

*Hartwell's Hill and the Northern Tract  
of the Bedford Naval Weapons Industrial Reserve  
Plant:*

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*Characterization, divestiture pathways, and future land use  
options – with special consideration given to potential for a  
Hartwell's Hill solar farm*

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## *Acknowledgments*

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*Lastly, we would like to recognize Mike Rosenberg, former long-time Bedford Select Board member and current community reporter for The Bedford Citizen. Mike conceived the idea of forming a committee to research the NWIRP northern tract's past, present, and potential future impacts on Bedford. The ultimate goal was to build and share a knowledge base that can help safeguard Bedford's voice in the NWIRP divestiture process and ensure that future options for the Hartwell's Hill NWIRP northern tract will center on Bedford to the benefit of its residents.*

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## EXECUTIVE SUMMARY

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The ad hoc Hartwell Road Committee was created in 2019 by the Bedford Select Board to explore issues relating to the former Bedford Naval Weapons Industrial Reserve Plant (NWIRP) property north of Hartwell Road including: characterization, ways for Bedford to participate in the upcoming Navy/GSA divestiture process, and possible impact of future land uses to nearby residential neighborhoods.

We have created a timeline of the history of the NWIRP; described its physical characteristics such as location and surroundings, topography, facility layout, building inventory, zoning and property use; and tried to give a brief summary of the Bedford NWIRP's long, complicated history of environmental contamination and remediation. We have also included some of the past and ongoing impacts that the northern NWIRP tract's Superfund level of contamination has had on the Town as a whole and on the surrounding community in particular.

We have discovered that the Navy's responsibility for remediation of the contaminated groundwater emanating from Hartwell's Hill will continue for many years (most likely decades), but does not preclude divestiture of the NWIRP and transfer to a new owner long before the Navy's ultimate cleanup goal is achieved. We have gathered information about the Navy divestiture process; how the interplay between the Navy, environmental regulatory agencies, and the GSA determine the timing of land transfer; and some options Bedford will have to safeguard its interests and participate in the northern NWIRP tract divestiture process.

The committee has tried to focus on potential future land uses that would minimize negative impacts on nearby residential neighborhoods and future liability for the Town and the Navy due to continuing and anticipated long-term environmental remediation and monitoring by the Navy of the polluted groundwater radiating outward from Hartwell's Hill. We have also searched for options that can preserve flexibility and choices for the future while benefiting the community in the immediate years following the divestiture of the NWIRP northern tract. We have found that a solar farm, as well as other combined open air uses, may provide the best of both worlds for near-term beneficial land use, as well as preserving future options based on the Town's evolving needs.

We have also described several issues of special concern including: an ongoing investigation into a potential threat of TCE vapor intrusion into a nearby residential neighborhood; inaccurate Navy site maps that may obscure present-day environmental concerns; and severe risk to local youth and adults who trespass on Hartwell's Hill to explore abandoned, deteriorating NWIRP buildings and infrastructure.

Based on our findings, we have offered a number of recommendations for the Select Board to consider with regard to the Town's position on the NWIRP land.

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## SITE CHARACTERIZATION

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### BEDFORD NWIRP HISTORY

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We have compiled a detailed timeline of the NWIRP history and Hartwell's Hill area land use, ownership, and history from 1941 to the present, as well as the Navy's projections for divestiture check points up to 2024 ([See Exhibit D](#)).

The Bedford NWIRP was created in 1952 for the Navy's contractor Raytheon to research and develop radar and missile guidance systems ([NAVFAC, Environmental; 2020, March; "Helping to win the Cold War"](#)). It eventually consisted of 45-46 acres (sources differ on exact acreage). The land is divided in two sections by Hartwell Road:

- The northern Hartwell's Hill tract (29 acres) with the Components Laboratory Building (built 1952-54) and a number of auxiliary buildings and structures ([See Map 2 and Exhibit N](#)).
- The now privately-owned southern tract (16 acres) adjacent to the airfield, aka the Southern Flight Test Area, which includes a large hangar/laboratory complex built in 1959; aka known as the Navy Hangar ([Map 2 and NAVFAC, Env.; 2020, March; "Helping to win the Cold War"](#)).

In 1953, the Air Force issued a use permit to the Navy for 20.9 acres of Air Force-owned land, including Hartwell's Hill. The land had originally been part of an eminent domain taking by the State in 1942 to expand the Bedford Airport; was subsequently leased by the State to the Air Force for nearly a decade; and had recently (February 25th, 1952) been donated by the State to the Air Force ([See Exhibits D, D1 and Map 10](#)).

The federal-owned NWIRP facility and the nearby Raytheon-owned laboratory/office complex constructed at 180 Hartwell Road (originally built in 1958-59, with later additions) were both important parts of the Bedford Complex of Raytheon's Missile and Radar Division, which "designed, fabricated, and tested prototype equipment for several significant missile guidance and control systems during the Cold War, including the Hawk, Sparrow III, SAM-D, and Patriot missile systems," ([NAVFAC, Env.; 2020, March; "Helping to win the Cold War"](#)).

Hanscom Air Force Base terminated its lease of Hanscom airfield and ceased military flight operations there in 1973 ([Exhibit D](#)). In 1977, the Air Force transferred ownership of 36.65 acres of the NWIRP land to the Navy without reimbursement [[See Bibliography note \(p. 146\) on Boatright, J.F. \(1977, March 11\)](#)], and without excessing the land through the GSA ([Boatright, J.F.; 1977, March 11; Attachment: Supplemental Data, #9h, p. 4](#)).

In 1983, groundwater contamination originating from the NWIRP Hartwell's Hill site was implicated by the Town's investigative hydrogeology studies in the contamination of the Hartwell Road municipal wellfield with TCE and benzene. The Navy disputed the Town's findings then, during the following decade of litigation, and still does to this day. The Town's contaminated Hartwell Road wellfield and the water treatment plant were shut down in 1984 and remain closed.

In 1994, the information gathered during multiple investigations of the contaminated groundwater culminated in the NWIRP (along with the nearby airfield) being added to the EPA's National Priorities list of Superfund sites (See Exhibits D and O; Bibliography: Bedford NWIRP history of environmental contamination and remediation; and Bib: Bedford Hartwell Road municipal wellfield link to the NWIRP and the Raytheon Missile Systems Division facility).

In 1999, Raytheon transferred its Missile Systems Division to Tucson, Arizona, and ceased operations at the NWIRP in December 2000 ([NAVFAC, Env.; 2020, March; "Helping to win the Cold War..."](#)). Shortly thereafter, the Navy shut down and vacated most of the facility ([Resolution Consultants; 2014, September 1; Section 1.4: page 1-10](#)).

The buildings and structures on top of Hartwell's Hill have been abandoned and unmaintained since 2000, and are in deteriorating and hazardous condition ([Exhibit N](#)). However, an automated groundwater treatment plant and nearby pump house at the base of the hill (near the The Edge Sports Center and its playing fields) are still operational and functioning in the remediation of the contaminated groundwater originating from Hartwell's Hill. The Navy's remediation and monitoring of groundwater contamination on and near NWIRP land has continued under EPA and MassDEP oversight since the closing of the NWIRP and is anticipated to last for many years to come ([See Exhibit K: Site 3 projected cleanup time](#)).

The 16-acre southern tract of the NWIRP property at 154 Hartwell Road, known as the Southern Flight Test Area (SFTA), located between Hartwell Road and the airfield, was divested by the Navy and sold by the GSA at public auction to a private party for \$9,040,000 in 2019 ([Exhibit D: Timeline](#)) ([Bibliography: Bedford NWIRP Divestiture](#)).

The northern Hartwell's Hill tract is currently in the process of being prepared for divestiture. Until recently the Navy had anticipated that the land would become eligible for deed transfer by 2024 ([Exhibit D: Timeline](#)). However the recent developments with the expanding TCE groundwater plume may push the estimated land transfer to 5 to 10 years from now (Navy communication, November 2021).

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## LOCATION, TOPOGRAPHY, AND FACILITY STRUCTURES

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The approximately 29-acre northern tract of the NWIRP (Parcel 077-0001-002 in the Bedford, MA Town Assessor's database) is in southwest Bedford ([Map 1](#)). This tract includes a segment of Hartwell Road that is owned by the Air Force. This road section extends from the east property line of the northern NWIRP tract to the west property line of the now privately-owned southern NWIRP

tract ([Map 5B](#)). “The [total NWIRP] property has approximately 1,380 feet of frontage along the southern side of Hartwell Road, and approximately 780 feet of frontage along the northern side of Hartwell Road.” ([Tetra Tech, 2020, September 1, p. 1-1](#))

The northern tract includes most of Hartwell’s Hill, which has an elevation of 207 to 215 feet above sea level and slopes steeply down to the north and east, with a more gradual slope to the south and west. Surrounding land ranges from 120 to 150 feet above sea level ([Map 3A](#)).

The northern NWIRP tract abuts residential neighborhoods, protected wetlands, a heavily used sports center and recreational playing fields and a parcel of Air Force-owned land that is zoned industrial, but was in residential use for nearly fifty years (1961-2009) ([See Maps 1, 4, 5A and Exhibits R, S](#)), and is separated by Hartwell Road from the now privately owned southern NWIRP tract which includes an aging Navy hangar complex ([Map 5B](#)). Massport-owned and operated Hanscom airfield also lies on the other side of Hartwell Road. Werfen/Instrumentation Laboratory (on the site of the former Raytheon Missile Systems Division at 180 Hartwell Road) is separated from the northern NWIRP tract by Hartwell Road, the sports center and recreational playing fields.

Ten vacant, deteriorating Navy buildings as well as other structures are sited on the hill (including: the Components Laboratory, a guardhouse, an incinerator, an air conditioning facility on the east side of the Components Lab, the Antenna Range Building, the Facility Storage Building, the Emergency Generator Building, the Ammunition Bunker to the east of the Components Lab, the Hazardous Waste Storage Facility, and the Government Building ([Navy RPM communication, November 2021](#)). Some of these buildings are shown on Map 2. Much of the hilltop surface is paved with cracked and deteriorating parking and driveway pavement. We have compiled a description of the ten buildings, their functions and dates of construction, as well as recent photographs of their condition when available ([See Exhibit N: Inventory of Hartwell’s Hill buildings and structures](#)).

The Navy Groundwater Extraction & Treatment System (GWETS) Building and Pump House (sited at the base of the hill, to the west) are still in operation. An inventory of previously demolished or removed Hartwell’s Hill NWIRP buildings and structures and their original functions is also shown in Exhibit N.

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## THE FOUR HARTWELL’S HILL SUPERFUND SITES

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The northern NWIRP tract has a long and troubled environmental history due to spills, leaks, and improper disposal of hazardous chemicals and fuels on and near Hartwell’s Hill by NWIRP personnel. Sometime before 1983, shallow and deep groundwater within and near Hartwell’s Hill became contaminated with volatile organic compounds (VOCs), including trichloroethylene [aka trichloroethene or TCE], trichloroethane, dichloroethene, tetrachloroethene (aka perchloroethylene or “perc”), benzene, toluene, ethylbenzene, xylene, and 1,4-dioxane. ([Camp et al., 1991; GEI Consultants, Inc., 1991](#)). The groundwater contaminant plumes have radiated down and outward from the Hill, with highest concentrations found in source areas on or near the top of Hartwell’s Hill ([Maps 8A, 8B, 9](#)).

During the earlier decades of NWIRP activity, there was limited understanding of how devastating and long-lasting groundwater contamination would prove to be, and how difficult and expensive it would be to remediate.

As a result of multiple investigations triggered by the initial 1983 detection of TCE in Bedford drinking water, highly contaminated groundwater was discovered near Hartwell's Hill. This caused the Bedford NWIRP to be placed on EPA's Superfund priority list in 1994 (EPA, 1993; "Mass bases cited for polluter list," 1993; EPA, 1994; "Contaminated sites in state ..." 1994; Bushnell, D., 1994). Since then, the Navy's environmental investigation, remediation and monitoring actions of groundwater, surface water and soil contamination at and near the Bedford NWIRP have been carried out under consultation with and review by the EPA and MassDEP (Exhibits D, K; Bibliography: Bedford NWIRP history of environmental contamination and remediation).

Four federal Superfund sites are associated with Hartwell's Hill and its past use for NWIRP activities (Maps 6, 7, 8A, 8B, 9; Exhibit K; Bibliography: Bedford NWIRP history of environmental contamination and remediation):

- **Site 1** – (Old incinerator ash disposal area) is classified as “No Further Action.” The northernmost ash deposit is also combined with construction debris, household trash, and old furniture that were discarded on the north hillside (Rogers et al., 1986, p. 8-1). Literature for Site 1 says that the incinerator ash deposits containing heavy metals described by Rogers et al. have been left in place, along with the hillside dump debris (Map 6 and Exhibit K).
- **Site 2** (Components Laboratory Building fuel tank leak area) is classified as “No Further Action.” It was discovered in 1982 when it was discovered that a 20,000 gallon underground fuel oil storage tank in use since 1953 was leaking oil which was entering a storm water pipe and being discharged down a grassy slope near the Transportation Building. Action was taken at the time to contain the spill and drain the leaking fuel tank. A consultant later estimated that 200 gallons of fuel oil may have escaped during the 1982 incident (Rogers et al., 1986, p. 8-3) (See Map 7 and Exhibit K).
- **Site 3** (solvent spills on Hartwell's Hill that have contaminated local groundwater) is delineated by a land use control boundary (LUC) that surrounds both the northern and southern tracts of the NWIRP, and also encompasses private property between Hartwell's Hill and Elm Brook. Within the northern tract LUC boundary, groundwater is contaminated with trichloroethylene (TCE) and 1,4-dioxane from the spills on Hartwell's Hill. The Navy is remediating and monitoring the groundwater contaminant plumes (See Maps 8A, 8B, and Exhibit K).
- **Site 4** (groundwater contaminated from fuel and waste petroleum products) has a smaller LUC boundary that lies within that of the Site 3 LUC. The contaminated groundwater extends from the north side of Hartwell's Hill, trending north northwest from the NWIRP property through private property. The Site 4 contaminants of concern include benzene, toluene, ethylbenzene, xylene (aka BTEX), 2-methylnaphthalene, and naphthalene (Resolution Consultants; 2014, September 1; p. 4-1). These contaminants are believed to

have originated from spills or disposal of waste petroleum at the Transportation Building on Hartwell's Hill and from a leaking underground fuel storage tank near the building (Resolution Consultants, 2014, September 1; p. 4-5 and 4-6) (Map 9 and Exhibit K).

The leaking fuel tank and piping were removed in 1988-89 and contaminated soil was excavated to the edge of the Transportation Building. (Resolution Consultants; 2014. September 1; p. 4-6). After demolition of the Transportation Building in 2001, the Navy used a combination of chemical and thermal remediation treatments on the in situ contaminated soil between 2001 and 2003, which reduced groundwater levels of VOCs, but not to target levels.

By 2009, the Navy believed that residual fuel and petroleum waste products in soil near the source area and under the footprint of the demolished Transportation Building were still "providing a continuing source of COCs [contaminants of concern] to Site 4 groundwater," (Tetra Tech NUS; 2009, September; Part 2, p. 2-17, paragraph 2) and considered additional excavation to accelerate the clean-up process. The Navy proposed to restore the site by:

*Installation of stabilization layer to bottom of excavation, then backfill with stored clean soil and clean treated soil. Repaving or reseed surface area. (Tetra Tech NUS; 2009, September 1; Part 2, p. 2-34).*

However, in 2011, the excavation remedy option was canceled, with the Navy citing its belief that its groundwater remediation goals had nearly been achieved. The Navy has since then only monitored Site 4 contaminant levels and is relying on natural attenuation to gradually reduce contaminants (Resolution Consultants; 2014, September 1; pp. 4-6 through 4-8). As of 2019, the Navy has stopped monitoring chemical of concern concentrations in Site 4 groundwater except for benzene (Renova-Sovereign JV; 2020, October 5; p.1).

Committee note: The Navy's original proposal to excavate and/or treat contaminated soil beneath buildings could still benefit the community if some Hartwell's Hill buildings and paved areas cover highly contaminated soil that is contributing to the expansion of the TCE and 1,4,-dioxane-tainted groundwater beyond present LUC boundaries (See Maps 8A, 8B).

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## LAND USE CONTROLS

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The northern NWIRP tract is entirely enclosed within the Site 3 LUC boundary which also includes a substantial expanse of privately-owned land extending northwest from the eastern and westernmost NWIRP property limits all the way to Elm Brook (Map 8A). Portions of 191, 193 Hartwell Road, 216A Concord Road, and 157 Bagley Avenue (all zoned either Residential B, C or both) are affected by the LUC restrictions. There is a smaller Site 4 LUC zone to the northwest of Hartwell's Hill which is contained within the large Site 3 LUC area.

These LUCs have been put in place to reduce the risk to people of being exposed to contaminant chemicals that are, or may be, present in the groundwater, surface water, and soil, as well as

potentially harmful vapors that could accumulate in structures within those zones. We note that in September of 2019, the Navy stated that none of the buildings on Hartwell's Hill have ever been tested for vapor intrusion. ([Exhibit K: Site 3 LUCs; and Tetra Tech, 2019, Section 2.1.1, pp. 2-3](#))

Site 3 LUC restrictions are designed to:

([From Resolution Consultants, 2017, December 1; Section 3.1, p. 6](#))

[Committee note: this report defines COC as contaminant of concern]

- *Prevent use of Site 3 groundwater as a drinking water supply until COC concentrations in groundwater achieve cleanup goals.*
- *Prevent occupancy of current and future Site 3 structures until COC concentrations allow for industrial use of the property.*
- *Prevent residential development of the Site 3 area until COC concentrations allow for unlimited use and unrestricted exposure.*
- *Maintain the integrity of the current or future remedial and monitoring systems, such as extraction and treatment wells, monitoring wells, and in-situ enhanced bioremediation.*

Some allowed Site 3 activities include ([From Resolution Consultants, 2017, December 1; Section 3.4, pp. 8-9](#)):

- *Remedy operation and maintenance (O&M) activities conducted in accordance with the approved Sampling and Analysis Plan (SAP) or other approved work plan to provide for the sampling, inspection, and installation of groundwater monitoring wells or other O&M actions.*
- *Environmental investigations and/or remedial actions conducted in accordance with an approved work plan.*
- *Vehicular and pedestrian traffic.*
- *Facility maintenance activities such as snow plowing, brush clearing, pest control, paving, and utility repair.*
- *Construction activities relating to the industrial use of the property, such as excavation and building repair, demolition, and construction.*
- *Equipment storage, including vehicle parking.*
- *Continuation of current private property use within the Site 3 LUC Area as undeveloped wetland and wooded land.*
- *Installation of any other systems to ensure that the remedial action remains effective and is protective of human health and the environment.*

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#### NOTE ON OUTDATED BASE MAPS IN RECENT NAVY PUBLICATIONS

The committee has noted that some site maps in the Navy's most recent NWIRP environmental publications are extremely outdated and omit many nearby homes and buildings that have been built since 1980. This includes about 142 homes on Independence Road, Garrison Drive, Colony Circle, Patriot Circle, Athena Road, Kendall Court, and Sorens Way; at least four homes on Bagley Avenue and Hartwell Road; and a nearby sports center (built 2007), and adjacent playing fields (built 2012).

