

Chapter 9

Wetlands/Wildlife/Water Resources

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This chapter summarizes information that was included in the *Draft ESPR* for wetlands/wildlife/water resources and provides responses to scoping elements identified in the MEPA Certificate related to information about Massport's National Pollution Discharge Elimination System (NPDES) permit; groundwater and surface water monitoring at Hanscom Field; figures that illustrate the current wetlands resources at Hanscom Field and the location of local water supplies; updated information on the Vegetation Management Plan (VMP); potential effects on the Hartwell Forest/Jordan Conservation Area; Massport's spill prevention program; and current and proposed use of deicing chemicals.

Summary of the *Draft ESPR*

The *Draft ESPR* made comparisons with the results reported in the 1995 *GEIR* as appropriate, and provided information on the status of the VMP, the Stormwater Pollution Prevention Plan (SWPPP), the Shawsheen River water quality monitoring program and the 2001 NPDES permit that includes six Hanscom Field tenants. Potential future effects were evaluated for the 2005 Moderate and High Growth scenarios and the 2015 Moderate and High Growth scenarios. The analysis in the *Draft ESPR* indicated the following:

- The current status of the wetland resource areas at Hanscom Field is relatively unchanged from the existing conditions documented in the 1995 *GEIR*.
- The Massachusetts Natural Heritage and Endangered Species Program have certified three vernal pools at Hanscom Field. The vernal pools are located in Concord to the west of Runway 11-29.
- Two perennial waterways exist at Hanscom Field: the Shawsheen River in Bedford and Elm Brook within Bedford, Concord and Lincoln.
- Some areas of Hanscom Field are located within an area identified in the Massachusetts Natural Heritage Atlas as a Priority Habitat of Rare Species.
- One state listed endangered species (Upland Sandpiper) and one threatened species (Grasshopper Sparrow) have been observed on the Hanscom Field property.

Massport continues to regularly update its Spill Prevention Control and Countermeasure (SPCC) Plan . Massport maintains contracts with emergency response cleanup contractors to respond to Massport or tenant spill events. In 1998, Massport conducted comprehensive environmental compliance audits of all Massport facilities at Hanscom Field and no significant environmental matters were identified. Seven of the eight sites identified in the 1995 *GEIR* were brought to regulatory closure prior to the preparation of this *ESPR*. The eighth site identified in the 1995 *GEIR*, a Tier II Disposal Site currently in Phase IV of the Massachusetts Contingency Plan (MCP), identified in the 1995 *GEIR* is now being addressed in accordance with the requirements of the Massachusetts Department of Environmental Protection (DEP) with additional material removal scheduled to begin in Fall 2003.

National Pollution Discharge Elimination System Permit

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Airports such as Hanscom Field are required to obtain a Storm Water Multi-sector General Permit under the NPDES permit program, a part of the federal Clean Water Act (33 USC 1251 et seq.). Under this permit program administered by the U.S. Environmental Protection Agency, airport owners and/or operators must satisfy specific requirements for operations conducted at the facility that have the potential to affect stormwater quality.

As discussed on Pages 9-11 and 9-12 of the *Draft ESPR*, Massport applied for and obtained the required NPDES permit for Hanscom Field from the U.S. Environmental Protection Agency in 2001. The permit application incorporated an updated and revised SWPPP (dated January 31, 2000) in compliance with the Storm Water Multi-sector General Permit, which provides a comprehensive assessment of activities at Hanscom Field having the potential for affecting stormwater quality, mandates Best Management Practices for protection of water quality, and defines a visual inspection program for monitoring the quality of stormwater discharges. The permit does not require laboratory water quality monitoring. Results of the visual monitoring program have not indicated the presence of any sheen or solids, which might require follow up investigation or analysis.

The current NPDES permit obtained for Hanscom Field is effective February 1, 2001, and remains valid for a five year period. Six tenants leasing property on Hanscom Field that engage in activities covered under the permit program are included as co-permittees under the NPDES permit: East Coast Aero Tech; East Coast Aviation; Executive Flyers Aviation; Jet Aviation of America, Inc.; Liberty Mutual Insurance Company; and Mercury Air Center.

