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Hanscom Air Force Base

Middlesex County, Massachusetts
CERCLIS #MA8570024424

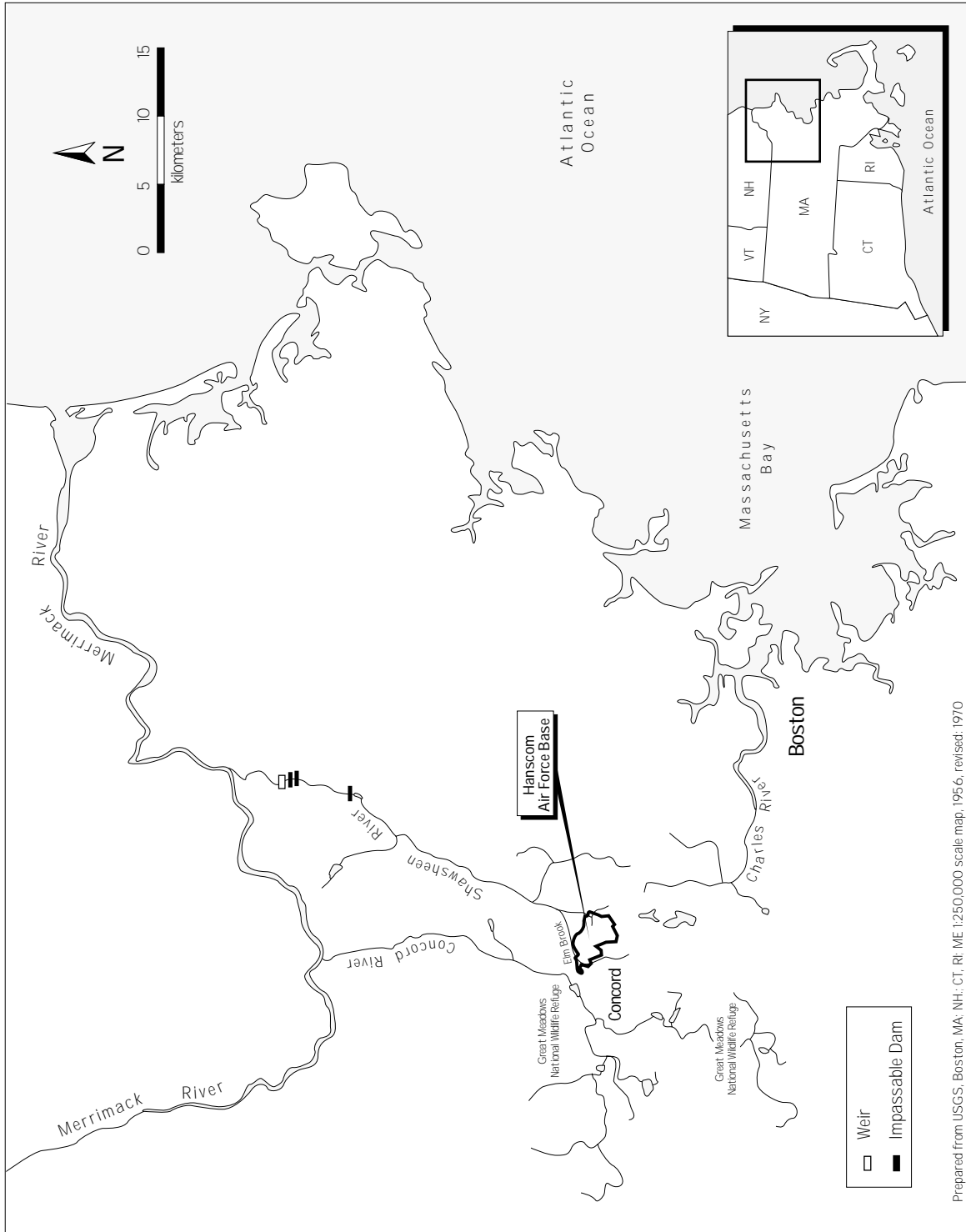
■ Site Exposure Potential

Hanscom Air Force Base (AFB) is located in Middlesex County, Massachusetts within the towns of Bedford, Concord, Lexington, and Lincoln. The site is located at the headwaters of the Shawsheen River, which flows for approximately 40 km downstream before entering the Merrimack River (Figure 1). The Merrimack River enters the Atlantic Ocean about 45 km downstream from the confluence of the Shawsheen River.