A number of the Navy site maps don't include the date of the older base map source, and are labeled only with the date that Navy data has been superimposed on the map. This can give a misleading impression that the maps are accurate and up to date, and that the area population is much lower and more distant from the NWIRP than is true.

Members have expressed concern that these omissions and inaccuracies could lead to underestimating potential risks and impacts of the groundwater contamination on the surrounding neighborhoods by federal and state agencies, as well as potential re-developers of Hartwell's Hill and other land near Hartwell's Hill – if those readers are unfamiliar with the Hartwell Road area of Bedford and mistakenly assume recent Navy maps are accurate and up to date.

We are proud to include in this report a number of maps of the NWIRP site recently created by the Bedford Department of Public Works Engineering/GIS Division Analyst Chris Nelson that very accurately depict Hartwell's Hill and the surrounding neighborhoods. ([Maps 1, 2, 3A, 4, 5A, and 5B](#)).

#### NWIRP LINK TO HARTWELL ROAD MUNICIPAL WELLFIELD CONTAMINATION

In October 1983, TCE was detected in the Town's water supply and traced back to the new Hartwell Road wellfield which had been put into production earlier in the year during March ([See Exhibits D and O](#)). Although the well water had initially been free of VOCs, by early 1984, all three of the new wells had to be shut down due to contamination with TCE, benzene, and five other volatile organic compounds ([GEI Consultants, Inc.; 1991, October 2; p. i](#)).

The Town carried out an intense environmental investigation to characterize the nature and origin of the contamination and its potential health and environmental risks ([Exhibit O](#)).

The research findings of the Town's hydrogeology consultants implicated the northern NWIRP tract on Hartwell's Hill as well as the Raytheon Missile Systems Division facility at 180 Hartwell Road as the most likely sources of the groundwater contamination that had been drawn into the new wellfield once the pumps had been activated. The Town's hydrogeology experts also concluded that although the airfield groundwater had similar contaminants that eventually would have been drawn into the wellfield, such contamination had not yet occurred during the short period that the well pumps were in operation.

The Town of Bedford filed suit in the mid-80s against Raytheon, the Navy, the Air Force, Massport, and a private party over the groundwater and wellfield contamination. The litigation was settled in 1993 with a payment of \$4.7 million by the defendants to the Town. Raytheon and the Navy together paid \$4 million of the settlement but did not admit liability for contamination of the wellfield. The Town's hydrogeology consultants had estimated that the cost to the town of replacing the Hartwell Road municipal wellfield water supply until the year 2025 would be \$9.2 million dollars ([Exhibit O](#)).

## ZONING AND PROPERTY USE ISSUES

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### Zoning

- Most of the northern NWIRP tract is zoned Industrial A; however, a third of it is actually zoned Residence B and C. (Maps 5A, 5B).
  - Part of the northern end of Hartwell's Hill within the NWIRP residential-zoned area is a hillside dump area consisting of a mixture of heavy-metal contaminated incinerator ash deposits, construction debris, household trash, furniture, and possibly other materials (empty drums and cans were found discarded on the site at least once). This waste was generated by NWIRP operations from at least 1953 to 1973 (Rogers et al., 1986, p. 8-1). Although the Site 1 incinerator ash deposit areas are shown and labeled on Navy maps, **this old NWIRP hillside dump site on residential-zoned land is not labeled as such.**
- Despite being zoned as industrial, the 44 acres of land directly to the west of the NWIRP, stretching along both sides of Hartwell Road was the site of the former Minuteman Village mobile home park (Exhibit R), which provided affordable housing for Hanscom Air Force Base enlisted personnel, officers, and their families from 1961 until 2009 (Metcalf and Eddy/AECOM, 2009).
- The 2009 report prepared for Hanscom Air Force Base states that decommissioning and restoration of the Minuteman Village site, **"would result in the creation of open space/vacant land in an area that has been residential for nearly 50 years."** (Metcalf and Eddy/AECOM, 2009, p. i).
  - Committee note: This useful natural airfield buffer zone west of Hartwell Road, with a long history of residential use will be destroyed if Massport clears the land and replaces the now thickly wooded, brushy, and grassy vegetation with paved surfaces and aviation facilities.

### Property use:

**The Bedford NWIRP facility was used for research and development of radar and missile guidance systems, not manufacturing.** A 1994 Agency for Toxic Substances and Disease Registry (ATSDR) study of the NWIRP states:

*NWIRP is not a production facility but **used strictly for research and development.***

*Research is conducted in two main structures: the Components Laboratory, built in the mid-1950s, and the Flight Test Facility, built in 1959, (ATSDR; 1994, June; p. 1).*

This R&D use aligns with the 2000 Record of Decision on Sites 1 and 2 description of the NWIRP:

*The mission of NWIRP Bedford is to design, fabricate, and test prototype weapons equipment, such as missile guidance and control systems. Activities at NWIRP Bedford are conducted in two main structures: the Components Laboratory and the Flight Test Facility, (ENSR: 2000a; September; p. 3 of 33, paragraph 4).*

The 2000 R&D description is repeated in ([Renova-Sovereign Joint Venture; 2020, Dec. 15; p. 1](#)) and in the most recent Bedford NWIRP history published by the Navy, which states:

*The primary mission of NWIRP Bedford was to provide Raytheon with facilities for engineering, research, testing and development of radar and missile guidance systems, (NAVFAC Environmental; 2020, March; Navy Base Cultural Resource Stories. Helping to win the Cold War: Radar and missile guidance systems development at Naval Weapons Industrial Reserve Plant (NWIRP) Bedford, Massachusetts; p. 3).*

Missiles and components related to the research at the NWIRP were manufactured at other locations, including Raytheon's Andover, MA plant [[See Bibliography: Bedford NWIRP and Raytheon Missile Systems Division \(180 Hartwell Road\) Property Use Descriptions \(1958 – 2020\)](#)].

## DIVESTITURE

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The southern tract of the NWIRP property at 154 Hartwell Road (formerly known as the Southern Flight Test Area or Navy hangar parcel), located between Hartwell Road and the airfield, was divested by the Navy and sold by the GSA at public auction to a private party for \$9,040,000 in 2019 ([Exhibit D and Bibliography: Bedford NWIRP divestiture history](#)).

The northern Hartwell's Hill tract is currently in the process of being prepared for divestiture and until recently the Navy had anticipated that the land would become eligible for deed transfer by 2024 ([Exhibit D](#)). However, the recent expansion of the Site 3 trichloroethylene groundwater plume ([Maps 8A, 8B](#)) and potential vapor intrusion threat to some offsite properties ([Exhibit L](#)) have triggered more investigation and may push the land transfer date to 5 to 10 years from now. The additional time may be needed for the Navy and environmental authorities to investigate, construct additional remedy components if needed, and then prove any new remedies are operating properly and successfully (Navy communication, November, 2021).

The divestiture process will have two main entry points for Bedford's participation:

- The Town may be able to negotiate directly with the GSA if no federal or state entity claims the property ([Exhibit C](#)).
- The Town may wait until the property is sold at public auction and join in the bidding process – unless some other non-federal, non-state entity expressed interest during the property screening period and has already entered into negotiation with the GSA for the land ([Bibliography: GSA documents about divestiture](#)).

However, Bedford must officially notify the GSA of its interest during the initial northern NWIRP tract screening period to protect its right to negotiate for the land before it is sold at public auction. If it does not, then the Town may be excluded from any future negotiations over the parcel. We are uncertain when the screening period will take place, but note that pre-pandemic, the GSA had estimated that the screening period would be set for June 2020. It was subsequently canceled. The Town must stay in contact with the local GSA Region 1 Branch Chief for Boston Operations to learn if or when the screening period for the Bedford NWIRP northern tract has been rescheduled (Navy RPM communication, November 2021).

To read about a successful collaboration between a small town, the Navy, and the GSA in preparing for an NWIRP property divestiture in Texas, see: Navy divestiture deep in the heart of Texas: Collaboration leads to successful remediation and redevelopment of McGregor Property. (2007, Summer). *Currents: The Navy's Environmental Magazine*, pp. 1-18. <https://documents.pub/document/sum07-navy-divestiture-deep-in-the-heart-of-deep-in-the-heart-of-divestiture.html>

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## ANALYSIS OF FUTURE LAND USE OPTIONS

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There are important environmental and physical constraints associated with the northern tract of the NWIRP that will affect how it can eventually be reused, such as:

- The presence of four Superfund sites on Hartwell's Hill ([Maps 6, 7, 8A, 8B, 9](#)).
- Its proximity to a general aviation airfield owned and operated by Massport.
- Its hill topography.
- It is accessed by a narrow, curving residential street with poor sightlines.
- Two thirds of the northern tract are zoned industrial, yet lie in close proximity to residential neighborhoods; recreational playing fields and facilities frequented by many families and youth; and vulnerable privately-owned wetlands between Hartwell's Hill and Elm Brook ([Maps 1 and 4 depict the community features surrounding Hartwell's Hill and the NWIRP](#)).
- It is presently occupied by at least ten deteriorating buildings and structures which have been vacant and unmaintained for over two decades. These have been described by the Navy as ([Exhibit N](#)):
  - *"buildings and structures that pose severe risks to human health and safety..."*
  - *"unmaintained" and "structurally unsound..."*
  - Containing *"unacceptably high levels of mold."*
  - Likely containing asbestos ([May 8, 2019 Navy RAB meeting discussion](#)).
  - *"in a deteriorating condition..."*
  - Experiencing *"trespassing juveniles and adults ... entering these buildings, despite various Navy security measures like signage, fencing, boarding up openings, and routine patrols."*
  - *Having never actually been tested for vapor intrusion during the past 21 years* – with the reasoning being that the LUC prohibits [legal] occupation of the buildings ([Tetra Tech; 2019, September 1; Section 2.1.1, pp. 2-3](#)), despite being located above or in close proximity to the highest concentrations of soil and groundwater contamination found on the northern NWIRP tract.
  - Including an earth-covered ammunition bunker once used for storing "engine charges" past their expiration dates, that the Navy documented as demolished and later discovered still exists.
  - Including an existing Antenna Range Building that was once used to store radioactive Cobalt-60.

The site's military usefulness ended in 2000, and the Navy has sought to divest the property since at least 1999 ([Exhibit D and Bibliography: Bedford NWIRP divestiture history](#)).

It is important to note that even after divestiture, federal legislation requires the Navy remain ultimately responsible for ongoing remediation and monitoring of the polluted groundwater radiating out from Hartwell's Hill, just as the Air Force also remains responsible for continuing remediation and monitoring of contaminated groundwater beneath the airfield, despite returning the airfield to the State for civilian general aviation flight operations in 1973.

Potential Hartwell's Hill land use options our committee explored included:

- Solar farm
- GSA public benefit conveyances
- Private commercial/industrial development

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## HARTWELL'S HILL SOLAR FARM

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The committee investigated the northern tract potential for future redevelopment as a solar farm and found many favorable factors supporting such a land use.

We began to focus on that possibility in 2019, after committee members contacted the town manager of a small town, McGregor, Texas, that also has an NWIRP installation, to discuss his town's experience with the divestiture process in 2007. The manager, Mr. Kevin Evans, stressed to us that if Bedford wishes to participate in the divestiture process, the Town should focus on potential land uses that would be beneficial and agreeable to the community as a whole, and which would not create future environmental or health-related liabilities for the Town or the Navy. Because of the size, zoning, location, and ongoing remediation of groundwater at the Hartwell's Hill tract, he suggested the committee explore the possibility of a solar farm.

The committee saw several advantages to Mr. Evan's suggestion that Bedford consider a possible Hartwell's Hill solar farm, such as:

- The installation could be remotely operated and monitored with no permanent onsite employees.
- After construction, it would not add to Hartwell Road daily traffic, since it would require only periodic inspection and maintenance.
- It would provide a significant source of clean, quiet, cost-effective renewable energy for Bedford and/or other users.

However, committee members also observed there were several requirements that must be satisfied before a Hartwell's Hill solar farm could be seriously considered, including that it be compatible with:

- General aviation airport operations at Massport's Hanscom airfield.
- Ongoing environmental remediation and monitoring of the NWIRP northern tract.
- The uneven terrain of Hartwell's Hill.
- The timing of Navy divestiture of the northern tract.
- The Town's financial means.
- The wishes of Bedford residents.
- Reconfiguration or modification. (This allows the Town maximum flexibility for additional uses of the property as remediation progresses and especially after clean-up is completed.)

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## 2020 AMERESCO PRELIMINARY ASSESSMENT

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To learn more about the feasibility of a solar farm on Hartwell's Hill, the committee requested an educational presentation from Ameresco, a Massachusetts-headquartered renewable energy company with experience developing, constructing, and operating solar arrays at other airports (including Boston Logan; [Exhibit E](#)), on brownfield and landfill sites, and at military installations.

Robert Jackson, Ameresco Director of Development, Solar Photovoltaic Projects, gave a talk to the committee at its January 23, 2020 meeting, about what special issues exist for solar installations near airfields and on land under environmental remediation in general. He also explained during the presentation and in an extensive question and answer session afterwards how these issues, as well as the uneven hill terrain could be managed for the Hartwell's Hill NWIRP land in particular.

Mr. Jackson's preliminary assessment of the NWIRP northern tract was that a Hartwell's Hill solar farm is indeed feasible. More details on Mr. Jackson's January 2020 solar energy presentation to the committee and the follow-up Q&A session can be seen here:

[https://www.bedfordma.gov/sites/g/files/vyhlf6866/f/minutes/approved\\_minutes\\_for\\_jan\\_23\\_2020\\_ahhrc\\_meeting.pdf](https://www.bedfordma.gov/sites/g/files/vyhlf6866/f/minutes/approved_minutes_for_jan_23_2020_ahhrc_meeting.pdf) )

**Ameresco Image of Potential Hartwell's Hill Solar Farm**



Image courtesy of Ameresco, 2021. All rights reserved

**Aviation operations:**

Mr. Jackson explained that potential aviation-related issues such as solar panel glare and glint are prevented by using FAA-approved solar glare hazard modeling and coordinating solar array design near airfields with the FAA and airport authorities.

The committee notes that The Edge Sports Center on Hartwell Road (less than 500 feet from the NWIRP property line), the Boston MedFlight headquarters and hangar on the other side of the airfield, and the Hanscom Field Civil Air Terminal itself all have extensive building-mounted solar arrays. Signature Flight Support is also currently constructing a replacement facility/hangar at the airport which will include a sizeable roof-top solar array.

**Ongoing remediation and monitoring of groundwater contaminants:**

Hartwell's Hill groundwater still has high levels of TCE and other volatile organic contaminants present, despite years of remediation. The Navy has estimated that some contaminant remediation/containment phases on and near Hartwell's Hill may continue for years or decades, and will require some degree of land use restrictions unless groundwater contaminant concentrations can be reduced to levels that meet safe drinking water standards.

Mr. Jackson's initial assessment was that a Hartwell's Hill solar farm would not interfere with ongoing site remediation or monitoring.

He also described the environmental permitting process and various installation options that are appropriate for solar farms that are situated on contaminated land.

Local towns with landfill solar arrays installed by Ameresco include Acton, Lowell, Sudbury, and Weston. (See [photographs of these and additional landfill solar arrays at Concord, Lexington, and the Superfund site solar farm in Billerica in Exhibits F and G](#)).

**Topography of Hartwell's Hill:**

Mr. Jackson described how issues of uneven terrain such as exist on Hartwell's Hill can be successfully managed using either concrete ballast foundations or pilings to support the solar panels. The choice depends on hillside slope, soil and bedrock depth, and contaminant source area cap presence or absence.

[Note: The committee recommends it may be beneficial for the Town to consider a more portable ballast system rather than piling-type solar array foundation. Portable ballasts would be more easily rearranged if the Navy and/or EPA remediation treatments should intensify and require installation of additional treatment or monitoring wells at some point in the future. **This system also allows reconfiguring panels to access space for future use.**]

### **Existing structures on Hartwell's Hill:**

Mr. Jackson explained that it is possible for ground-mounted and building-mounted solar arrays to be combined if the existing Navy structures are to remain in place, or for the solar arrays to be built in phases if Navy buildings are to be demolished over a lengthy period of time. This combination also allows the arrays to be moved, changed, and modified in the future as the site is remediated.

However, he estimated that if all the existing deteriorating Navy structures on Hartwell's Hill were first demolished and removed, potential energy production capacity from a Hartwell's Hill solar farm would triple from 1 MW DC to slightly more than 3 MW DC (R. Jackson communication, February 2021).

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### **2014 EPA PRELIMINARY ASSESSMENT**

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The committee discovered that the EPA had examined the compatibility of a solar energy installation with aviation operations; ongoing environmental remediation and monitoring; and additional issues such as power transmission access, development incentives, and financing opportunities in a 2014 study prepared for the Navy ([EPA; 2014, January; Preliminary Assessment of Renewable Energy Opportunities: Naval Weapons Industrial Reserve Plant, Bedford, Massachusetts](#)).

