslands, fallow fields, and pastures) as well as sandplain heathlands with clump-forming grasses, bare patches, and scattered shrubs or saplings growing in typically dry and well drained soils. This type of habitat serves as nesting habitat, cover, foraging sites, and singing perches for the Vesper Sparrow. The NHESP- described natural community with which this species is associated is Cultural Grassland (formerly described as Sandplain Grassland – Cultural Community), which is often a maintained, open community dominated by grasses, normally maintained by mowing.

Methodology for Identification of Habitat

Three (3) evenly spaced surveys will be conducted between May 1st and July 31st, between the hours of 5:30-10:00 a.m. and 6:00 to 8:00 p.m., during non-windy, non-rainy conditions. Surveys for the Vesper Sparrow and its habitat will concentrate on managed grassland areas adjacent to airport runways and taxiways, as well as target areas of open grassland habitat and at the edges of paved areas within and immediately adjacent to the airport facility. Walking transects will be established approximately 150 meters apart.

Field surveys will include both listening and visual surveys. As this species is known to frequently sing during the early evening hours, habitat assessments will be timed appropriately. Field investigators may solicit territorial singing by playing recorded vocalizations of this species, and may attempt to record species response to these recordings.

Any individual Vesper Sparrow encountered will be documented and its location plotted, its activity (nesting, foraging, singing, etc.), including observations of adult individuals carrying food, and a description of the habitat occupied. Photographs will be taken as obtainable. A Rare Animal Observation Form will be completed for submission to the Massachusetts Natural Heritage and Endangered Species Program. Observers will also document any observations of two other bird species, which utilize the same habitat types: the Grasshopper Sparrow (*Ammodramus savannarum*) and the Northern Harrier (*Circus cyaneus*). Incidental bird species observed within these areas will also be recorded.

References

Swain, Patricia, C., and J.B. Kearsley. Classification of the Natural Communities of Massachusetts. Natural Heritage and Endangered Species Program - Massachusetts Division of Fish and Wildlife, Westborough, Massachusetts, DRAFT July 2000.

Connecticut Department of Environmental Protection, Wildlife In Connecticut Endangered And Threatened Species Series, Vesper Sparrow (*Pooecetes gramineus*) website.
<http://dep.state.ct.us/burnatr/wildlife/factshts/vesp.htm>

New Jersey Department of Environmental Protection, Endangered Species Program website
www.nj.gov/dep/fgw/ensp/pdf/end-thrtened/vespersparrow.pdf

NatureServ Explorer Fact Sheet on Vesper Sparrow

Ehrlich, P. R., D. S. Dobkin, and D. Wheye. 1988. The birder's handbook: a field guide to the natural history of North American birds. New York: A Fireside Book published by Simon & Schuster, Inc., 785 pp.

J:\4027 E&K-PTown Airport\Correspondence\NHESP rare species\rare spp habitat protocols\P gramineus (revised).doc

Eastern Box Turtle (*Terrapene c. carolina*)

(Massachusetts Species of Special Concern)

Description

The Eastern box turtle is a small to medium-sized (4.5 to 8-inch) terrestrial turtle, recognized by its domed, globular carapace with a pattern of orange or yellow markings on a dark brown or black background. Adults have varying amounts of yellow, orange, and pink pigment on the head, neck, throat, and forelimbs (Klemens, 1993).

Reported Habitat

Available literature describing this species reports that this species uses a relatively wide range of terrestrial habitat types, including woodlands, field edges and thickets (DeGraaf and Rudis, 1983). These habitats are generally characterized by sandy, well-drained soils and, despite this species association with terrestrial habitats, they have been found in various wetland habitat types including wet meadows and lowland swamps (Klemens, 1993). The Massachusetts NHESP-described natural communities with which this species is associated include Coastal Forest/Woodland and Pitch Pine-Oak Forest.

Methodology for Identification and Mapping of Habitat

The Horsley Witten Group (HW) will perform meander surveys along walking transects for the Eastern Box Turtle within each habitat type at the site. The primary habitat types at this site within which searches will predominantly be done will be any coastal forest/woodland or pitch pine-oak forest habitat, along edges of ecotones (i.e., "edge areas") between these wooded habitats and any open field or wet meadow habitats, and into the wetland edges.

As this species is strictly diurnal, field surveys specifically performed to observe this species will be done in the early morning and/or during the day immediately following storm events when the species is reported to be most active (Klemens, 1993). Surveys will occur primarily in the spring and fall.

HW will document any box turtle encountered by recording its observed location with a GPS unit (for habitat mapping purposes), its apparent activity (nesting, aestivation, direction of travel, etc.), a description of the habitat in which the individual animal was observed, and any characteristic markings, including evidence of injury to the animal. Photographs of each individual will be collected and shells will be carefully notched (for general population study efforts). A Rare Animal Observation Form will be completed for submission to the Massachusetts Natural Heritage and Endangered Species Program. Any box turtle remains will be documented as well.

References

- Massachusetts Natural Heritage and Endangered Species Program Fact Sheet – Eastern Box Turtle
- DeGraaf, Richard M. and Rudis, Deborah D. Amphibians and Reptiles of New England, Amherst, Massachusetts: The University of Massachusetts, 1983.
- Klemens, Michael W., Amphibians and Reptiles of Connecticut and Adjacent Regions. State Geological and Natural History Survey of Connecticut, Bulletin 12, Connecticut DEP, 1993.
- Swain, Patricia, C., and J.B. Kearsley. Classification of the Natural Communities of Massachusetts. Natural Heritage and Endangered Species Program - Massachusetts Division of Fish and Wildlife, Westborough, Massachusetts, DRAFT July 2000.

Broom Crowberry (*Corema conradii*)

(Massachusetts Species of Special Concern)

Description

Broom Crowberry is a low-growing, densely branching evergreen shrub with tiny leaves. This species blooms between March and May with inconspicuous reddish purple flowers. Summer growth is characterized by a bright yellow-green coloration, distinguishing this species from similar heather-like plants.

Reported Habitat

This species inhabits open areas (low shrub or moor communities or sandy flats, as well as dry pitch pine/scrub oak barrens and relic sand dunes. Associated species include scrub oak (*Quercus ilicifolia*), pitch pine (*Pinus rigida*), golden heather (*Hudsonia ericoides*), and bearberry (*Arctostaphylos uva-ursi*). The NHESP- described natural communities with which this species is associated include Scrub Oak Shrubland and the Pitch Pine – Scrub Oak Community.

Broom Crowberry was previously recorded at the Provincetown Municipal Airport in the managed grassland habitat southwest of the glide slope antennae. The airport's current environmental consultant has documented additional records of this species within a developing sandplain grassland habitat. All documented occurrences of this species will be incorporated within any future project development.

Methodology for Identification and Mapping of Habitat

Horsley Witten Group (HW) will conduct meander surveys for Broom Crowberry, targeting areas of open grassland habitat and/or sandplain grasslands/heathlands, as well as pitch-pine forested areas with associated plant communities (described above) to search for occurrences of Broom Crowberry located in and immediately adjacent to the airport facility.

Survey protocols will follow the guidelines outlined in the *NHESP Plant Survey Protocols*, noting precisely when and how the surveys were conducted, and following reporting guidelines for all occurrences of this species.

The location of any Broom Crowberry communities encountered within the site will be recorded by field measurements (when practical) and by using a GPS unit for potential future mapping. Documentation will include photographs and a description of the habitat occupied, including the associated plant community. A Rare Plant Observation Form will be completed for submission to the Massachusetts Natural Heritage and Endangered Species Program.

References

Swain, Patricia, C., and J.B. Kearsley. Classification of the Natural Communities of Massachusetts. Natural Heritage and Endangered Species Program - Massachusetts Division of Fish and Wildlife, Westborough, Massachusetts, DRAFT July 2000.

Massachusetts Natural Heritage and Endangered Species Program Fact Sheet – Broom Crowberry (1985).

Eastern Spadefoot (*Scaphiopus h. holbrookii*)

(Massachusetts Threatened Species)

Description

The Eastern Spadefoot is a medium-sized, smooth-skinned toad with small, scattered warts. Distinguishing characteristics are a bright golden eye with a vertical pupil and a dorsal pattern of two golden stripes (Klemens, 1993). A spade-like, black horny projection is located on the inner border of the foot. The call is a short, explosive, low-pitched "wank" repeated every two seconds (Martof, 1980).

Reported Habitat

Available literature describing this species reports that spadefoots require dry sandy or loose soils in areas of sparse shrub growth of open forest areas (DeGraaf and Rudis, 1983). In addition, this species breeds only in shallow, temporary pools formed after very heavy, warm rains and may be found in large numbers when rainfall is extensive (Martof, 1980). The NHESP-described natural communities with which this species is associated and that may exist at the subject site include Coastal Interdunal Marsh/Swale, Wet Meadow, and Shrub Swamp.

Methodology for Identification and Mapping of Habitat

Fieldwork to identify suitable habitats for the Eastern Spadefoot will involve location of all isolated depressions within the defined limits of the survey area that may temporarily hold water after significant rainfalls. Once these isolated areas are identified, these areas will be observed approximately once every three (3) weeks following significant rainfall events from April through September in order to observe evidence of breeding activity (i.e. mating pairs or vocalizations) with an emphasis on the tadpole larval stage. At least one evening observation period will be performed in the period between the mid-July and mid-September, when the breeding season is reported to end. We intend to acquire a recording of this species vocalization and use this recording during the evening observation period. The locations of all potential and known breeding habitats will be mapped and any individuals observed will be photographed and the location(s) in which they were observed will be located by GPS. In addition, a Rare Animal Observation Form will be completed for submission to the NHESP.

References

Massachusetts Natural Heritage and Endangered Species Program Fact Sheet – Eastern Spadefoot

Swain, Patricia, C., and J.B. Kearsley. Classification of the Natural Communities of Massachusetts. Natural Heritage and Endangered Species Program - Massachusetts Division of Fish and Wildlife, Westborough, Massachusetts, DRAFT July 2000.

DeGraaf, Richard M. and Rudis, Deborah D. Amphibians and Reptiles of New England, Amherst, Massachusetts: The University of Massachusetts, 1983.

Klemens, Michael W., Amphibians and Reptiles of Connecticut and Adjacent Regions. State Geological and Natural History Survey of Connecticut, Bulletin 12, Connecticut DEP, 1993.

Martof, Bernard S., W. M. Palmer, J. R. Bailey, J. R. Harrison. Amphibians and Reptiles of the Carolinas and Virginia. The University of North Carolina Press, Chapel Hill, 1980.



Natural Heritage & Endangered Species Program

Massachusetts Division of Fisheries & Wildlife

Please submit field forms, a copy of a USGS map, and all supporting documentation to the State Botanist at:

Natural Heritage and Endangered Species Program
Massachusetts Division of Fisheries and Wildlife
Route 135, Westborough MA 01581
(508) 792-7270 Ext. 200

RARE PLANT OBSERVATION FORM

SPECIES SCIENTIFIC NAME: *Corema conradii*

Element Occurrence No., if known:

Observation Date: 8-24-04 (initial)

Today's Date: 01-17-06

Population Found? ☒ Yes ☐ No

Observed By: Michael Ball of the Horsley Witten Group, Inc.

Other Observers: Jennifer McKay, Amy Ball

Observer's Address: 90 Route 6A Sandwich, Massachusetts 02563

Observer's Email Address: mball@horsleywitten.com

Telephone: 508-833-6600 ext. 105

Photograph Taken? ☒ Yes ☐ No (if yes, please attach, and label back with your name, date taken, and the location)

Specimen Collected? ☐ Yes ☒ No Collection #

Repository:

Site Name (informal): Provincetown Airport

USGS Topo Name: Provincetown

County: Barnstable

Town: Provincetown

Directions to the rare plant population (if found), or search area (if not found). Mark the location on a copy of the USGS topo map.

Proceed to the glide slope antenna structure near the southwest end of the airport runway. At building face west. The slightly elevated, open grassland community in front of you supports the population of this rare plant. (On date of observation each mound of crowberry observed was marked with a numbered pink pin flag. However, we expect that only the metal pins remains and not the flagging material.)

GPS Coordinates: System used (check one): ☐ UTM ☐ Lat-Long ☐ Mass. State Plane Datum:

At, or near, the center of the population:

or:

Least-rectangle (i.e., the coordinates delimiting the north, east, south, and west corners of the population):

North

East

South

West

Has the full extent of the population been determined? (check one) ☒ yes; ☐ no; ☐ uncertain whether full extent is known

Identification Problems? ☐ Yes ☒ No **Explain:**

Diagnostic Characters used: much branched bushy shrub to 5dm tall, 2m wide; lvs linear, 3-6 mm **Reference used:** Gleason & Cronquist

Do other members of the genus or look-alike plants occur at this site? ☐ Yes ☒ No

Explain: Hudsonia also present; however, the two species are fairly distinctive

Population Data

Approximate Area Occupied by the Population (check appropriate unit): apx. 1,850 ☒ sq. m ☐ ha ☐ sq. ft ☐ sq. yds ☐ acres

Population Size:

Total number of "genets" (i.e., genetically distinct, or clearly separate individuals): 52 (☒ Precise count or ☐ estimate?)
and/or

Total number of "ramets" (e.g., stems or shoots arising from clones): (☐ Precise count or ☐ estimate?)

Population Structure (check all that apply):

Age Classes Present

- ☐ Seedlings
- ☐ Immature plants
- ☒ Mature plants
- ☐ Plants of unknown age

Reproductive Condition of the Population on this Date

- | | |
|--|--|
| <input checked="" type="checkbox"/> Vegetative (in leaf) | <input type="checkbox"/> Mature fruit |
| <input type="checkbox"/> In bud | <input type="checkbox"/> Seed dispersing |
| <input type="checkbox"/> In flower | <input type="checkbox"/> Senescent |
| <input type="checkbox"/> Immature fruit | <input type="checkbox"/> Dormant |

How would you characterize the vigor of this population? ☒ Excellent

☐ Good

☐ Fair

☐ Poor

Evidence of Disease, Predation, or Injury? No

Pollinators: unknown

Environmental Setting

Describe the plant community and list the associated species:

Population is located adjacent to an airport runway in a Cultural Grassland community that is maintained by regular mowing.

Other observed plant species comprising this habitat included *Hudsonia tomentosa*, *Schizachyrium scoparius*, *Danthonia spicata*, *Holcus lanatus*.

List any exotic plant species present and discuss their possible impacts:

Exotics including *Holcus lanatus*, *Festuca ovina*, and *Poa pratensis* were observed as part of the plant community, but not in significant amounts.

Describe evidence of natural or human-caused disturbance (including changes in ecological processes) and effects on population:

Maintenance by infrequent mowing may benefit the species by maintaining conditions favorable for its growth.

Surrounding Land Use: municipal airport

Elevation: <10 ☒ ft. or ☐ m?

Soil Type(s): Hooksan - Beaches - Dune Land

Surficial Geology: Dune / Interdunal Swale

Bedrock Geology: unknown

Check Appropriate Habitat Descriptors:

<u>Landform/Topography</u>	<u>Aspect</u> °	<u>Slope</u> %	<u>Light</u>	<u>Soil Moisture Regime</u>	<u>Important Ecological Processes</u>
<input type="checkbox"/> summit/crest	<input type="checkbox"/> N <input type="checkbox"/> NE	<input checked="" type="checkbox"/> flat	<input checked="" type="checkbox"/> open	<input type="checkbox"/> xeric	<input type="checkbox"/> seasonal or regular flooding
<input type="checkbox"/> upper slope	<input type="checkbox"/> E <input type="checkbox"/> SE	<input type="checkbox"/> gentle	<input type="checkbox"/> filtered	<input checked="" type="checkbox"/> dry	<input type="checkbox"/> groundwater seepage
<input type="checkbox"/> mid slope	<input type="checkbox"/> S <input type="checkbox"/> SW	<input type="checkbox"/> average	<input type="checkbox"/> shade	<input type="checkbox"/> mesic	<input type="checkbox"/> colluvial processes
<input type="checkbox"/> lower slope	<input type="checkbox"/> W <input type="checkbox"/> NW	<input type="checkbox"/> rather steep		<input type="checkbox"/> wet	<input type="checkbox"/> alluvial processes
<input type="checkbox"/> rolling terrain/plain	<input checked="" type="checkbox"/> flat/variable	<input type="checkbox"/> steep		<input type="checkbox"/> inundated	<input checked="" type="checkbox"/> wind/salt spray
<input checked="" type="checkbox"/> flood plain/terrace		<input type="checkbox"/> very steep			<input type="checkbox"/> erosion
<input type="checkbox"/> wetland		<input type="checkbox"/> abrupt			<input type="checkbox"/> fire
<input type="checkbox"/> shore/pond/lake/stream					<input type="checkbox"/> none apparent

Describe Microhabitat Conditions:

Conservation Information

Land Owned/Managed by:

Name(s)

Address

Telephone

CC National Seashore / NPS

Marconi Site Road, South Wellfleet

(508)-349-3785

P-Town Municipal Airport

Race Point Road, Provincetown

(508)-487-0241

Managed Area Name: Provincetown Municipal Airport

Contact Person: Arthur "Butch" Lisenby (Mgr.)

Owner Comments:

Are any *past* or *existing* negative impacts on the Element Occurrence evident? What additional factors might *potentially* threaten the population?

None

What are your recommendations for future inventory, monitoring, research, and/or management?

Annual count of individual genets. Continue existing maintenance practice of mowing area.

What are your protection recommendations? Continue existing maintenance of area to maintain plant community structure.

Additional Comments:

Signature: _____

Justin M. Bell

Date: _____

1/17/06

For office use only: *Relative Size:* _____ *Relative Condition:* _____ *Relative Landscape Context:* _____ *MA EO Rank:* _____

MA EO Rank Comments: _____

Global EO Rank: _____ *Global EO Rank Comments:* _____

Sketch:

Use this space to draw or diagram useful information about the rare plant occurrence, such as its location relative to landmarks and habitat features. Consider depicting, for instance, a vertical cross section of a population's position on a ledge or slope, or how a population is distributed in clumped patches in the habitat relative to boulders, stone walls, brooks, trees, etc.

SEE ATTACHED FIGURES.

Please:

**Don't forget to attach a copy of a USGS topo map indicating the location of the rare plants or the search area!
Mark the location of the rare plants as precisely as possible, and label with the map source, date and species name.**

Appendix 2.2 Wetland Descriptions and Observations of Habitat Suitability Relative to
the Eastern Spadefoot, Horsley Witten Group, June 2008, revised July
2009

Horsley Witten Group

Sustainable Environmental Solutions

90 Route 6A • Sandwich, MA • 02563

Phone - 508-833-6600 • Fax - 508-833-3150 • www.horsleywitten.com



Wetland Descriptions and Observations of Habitat Suitability

Relative to the Eastern Spadefoot (*Scaphiopus h. holbrookii*)

Provincetown Municipal Airport
Provincetown, Massachusetts

June 2008

Revised July 2009

Prepared for:

Jacobs Engineering Group
343 Congress Street, Suite 200
Boston, Massachusetts
02210



**Wetland Descriptions and Observations of Habitat Suitability
Relative to the Eastern Spadefoot (*Scaphiopus h. holbrookii*)**

**Provincetown Municipal Airport
Provincetown, Massachusetts**

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**Wetland Descriptions and Observations of Habitat Suitability
Relative to the Eastern Spadefoot (*Scaphiopus h. holbrookii*)
At Provincetown Municipal Airport**

Introduction and Background

Following the issuance of the Massachusetts Environmental Policy Act (MEPA) Certificate for the Notice of Project Change/Draft Environmental Impact Report/Environmental Assessment (NPC/DEIR/EA), Airport representatives met with staff from the Massachusetts Natural Heritage and Endangered Species Program (NHESP) and the National Park Service (NPS) to discuss their specific comments regarding potential impacts to rare species habitat. Since many of the Capital Improvement Program (CIP) projects will impact isolated wetlands, NHESP and NPS will require additional input specifically regarding the Eastern Spadefoot (*Scaphiopus h. holbrookii*). These agencies indicated that to evaluate the impact on Eastern Spadefoot habitat for MESA review that there was a need for the Airport to conduct additional wildlife surveys to assess the prime and potential breeding habitat for this species within the potential project impact areas. This information has also been used to refine project siting in relation to Eastern Spadefoot habitat to minimize impacts and to avoid a Take.

The following habitat suitability report has been prepared by the Horsley Witten Group, Inc. (HW) to support the Provincetown Municipal Airport environmental review and permitting process. At the recommendation of NHESP, HW field biologists communicated frequently with Brad C. Timm, a Ph.D. student at the University of Massachusetts, Amherst, who is currently conducting studies on various aspects of the Eastern Spadefoot in the Cape Cod National Seashore (CCNS) for his Ph.D. thesis.

The Airport is situated within the bounds of the CCNS which is federally owned land administered by the NPS. The Airport contains diverse natural resources including freshwater wetlands, open grasslands, forested areas and a system of coastal dunes. Portions of these habitats are managed as part of routine airport operations. The Airport is also located within *Priority Habitat of Rare Species* and *Estimated Habitat of Rare Wildlife and Certified Vernal Pools* as mapped by NHESP as shown in Figure 1. The Airport is currently mapped for four State-listed rare species: Eastern Box Turtle, Eastern Spadefoot, Vesper Sparrow and Broom Crowberry. To support the MEPA and NEPA process, rare wildlife and plant surveys were previously conducted to assess the existing habitats for use in future site planning to address the Massachusetts *Endangered Species Act* (M.G.L. Ch. 131A) (MESA). These studies were completed in 2004-2005, and the results of these habitat assessments were presented in the Draft EIR/EA (EEA No. 13789).

Included within this report are a general description of the Airport property, a brief description of the ecology and life history of the Eastern Spadefoot and its habitat requirements, a discussion of field methodologies, and the results of the Eastern Spadefoot breeding habitat assessments conducted in March and April, 2008.

Additional site visits and habitat surveys were conducted on November 17 and 18, 2008, with Brad Timm with the intent of verifying all previously documented spadefoot breeding habitat and locating any potential habitat areas that were not identified during the site visits earlier in 2008. All wetland descriptions, tables, and figures have been updated to incorporate additional information that was collected during the field survey with Brad Timm.

This information is intended to supplement earlier habitat assessments for rare species conducted at the Airport.

General Site Description

The Airport occupies approximately 322 acres of land within the CCNS, at the northern tip of Cape Cod (Figure 1). Race Point Road and the Coast Guard Station at Race Point are located to the immediate northeast. Areas at the Airport that are maintained for airport operations include an airport terminal, a hangar, and other buildings, a paved runway and taxiway, gravel and paved parking areas, and navigation equipment. Areas along the taxiway and runway, as well as the approach areas, include vegetative communities that are mowed to maintain aviation safety areas and navigational surfaces. Non-managed areas include isolated and bordering vegetated wetlands and coastal dune communities. South of the airfield, there is a mosaic of isolated vegetated wetlands, which range from forested to scrub-shrub to open meadow habitats which are interspersed with vegetated coastal dune communities. Additional discussions on the habitats found at the Airport were included within the appendices of the NPC/DEIR/EA.

Eastern Spadefoot Life History

The Eastern Spadefoot is a medium-sized toad, protected as a Threatened Species in Massachusetts. It is also characterized as an obligate vernal pool species in the state. The Spadefoot has a squat body with short legs and a large head, and is distinguished by its vertically-elliptical pupils. The skin is fairly smooth and is covered by small, scattered warts. The Spadefoot's coloring is generally grayish to blackish-brown with olive markings. Two characteristic yellowish lines run from each eye down the dorsal surface of the toad, forming what is often called a "lyre-shaped" pattern. The Spadefoot gets its name from the single, sharp-edged spade on the inner surface of each hind foot which aids in its ability to burrow.

The Spadefoot requires dry sand or sandy loam soils that are normally associated with pitch pine barrens, coastal oak woodlands, or sparse shrub communities, all of which are interspersed by temporary ponds. This nocturnal species has been documented to burrow up to depths of eight feet below the surface. Since this species is active only at night, their activity peaks just after sundown and right before sunrise. During the summer, a Spadefoot has been documented to remain in its burrow an average of 9.5 days between feedings.

Breeding Habitat Requirements

Wetland habitat quality is the most critical factor in determining the potential for an area to serve as habitat for the Eastern Spadefoot. Early successional temporary wetlands serve as optimal breeding sites for this species. More established wetlands (i.e., those wetlands with a thick canopy and shrub cover) are less ideal, since dense vegetation results in an increase in evapotranspiration and reduces available water, thus reducing the length of the hydroperiod. A shortened hydroperiod may not be able to maintain adequate water levels to sustain breeding activities and juvenile development of the Eastern Spadefoot.

A less-densely vegetated wetland that demonstrates a strong connection to the groundwater table will most likely be able to support a larger breeding population of the Eastern Spadefoot and facilitate successful reproduction. Generally, the only vegetation established in these ideal wetlands is cranberry (*Vaccinium* spp.) or scattered forbs (sedges, grasses, rushes). Cranberry often emerges above the water surface, and varying degrees of the presence of the cranberry within the water column do not appear to deter or impair breeding activities (Brad Timm, pers. comm.).

In addition, dense perimeter vegetation around a wetland may deter the Eastern Spadefoot from utilizing the wetland for breeding. For instance, if vegetation is dense and spans laterally upwards of 10 meters (about 32 feet), it is unlikely that a Spadefoot will attempt to traverse the barrier to breed in the wetland, even if open water exists beyond that vegetation, particularly if an alternative potential breeding site is available with little to no such physical barrier.

The lack of a tree canopy and shrub understory in these open wetlands allows for more sunlight penetration and higher ambient temperatures, both of which enhance the development rates of the Eastern Spadefoot. This species begins to breed in mid to late April, and the hydroperiod of the breeding site ideally should last until mid to late June. If standing water is observed in a wetland at the beginning of seasonal high groundwater, then the wetland has a greater chance of functioning as viable breeding habitat, as water levels are likely to increase as a result of subsequent storm events.

Prime (i.e., ideal or optimal) breeding habitat would contain several inches of standing water in an openly vegetated wetland, where areas of open water occupy between five meters by five meters (270 SF), to 10 meters by 10 meters (about 1,000 SF) or more, of the wetland surface; smaller pockets of water are less likely to sustain proper water levels to support breeding, although may provide potential breeding habitat for the Eastern Spadefoot.

Non-breeding Habitat Requirements

The quality of available upland habitat is a secondary determinant of prime or optimal versus potential Eastern Spadefoot habitat. The home range of this toad species extends from 5 meters up to 450 meters. This extensive home range indicates that burrowing and foraging activities

may not occur immediately upgradient from the breeding habitat, and that quality upland habitat does not necessarily need to be in close proximity to a given breeding pool.

Preferred upland is generally characterized by open sandy areas colonized by scattered, low-lying pitch pine with a lichen edge. The low-lying pitch pine with a low, 'weeping' branch morphology provides substantial ground cover without high root density that would otherwise impair this species' ability to burrow. Thus upland areas with dense vegetation and root mass are less suitable as burrowing sites, although these areas may provide cover for nocturnal foraging.

Methodology

HW conducted site visits on March 4 and 6, and April 3, 10, and 15, 2008, to re-examine previously delineated wetland areas and assess their potential suitability as Eastern Spadefoot habitat. All wetland areas surrounding the airfield within the potential impact area of the preferred alternatives of the proposed projects as identified in the Draft EIR/EA were observed (Figure 2). The HW survey was specifically conducted during a period of seasonal high groundwater at the recommendation of Brad Timm.

The selected wetlands were surveyed for their potential to support the breeding activities of the Eastern Spadefoot. A wetland's degree of potential as breeding habitat was based upon observations of standing water (at a period of typical seasonal high groundwater), vegetation within the wetland and vegetation surrounding the wetland. Areas of potential habitat within each wetland were located with a GPS unit with sub-meter accuracy and mapped on the existing wetland plans (Figure 2). Data points were collected from the center of each potential breeding area. The square footage of each area was also estimated while in the field and depth of standing water was measured (in inches) with a standard tape measure. Photographs were taken of all wetlands to document standing water, vegetation, and overall wetland characteristics.

The following observations of each wetland are based upon the March and April site visits as well as the November site visits with Brad Timm and are intended to serve as an assessment of prime and potential Eastern Spadefoot habitat.

Observations

A description of observations made in each wetland area is presented below (in alphabetical order). Table 1 summarizes the potential of each wetland area to provide suitable breeding habitat for this species. Figure 2 presents areas with prime (ideal) or high potential to provide breeding habitat based upon our observations. Where appropriate comments are made regarding the adjacent upland community to certain wetland areas.