Water Quality Monitoring

The *Draft ESPR* reported on Massport's surface water quality monitoring program at stormwater outfalls from Hanscom Field to the Shawsheen River and Elm Brook over the four-year period from 1998 to 2001. This monitoring program was undertaken as a follow-up to the 1995 *GEIR*. Six rounds of surface water samples from three specified locations were collected over the four-year period and submitted for laboratory analysis. The samples were analyzed for a variety of physical and chemical properties. The results of the monitoring were compared with typical concentrations that may be found in inland surface waters and stormwater. In general, the observed water quality parameters were within appropriate benchmark values. Based upon the results of this program, no further water quality sampling is planned.

Currently, groundwater monitoring is only conducted in association with MCP site cleanup activities. No contaminants are introduced into the groundwater as the result of airport operations. As indicated in the *Draft ESPR*, there is only one active MCP site at Hanscom Field and no effects resulting from soil contamination have been observed in the groundwater. However, groundwater will be monitored and treated if applicable during remediation scheduled to take place during Fall 2003.

Massport's spill prevention program as detailed on page 9-15 of the *Draft ESPR* includes development and implementation of an SPCCP, maintenance of contracts with emergency response contractors and implementation of annual environmental health and safety training that includes spill prevention training.

Wetlands Resources

Figure 9-1 is a comprehensive wetlands resource map of Hanscom Field that incorporates the wetland delineations determined for the Notice of Intent (NOI) filings for the 2002 VMP. Table 9-1 provides descriptions of the individual Hanscom Field wetland areas' vegetation, soils, and hydrology. As noted in the *Draft ESPR*, wetland boundaries, overall, remain similar to those originally delineated in 1996 and certified by the towns through an Abbreviated Notice of Resource Area Delineation (ANRAD) process in 1998.

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Water Resources

The locations of public water supplies within Bedford, Concord, Lexington and Lincoln are shown on Figure 9-2. Table 9-2 presents the name, location, type (well vs. surface water), and community served by each public water supply facility, as well as the approximate distance from the water supply to Hanscom Field. As shown in the table, the municipal water supplies vary in distance from Hanscom Field from 0.9 to 7.3 miles.

- Bedford is served in part by the Massachusetts Water Resources Authority (MWRA), and in part by twelve public water supply sources.
- Concord is served by ten public water supply sources.
- Lexington is served by the MWRA and has no municipal water supply sources.
- Lincoln is served by four public water supply sources.

Massport recently concluded a deicing study (April 15, 2003) at Hanscom Field. The purpose of this analysis was to summarize existing aircraft deicing practices, evaluate potential airfield deicing alternatives and assess current and potential effects on receiving waters from deicing activities. The details of the deicing study are presented later in this chapter. The report finds that all deicing compounds used or under consideration for use at Hanscom Field exhibit little to no human toxicity and that none is considered harmful by ingestion or has known long-term health effects. Neither the United States Environmental Protection Agency nor the Massachusetts Department of Environmental Protection has identified an "unsafe" concentration of deicing fluid. The study concluded that neither current nor future scenario deicing activities at Hanscom Field will adversely affect the water supply for Bedford, Burlington or any other communities.