The EPA assessment was quite positive. Its findings ([EPA ; 2014, January; p. 13](#)), quoted below:

- *NWIRP Bedford could potentially support utility-scale photovoltaic solar development.*
- *PV solar project size could range from 0.5 to 2.8MW.*
- *Solar development would be unlikely to interfere with current or future site [environmental] remedies.*
- *Potential issues with glint and glare will need to be reviewed with the FAA and Hanscom Field. However, glint and glare studies generally suggest that glint and glare should not affect flight navigation.*
- *The ability to use incentives and obtain a long-term power purchase agreement would be critical for the economic viability of a utility-scale project at NWIRP Bedford.*
- *The Air Force, which operates the nearby Hanscom Air Force Base, is operating under laws and executive orders that mandate or encourage RE at federal facilities. PV solar development projects at NWIRP Bedford could potentially enable the Air Force to meet the federal requirements or goals for RE use.*
- *An RE project at NWIRP Bedford affiliated with Hanscom Air Force Base could also help the state achieve its goals of implementing energy solutions at Massachusetts-based military bases.*

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## HANSCOM AIR FORCE BASE SOLAR GLARE STUDY

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The NWIRP is one of 11 potential solar PV project sites near the airfield that are under consideration by Hanscom Air Force Base. HAFB Public Affairs Office has explained that during a preliminary evaluation for glare analysis, all 11 sites were found to comply with FAA standards.

*Hanscom AFB conducted an analysis using FAA-approved Solar Glare Hazard Analysis Tool (SGHAT) to identify any potential solar glare hazards from the PV system to aircraft or the air traffic control tower at Hanscom Field. Hanscom AFB completed an analysis of the 11 proposed solar PV sites using the SGHAT and determined that all sites will comply with FAA standards. Hanscom AFB also completed and submitted FAA Form 7460-1 Notice of Proposed Construction or Alteration to FAA for approval, (2015 Environmental Assessment of HAFB proposed solar photovoltaic system installation).*

The HAFB Public Affairs Office and the Civil Engineering Division noted (November 2021):

*The FAA will not approve the Form 7460-1 until there are more details regarding the equipment, which necessitates holding approval in abeyance until we have a proposal.*

In answer to a query about why the solar PV projects have been on hold, the Public Affairs Office and Civil Engineering Division explained (November 2021):

*Solar PV initiatives have been largely awaiting scoping determinations for the Energy-as-a Service (EaaS) pilot program. If EaaS does not use some of the proposed solar PV sites, Hanscom may pursue separate solar PV projects at some or all of the unused sites.*

[Note: Hanscom Air Force Base is one of two Air Force Bases that have been selected as pilot sites for the EaaS program.

*With EaaS, the Air Force will leverage the expertise of those whose business is built around energy, allowing us the ability to define when and where we need power to carry out our mission," said Deputy Assistant Secretary of the Air Force for Environment, Safety and Infrastructure Mark A. Correll in a Request for Information article earlier this month. "Turning to industry to generate world-class thinking around this new approach to installation energy will help ensure the readiness and resilience of our bases, (66th Air Base Group Public Affairs; 2019, May 31; paragraph 8)*

<https://www.hanscom.af.mil/News/Article-Display/Article/1862907/hanscom-selected-as-pilot-site-for-energy-as-a-service-concept/>

Please See Exhibit J for more details.]

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## GSA PUBLIC BENEFIT CONVEYANCES

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Members first considered GSA public benefit conveyances (PBC) because of the potential advantage to the Town: eligible PBCs can earn a discount from the GSA of up to 100% of the property's fair market value ([Exhibit A](#)).

However, the committee believes a number of the GSA public benefit conveyance options would be precluded by the NWIRP land's Superfund site history, status of continuing remediation treatments, location, industrial zoning restrictions on future uses, and land use restrictions in place to protect human health ([Exhibit B: Committee analysis of GSA PBC options](#)). We have observed it seems unlikely that the power transmission lines PBC would qualify, *unless* it was to be associated with a Hartwell's Hill solar farm.

There are several land use options which may qualify as PBCs. They include setting aside some or all of the land (if permitted by LUCs in effect at divestiture) as a park and/or recreational and/or wildlife conservation area. An open air historic monument (if LUCs allow) could also qualify as a PBC ([Exhibit B](#)). We note that reserving land for these options (upon divestiture if LUCs allow, or for the future when clean-up is achieved) would be compatible with a solar farm.

It is up to Bedford to choose the land uses that will best meet its present and future needs. A modifiable solar farm that can be reconfigured in the future as needed will give Bedford maximum freedom and flexibility of choice.

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## INDUSTRIAL AND/OR COMMERCIAL DEVELOPMENT

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Acquisition of this property gives Bedford control over what happens to the land. If the Town wants industrial or commercial development on Hartwell's Hill some day when and if LUCs allow (in conjunction with or even in place of a solar farm) – the choice will be preserved for future leaders and the community to decide if that is what Bedford needs.

**In the meantime, we note that Bedford's tax base will not diminish if the Town acquires control of this site – it has not been on the tax rolls for the past eight decades.**

Some issues we have found to be of concern with respect to potential industrial or commercial development of Hartwell's Hill:

- Present restrictions don't allow occupancy of any structures that might be built within the LUC boundary. ([See Exhibit K](#)).
- **Residential neighborhoods and recreational areas along Hartwell Road will be especially vulnerable to negative impacts from certain types of industrial uses that may not be prohibited by the land's Superfund status** ([See Map 4](#)).

The nearby area has changed significantly during the past 21 years since the Navy and Raytheon vacated the NWIRP. Significant new developments such as the Hartwell Farms neighborhood at Kendall Court (with 75 families) and the Soren's Way homes across from Chip-In Farm; The Edge Sports Center (built 2007) and playing fields (built 2012) have also been constructed during the past 21 years since the NWIRP was shut down.

Families living in those new residential areas or who have moved into other homes near the NWIRP since 2000, have never experienced heavy industrial-related road traffic originating from Hartwell's Hill (nor air noise originating from the former Navy hangar on the southern tract of the NWIRP).

- Heavy commercial/industrial traffic and especially heavy truck traffic on Hartwell Road is difficult and risky for drivers, for pedestrians, for bicyclists, and for residents – along *all* of

Hartwell Road, not just one half or the other ([See Exhibit Q: The Trouble with Hartwell Road](#)). We note:

- Hartwell's Hill is accessed by a narrow, curving residential road with poor sightlines. We note that the *entire* length of Hartwell Road is narrow from South Road to Concord Road – not just the section adjacent to Hartwell's Hill or the east or west half.
- Most of Hartwell Road west does not have a sidewalk, so pedestrians are forced to walk in the street when the roadside is covered with snow, ice, puddles, or overgrown vegetation.
- Changing or intensifying remediation of the Hartwell's Hill Superfund sites has potential to disrupt businesses operating on the hilltop. [Note the additional Navy drilling on and near the hill which took place during 2021 to investigate an unanticipated TCE groundwater plume expansion and an accompanying threat of vapor intrusion to a nearby residential area ([Tetra Tech; 2021, April 1](#)).]
- The NWIRP's location on Hartwell's Hill has demonstrated that a hilltop is one of the worst places for industrial chemical accidents and spills to occur.
  - The topography and local stratigraphy ([See Maps 3A and 3B](#)) mean that spilled, leaking or improperly disposed contaminants can be carried rapidly downhill by surface runoff water or storm drains; and/or soak into the hilltop ground and then radiate down and outward in groundwater flowing into surrounding areas.
  - Hartwell's Hill is also bordered by homes to the east and north east
  - It is also bordered to the north and northwest by a sensitive environmental area (the protected wetlands between the hill and Elm Brook).
  - It is surrounded by a protected groundwater resource, which has already been contaminated by past research and development activities of the NWIRP on top of Hartwell's Hill.
  - The ongoing clean-up of that Bedford groundwater resource has already taken decades, cost millions, and has many more years to go. Although the Navy is responsible for the remediation of contamination generated during its and Raytheon's use of Hartwell's Hill, clean-up of any new contamination generated by a new owner will be that owner's responsibility.
- Potentially incompatible zoning issues such as:
  - Although about two thirds of the NWIRP northern tract is zoned industrial, one third of the tract (the northernmost side of Hartwell's Hill) is actually zoned Residence B and C ([See Maps 5, 5B](#)).
  - About half of the NWIRP northern tract is surrounded by residential zoning (to the east, north, and northwest) and land that was in residential use from 1961-2009 even though it was zoned industrial (the site of the former HAFB Minuteman Village mobile home park), or land used for recreational purposes ([See Maps 2 and 5B; Exhibits R and S](#)).
  - Several other acres of the former Minuteman Village land were redeveloped in 2012 by The Edge Sports Center as two recreational sport playing fields, which are in extremely close proximity to the west property line of the NWIRP ([Map 4](#)).

Consideration of the strengths and weaknesses of these various options; the ability to modify a solar farm to maximize potential future land uses and parks as remediation proceeds and LUCs allow; and the nature and history of the NWIRP northern land tract led our committee to rank a Hartwell's Hill solar farm at the top of the list of future redevelopment uses we would like to recommend for consideration of the Select Board and our Town.

## RECOMMENDATIONS

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### PRIMARY FUTURE LAND USE RECOMMENDATION: HARTWELL'S HILL SOLAR FARM

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The committee suggests that despite the environmental challenges, the federal divestiture of the 29 acres of the Hartwell's Hill NWIRP northern tract presents a unique opportunity for the Town to acquire ownership of a large land tract which could host a solar farm.

A solar farm would meet the criteria of being a beneficial land use (clean renewable energy) with low impact to nearby residential neighborhoods (quiet, with little or no increased traffic on Hartwell Road); being eligible for state and federal support; and presenting no future liability for the Town or the Navy by disrupting environmental cleanup operations or exposing humans to unnecessary health risks.

Two preliminary evaluations of solar energy potential for the NWIRP property, one prepared by EPA New England for the Department of the Navy (EPA, 2014) and an independent initial assessment by renewable energy company Ameresco for an educational presentation to our committee (Jackson, R.E., 2020), both indicate that a Hartwell's Hill solar farm is very likely to be compatible with ongoing Navy remediation and Hanscom Field aviation operations.

In addition, the committee learned that Hanscom Air Force Base has already conducted a preliminary analysis of solar glare hazards from a potential array at the NWIRP, as well as 10 other sites near the airfield, and found all 11 sites will comply with FAA standards (Exhibit J).

The committee also found numerous examples of solar farms and arrays in successful operation adjacent to airfields and airports, including Logan Airport and Hanscom Field itself (Exhibit E).

As the Navy's remediation proceeds and the land and groundwater is cleaned up, there is potential for federal and state environmental agencies to approve some of the acreage to be safe and suitable for a multitude of other uses in addition to a solar farm: a park for people, pets, and wildlife to enjoy; a place of recreation for walking, biking, running, exercising, and playing outdoor sports; a place of refuge for the threatened, endangered and special concern species that live near the airfield perimeter (Exhibit B); or a combination of any of the above. Preserving this space flexibility for the future could be attractive and useful to Bedford.

It is possible that some of the land may be judged by environmental agencies as suitable for such uses at time of divestiture (See current Site 3 land use controls in effect: Exhibit K).

However, we note that it is also possible that there may be setbacks or discoveries which will require additional remediation. That happened this past year when measurements showed that the TCE groundwater plume concentration seems to have increased at one monitoring well and may now be threatening at least one nearby neighborhood.

Open-air land uses may be safer and more suitable for the Hartwell's Hill tract than more intense re-development since it is the original source site for the volatile organic compounds contaminating the groundwater radiating outward from the Hill, groundwater concentrations of contaminants are highest on the Hill, and contaminated soil likely remains beneath some building footprints or paved areas.

Preserving safety and adaptability applies not only to evolving remediation requirements and techniques, but also to changing needs of the Town. Twenty to thirty years from now when a solar farm lease/operation contract would expire, Bedford's next generation may need and want to keep a Hartwell's Hill solar farm more than ever. The option for a future lease operation renewal or extension can be written into a present-day contract to preserve that choice for them.

As the land and groundwater become cleaner each year due to the combined efforts of the Navy, EPA, MassDEP, and natural attenuation by soil microorganisms, someday – whether in one decade, two, four, or eight – it is possible that Hartwell's Hill can be whatever the Town should need it to be. Allowing Bedford's future residents' greatest need to be decided at that point in time is an opportunity our town can control and preserve.

And in the meantime, a Hartwell's Hill solar farm could safely operate to benefit the Town, its partners, the environment, and to protect the land use flexibility for the future.

Reacquiring this land that was taken from Bedford landowners by eminent domain almost eighty years ago, and which has served its military purpose well and is no longer needed or wanted by the Navy, is good insurance for the future of Bedford.

**Solar farm to be achieved via one or more of these options:**

Aside from the Navy's progress in environmental remediation, which is the factor that controls the divestiture timeline, the potential for a Hartwell's Hill solar farm also depends on other variables such as ownership, partnerships, return on investment, and cost-saving advancements in solar energy technology. The committee believes there are several options the Town should explore, including:

- Ask for direct donation of the land to the Town by the Navy and GSA.
- Purchase the land from the GSA at a discount from fair market value per the public benefit conveyance program (ideally a 100% discount).
- Purchase the land from the GSA outside of the public benefit conveyance program and then lease the land to a renewable energy company who will build and operate a solar farm. Such a project may receive special attention and support from the EPA because of the land's Superfund site status.
- Partner with a renewable energy company to finance the purchase of the land from the GSA and then lease the land to the company to build and operate a solar farm.
- Partner with the Air Force in negotiating with the GSA and Navy to obtain the northern NWIRP tract of land, with the goal of building a Hartwell's Hill solar farm project to benefit both Bedford and the Hanscom Air Force Base.

- Partner with HAFB to seek grant funding for a Hartwell’s Hill solar farm from the Department of Defense Office of Local Defense Community Cooperation pilot program.
- Seek assistance from our state and federal legislators with acquiring the Hartwell’s Hill NWIRP northern tract from the GSA for the town. Our legislators can facilitate alliances between Bedford and state and federal agencies that strongly support development of renewable energy projects on Superfund sites.

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## SECONDARY FUTURE LAND USE RECOMMENDATION: COMBINED USES

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The following land uses may be compatible with or possible alternatives to a solar farm that could qualify for the GSA public benefit conveyance program:

- **Historic Monument:** Small park with open air educational kiosk or outdoor monument at the southernmost section of property, overlooking the airfield, explaining the NWIRP’s contributions to missile guidance and radar systems development during the Cold War and beyond, until 2000. The history of the land and people of the surrounding area before 1941 should also be acknowledged.
- **Parks and Recreation:** See above.
- **Wildlife Conservation:** Mitigation for massive loss of habitat due to development of the 1000+ acre airfield and post 1945 land development (residential and industrial) by the military and the defense contractor Raytheon along Hartwell Road. (This option should be evaluated by the Conservation Commission and Mass. Fisheries and Wildlife Department).

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## GENERAL RECOMMENDATIONS

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Regarding the divestiture process:

- We recommend that Bedford carefully monitor and prepare to participate in the GSA screening process for Hartwell’s Hill northern NWIRP tract in order to preserve the Town’s options regarding the property.

Regarding other airfield perimeter federal-owned or leased land ([See Exhibit P](#)):

- We recommend that Bedford proactively explore opportunities regarding other airfield perimeter federal-owned or leased land such as:
  - The remaining 6.3 acres of Air Force-owned former Minuteman Village on Hartwell Road.
  - The Air Force-leased and operated FamCamp on South Road (Air Force FamCamp land lease with Massport comes up for renewal in 2027).

Regarding North Airfield recently proposed aviation facility development projects along Hartwell Road (both private and Massport-owned):

- These projects have potential to increase road traffic, air noise, and airfield ground noise; decrease neighborhood air quality due to leaded avgas and jet fuel exhaust emissions; and increase risk of local surface and groundwater contamination due to spills or leaks of aviation fuel and aircraft engine degreasers/solvents, and use of aircraft deicing agents.

Therefore, we recommend that Bedford proactively negotiate for mitigation of potential negative impacts to the Town and nearby residential neighborhoods and recreational areas.

- We suggest that the Town consider asking Massport to preserve the useful natural airfield buffer zone that is the site of the former Minuteman Village west of Hartwell Road. The area is now largely covered with shrubs, thick brush, young trees, some mature trees, grass and wildflowers.
- Although the land is zoned industrial park, it was used as residential for the Air Force personnel and their families for nearly 50 years between 1961 and 2009.
- The original landscaping was planted and maintained by the Air Force to help buffer and protect the Minuteman Village residents from the disturbance of airfield operations (See [Metcalf and Eddy/AECOM. \(2009\). Decommissioning of the Minuteman Village Mobile Home Park and restoration of the site: Final environmental assessment](#)).
- The Air Force attempted to preserve the plantings and trees as the Village was being dismantled and removed, in anticipation that the land would return to an overgrown meadow state and create an attractive open air space ([Exhibit R](#)).
- It would cost nothing to allow this natural airfield buffer park to keep serving that purpose, rather than clearing or paving it for an aviation facility so close to a residential neighborhood (75 families live at Hartwell Farms on Kendall Road and popular recreational playing fields are directly across the street from the site).
- By comparison, Massport has invested millions of dollars to create four airfield buffer parks at Logan Airport.

Regarding any future industrial development of Hartwell's Hill or along Hartwell Road:

- We recommend the Town carefully weigh the cost of allowing any future development project that has potential to exacerbate local groundwater contamination and recall:
  - The Hartwell Road municipal wellfield remains closed to this day, 37 years after being shut down from TCE contamination from contaminated groundwater.
  - The Navy estimates that it may require decades more to clean up the trichloroethylene contaminating groundwater radiating outward Hartwell's Hill.
  - The groundwater contamination cost may go much higher, as the TCE groundwater plume originating from Hartwell's Hill is now being investigated as a potential vapor intrusion threat to a nearby residential area (and to enclosed structures within 100 feet of the TCE plume front).
  - A 1979 quote from EPA New England director of water analysis, Thomas Spitler: *We're really learning a sad lesson. We're learning that it takes a very short time to foul up the water, and a very long time to clean it up,* ([Thomas Spitler, as cited by Ackerman, J. in \*The Boston Globe\*: "Chemicals on tap ...". February 25, 1979, p. 129](#)).

[Committee note: Mr. Spitler was speaking about the loss of another Bedford municipal wellfield on the other side of town during the 1970s, also due to TCE contamination, but created by nearby industrial operations in the corridor between the Middlesex Turnpike and Route 3.]