Military operations began in 1942, with the U.S. Air Force occupying 420 hectares at the site by 1952. Numerous hazardous substances were

used, generated, and disposed during military operations at the site. These substances included chlorinated solvents, gasoline and jet fuels, tetraethyl lead, and PCBs. Fourteen potential source areas have been identified at Hanscom AFB (Table 1; Halliburton NUS 1993). Six of the source areas are shown in Figure 2; the locations of the remaining eight source areas were not available.

Although military flying activities ceased in 1973, the U.S. Air Force continues to operate the Electronic Systems Division of the Air Force



Prepared from USGS, Boston, MA, NH, CT, RI, ME 1:250,000 scale map, 1956, rev/used: 1970

Figure 1. Hanscom Air Force Base in Massachusetts.

Table 1. Types of waste disposed of at 14 areas of concern at the Hanscom Air Force Base.

Source Area	Period of Operation	Type of Waste Disposed or Spilled
Fire Training Area I	1950s to 1960s	Contaminated fuels, solvents, and spent laboratory chemicals were dumped into a pit and ignited. An estimated 60 to 80 drums of unspecified volume were disposed.
Fire Training Area II	Late 1960s to 1973	Unknown quantities of degreasing chemicals, paint thinners, solvents, and waste oils were dumped into a pit and ignited.
Paint Waste Disposal Area	1966 to 1972	Unknown quantities of paint waste, solvents, and metal plating wastes were disposed. Approximately 50 208-liter drums of waste airplane oils and waste paint were buried in a trench.
Jet Fuel Residue/ Tank Sludge Disposal Area	1959 and 1960	An estimated 2,500 to 7,000 drums of unspecified volume containing waste airplane fuel, oils, and paint wastes were buried in trenches. Some drums were reportedly leaking at the time of burial.
Sanitary Landfill	1964 to 1974	Unknown quantities of wastes from all shops and laboratories were disposed of, including spent laboratory chemicals.
Scott Circle Landfill	Early 1950s to 1973	The primary waste was construction debris, but paint, paint thinner, solvents, waste oils, and laboratory chemicals were also reportedly disposed. Exact quantities of waste are unknown.
Industrial Wastewater Treatment System	1955 to 1976	This system removed oily wastes and neutralized wash water from base machine shops. Unknown quantities of sludge from the system was dewatered at the filter beds and placed in the Tank Sludge Disposal Area.
Former Filter Bed Area	Late 1940s to early 1970s	This area was used to dewater sludge, and as a sludge disposal area and landfill. Approximately 200 DDT canisters of unknown size were buried in the late 1940s.
Administration Building Jet Fuel Spill	1954	Approximately 19,000 liters of JP-4 jet fuel were spilled on 0.2 hectares of land.
Building 1128 Mercury Spill	1975	An unknown quantity of elemental mercury spilled into the sanitary sewer system.
Motor Pool Fuel Leak	1981	A leaking 72,000-liter underground unleaded gasoline tank was removed and contaminated soils were excavated.
Base Service Station Leak	1981	Approximately 42,000 liters of fuel leaked from an underground gasoline tank.
Various Fuel Spills on Runways and Taxiways	Various dates	Quantities of fuel at various spills ranged from 19 to more than 1,100 liters.
PCB Transformer Area	Unknown	Unserviceable transformers containing PCBs were stored in a building constructed on a concrete slab floor with no floor drains. No release to the environment is suspected at this site.