Wetland Observations and Breeding Habitat Assessment

SOUTH SIDE OF AIRPORT

Wetland A is characterized by a well-established plant community and has high stem density. Pockets of standing water are present during periods of high groundwater prior to the growing season and are, on average, three inches deep. Upland immediately adjacent to Wetland A has thick vegetation/groundcover. While there are small pockets of open water that may hold minimum potential for Spadefoot breeding, it is unlikely that the water levels could be sustained at appropriate levels, due to the amount of evapotranspiration that would occur from the vegetative community. This wetland has low potential to serve as breeding habitat.

Wetland B possesses areas that have prime and potential areas Spadefoot breeding. A few open patches of standing water with cranberry may serve as breeding areas. Approximate depth of standing water in the eastern region of the wetland ranges from two to four inches and is an average of six to eight inches in the western region, which is vegetated by patches of *Phragmites*. This portion of the wetland is less densely vegetated than other regions of the wetland. The majority of the wetland, however, has thick plant growth and moderate canopy cover. Pitch pine creates a significant amount of shade over the wetland, and meadowsweet occurs in dense patches throughout the wetlands, rendering those areas less than ideal breeding habitat. The upland surrounding Wetland B provides some suitable burrowing and foraging habitat, but is still not what could be characterized as ideal upland. The upland has clumps of various grasses, some pitch pine, and some lichen cover. There are few areas of open sand to the south and southwest of Wetland B.

Wetland BA has approximately two inches of standing open water. Vegetation includes pitch pine and cranberry. Adjacent upland areas are suitable as non-breeding habitat. This wetland holds potential as breeding habitat.

Wetland BB has no standing water and is an open area of sedges and black rush (*Juncus gerardii*). It is unlikely that this wetland would serve as breeding habitat.

Wetland BC has areas with an open canopy, sunlight exposure, cranberry growth, and standing water, which comprise the ideal characters for Spadefoot breeding habitat. The remainder of the wetland is colonized by dense populations of sheep laurel (*Kalmia angustifolia*) and mature pitch pines. Nearby (but not immediately adjacent) open sandy patches with scattered pitch pine provide suitable upland habitat for all non-breeding activities. There are several areas within this wetland that provide near optimal breeding habitat, with standing water ranging from two to five inches.

Wetland CA has very dense plant growth in the center. Sparse clumps of twig-rush (*Cladium mariscoides*) and woolgrass (*Scirpus cyperinus*) occupy the perimeter of the wetland. The canopy is thin and sunlight penetrates through to the understory and water surface. The pitch pine density may be characterized as moderate. Approximately three to four inches of standing

water were present during initial site visits. Contiguous upland habitat is suitable for burrowing and foraging activities. The open area of water in this wetland that is closest to the CCNS bike path may serve as optimal breeding habitat.

Wetland CB has an average of three to four inches of standing water during seasonal high groundwater, however, the majority of the wetland has a moderate amount of established vegetation, including twig-rush (*Cladium mariscoides*) and dwarf huckleberry (*Gaylussacia dumosa*). Open patches of water within Wetland CB with intermediate exposure to sunlight may provide potential breeding habitat for the Eastern Spadefoot.

Wetland CC supported almost no standing water during site observations in 2008. In addition, this wetland is densely vegetated with a canopy of pitch pine and a dense understory of dwarf huckleberry, grasses, and sedges. This wetland will not likely serve as breeding habitat for the Eastern Spadefoot.

Wetland CD has dense vegetation, comprised primarily by pitch pine, dwarf huckleberry and cranberry. The pitch pine forms a closed canopy, minimizing the wetland's exposure to sunlight. Standing water averaged two to three inches, however, once the growing season commences water drawdown is anticipated to be substantial from the established plant community. The wetland itself does not appear to be ideal for Spadefoot breeding, but does hold slight potential. The surrounding upland provides suitable non-breeding habitat.

Wetland C/J/FK contains some discrete areas that have potential to support breeding populations of the Eastern Spadefoot along with large uninterrupted swaths of prime breeding habitat. The northeastern section of C/J/FK, specifically near flag J-60 (see Figure 2), is a large open area of cranberry where HW observed as much as 10 to 12 inches of standing water which would provide high potential as breeding habitat. In addition, this portion of Wetland C/J/FK does not have a pitch pine canopy and there is very little shrub growth (small clumps of dwarf huckleberry and woolgrass). Adjacent upland "islands" of dune habitat provide ideal burrowing and foraging areas and would ultimately provide optimal interplay between upland and wetland for the Eastern Spadefoot.

More interior portions of wetland C/J/FK have areas of open water that have some/average potential to host Spadefoot breeding. Small areas of upland in the interior of this wetland possess the characteristics of ideal Spadefoot upland habitat.

Wetland D has one to two inches of standing water during seasonal high groundwater. However, like Wetland DF (below), the pitch pine is very dense and the wetland has a very thick canopy with little sunlight exposure. This wetland would not provide ideal breeding habitat, but may hold low potential in some years.

Wetland DA has two to three inches of standing water during seasonal high groundwater. Pitch pine forms moderate canopy cover. Twig-rush occurs in scattered clumps. Some open patches

of water are present within the wetland in conjunction with canopy openings. This wetland does not have potential to support Spadefoot breeding.

Wetland DB is a large wetland with several open pockets of water. A portion of DB that is near the “connector channel” to FG has an open canopy, substantial sunlight exposure, and significant amounts standing water in some areas totals seven to eight inches and has potential to support breeding populations of the Eastern Spadefoot. Vegetation throughout the wetland consists of sparse pitch pine, patches of cranberry, and scattered twig-rush around the perimeter. Several other large open pockets of water, approximately 600 SF to 800 SF each, quite similar to aforementioned area are present throughout Wetland DB and have potential to host breeding activities. Some areas of this have been categorized as prime/optimal breeding habitat. Nearby upland is also optimal in most areas.

Wetland DC supported no standing water during 2008 site visits and vegetation was limited to black rush. This area is not believed to have potential as Eastern Spadefoot breeding habitat.

Wetland DD has large open areas of standing water (averaging three inches in depth) within the wetland with little to no canopy cover. Pitch pine is only moderately dense in certain areas, not throughout the entirety of the wetland. Cranberry is the primary plant in these open areas with scattered patches of twig-rush. In the southern central portion of Wetland DD there is a large open area with significant standing water that has high potential to serve as ideal breeding habitat. Adjacent upland areas characterized by low-lying pitch pine, lichen and open sands are also suitable for non-breeding activities. This wetland has potential to serve as breeding habitat.

Wetland DE has an average of three inches standing water during seasonal high groundwater. There is no canopy cover and this wetland receives maximum exposure to sunlight. Scattered pitch pine seedlings are also present throughout the wetland and contiguous upland. This wetland is believed to have potential as Eastern Spadefoot breeding habitat.

Wetland DF has one to two inches of standing water. Pitch pine in this wetland is extremely dense and the wetland is heavily shaded. This wetland would not provide potential breeding habitat.

Wetland DG has no standing water and holds no potential as a breeding site.

Wetland DH has a well-established population of pitch pine and thick canopy cover. The wetland has one to two inches of standing water but is well shaded and may not have great potential as a breeding site for the Eastern Spadefoot. Some suitable upland is present around the wetland, however.

Wetland DI has one to two inches of standing water and moderately dense pitch pine cover. There is no cranberry. The wetland is partially shaded. The wetland is not ideal for breeding, but may hold some potential. Portions of the adjacent upland are good burrowing and foraging habitat.

Wetland DJ has one inch of standing water, dense pitch pine cover, and does not hold potential as breeding habitat.

Wetland DK has portions with the potential to host breeding activities of the Eastern Spadefoot, specifically the areas that are closest to the airfield, as well as patches along the northern boundary of the wetland. Depth of standing water averages two inches. Pitch pine is present in the wetland, but does not form a closed canopy. Standing water is present at seasonal high groundwater. Cranberry is present in well established mats among several open areas of standing water. Low lying pitch pine surrounded by open sand and lichen cover provides an ideal upland habitat contiguous with Wetland DK. Overall, breeding habitat potential can be characterized as moderate.

Wetland DL has minimal amounts of standing water (totaling no more than one inch) during seasonal high groundwater and the wetland has a thick canopy of established pitch pine. This wetland has little potential as breeding habitat.

Wetland DM does not have standing water during seasonal high groundwater. It has no potential to serve as breeding habitat for the Eastern Spadefoot.

Wetland E, especially the portion abutting the airfield, possesses areas that function as prime and potential breeding habitat. There is a significant amount of standing water about three to four inches deep. Thick mats of cranberry are also present. There are dense clumps of flat-top goldenrod. Large pitch pines are also scattered throughout the area. Water levels and vegetation indicate that this wetland will be able to maintain sufficient water levels for the duration of the breeding season.

Wetland EA has minimal amounts of standing water, totaling no more than one inch. Vegetation is very dense in this wetland. This wetland does not have potential to support Eastern Spadefoot breeding activities.

Wetland EB has pockets of shallow standing water in many areas and the soil is highly saturated throughout the rest of the wetland. Water depth is approximately two inches in areas of standing water. Vegetation is limited to clumps of woolgrass and black rush. This wetland has potential to serve as breeding habitat.

Wetland F has an area that may serve as a prime breeding site. There is almost one foot of standing water in an open area at the edge of a stand of pitch pine that comprises the northern portion closest to the airfield. Vegetation is primarily black rush, twig-rush and soft rush. The water depth and exposure to sunlight suggest that this wetland has high potential to maintain water levels and support breeding. Suitable upland habitat is also nearby.

Wetland FA has only a slight amount of standing water, totaling no more than one inch. Pitch pine is very dense and there is no cranberry present. It is unlikely that this wetland will serve as breeding habitat.

Wetland FB has only a slight amount of standing water, and is approximately half an inch deep. Pitch pine is very dense and there is no cranberry present. It is unlikely that this wetland will serve as breeding habitat.

Wetland FC does not have standing water. Vegetation is minimal. Some pitch pine is present, but remains sparsely scattered throughout the wetland. This wetland is unlikely habitat for the breeding activities of the Eastern Spadefoot.

Wetland FD does not have standing water. Vegetation is minimal. Some pitch pine is present, but remains sparsely scattered throughout the wetland. This wetland is unlikely habitat for the breeding activities of the Eastern Spadefoot.

Wetland FE has minimal standing water (less than one inch deep) during seasonal high groundwater. Small clusters of cranberry exist. Although this wetland is not suitable for breeding, the adjacent upland has great potential to support the burrowing and foraging activities of the Spadefoot.

Wetland FF has less than one inch of standing water and is unlikely habitat for the breeding activities of the Eastern Spadefoot. Vegetation is primarily pitch pine, which occurs at a moderate density.

Wetland FG has an open canopy with substantial sunlight exposure. There is very little standing water, which is approximately one to two inches deep. Vegetation consists mostly of twig-rush and scattered cranberry. Due to the minimal amount of water present, Wetland FG may not be suitable for Spadefoot breeding and is not ideal habitat.

Wetland FH has no more than two inches of standing water during seasonal high groundwater. Vegetation is primarily pitch pine, which occurs at a moderate density. This wetland has little potential to serve as prime Spadefoot breeding habitat.

Wetland FI has no standing water. Vegetation is limited to patches of black rush. This wetland will not serve as Eastern Spadefoot breeding habitat.

Wetland FJ has no standing water. Vegetation is primarily scattered pitch pine and black rush. This wetland does not have potential to serve as breeding habitat.

Wetland H is confined by the runway and taxiway. Vegetation consists primarily of red chokeberry, winterberry, steeplebush, highbush blueberry, cranberry, bayberry, and poison ivy, along with large sphagnum mats found throughout the wetland. Large pockets of standing water persist in this wetland throughout the year, providing potential breeding areas for the spadefoot.

The isolated location of this wetland (i.e., inside the runway and taxiway) may greatly deter the Spadefoot from utilizing this wetland for breeding. If this wetland was not quite as isolated, it would hold potential to provide prime breeding areas, due to the large amounts of standing water that are present year-round, regardless of the moderately dense vegetation.

Wetland I, also confined by the runway and taxiway, possesses several areas of potential breeding habitat. Vegetation is consistent with vegetation observed within Wetland H. Large sphagnum mats occur throughout this wetland as well. Standing water persists in this wetland throughout the year, providing multiple potential breeding areas for the spadefoot. However, as with Wetland H, the isolated location of this wetland (i.e., inside the runway and taxiway) may greatly deter this species from utilizing this wetland for breeding. If this wetland was not as isolated from the surrounding natural landscape, it would otherwise serve as prime breeding habitat, due to the large amounts of standing water that are present year-round, regardless of the moderately dense vegetation.

Wetland K consists primarily of an open expanse of water, the majority of which abuts an open dune/pitch pine area. While Wetland K had originally been delineated (during the Airport Master Plan Update process) as just the submarine-shaped wetland area, it should be noted that further field investigations revealed that Wetland K is hydrologically connected with Wetland L just beyond the treeline to the north (see Photo 4). Standing water is approximately eight inches deep (or more) throughout the wetland. Cranberry is the dominant plant in this wetland and is abundant. The depth of the water column would be able to support the entire breeding season of the Spadefoot. According to HW observations since 2004 during all seasons, standing water is present in this wetland year round. The immediate upland is characterized by low lying pitch pine, open sand, and scattered lichen ground cover; these are the ideal upland characteristics for Eastern Spadefoot foraging and burrowing habitat. The amount of standing water and lack of canopy cover result in ideal Spadefoot breeding habitat. Due to this combination of ideal characteristics, Wetland K possesses the most ideal breeding habitat area, as well as the most optimal overall habitat. The northeastern portions of Wetland K, however, are less ideal due to moderate pitch pine cover and shading.

Wetland L is generally characterized by dense stands of pitch pine with substantial shading. Standing water (three to four inches deep, on average) is present and patches of cranberry can be found throughout. The dense canopy cover, however, detracts from the potential of this wetland to host Eastern Spadefoot breeding due to the lack of sunlight. It should be noted that Wetland L is hydrologically connected to Wetland K.

The central region of Wetland L is considered prime breeding habitat. There is no canopy cover and patches of black rush, twig-rush and cranberry comprise the groundcover. There is a significant amount of standing water which may be able to support breeding and larval development. Patches of adjacent upland may also provide suitable habitat. Overall, this wetland has optimal/high potential to serve as habitat.

Wetland C was also observed. Upland habitat in the area is not consistent with the characteristics of preferred upland of the Spadefoot. Thus, there may not be ideal foraging and burrowing areas on the northern side of the airport. This wetland has standing water, averaging five inches or more in depth in certain areas, but exhibited extremely dense vegetation, especially around the perimeter, which would deter Spadefoot passage and utilization of the wetland for breeding. However, due to the large volume of water sustained by the wetland, it holds moderate potential as breeding habitat. Areas within the large expanse of Wetland C exhibiting potential breeding habitat characteristics were GPS-located as potential breeding habitat.

NORTH SIDE OF AIRPORT

Wetland AA possesses a vegetative community that consists of clumps of woolgrass, twig rush and black rush. There is no standing water in this wetland. It is unlikely that Wetland AA would serve as potential habitat.

Wetland AB is a small isolated wetland consisting of clumps of woolgrass, twig rush, soft rush and black rush. Some sedimentation has also occurred in this wetland; sand has been blown in from the surrounding dunes. There was minimal standing water in this wetland at the time of the November site visits. It is possible that this wetland holds potential to serve as breeding habitat.

Wetland AC has no standing water. Dominant vegetation in the wetland includes clumps of woolgrass, pilewort (*Erechtites hieracifolia*), and slender-leaf goldenrod (*Euthamia tenuifolia*) interspersed with patches of bayberry and willow. This wetland does not have potential to support a breeding population of the Spadefoot.

Wetland AE has no standing water. This densely vegetated wetland consists of a large, central patch of common reed (*Phragmites australis*) with clumps of willow, woolgrass, Gray's Flatsedge (*Cyperus grayii*), hyssop-leaved boneset (*Eupatorium hyssopifolium*), bayberry, pilewort and black rush. This wetland does not have potential to host the breeding activities of the Eastern Spadefoot.

Wetland AF has pockets of standing water, but the water is no more than one to two inches deep. Vegetation within Wetland AF consists of large clumps of willow dominating the wetland interior with large clumps and patches of cranberry, bayberry, hyssop-leaved boneset, slender-leaf goldenrod, common reed, poison ivy, twig-rush, black rush and woolgrass. The northwestern portion of the wetland has a larger pocket of open water with minimal canopy cover and dense patches of cranberry. The remainder of the wetland has very thick vegetation that may very well deter breeding. A small portion of this wetland holds potential to serve as breeding habitat for the Spadefoot; however, adjacent uplands are not ideal for burrowing and foraging.

Wetland AG has groundwater at the soil surface, but no standing water is present. The vegetation within this wetland includes bayberry, twig-rush, woolgrass, black rush, pitch pine

seedlings and hyssop-leaved boneset. This wetland is unlikely to serve as potential Spadefoot breeding habitat.

Wetland AI does not have standing water. The vegetation is dominated by bayberry and poison ivy, both species extending beyond the boundary of the wetland itself. Additional vegetation includes willow, twig-rush, woolgrass, black rush and patches of hyssop-leaved boneset. This wetland does not hold potential as Spadefoot breeding habitat.

Wetland AJ has no standing water. The vegetation is limited to black rush and twig-rush. This wetland would not be able to support the breeding activities of the Eastern Spadefoot.

Wetland AK has damp soil but no standing water during seasonal high groundwater. This wetland area displays two different types of dense vegetative communities: the western half of the wetland is dominated by pussy willow and dwarf huckleberry with the remaining areas dominated by Virginia rose, bayberry, poison ivy, spotted Joe-Pye weed, meadowsweet, woolgrass, twig-rush and steeplebush. This wetland does not have potential to serve as breeding habitat for the Eastern Spadefoot.

Wetland AL has pockets of standing water, most of which are concentrated in the interior. These areas have an average depth of two inches. Dense vegetation forms a thick perimeter around the wetland. There is a dense low shrub community of Virginia rose, bayberry and poison ivy interspersed with clumps and patches of woolgrass, marsh fern, twig-rush and black rush. Dense patches of cranberry were observed in the wetland interior. This wetland is unlikely to serve as potential breeding habitat for the Eastern Spadefoot, primarily due to the thick perimeter vegetation.

Wetland AM has a significant amount of standing water during seasonal high groundwater, averaging three to four inches. This densely vegetated wetland is dominated by bayberry, winterberry, woolgrass, slender-leaf goldenrod, twig-rush, poison ivy, reed canary-grass, sea myrtle, Virginia rose, marsh St. Johns wort and New England aster. A dense open patch of cranberry is present in the center of the wetland. The thick vegetation encountered in this wetland makes it less than ideal breeding habitat.

Of note, upland area encountered on the northern side of the airport is generally not ideal habitat for Eastern Spadefoot burrowing and foraging activities. No low-lying pitch pine is present with a sandy edge. The upland consists mostly of upland dunes with thick grass, sedge and rush cover, or is characterized by open sandy dunes with little to no vegetation or groundcover. Ideal upland habitat seems to be more frequently encountered throughout the southern portion of the airport property.

The wetlands on the southwestern tail of the property were also not observed during this site visit and Spadefoot habitat assessment, for they fall outside of proposed project impact areas. A description of this wetland series is provided below. These descriptions are based upon previous site visits outside of seasonal high groundwater.

Wetland CE is a larger isolated wetland marked by 81 flagging stations. The vegetative community of this wetland is similar to that found within Wetlands CC and CD with the addition of clumps and patches of inkberry (*Ilex glabra*).

Wetland CF is an isolated shrub swamp with a vegetative community dominated by highbush blueberry along with clumps and patches of black grass, sphagnum moss and cinnamon fern (*Osmunda cinnamomea*). Flags CF1 through CF19 mark the boundary of this wetland.

Wetland CG is an extensive isolated wetland located along the lease line that extends well beyond this boundary. As a result, HW delineated only a portion of this wetland (175 flags). The vegetation within this wetland includes expansive patches of cranberry, patches and clumps of sphagnum moss, twig-rush, black grass, fireweed (*Epilobium angustifolium*) and woolgrass. Shrub species encountered include sweet pepperbush (*Clethra alnifolia*) and highbush blueberry, with a canopy of pitch pine and swamp tupelo.

Wetland CH is a large open isolated wetland consisting of 142 flags that was delineated in several non-contiguous flagging series due to its proximity to the lease corner. Several linear-shaped islands of coastal dune were encountered within the interior of this wetland area. The vegetation of this wetland includes expansive areas of cranberry interspersed with clumps and patches of sheep laurel (*Kalmia angustifolia*), highbush blueberry, individual pitch pine (in forested portions of this wetland), dwarf huckleberry, patches of sphagnum moss, twig-rush, woolgrass and small entanglements of common greenbrier (*Smilax rotundifolia*).

Wetland CI is an isolated wetland that was only partially delineated due to its location along the lease line (40 flags in two series). Vegetation in this wetland includes pitch pine, woolgrass, black grass, twig-rush, winterberry, cranberry and highbush blueberry.

Wetland CJ is a very small triangular isolated wetland consisting of only three flags. The vegetative community within this open area is limited to black grass and twig-rush.

Wetland CK is a somewhat larger isolated wetland consisting of 21 flags. As with Wetland CJ, the vegetation is limited to twig-rush and black grass with a pitch pine canopy.

Wetland CL is a small isolated wetland, and the only wetland located among the secondary dune system in the southern “tail” of the Airport property. As with Wetland CK, the vegetation within this wetland is limited to pitch pine and black grass, along with obvious surficial indicators of hydrology (soil staining). Flags CL1 through CL13 mark the boundary of this wetland.

Wetland CM is an isolated wetland located just off-site of the southernmost lease corner. Flagging stations CM1 through CM12 mark a portion of this large wetland area. Vegetation within this shrub swamp included large patches of cranberry, with clumps and patches of sphagnum moss, woolgrass, dwarf huckleberry, sheep laurel, highbush blueberry, bayberry,

poison ivy, inkberry and twig-rush. A large patch of common reed and scattered pitch pine cover the wetland periphery.

Wetland CN is a small isolated wetland consisting of only four flags. The wetland is composed of black grass with surficial evidence of hydrology (soil staining) and subsurface hydric soils.

Wetland CO is an expansive linear wetland consisting of 107 flags, often with narrow (three to four foot wide) connections between lobes. Several upland islands of secondary coastal dune habitat were encountered within the interior of Wetland CO. The vegetation of this transitional shrub swamp/forested wetland includes a pitch pine canopy with a diverse shrub community of swamp azalea (*Rhododendron viscosum*), bayberry, sheep laurel and highbush blueberry. Additional vegetation consists of soft rush, sphagnum moss, common greenbrier, royal fern, cinnamon fern, twig-rush, black grass, poison ivy and dense, scattered patches of cranberry.

Wetland CP is an isolated wetland consisting of 41 flags with a large upland island of coastal dune. The vegetation of this wetland is forested with a canopy of pitch pine including highbush blueberry, bayberry, swamp dewberry (*Rubus hispidus*), cranberry, black grass, soft rush, woolgrass, broom sedge (*Andropogon virginicus*), twig-rush, dwarf huckleberry, New England aster, scattered common reed, occasional black cherry (*Prunus serotina*), slender-leaf goldenrod and poison ivy.

Wetland CQ is a smaller isolated wetland consisting of 16 flags. The vegetation includes bayberry, twig-rush, black grass, woolgrass, pitch pine, swamp dewberry and poison ivy.

Wetland CR is a small isolated wetland consisting of only six flags. The vegetation of this open emergent marsh community is composed of woolgrass, twig-rush and black grass.

Wetland CS represents a portion of the larger BVW along Hatches Harbor, and is marked by 18 flags. The vegetation within this wetland area consists of woolgrass, bayberry, twig-rush, black grass and occasional pitch pine.

Wetland CT/J is a BVW associated with the Hatches Harbor wetland system. Flagging stations represent the southwestern boundary of Wetland J, which abuts managed areas near the runway. While the wetland boundary is representative of a freshwater wetland (BVW), the vegetative community transitions from freshwater to brackish to saline, and contains a large diversity of wetland indicator species. Species encountered include black grass, slender-leaf goldenrod, St. John's wort, marsh fern, twig-rush, swamp dewberry, cranberry, poison ivy and common greenbrier. Interior sections contain a large area dominated by common reed, while the upper edge of the brackish community is composed of several shrub species, including highbush blueberry, bayberry, winterberry, meadowsweet and scattered eastern red cedar (*Juniperus virginiana*).

Wetland CU is a small isolated wetland consisting of eight flags. The vegetation is mainly scattered clumps of woolgrass, bayberry, slender-leaf goldenrod and swamp dewberry vines.

Wetland CV is another small isolated wetland delineated by only three flags, encompassing clumps and patches of woolgrass, twig-rush, and slender-leaf goldenrod, with scattered bayberry and swamp dewberry vines.



Photo 1. Suitable upland habitat for Eastern Spadefoot adults. Photo taken at the Provincetown Municipal Airport, March 2008.



Photo 2. A creeping pitch pine edge meeting an area of open sand. This is an example of preferred upland habitat for adult Eastern Spadefoots. Photo taken at Provincetown Municipal Airport, March 2008.



Photo 3. Low-lying pitch pine branches that form ideal upland habitat for the Eastern Spadefoot. Photo taken at Provincetown Municipal Airport, March 2008.

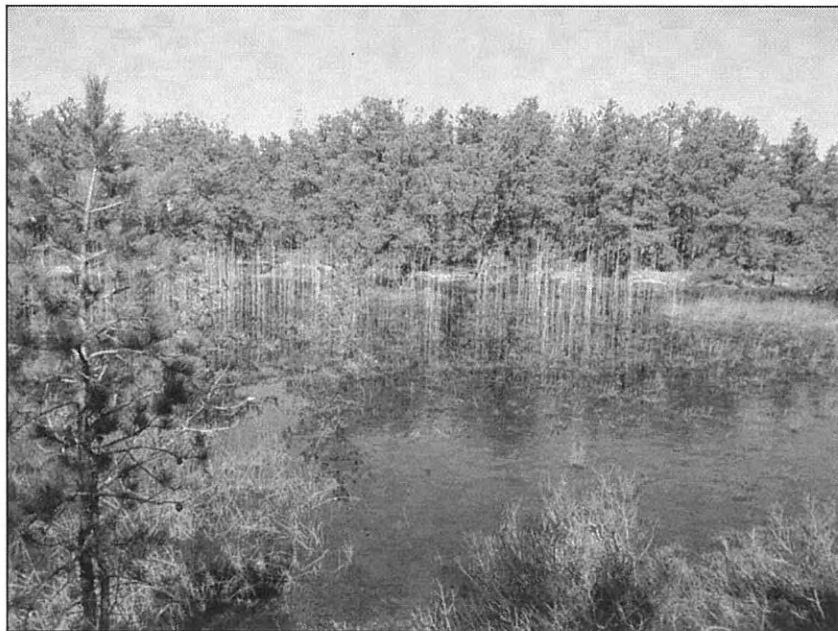


Photo 4. Wetland K at Provincetown Municipal Airport. This is ideal (prime) Eastern Spadefoot breeding habitat. Photo taken March 2008.



Photo 5. Wetland BC is a high-quality to ideal area for Eastern Spadefoot breeding at Provincetown Municipal Airport. Photo taken March 2008.



Photo 6. Wetland DD is also a high-potential to ideal quality habitat for Eastern Spadefoot breeding. Photo taken at Provincetown Municipal Airport, March 2008.