## RECOMMENDATIONS ON THREE ITEMS OF SPECIAL CONCERN

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### **1. Potential vapor intrusion into occupied structures from the site 3 TCE groundwater contaminant plume**

Extra attention of town officials and residents is warranted for Superfund Site 3 of the northern NWIRP because it is still undergoing active remediation, its TCE and 1,4-dioxane groundwater contaminant plumes are quite extensive, as are its LUC boundaries, and data shows that the TCE plume is expanding, and that both the TCE and 1,4-dioxane plume fronts may have become “unbounded” at several areas along the LUC perimeter (meaning they have migrated outside the protective LUC boundary and the Navy is uncertain of the exact location of the plume fronts at those places).

Of most special concern is the potential that the TCE plume may now be threatening at least one nearby neighborhood outside the present LUC boundary with potentially harmful vapor intrusion ([Tetra Tech; 2021, April 1](#)). Research shows that preferential pathways may allow TCE vapors to travel faster and farther than the actual groundwater plume fronts and potentially threaten residences and businesses well outside the recommended 100’ buffer zone beyond contamination plume fronts ([Exhibit M](#)).

We recommend the Town immediately coordinate with MassDEP, EPA, and the Navy to follow the MassDEP recommendations for complete, open, and early communication about potential TCE vapor intrusion into a home which was detected in September 2020: not only potentially affected residents, but with all nearby neighborhoods, and with the general public and community as a whole. Open communication can prevent the erosion of trust between the community, its leaders, and the Navy and state and federal environmental officials ([Exhibit M](#)).

We also recommend the Town proactively work with MassDEP, EPA, and the Navy to investigate the potential for vapor intrusion into indoor spaces within any structures that fall within the recommended 100’ buffer zone ahead of the TCE plume fronts.

We suggest the Town consider proactively investigating, or requesting investigation by MassDEP, EPA, and the Navy, to determine whether any preferential contaminant migration pathways may exist (such as old or damaged sewer and storm water lines, buried utility lines, or permeable natural gravel deposits) which may allow TCE vapors to travel beyond the 100’ buffer zone ([Exhibit M](#)). A whole range of mitigations exist which can protect residents or business employees if potential vapor intrusion preferential pathways are detected ([Exhibit M](#)).

## 2. Inaccurate Navy site maps

Regarding recent Navy NWIRP site maps that don't depict nearby homes, recreational facilities, and playing fields built since 1980:

- The committee recommends the Town request the Navy update its site maps more frequently.

Regarding an NWIRP-era dump site on the north slope of Hartwell's Hill in a residential-zoned area of the NWIRP property which may still be present (composed of a mixture of Site 1 incinerator ash, construction debris, household trash, discarded furniture, and where empty drums and cans were discovered at least once [[See Exhibit K: Site 1 details](#)]):

- The committee recommends the Town ask the Navy update its maps to delineate the extent, location, and nature of this hillside dump area.

Regarding two down-slope areas from Site 1 that may be contaminated by heavy metal-containing incinerator ash which washed down the hillside ([Rogers et al., 1986, p. 8-1](#)):

- The committee recommends the Town ask the Navy to update its maps to delineate the extent and location of these heavy-metal contaminated downslope areas.
- We also recommend the Town ask the Navy to mark these two down-slope areas with additional signage warning that heavy metal contaminants may still be present in soil in those areas, in addition to whatever general purpose LUC signage already exists for the 29-acre northern NWIRP tract.

## 3. Longterm and ongoing hazards to local juveniles trespassing on Hartwell's Hill

### Navy quotes about this issue:

*I am writing to notify your organization of a proposed Department of the Navy action to demolish historic buildings and structures that pose severe risks to human health and safety located at the northern tract of Naval Weapons Industrial Reserve Plant (NWIRP) Bedford, Massachusetts, [Michael Sydla, Division Director, Naval Sea Systems Command (04I); 2018, June 8; Letter to the Bedford Historic Preservation Commission; p. 1.]*

*The Navy has no alternative use for these buildings. Trespassing juveniles and adults, however, have found a use, entering these buildings, despite various Navy security measures like signage, fencing, boarding up openings, and routine patrols. This ongoing trespass poses not only a security concern but continuing significant safety and health risks since these unmaintained buildings are structurally unsound and contain unacceptably high levels of mold, [Michael Sydla, Division Director, Naval Sea Systems Command (04I); 2018, June 8; Letter to the Bedford Historic Preservation Commission; pp. 1, 2.]*

A number of community members have said that trespassing by local youth on Hartwell's Hill has been going on for many years.

Structurally unsound, unmaintained buildings increase the risk of serious or fatal injuries to trespassing teenagers and adults who gain entry into the old buildings. Photographs of the

deteriorating buildings and other hazardous conditions on Hartwell's Hill show broken windows in the Components Laboratory and Antenna Range Building, a missing board cover from the Government Building, an uncovered manhole, and one of several wells missing covers. They also show extensive and recurring graffiti on upper levels of the two taller buildings (Please see Exhibit N: Photos 1-10). These photographs emphasize the possibility of severe risks to local youth exploring Hartwell's Hill and its abandoned buildings including:

- Falls through an uncovered storm or sewer manhole.
- Falls off of or through 2 and 3 story height deteriorating rooftops.
- Injury from broken window glass.
- Falls into the extensive basement complex of the Components Laboratory.
- Exposure to building interiors contaminated with mold and deteriorating asbestos.
- Exposure to potential TCE fumes that may have entered buildings through preferential pathways for vapor intrusion such as empty plumbing drain traps (Exhibit M). [Note: There has been no running water in the buildings since 2000 (Navy communication, November 2021). No actual testing of Hartwell's Hill NWIRP buildings for volatile organic compound vapor intrusion has ever been conducted (See Exhibit N: Is VOC vapor intrusion a risk to local juveniles trespassing in Hartwell's Hill buildings?).]
- Infrequent site inspections by Navy personnel. This means that individuals who explore the buildings on Hartwell's Hill may not be found for some time if they are seriously injured, overcome by chemical fumes, become entrapped in one of the aging structures, or fall through an uncovered manhole. [Note: The RPM has deemed the Hartwell's Hill buildings too dangerous to authorize entry since 2006, and no "deep access" by Navy personnel beyond a few feet past an entry door has occurred since then (RPM communication, November 2021).]
- Additional hazards for curious young trespassers may exist such as the earth-covered ammunition bunker once used to store "engine charges" past their expiration date.

Although we are aware that security measures have been added during the last several years (two surveillance cameras in 2018 on buildings at the base of the hill, and a Navy request for more frequent Bedford police patrols), these precautions may still be inadequate. The 29-acre property has an extensive perimeter through sometimes densely wooded or steep terrain that cannot be observed from Hartwell Road or from the two buildings at the base of the hill where security cameras have been placed.

Given that existing buildings on Hartwell's Hill do not seem to be safe or salvageable per the Navy's description in several reports and documents (Exhibit N), their value for rehabilitation and re-use is very questionable.

Some of the deteriorating structures and old paved areas may also conceal contaminated soil beneath them, which could be a continuing source of future groundwater contamination. The Navy itself has said that excavation and removal of highly contaminated soil under at least one of the buildings (Transportation Building) would have likely speeded remediation of local groundwater (Tetra Tech NUS; 2009, September 1; Part 2, p. 2-16, paragraph 2).

In view of the above factors, as well as:

- The likely expense and challenges of safely demolishing and removing the deteriorating buildings, and in particular the enormous concrete and steel-reinforced Components Laboratory Building ([Exhibit N](#)).
- The tripling of potential solar energy production if the structures are demolished and removed.
- The Navy contractors' experience and skill with similar demolition projects ([discussed during the May 8, 2019 Navy RAB meeting in Bedford](#)).

Committee members recommend that the Town ask the Department of the Navy to:

- Promptly demolish and remove deteriorating buildings, structures, and pavement.
- Excavate and remove contaminated soil remaining under building or pavement footprints
- Replace with clean fill and topsoil.
- Stabilize new topsoil and newly exposed soil by seeding or planting appropriate groundcovers.

## CONCLUSION

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Bedford hosted the NWIRP and its important missile guidance systems research and development program for nearly 70 years. Although the military, the nation as a whole, and our town benefited from that weapons research, Bedford has also paid a heavy financial and environmental cost for hosting the NWIRP.

The negative consequences include contamination of an important drinking water resource, loss of the Town's investment in the Hartwell Road municipal wellfield and water treatment plant, the continuing cost incurred (1984-2021 and beyond) for replacing our contaminated water supply with potable water purchased from the MWRA, and now potential risk to at least one nearby neighborhood from TCE vapor intrusion originating from the NWIRP northern tract.

The committee suggests that if the Town decides to acquire the Hartwell's Hill NWIRP tract (after Navy divestiture) in order to host either a solar farm, or for other redevelopment use, this costly environmental history be used to strengthen the case to the GSA and the Navy that the property should be transferred to Bedford under the most favorable terms possible.

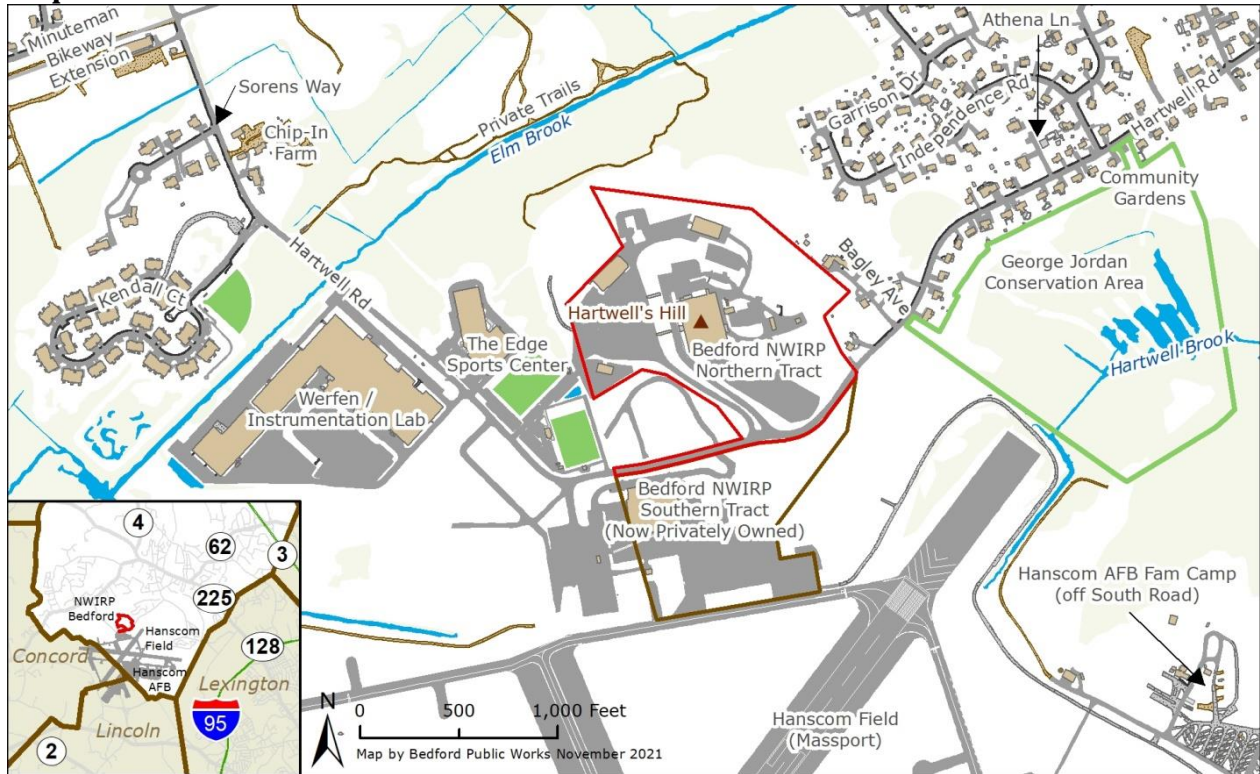
Our analysis leads us to recommend the Town consider a solar farm on Hartwell's Hill as a safe, beneficial, and flexible future land use option for the northern NWIRP tract and we have outlined a number of sources of potential support and funding for such a project: federal, state, industry, and military ([See Exhibits H, I, J and Bibliography: Solar](#)).

We also recommend that the Town ask the Navy to promptly demolish and remove the remaining deteriorating NWIRP structures and old pavement on Hartwell's Hill - along with any contaminated soil concealed beneath building slabs and pavement - and restore the site where needed with clean topsoil and stabilizing groundcover seeding and plantings. We believe this full restoration of Hartwell's Hill should be considered part of the Navy's overall responsibility to Bedford.

# MAPS

## MAP 1: BEDFORD NWIRP SITE

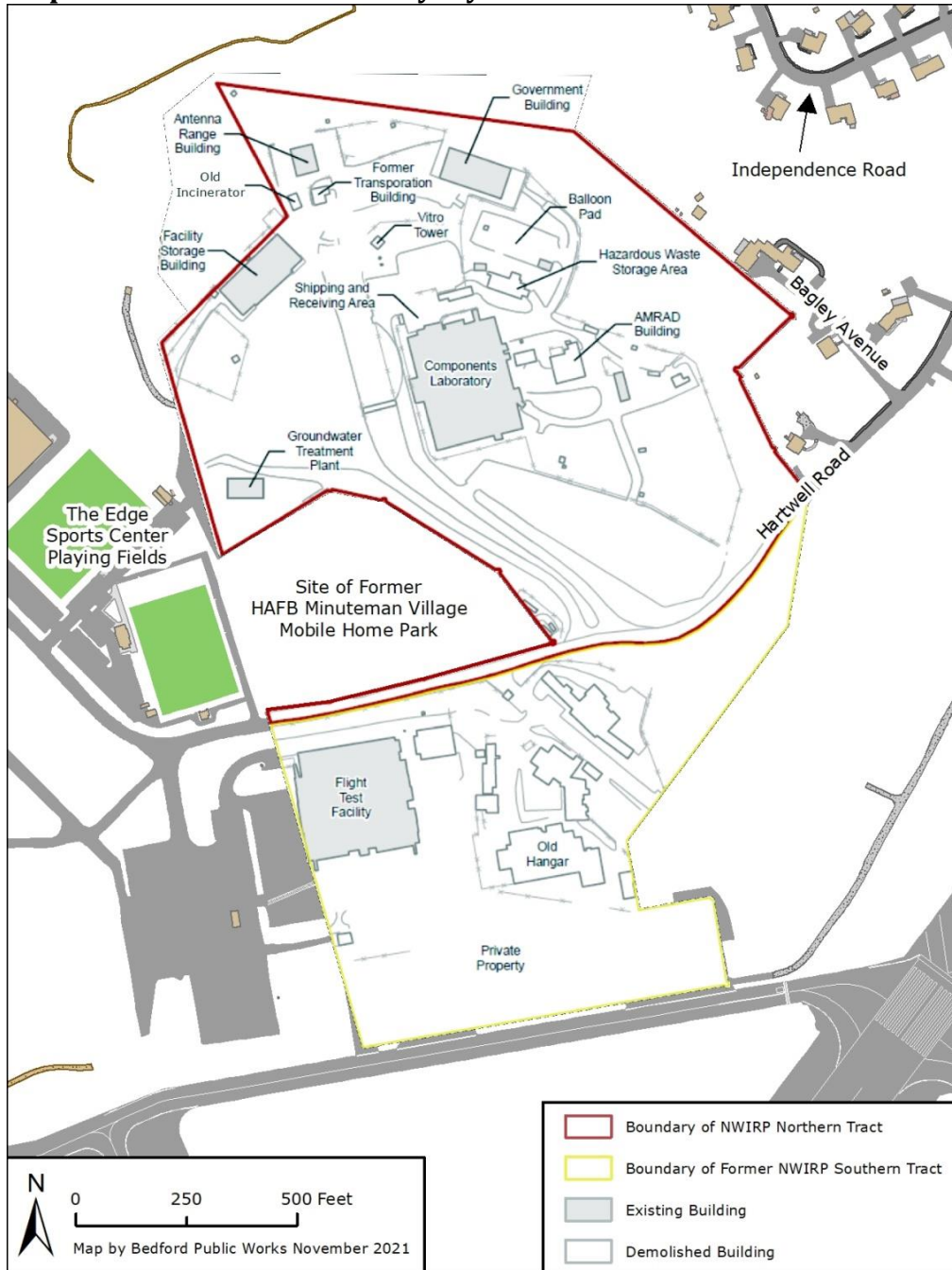
**Map 1: Bedford NWIRP site**



Credit: Map created for this report by courtesy of the Bedford Department of Public Works and Engineering/GIS Division Analyst C. Nelson (November 2021).