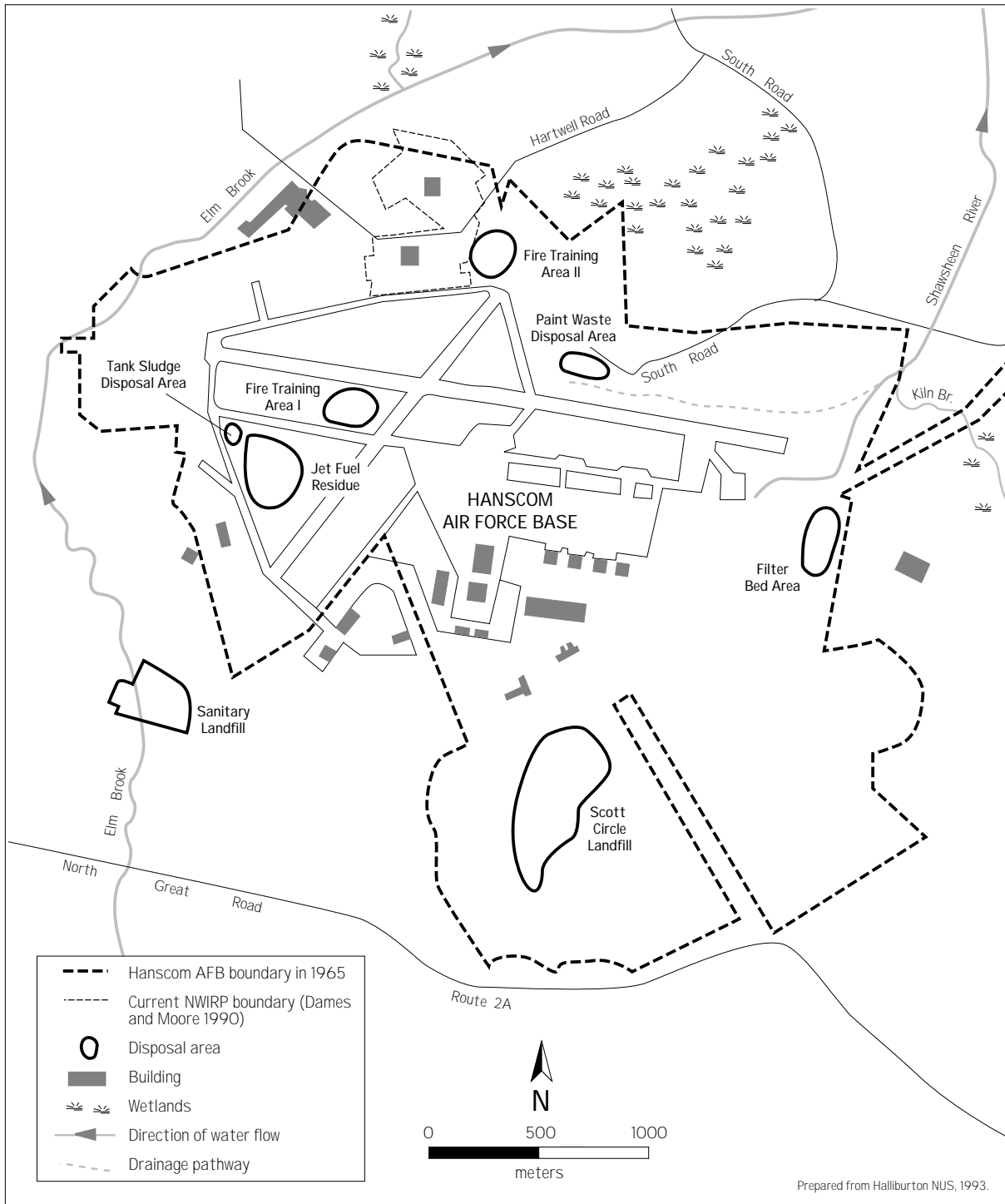


Figure 2. Hazardous waste sites at Hanscom Air Force Base. The locations of all 14 sites identified in Table 1 were not available.

Systems Command on 160 hectares at Hanscom AFB. The Massachusetts Port Authority currently operates a civilian airport, L.G. Hanscom Field, on land that was previously part of Hanscom AFB.

Surface water runoff and groundwater migration are the potential pathways of contaminant transport from the site to NOAA trust resources and associated habitats. Hanscom AFB is located on a flat plain with very low relief. The principal surface drainage features at the site are the Shawsheen River, which originates in the eastern part of the site and flows toward the northeast, and Elm Brook, which is located in the western part of the site and flows northwest into the Shawsheen River. Surface runoff from the site enters a storm drain system consisting of ditches, culverts, and subdrains. The stormwater system drains into Elm Brook, the Shawsheen River, and the wetlands to the northeast of the site.

Groundwater is 1.2 to 3 m below the ground surface within lacustrine deposits of glacial origin. The upper, unconfined aquifer consists of sandy outwash deposits 5.5 to 7 m thick. A low-permeability lacustrine deposit of fine sands, silts, and clays underlies the outwash deposits, and varies in thickness from 6 to 15 m. A thin, sandy till underlies the lacustrine deposits, forming a semi-confined lower aquifer above the bedrock. Groundwater flow in the surficial aquifer is generally toward the northeast (NUS Corporation 1988).

■ NOAA Trust Habitats and Species

Habitats of primary concern to NOAA are surface water and associated bottom substrates of Elm Brook and the Shawsheen River. At a measuring location in Bedford about 1 km downstream from the site, the river bottom varies from sandy to rocky, with a measured stream flow ranging from 0.079 to 2.6 m³/second. In general, the Shawsheen River is a wide, shallow, slow-moving river. Some channelized areas in the river contain gravel and faster-moving water that could be suitable spawning habitat for anadromous fish (Jackson personal communication 1994). Surface water of the Shawsheen River is designated Class B (fishable and swimmable) by the Massachusetts Department of Environmental Protection.