Table 9-1 Wetland Description Table *

Wetland I.D.	Resource Areas*	Wetland Type**	Soil Type ***	Notes
1-1	BVW, Bank, LUWB, Riverfront	PF01, PSS, R3	Saco	This wetland complex comprises forested and scrub/shrub wetland types with several channelized drainage swales. Dominant species include red maple, trembling aspen, glossy buckthorn, highbush blueberry, silky dogwood, speckled alder, and cinnamon fern.
1-2	BVW, Bank	PF01, PSS1, R4, PEM	Scarboro, Freetown	This wetland complex is primarily a red maple swamp with scrub/shrub and emergent portions. Dominant vegetation includes red maple, highbush blueberry, glossy buckthorn, tussock sedge, soft rush, and Sphagnum. Beaver activity has flooded a portion of this wetland.
1-3	Non-jurisdictional	PSS1	Udorthents-Sandy	This scrub/shrub wetland wraps around the end of Runway 23. It is disturbed, isolated, and presumed to be non-jurisdictional under the Massachusetts WPA. The dominant shrubs in the wetland are speckled alder and elderberry.
1-4	BVW, Bank	PF01, PSS1, PEM1	Scarboro, Udorthents-Sandy	Wetland 1-4 is a detention basin that borders on a larger red maple swamp.
1-5	Non-jurisdictional	PSS1	Udorthents-Sandy	This wetland is a relatively small isolated depression within a mowed area. It is not a state jurisdictional area.
2-1	BVW, Bank, LUWB, Riverfront	PF01, PSS1, PEM1, R3, R4,	Freetown, Wareham, Scarboro, Swansea	This wetland complex is associated with Elm Brook. It contains forested, scrub/shrub and emergent wetland types. Dominant species include red maple, highbush blueberry, glossy buckthorn, northern arrowwood, woolgrass, tussock sedge, soft rush, and sphagnum.
2-2	Non-jurisdictional	PSS1, PEM1	Udorthents-Sandy	Not a state jurisdictional wetland area.
2-3	Non-jurisdictional	PUB3	Deerfield	This is an isolated non-jurisdictional wetland area with limited wetland vegetation. This area was previously identified in the 1995 GEIR as a possible vernal pool.
2-4	Certified Vernal Pools	PSS1, PUB PEM1	Windsor, Deerfield	This wetland area comprises several isolated wetlands apparently formed within depressions created by past earth moving activities. They are scrub/shrub and emergent wetlands dominated by willow, silky dogwood, purple loosestrife, and sensitive fern. According to the 2000-2001 edition of the Massachusetts Natural Heritage Atlas, this area contains two certified vernal pools.
2-5	Certified Vernal Pool	PSS1	Deerfield	This isolated wetland area is also apparently formed in a man-made depression and contains purple loosestrife and Sphagnum. According to the Massachusetts Natural Heritage Atlas, this area has been certified as a vernal pool.
2-6	Non-jurisdictional	PSS1	Deerfield	These isolated wetlands have possibly formed in man-made depressions in a disturbed area. They are forested and scrub/shrub wetland types dominated by red maple, American elm, glossy buckthorn, silky dogwood, arrowwood, and multiflora rose.
2-7	Non-jurisdictional	PF01	Scarboro	

Table 9-1 Wetland Description Table * (cont.)

Wetland I.D.	Resource Areas*	Wetland Type**	Soil Type ***	Notes
2-8	BVW	PFO1, PSS1, PEM1,	Scarboro	This wetland is a red maple swamp that also contains portions of scrub/shrub wetland and emergent wetland. It receives road drainage from Old Bedford Road.
2-9	Bank	R4	Udorthents-Loamy	This area is an open drainage ditch that outlets to Elm Brook.
3-1	ILSF possible	PFO1	Canton	With the exception of wetland area 3-5, areas 3-1 through 3-7 all appear to be man -made either inadvertently or for stormwater management purposes. Wetland 3-5 appears to be relatively undisturbed forested wetland dominated by red maple, trembling aspen, and winterberry. Wetlands 3-1, 3-2, 3-4, and 3-6 are forested and scrub/shrub wetlands with small emergent areas. Dominant species in the forested and scrub/shrub areas include red maple, glossy buckthorn, gray birch, trembling aspen, speckled alder, and cinnamon fern. Wetlands 3-3 and 3-7 are vegetated swales dominated by emergent species such as cattail and purple loosestrife.
3-2	Non-Jurisdictional	PFO1	Canton	
3-3	Non-Jurisdictional	PEM1	Canton	
3-4	Non-Jurisdictional	PSS1, PEM1, PUB	Canton	
3-5	Non-Jurisdictional	PFO1	Canton	
3-6	BVW, Bank	PFO1	Canton	
3-7	BVW	PEM1, PSS1	Canton	This relatively large and undisturbed wetland complex consists of forested, scrub/shrub, and emergent communities. It is also within the Elm Brook floodplain. Forested red maple swamp with a glossy buckthorn understory is the dominant type of wetland in this complex. Portions of the complex also include purple loosestrife, dominated marsh and farmed areas.
3-8	BVW, Bank, BLSF	PFO1, PSS1, PEM1, R4	Freetown, Wareham, Deerfield, Birdsall	