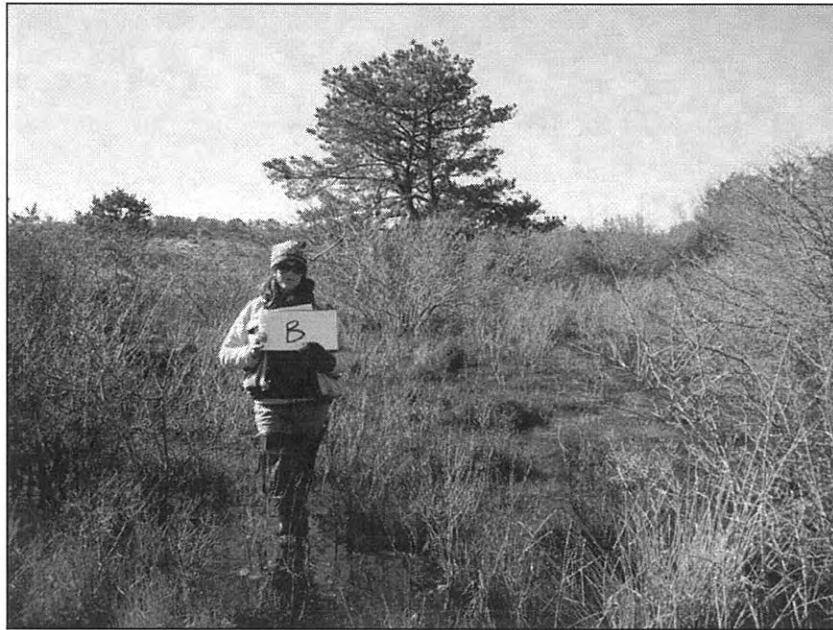


Photo 7. Wetland B has moderate to high potential to serve as Eastern Spadefoot breeding habitat at Provincetown Municipal Airport. Photo taken March 2008.



Photo 8. Wetland DE has moderate potential to serve as Eastern Spadefoot breeding habitat. Photo taken at Provincetown Municipal Airport, March 2008.



Photo 9. Wetland E has moderate potential to serve as Eastern Spadefoot breeding habitat at Provincetown Municipal Airport. Photo taken March 2008.

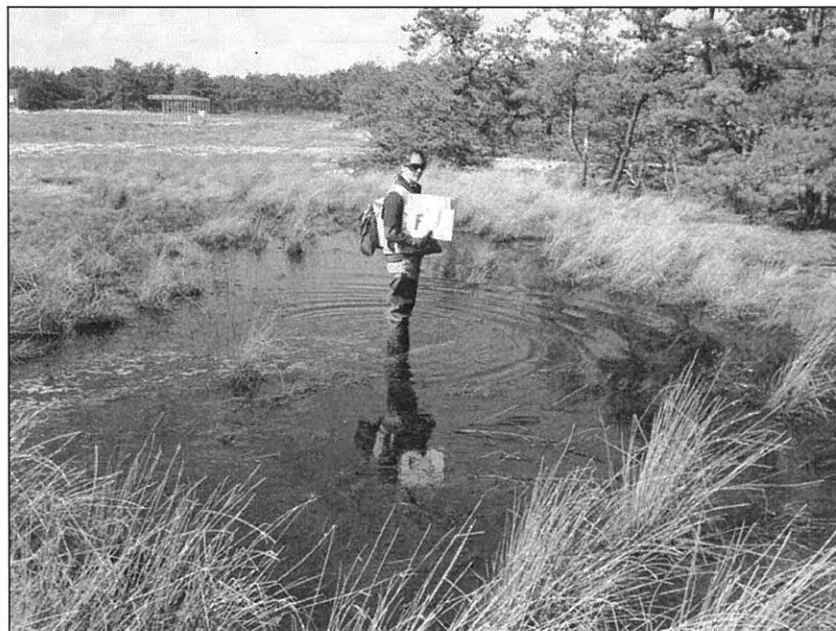


Photo 10. Wetland F has moderate to high potential to serve as Eastern Spadefoot breeding habitat at Provincetown Municipal Airport. Photo taken March 2008.



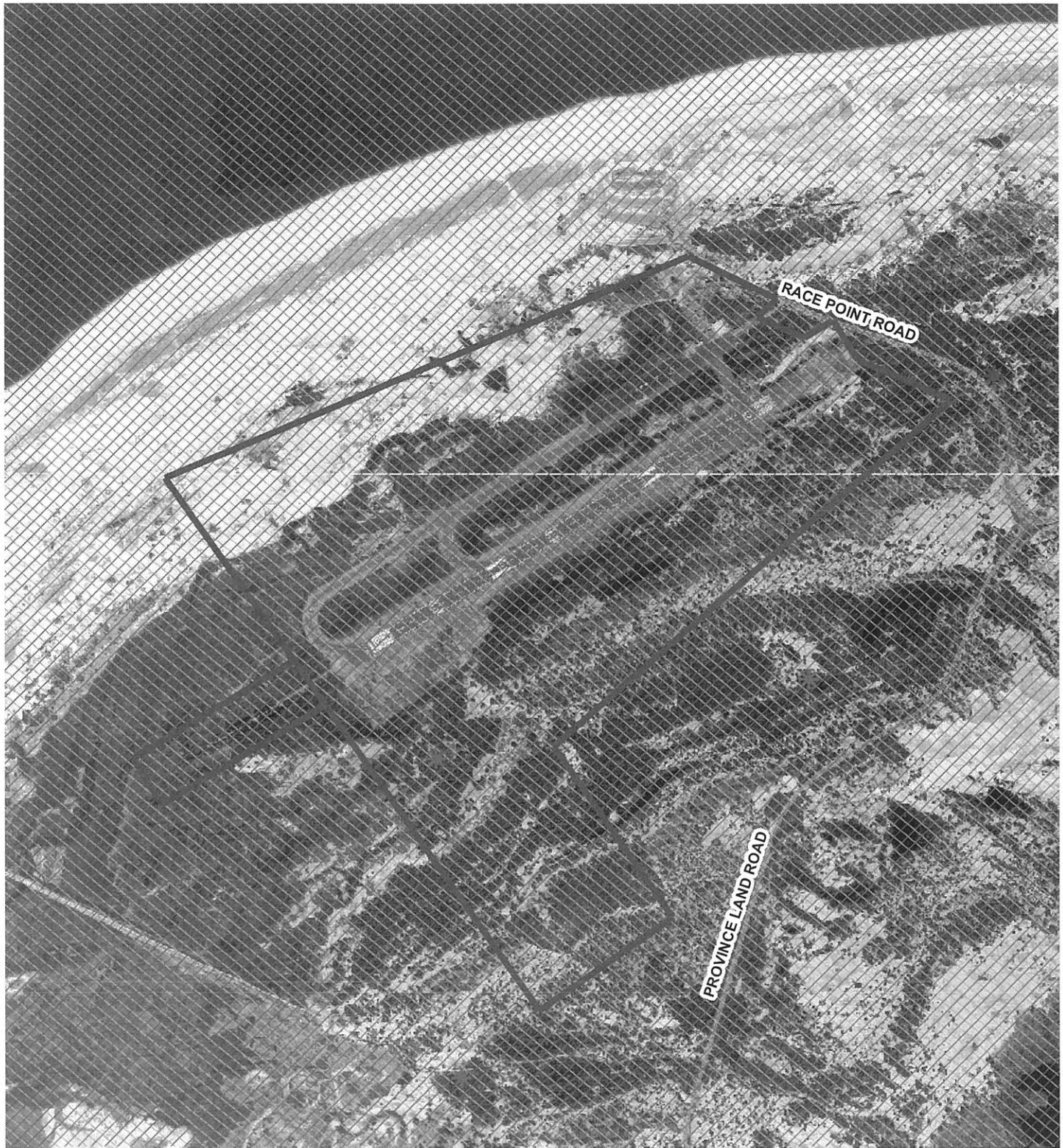
Photo 11. Wetland BA is an example of a wetland with low to moderate potential to serve as Eastern Spadefoot breeding habitat. Photo taken at Provincetown Municipal Airport, March 2008.








Photo 12. Wetland C is an example of a wetland with low potential to serve as Eastern Spadefoot breeding habitat. Photo taken March 2008, at Provincetown Municipal Airport.

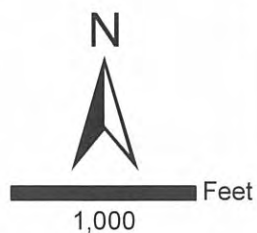


Photo 13. Wetland AE is an example of a wetland with little to no potential to serve as Eastern Spadefoot breeding habitat. Photo taken at Provincetown Municipal Airport, March 2008.



Legend

-  Lease Line
-  NHESP Potential Vernal Pools - December 2000
-  NHESP Certified Vernal Pools - September 2006
-  NHESP Priority Habitats of Rare Species
September 2006
-  NHESP Estimated Habitats of Rare Wildlife
September 2006



Horsley Witten Group
phone: 508-833-6500
www.horsleywitten.com 

Natural Heritage & Endangered
Species Program
Provincetown Municipal Airport
Provincetown, MA

12/13/06 ec
J:\4027 E&K-PTown Airport\GIS

Figure 1

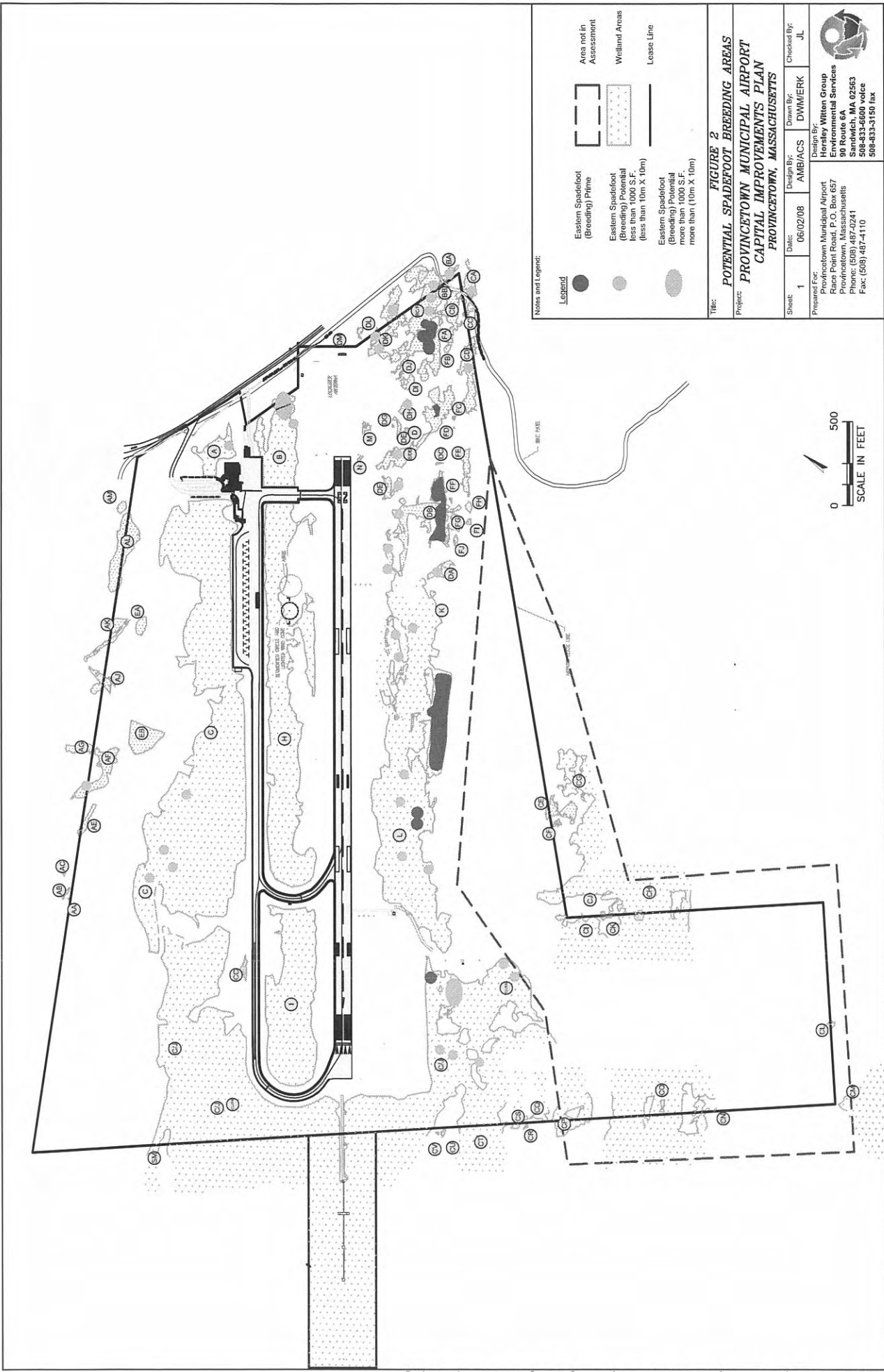


Table 1. Summary of Eastern Spadefoot breeding habitat identified at the Provincetown Municipal Airport, Provincetown, Massachusetts.

WETLAND AREA	PRIME (IDEAL)	POTENTIAL	LOW POTENTIAL/NO POTENTIAL
Salt Marsh			X
Wetland AA			X
Wetland AB		X	
Wetland AC			X
Wetland AE			X
Wetland AF		X	
Wetland AG			X
Wetland AI			X
Wetland AJ			X
Wetland AK			X
Wetland AL			X
Wetland AM		X	X
Wetland BA		X	
Wetland BB			X
Wetland BC		X	
Wetland CA	X	X	
Wetland CB		X	
Wetland CC			X
Wetland CD		X	
Wetland DA			
Wetland DB/FG	X	X	
Wetland DC			X
Wetland DD	X	X	
Wetland DE		X	
Wetland DF			X
Wetland DG			X
Wetland DH			X
Wetland DI			X
Wetland DJ			X
Wetland DK		X	
Wetland DL			X
Wetland DM			X
Wetland EA			X
Wetland EB		X	X
Wetland FA			X
Wetland FB			X
Wetland FC			X
Wetland FD			X
Wetland FE			X
Wetland FF			X
Wetland FH			X
Wetland FI			X
Wetland FJ			X
Wetland A		X	
Wetland B	X	X	
Wetland C		X	X
Wetland C/J/FK	X	X	
Wetland D			X
Wetland E	X	X	
Wetland F		X	
Wetland H		X	X
Wetland I		X	X
Wetland K	X	X	
Wetland L	X	X	
Wetland M			X
Wetland N			X

Note: Wetland areas not listed were not assessed for the potential to provide breeding habitat for Eastern Spadefoot.
Also, Wetland G was incorporated into Wetland BC/F during initial delineation.

APPENDIX 3

NPDES Plans

1. Storm Water Pollution Prevention Plan, Eggleston Environmental, October 2000, revised July 2003
2. Spill Prevention Control and Countermeasures Plan, Horsley Witten Group, March 29, 2007 (Final with signatures)

Appendix 3.1 Storm Water Pollution Prevention Plan, Eggleston Environmental, October 2000, revised July 2003

Provincetown Municipal Airport Storm Water Pollution Prevention Plan

***October 2000,
Revised July 2002***

Prepared for:
Town of Provincetown
Provincetown Airport Commission
Town Hall
260 Commercial Street
Provincetown, MA 02657

Prepared by:
Eggleston Environmental
55 Old Coach Road
Sudbury, MA 01776

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Provincetown Municipal Airport Storm Water Pollution Prevention Plan

1. Introduction and Background

Provincetown Municipal Airport (PMA) is a commercial service airport located approximately two miles from the center of Provincetown, Massachusetts (Figure 1). The airport occupies over 322 acres of land situated within the Cape Cod National Seashore, a unit of the U.S. Department of the Interior, National Park Service. The Town of Provincetown, through its Airport Commission, operates and maintains the airport under the conditions of a Special Use Permit (S.U.P. No. NES CACO 2170 02047) issued by the National Park Service. The permit is currently valid through the year 2022.

This Stormwater Pollution Prevention Plan (SWPPP) has been developed in accordance with the requirements of the United States Environmental Protection Agency's National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activity, 40 CFR 122.28(b). The plan also adheres to the standards of the Cape Cod Commission Regional Policy Plan and the Massachusetts Wetlands Protection Act and Stormwater Policy with respect to stormwater management. The purpose of the SWPPP is to identify potential sources of stormwater pollution at the airport facility and to establish measures to eliminate, minimize or reduce the amount of pollution in the stormwater discharged from the site.

This SWPPP was originally adopted by the Provincetown Airport Commission in October 2000, and has been updated based on modifications to the facility and its operations through June, 2002. The SWPPP is intended as a tool to be used by airport personnel on an ongoing basis. A copy of the document must remain on site. Airport management and staff need to be familiar with the content of the SWPPP and monitor its implementation. Provision has also been made for periodic reviews and updates of the SWPPP to account for changing conditions at the airport and to ensure the SWPPP's usefulness into the future.

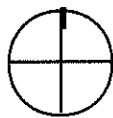
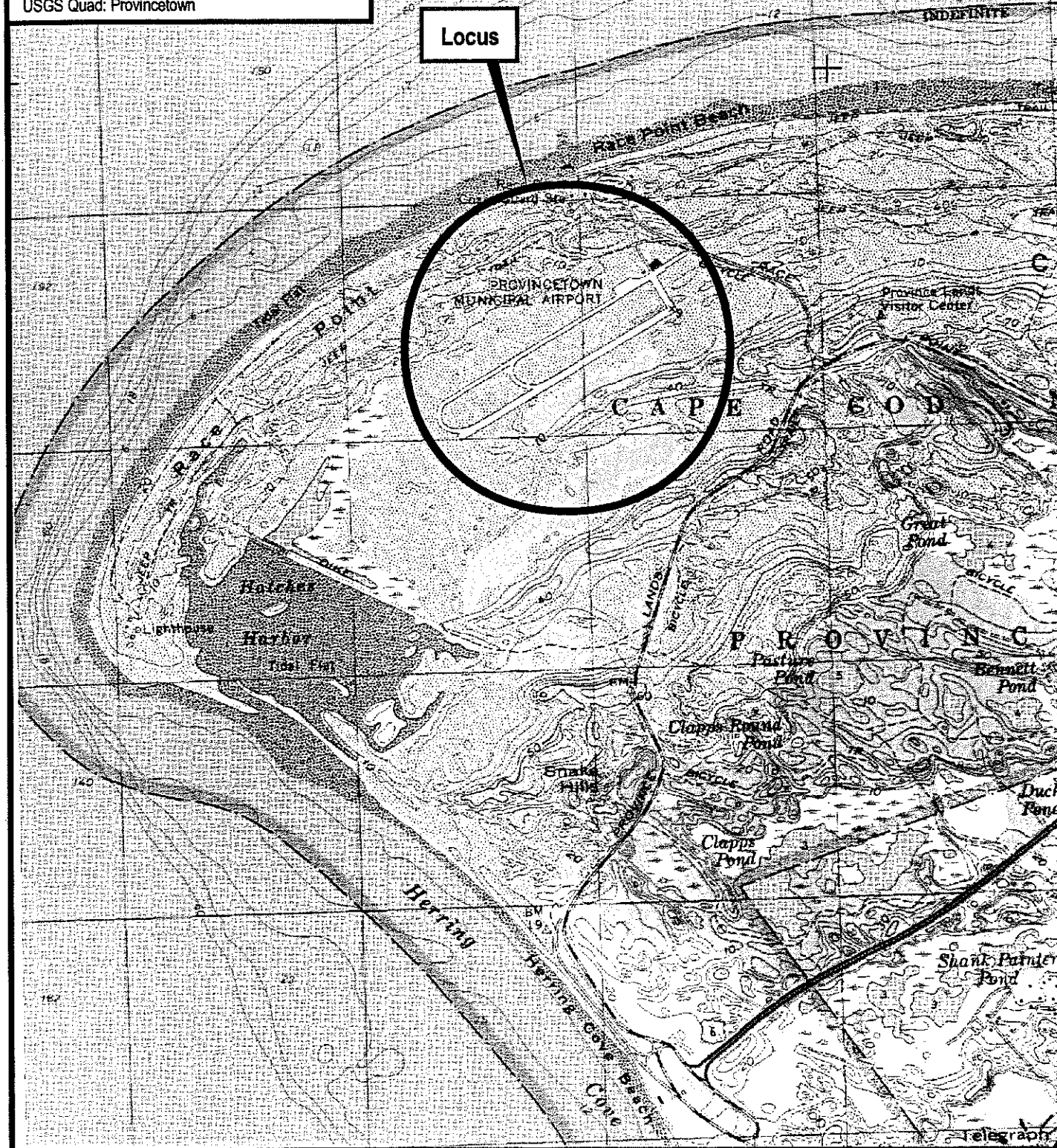
2. Pollution Prevention Team

Conditions of the General Permit require the formation of a Pollution Prevention Team, the members of which will be responsible for the implementation, maintenance and updating of the SWPPP. The Pollution Prevention Team should consist of one or more individuals from the airport staff. Consistent with the size of the operations at PMA, and the relatively uncomplicated nature of the SWPPP for this facility, the Pollution Prevention Team will be comprised of the following personnel:

Data compiled from the following source:
MassGIS, Commonwealth of Massachusetts EOEa

USGS Topographic Quadrangle Images:
December 1995, June 2001

USGS Quad: Provincetown



Approximate Scale: 1"=2,000'

**Reconstruct Runway 7-25
Provincetown Municipal Airport
Provincetown, MA**

Figure 1

Arthur Lisenby, Airport General Manager and SWPPP Administrator – Overall responsibility for all stages of SWPPP development and implementation for all airport and tenant facilities, annual SWPPP compliance evaluations and periodic updates of the SWPPP as warranted by changing conditions.

Joady Brown, Cape Air Station Manager – Responsible for record keeping as required by the SWPPP (e.g. spill reports, materials inventories), training of personnel regarding SWPPP requirements, and emergency response coordination.

3. Description of the Facility

The Provincetown Municipal Airport is currently comprised of a single 3,500-foot paved precision instrument runway with a full-length parallel taxiway, two aprons, a turf aircraft parking area, a terminal building, hangar, and other aviation service facilities as shown on the attached Airport Layout Plan (Figure 2). Plans are currently underway to construct runway safety areas and expand the general aviation parking areas.

The airport's only commercial air service provider is Cape Air, which provides scheduled air service between Provincetown and Boston's Logan International Airport. Cape Air is also the Fixed-Base Operator (FBO), providing all ground based airport services. The airport is also used for general aviation and for medical flights. Annual operations at PMA are approximately 23,000 at present and have been projected to grow to approximately 26,300 operations by the year 2010. Commercial service operations represent about 24 percent of this total.

The airport is topographically situated in a low-lying and flat swale between a series of dune ridges. Soils throughout the area are highly permeable beach sands. There are a variety of vegetated wetland types located on and immediately surrounding the airport property, including wooded shrub swamps and wet meadow communities. An extensive salt marsh system extends westward from the airport property.

Approximately six percent of the 322-acre site is paved. Existing structures on the PMA property include a 12,000 square foot terminal building and attached aircraft hangar, a 1,300 square foot equipment garage, and a 10,000-gallon fuel storage tank facility. Sanitary waste from the airport is discharged to a 10,000-gallon mounded septic system located on the northern boundary of the property. All stormwater runoff from the PMA facility is discharged on site, primarily through infiltration.

4. Site Assessment

Lisa D. Eggleston, P.E., stormwater specialist and Arthur Lisenby, Airport Manager conducted an initial site assessment inspection of the PMA property on September 13th, 1999. The purpose of the inspection was to assess existing drainage patterns on the property and identify potential sources of pollution to stormwater runoff within each operational area of the airport facility. This section presents the findings of that inspection. In accordance with the Multi-Sector General Permit requirements, the site assessment also identifies significant spills or leaks that have occurred on the property in the past three years and any non-storm water discharges to the storm drainage system.

4.1 Runway and Taxiway

As stated previously, the PMA has just one 3,500-foot paved runway with a full-length parallel taxiway. Stormwater runoff from these areas is via sheet flow to surrounding grassed areas, with subsequent infiltration to underlying soils. All of the grassed areas are mown regularly.

No potential pollutant sources were identified within the runway and taxiway portions of the site. Maintenance of these areas is limited and no deicing chemicals are used. During winter operation, snow is plowed from the runway and taxiway. During severe winter weather the airport is closed.

The existing drainage system provides optimal dispersion, filtering and infiltration of stormwater runoff and thus generally does not warrant modification from a water quality standpoint.

4.2 General Aviation Parking

Aircraft presently are parked on either the paved general aviation parking apron (primarily) or the adjacent turf parking areas (for overflow parking). Both of these areas are to be expanded under the current plan. As with the runway and taxiway areas, runoff from the paved surfaces presently sheet flows to adjacent grassed buffer areas where it rapidly infiltrates into the sandy soils. The grade of the apron is very flat hence velocities and associated scour are minimal. The grassed area functions quite effectively as a vegetated filter strip, providing a high degree of treatment and infiltration of runoff before it reaches the adjacent wetland.

With the planned extension of the general aviation parking apron, the pavement will extend closer to the edge of the wetlands, thus encroaching on the grassed buffer area. In

order to ensure that no untreated runoff is discharged directly to the wetland, it is currently planned that a grassed filter strip at least three feet wide will be maintained between the edge-of-pavement and the wetland. All surface runoff from the apron will be directed onto the filter strip. That portion of the apron where wetland filling is proposed, or where there is insufficient distance from the pavement to the wetland boundary to provide a three-foot filter strip, will be curbed or graded slightly to divert flow to the filter strip.

4.3 Fueling Operations

Aviation fuel is stored in a 10,000-gallon underground storage tank located on the north end of the general aviation parking area. The tank is double-walled to prevent leakage. Unleaded aviation gasoline (AVGAS) is the only fuel stored on site. Periodic use of the airport by jet-fueled aircraft (e.g. the U.S. Navy) requires that the users provide their own fuel and containment facility for fueling operations.

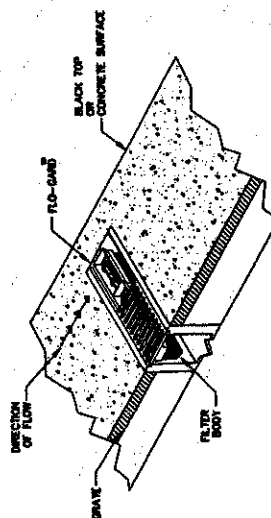
Fueling of aircraft on the PMA property is currently conducted via a 1,200-gallon mobile truck on both the paved and unpaved general aviation parking aprons. Fueling operations have the potential to impact stormwater quality in the event of a spill or overflow; therefore modifications to the current fueling practices to minimize these risks are included among the Best Management Practices (BMPs) described in Section 5.

4.4 Terminal, Hangar and Equipment Storage Buildings

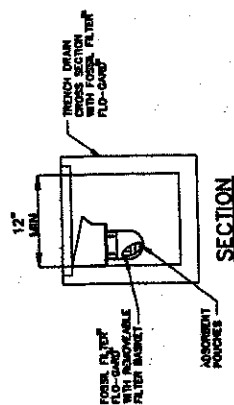
Roof drains from the terminal building (including the hangar) and equipment garage splash to the ground, with the runoff subsequently draining off the pavement and infiltrating into the ground. Roof drainage is generally considered clean and does not pose a significant risk to stormwater quality.

As shown in Figure 3, there are two catch basins and a trench drain in the vicinity of the terminal and equipment storage buildings, each of which drain small areas of pavement to prevent flooding and/or icing. Flow to the catch basin located just to the west of the terminal building discharges to the adjacent wetland immediately northwest. A second catch basin located in the passenger loading area discharges to the ground surface within the buffer zone to a wetland area to the east of the terminal. This outflow pipe also receives drainage from a trench drain in front of the equipment storage building. The tributary areas to both outfalls are relatively small and do not encompass activities with significant potential for stormwater contamination.

DETAIL PLAN
SCALE: 1"=3'



TYPICAL TRENCH DRAIN INSTALLATION



TRENCH DRAIN INSERT DETAIL

FIGURE 3

TOWN OF PROVINCETOWN
AP 3-28-2013-16

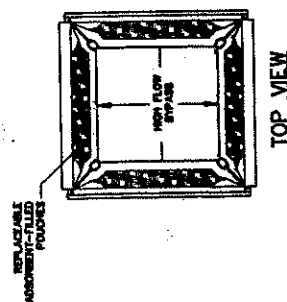
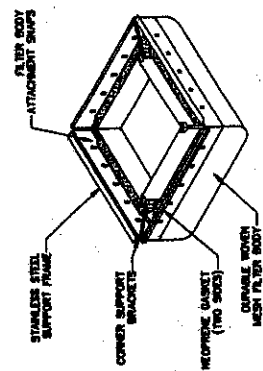
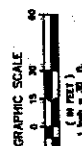
PROVINCETOWN MUNICIPAL REPORT
PROVINCETOWN, MASSACHUSETTS

STORMWATER DRAINAGE PLAN

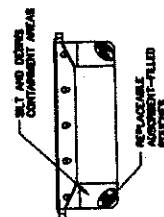
Schmidt
AND ASSOCIATES

REVISION	DATE	BY	DATE	BY	DATE	BY	DATE	BY
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28	01/11/13	JS	01/11/13	JS	01/11/13	JS	01/11/13	JS
29	01/11/13	JS	01/11/13	JS	01/11/13	JS	01/11/13	JS
30	01/11/13	JS	01/11/13	JS	01/11/13	JS	01/11/13	JS
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38	01/11/13	JS	01/11/13	JS	01/11/13	JS	01/11/13	JS
39	01/11/13	JS	01/11/13	JS	01/11/13	JS	01/11/13	JS
40	01/11/13	JS	01/11/13	JS	01/11/13	JS	01/11/13	JS

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TOP VIEW



SECTION VIEW

CATCH BASIN INSERT DETAIL

It is currently planned that the catchbasins and trench drain will be fitted with a Flo-Gard™ fossil filter filtration system to remove 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. A detail of the filtration system is shown in Figure 3. All of the stormwater structures on the site, including the proposed stormwater filtration systems, are to be maintained in accordance with the July 2002 Stormwater Operation and Maintenance Plan prepared for the Provincetown Airport Commission by Edwards and Kelcey, Inc.