MAP 2: BEDFORD NWIRP FACILITY LAYOUT

Map 2: Bedford NWIRP facility layout



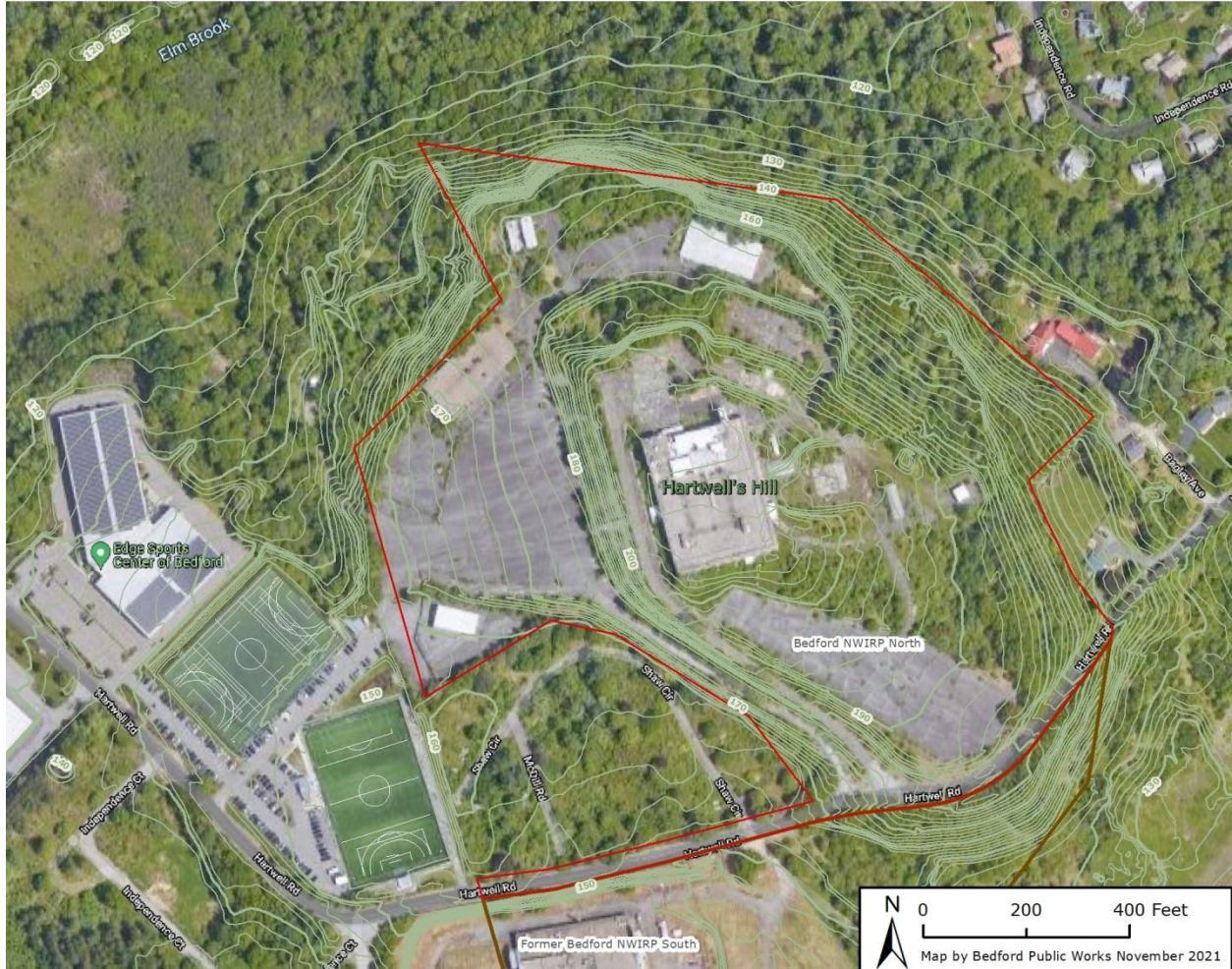
Credit: Hybrid map created for this report by courtesy of the Bedford Department of Public Works and Engineering/GIS Division Analyst C. Nelson (November 2021).

The overlay of the NWIRP facility layout and building information has been added from: Tetra Tech (2021, September 1) Final fiscal year 2021 site management plan - Naval Weapons Industrial Reserve Plant, Bedford, MA. Figure 1-2: Facility Layout Map, page 1-4, which in turn is based on a figure in the 2019 Five Year Review of the Bedford NWIRP. Only some of the 10 existing buildings on Hartwell's Hill are labeled.

[Note: the Navy is currently in the process of updating its figures from the 2019 Five Year Review, based on questions it has received from this committee (Navy RPM communication, November 2021).]

MAP 3A: HARTWELL'S HILL TOPOGRAPHY

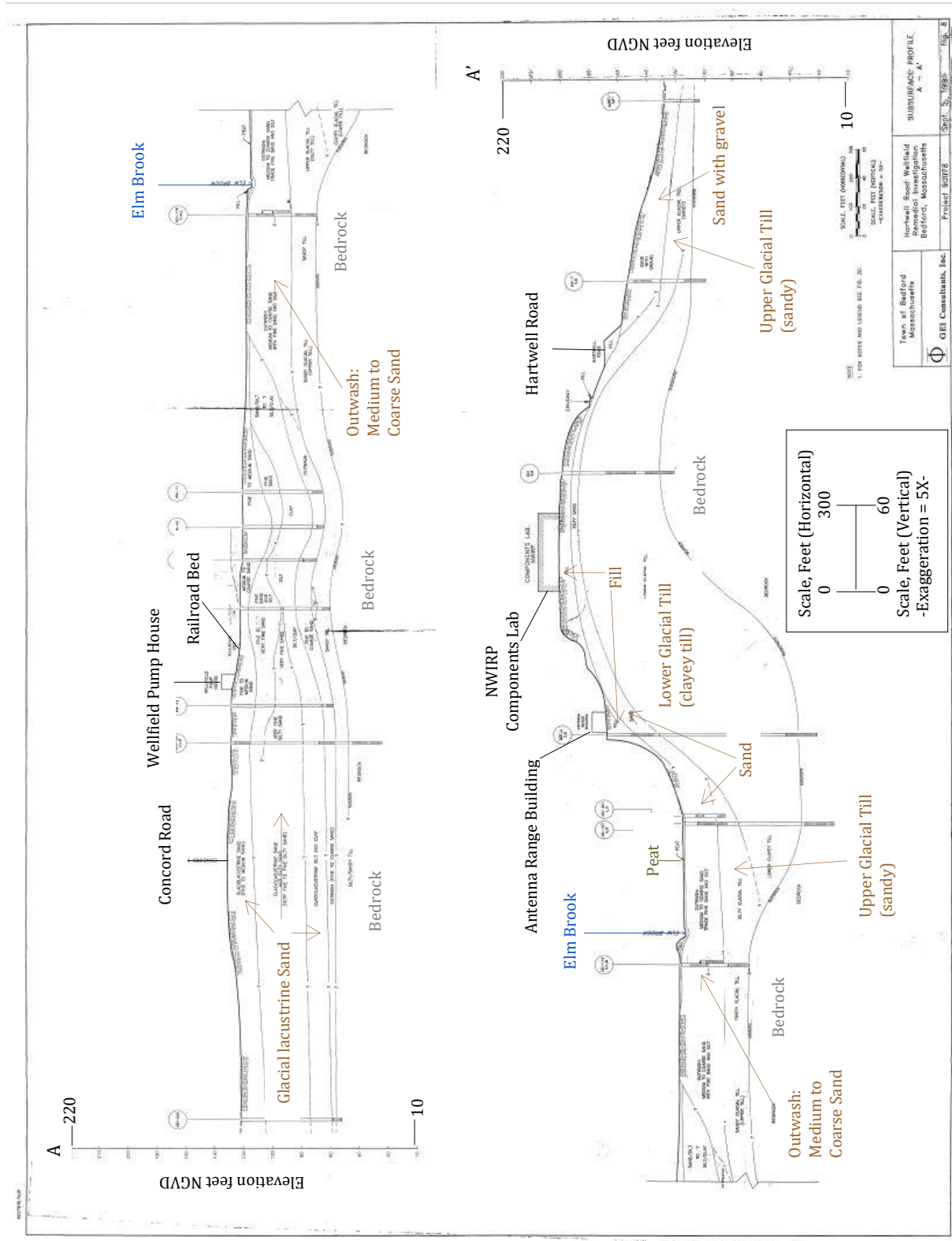
Map 3A: Hartwell's Hill Topography



Credit: Hybrid map created for this report by courtesy of the Bedford Department of Public Works and Engineering/GIS Division Analyst C. Nelson (November 2021).

# MAP 3B: HARTWELL'S HILL CROSS SECTION

Map 3B: Hartwell's Hill subsurface profile (A northwest to A' southeast)

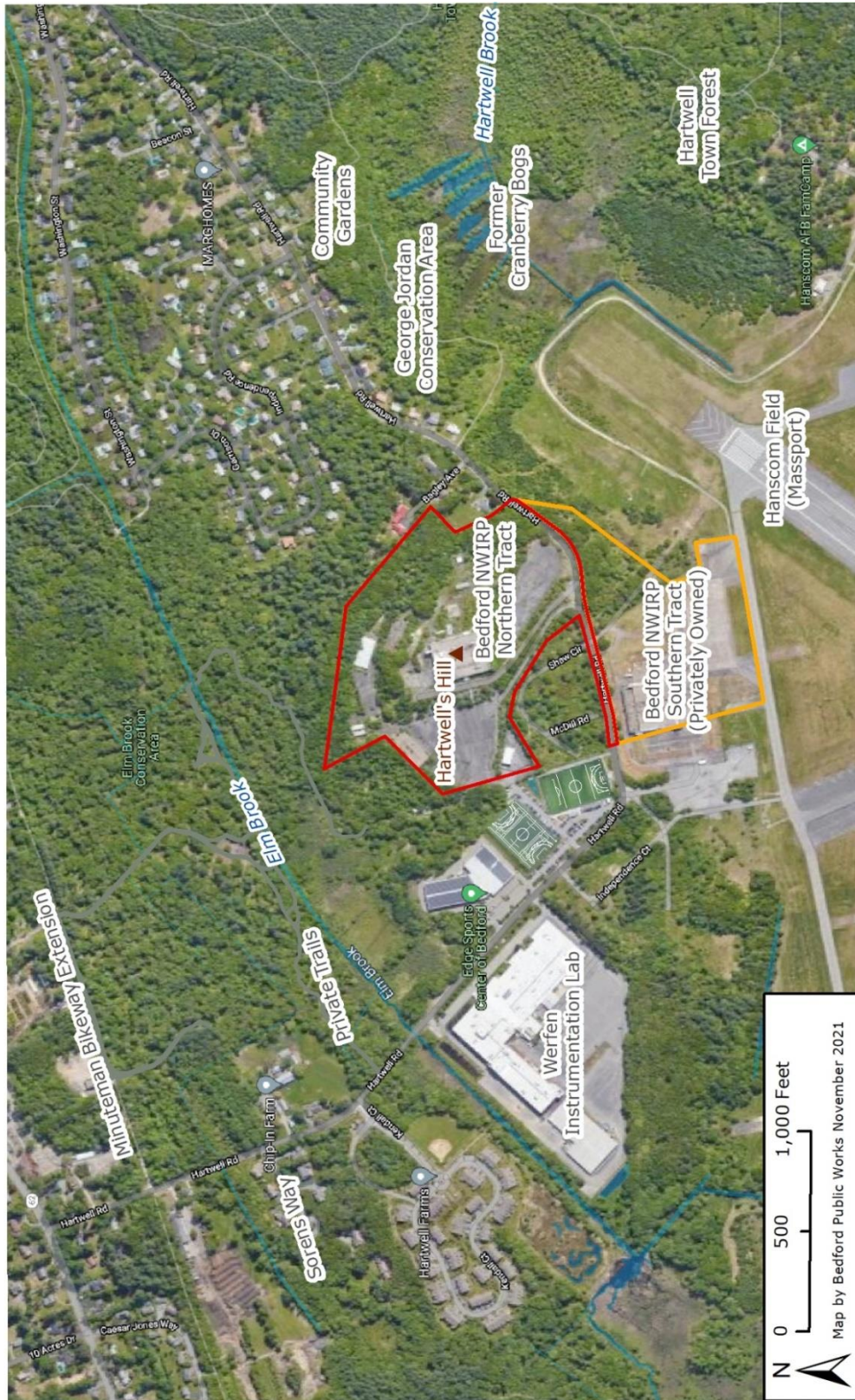


Credit: GEI Consultants, Inc. (1991, September 18) Hartwell Road wellfield remedial investigation, Town of Bedford, MA: Volume II, Figure 8: Subsurface Profile, A - A'.

Note: Overlay of larger GEI labels added November 2021 by J. Boles for ad hoc Hartwell Road Committee report

MAP 4: HARTWELL'S HILL AREA COMMUNITY FEATURES

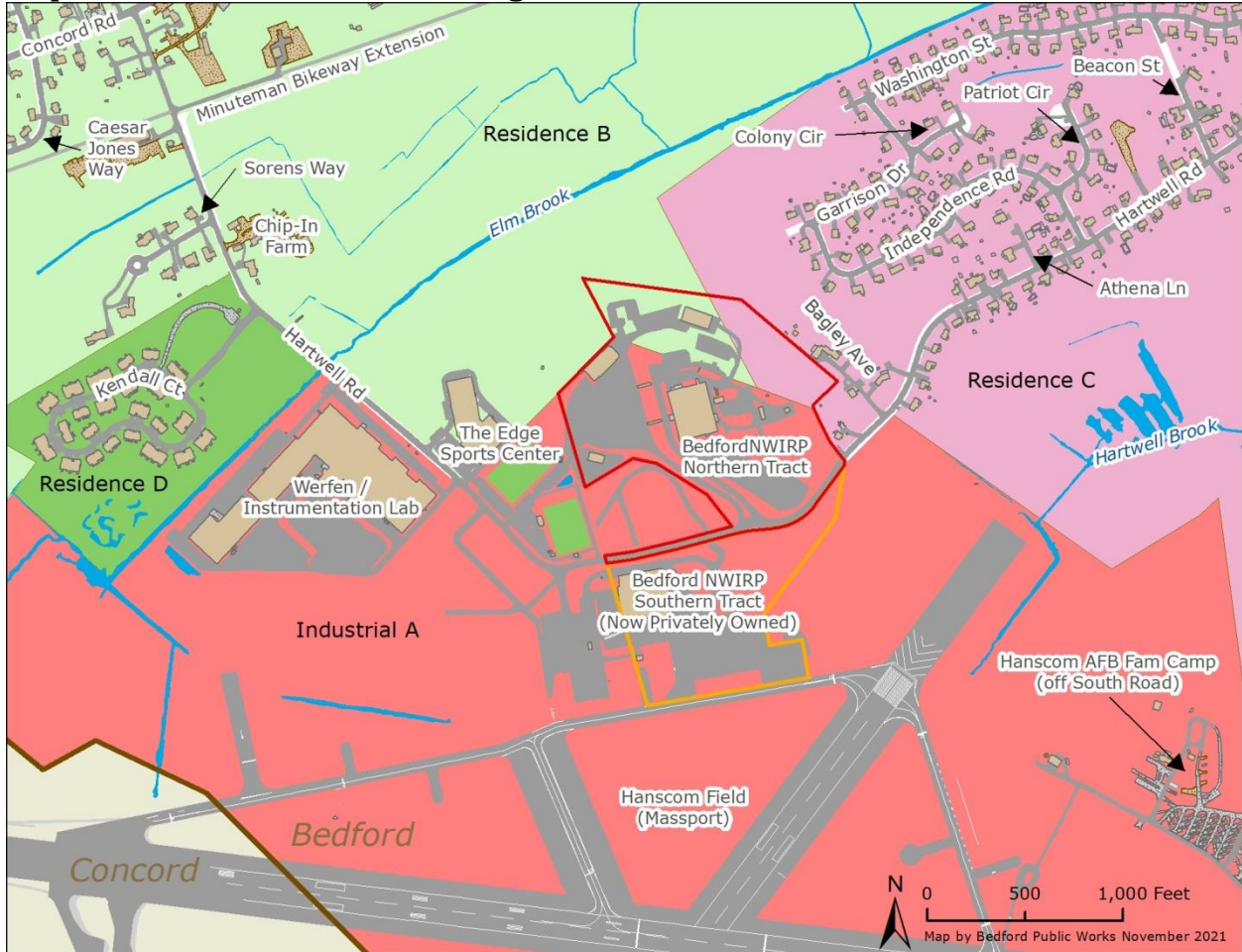
Map 4: Hartwell's Hill area community



Credit: Map created for this report by courtesy of the Bedford Department of Public Works and Engineering/GIS Division Analyst C. Nelson (November 2021).

MAP 5A: HARTWELL'S HILL AREA ZONING

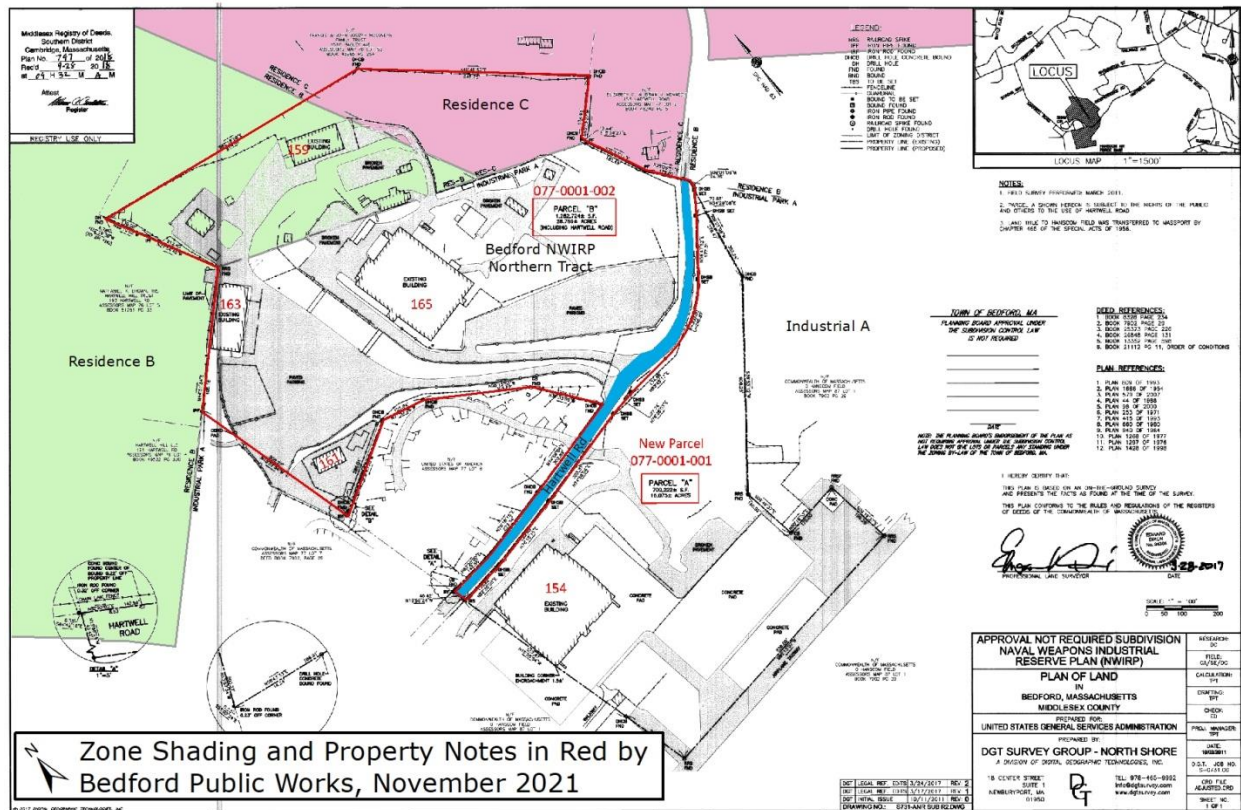
Map 5A: Hartwell's Hill area zoning



Credit: Map created for this report by courtesy of the Bedford Department of Public Works and Engineering/GIS Division Analyst C. Nelson (November 2021).