Sources:

1995 GEIR

* Massachusetts WPA Resource Areas (310 CMR 10.00)

RA 200 -foot Riverfront Area
 BVW Bordering Vegetated Wetland
 Bank Land that abuts and confines a water body
 LUWB Land Under Water Bodies waterways
 ILSF Isolated Land Subject to Flooding
 Isolated Wetland is hydrologically isolated (Not a Massachusetts WPA Resource Area)

** Wetland Type (Cowardin et al, 1977)

PFO 1 Palustrine Forested/Broad-Leaved Deciduous
 PFO 4 Palustrine Forested/Needle-Leaved Evergreen
 PSS 1 Palustrine Scrub-Shrub/Broad-Leaved Deciduous
 PEM 1 Palustrine Emergent/Persistent
 PUB Palustrine Unconsolidated Bottom (unvegetated wetland)
 R3 Riverine (perennial)
 R4 Riverine (intermittent)
 B Beaver influence

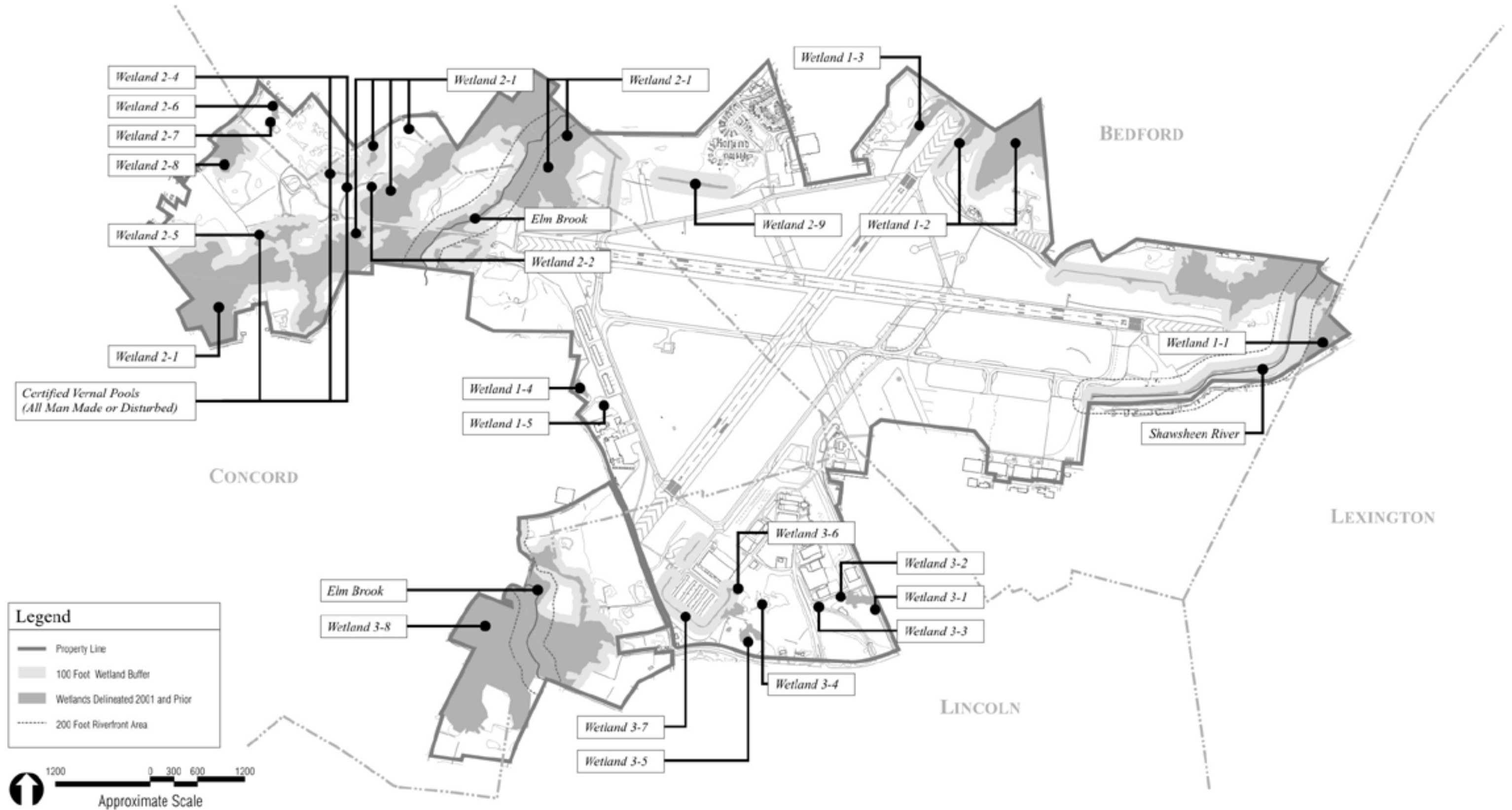
*** Soil series mapped by USDA SCS (Middlesex Conservation District, 1986)