With the exception of the aircraft fuel storage described above, all materials used on the site that could pose a potential risk to stormwater quality (e.g. paints, solvents, lubricants etc.) are stored in closed containers within the confines of the hangar and the emergency equipment storage buildings. Although there are floor drains in the hangar, they have been sealed off. Hence, other than during incidental use on the airport property, any leaks or spills of these materials would be contained within the buildings. Both the hangar and the emergency vehicle storage building are equipped with spill kits to facilitate cleanup in the event of a spill, and are swept clean on a daily basis.

4.5 Automobile Parking

There are two automobile parking lots on the airport property. The main parking lot, located on the north side of the terminal building, accommodates 40 to 50 vehicles. Only the traffic aisles are paved, with the parking spaces and median remaining unpaved, thus allowing filtering and infiltration of runoff. The median is also equipped with a gravel swale to facilitate drainage. The employee parking area to the east of the equipment garage is constructed in a similar manner, with only the driveway portion paved. It provides parking for 15 to 20 vehicles.

No significant pollutant sources associated with the industrial use of the PMA property were identified in these areas.

4.6 Deicing Operations

Minimal deicing of Cape Air aircraft is conducted at the airport, using Type 1 propylene glycol dispensed from a small (25 gallon) motorized cart. Deicing is conducted on the pavement area immediately located in front of the hangar that is not tributary to either of the catchbasins on the site. The propylene glycol is stored in two 55-gallon drums kept inside the hangar and annual usage is less than the 110-gallon total storage volume.

No pavement sanding or deicing is conducted at the facility.

4.7 Aircraft Maintenance

No significant aircraft maintenance and/or repair operations are conducted on the Provincetown Airport site, except to get the planes to flyable condition for repair elsewhere. Any such activities take place within the hangar, thus preventing exposure to stormwater. Washing of aircraft is not routinely conducted anywhere on the property.

4.8 Past Spills and Leaks

There were no significant spills or leaks of toxic or hazardous chemicals on the PMA property within the three years preceding the October 2000 SWPPP, nor have there been any since that time. Significant spills are defined as releases of hazardous substances in reportable quantities (as listed in 40CFR Parts 117 and 302) within a 24-hour period. A leaky underground storage tank (LUST) was reported in 1988. Remediation of that spill has recently been completed and the fuel tank replaced with a double-walled above ground storage tank.

4.9 Non-Stormwater Discharges

There are no known unauthorized non-storm water discharges on the PMA property.

5. Best Management Practices (BMPs)

This section of the SWPPP identifies the controls and measures, or "Best Management Practices" (BMPs) recommended for implementation at the Provincetown Municipal Airport facility to protect the quality of site runoff. Overall, the emphasis of the BMP Plan is on source controls and reinforced "good housekeeping" practices – those measures that generally prevent contaminants from coming in contact with stormwater. The stormwater filtration systems proposed for the two catchbasins and the trench drain system will provide additional protection of stormwater quality.

The BMPs are provided in a checklist format to facilitate evaluation of their implementation status.

5.1 Good Housekeeping Practices

- ♦ Require good housekeeping and site maintenance practices by all employees and tenants of the facility.
- ♦ Maintain working and storage areas on the site in a clean and orderly manner.

- ♦ Keep all solvents, cleaners, de-greasers, paints, lubricants and similar type liquids in plainly labeled closed storage containers inside the buildings. Outside storage of any such products shall be avoided.
- ♦ Provide appropriate storage for waste oil and related products and regular removal by contract waste haulers.
- ♦ Prohibit the use of open dumpsters on the site, and provide regularly scheduled trash pickup.

5.2 Structural Control Measures

- ♦ Install Flo-Gard filter systems in the two on-site catchbasins and the trench drain (Figure 3).

5.3 Preventive Maintenance

- ♦ Conduct inspection and maintenance of all stormwater management systems four times per year, in accordance with the schedule provided in the July 2002 Stormwater Operation and Maintenance Plan and included as Appendix A of this document. Document each inspection and actions taken on the form provided.
- ♦ Maintain all mechanical equipment, aircraft and other vehicles stored on the site in good repair and inspect at least quarterly for leaks. Use drip pans to collect any leaking material and conduct repairs promptly.

5.4 Fueling Operations

- ♦ Only trained and qualified operators and maintenance personnel shall be permitted to operate the fueling equipment.
- ♦ Restrict fueling of aircraft to paved surface areas located a minimum of 10 feet from the edge of pavement and 10 feet from the two on-site catchbasins and trench drain.
- ♦ Maintain spill kits at key locations on the site, including the fuel storage facility and on the mobile fueling vehicle. Proper use of the spill kits will be included in operator training.
- ♦ Fueling equipment is also equipped with an emergency shutoff valve and fire extinguisher in the event of an emergency.
- ♦ Any fuel spills that do occur shall be cleaned up immediately using dry absorbent materials and properly disposed of.
- ♦ Conduct quarterly inspections of fuel storage and dispensing equipment to check for leaks and maintain accordingly.

5.5 Deicing Management

- ♦ Review operating procedures pertaining to deicing to prevent overapplication of deicing chemicals.
- ♦ Restrict aircraft deicing operations to areas with paved surfaces at least 10 feet from the edge-of-pavement and outside of the drainage areas to the catchbasins and trench drain.
- ♦ Maintain accurate records of deicing chemical usage on the site.

5.6 Spill Prevention and Response

- ♦ Small spills shall be contained, cleaned up and disposed of properly using dry sweeping, vacuuming or the sorbents and gels contained in the on-site spill kits. Washing down of spills is prohibited.
- ♦ Maintain the material safety data sheets (MSDSs) for hazardous chemicals stored or used on site in an accessible location on the site. The MSDSs list recommended actions for spills and container leaks, and also provide emergency phone numbers and occupational health hazard information.
- ♦ Emergency action should be requested immediately from the Provincetown Fire Department in the event of a large spill.
- ♦ Identify outside environmental consultants and cleanup contractors for emergency response and post names and phone numbers in prominent locations near the fuel storage facility and hangar.
- ♦ Report any releases of oil and regulated hazardous substances in excess of reportable quantities (per CERCLA and Clean Water Act regulations) to the Massachusetts DEP, EPA and other appropriate parties. A listing of the parties to be contacted shall be maintained by the Pollution Prevention Team and distributed to airport personnel on an annual basis or as changes occur.

5.7 Pollution Prevention Training

- ♦ Inform personnel responsible for implementing tasks identified in the SWPPP of their role and the overall goals of the plan.
- ♦ Conduct training of personnel on pollution prevention measures and controls and record keeping practices at least once annually and include as part of the standard training for new employees.
- ♦ Provide educational materials (in the form of leaflets or flyers) on the prevention of stormwater pollution and spill response to owners and operators of private aircraft using the site.

5.8 Visual Inspections and SWPPP Evaluation

- Conduct visual inspections of the stormwater treatment systems in accordance with the schedule provided in the July 2002 Stormwater Operation and Maintenance Plan (see Appendix A). Complete checklist provided and follow-up on action items to see that they are completed.
- Conduct a visual inspection and compliance evaluation of the entire PMA site at least once per year to assess compliance with the SWPPP.
- Conduct at least one additional visual inspection of site runoff conditions during wet weather.
- Review and update the SWPPP when any significant changes in operations or facilities occur or periodically as deemed appropriate to maintain it as a useful working tool.

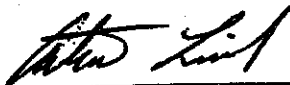
6. Implementation Schedule

Implementation of most of the Best Management Practices outlined in Section 5 above is ongoing at the PMA facility. It is anticipated that the stormwater filtration systems will be installed within the next six months.

7. Certification

In accordance with the requirements of the General Permit, the following certification is made relative to the preparation of this SWPPP document:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry or inquiries of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations.



Arthur Lisenby
Airport Manager

Appendix A

**Provincetown Municipal Airport
Stormwater Operation and Maintenance Plan**

Inspection and Maintenance Schedule*

All items inspected four times per year, January, April, August, October

Item	Maintenance	Maintenance Interval
Buffer Strips		As needed in April and August.
<ul style="list-style-type: none"> • Check condition of vegetation along edge of all paved surfaces. • Note damaged areas. • Note areas with debris. • Check mowing height of mowers. 	<ul style="list-style-type: none"> • Reseed and fertilize. • Rake areas. • Mowers should be set for 4 inches or higher. 	
Catch Basin-Terminal West		As needed at time of inspection.
<ul style="list-style-type: none"> • Check for debris around grate. • Check level of sediment in sump. • Check filter system. 	<ul style="list-style-type: none"> • Sweep area. • Remove if deeper than 8 inches. • Replace if more than 50% coated with contaminants. 	
Catch Basin-Terminal South		As needed at time of inspection.
<ul style="list-style-type: none"> • Check for debris around grate. • Check level of sediment in sump. • Check filter system. 	<ul style="list-style-type: none"> • Sweep area. • Remove if deeper than 8 inches. • Replace if more than 50% coated with contaminants. 	
Trench Drain – SRE Bldg.		As needed at time of inspection.
<ul style="list-style-type: none"> • Check for debris around grate. • Check level of sediment in drain. • Check filter system. 	<ul style="list-style-type: none"> • Sweep area. • Remove if deeper than 8 inches. • Replace if more than 50% coated with contaminants. 	

* Items are identified on Stormwater Drainage Plan

Provincetown Municipal Airport		Stormwater Operation and Maintenance Plan	
Inspection Report Form			
All items inspected four times per year: January, April, August, and October			
Inspected by: _____			
Date: _____			
Checklist of Items *	Required Maintenance	Notes	
Buffer Strips		Action Items and Schedule	
<input type="checkbox"/> Check condition of vegetation along edge of all paved surfaces. <input type="checkbox"/> No damaged areas <input type="checkbox"/> Damaged areas. <input type="checkbox"/> Areas with debris. <input type="checkbox"/> No areas with debris <input type="checkbox"/> Check mowing height of mowers.	<input type="checkbox"/> No maintenance required. <input type="checkbox"/> Reseed and fertilize. <input type="checkbox"/> Rake areas. <input type="checkbox"/> Mowers should be set for 4 inches or higher.		
Catch Basin – Terminal West <input type="checkbox"/> Check Grate for debris. <input type="checkbox"/> Measure level of sediment in sump: _____ inches. <input type="checkbox"/> Check filter system. Replace filter if granules more than 50% coated with contaminants.	<input type="checkbox"/> Sweep area. <input type="checkbox"/> Sediments removed: deeper than 8 inches. <input type="checkbox"/> Filter granules OK <input type="checkbox"/> Filter granules replaced		
Catch Basin – Terminal South <input type="checkbox"/> Check Grate for debris. <input type="checkbox"/> Measure level of sediment in sump: _____ inches. <input type="checkbox"/> Check filter system. Replace filter if granules more than 50% coated with contaminants.	<input type="checkbox"/> Sweep area. <input type="checkbox"/> Sediments removed: deeper than 8 inches. <input type="checkbox"/> Filter granules OK <input type="checkbox"/> Filter granules replaced		
Trench Drain – SRE Bldg. <input type="checkbox"/> Check Grate for debris. <input type="checkbox"/> Measure level of sediment in drain: _____ inches. <input type="checkbox"/> Check filter system. Replace filter if granules more than 50% coated with contaminants.	<input type="checkbox"/> Sweep area. <input type="checkbox"/> Sediments removed: deeper than 8 inches. <input type="checkbox"/> Filter granules OK <input type="checkbox"/> Filter granules replaced		
* Items are identified on Stormwater Drainage Plan			

Appendix 3.2 Spill Prevention Control and Countermeasures Plan, Horsley Witten Group, March 29, 2007 (Final with signatures)

Horsley Witten Group

Sustainable Environmental Solutions

90 Route 5A • Sandwich, MA • 02563
Phone - 508-833-6600 • Fax - 508-833-3150 • www.horsleywitten.com



Spill Prevention Control and Countermeasures Plan

March 29, 2007



Prepared for:

Provincetown Municipal Airport
176 Race Point Road
Provincetown, MA

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

PROVINCETOWN MUNICIPAL AIRPORT PROVINCETOWN, MASSACHUSETTS

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**EMERGENCY RESPONSE ACTION PLAN
ATTACHMENT
TO THE SPILL PREVENTION CONTROL
AND COUNTERMEASURE PLAN**

**EMERGENCY RESPONSE ACTION PLAN
ATTACHMENT TO THE SPILL PREVENTION CONTROL AND
COUNTERMEASURE PLAN**

**PROVINCETOWN MUNICIPAL AIRPORT
176 RACE POINT ROAD
PROVINCETOWN, MASSACHUSETTS**

This Emergency Response Action Plan has been developed for the Provincetown Municipal Airport, 176 Race Point Road, Provincetown, Massachusetts 02657 as a guide to assist in the response to releases of oil or hazardous materials to the environment.

1.0 EMERGENCY NOTIFICATION PHONE LIST

National Response Center (to report a release to navigable waters)

24-Hour Call Center: 800-424-8802

Massachusetts Department of Environmental Protection (DEP)

Emergency Response Center

24-Hour Call Center: 888-304-1133

Massachusetts State Police

911

Provincetown Fire Department

911

508-487-1212

Provincetown Airport Operations

508-487-0241

508-722-4750 (24-hour contact number)

Provincetown Municipal Airport Emergency Response Personnel include the following:

Spill Response Program Manager:

Arthur Lisenby
Airport Manager
Provincetown Municipal Airport
508-487-0241
508-722-4750 (24-hour contact number)

Spill Response Coordinator:

Joady Brown
Cape Air Station Manager
508-487-0241
508-487-0471 (24-hour contact number)

Local consultants and contractors to contact for spill response:

Spill Containment and Cleanup Contractors:

Fleet Environmental Services, Inc.

24-Hour Call Center: **888-233-5338**

Clean Harbors Environmental Services, Inc.

24-Hour Call Center **800-645-8265**

Licensed Site Professional:

Horsley Witten Group, Inc.

90 Route 6A

Sandwich, Massachusetts

508-833-6600

Mark Nelson, LSP

508-566-0912 (cellular phone)

508-362-6582 (after business hours)

Joe Longo, Senior Project Manager

508-274-0947 (cellular phone)

508-759-3311 (after business hours)

2.0 IMMEDIATE ACTIONS

Spill response actions may include the following (as personnel safety allows)

- 1) Initiate evacuation, if necessary.
- 2) Notify Federal and State Emergency Response Personnel (see Section 1.0).
- 3) Stop spill flow when possible without risk of personal injury.
- 4) Contain the spill using whatever means readily available.
- 5) Make the spill location off limits to unauthorized personnel.
- 6) Restrict all sources of ignition when flammable substances are involved.
- 7) Report the release to the appropriate regulatory agencies (DEP, Fire Department, Airport Operations).

3.0 RELEASE NOTIFICATION FORM

RELEASE NOTIFICATION FORM

A. Incident Description

Date: _____ Reporter: _____
Time of Incident: _____ Time of Report: _____
Facility Name: _____
Facility Telephone #: _____
Location of Release: _____
Facility Location: _____
Street Address: _____
City/Town: _____

B. Release Description

Type of material(s) released: _____
Estimated quantity released: _____
Were there injuries to anyone on site? _____
Did the release impact a catch basin or storm drain? _____
Describe the ground surface that the release occurred over: _____

_____ Did the release enter or travel along underground utilities (pipes, conduit, etc.)?

_____ How did the release occur?

_____ Other details: _____

_____ Are any surface waters impacted, or in danger of being impacted?

C. Spill Response Program Notification Requirements

IN THE EVENT OF ANY RELEASE, IMMEDIATELY NOTIFY:
PROGRAM MANAGER ARTHUR LIENBY (508) 722-4750
SPILL RESPONSE COORDINATOR JOADY BROWN (508) 487-0471

D. State and Federal Notification Requirements

Does Massachusetts Department of Environmental Protection (DEP) Require Notification?

- **A release of ≥ 10 Gallons Gas/Diesel/Oil requires DEP Notification**
- **A release of an unknown quantity requires DEP notification**

If required, notify Massachusetts DEP at (888) 304-1133*

Does the USCG/Federal National Response Center (NRC) Require Notification?

- A discharge to navigable waters requires USCG/NRC notification
- A sheen on water surface is considered a harmful quantity

If required, notify USCG/NRC at (800) 424-8802*

*** record any instructions/information from DEP or NRC in the space provided below.**

E. Generator Information

Generator/Responsible Party: _____
 Street Address: _____
 City/Town: _____ State: _____
 Contact Person: _____ Title: _____
 Contact Telephone Number: _____

F. Documentation of Notification

(record time of agency/contact notification, instructions, reporting number, etc. here)

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4.0 REPORTABLE CONDITIONS

In accordance with Commonwealth of Massachusetts regulations, 310 CMR 30 and 310 CMR 40.0000, a release or threat of a release of a reportable quantity of oil and or hazardous materials must be reported to DEP. Under DEP regulations 310 CMR 40.0000 a release of oil, diesel, or gasoline of **10-gallons or greater** is considered reportable. Contaminants detected in the environment at or above a certain concentration require reporting to the DEP, are listed in 310 CMR 40.1600. Refer to Appendix E and F of the Provincetown Municipal Airport Spill Prevention Control and Countermeasure Plan for forms to be completed during a spill event.

Federal reportable quantities for releases into soil, water and air are listed in Table 302.4 of 40 CFR 302.4. Each regulatory agency has these reportable quantities posted on its website (www.state.gov/dep; and www.epa.gov).

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APPROVAL AND CERTIFICATION FORM

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN


PROVINCETOWN MUNICIPAL AIRPORT PROVINCETOWN, MASSACHUSETTS

APPROVAL AND CERTIFICATION

MANAGEMENT APPROVAL

This oil and hazardous substances Spill Prevention, Control, and Countermeasure Plan and attached Emergency Response Action Plan has been carefully reviewed by Provincetown Municipal Airport Management. Management concurs with and supports the programs and procedures which are to be implemented, periodically reviewed, and updated in accordance with Federal Regulation 40 CFR 112.

Signature: _____



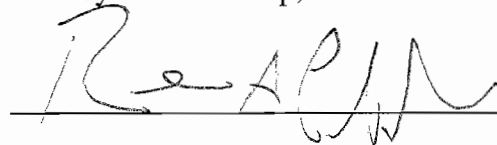
Arthur Lisenby
Spill Response Program Manager
Airport Manager
Provincetown Municipal Airport

PROFESSIONAL ENGINEER CERTIFICATION

I hereby certify that I am familiar with the provisions of Federal Regulation 40 CFR 112 and attest that the Spill Prevention, Control, and Countermeasure Plan has been prepared in accordance with reasonable and prudent engineering practices, and satisfies the current requirements of the aforementioned regulation.

Name: Richard A. Claytor, Jr., P.E.
Horsley Witten Group, Inc.

Signature: _____



Date: June 21, 2007

Registration Number: 45116

RECORD OF CHANGES

RECORD OF CHANGES

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SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

PROVINCETOWN MUNICIPAL AIRPORT 176 RACE POINT ROAD PROVINCETOWN, MASSACHUSETTS

1.0 INTRODUCTION

Code of Federal Regulations 40, Subpart 112 (40 CFR 112) provides guidance for the development of Spill Prevention Control and Countermeasure Plans (SPCCP) and establishes procedures and methods to prevent the discharge of oil from non-transportation-related facilities into surface waters and adjoining shorelines. Additionally, Massachusetts State regulations (310 CMR 30.521(4)) require SPCCPs, with added requirements to comply with State 310 CMR 30 Hazardous Waste regulations. The Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Regulation 40 CFR 300.3, and the Resource Conservation and Recovery Act (RCRA) Regulation 40 CFR 264.52 expand the scope of the SPCCP to incorporate hazardous materials as defined in 40 CFR 302.3.

An SPCCP must be written and certified for an installation or commercial entity when one of the following criteria is met:

1. There is a reasonable potential for discharging oil from fixed facilities into waters of the United States, or
2. The oil storage capacity on-site exceeds either:
 - a. 42,000 gallons of total underground storage, or
 - b. 1,320 gallons of total above-ground storage, or any single container having a capacity in excess of 660 gallons.

Additionally, an SPCCP must be written for an installation or commercial entity if:

1. There is a toxic storage and disposal facility present, or
2. There is sufficient storage of a hazardous material on-site that would produce a reportable quantity release, should a release occur, or
3. A chemical is present in amounts equal to or above its threshold planning quantity.

This SPCCP has been prepared for the Provincetown Municipal Airport, 176 Race Point Road, Provincetown, Massachusetts 02657, due to the following:

1. There is a reasonable potential for discharging fuel and oil into the waters of the United States, and
2. Above-ground fuel storage capacity exceeds 1,320 gallons, with a single container having a capacity in excess of 660 gallons.

2.0 SPCCP IMPLEMENTATION

This SPCCP is to be implemented by Airport personnel and the employees of Cape Air, the Airport's Fixed Base Operator (FBO). The Spill Response Program Manager (Program Manager) and Spill Response Coordinator (Coordinator) are responsible, to the greatest extent possible, for ensuring employee awareness, program participation, and operational compliance with the guidelines provided in this plan. Copies of this plan are to be maintained in the Airport Manager's Office, and any other location determined by the Program Manager.

Spill Response Program Manager:

Arthur Lisenby
Airport Manager
Provincetown Municipal Airport
508-487-0241 (office)
508-722-4750 (24-hour contact number)

Spill Response Coordinator:

Joady Brown
Cape Air Station Manager
Provincetown Municipal Airport
508-487-0241 (office)
508-487-0471 (24-hour contact number)

3.0 SPCCP REVIEW

If there is a change in the facility design, construction, operation, or maintenance which materially affects the potential for an oil discharge into surface waters and adjoining shorelines, this SPCCP shall be amended in accordance with 40 CFR, parts 112.5 and 112.7. Amendments shall be implemented no later than six months after such changes occur. The Program Manager shall review and evaluate the SPCCP every five years. The Program Manager shall amend the SPCCP within six months of the five year review to include more effective spill prevention and control technology, if available. No amendment to this SPCCP shall be effective to satisfy these requirements unless it has been certified by a Professional Engineer in accordance with 40 CFR 112.3(d). Statements of Airport Management Approval and Professional Engineer Certification, and a SPCCP Revision Log are included as prefaces to this plan. Amendments which do not significantly alter the potential for a discharge to occur, such as name and address revisions, do not require an Engineer's certification, however, all revisions shall be recorded in the SPCCP Revision Log.

4.0 PERSONNEL TRAINING

The Coordinator shall designate trained personnel for Airport operations involving the transport, use, or storage of oil or hazardous materials. The Program Manager and Coordinator will be responsible for ensuring spill awareness among personnel, and operational compliance with the provisions of this plan.

At a minimum, oil-handling personnel shall be trained in the operation and maintenance of related facility equipment, facility discharge procedures, applicable laws and regulations, and the contents of this SPCCP. On an annual basis, the Coordinator shall conduct discharge prevention briefings for all oil-handling personnel, and include discussions of the SPCCP, any discharges within the past year, or changes to the facility that might affect the potential for a discharge. Discharge prevention briefings should be conducted in advance of the Airport's peak period of usage, and during the orientation of any new personnel.

No provisions within this Plan, expressed or understood, relieve the Airport / FBO from providing response training to their employees, as required by Local, State and Federal regulations. At the direction of the Coordinator, appropriately trained personnel shall provide 24-hour contact information for inclusion in Section 7.2 and in the attached Emergency Response Action Plan (ERAP), described further in Section 10.0.

5.0 PLAN LIMITATIONS

This plan provides information critical to the prevention of, and response to, releases of oil or hazardous materials at the Airport, and includes discussions of Airport operations, storage facilities, and transfer procedures. The Airport assumes no liability or responsibility for FBO operational compliance with applicable Local, State, and Federal Regulations, including the requirements established in 40 CFR 112, and described in this SPCCP. An FBO required to maintain a SPCCP shall do so independently of this SPCCP.

6.0 APPLICATION OF SUBSTANTIAL HARM CRITERIA

Appendix C of 40 CFR 112 requires a facility to determine whether or not their facility is considered a "substantial harm facility." Certification of the applicability of the substantial harm criteria for Provincetown Municipal Airport is included as Appendix A. Substantial harm facilities are required to submit a Facility Response Plan to the Environmental Protection Agency's (EPA) Regional Administrator. The Provincetown Municipal Airport is not considered a "substantial harm" facility, and is not required to submit a Facility Response Plan to the EPA Regional Administrator.

7.0 FACILITY INFORMATION

7.1 Facility Description and Operations

Provincetown Municipal Airport provides commercial airline service between Provincetown and Boston, Massachusetts. The Airport was constructed in January of 1947 and is located at the northeastern point of Cape Cod. A site locus and existing conditions orthophoto are included as Figures 1 and 2. The Airport is located within the Cape Cod National Seashore (CCNS) National Park. The National Seashore was created in 1966 by a conveyance of land from the Commonwealth of Massachusetts to the National Park Service (NPS). The Airport currently operates under the conditions of a Special Use Permit (S.U.P. No. NES CACO 2170 02047) issued by NPS. The Airport includes one runway (7/25) oriented in a northeast/southwest direction and a full length taxiway running parallel to the runway.

Airport property consists of approximately 322 acres, of which approximately 20 are paved for use as taxiways, runways, parking aprons, and parking areas. The Airport is bordered to the north, south, east, and west, by CCNS land. Structures on Airport property include the Main Terminal, Airport Managers office, Transportation Security Administration (TSA) building, a service and storage hangar, and the Airport Rescue Fire Fighting/Snow Removal Equipment (ARFF/SRE) building. A detailed site map is included as Figure 3.

Currently, Enterprise Car Rental and Cape Air are the only tenant businesses operating on Airport property. Enterprise operates a customer service desk in the main terminal building, and does not service, store, or refuel vehicles at the Airport. In addition to being the Airport's sole commercial air transportation provider, Cape Air is the Airport's FBO, and is responsible for all bulk transfers of fuel at the Airport during vendor delivery of fuel, mobile refueler transfers, and refueling of aircraft. Cape Air maintains a Massachusetts Hazardous Waste Generator ID (MAD981211253), and is classified as a small quantity generator, generating between 100 kilograms (kg) and 1,000 kg of hazardous waste per month.

Airport Operations responsibilities include airport security, equipment operation and maintenance, and facility maintenance and grounds-keeping. Maintenance of Airport vehicles and grounds-keeping equipment occurs at the ARFF/SRE building and storage hangar, and includes fluid changes, filter changes, refueling, minor vehicle repair, and maintenance of related equipment. Oil and hazardous material use and storage at the Airport includes aviation fuel, oil, lube oil, waste oil, de-icing or anti-icing solution, paints, industrial chemicals, compressed gases, solvents, and cleaning solutions.

Facility maintenance operations include structural maintenance and repairs, painting, mowing, grounds keeping, snow removal, and utility maintenance.

7.2 FBO and Airport Operations Information

Contact information for Airport / FBO operations involving the use of petroleum are presented below:

Arthur Lisenby
Airport Manager
Provincetown Municipal Airport
508-487-0241
508-722-4750 (24-hour contact number)

Joady Brown
Cape Air Station Manager
Provincetown Municipal Airport
508-487-0241
508-487-0471 (24-hour contact number)

7.3 Facility Security

The Airport is manned between 12 and 18 hours per day, based upon seasonal fluctuations in Airport use. Airport security is maintained through several means. Access to portions of the runway, and the entire main terminal area, is restricted by a partial perimeter fence and by field supervision. Unsupervised entry within the perimeter fence is limited to approved personnel who carry Airport-assigned identification. Facility security staffing includes personnel from the Provincetown Police Department, and the TSA. All fuel transfer and storage areas are located within the main perimeter fence. The Airport's fuel farm facility is also surrounded by an additional security fence, and can only be accessed by approved personnel. The fuel transfer facility and the fuel farm are equipped with adequate lighting to aid in the observation of a release and deter any acts of vandalism.