## MAP 5B: BEDFORD NWIRP ZONING CLOSE-UP

### Map 5B: Bedford NWIRP zoning close-up



Credit: Hybrid NWIRP zoning and subdivision map created for this report by the courtesy of the Bedford Public Works and Engineering/GIS Division Analyst C. Nelson (November 2021).

- Base map: DGT Survey Group – North Shore, Division of Digital Geographic Technologies, Inc. (2011, October 3). Subdivision Naval Weapons Industrial Reserve Plan[t], (NWIRP) Plan of Land in Bedford, MA, Middlesex County. Prepared for United States General Service Administration.
- Zoning labels, shading and parcel notes: Bedford Public Works Engineering/GIS Division Analyst C. Nelson.
- Committee notes:
  - The segment of Hartwell Road that is still owned by the Air Force is shaded blue.
  - We draw attention to the residential zoning of the north/northeastern third of the NWIRP northern tract property.
  - At least one and possibly both of the heavy-metal contaminated incinerator ash deposits that make up Superfund Site 1 lie within the residential-zoned NWIRP property area (See Map 6).
  - In addition, an NWIRP-era hillside dump of contaminated ash mixed with construction debris, household trash, discarded furniture, and possibly other materials was operating within that residential-zoned area of the northern NWIRP tract from 1953 to 1973 (Rogers et al., 1986, p. 8-1).
  - A NWIRP remediation document indicates that no removal or treatment action was taken for the ash deposits before they were classified as “No Further Action” (ENSR; 2000a, September; ROD for Site 1), so they remain in place. We note that although the Site 1 ash deposits are shown on later Navy maps, the former hillside mixed debris dump site itself does not appear to be labeled as such.

## MAP 6: SITE 1 OLD INCINERATOR ASH DISPOSAL AREAS

**Map 6: Site 1 Old Incinerator ash disposal areas  
(northwestern & northern Hartwell's Hill)**



Credit: NAVFAC Environmental website: Naval Weapons Industrial Reserve Plant (NWIRP), Bedford.  
Site 1 – Old incinerator ash disposal area. [Retrieved 11/26/21]  
[Pink outlines show both ash disposal areas]  
[https://www.nawfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/installation\\_map/navfac\\_atlantic/midlant/nwirp\\_bedford/site\\_descriptions/site01.html](https://www.nawfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/installation_map/navfac_atlantic/midlant/nwirp_bedford/site_descriptions/site01.html)

MAP 7: SITE 2 COMPONENTS LABORATORY BUILDING FUEL TANK LEAK

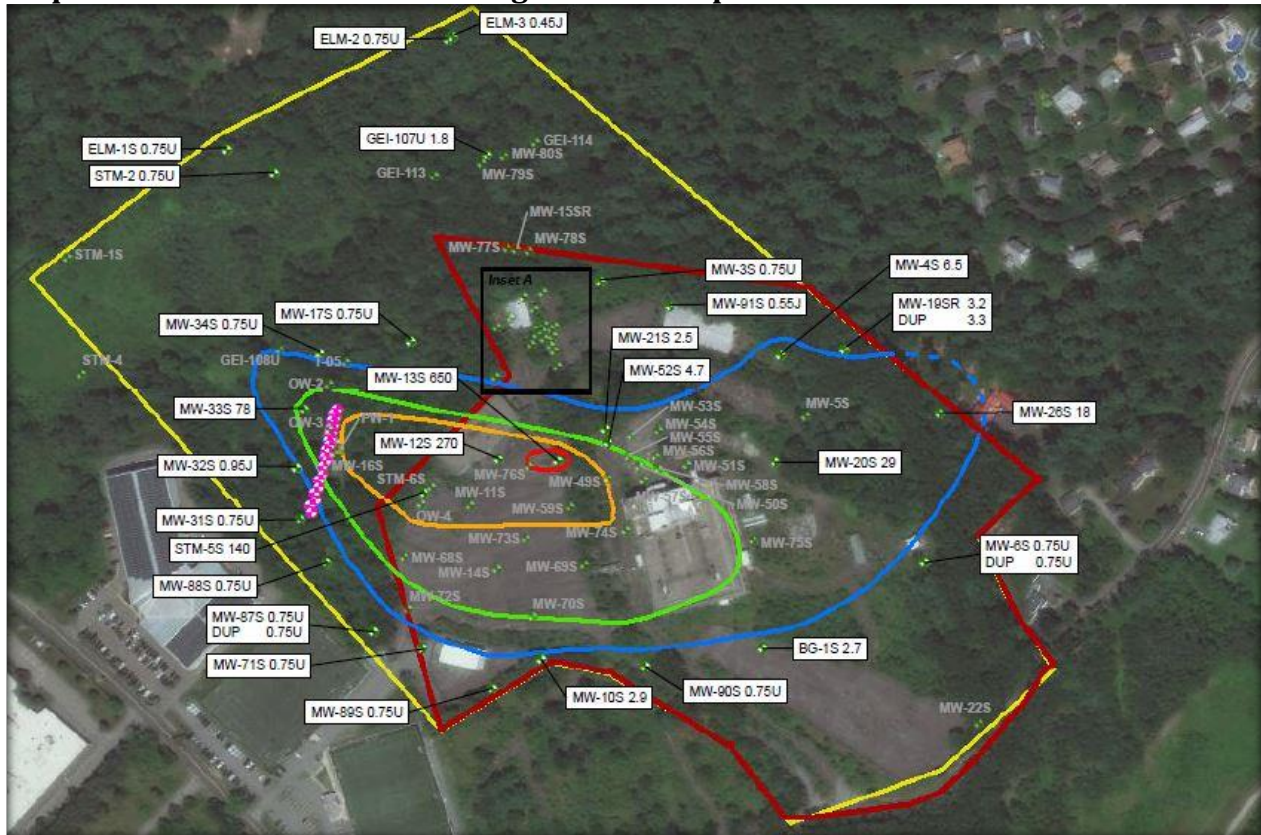
**Map 7: Site 2 Components Laboratory Building fuel tank leak**



Credit: NAVFAC Environmental website: Naval Weapons Industrial Reserve Plant (NWIRP), Bedford.  
Site 2 – Components Laboratory Fuel Tank. [Retrieved 11/26/21]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/installation\\_map/navfac\\_atlantic/midlant/nwirp\\_bedford/site\\_descriptions/site02.html](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/installation_map/navfac_atlantic/midlant/nwirp_bedford/site_descriptions/site02.html)

## MAP 8A: SITE 3 NORTHERN TRACT TCE GROUNDWATER PLUME

**Map 8A: Site 3 northern tract TCE groundwater plume**



Credit: This map is part of a larger Tetra Tech map (dated 5/5/20) captioned: Figure 1: Trichloroethene Concentrations, Shallow Zone, January – February 2020, Former NWIRP, Bedford – Site 3, Bedford MA (p. 79 of 386). The original figure is from Tetra Tech, (2021, April 1). Field task modification request form. Uniform federal policy sampling and analysis plan addendum for vapor intrusion, soil gas and additional groundwater investigation of chlorinated volatile organic compounds and 1,4-dioxane. Naval Weapons Station [sic] Industrial Reserve Plant, Bedford, MA.

[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=001476&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=001476&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)

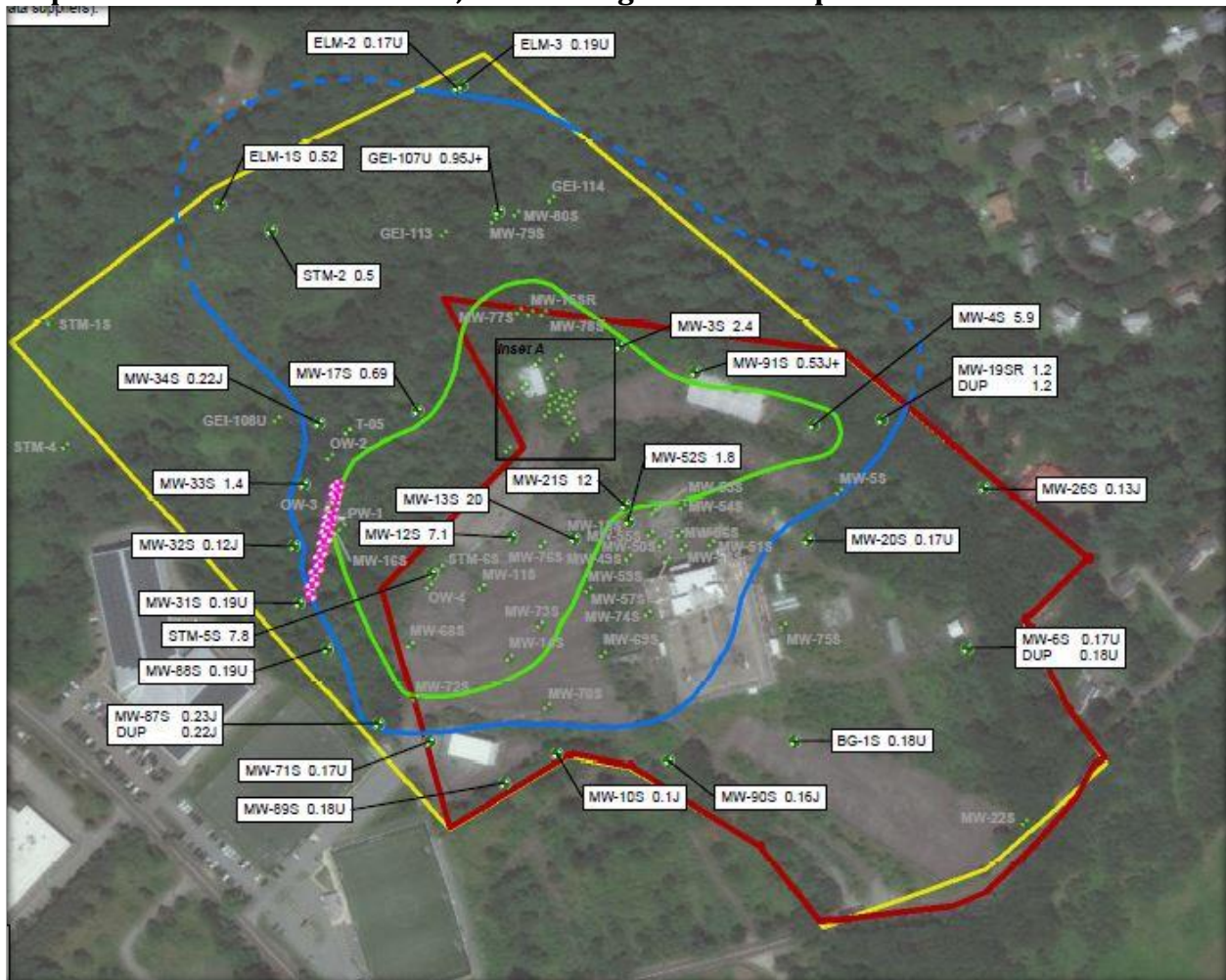
The Tetra Tech Figure 1 Legend shows TCE groundwater concentrations ranging from greater than 500 ppb (ug/L) to a low of less than 5ppb (ug/L) in a pattern of concentric rings:

- Red inner ring = greater than 500 ppb
- Orange ring = 100ppb
- Green ring = 50 ppb
- Blue ring = less than 5 ppb
- Small green circles = monitoring wells
- Small pink circles = extraction wells
- Yellow outline (covered by red NWIRP property line in some areas) is the boundary of the protective LUC zone.

[Committee note: For scale, the long side of the Components Laboratory (large gray rectangular building at the center of the northern NWIRP tract) measures about 263 feet in length.]

MAP 8B: SITE 3 NORTHERN TRACT 1,4-DIOXANE GROUNDWATER PLUME

Map 8B: Site 3 northern tract 1,4-Dioxane groundwater plume



Credit: This map is extracted from a larger Tetra Tech map (dated 5/5/20) captioned: Figure 5: 1,4-Dioxane Concentrations, Shallow Zone, January - February 2020, Former NWIRP, Bedford - Site 3, Bedford MA (p. 83 of 386). The original figure is from Tetra Tech, (2021, April 1). Field task modification request form. Uniform federal policy sampling and analysis plan addendum for vapor intrusion, soil gas and additional groundwater investigation of chlorinated volatile organic compounds and 1,4-dioxane. Naval Weapons Station [sic] Industrial Reserve Plant, Bedford, MA. [https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=001476&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&pinstln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=001476&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&pinstln_id=BEDFORD_NWIRP)

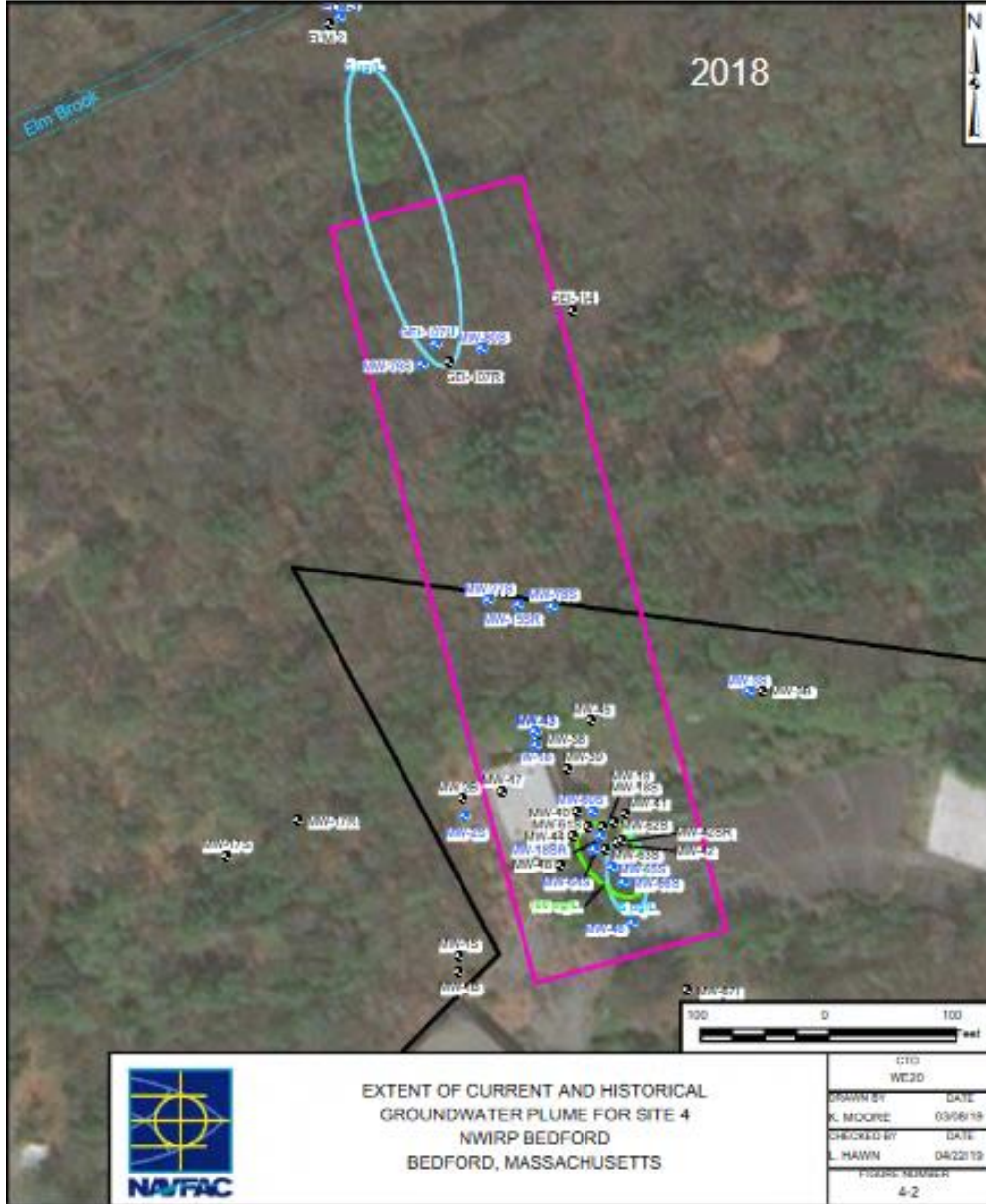
The Tetra Tech Figure 5 Legend shows 1,4-Dioxane groundwater concentrations ranging from 0.2 to 2 ug/L in a pattern of concentric rings:

- Green ring = 2 ug/L
- Blue ring = 0.2 ug/L
- Small green circles = monitoring wells
- Small pink circles = extraction wells
- Yellow outline (partially covered by the red NWIRP property line in some areas) is the boundary of the protective LUC zone.

[Committee note: For scale, the long side of the Components Laboratory (large gray rectangular building at the center of the northern NWIRP tract) measures about 263 feet in length.]