Table 9-2 Public Water Supplies in Bedford, Concord, Lexington and Lincoln

Town	Source ID #	Site Name	Type	Approximate Distance from Hanscom Field*
Bedford	3023000-11G	Well # 11 (Hartwell Rd. G.P. Well #11)	Groundwater	0.9 miles
Bedford	3023000-10G	Well # 10 (Hartwell Rd. Well #10)	Groundwater	0.9 miles
Bedford	3023000-12G	Well # 12 (Hartwell Rd. G.P. Well #12)	Groundwater	1.0 miles
Bedford	3023000-09G	Well # 5 (Shawsheen G.D. Well #5)	Groundwater	2.2 miles
Bedford	3023000-08G	Well # 4 (Shawsheen G.D. Well #4)	Groundwater	2.2 miles
Bedford	3023000-04G	Well # 6 Dug Well	Groundwater	2.3 miles
Bedford	3023000-02G	Well # 2 (Shawsheen Rd. G.P. Well)	Groundwater	2.3 miles
Bedford	3023000-01G	Well # 1 (Page School G.P. Well)	Groundwater	2.3 miles
Bedford	3023000-03G	Well # 3 (MITRE/Rte. 62 G.P. Well)	Groundwater	3.5 miles
Bedford	3023000-05G	Well # 7 (Turnpike G.P. Well #7)	Groundwater	4.0 miles
Bedford	3023000-07G	Well # 9 (Turnpike G.P. Well #9)	Groundwater	4.0 miles
Bedford	3023000-06G	Well # 8 (Turnpike G.P. Well #8)	Groundwater	4.2 miles
Concord	3067000-02G	Hugh Cargill G.P. Well	Groundwater	3.1 miles
Concord	3067000-07G	Hugh Cargill Wellfield (Replacement)	Groundwater	3.2 miles
Concord	3067000-06G	Robinson G.P. Well	Groundwater	4.3 miles
Concord	3067000-03G	Deaconess GP Well	Groundwater	4.7 miles
Concord	3067003-01G	Michaels Restaurant	Transient Non-Community	5.4 miles
Concord	3067016-01G	Taranto Realty Trust	Transient Non-Community	5.4 miles
Concord	3067000-01G	Jennie Dugan Well	Groundwater	5.9 miles
Concord	3067000-04G	White Pond Well	Groundwater	6.0 miles
Concord	3067000-05G	Second Division GP Well	Groundwater	6.8 miles
Concord	3067015-01G	Valley Sports Inc.	Transient Non-Community	7.3 miles
Lincoln	3157000-02G	Farrar Pond GP Well	Groundwater	3.1 miles
Lincoln	3157000-01S	Flints Pond	Surface Water	3.1 miles
Lincoln	3049000-04S	Hobbs Brook Res. Upper	Surface Water	3.5 miles
Lincoln	3157000-01G	Tower Rd. GP Well	Groundwater	5.3 miles

Source: MassGIS, 2002

* Approximate distances measured from Hanscom Field runway intersection



Vegetation Management Plan

The status of the VMP was described in Chapter 9 - Wetlands/Wildlife/Water Quality of the *Draft ESPR*. At the time of the *Draft ESPR* filing, Massport had submitted NOIs for the VMP under the Massachusetts Wetland Protection Act (M.G.L. Ch. 131 s. 40) to the Conservation Commissions of Bedford, Concord, Lexington and Lincoln. The NOIs clearly describe the elements of the VMP and are the appropriate venues for addressing the VMP. Since the *Draft ESPR*, Massport has received all Orders of Conditions for the NOIs in Bedford, Concord, Lexington and Lincoln. It is anticipated that the VMP project will begin during the dry months of summer 2003 and/or during frozen conditions in 2004.