7.4 Wastewater Management

Wastewater generated at the Airport is discharged to an on-site septic system.

7.5 Stormwater Management

Stormwater management at the Airport is accomplished primarily through sheet flow runoff at the edge of impervious surfaces. Stormwater along runway 7/25 and the full length taxiway is infiltrated at the pavement edge. Stormwater in the main terminal and apron area either infiltrates at the pavement edge, or is collected by one of three catch basins (Figure 3). A catch basin located west of the main terminal building discharges to a wetland area located approximately 40 feet east of the fuel farm. A catch basin located south of the main terminal, and a french drain trench located along the front of the ARFF/SRE building, both discharge to a wetland area approximately 15 feet north of the ARFF/SRE building (Figure 3). All catch basins are outfitted with filters designed to

ARFF/SRE building (Figure 3). All catch basins are outfitted with filters designed to absorb petroleum hydrocarbons. In the event of a discharge of oil or hazardous materials to a catch basin, or the observation of contaminants in collected stormwater within the discharge wetlands, a licensed contractor will provide for proper removal, transfer, and disposal.

7.6 Spill History

Facilities having experienced one or more spills within a year of the effective date of the SPCCP are required to describe each spill, any corrective actions taken, and plans for preventing recurrence. No reportable spills have occurred at the Airport during that time period.

8.0 STORAGE AND TRANSFER OF FUEL

Significant volumes of petroleum are stored and transferred at the Airport's fuel farm. Fueling of aircraft by the Airport's mobile refueler represents a significant portion of the fuel transfers conducted at the Airport, and is described in greater detail in Section 8.2. Standard procedures for the transfer of fuel are included as Appendix B.

8.1 Bulk Storage of Fuel

Specific characteristics of storage tanks are provided in Table 1. Secondary containment measures have been installed in all Airport fuel storage areas. The construction of all Airport tanks complies with American Petroleum Institute (API) and American Society for Testing and Materials (ASTM) standards.

Table 1. Fixed Fuel Storage

Location	Product	Tank Type	Spill Protection	Volume (gallons)
Airport Fuel Farm	100 LL Avgas	UST ¹	Double walled tank, with interstitial monitoring and cathodic protection. Transfer lines contained within fiberglass secondary wall with interstitial monitoring	10,000
Main Terminal East / Generator	Diesel Fuel Oil	AST ²	Concrete reinforced walls	500
Main Terminal Mechanical Room	No. 2 Heating Oil	AST	None	(2) 275

Notes:

¹ Underground Storage Tank

² Aboveground Storage Tank

Tank locations are included on Figure 3

Table 2. Mobile Refueler

Operator	Product	Secondary Protection	Storage Capacity (gallons)
Cape Air	100 LL Avgas	None	1,200

The Airport assumes no liability or responsibility for FBO operational compliance with applicable Local, State, and Federal Regulations, including the requirements established in 40 CFR 112, and described in this Plan. Cape Air is the FBO and conducts the refueling operations; they are therefore required to comply with the requirements of this SPCCP.

8.2 Fuel Delivery

Fuel delivery procedures are included as Appendix B.

8.2.1 100 – LL Avgas Delivery

100-LL Avgas fuel is delivered and transferred at the Airport's transfer depot to a single 10,000-gallon UST. During fuel transfer, the vendor delivery truck is located on an impervious surface, aiding in the detection of, and response to, any potential releases.

Flexible transfer lines, used for connecting fuel delivery trucks to the above-ground transfer manifold, are inspected prior to each fuel transfer, and are replaced as necessary. Fuel deliveries are generally made during daylight hours; however, after-hours deliveries are conducted when necessary. All fuel delivery operations involve a minimum of two people. Direct communication between the refueling agent and Airport / FBO personnel is maintained throughout the transfer.

Airport / FBO personnel are responsible for the assessment of Avgas quality at the time of delivery and for the inspection of all fuel transfer and containment equipment. Vendor delivery of Avgas is coordinated and supervised through the Airport Manager or Cape Air Station Manager.

8.2.2 No. 2 Heating oil and Diesel Fuel Delivery

No. 2 Heating oil and Diesel fuel are stored and transferred at each respective storage tank (Table 1). Direct connections between the delivery truck and storage tank are accomplished through a flexible transfer line. Fuel flow during transfer is controlled by the tank truck operator, and incorporates a dead man switch. Delivery of No. 2 Heating oil and Diesel fuel is supervised by Airport personnel.

8.3 Mobile Refueler Operations

Transfer of fuel between the mobile refueling truck and aircraft occurs regularly at the Airport, and is described in further detail below. Standard procedures for the transfer of fuel to the mobile refueler are included as Appendix B.

During normal hours of operation, the mobile refueler is staged in the paved apron area adjacent to the ARFF/SRE building. Refueling of aircraft typically occurs along the apron and parking areas, and is conducted by trained Airport / FBO personnel. As a best management practice, aircraft refueling should involve two Airport / FBO personnel. The mobile refueler staging area is well-lit, aiding in the detection of a release or potential release of fuel during night-time operations.

40 CFR 112.7(c) and 112.8(c) require all mobile or portable fuel containers to be designed, positioned, and operated within a means of containment allowing for any discharge to be contained. All refueling of aircraft occurs over impervious surfaces, allowing for any discharge to be properly contained using the spill response resources maintained at the ARFF/SRE building. Rule change EPA-HQ-OPA-2005-0001; FRL-8258-3 exempts airport refuelers from the “sized” secondary containment requirements established in 40 CFR 112.8(c)(2) and (11). Mobile refuelers are still subject to the general secondary requirements established in 40 CFR 112.7(c). An EPA SPCC Rule Amendment Fact Sheet is included as Appendix C.

The Airport is not a substantial harm facility, and is therefore not required to provide response resources based upon a “most-likely” or “worst-case” discharge calculation. The Airport currently maintains spill response resources sufficient to respond to a discharge during aircraft refueling. In order to comply with the secondary containment regulations of 40 CFR 112.7(c) and 112.8(c), the Airport maintains rapid deployment spill containment and recovery equipment at the fuel farm transfer station and the ARFF/SRE building. Examples of typical spill response equipment is as follows:

- Absorbent Spill Pads
- Disposal Bags
- Absorbent Booms and Napkins
- Chemsearch™ Absorbent (speedi-dry)
- 8' x 8' Pop-Up Pool
- Absorbent Pillows
- Magnetic Catch Basin Cover
- Safety-Vac™ Product Recovery Cart

8.3.1 Transfer of Avgas to Mobile Refuelers

The Airport currently operates one Avgas mobile refueler. Avgas is transferred to the Airport's refuelers at the fuel farm transfer station, over an impervious surface, allowing for the observation and containment of any discharge. Refueling of the mobile refueler does not involve a direct connection, relying instead on Airport / FBO personnel to

conduct refueling “over the top”, via a conventional fuel pump hand lever. Airport personnel conduct daily inspections of all associated transfer equipment, including transfer hoses, flow control devices, and spill prevention devices. A mobile refueler daily inspection sheet is included as Appendix D.

8.3.2 Transfer of Avgas to Aircraft

Avgas is transferred to aircraft on the terminal apron by the Airport’s mobile refueler. Refueling does not take place on the General Aviation apron. Properly trained Airport / FBO personnel conduct all transfers of Avgas to aircraft. Aircraft fueling procedures are summarized in Appendix B. In the event that aircraft refueling must be conducted in close proximity to a drainage catch basin, a magnetic catch basin cover should be used to minimize potential impacts associated with a release.

9.0 SPILL PREVENTION AND POTENTIAL SPILL PATHWAYS

Where experience indicates a reasonable potential for the release of oil to the environment, 40 CFR 112.7(b) requires that a SPCCP predict a flow pathway for any released material. Potential discharge pathways for each fuel storage and transfer area are predicted below.

9.1 100 – LL Avgas

The Airport’s fuel farm consists of one 10,000-gallon 100 – LL Avgas UST. Spill prevention controls associated with the Avgas UST include cathodic protection, secondary containment in the form of a fiberglass double walled tank, and interstitial monitoring. Fixed fuel transfer lines are wrapped in secondary containment fiberglass housings, also equipped with interstitial monitoring. In the event of failure of the primary containment tank in the 100 – LL Avgas UST, a release would be contained by the tank’s secondary containment wall, and an alarm would alert the Airport / FBO personnel. In the event of failure of the tank’s secondary containment wall, fuel would be released to the soil and fill material around and/or below the UST.

9.2 Fuel Farm Transfer Station

Standard operating procedures for the delivery and dispensing of 100 - LL Avgas at the fuel farm transfer station should limit the likelihood of a release during fuel transfer. The fuel transfer station is equipped with emergency shut-offs. Spill response resources are maintained at the fuel farm transfer station and at the nearby ARFF/SRE building.

In the event that a release should occur at the mobile refueler during fuel transfer, fuel would be released to the pavement below. Dependent upon the precise location of the release, fuel would travel across the pavement surface, reaching and entering the soil found at the pavement’s edge.

9.3 Refueling of Aircraft

Standard operating procedures for aircraft refueling reduce the potential for a discharge (Appendix B). Refueling of all aircraft is conducted by trained Airport / FBO personnel, and typically occurs on the apron and parking area adjacent to the taxiway. There are no spill prevention systems associated with the refueling of aircraft. A release during refueling would impact the paved apron surface, where the discharge could be contained using available spill response resources found at the fuel transfer depot and ARFF/SRE building. Fuel spilled during aircraft refueling could potentially migrate toward, and enter, the apron area catch basins and/or the soil found at the pavement edge. Magnetic catch basin covers are stored at the fuel farm transfer station for rapid deployment in response to a release of fuel to the pavement.

10.0 EMERGENCY RESPONSE ACTION PLAN

An ERAP is intended to provide easy access to instructions for Airport / FBO personnel in the event of a release. An ERAP will remain attached as a preface to this SPCCP, and be distributed to Airport / FBO personnel at the discretion of the Program Manager. The ERAP will be kept on file and updated as described in Section 3.0 of this plan.

The ERAP shall contain the following information, and shall be constructed to facilitate and expedite response to a release of threat of release of oil or hazardous materials:

1. Facility name, address, and general location;
2. 24-hour contact information for the Spill Response Program Manager, Coordinator, and any additional related personnel;
3. Local, State, and Federal Emergency Response contact information;
4. Recommended guidelines for spill abatement, response, etc.;
5. A site map that includes the following:
 - a. first aid supply locations
 - b. spill response supply locations
 - c. emergency exit locations
 - d. floor-drain, manhole, and sewer grate locations, etc.
 - e. location of oil and hazardous materials bulk storage areas;
6. Additional Response Resources Contact Information (e.g., LSP, outside spill cleanup contractor); and,
7. Forms to aid in proper documentation and reporting of a release.

11.0 SPILL RESPONSE PROCEDURES

In the event of a release, or threat of release, of oil or hazardous material to the environment, Airport / FBO personnel shall implement response actions to contain the release. The Coordinator or Program Manager shall be notified as soon as possible. The following response actions should be followed for most releases.

Note: Any personnel undertaking any response activity are responsible for ensuring that appropriate, properly-fitted, personnel protective equipment (PPE) is worn at all times.

11.1 General Response Procedures for Airport / FBO personnel:

(Note: Only properly trained Airport / FBO employees shall respond to a release of oil or hazardous materials.)

1. Initiate evacuation, if necessary;
2. Notify Coordinator or Program Manager, listed in Section 2.0;
3. Stop spill flow when possible without risk of personal injury to self or others;
4. Immediately deploy any readily available response resources (e.g., absorbent pads, drain covers, granulated absorbent, etc.);
5. Make the release area off limits to unauthorized personnel;
6. Restrict all sources of ignition when flammable substances are involved;
7. Continue response actions at the direction of the Coordinator or Program Manager; and,
8. Ensure that all contaminated response resources and PPE are properly containerized and labeled for disposal by a licensed hazardous waste handler.

The sequence of the initial response action may be altered depending upon the spill characteristics (i.e., type of material, quantity). The following section describes Coordinator and Program Manager responsibilities during a spill event.

11.1.1 Spill Response Coordinator

(Note: If the Program Manager is unavailable, the Coordinator is authorized to activate emergency response contractors, and initiate any regulatory reporting procedures.)

1. Evacuate any non-essential personnel, if necessary;
2. Eliminate the source of the release, if not already accomplished, without jeopardizing the health and safety of self or others;
3. Report the release to the appropriate local contacts (Provincetown Fire Department, Emergency Response Contractors, Board of Health). When notifying any outside agency of a release of oil or hazardous material the following information, at minimum, should be provided:
 - a. Name of individual reporting spill;
 - b. Release location and contact information;
 - c. Substance released, estimated amount;
 - d. Date and time of release;
 - e. Description of response actions, undertaken and planned;
 - f. Other agencies notified or to be notified; and,

- g. Any other relevant information.
4. Direct the deployment of response resources and ensure their proper use;
5. Minimize the potential for environmental impact;
6. Notify emergency response contractors if necessary;
7. Notify the Program Manager and inform them of the release. Determine if release requires Massachusetts Department of Environmental Protection (DEP) or Federal notification, as described in Section 12.0;
8. Ensure that all contaminated response resources and PPE are properly containerized and labeled for disposal by a licensed hazardous waste handler; and,
9. Properly document all response activities; including generator information, response personnel, emergency contractor information, and any related correspondence.

11.1.2 Spill Response Program Manager

1. Determine if the release requires notification, as described in Section 12.0;
2. Ensure proper notification of authorities and/or outside response contractors;
3. Ensure proper documentation of release and response activities; a Spill Reporting Form is included as Appendix E;
4. Retain Hazardous Waste Manifests or Bills of Lading from licensed hazardous waste handlers; and,
5. Take additional measures, as necessary, to minimize potential for subsequent environmental impact (e.g., install absorbent boom at stormwater outfalls to capture stormwater-transported contaminants).

12.0 NOTIFICATION REQUIREMENTS

In response to a release of oil or hazardous materials, responsible parties are required to conduct response activities in accordance with Massachusetts General Laws, Chapter 21E, 40 CFR 112, and the Massachusetts Contingency Plan (310 CMR 40). Notification of Local, State, or Federal agencies may be necessary. All releases, regardless of size or material, shall be reported to the Coordinator or Program Manager. The Coordinator or Program Manager shall establish whether a harmful quantity has been released, and if the release requires notification of outside agencies.

Federal regulations generally define an oil spill of harmful quantity as “....such quantities of oil determined to be harmful to the public health or welfare.....to include discharges which exceed applicable water quality standards.....or cause a film or sheen on the surface of the water, or cause a sludge or emulsion to be deposited beneath the water surface.” “Navigable waters” has been defined as all water bodies and streams, including surface waters and groundwater.

Massachusetts regulations 310 CMR 40.0000 define a release of 10 gallons or greater of oil or gasoline as a reportable quantity. Contaminants detected in the environment at or above threshold concentrations also require reporting to DEP, and are listed in 310 CMR 40.1600. Additionally, a release of oil or hazardous materials (any quantity) to a

stormwater conveyance (e.g., leaching catch basins, culverts) requires DEP notification. Refer to Appendix F for DEP release notification forms.

In the event of a single discharge of more than 1,000 gallons into or upon the navigable waters of the U.S. or adjoining shorelines, or two discharges greater than 42 gallons within any 12 month period, the SPCCP shall be submitted to the EPA Region 1 Regional Administrator and DEP for review.

12.1 Reporting to State and Federal Agencies

In accordance with Massachusetts Regulations 310 CMR 30.0000 and 310 CMR 40.0000, certain releases or threats of releases of a reportable quantity of oil and or hazardous materials must be reported to DEP within 2 hours (www.state.ma.gov/dep). Federal reportable quantities for releases into soil, water and air are listed in Table 302.4 of 40 CFR 302.4. Refer to Appendix E for a general outline of reporting steps and requirements.

If a harmful or reportable quantity, as defined by state and/or federal regulations, has been discharged, the spill should be reported to the following agencies:

National Response Center
24 Hour: 800-424-8802

Massachusetts Department of Environmental Protection
Emergency Response Center
Daytime: 508-946-2700
After Hours: 888-304-1133

Massachusetts State Police
911

Provincetown Police Department
508-228-1213

Provincetown Fire Department
508-487-1212

The following information must be provided to State and Federal agencies when a spill is reported. All correspondence with Local, State, or Federal agencies should be recorded on a Spill Reporting Form, included as Appendix E.

1. Name, location and type of facility;
2. Person in charge of facility and phone number;
3. Name and phone number of person reporting;
4. Type and estimated amount of material;
5. Location of spill;

6. Time and date of incident;
7. Impacted waterways;
8. Whether or not storm drains have been impacted;
9. Cause of incident and equipment involved;
10. Injuries and/or property damage;
11. Duration of discharge;
12. Response Actions taken; and,
13. Agencies notified.

13.0 SPILL RESPONSE RESOURCES

Spill response equipment is maintained at the fuel transfer station and ARFF/SRE building, in close proximity to fuel transfer locations. A spill kit including pad absorbents, granulated absorbent, sorbent booms, "pop-up" pools, magnetic catch-basin covers, and miscellaneous hand tools are stored in a weather-tight drum outside the fuel farm transfer station and ARFF/SRE building for quick deployment.

14.0 INSPECTIONS

The Airport conducts regular inspections of fuel storage tanks, including the mobile refueler. Inspections are conducted by properly trained Airport / FBO personnel, and are recorded on inspection sheets. Inspection sheets are kept on file at the Operations office for a minimum of three years, as required by 40 CFR 112.7. Mobile refueler and fuel farm inspection sheets are included as Appendix D and G.

14.1 Daily Inspections

On a daily basis, Airport personnel conduct inspections of the Airport's mobile refueler and the Airport fuel farm.

The mobile refueler daily inspection routine is as follows:

1. Parking brake or chock
2. Inspect compartments
3. Dome covers and gaskets
4. Loose gear
5. Vertical lights
6. Fluid levels
7. Engine hoses and lines
8. Engine filters
9. Belts
10. Wiring
11. Engine compartment
12. Upholstery
13. Glass-mirrors
14. No debris
15. Operating manual

16. Controls free
17. Start engine
18. Brakes and gear train
19. Power take-off
20. Steering, horn, wipers
21. Lights
22. Body condition
23. Fire extinguishers
24. Tires and wheels
25. Safety cut-off valves
26. Piping and flanges
27. Drain sumps
28. P-T-O shafts and pumps
29. Dispensing accessories
30. Dispensing hoses
31. Meter check
32. Valves, gauges, interlock
33. Shut down
34. Recheck 26, 28, 29, 30, 31, 32
35. Pressure drop, filter, filter / separator
36. Quality control

The Airport fuel farm daily inspection routine is as follows:

1. Fuel level
2. Emergency shut-off
3. Water test
4. Hoses, nozzles, and dust caps
5. Static grounding (ground reels, cables, and clamps)
6. Fire extinguishers
7. Electrical control switches
8. Fuel pumping
9. Piping or valve leaks
10. Nozzle or loading arm
11. Product identification
12. No smoking sign placement
13. Security

14.2 Monthly Inspections

On a monthly basis, Airport personnel conduct inspections of the Airport's mobile refueler and the Airport fuel farm.

The mobile refueler is inspected for:

1. Grounding cable continuity
2. Nozzle screens
3. Fueling hoses

The Airport fuel farm is inspected for:

1. Grounding cable continuity
2. Nozzle screens
3. Fueling hoses

14.3 Additional Inspection and Maintenance

Periodic cleaning and testing of the fuel storage tank and mobile refueler is conducted by outside contractors. Tanks are inspected for wall thickness, corrosion, tank integrity, and tank tightness.

40 CFR 112.7(i) mandates; "If a field-constructed above ground container undergoes a repair, alteration, reconstruction, or change in service that might affect the risk of a discharge or failure due to brittle fracture or other catastrophe, or has discharged oil or failed due to brittle fracture failure or other catastrophe, (the Airport) must evaluate the container for risk of discharge due to brittle fracture or other catastrophe, and as necessary, take appropriate action".

15.0 PROACTIVE MEASURES AND RECOMMENDATIONS FOR SPILL PREVENTION AND SAFETY

To comply with the Local, State and Federal regulations cited in this Plan, the Airport / FBO will continue to incorporate spill prevention and safety measures into daily operations. Refer to Appendix H for examples of the spill response and safety equipment referenced below, and for a list of equipment vendors. The following are general recommendations.

- Storage locations for oil and/or hazardous materials will be indoors or otherwise protected from the environment, and, when feasible, within secondary containment capable of holding 110% of the volume of the largest container or tank.
- All flammable materials should be kept in a suitable storage locker or facility.
- The Airport shall maintain sufficient spill response resources to respond to likely releases from aircraft refueling and fuel transfer.
- The fuel transfer station and ARFF/SRE building should be outfitted with a magnetic catch basin cover, Speedi-dry™, a "pop-up pool" to contain a release of up to 65 gallons, and other approved response equipment.
- The mobile refueler should be outfitted with a magnetic catch basin cover and Speedi-dry.

- Quantities of hazardous materials should be kept to a minimum. Only frequently used hazardous materials should be kept in storage. Expired, obsolete, or otherwise unused hazardous materials should be disposed of properly.
- Empty drums and containers should be properly disposed of and not allowed to accumulate in bulk.
- Refueling and fuel transfer should only occur in areas that are covered by an impervious layer of asphalt or concrete, and should occur as far away from stormwater catch basins as possible.
- Waste oil storage by the Airport / FBO shall comply with Federal, State, and local regulations related to waste accumulation volume and time limits. Waste oil drums shall be clearly labeled, and all manifests kept on file for three years.
- Indoor liquid hazardous materials should be stored in a location such that a spill from the largest container or tank will be contained or absorbed. All hazardous materials should be stored in flame retardant storage lockers, and transferred to proper dispensing containers prior to use.
- Compressed gases should be stored in locations protected from vehicles traffic, including fork lifts, by protective bollards or concrete walls or dikes.
- General waste should be separated from hazardous waste prior to disposal. Hazardous waste, including hazardous waste containers, should not be disposed of in general waste dumpsters.
- Material Data Safety Sheets shall be posted in an area that is obvious to all employees in the case of an emergency (i.e. in area of use). MSDSs shall be updated regularly. Emergency eyewash and shower stations should be located in areas where oil and/or hazardous materials are used.
- Aircraft de-icing should only be performed in designated areas to avoid direct runoff to adjacent surface waters and/or stormwater conveyances.
- Delivery of fuel from transport vehicles to storage tanks shall be supervised by a properly trained employee or supervisor.
- Transfer of fuel to mobile refuelers or aircraft shall only be conducted by properly trained employees.
- Whenever possible, biodegradable materials should be substituted for hazardous materials.

16.0 REFERENCES

Eggleston Environmental, July 2002. Storm Water Pollution Prevention Plan for Provincetown Municipal Airport, Provincetown, Massachusetts.

Massachusetts Department of Environmental Protection. See their homepage at www.state.ma.gov/dep

Massachusetts Department of Environmental Protection. April 3, 2006. Massachusetts Contingency Plan: Massachusetts Department of Environmental Protection, Bureau of Waste Site Cleanup, 310 CMR 40.0000.

Massachusetts Department of Environmental Protection. Massachusetts General Laws: Massachusetts Oil and Hazardous Material Release Prevention and Response Act, Chapter 21E.

Massachusetts Board of Fire Prevention Regulations. June 16, 2003. Massachusetts Comprehensive Fire Safety Code, Tanks and Containers, 527 CMR 9.00.

Massachusetts Department of Environmental Protection. 2000. Massachusetts Hazardous Waste Regulations: Massachusetts Department of Environmental Protection, 310 CMR 30.

Provincetown Municipal Airport Commission, Runway Improvement Project, Project Overview.

U.S. Environmental Protection Agency. July 17, 2002. Environmental Protection Agency Federal Regulations 40 CFR 112.

U.S. Environmental Protection Agency, Oil Program. See their homepage at www.epa.gov/oilspill/

APPENDIX A:

CERTIFICATION OF THE APPLICABILITY OF THE SUBSTANTIAL HARM CRITERIA

**SPILL PREVENTION CONTROL AND COUNTERMEASURES PLAN
PROVINCETOWN MUNICIPAL AIRPORT
PROVINCETOWN, MASSACHUSETTS**

**CERTIFICATION OF THE APPLICABILITY OF THE SUBSTANTIAL HARM
CRITERIA**

Federal Regulation 40 CFR 112.20, Appendix C, requires a facility to certify whether or not it is considered to pose a substantial harm. A determination of substantial harm status is based on the criteria below.

Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?

The facility does not transfer oil over water. The facility does have a total oil storage capacity greater than or equal to 42,000 gallons.

Does the facility have a total oil storage capacity greater than or equal to 1,000,000 gallons and does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest aboveground storage tank plus sufficient freeboard to allow for precipitation within any aboveground storage tank area?

No, the facility does not have a total oil storage capacity greater than or equal to 1,000,000 gallons.

Does the facility have a total oil storage capacity greater than or equal to 1,000,000 gallons and is the facility located at a distance (as calculated using the appropriate formula in Attachment C-III to 40 CFR 112, or a comparable formula) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments? For further description of fish and wildlife and sensitive environments, see Appendices I, II, and III to DOC/NOAA's "Guidance for Facility and Vessel Response Plans: Fish and Wildlife and Sensitive Environments" (see Appendix E to 40 CFR 112, section 13, for availability) and the applicable Area Contingency Plan.

No, the facility does not have a total storage capacity greater than or equal to 1,000,000 gallons.

Does the facility have a total oil storage capacity greater than or equal to 1,000,000 gallons and is the facility located at a distance (as calculated using the appropriate formula in Attachment C-III to 40 CFR 112, or a comparable formula) such that a discharge from the facility would shut down a public drinking water intake.

No, the facility does not have a total storage capacity greater than or equal to 1,000,000 gallons.

Does the facility have a total oil storage capacity greater than or equal to 1,000,000 gallons and has the facility experienced a reportable spill in an amount greater than or equal to 10,000 gallons within the last 5 years?

No, the facility does not have a total storage capacity greater than or equal to 1,000,000 gallons.

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

Signature: 

Name: ARTHUR W LISOVSKY

Title: MANAGER

Date: 6/27/07

APPENDIX B:

FUEL DELIVERY AND TRANSFER PROCEDURES

PROVINCETOWN MUNICIPAL AIRPORT FUEL DELIVERY AND TRANSFER PROCEDURES

The following general procedures should be followed during fuel delivery, transfer of fuel, and refueling of aircraft.

Vendor Delivery of Fuel

1. The vendor driver shall coordinate delivery time with the appropriate Airport / FBO personnel.
2. All paperwork associated with the order should be inspected prior to transfer to ensure delivery of proper fuel quantity and type.
3. Appropriately trained personnel shall be present throughout entire fuel transfer.
4. Airport / FBO personnel shall identify the appropriate storage tank for delivery, and identify/inspect all mechanisms or piping associated with the fuel transfer.
5. Airport storage tanks should be inspected for capacity prior to fuel transfer.
6. All vehicles in the fuel transfer area shall be turned off, and sources of ignition eliminated.
7. A sample of the vendor fuel, for delivery, should be obtained in a suitable container. The sampled fuel should be inspected for color, and results should be recorded and compared against original order.
8. During fuel transfer, secondary containment measures should be employed, if possible. Wheels should be chocked to prevent vehicle movement during transfer.
9. During fuel transfer, at least one attendant shall be present at all times. There shall be no use of automated pumping systems.
10. The delivery vehicle shall be properly grounded and bonded.
11. The truck operator shall be responsible for making all connections between the truck and any piping involved in the fuel transfer. Both the operator and Airport / FBO personnel shall inspect transfer piping, prior to fuel transfer.
12. Spill response resources should be readily available, for cleanup or containment of small spills. Airport / FBO personnel shall be responsible for the proper management of small spills.
13. The truck operator and Airport / FBO personnel shall be aware of all safety and fuel flow control devices, such as pump shut-off and "dead-man" switches.
14. Once fuel transfer has begun, Airport / FBO personnel shall inspect all fittings, couplings, hoses, and associated transfer materials, for evidence of leaking.
15. In the event of a release, or threat of release, due to a failure in any of the fuel transfer equipment, fuel flow shall cease immediately, and appropriate response actions shall be taken to clean up the release.
16. Fuel transfer shall not occur unless all transfer equipment is being used as intended and approved.
17. Upon completion of fuel transfer, the truck operator shall ensure that all transfer lines are cleared of their contents before disconnect, so as to avoid any releases during disconnect.