MAP 9: SITE 4 BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENE  
GROUNDWATER PLUME

Map 9: Site 4 Benzene, Toluene, Ethylbenzene & Xylene groundwater plume



Credit: This map is extracted from a larger figure in Tetra Tech (2019, September 1). Final Second Five Year Review NWIRP Bedford, MA Figure 4-2: Extent of current and historical groundwater plume for site 4 NWIRP Bedford, p. 116 of 215. See original figure (a comparison of the BTEX plume extent from 1998 to 2018) here: [https://www.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=001384&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=001384&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)

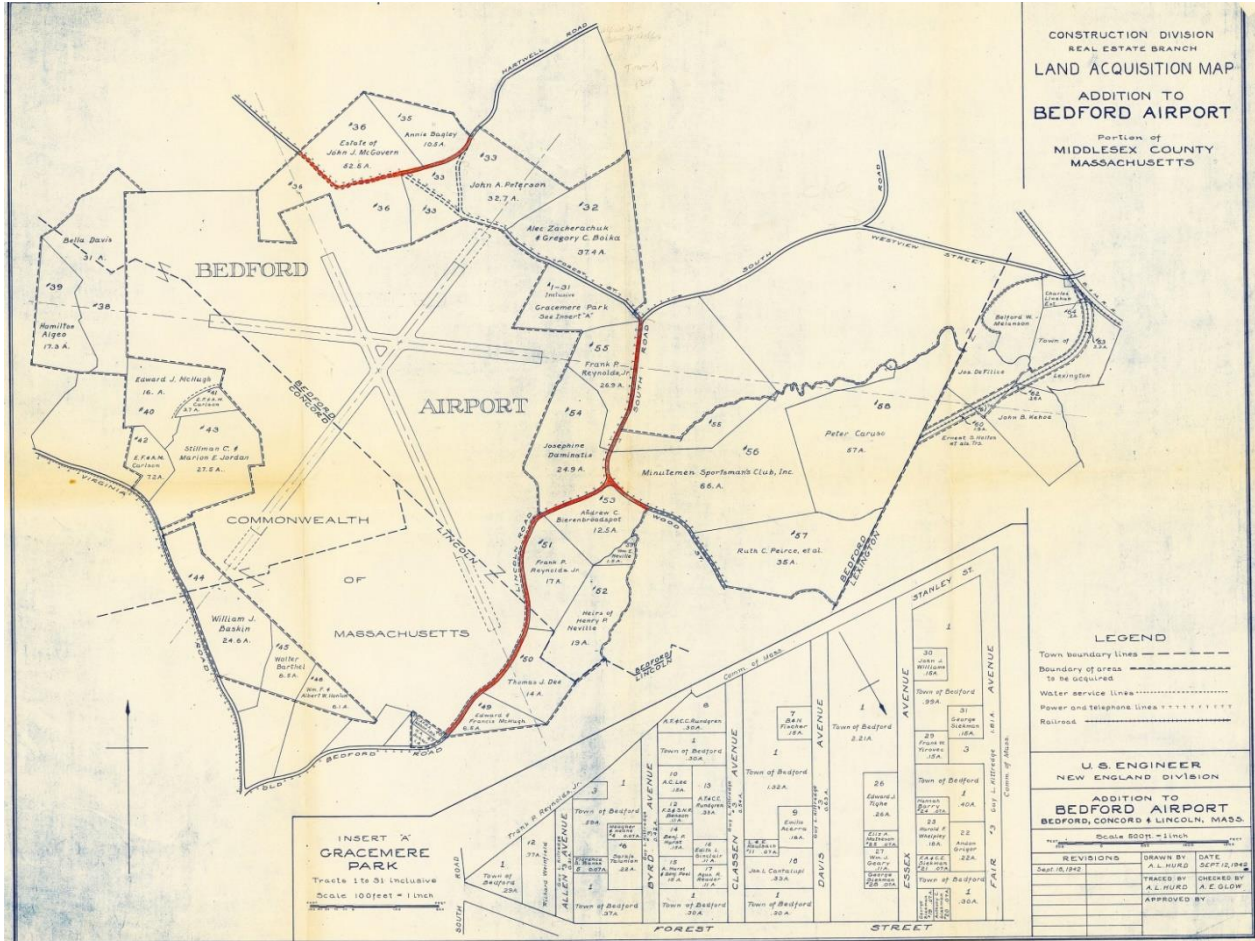
Note:

- Blue = Benzene groundwater plume
- Green = BTEX plume
- Pink = LUC boundary

Black = NWIRP northern tract boundary

MAP 10: 1942 "LAND ACQUISITION MAP - ADDITION TO BEDFORD AIRPORT"

1942 "Land Acquisition Map - Addition to Bedford Airport"



Credit: U.S. Engineer, New England Division. (1942, September). Construction Division, Real Estate Branch. Caption: Land Acquisition Map Addition to Bedford Airport. Drawn by A.L. Hurd: September 12, 1942; Checked by A.E. Glow; Revised: September 18, 1942. Repository: Bedford Town Archives. This map was shared courtesy of Dan Silverman; John Linz; and Al Bartovics, former Bedford Town Archivist.

[Committee note: See the land parcels on both sides of Hartwell Road here that later made up the NWIRP property and the HAFB Minuteman Village mobile home park. (See also Exhibit D1: 1942 land taking and easements deed.) A search is also underway to locate a copy of the map of the first land taking for the Bedford Airport in 1941 (the central airfield), courtesy of Bedford Town Archivist, Ashley Large.]

## APPENDIX

### EXHIBIT A: GSA PUBLIC BENEFIT CONVEYANCE AUTHORITIES AND GENERAL INFORMATION CHART

PUBLIC BENEFIT PROGRAM	AUTHORITY	ELIGIBLE PUBLIC AGENCY or NONPROFIT	SPONSORING AGENT	DISCOUNT	USE RESTRICTION	TIME RESTRICTION	PROCEDURE OUTLINE	COMPLIANCE
NEGOTIATED SALE	40 USC 545(b)(8) 40 USC 484(e)(3)(F)	PUBLIC BODY OR TAX SUPPORTED INSTITUTIONS	NONE, GSA FACILITATES NEGOTIATION	0	NO EXCESS PROFITS ALLOWED	NONE	GSA NEGOTIATES FMV; GSA SUPPLIES DEED	ADMINISTRATOR OF THE GENERAL SERVICES
EDUCATION	40 USC 650(c) 40 USC 484(k)(1)(A)	PUBLIC BODY, TAX SUPPORTED OR NON-PROFIT EDUCATIONAL INSTITUTIONS	DEPARTMENT OF EDUCATION	UP TO 100	BASED UPON APPROVED PLAN FOR EDUCATIONAL USE	30 YEARS	ED SUPPLIES APPLICATION & DEED; GSA SUPPLIES ASSIGNMENT LETTER TO ED	SECRETARY OF THE DEPARTMENT OF EDUCATION
PUBLIC HEALTH	40 USC 650(d) 40 USC 484(k)(1)(E)	PUBLIC BODY, TAX SUPPORTED OR NON-PROFIT MEDICAL INSTITUTIONS	DEPARTMENT OF HEALTH AND HUMAN SERVICES	UP TO 100	BASED UPON APPROVED PLAN FOR PUBLIC HEALTH USE	30 YEARS	HHS SUPPLIES APPLICATION & DEED; GSA SUPPLIES ASSIGNMENT LETTER TO HHS	SECRETARY OF HEALTH AND HUMAN SERVICES
PARK AND RECREATION	40 USC 650(e) 40 USC 484(k)(2)	PUBLIC BODY	DEPARTMENT OF THE INTERIOR, NATIONAL PARK SERVICE	UP TO 100	PARK OR RECREATION AREA USE	PERPETUITY	DOI/NPS SUPPLIES APPLICATION & DEED; GSA SUPPLIES ASSIGNMENT LETTER TO DOI/NPS	SECRETARY OF THE INTERIOR (NATIONAL PARK SERVICE)
SELF HELP HOUSING	40 USC 550(f)(3) 40 USC 484(k)(6)	STATE AND LOCAL AGENCIES AND NON-PROFIT ORGANIZATIONS	DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT	UP TO 100	SELF-HELP HOUSING ONLY	30 YEARS - MULTIFAMILY 20 YEARS - SINGLE FAMILY	HUD SUPPLIES APPLICATION & DEED; GSA SUPPLIES ASSIGNMENT LETTER TO HUD	SECRETARY OF THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
HISTORIC MONUMENT	40 USC 550(h) 40 USC 484(k)(3)	PUBLIC BODY	DEPARTMENT OF THE INTERIOR, NATIONAL PARK SERVICE	100	NO USE RESTRICTIONS BUT ALL PROFITS FROM USE ARE TO BE USED FOR PRESERVATION	PERPETUITY	NPS SUPPLIES APPLICATION; GSA SUPPLIES DEED.	SECRETARY OF THE INTERIOR (NATIONAL PARK SERVICE)
CORRECTIONAL	40 USC 553 40 USC 484(p)	PUBLIC BODY	DEPARTMENT OF JUSTICE, ATTORNEY GENERAL	100	CORRECTIONAL USE	PERPETUITY	DOJ SUPPLIES APPLICATION; GSA SUPPLIES DEED	ADMINISTRATOR OF THE GENERAL SERVICES
LAW ENFORCEMENT	40 USC 553 40 USC 484(p)	PUBLIC BODY	DEPARTMENT OF JUSTICE, ATTORNEY GENERAL	100	LAW ENFORCEMENT USE	PERPETUITY	DOJ SUPPLIES APPLICATION; GSA SUPPLIES DEED	ADMINISTRATOR OF THE GENERAL SERVICES
EMERGENCY MANAGEMENT RESPONSE, INCLUDING FIRE	40 USC 553 40 USC 484(p)	PUBLIC BODY	FEDERAL EMERGENCY MANAGEMENT AGENCY	100	EMERGENCY MANAGEMENT RESPONSE, INCLUDING FIRE USE	PERPETUITY	FEMA SUPPLIES APPLICATION; GSA SUPPLIES DEED	ADMINISTRATOR OF THE GENERAL SERVICES
PORT FACILITY	40 USC 554 40 USC 484(q)	PUBLIC BODY	DEPARTMENT OF TRANSPORTATION, MARITIME ADMINISTRATION	100	DEVELOPMENT AND OPERATION OF A PORT	PERPETUITY	MARAD SUPPLIES APPLICATION & DEED; GSA SUPPLIES ASSIGNMENT LETTER TO MARAD	SECRETARY OF THE DEPARTMENT OF TRANSPORTATION
HOMELESS	42 U.S.C. 11411	STATE AND LOCAL AGENCIES AND NON-PROFIT ORGANIZATIONS PROVIDING SERVICES TO THE HOMELESS	DEPARTMENT OF HEALTH AND HUMAN SERVICES	100	HOMELESS-RELATED ONLY	30 YEARS	HHS SUPPLIES APPLICATION & DEED; GSA SUPPLIES ASSIGNMENT LETTER TO HHS	SECRETARY OF HEALTH AND HUMAN SERVICES
WILDLIFE CONSERVATION	16 U.S.C. 667b-d	STATE AGENCY ADMINISTERING WILDLIFE RESOURCES	DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE	100	WILDLIFE CONSERVATION USE	PERPETUITY	GSA SUPPLIES APPLICATION & DEED	ADMINISTRATOR OF THE GENERAL SERVICES
PUBLIC AIRPORT	49 U.S.C. 47151	PUBLIC BODY	DEPARTMENT OF TRANSPORTATION, FEDERAL AVIATION ADMINISTRATION	UP TO 100	DEVELOPMENT, IMPROVEMENT, OPERATION, OR MAINTENANCE OF A PUBLIC AIRPORT	PERPETUITY	GSA SUPPLIES APPLICATION & DEED	ADMINISTRATOR OF THE FEDERAL AVIATION ADMINISTRATION
HIGHWAY	23 U.S.C. 107 & 317	STATE WHEREIN THE PROPERTY IS SITUATED	DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION	100	HIGHWAY USE RELATED TO INTERSTATE HIGHWAY NETWORK	PERPETUITY	FHWA SUPPLIES APPLICATION & DEED; GSA SUPPLIES ASSIGNMENT LETTER TO FHWA	ADMINISTRATOR OF THE FEDERAL HIGHWAY ADMINISTRATION
WIDENING OF PUBLIC ROADS	40 USC 1304(b) 40 U.S.C. 345c	PUBLIC BODY	HEAD OF THE DISPOSAL AGENCY	0-100	HIGHWAY USE RELATED TO INTERSTATE HIGHWAY NETWORK	PERPETUITY	DISPOSAL AGENCY SUPPLIES APPLICATION & DEED	DISPOSAL AGENCY
POWER TRANSMISSION LINES	50 U.S.C. App. 1622(d)	PUBLIC BODY	GSA	0	PUBLIC OR COOPERATIVE POWER PROJECT USE	NONE	GSA SUPPLIES APPLICATION & DEED	ADMINISTRATOR OF THE GENERAL SERVICES

Updated June 2018

Current Authority  
Previous Authority

Source: GSA. Resources for State, Local and Public Body Customers: *Federal Property for Public Use*.

<https://disposal.gsa.gov/s/stateandlocal>

**EXHIBIT B: COMMITTEE ANALYSIS  
OF GSA PUBLIC BENEFIT CONVEYANCE OPTIONS**

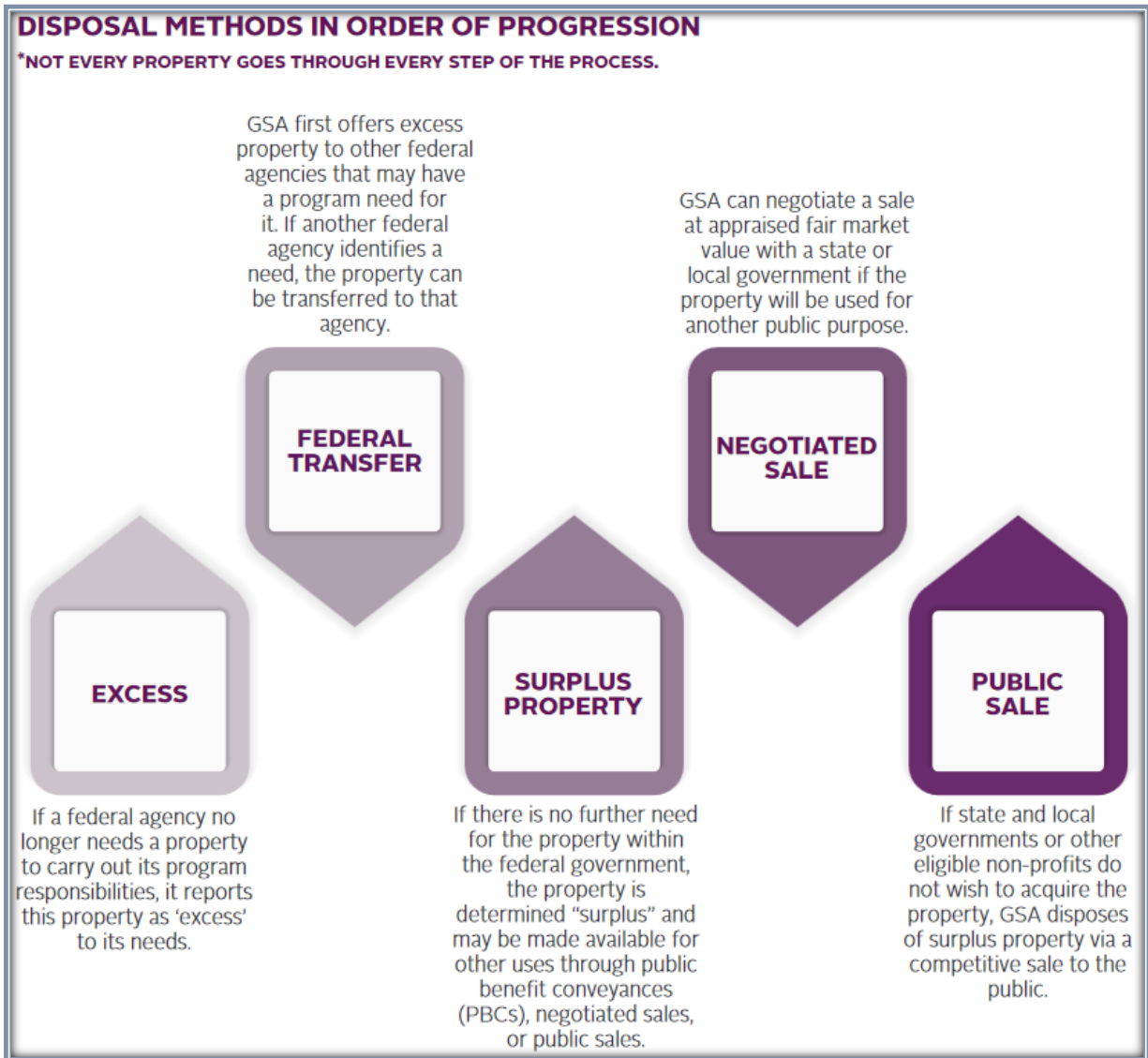
**Part 1: Committee analysis of NWIRP northern tract future land uses  
which may qualify for public benefit conveyance**

<b>Potential land uses which may qualify for public benefit conveyance:</b>	<b>Reasons:</b>
Historic Monument	The history and military significance of the Bedford NWIRP during the Cold War and beyond until 2000 may merit consideration for an open air educational/commemorative monument. The Navy, National Parks Service, State Historical Commission and Bedford historical associations could advise the Town on this possibility.
Park or Recreational Area	<p>Clearly, because of ongoing remediation operations, existing land use restrictions, as well as structurally unsound, deteriorating buildings, structures and pavement, the full NWIRP acreage is not currently appropriate for a park or general recreation activities (although that may change in the future).</p> <p>However, the EPA, the MassDEP, and the National Park Service might advise the Town if some of the acreage around a potential historic monument site that could be set aside as a park.</p>
Wildlife conservation	<p>A number of State Endangered, Threatened, or Special Concern native species live on or near Hanscom airfield such as: Upland Sandpipers (Endangered), Grasshopper Sparrows (Threatened), Blanding's Turtles (Threatened), and Wood Turtles (Special Concern) (<a href="#">Massport 2017 ESPR; 2019, May; Table 9-2, p. 9-19</a>).</p> <p>Federally listed Northern Long-eared Bats (Threatened) also have habitat which overlaps the Hanscom airfield area (<a href="#">Massport 2017 ESPR; 2019, May; p. 9-20</a>).</p> <p>The Massachusetts Wildlife Action Plan-classified Regional Species of Greatest Conservation Need that have been observed living on or near the airfield, include: Bobolinks (very high priority), Eastern Meadowlarks (very high priority) and American Kestrels (high priority) (<a href="#">Massport 2017 ESPR; 2019, May; pp. 9- 20 and 9-21</a>).</p> <p>Shrub stands at Hanscom airfield also provide habitat for birds with declining populations of State and/or Regional Concern, including: Field Sparrows, Brown Thrashers, Prairie Warblers, Indigo Buntings, and Blue-winged Warblers (<a href="#">Massport 2017 ESPR; 2019, May; Table 9-3, p. 9-21</a>).</p> <p>The US Fish and Wildlife Service, and State Division of Fisheries and Wildlife could advise the Town if some NWIRP acreage should be set aside for wildlife conservation.</p>

**Part 2: Committee analysis of NWIRP northern tract future land uses  
which are unlikely to qualify for public benefit conveyance**

Potential land uses which are unlikely to qualify for public benefit conveyance:	Reasons:
Correctional Facility	Superfund history and ongoing remediation, land use controls in effect to protect human health prohibit residential use, industrial vs residential zoning, location, plus community concerns
Homeless Services	Same. Plus, not appropriate for an already health-vulnerable population
Self Help Housing	Same
Public Health Services	Same
Law Enforcement	Land use controls would prohibit overnight use to protect human health. Plus Bedford has already chosen to renovate and expand its existing Police Headquarters at its more central and suitable location
Emergency Management Response Including Fire	Same
Education - such as a school or museum	Superfund history and ongoing remediation, land use controls in effect to protect human health, industrial zoning (although committee notes it is possible that a small open air educational kiosk or an outdoor historic monument might qualify for consideration)
Public Airport	The Hanscom Field airport administrative manager stated during a 2018 Hanscom Field Advisory Commission meeting that Massport had formally declined the divested Navy Hangar parcel [aka the NWIRP southern tract] ( <a href="#">Massport Hanscom Field projects and third party development report, April 2018, p. 2</a> ; and <a href="#">Laferriere, J. 2018, May 3</a> ).
Port Facility	Location
Highway	Location
Public Road Widening	Unlikely to qualify based on required interstate highway connection. (However, the committee noted the Town on its own may wish to pursue the widening of the section of Hartwell Road fronting Hartwell's Hill to include a shoulder and/or bike path for general road safety.)
Power Transmission Lines	Unlikely to qualify, <i>unless the lines come from a Hartwell's Hill solar farm.</i>

## EXHIBIT C: GSA FEDERAL REAL PROPERTY DISPOSAL PROCESS CHART



Credit: This chart comes from the GSA webpage: Your Guide to Acquiring Federal Real Estate for Public Uses, p. 5.  
<https://disposal.gsa.gov/resource/1530028366000/AcquiringFederalRealEstateForPublicUses>

The Committee notes that the Navy's southern tract of the Bedford NWIRP (aka Navy Hangar parcel) was screened for interest by non-federal parties in 2011. At that time Massport apparently declared its interest in the land, so Bedford did not. However, in 2018 Massport announced it would not seek to acquire the land after all. Because the Town had not initially expressed interest during the 2011 screening, GSA rejected Bedford's request to negotiate for the parcel and sold the property at public auction.