Hartwell Forest/Jordan Conservation Area

The Hartwell Forest/Jordan Conservation Area is a Town of Bedford public open space that is located at the end of Runway 23, off airport property. Chapter 10 - Cultural and Historic Resources of the *Draft ESPR* described the Hartwell Forest/Jordan Conservation Area and public uses of this area. The VMP described obstructions and identified the Hartwell Forest/Jordan Conservation Area as an area that will require additional analysis to determine potential solutions and actions that could be taken. It is anticipated that any such proposal will involve close coordination with the FAA and the Town of Bedford and would be reported in the 2005 *ESPR*.

The Hartwell Forest/Jordan Conservation Area and the VMP are not related to the Runway Safety Area (RSA) project. The RSA project will most likely require wetlands permitting and, possibly, MEPA review. This project, which is on airport property, does not increase or lengthen an existing runway and will not affect the approaches to Runway 23 End

Spill Prevention Program

The *Draft ESPR* described Massport's spill prevention efforts. Since the 1995 *GEIR*, Massport has continued to regularly update its Spill Prevention Control and Countermeasure Plan (SPCC) for Hanscom Field, a plan outlining the steps to be taken in the event of an accidental petroleum release. The plan has been developed for Massport facilities at Hanscom Field; Massport tenants are responsible for maintaining their own individual SPCC plans specific to their operations, as needed.

The SPCC plan identifies potential discharge or spill activities that may result in a release, spill prevention measures, control methods and an action plan in the event of a release including notification procedures, key personnel, a listing of available response equipment, tank and fuel delivery checklists, and contact numbers in case of an emergency. The plan includes a listing of all active oil storage tanks owned and operated by Massport as well as a general listing of other types of smaller volume (55-gallon drum) storage of petroleum-based products including motor oil, waste oil, and hydraulic fluid.

Massport maintains contracts with emergency response cleanup contractors that will respond to Massport or Massport tenant spill events at Hanscom Field. In addition, the Hanscom AFB Fire Department is responsible for responding to emergency situations, including hazardous material spills, at Hanscom Field. The Fire Department maintains detailed spill reports for all reported spills at Hanscom.

Massport also requires annual environmental health and safety training for its employees at Hanscom Field. The training is designed to review hazardous materials used at the facilities, hazardous waste management, asbestos procedures, stormwater pollution prevention and SPCC requirements, first responder procedures and general environmental health and safety information. In addition, Massport has developed an Environmental Management Policy and has implemented an Environmental Management System (EMS) at

Hanscom Field, which provides the framework for tracking, managing and improving environmental performance.

Records from the two Fixed Base Operators at Hanscom field, Jet Aviation and Signature, indicate that 7,100,000 gallons of jet fuel were used in 2000. In 2001, this figure increased to 7,300,000 and to 8,200,000 in 2002.

Deicing Activities

Chemical deicers are not currently used on Hanscom runways or taxiways; all snow removal is performed with mechanical equipment using plows and blowers. Sand is applied to increase traction. Massport is considering the use of a chemical runway deicer at Hanscom Field to enhance safety during inclement winter weather. At most airports, chemical deicers are used in conjunction with mechanical equipment for snow removal. These deicers include newer products (e.g. potassium acetate, sodium formate) that have shown their effectiveness in snow and ice removal, and have been found to have significantly fewer environmental effects compared with traditional glycol-based deicers.

Aircraft deicing and anti-icing activities at Hanscom Field are conducted by Shuttle America, Jet Aviation, Signature Flight Support, and the United States Air Force. All four entities use products that are a dilute solution of propylene glycol (PG), water, and proprietary corrosion inhibitors to deice aircraft. Almost all of the deicing is conducted near the Civil Air Terminal or the hangars, and, after additional dilution with ice and snow, some of the deicing fluid reaches storm drains that discharge to the Shawsheen River. A few aircraft are deiced at the west end of Runway 11-29 immediately before take-off, and some of this deicing fluid is discharged through catch basins to Elm Brook.