18. Airport / FBO personnel shall be responsible for the proper stowing of all facility transfer lines.
19. Any sample material, or absorbent materials used to clean up a small release shall be properly disposed of by a licensed disposal company. Proper paperwork shall be kept on file, and the Spill Response Coordinator or Program Manager notified.

Transfer of Fuel to Mobile Refuelers

1. Transfer of fuel to mobile refuelers shall be done by appropriately trained Airport / FBO personnel (the operator), only.
2. All fuel flow control devices, such as "dead-man" switches, shall be inspected for proper operation prior to fuel transfer.
3. All vehicles in the fuel transfer area shall be turned off, and sources of ignition eliminated.
4. Wheels shall be chocked to prevent vehicle movement during fuel transfer.
5. The operator shall ensure that spill response resources to clean up or contain a small spill are readily available.
6. The mobile refueler shall be properly grounded and bonded.
7. Fuel transfer equipment, including hose material and couplings, should be of an appropriate material, and shall be inspected by the operator prior to each use.
8. If possible, transfer lines should implement dry-disconnect fittings and couplings that prevent the flow of fuel until properly connected to a mated coupling.
9. The operator shall be aware of all safety and fuel flow control devices, such as pump shut-off and "dead-man" switches.
10. The operator shall gauge mobile refueler tank capacity prior to fuel transfer, and monitor tank level during transfer.
11. Once fuel transfer has begun, the operator shall inspect all fittings, couplings, hoses, and associated transfer materials, for evidence of leaking.
12. During fuel transfer, at least one attendant shall be present at all times. There shall be no use of automated pumping systems.
13. In the event of a release, or threat of release, due to a failure in any of the fuel transfer equipment, fuel flow shall cease immediately, and appropriate response actions shall be taken to cleanup the release.
14. Fuel transfer shall not occur unless all transfer equipment is being used as intended and approved.
15. Upon completion of fuel transfer, the operator shall ensure that all transfer lines are cleared of their contents before disconnect, so as to avoid any releases during disconnect.
16. The operator shall be responsible for the proper stowing of all facility transfer lines.
17. Any absorbent materials used to clean up a small release shall be properly disposed of by a licensed disposal company. Proper paperwork shall be kept on file, and the Spill Response Coordinator or Program Manager notified.

Transfer of Fuel to Aircraft

1. Transfer of fuel from mobile refuelers to aircraft shall only be done by appropriately trained Airport / FBO personnel.
2. All fuel flow control devices, such as “dead-man” switches, shall be inspected for proper operation prior to fuel transfer.
3. All vehicles in the fuel transfer area shall be turned off, and sources of ignition eliminated.
4. Refueler and aircraft wheels shall be chocked to prevent movement of either vehicle during fuel transfer.
5. All fueling of aircraft shall be completed outside of hangars or maintenance buildings.
6. The operator shall observe the locations of any stormwater catch basins and avoid refueling at or near such structures.
7. The operator shall ensure that spill response resources to clean up or contain a small spill are readily available.
8. The mobile refueler and aircraft shall be properly bonded.
9. Fuel transfer equipment, including hose material and couplings, should be of an appropriate material, and shall be inspected by the operator prior to use.
10. Fuel transfer lines should be located, or “run-out” so as to avoid being run-over, or otherwise damaged, by vehicle traffic in the area.
11. If possible, transfer lines should implement dry-disconnect fittings and couplings that prevent the flow of fuel until properly connected to a mated coupling.
12. The operator shall be aware of all safety and fuel flow control devices, such as pump shut-off and “dead-man” switches.
13. Before fueling, the operator shall ensure that all related aircraft equipment is prepared to accept transferred fuel.
14. While fuel is being transferred, the operator shall position themselves to visually observe transfer lines for leaks or other failures.
15. During fuel transfer, at least one attendant shall be present at all times. There shall be no use of automated pumping systems.
16. Once fuel transfer has begun, the operator shall inspect all fittings, couplings, hoses, and associated transfer materials, for evidence of leaking.
17. In the event of a release, or threat of release, due to a failure in any of the fuel transfer equipment, fuel flow shall cease immediately, and appropriate response actions shall be taken to clean up the release.
18. Fuel transfer shall not occur unless all transfer equipment is being used as intended and approved.
19. Upon completion of fuel transfer, the operator shall ensure that all transfer lines are cleared of their contents before disconnect, so as to avoid any releases during disconnect.
20. The operator shall be responsible for the proper stowing of all facility transfer lines.
21. Any absorbent materials used to clean up a small release shall be properly disposed of by a licensed disposal company. Proper paperwork shall be kept on file, and the Spill Response Coordinator or Program Manager notified.

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APPENDIX C:

RULE AMMENDMENTS



Spill Prevention, Control, and Countermeasure (SPCC) Rule Amendments

Streamlined Requirements for Mobile Refuelers

In December 2006, EPA amended the SPCC rule to streamline some of the requirements for facilities with smaller oil storage capacity and specific types of equipment, including those for sized secondary containment for mobile refuelers. Owners and operators of mobile refuelers at a non-transportation-related facility will no longer need to provide sized secondary containment systems, which are systems large enough to contain the capacity of the largest single compartment or container on a mobile refueler along with enough room to contain precipitation. Providing sized secondary containment for vehicles that move frequently within a facility to perform refueling operations can raise safety and security concerns. However, the SPCC rule's general secondary containment requirements still apply to mobile refuelers as well as containment requirements associated with oil transfers.

What is a mobile refueler?

A mobile refueler is a bulk storage container onboard a vehicle or being towed that is designed or used solely to store and transport fuel for transfer into or from an aircraft, motor vehicle, locomotive, vessel, ground service equipment, or other oil storage container.

Mobile refuelers may be found at the following non-transportation-related locations: industrial sites, airports, military bases, construction sites, chemical complexes, mining sites, seaport terminals, and tank truck home bases.

How do the new changes apply to mobile refuelers?

Mobile refuelers are now exempt from the following sized secondary containment provisions that still apply to all other bulk storage containers and mobile/portable bulk storage containers:

- Sections 112.8(c)(2) and (11) for petroleum oils
- Sections 112.12(c)(2) and (11) for animal fats and vegetable oils

These provisions previously required sized secondary containment for mobile refuelers, such as a dike or catchment basin, of sufficient size to contain the capacity of the largest

compartment or container on a mobile refueler along with enough room to contain precipitation.

The exemption does not apply to refuelers used primarily for the bulk storage of oil in a fixed location in place of stationary containers (e.g., a refueler that no longer can move or conduct transfers and is left only to serve as a bulk storage container).

What secondary containment requirements continue to apply?

General secondary containment requirements in §112.7(c) still apply to mobile refuelers at SPCC regulated facilities.

General secondary containment should be designed to address the most likely discharge from the container and from oil transfers into or from the mobile refueler. The general secondary containment requirements:

- Do not prescribe a size for a secondary containment structure but require that the containment system prevent the spilled oil from escaping the system prior to clean up occurring
- Require appropriate containment and/or diversionary structures or equipment to prevent a discharge to navigable waters or adjoining shorelines

- Allow for the use of certain types of active containment measures that prevent a discharge to navigable waters or adjoining shorelines.

When could active containment measures be appropriate?

Active containment measures require deployment or other specific action by the owner or operator. For discharges that occur only during manned activities, such as transfers, an active measure may be appropriate, as long as the measure can contain the volume and rate of oil, is properly constructed, and is deployed in a timely manner.

These active measures could also be applied to other situations, as deemed appropriate by a Professional Engineer (or owner/operator of a qualified facility).

Do sized secondary containment requirements still apply to other mobile or portable bulk storage containers?

Yes. When mobile or portable bulk storage containers (such as drums, skids, railcars and totes) are in a stationary, unattended mode and not under the direct oversight or control of facility personnel, the sized secondary requirements apply. When mobile or portable bulk storage containers (other than mobile refuelers) are involved in on-site movement, e.g., being towed by vehicles (including locomotives) or moved to/from a designated operational area, then the general secondary containment requirements apply.

When is a mobile refueler subject to SPCC requirements?

According to a 1971 Memorandum of Understanding between the Department of Transportation (DOT) and the Environmental Protection Agency, EPA regulates non-transportation-related facilities and DOT regulates transportation-related facilities:

- Mobile refuelers that operate solely within the confines of a non-transportation-related facility subject to the SPCC rule must comply with the general secondary containment requirements during all periods of operation.
- Other mobile refuelers (i.e., transportation-related) involved in a transfer operation at an SPCC-regulated facility would be subject to the loading/unloading rack requirements when the transfer occurs at a rack or the general secondary containment requirements for all other transfers.

For more information on EPA's jurisdiction, please see Appendix A to 40 CFR part 112.

For More Information

Read the SPCC rule amendment

www.epa.gov/oilspill

Review the Oil Pollution Prevention regulation (40 CFR part 112)

<http://www.gpoaccess.gov/cfr/>

Visit the EPA Office of Emergency Management Web site

www.epa.gov/emergencies

Call the Superfund, TRI, EPCRA, RMP, and Oil Information Center

(800) 424-9346 or (703) 412-9810

TDD (800) 553-7672 or (703) 412-3323

www.epa.gov/superfund/resources/infocenter

To Report an Oil or Chemical Spill

Call the National Response Center

(800) 424-8802 or (202) 267-2675

TDD (202) 267-4477

APPENDIX D:

DAILY INSPECTION RECORD - FUELERS

DAILY INSPECTION RECORD - FUELERS

CAPE AIR
HYANNIS AIR SERVICE

100LL

* If Oil was added, show amount under Remarks on reverse side.
Also, use space on reverse side for place to enter oil drain, chassis lubrication and wash jobs.

MONTH		EQUIPMENT NO.		LOCATION		MA. (PVC)		CODE		Repairs Needed		Repaired																				
		2004 ISUZU		PROVINCETOWN				✓ - Satisfactory		○ - Repairs Needed		⊗ - Repaired																				
DAY OF THE MONTH		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ON TOP																																
BEFORE STARTING ENGINE																																
IN CAB																																
WALK AROUND																																
AFTER STARTING ENGINE																																
FUELING																																
FIRST ACFT.																																
34. Recheck 26, 28, 29, 30, 31, 32																																
35. Pressure drop, filter, filter/seperator																																
36. Quality Control																																

DAILY INSPECTION RECORD
 PROVINCETOWN, MA.
 FUELERS

CAPE AIR / HYANNIS AIR SERVICE

100LL

MONTH:

EQUIP: *2004 ISUZU*

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MONTHLY INSPECTION	CO	DATE	AGENT	REMARKS
GROUND CABLE CONTINUITY				OHMS
NOZZLE SCREENS				
FUELING HOSES				
COMMENTS				

APPENDIX E:

INTERNAL RELEASE NOTIFICATION FORM:

RELEASE NOTIFICATION FORM

A. Incident Description

Date: _____ Reporter: _____
Time of Incident: _____ Time of Report: _____
Facility Name: _____
Facility Telephone #: _____
Location of Release: _____
Facility Location: _____
Street Address: _____
City/Town: _____

B. Release Description

Type of material(s) released: _____
Estimated quantity released: _____
Were there injuries to anyone on site?: _____
Did the release impact a catch basin or storm drain?: _____
Describe the ground surface that the release occurred over: _____

Did the release enter or travel along underground utilities (pipes, conduit, etc.)?: _____

How did the release occur? _____

Other details: _____

Are any surface waters impacted, or in danger of being impacted?

C. Spill Response Program Notification Requirements

IN THE EVENT OF ANY RELEASE, IMMEDIATELY NOTIFY:
PROGRAM MANAGER ARTHUR LIENBY (508) 722-4750
SPILL RESPONSE COORDINATOR JOADY BROWN (508) 487-0471

D. State and Federal Notification Requirements

Does Massachusetts Department of Environmental Protection (DEP) Require Notification?

- A release of ≥ 10 Gallons Gas/Diesel/Oil requires DEP Notification
- A release of an unknown quantity requires DEP notification

If required, notify DEP at (888) 304-1133*

Does the USCG/Federal National Response Center (NRC) Require Notification?

- A discharge to navigable waters requires USCG/NRC notification
- A sheen on water surface is considered a harmful quantity

If required, notify USCG/NRC at (800) 424-8802*

*** record any instructions/information from DEP or NRC in the space provided below.**

E. Generator Information

Generator/Responsible Party: _____

Street Address: _____

City/Town: _____ State: _____

Contact Person: _____ Title: _____

Contact Telephone Number: _____

F. Documentation of Notification

(record time of agency/contact notification, instructions, reporting number, etc. here)

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

D. State and Federal Notification Requirements

Does Massachusetts Department of Environmental Protection (DEP) Require Notification?

- A release of ≥ 10 Gallons Gas/Diesel/Oil requires DEP Notification
- A release of an unknown quantity requires DEP notification

If required, notify DEP at (888) 304-1133*

Does the USCG/Federal National Response Center (NRC) Require Notification?

- A discharge to navigable waters requires USCG/NRC notification
- A sheen on water surface is considered a harmful quantity

If required, notify USCG/NRC at (800) 424-8802*

*** record any instructions/information from DEP or NRC in the space provided below.**

E. Generator Information

Generator/Responsible Party: _____

Street Address: _____

City/Town: _____ State: _____

Contact Person: _____ Title: _____

Contact Telephone Number: _____

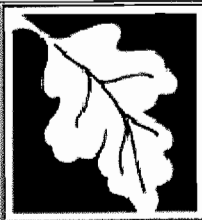
F. Documentation of Notification

(record time of agency/contact notification, instructions, reporting number, etc. here)

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

APPENDIX F:

**RELEASE NOTIFICATION AND NOTIFICATION RETRACTION FORM
DEP BWCS103**



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC103

RELEASE NOTIFICATION & NOTIFICATION
RETRACTION FORM

Release Tracking Number

-

Pursuant to 310 CMR 40.0335 and 310 CMR 40.0371 (Subpart C)

A. RELEASE OR THREAT OF RELEASE LOCATION:

1. Release Name/Location Aid: _____
2. Street Address: _____
3. City/Town: _____ 4. ZIP Code: _____
5. UTM Coordinates: a. UTM N: _____ b. UTM E: _____

B. THIS FORM IS BEING USED TO: (check one)

- ☐ 1. Submit a **Release Notification**
- ☐ 2. Submit a **Revised Release Notification**
- ☐ 3. Submit a **Retraction of a Previously Reported Notification** of a release or threat of release including supporting documentation required pursuant to 310 CMR 40.0335 (Section C is not required)

(All sections of this transmittal form must be filled out unless otherwise noted above)

C. INFORMATION DESCRIBING THE RELEASE OR THREAT OF RELEASE (TOR):

1. Date and time of Oral Notification, if applicable: _____ Time: _____ ☐ AM ☐ PM
mm/dd/yyyy hh:mm
2. Date and time you obtained knowledge of the Release or TOR: _____ Time: _____ ☐ AM ☐ PM
mm/dd/yyyy hh:mm
3. Date and time release or TOR occurred, if known: _____ Time: _____ ☐ AM ☐ PM
mm/dd/yyyy hh:mm

Check all Notification Thresholds that apply to the Release or Threat of Release:
(for more information see 310 CMR 40.0310 - 40.0315)

4. 2 HOUR REPORTING CONDITIONS

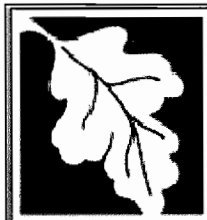
- ☐ a. Sudden Release
- ☐ b. Threat of Sudden Release
- ☐ c. Oil Sheen on Surface Water
- ☐ d. Poses Imminent Hazard
- ☐ e. Could Pose Imminent Hazard
- ☐ f. Release Detected in Private Well
- ☐ g. Release to Storm Drain
- ☐ h. Sanitary Sewer Release (Imminent Hazard Only)

5. 72 HOUR REPORTING CONDITIONS

- ☐ a. Subsurface Non-Aqueous Phase Liquid (NAPL) Equal to or Greater than 1/2 Inch
- ☐ b. Underground Storage Tank (UST) Release
- ☐ c. Threat of UST Release
- ☐ d. Release to Groundwater near Water Supply
- ☐ e. Release to Groundwater near School or Residence
- ☐ f. Substantial Release Migration

6. 120 DAY REPORTING CONDITIONS

- ☐ a. Release of Hazardous Material(s) to Soil or Groundwater Exceeding Reportable Concentration(s)
- ☐ b. Release of Oil to Soil Exceeding Reportable Concentration(s) and Affecting More than 2 Cubic Yards
- ☐ c. Release of Oil to Groundwater Exceeding Reportable Concentration(s)
- ☐ d. Subsurface Non-Aqueous Phase Liquid (NAPL) Equal to or Greater than 1/8 Inch and Less than 1/2 Inch



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC103

**RELEASE NOTIFICATION & NOTIFICATION
RETRACTION FORM**

Release Tracking Number

-

Pursuant to 310 CMR 40.0335 and 310 CMR 40.0371 (Subpart C)

C. INFORMATION DESCRIBING THE RELEASE OR THREAT OF RELEASE (TOR): (cont.)

7. List below the Oils (O) or Hazardous Materials (HM) that exceed their Reportable Concentration (RC) or Reportable Quantity (RQ) by the greatest amount.

O or HM Released	CAS Number, if known	O or HM	Amount or Concentration	Units	RCs Exceeded, if Applicable (RCS-1, RCS-2, RCGW-1, RCGW-2)

☐ 8. Check here if a list of additional Oil and Hazardous Materials subject to reporting is attached.

D. PERSON REQUIRED TO NOTIFY:

1. Check all that apply: ☐ a. change in contact name ☐ b. change of address ☐ c. change in the person notifying

2. Name of Organization: _____

3. Contact First Name: _____ 4. Last Name: _____

5. Street: _____ 6. Title: _____

7. City/Town: _____ 8. State: _____ 9. ZIP Code: _____

10. Telephone: _____ 11. Ext.: _____ 12. FAX: _____

☐ 13. Check here if attaching names and addresses of owners of properties affected by the Release or Threat of Release, other than an owner who is submitting this Release Notification (required).

E. RELATIONSHIP OF PERSON TO RELEASE OR THREAT OF RELEASE:

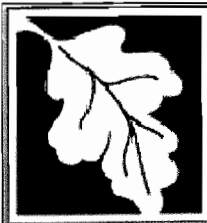
☐ 1. RP or PRP ☐ a. Owner ☐ b. Operator ☐ c. Generator ☐ d. Transporter

☐ e. Other RP or PRP Specify: _____

☐ 2. Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

☐ 3. Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

☐ 4. Any Other Person Otherwise Required to Notify Specify Relationship: _____



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC103

**RELEASE NOTIFICATION & NOTIFICATION
RETRACTION FORM**

Pursuant to 310 CMR 40.0335 and 310 CMR 40.0371 (Subpart C)

Release Tracking Number

-

F. CERTIFICATION OF PERSON REQUIRED TO NOTIFY:

1. I, _____, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

2. By: _____ 3. Title: _____
Signature

4. For: _____ 5. Date: _____
(Name of person or entity recorded in Section D) mm/dd/yyyy

☐ 6. Check here if the address of the person providing certification is different from address recorded in Section D.

7. Street: _____

8. City/Town: _____ 9. State: _____ 10. ZIP Code: _____

11. Telephone: _____ 12. Ext.: _____ 13. FAX: _____

**YOU ARE SUBJECT TO AN ANNUAL COMPLIANCE ASSURANCE FEE OF UP TO \$10,000 PER
BILLABLE YEAR FOR THIS DISPOSAL SITE. YOU MUST LEGIBLY COMPLETE ALL RELEVANT
SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU
SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE.**

Date Stamp (DEP USE ONLY:)

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APPENDIX G:

DAILY INSPECTION RECORD

DAILY INSPECTION RECORD
FIXED EQUIPMENT FUEL STORAGE SYSTEM

CAPE AIR / HYANNIS AIR SERVICE

PRODUCT

LOCATION		MONTH		YEAR		TANK #		TANK NUMBER		PRODUCT		CODES		Satisfactory		Repairs Needed		Repaired																
PROVINCETOWN, MA.		DAY OF THE MONTH		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1. Gauge Tanks — Quantity		GALLONS																																
		TANK GAGE																																
2. EMERGENCY SHUT OFF		FUEL PUMP																																
3.																																		
4.																																		
5. Water		Test																																
6. Hoses - Nozzles - Dust Caps																																		
7. Static Grounding																																		
8. Electrical Control Switches																																		
9. Fire Extinguisher Gauge																																		
10. General Condition of Area																																		
1. PUMPS FUEL																																		
2. Piping or Valve Leaks																																		
3. Nozzle or Loading Arm																																		
4.																																		
1. Product Identification																																		
2. No Smoking Signs																																		
3. Security																																		
INITIALS →																																		

BEFORE STARTING PUMP

PUMPING

GENERAL

100LL

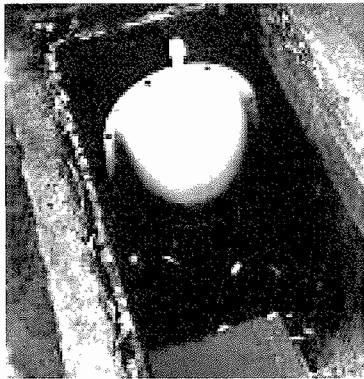
EQUIP: TANK #1

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COMMENTS

APPENDIX H:

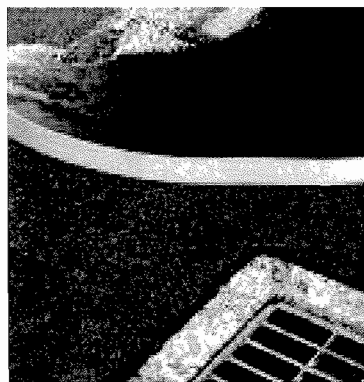
RESPONSE RESOURCE EXAMPLES AND VENDORS



Storm Drain Hood



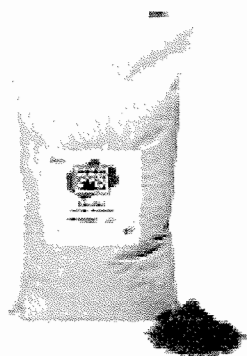
Magnetic Storm Drain Cover



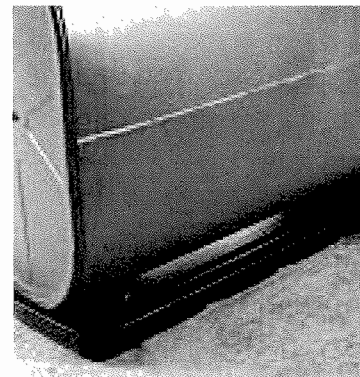
Containment Berm



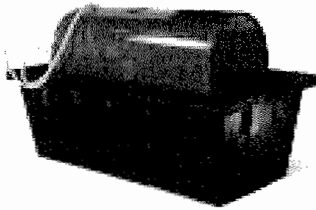
Collapsible Containment Pool



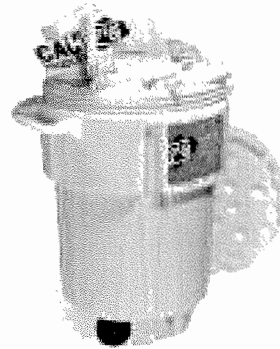
Loose Absorbent



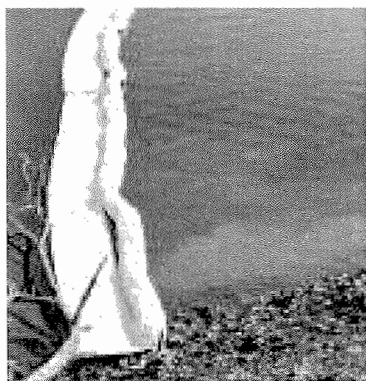
Leak/Spill Containment



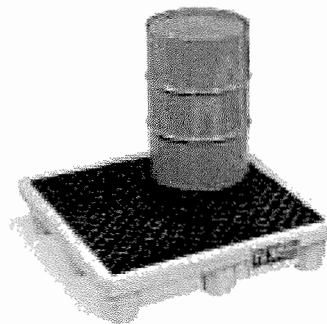
Secondary Containment



Portable Spill Kit



Absorbent Boom



Secondary Containment

Vendor Information:

New Pig Corporation
1-800-HOT-HOGS® (468-4647)
www.newpig.com

Interstate Products
1-800-474-7294
www.interstateproducts.com

SpillKits911
1-800-474-5911
www.spillkits911.com/

Complete Environmental Products, Inc.
1-800-444-4237
www.cepsorbents.com/

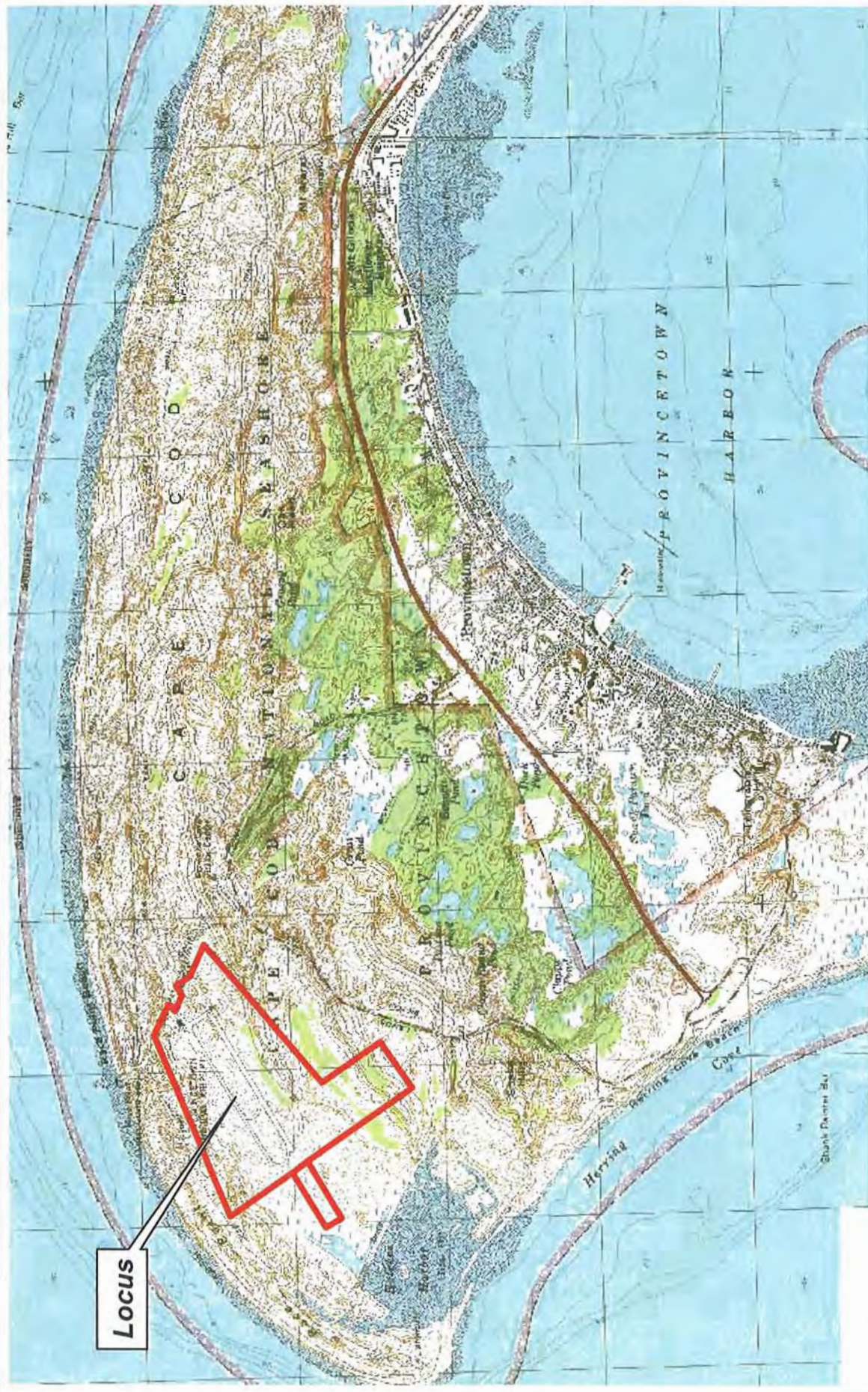
Arcus Absorbents, Inc.
1-877-227-6727
www.arcusabsorbents.com/