American eel are the only NOAA trust resource near the site. Anadromous fish such as Atlantic salmon, American shad, alewife, and blueback herring may have used the Shawsheen River historically. However, fish passage on the river is now restricted by one weir and three dams between the Merrimack River and Hanscom AFB (Jackson personal communication 1994). The weir, which represents the first restriction on the Shawsheen River, is approximately 6.8 km upstream from the Merrimack River. Fish passage beyond the weir is only possible at high water. Three dams are situated above the weir at 8.2 km (the J.P. Stevens Dam), 9 km (the Redman Card and Clothing Co. Dam), and 13 km (Ballardvale Dam) upstream from the Merrimack River.

Fish passage is not possible at any of these dams. Although there is a restoration program for Atlantic salmon in the Merrimack River watershed, the Shawsheen River is not included in the program and there are no plans to install fish passage facilities. Atlantic salmon, American shad, and alewife have been caught at the confluence of the Shawsheen and Merrimack rivers. It is not known whether those species would travel upstream in the Shawsheen River if there were no barriers to migration.

The Shawsheen River supports a recreational fishery for warmwater fish species. The Massachusetts Division of Fisheries and Wildlife annually stocks trout in both Elm Brook and the Shawsheen River. In 1993, 350 brook trout and 300 brown trout were released in Elm Brook, and 2,000 rainbow trout were released in the Shawsheen River (Jackson personal communication 1994).

There are no health advisories for the consumption of fish caught in Elm Brook or the Shawsheen River.

■ Site-Related Contamination

There has been limited environmental sampling at the site. Information was not available regarding contamination of soils at the site. Site investigations consisted primarily of groundwater monitoring for VOCs. Five rounds of sampling were

conducted between 1986 and 1991, from 38 monitoring wells (Haley & Aldrich 1991). Groundwater samples were collected from only five of the 14 waste disposal areas: the Former Fire Training Area I, the Former Fire Training Area II, the Jet Fuel Residue/Tank Sludge Disposal Area, the Sanitary Landfill, and the Paint Waste Disposal Area. Trichloroethylene (TCE), the primary contaminant of concern in groundwater samples collected from the site, was measured at a maximum concentration of 48,000 µg/l in a sample collected from the Former Fire Training Area II (GEI Consultants, Inc. 1991). AWQC are not available for TCE, but the freshwater chronic LOEL is 21,900 µg/l (U.S. EPA 1993). Other VOCs (1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, 1,2-dichloroethene, tetrachloroethylene, and 1,1,1-trichloroethane) were frequently detected in groundwater at concentrations below their respective LOELs, where those guidelines were available. Vinyl chloride was detected in groundwater from the Fire Training Area II at a maximum concentration of 650,000 µg/l (GEI Consultants, Inc. 1991). Screening guidelines were not available for vinyl chloride.

Groundwater samples collected by Haley and Aldrich in 1986 were analyzed for trace elements (NUS 1988). Maximum concentrations of cadmium, chromium, copper, and lead in groundwater exceeded their respective freshwater chronic AWQCs, but not by more than ten times. Detailed information was not available in the documents reviewed on the location of

monitoring wells, and the nature and extent of groundwater contamination by trace elements. .

Two surface-water samples were collected from a drainage pathway leading from the Former Fire Training Area II to the wetlands north of the site as part of the monitoring program conducted by Haley & Aldrich (1991). The surface water samples were analyzed only for VOCs. TCE was detected at a concentration of 93 µg/l in the surface water sample collected closest to the site. It is not known whether surface water or sediment samples were collected from Elm Brook or the Shawsheen River to evaluate contaminant migration via surface transport.

■ Summary

Investigations at the Hanscom AFB have been limited primarily to contamination of environmental media by VOCs. The detection of VOCs in surface water draining the site suggests that contaminants are being transported off-site. Little information has been collected regarding contamination by trace elements, PAHs, PCBs, or pesticides. Three dams situated between 27 and 33 km downstream from the site currently block the upstream migration of all NOAA trust species except for the catadromous American eel. There are no plans for restoring fish passage to the Shawsheen River. Due to the nature of activities conducted over the past 50 years, past disposal practices, and proximity to local waterways, it is

possible that site-related contaminants have migrated off-site to habitat used by American eel.

■ References

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