Massport employs Best Management Practices both as a part of its sustainability efforts to manage stormwater runoff quality at Hanscom Field, and as a component of its NPDES permit. The *Draft ESPR* referenced aircraft deicing as an Activity-Specific component of Hanscom Field's Best Management Practices. Aircraft deicing is done during snow and ice events by commercial and business aircraft operators, using propylene glycol, which is included in the NPDES permit.

Evaluation of Potential Airfield Deicing Compounds

To enhance aircraft safety at Hanscom Field, Massport is considering the use of a chemical deicer on the airfield during the 2003-2004 snow season. Massport is committed to the use of a non-glycol based deicer because these alternative deicers have less effect on receiving water bodies. Effluent and in-stream water sampling will be conducted during 2003-2004 deicing events to confirm results presented in the deicing study and to determine the DO impact to the receiving water bodies.

Five deicers were evaluated for effectiveness, aquatic and human toxicity, dissolved oxygen consumption, availability, ease of application, and cost. Calcium magnesium acetate (solid) is not recommended at this time because no FAA-certified product exists. Potassium formate (liquid) is not recommended because it is only manufactured in Norway, making it difficult to obtain at short notice if needed at the airfield. Sodium acetate (solid) is not recommended because its oxygen demand is higher than for sodium formate the other solid deicing compound under consideration.

The study recommended two compounds - sodium formate and potassium acetate - for use at Hanscom Field. Sodium formate is a solid compound and would be used primarily for deicing (applied to existing snow and ice). Potassium acetate is a liquid compound and would be used primarily for anti-icing (applied to dry pavement in anticipation of a storm). These two compounds can be used together in severe weather

conditions - potassium acetate at the onset of a storm, followed by sodium formate as the storm progresses to more effectively keep runway surfaces clear.

Human Toxicity

The three deicing compounds considered in this analysis - propylene glycol (currently used on aircraft) and sodium formate and potassium acetate (under consideration for airfield deicing) - exhibit minimal to no human toxicity. At worst, they are a short-term eye irritant when contacted full-strength (as for airport personnel applying the chemicals). None of these deicers is considered harmful by ingestion, and none has known long-term health effects. Neither the EPA nor DEP has identified an "unsafe" concentration of deicing fluid. Estimated maximum deicer concentrations (including airfield deicing) predicted in the Shawsheen River and Elm Brook do not exceed any safety thresholds for human health. Neither current nor estimated "moderate growth" deicing activities at Hanscom Field were found to affect adversely the water supply for Bedford or Burlington. Since the Shawsheen River and Elm Brook do not flow from Hanscom Field into Concord, Lexington or Lincoln, deicing activities at Hanscom Field would not affect waterways in those communities.

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Aquatic Toxicity

According to the U.S. Fish and Wildlife toxicity scale, all three of the deicing compounds are considered "relatively harmless" to the aquatic ecosystem. For each compound, concentrations greater than 1,500 mg/l would be required to cause an adverse effect; all predicted concentrations in the Shawsheen River and Elm Brook are well below this value. Therefore, neither current nor estimated "moderate growth" deicing activities at Hanscom Field would be expected to adversely affect the ecosystem of the Shawsheen River or Elm Brook.

Dissolved Oxygen Effects

When released to receiving water, deicing compounds consume oxygen as they undergo biodegradation. Reduced dissolved oxygen (DO) levels can adversely affect aquatic species. Due to the cold water temperature during the deicing season and the intermittent nature of deicer discharges, the DO degradation rate is low, minimizing the magnitude of an oxygen depression (or "DO sag") in the receiving waters. In the analysis, on all simulated days, the DO sag was less than 2.0 mg/l, and the "worst" day had a sag of 1.7 mg/l, from assumed oxygen levels of 12 mg/l. On all days, predicted conditions in the Shawsheen River and Elm Brook met the state water quality standards for dissolved oxygen.

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