West Coast Spill Supplies
1-888-548-3800
www.spillsupply.com/

Guardian Environmental
1-860-350-2200
www.guardianenvironmental.com


Ben Meadows
1-800-241-6401
www.benmeadows.com

FIGURES:



Locus

Legend

 Lease Line



Horsley Witten Group
phone 508-833-6600
www.horsleywitten.com

USGS Locus
Provincetown Municipal Airport
Provincetown, MA

3/9/07 ec ec
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Figure 1

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Aerial Photo
Provincetown Municipal Airport
Provincetown, MA

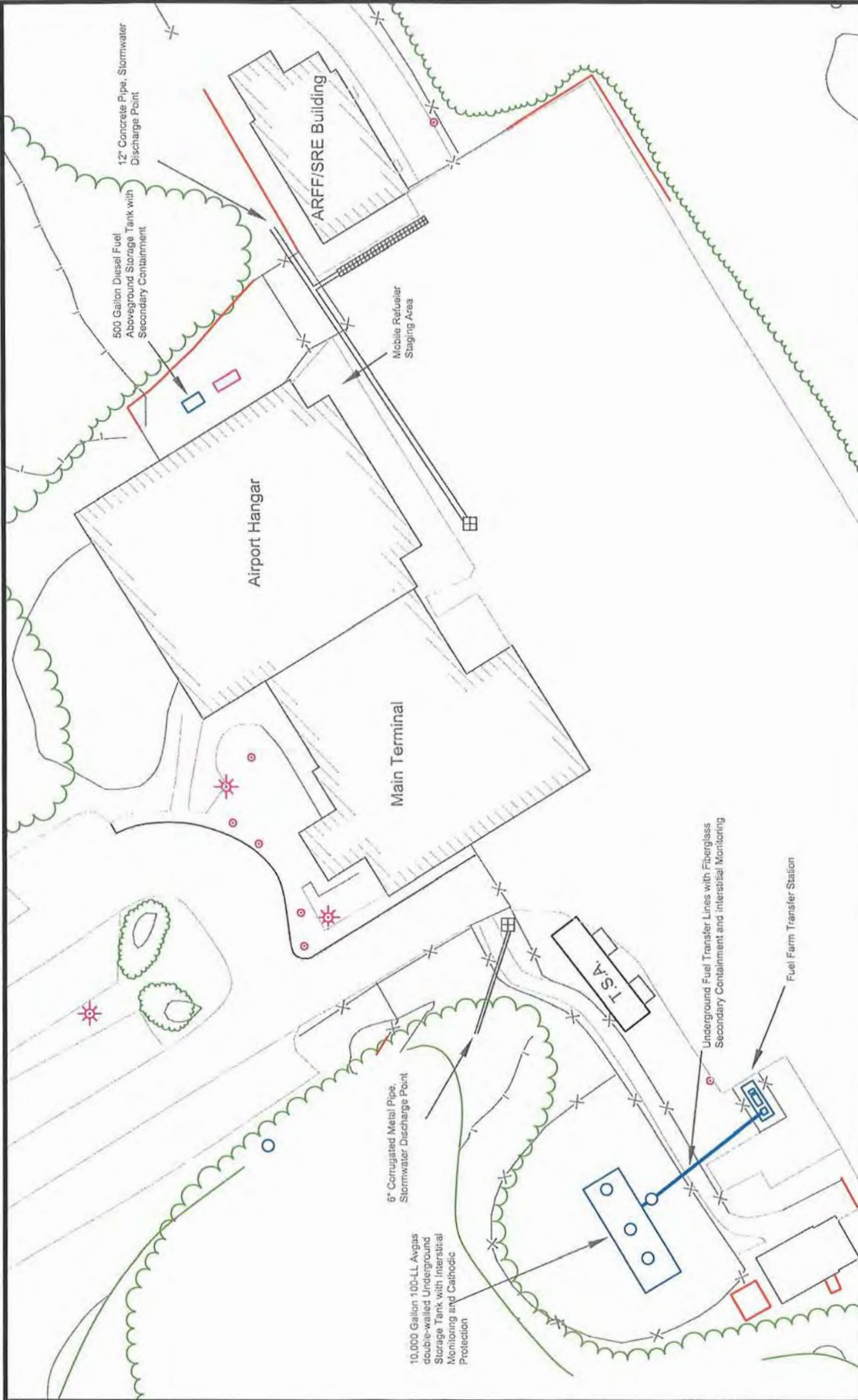
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Figure 2



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Provincetown Municipal Airport Fuel Storage Locations and Site Layout

04/13/07 GH SPCCP Fig 3.dwg

Figure 3

North



APPENDIX 4
Traffic and Parking Study Reports

1. Traffic Operation Report and Parking Analysis, Jacobs Edwards and Kelcey, November 2006, revised March 2008
2. Supplemental Parking Memo, Jacobs Engineering, September, 2008

Appendix 4.1 Traffic Operation Report and Parking Analysis, Jacobs Edwards and Kelcey, November 2006, revised March 2008

**TRAFFIC OPERATION REPORT AND
PARKING ANALYSIS**

**PROVINCETOWN MUNICIPAL AIRPORT
*PROVINCETOWN, MASSACHUSETTS***



PREPARED FOR:

**Provincetown Municipal Airport Commission
P.O. Box 657, Race Point Road
Provincetown, MA 02657**

PREPARED BY:

**Jacobs Edwards and Kelcey
343 Congress Street
Boston, MA 02210**

November 2006

Revised March 2008

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1. Turning Movement Counts 2006
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3. Network Sheets
4. Crash Data Calculations
5. March 26, 2008 Memo

1.0 INTRODUCTION

This report evaluates traffic operations and parking demand to support the environmental analysis and permitting for the Provincetown Municipal Airport's Capital Improvements Plan. The November 2006 Report has been revised to respond to comments received on the Draft EIR/EA. The traffic analysis has been prepared in conformance with MEPA guidelines for Traffic Impact Assessment and the Cape Cod Commission's guidance documents. The report examines traffic impacts, parking, transportation demand management (TDM), bicycle facilities, and pedestrian accommodations. The operational efficiency of the existing parking facility, traffic operations at the intersection of Route 6 at Conwell Street and Race Point Road, and the intersection of Race Point Road with Airport Drive has been examined. Parking demand for existing and future conditions has also been evaluated.

Data collection revealed heavy use on the local roadways during the summer tourist season. However, traffic analysis at the intersection of Route 6 and Conwell Street showed that the existing signal could accommodate future increases in demand at the Airport. Additionally, the traffic analysis for the intersection of Airport Drive and Race Point Road also indicates that the intersection (unsignalized) can accommodate future increases. Concerning parking, the average weekday demand for parking at the Airport is met by the existing parking area, but the parking area is operating close to full capacity. The Airport's passenger parking area, however, does not meet existing peak demand periods. The need for additional parking spaces to meet existing peak demand periods, as well as future increases in passenger enplanements, is discussed further in the parking analysis section.

2.0 TRAFFIC OPERATIONS STUDY

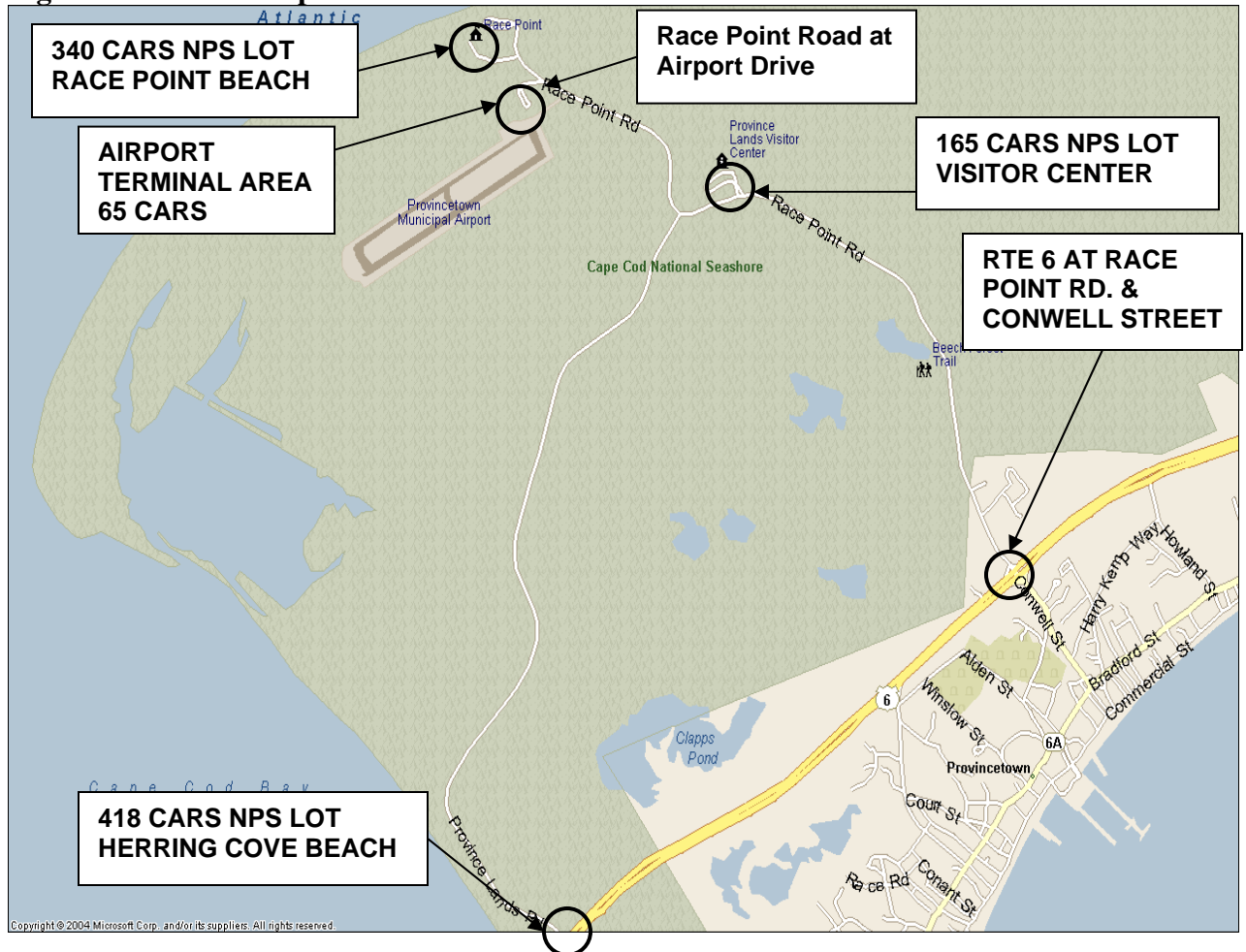
2.1 Background & Study Area

Provincetown Municipal Airport, located in Provincetown, MA, is a Primary Service Airport as defined by the Federal Aviation Administration (FAA). It serves scheduled commercial flights, private sightseeing tours, and general aviation. During the peak summer months of June, July, and August, there are six flights per day to Boston-Logan (BOS) in nine-passenger Cessna 402 commuter planes operated by Cape Air. During the peak seasons, each scheduled "flight" can actually require as many as six extra sections (aircraft) to accommodate passenger demand. In addition there are also sightseeing tours originating at the Airport, as well private general aviation activity. During the peak season in 2004, nearly 2,700 passengers arrived and departed through the Provincetown Municipal Airport monthly. The Airport is located within the Cape Cod National Seashore, part of the National Park Service (NPS), which also has a peak season with a significant increase in the number of summer visitors. The main access for both the Airport and the visitor center is Race Point Road. Figure 1 shows the location of the Airport, roads, the NPS Province Lands Visitor Center, NPS parking lots, and intersections within the study area.

Traffic on Race Point Road, leaving northbound from the intersection with Route 6 and Conwell Street, enters the National Seashore, passes an intersection with Province Lands Road, and arrives at the Airport driveway approximately two miles from the intersection with Route 6. Race Point Road continues on to Race Point Beach, where special off-road vehicles may

continue on the beach or along specific restricted Park Service roads. The NPS operates a large, five-bay parking facility at Race Point Beach that is capable of parking approximately 340 automobiles. The NPS also operates a 165 car parking lot at the Province Lands Visitor Center and a 418 car parking lot at Herring Cove Beach, at the west end of Province Lands Road. Although vehicles may arrive at the Airport via Province Lands Road, traffic counts conducted by the Cape Cod Commission (CCC) revealed traffic is very light on this road, and the vast majority of the traffic utilizes Race Point Road for Airport access. An analysis of the intersection of Province Lands Road and Route 6 was not scoped by MEPA and would not be warranted based on the CCC traffic counts.

Figure 1 Location Map



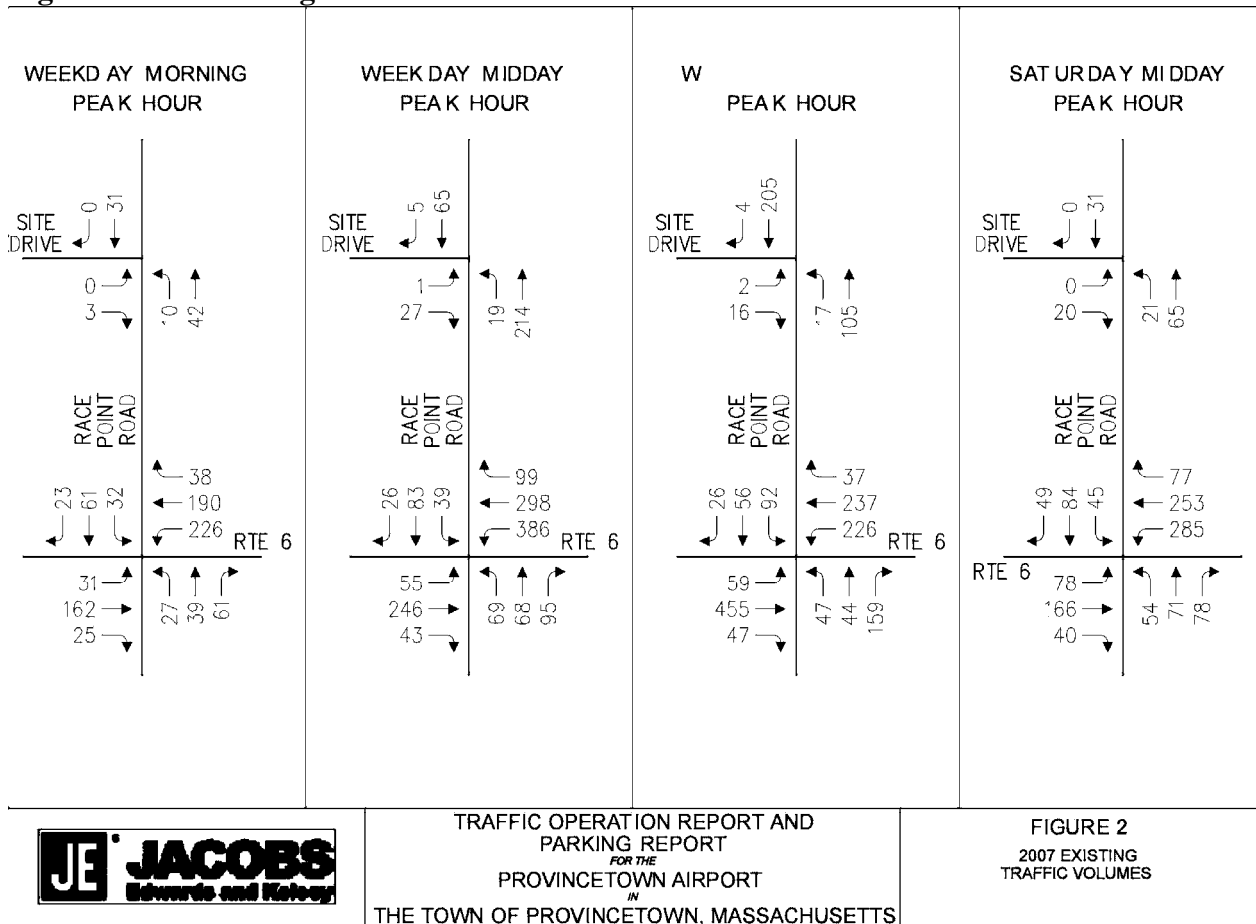
Within the study area, Race Point Road, Province Lands Road, and Conwell Street are all two lane local roads. The intersection of Race Point Road and Province Lands Road is under stop control. Route 6 is a major arterial with two travel lanes and a speed limit of 55 mph. There are exclusive left turn lanes at the intersection with Conwell Street and Race Point Road.

2.2 Data Collection

Automatic Traffic Recorders (ATR) and Turning Movement Counts (TMC) were used to collect current traffic data in August 2006, and August/September 2007, which is within the peak period. The ATRs were placed along Airport Drive, west of Race Point Road, Race Point Road, south of Airport Drive, and on Race Point Road, north of Route 6 (near the National Park boundary). These ATRs collected average daily traffic volumes over an extended period of time and provide an hourly volume breakdown.

The TMCs were performed during the weekday morning, midday, evening and Saturday midday peak periods. The TMCs were conducted at the study area intersections of Route 6 at Race Point Road, and Race Point Road at Airport Drive. The existing traffic volumes are depicted on Figure 2, with the traffic count information provided in the *Technical Appendix* of this report.

Figure 2 2007 Existing Traffic Volumes



In addition, a parking occupancy and turnover study of the Airport parking area was conducted. The results of the parking study are discussed in Section 3.0.

2.3 Level of Service Criteria

Level of Service (LOS) is a term used to describe the quality of the traffic flow on a roadway facility at a particular point in time. It is an aggregate measure of travel delay, travel speed, congestion, driver discomfort, convenience, and safety based on a comparison of roadway facility capacity to travel demand. Operating levels of service are reported on a scale of A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. LOS A represents free-flow conditions with little or no traffic delays, while LOS F represents a forced-flow condition with long delays and traffic demands exceeding roadway capacity.

Roadway operating levels of service are calculated following procedures defined in the *2000 Highway Capacity Manual (HCM)*, published by the Transportation Research Board. For signalized intersections, the operating level of service is based on travel delay. Delay can be measured in the field, but is generally calculated as a function of the traffic volume; quality of traffic progression; the green ratio; the cycle length; the v/c (volume/capacity) ratio; and the capacity of each intersection approach, as appropriate. Delay criteria for unsignalized intersections are calculated for the side street or minor street approach and for left turns from the major street. The specific criteria applied per the HCM for signalized and unsignalized intersections are summarized in Table 1.

Table 1 Intersection Level of Service Criteria		
Level of Service	Average Stopped Delay per Vehicle (seconds)	
	Signalized Intersection	Unsignalized Intersection
A	0 - 10	0 - 10
B	>10 - 20	>10 - 15
C	>20 - 35	>15 - 25
D	>35 - 55	>25 - 35
E	>55 - 80	>35 - 50
F	>80	>50

Source: *Highway Capacity Manual*, Special Report 209, Transportation Research Board; Washington, DC; 2000.

2.4 Capacity Analysis

Existing Conditions

Existing peak hour traffic operations in the traffic study area were assessed from both a quantitative and qualitative perspective. The qualitative analysis is based on field observations made during peak traffic periods, while the quantitative analysis is based on calculated intersection operating levels of service as described in greater detail below.

Utilizing the TMC collected for this project, the Study Team conducted a level-of-service (LOS) analysis of the signalized intersection of Route 6 at Conwell Street and Race Point Road and the unsignalized intersection of Race Point Road and Airport Drive. The analysis was done by using the widely accepted software program Synchro v.6.0, which is based upon the concepts and

procedures described in the HCM. The summary of the analysis is shown in Figure 2 and Tables 2 and 3. In addition to delay, the 95th percentile queue length is shown, which represents the maximum queue length, and the volume to capacity ratio (v/c) is reported, which measures the saturation of a particular approach. Values typically fall between 0 and 1.0, with values over 1.0 implying that the approach or intersection exceeds capacity.

Table 2 Signalized Intersection Level of Service Summary

Intersection/Peak Period/Movement	2007 Existing Conditions				2024 Design Year Conditions				2024 Design Year Conditions			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d 50 th /95 th	V/C	Delay	LOS	Queue ^d 50 th /95 th	V/C	Delay	LOS	Queue ^d 50 th /95 th
Route 6 at Conwell Street and Race Point Road												
<i>Weekday Morning Peak Hour:</i>												
Route 6 EB L	0.04	2.9	A	3/12	0.05	3.1	A	4/15	0.05	3.1	A	4/15
Route 6 EB T	0.07	2.9	A	9/20	0.09	3.2	A	12/27	0.09	3.2	A	12/27
Route 6 EB R	0.02	2.8	A	0/7	0.02	3.0	A	0/8	0.02	3.0	A	0/8
Route 6 WB L	0.28	4.3	A	30/69	0.36	5.2	A	39/97	0.36	5.2	A	39/97
Route 6 WB T	0.08	3.0	A	11/23	0.10	3.3	A	14/30	0.10	3.3	A	14/30
Route 6 WB R	0.03	2.9	A	0/8	0.03	3.1	A	0/10	0.03	3.1	A	0/10
Conwell Street NB LT	0.27	27.2	C	22/52	0.32	25.4	C	28/61	0.32	25.2	C	28/61
Conwell Street NB R	0.04	25.7	C	0/26	0.05	23.6	C	0/28	0.05	23.4	C	0/28
Race Point Road SB LT	0.37	28.0	C	32/69	0.48	26.8	C	44/87	0.48	26.6	C	44/87
Race Point Road SB R	0.02	25.5	C	0/16	0.02	23.4	C	0/19	0.02	23.3	C	0/19
Overall	0.30	9.6	A	--	0.38	9.8	A	--	0.38	9.7	A	--
<i>Weekday Midday Peak Hour:</i>												
Route 6 EB L	0.08	3.5	A	7/23	0.12	4.7	A	10/30	0.12	4.7	A	10/30
Route 6 EB T	0.11	3.5	A	16/36	0.14	4.7	A	22/46	0.14	4.8	A	22/46
Route 6 EB R	0.03	3.3	A	0/11	0.03	4.4	A	0/12	0.03	4.4	A	0/12
Route 6 WB L	0.54	8.0	A	73/193	0.75	16.0	B	114/349	0.75	16.1	B	114/349
Route 6 WB T	0.13	3.7	A	20/43	0.17	5.0	A	27/55	0.17	5.0	A	27/55
Route 6 WB R	0.07	3.5	A	0/16	0.08	4.7	A	0/19	0.08	4.7	A	0/19
Conwell Street NB LT	0.58	31.2	C	49/97	0.55	23.5	C	62/116	0.56	23.8	C	63/118
Conwell Street NB R	0.07	25.2	C	0/32	0.08	19.1	B	0/34	0.08	19.1	B	0/34
Race Point Road SB LT	0.44	28.1	C	43/85	0.44	21.7	C	55/104	0.45	21.8	C	57/107
Race Point Road SB R	0.02	24.9	C	0/17	0.02	18.8	B	0/19	0.02	18.8	B	0/19
Overall	0.55	10.9	B	--	0.70	11.9	B	--	0.70	12.0	B	--
<i>Weekday Evening Peak Hour:</i>												
Route 6 EB L	0.08	3.6	A	8/26	0.12	5.0	A	11/32	0.13	5.1	A	12/33
Route 6 EB T	0.20	3.9	A	34/69	0.27	5.5	A	48/85	0.27	5.6	A	48/85
Route 6 EB R	0.03	3.4	A	0/12	0.04	4.7	A	0/13	0.04	4.7	A	0/13
Route 6 WB L	0.41	6.7	A	39/111	0.60	12.6	B	61/170	0.60	12.7	B	61/170
Route 6 WB T	0.11	3.7	A	16/37	0.14	5.1	A	23/45	0.14	5.2	A	23/45
Route 6 WB R	0.03	3.5	A	0/10	0.04	4.7	A	0/13	0.04	4.8	A	0/13
Conwell Street NB LT	0.36	24.1	C	32/67	0.36	20.9	C	42/84	0.36	20.9	C	42/85
Conwell Street NB R	0.11	22.2	C	0/40	0.13	19.2	B	0/43	0.13	19.1	B	0/43
Race Point Road SB LT	0.58	27.5	C	54/104	0.58	24.1	C	70/130	0.59	24.1	C	71/132
Race Point Road SB R	0.02	21.7	C	0/17	0.02	18.5	B	0/19	0.02	18.5	B	0/19
Overall	0.45	10.1	B	--	0.59	11.0	B	--	0.60	11.0	B	--
<i>Saturday Midday Peak Hour:</i>												
Route 6 EB L	0.11	3.4	A	9/29	0.16	4.7	A	13/39	0.16	4.7	A	13/40
Route 6 EB T	0.07	3.3	A	10/24	0.10	4.4	A	14/32	0.10	4.5	A	14/32
Route 6 EB R	0.03	3.2	A	0/10	0.03	4.2	A	0/12	0.03	4.3	A	0/12
Route 6 WB L	0.37	5.4	A	43/107	0.50	8.5	A	61/156	0.50	8.6	A	62/156
Route 6 WB T	0.11	3.5	A	15/34	0.15	4.7	A	22/46	0.15	4.7	A	22/47
Route 6 WB R	0.05	3.3	A	0/13	0.07	4.4	A	0/17	0.07	4.5	A	0/17
Conwell Street NB LT	0.54	29.8	C	45/89	0.51	22.6	C	57/108	0.51	22.6	C	57/108
Conwell Street NB R	0.05	25.3	C	0/29	0.06	19.2	B	0/31	0.06	19.1	B	0/31
Race Point Road SB LT	0.50	28.9	C	46/91	0.50	22.4	C	61/113	0.51	22.4	C	62/115
Race Point Road SB R	0.03	25.2	C	0/23	0.04	19.0	B	0/25	0.04	19.0	B	0/26
Overall	0.40	11.1	B	--	0.50	10.5	B	--	0.50	10.6	B	--

^aVolume to Capacity Ratio

^bAverage Delay Time in Seconds

^cLevel-of-Service

^dQueue Length in Feet.

NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound; NEB Northeastbound; SEB = Southeastbound; SWB = Southwestbound; NWB = Northwestbound.

L = Left Turn; T = Through; R = Right Turn; LT = Shared Left-turn/Thorough; TR Shared Through/Right-turn; LR = Shared Left/Right-turn; LTR = Shared Left/Through/Right-turn.

Table 3 Unsignalized Intersection Level of Service Summary

Intersection/Peak Period/Movement	2007 Existing Conditions				2024 Design Year Conditions				2024 Design Year Conditions			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
Race Point Road at the Provincetown Airport Driveway												
<i>Weekday Morning Peak Hour:</i>												
Provincetown Airport Driveway EB LR	0.00	8.5	A	0	0.00	8.5	A	0	0.00	8.5	A	0
Race Point Road NB LT	0.01	1.5	A	1	0.01	1.3	A	1	0.01	1.5	A	1
Race Point Road SB TR	0.02	0.0	A	1	0.02	0.0	A	0	0.02	0.0	A	0
<i>Weekday Midday Peak Hour:</i>												
Provincetown Airport Driveway EB LR	0.03	8.8	A	2	0.03	8.9	A	2	0.04	8.9	A	3
Race Point Road NB LT	0.01	0.7	A	1	0.01	0.6	A	1	0.02	0.8	A	1
Race Point Road SB TR	0.04	0.0	A	0	0.05	0.0	A	0	0.05	0.0	A	0
<i>Weekday Evening Peak Hour:</i>												
Provincetown Airport Driveway EB LR	0.02	9.7	A	2	0.03	10.0	A	2	0.03	10.0	A	2
Race Point Road NB LT	0.01	1.2	A	1	0.01	1.0	A	1	0.02	1.2	A	1
Race Point Road SB TR	0.13	0.0	A	0	0.16	0.0	A	0	0.16	0.0	A	0
<i>Saturday Midday Peak Hour:</i>												
Provincetown Airport Driveway EB LR	0.02	8.5	A	2	0.02	8.6	A	2	0.02	8.6	A	2
Race Point Road NB LT	0.01	1.9	A	1	0.01	1.7	A	1	0.02	1.8	A	1
Race Point Road SB TR	0.02	0.0	A	0	0.02	0.0	A	0	0.02	0.0	A	0
^a Volume to Capacity Ratio ^b Average Delay Time in Seconds ^c Level-of-Service ^d Queue Length in Feet. NB = Northbound; SB = Southbound; EB = Eastbound. LT = Shared Left-turn/Thorough; TR Shared Through/Right-turn; LR = Shared Left/Right-turn.												

As shown in Table 2, the overall LOS during all time periods is acceptable, with the only concern being the 469-foot queue from Route 6 West onto Conwell Street. This turn, however, is into Provincetown center, away from the Airport and the study area. Turning movements relevant to the Airport route, such as Race Point Road southbound, have acceptable delays.

Future Conditions

In order to assess the potential traffic impacts of the proposed project, existing traffic volumes were projected to a future design year. A **seventeen-year traffic projection** was utilized on the study area roadways for consistency with the Providence Airport 2005 Master Plan. It should be noted that this horizon exceeds the MEPA guidelines for the preparation of traffic impact studies, which typically prescribes a five-year horizon. Under the No-Build alternative, traffic increases along the study area roadways are associated with normal traffic growth patterns as well as other currently planned development projects.

The **2024 Build** scenario consists of anticipated traffic associated with the project superimposed upon the 2024 No-Build scenario traffic volumes. The impacts of the proposed development may be determined by making comparisons to the 2024 No-Build alternative, which assumes that the project is not built. The development and analysis of these future traffic flows for both the No-Build and Build conditions are described in the following text.

Traffic Growth from Other Developments

Traffic growth on area roadways is a function of the expected land development in the immediate area, as well as the surrounding region. Several methods are used to estimate this growth. To develop the seventeen-year forecast, two components of traffic growth were considered: traffic generated by both background growth and planned projects.

First, an annual-average traffic-growth percentage was determined. After a review of CCC historical traffic volume data at several locations within the Town of Provincetown, it was determined that traffic volumes have actually decreased by approximately 0.6 percent per year over the past 10 years. However, to present a conservative (worst case) analysis and to match standard regional/local engineering practices, an increase of 1.0 percent per year compounded annual growth rate was used to account for general background traffic growth.

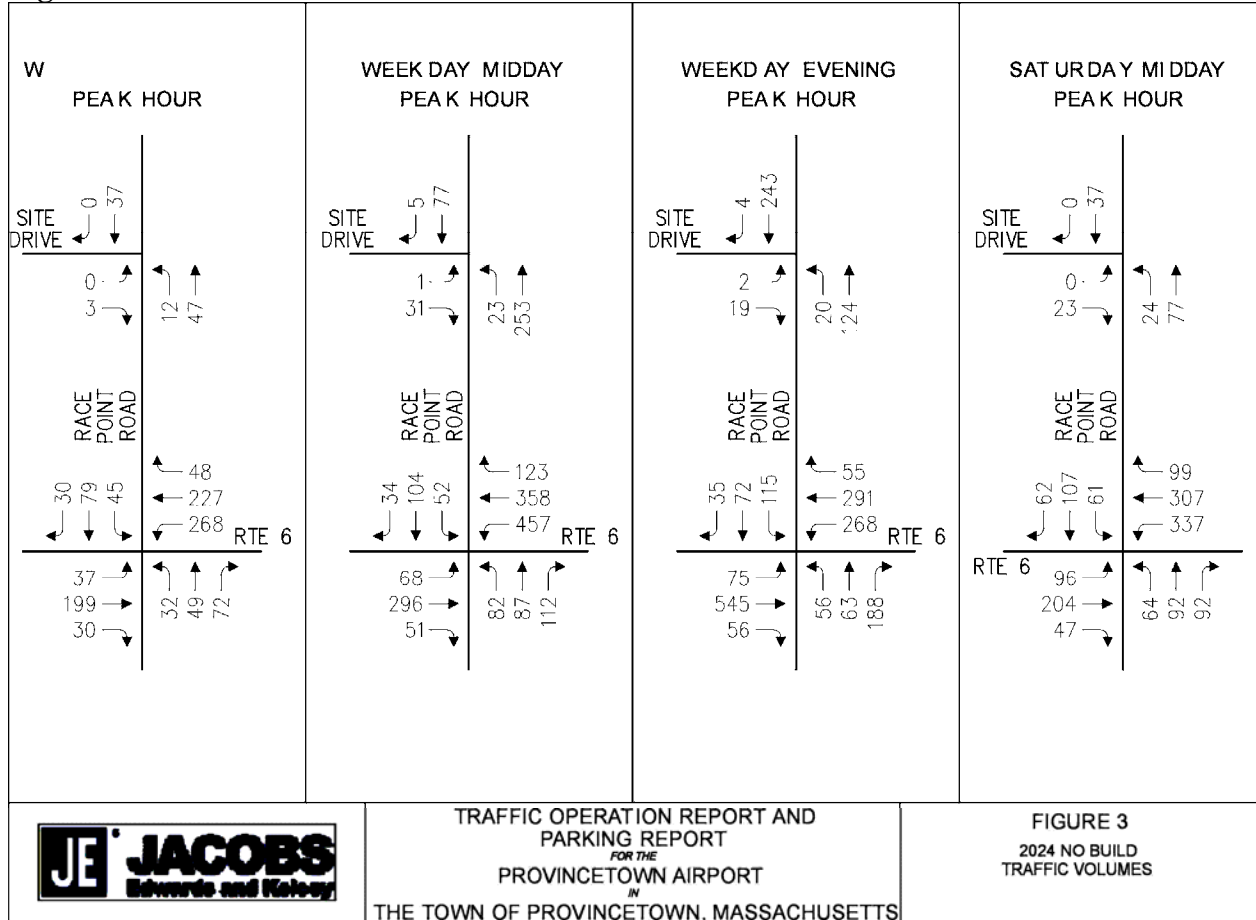
Second, any planned or approved specific developments were included that would generate a significant volume of traffic on study area roads within the next 17 years. Based on discussions with officials from the Town of Provincetown in February-March 2008, there are several projects planned that will add traffic to the study area in the near future:

- Proposed 19-35 Race Point Road Residential Development, Provincetown, MA. This proposed project consists of the construction of 35 residential apartment units located off Race Point Road just north of the intersection of Route 6, and to the south of the Provincetown Airport. Traffic volumes associated with this development were estimated based on trip generation calculations provided by the ITE and distributed based on existing roadway travel patterns. The network sheets are included in the *Technical Appendix*.
- Proposed Shankpainter Road Residential Development, Provincetown, MA. At this time, it is anticipated that a future development will be constructed on Shankpainter Road, located off Route 6 east of the study area. This project is at its preliminary stages and may undergo several alterations before a final construction plan is determined. In order to provide a conservative estimation of traffic conditions, it was assumed that this development would be constructed as a 40-unit apartment complex. This estimate was based on discussions with the Town of Provincetown and applied to the roadway based on trip generation calculations provided by the ITE and distributed based on existing roadway travel patterns. These trips are included in the *Technical Appendix*.

Additionally, based on a review of the MassHighway Transportation Improvement Plan, no roadway improvement projects (outside of routine maintenance) are anticipated within the study area.

The 2024 No-Build traffic volume networks were developed by applying a background growth rate and by adding traffic associated with proposed developments to be completed by others. The 2024 No-Build peak-hour traffic flow networks are represented on Figure 3.

Figure 3 2024 No Build Traffic Volumes



Project Generated Traffic Growth

Anticipated traffic volumes to be generated by the proposed development were determined and assigned to the 2024 No Build roadway networks in order to develop the 2024 Build traffic scenarios. Procedures used to generate and assign trips to the roadway networks are described below and discussed in more detail in a memo included in the *Technical Appendix*.

Project Trip Generation

Anticipated 2024 traffic volumes were based on Passenger Enplanement projections published in the Provincetown Airport 2005 Master Plan. The forecasted enplanement totals were applied to a trip rate which was empirically calculated based on the existing amount of vehicular traffic entering and exiting the site. This methodology was suggested by CCC and is similar to one used to generate vehicular trips associated with the Terminal project at the Barnstable Airport. The projected number of trips was then subtracted from the existing traffic, in order to arrive at the increased amount of trips estimated to be generated by the Provincetown Airport in the future.

Presently, 141 passengers use the Provincetown Airport on a peak period average day (as stated in the 2005 Master Plan). Reviewing traffic counts conducted at the site driveway, 13 vehicles

access the site (10 enter, 3 exit) during the weekday morning peak period, 52 vehicles access the airport during the weekday midday peak period (24 enter, 28 exit), 39 access the airport during the weekday evening peak period (21 enter, 18 exit) and 41 access the airport during the Saturday midday peak period (21 enter, 20 exit). Projecting these volumes based on the anticipated future passenger count results in motor vehicle trip increases ranging from 2 to 8 vehicles during the peak periods. The analysis results are summarized in Table 4.

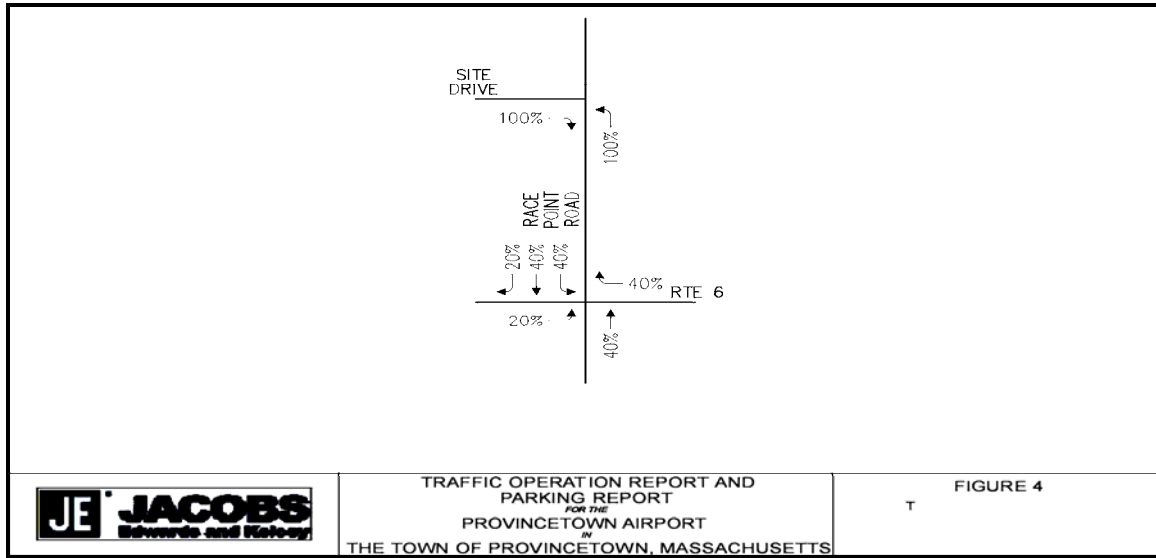
Table 4 Trip Generation Using Empirical Method							
	(A) Existing Number of Daily Passengers ¹	(B) Existing Airport Generated Trips ²	(C=A/B) Trip Generation Rate	(D) Projected Number of Daily Passengers ¹	(E=DxC) Projected Airport Generated Trips	(F=E-B) Trip Increase	(G=F/B) Percentage of Trip Generation Increase
Weekday Morning Peak Hour	141	13	0.09	162	15	2	15.4%
<i>Entering</i>		10			12	2	20.0%
<i>Exiting</i>		3			3	0	0.0%
Weekday Midday Peak Hour	141	52	0.37	162	60	8	15.4%
<i>Entering</i>		24			28	4	16.7%
<i>Exiting</i>		28			32	4	14.3%
Weekday Evening Peak Hour	141	39	0.28	162	45	6	15.4%
<i>Entering</i>		21			24	3	14.3%
<i>Exiting</i>		18			21	3	16.7%
Saturday Midday Peak Hour	141	41	0.29	162	47	6	14.6%
<i>Entering</i>		21			24	3	14.3%
<i>Exiting</i>		20			23	3	15.0%
¹ Based on the 2024 Demand Forecasts Section of the 2005 Airport Master Plan, Peak Period Average Day.							
² As observed in August 2007.							

Project Trip Distribution

The directional distribution of proposed new site traffic on the area roadways is based on the existing traffic flow pattern observed within the study area and is shown in Table 5. This distribution is also depicted on Figure 4.

Table 5 Trip Distribution Summary		
Road	Direction (To/From)	Percent Site Traffic Distribution
Route 6	East	40%
Route 6	West	20%
Conwell Street	South	40%
	Total	100%

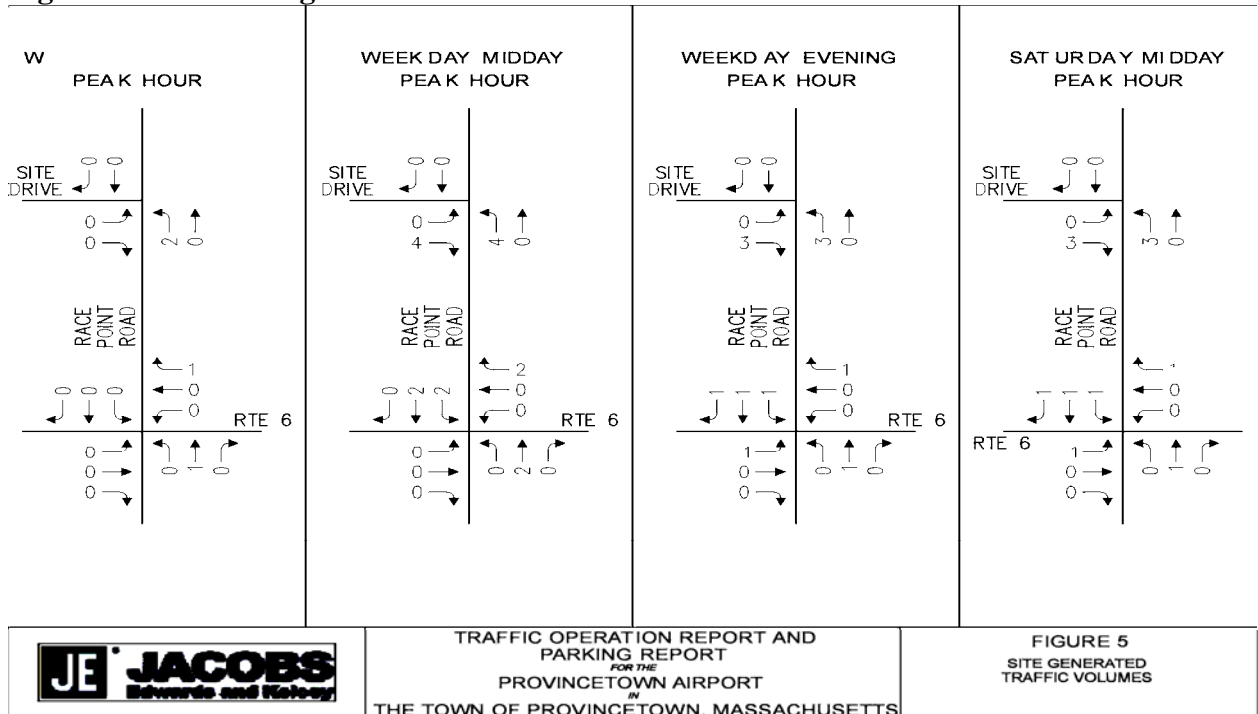
Figure 4 2007 Race Point Road Turning Distribution



The results indicate approximately 40 percent of the new site traffic is expected to and from the east on Route 6, 20 percent is expected to and from the west on Route 6 and 40 percent is expected to and from the south on Conwell Street.

The site generated volumes are shown in Figure 5 for the weekday morning, midday, and evening and Saturday midday peak hours.

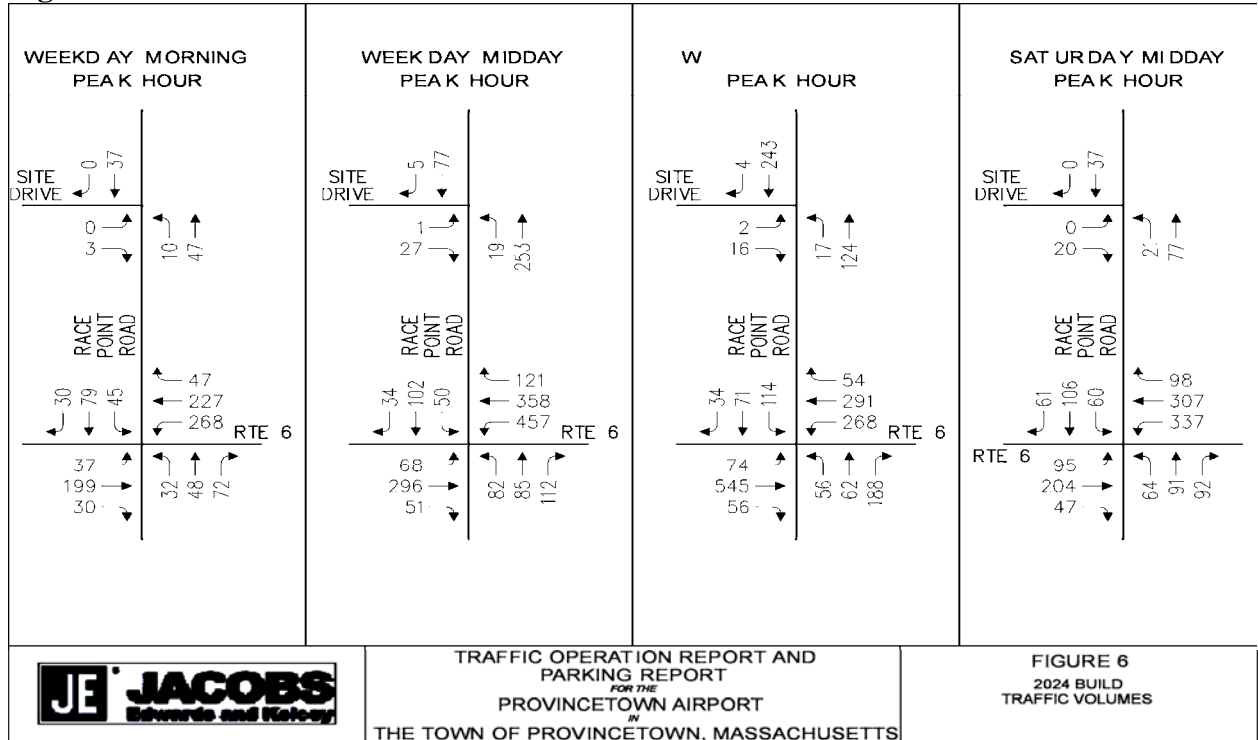
Figure 5 2007 Existing Traffic Volumes



Future Traffic Volumes

Anticipated site-generated traffic volumes were combined with the 2024 No Build peak hour traffic volumes. The resulting traffic flows represent the 2024 Build weekday morning, midday, evening, and Saturday midday peak periods, as illustrated on Figure 6.

Figure 6 2024 Build Scenario Traffic Volumes



Summary of LOS Analysis Results

Level of Service analyses were conducted utilizing Synchro software methodology to determine the Existing, No Build and Build peak hour operating levels of service at the study area intersections. The results for signalized intersection are shown in Table 2, with the unsignalized intersections shown on Table 3.

Signalized Intersection of Route 6 at Conwell Street and Race Point Road

Under all conditions (2007 Existing, 2024 No Build and 2024 Build), this intersection currently operates at LOS A during the weekday morning peak hour and at LOS B during the weekday midday, evening and Saturday midday peak hours.

Unsignalized Intersection at Race Point Road and Airport Drive

Under all conditions, the critical movements (all movements from the Provincetown Airport driveway) at this unsignalized intersection operate at LOS A during the weekday morning, midday, and evening and Saturday midday peak hours.

2.5 Motor Vehicle Crash Data

Crash data was obtained from the MassHighway Crash Database for accidents occurring within the study area over the most recent three-year period, 2004-2006. Crash data for a given location is provided in terms of severity (property damage only, injury or fatality), collision type, and number of accidents. A summary of this crash data is shown in Table 6. A total of 6 crashes occurred within the study area roadways, all at the intersection of Route 6 at Race Point Road and Conwell Street. Approximately 50 percent of the accidents were either angle type or rear end crashes, indicating turning conflicts with through movements or failures to yield. No fatalities occurred within the study area during this period.

Crash data for a given location is normally identified as either a spot location (intersection, bridge or major driveway), or road section (mid-block) of varying length. The accident rate basis for calculations presented in Table 6 is based on spot locations. The formula for calculating the crash rate for an intersection or spot location is typically expressed in million entering vehicles (MEV).

High-accident locations can be identified where frequency of occurrence exceeds the average rates for similar locations or conditions. The calculated rates for each intersection were compared with MassHighway's 2005 Average Accident Rates for District 5, which includes the South Shore and the Cape. The average MEV for District 5 is 0.84 for signalized intersections and 0.59 for unsignalized intersections. The calculated crash rate for the intersection of Route 6 at Race Point Road and Conwell Street is 0.33, lower than average for signalized intersections. The crash rate calculations are provided in the *Technical Appendix*.

Table 6 Accident Data Summary										
Location	Number of Accidents		Crash Rate ^b	Severity			Type			
	Total	Avg/Year		PD ^a	PI ^b	F ^c	CM ^d	RE ^e	HO ^f	Other
Route 6 at Race Point Road and Conwell Street	6	2.00	0.33	1	5	0	1	2	2	1
Race Point Road at the Provincetown Airport Driveway	0	0.00	0.00	0	0	0	0	0	0	0
Total	6	-	-	1	5	0	1	2	2	1
^a Property Damage Only; ^b Personal Injury; ^c Fatality; ^d Cross Movement (or angle); ^e Rear End; ^f Head On.										
^b Crash Rate Per Million Entering Vehicles (MEV)										

3.0 PARKING CAPACITY ANALYSIS

3.1 Data Collection

The parking study was conducted on Thursday, August 24, 2006, immediately after the TMCs and was taken during three time periods, from 9:10 AM to 9:40 AM, 1:40 PM to 2:10 PM, and 6:20 PM to 6:50 PM. At three 10-minute intervals within each time period, the field engineer wrote down the license plates of all of the vehicles in the parking lot. The three intervals helped create a better understanding of the parking turnover and occupancy during the set time periods.

3.2 Parking Data Review

The existing PVC parking lot has a total of 62 spaces, including 3 spaces designated for handicapped plate vehicles and 5 for the Enterprise Rental Car Company. Employee parking is in a separate area and is not included in this analysis. The parking occupancy data was analyzed and sub-divided into three categories, regular passenger parking, rental car spaces, and handicapped spaces. Table 7 reviews the occupancy of the existing spaces taken during a single weekday in August 2006. The percentage has not been averaged or adjusted. Additional qualitative observations were made during a week in the summer of 2007. Occupancy was higher than that observed in 2006.

Table 7 Parking Lot Weekday Occupancy			
	AM Period	Midday Period	PM Period
Passenger Parking	63.2 %	83.9 %	66.1 %
Rental Cars	100.0 %	100.0 %	100.0 %
Handicapped	0.0 %	22.2 %	0.0 %
Overall	63.1 %	82.3 %	74.7 %

As shown in Table 7, during the midday the parking lot is fairly well occupied. The rental car spaces were always occupied because the car rental company transfers cars as needed from the employee lot. The field engineer observed that there were additional rental cars parked in conventional two hour spaces. It is important to note, applying duration data to the occupancy numbers, that 16 spaces were occupied by vehicles during the entire day. Excluding the 5 rental car spaces, these long-term occupants account for 27% (16 out of 59) of the overall parking occupancy. In terms of turnover, there was very little turnover observed during any of the observation periods. During all intervals, there were no changes at any of the parking spaces in at least 85% of the available spaces.

3.3 Parking Generation

Recognized guidelines for parking and trip generation are published by the Institute of Transportation Engineers (ITE) for many different land uses based upon studies taken across the United States. The land use code 021 (Commercial Airport) is normally used for estimating the number of spaces required at a similar Airport. However, Table 8 summarizes the number of spaces necessary at the Airport during the peak hour, based upon the number of passenger enplanements, obtained from the 2005 Airport Master Plan. The projections utilizing enplaning passengers, shown in Table 8, is a more accurate projection to use compared to flights, because of the variation of the definition of a flight and specific operating condition at the Airport. Since Cape Air aircraft are much smaller than the typical commercial flight, a flight at the airport can actually involve several planes as explained in Section 2.1.

Current peak period parking space needs range from 62 to 126 spaces using passengers over weekday or weekend data. It is projected that for the highest demand period of 2024 on a Saturday during the peak season, 145 spaces are predicted to be necessary compared to the 62 existing spaces. Thus, there is a need for up to 83 additional spaces to meet future needs.

Table 8 Parking Generation Summary							
Generator Type	Peak Period	2004 Existing Conditions			2024 Projected Conditions		
		Passengers¹	Average Parking Rate²	Parking Spaces Required	Passengers¹	Average Parking Rate	Parking Spaces Required
Enplaning Passengers	<u>Weekday</u>	141 enplaning	0.44	62	162	0.44	72
	<u>Saturday</u>	passengers	0.89	126	enplaning	0.89	145
	<u>Sunday</u>		0.84	119	passengers	0.84	137
¹ Information from the Provincetown Municipal Airport 2005 Master Plan							
² Values from ITE parking Generation handbook, 2 nd Edition, 1987.							

4.0 TRANSPORTATION DEMAND MANAGEMENT REVIEW (TDM)

Currently, there are three measures in place that will continue to reduce parking demand, referred to collectively as Transportation Demand Management (TDM). These measures are rental car availability, taxi cabs, and a shuttle bus service to Provincetown managed by the Cape Cod Regional Transit Authority (CCRTA). Enterprise Rent-A-Car currently operates out of the Airport and has 5 dedicated spaces in the parking lot. There was turnover in these spaces as the rental agency rented out the vehicles and accepted the return of old ones.

The primary taxi cab companies in Provincetown typically have one taxi that is coordinated with the arrival of the scheduled Cape Air commercial service.

The Provincetown shuttle bus previously had a scheduled stop at the Airport to pick up passengers for transit to Provincetown center, approximately 2.5 miles to the south of the Airport. The shuttle bus modified the schedule to a call when needed system, where the bus will stop at the Airport when called en-route. The shuttle bus does not seem to be synchronized with Cape Air commercial flights.

Another underutilized TDM application is parking enforcement. The Airport Commission has reported in the past that tourists traveling to Race Point Beach would utilize the Airport parking lot (no fee) as opposed to paying the National Seashore fee at the beach. Especially on the weekends, this problem has contributed to the parking shortage at the Airport.

5.0 BICYCLE AND PEDESTRIAN ACCOMMODATIONS REVIEW

Bicycles are typically not a mode of transportation used to go to the Airport. However the Provincetown Airport is immediately adjacent to the Province Lands Bicycle Path, a dedicated off-road paved path that leads most of the way to Provincetown center. One could hypothesize that a customer or employee could use their bicycle if they were taking a private sightseeing tour or utilizing general aviation (i.e. private plane).

Race Point Road does not have any sidewalks throughout its entire length and pedestrians are prohibited from using the bicycle path as a walkway. Within the Airport terminal drop-off zone, there is adequate pedestrian access.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Traffic

The Study Team observed parking and traffic operations within the study area of the Provincetown Municipal Airport in August of 2006. The traffic signal of Route 6 at Conwell Street at Race Point Road adequately handled traffic from the Airport on Race Point Road with acceptable delays and queues, and it is likely that it will continue to do so in the future condition.

Parking

Although parking demand observed on a single weekday during the peak summer period was met by the existing parking lot, the current number of spaces does not meet the needs for the existing peak weekend periods or the 2024 future projections for both weekday and weekends. There is a need for at least 83 additional spaces during the planning period.

Transportation Demand Measures (TDM)

The Airport should continue to enhance TDM measures through coordination with CCRTA, Enterprise Rent-A-Car, the National Park Service, and the Provincetown Police Department for parking enforcement. The Airport should work with Enterprise to determine the number of rental car spaces necessary during the summer peak season. Coordination between three entities (Cape Air, Cape Cod Regional Transit Authority, and the Airport Commission) might enhance ridership on the shuttle bus. Enforcement of the parking rules, with fines and towing, might address the issue of non-airport use of the lot. Similarly, long term parking without the long term permit should not be allowed. Bicycle racks are provided at the Airport. All of these measures will help to alleviate increased parking demand.