**EXHIBIT D: TIMELINE OF HARTWELL'S HILL AND NWIRP HISTORY**

**Timeline of Hartwell's Hill and NWIRP History**

(Note that key documents and the Navy's estimated dates for divestiture steps between 2020 and 2024 are shown in **bold**. However, the divestiture process can accelerate or slow down, depending on remediation complications or advances. The property does not have to be contaminant-free before deed transfer, as long as the Navy demonstrates to environmental regulatory agencies that cleanup remedies are in place and operating successfully.)

1941	<p>May 14:</p> <ul style="list-style-type: none"> <li>At a cost of \$60,000, the Commonwealth of Massachusetts acquired 509 acres of land for the Boston auxiliary airport at Bedford," (Del Papa and Warner, 1987, p. 1). <b>Committee note: the land was taken by eminent domain.</b></li> </ul> <p>July 17:</p> <ul style="list-style-type: none"> <li>Ground-breaking ceremony (Del Papa and Warner, 1987, p. 1).</li> </ul>
1942	<p>June 24:</p> <ul style="list-style-type: none"> <li>The State takes additional land by eminent domain to expand the perimeter of the Bedford Airport, including (See Map 10): <ul style="list-style-type: none"> <li>52.5 acres of land owned by the estate of John J. McGovern, Bedford</li> <li>10.5 acres owned by Annie McGovern [Bagley], Bedford</li> <li>32.7 acres owned by John A. Peterson, Bedford</li> <li>Acreage is also taken from nearly three dozen other Bedford families at this time</li> <li>Acreage is also taken from more than a dozen families in Concord, Lincoln, and Lexington at this time.</li> </ul> </li> </ul> <p>Portions of the land acquisitions from John J. McGovern's estate, Annie McGovern [Bagley], and John A. Peterson will later be set aside for the NWIRP northern and southern tracts. Eventually (from 1961-2009), most or all of the 44 acres of the HAFB Minuteman Village mobile home park for Air Force personnel and their families will occupy both sides of Hartwell Road on land originally taken from the McGovern estate (Map 10 and Exhibit R: Minuteman Village zoning map)</p> <p>July 1:</p> <ul style="list-style-type: none"> <li>Army Corps of Engineers negotiates a one-year lease (renewable yearly until June 30, 1947) of the airfield from the Massachusetts Department of Public Works (Del Papa and Warner, 1987, p. 1).</li> </ul> <p>July 2:</p> <ul style="list-style-type: none"> <li>Military aircraft begin arriving (Del Papa and Warner, 1987, p. 1).</li> </ul>
1943	<p>Feb. 11:</p> <ul style="list-style-type: none"> <li>The airfield is officially dedicated in memory of Laurence G. Hanscom, a Worcester Telegram journalist, amateur pilot, and aviation enthusiast, who died in a plane crash two years earlier (Del Papa and Warner, 1987, p. 1). (See also "Plane Crash: Reporter, Doctor Killed at Saugus While Stunting." Boston Daily Globe, Feb. 10, 1941, pp. 1-2)</li> </ul>
1947	<p>June:</p> <ul style="list-style-type: none"> <li>Army Corps of Engineers and Army Air Forces receive a five-year lease extension from July 1, 1947 to June 30, 1952 from the Commonwealth of Massachusetts for joint use of the airfield (Del Papa and Warner, 1987, p. 2).</li> </ul>
1951	<p>October 12:</p> <ul style="list-style-type: none"> <li>Secretary of the Air Force asks the Commonwealth of Massachusetts to donate the airfield to the Air Force. "The Governor replied that the Commonwealth would prefer to lease the field to the Federal Government." (Del Papa and Warner, 1987, p. 3).</li> </ul>

<p>1952</p>	<p>February 25:</p> <ul style="list-style-type: none"> <li>• Deed of transfer from Commonwealth of Massachusetts to the United States of America. (Referenced in Boatright, J.F.; 1977, March 11; Attachment: Supplemental Data, #4, p. 2) (Del Papa and Warner, 1987, p. 3)</li> </ul> <p>May 7:</p> <ul style="list-style-type: none"> <li>• The Air Force and State agree to a compromise with regard to the Air Force's 1951 request that the airfield be donated to the Air Force: <ul style="list-style-type: none"> <li>○ 396 acres are ceded by the Commonwealth to the United States</li> <li>○ 641 acres are leased by the Commonwealth to the United States</li> <li>○ 83 acres are retained by the Commonwealth</li> <li>○ The lease will run for 25 years until 1977 and is renewable for an additional 25 years, "but must expire no later than 30 June 2002." (Del Papa and Warner, 1987, p. 3)</li> </ul> </li> </ul> <p>[Note: it is likely - but has not yet been confirmed by the committee - that the 396 acres deeded to the Air Force includes most of the land parcel that becomes the NWIRP.]</p> <ul style="list-style-type: none"> <li>• NWIRP Bedford (originally called NIRAP – Naval Industrial Reserve Aircraft Plant) is created as a government owned-contractor operated (GOCO) facility. First, the U.S. Naval Air Systems Command (NAVAIR), and later the U.S. Naval Sea Systems Command (NAVSEA) will serve as the government entity. The Raytheon Company serves as the contractor (NAVFAC Env.; 2020; Helping to win the Cold War ...; pp. 3, 14).</li> </ul> <p>The NWIRP mission will be "to provide the Raytheon Manufacturing Company of Waltham, Massachusetts, with facilities for research and development of radar, missile guidance systems, and related equipment." (Rogers et al., 1986, p. 4-2 )</p> <p>October 23:</p> <ul style="list-style-type: none"> <li>• Construction of the Components Laboratory Building atop Hartwell's Hill begins (Rogers et al., 1986, p. 4-2).</li> </ul>
<p>1953</p>	<p>February 16:</p> <ul style="list-style-type: none"> <li>• The Department of the Air Force grants Permit DA19-0160-ENG-5782 to the Department of the Navy "to use and occupy a certain area of land, being a portion of Hanscom Air Force Base, Bedford, Massachusetts, consisting of approximately 20.9 acres as shown in green and red cross hatch on the map attached ... together with the use of flying facilities located at said installation in common with others ..." The use permit will continue "as long as the current Raytheon contract for missile and radar testing (No. 1-1147) is in effect, but revocable at will by the Secretary of the Air Force," (See Exhibit D1: 1953 land use permit, paragraph 1).</li> </ul>
<p>1954</p>	<p>April 21:</p> <ul style="list-style-type: none"> <li>• Components Laboratory completion and dedication ceremony. Fabrication, components assembly, and vibration-testing, drop-testing, and nondestructive testing of missile guidance hardware prototypes begins.</li> </ul>
<p>1958</p>	<p>August 12:</p> <ul style="list-style-type: none"> <li>• The Navy's 1953 land use permit is amended to add more 6.1 acres to the NWIRP site (See Ref: Dept. of the Air Force; 1958, August 12; Amendment No. 3 to 1953 Permit #DA19-016 ENG 5782).</li> </ul>

1959	<p>July 6:</p> <ul style="list-style-type: none"> <li>The 1953 land use permit from the Air Force to the Navy is again amended <b>“to include approximately 5 additional acres of land.”</b> (See Ref: Dept. of the Air Force; 1959, July 6; Amendment No. 4 to 1953 Permit #DA19-016 ENG 5782). [The parcel was 5.62 acres exactly according to Rogers et al., 1986, p. 4-2.]</li> </ul> <p>September 16:</p> <ul style="list-style-type: none"> <li>The NWIRP southern tract new flight and missile test laboratory/hangar complex [aka simply the Navy Hangar] is dedicated. Cost: <b>“nearly \$2 million”</b> (“Missile Lab Dedicated ...; 1959, Sept. 17; <i>The Boston Globe</i>, p. 12).</li> </ul>
1967	<p>September 29:</p> <ul style="list-style-type: none"> <li>The 1953 permit is again amended <b>to add 0.85 more acres to the NWIRP</b> to be used as parking (See Ref: Dept. of the Air Force; 1967, September 29; Amendment No. 5 to 1953 Permit #DA19-016 ENG 5782 ).</li> </ul>
1973	<p>September 1:</p> <ul style="list-style-type: none"> <li><b>“Air Force flying activities at Hanscom Field were officially terminated.”</b>(Del Papa and Warner, 1987, p. 10)</li> </ul> <p>[Note: the Department of Defense and HAFB Electronic Systems Division (later known as the Electronic Systems Center) had jointly announced in April '73 the decision to terminate AF flight operations at Hanscom Field (Del Papa and Warner, 1987, p. 10).]</p>
1974	<p>August 31:</p> <ul style="list-style-type: none"> <li><b>The Air Force lease of the actual airfield is terminated</b> (Del Papa and Warner, 1987, p. 10). [Note: the Air Force retained its ownership and operation of the non-flying base adjacent to the airfield].</li> </ul>
1977	<p>January 18:</p> <ul style="list-style-type: none"> <li><b>The Laurence G. Hanscom Air Force Base is renamed Hanscom Air Force Base</b> (Del Papa and Warner, 1987, p. 11).</li> </ul> <p>May 18:</p> <ul style="list-style-type: none"> <li>Air Force transfers ownership of 36.65 acres of the NWIRP site to the Navy.</li> <li>AF notes the land was not reported as excess property to General Services Administration. (Boatright, J.F.; 1977, March 11; Attachment: Supplemental Data, #9h, p. 4)</li> <li>The land value is estimated at \$89,598.25 in 1977 (Exhibit D1).</li> <li>AF notes that <b>“The portion of 36.65 acres of fee owned land herein transferred to the Department of the Navy was originally acquired from the Commonwealth of Massachusetts by Deed dated 25 February 1952 by Donation and is a portion of Tract A-101.”</b> (Boatright, J.F.; 1977, March 11; Attachment: Supplemental Data, #9e, p. 3).</li> <li><b>“the Department of the Air Force hereby transfers to the Department of the Navy, without reimbursement, approximately 36.65 acres of land in fee, together with a 1,072 lineal foot water main thereon.”</b> [See Bibliography note (p. 146) on Boatright, J.F. (1977, March 11)]</li> <li>The AF also notes: <b>“The land herein transferred is owned in fee by the United States of America.”</b> (Boatright, J.F.; 1977, March 11; Attachment: Supplemental Data, #9g, p. 3)</li> <li>The AF notes that the transfer is <b>“Subject to all terms, conditions and reservations included in Deed dated 25 February 1952 from the Commonwealth of Massachusetts to the United States of America.”</b> (Boatright, J.F.; 1977, March 11; Attachment: Supplemental Data, #4, p. 2)</li> </ul>

1983	<p>March:</p> <ul style="list-style-type: none"> <li>Hartwell Rd municipal wellfield &amp; water treatment plant begin operation (GEI; 1991, October 2; Vol. I, p. 1).</li> </ul> <p>October:</p> <ul style="list-style-type: none"> <li>VOC contaminants detected in Town tap water are traced back to the new Hartwell Rd wellfield (GEI; 1991, October 2; Vol. I, p. 1).</li> </ul> <p>December 9:</p> <ul style="list-style-type: none"> <li>First well (PW11) is switched to pump water to waste (GEI; 1991, October 2; Vol. I, p. 1).</li> </ul>
1984	<p>January 25:</p> <ul style="list-style-type: none"> <li>Second well (PW10) is switched to pump water to waste (GEI; 1991, October 2; Vol. I, p. 1).</li> </ul> <p>April 3:</p> <ul style="list-style-type: none"> <li>All three wells (PW10, 11,12) are shut down (GEI; 1991, October 2; Vol. I, p. 1).</li> </ul>
1985	<p>Extensive sampling and testing traces the groundwater contaminants back to NWIRP Hartwell's Hill and the Raytheon Missile Systems Division site at 180 Hartwell Road</p> <p>Department of Defense environmental investigation of the NWIRP also begins (ATSDR; 2005, August; p. 5)</p>
1985/1986?	Town files suit against Raytheon, Navy, and other defendants over contamination of groundwater source for Hartwell Road municipal wellfield
1991	Camp, Dresser & McKee study estimates the cost to the Town of replacing the anticipated production of the Hartwell Road wellfield with water from the MWRA from 1992 to 2025 will be \$9.2 million. (Camp et al., 1991, Table 4-1)
1993	<p>Lawsuit with Raytheon and the federal government over contamination of the Hartwell Road wellfield settled by a \$4.7 million payment to Bedford, but Raytheon and the Navy do not admit liability.</p> <p>Town uses the settlement to help purchase permanent MWRA membership (Sullivan, M., 1993, August 29; The Boston Globe, pp. 291, 296)</p>
1994	<p>May 31:</p> <ul style="list-style-type: none"> <li>The Bedford NWIRP is placed on National Priorities List of Superfund sites by the EPA (ATSDR; 2006, August; p. 5). "Environmental cleanup activities at the Site have continued in accordance with CERCLA since that time" (ENSR; 2000a, September; p. 5 of 33).</li> </ul>
1996	March: First Bedford NWIRP RAB meeting held (ENSR; 2000a, September; p. 5 of 33).
1999	<p>Raytheon transfers its Missile Systems Division from Bedford to Tucson, AZ (NAVFAC, Env.; 2020, March; "Helping to win the Cold War..."; p. 28)</p> <p>July 15, 16, 25:</p> <ul style="list-style-type: none"> <li>The Navy posts public notice of its intent to transfer the NWIRP to a public and/or private entity (Dept. of Navy public notices of 1999, July 15, 16, 25; The Boston Globe).</li> </ul>
2000	<p>September:</p> <ul style="list-style-type: none"> <li>Record of Decision: Site 1 – Old Incinerator Ash Disposal Area (ENSR; 2000a, September).</li> <li>Record of Decision: Site 2 – Components Laboratory Fuel Oil Tank (ENSR; 2000b, September).</li> </ul> <p>December:</p> <ul style="list-style-type: none"> <li>Raytheon ceases operations at the NWIRP (ATSDR; 2005, August; p. 1).</li> <li>"Naval Sea Systems Command has considered the property excess since December 2000 and intends to transfer the property after all CERCLA requirements have been satisfied," (Resolution Consultants; 2014, September 1; Section 1.4: page 1-10).</li> <li>Since December 2000, "the facility has remained vacant and inactive except for the operation of remediation systems," (Resolution Consultants; 2014, September 1; Section 1.4: page 1-10).</li> </ul>

2005	Raytheon's former Missile Systems Division property at 180 Hartwell Road is sold to the In It To Win It LLC, an affiliate of VinCo Properties Inc. The office/R&D complex on 53 acres of land sells for \$12.5 million ( <a href="#">"Raytheon unit's Bedford site sells..."</a> ; <i>Boston Business Journal</i> ; 2005, January 24/27).
2006	Navy Remedial Project Manager deems the condition of the unmaintained Hartwell's Hill NWIRP buildings too dangerous to any longer authorize entry (RPM communication, November 2021).
2014	First 5-Year Review for all of NWIRP property ( <a href="#">Resolution Consultants</a> ; 2014, September 1) [ <a href="#">NAVFAC Bedford NWIRP Record #001222</a> ]
2018	August 13: <ul style="list-style-type: none"> <li>GSA begins public auction of southern NWIRP tract (<a href="#">Oleksinski, B.</a>; 2018, July 27) (<a href="#">GSA</a>; 2018, October 1)</li> </ul>
2019	January 24: <ul style="list-style-type: none"> <li>Bedford Selectman Mike Rosenberg announces to John Beatty, the Executive Director of the Massachusetts Military Asset Security and Strategy Task Force, during a Hanscom Area Town Committee (HATS) meeting that Bedford wants "a seat at the table, and we'd like to have the only seat at the table, at least initially..." for the future divestiture of the remaining Navy property [the NWIRP northern tract on Hartwell's Hill]. "Bedford is interested in taking a proactive approach," Rosenberg explained, "so any future Naval divestiture process includes the Town's interests." (<a href="#">Staking Bedford's Claim...</a>; 2019, February 9; <i>The Bedford Citizen</i>).</li> </ul> February 1: Southern NWIRP tract sold by GSA at public auction to private developer for \$9,040,000 ( <a href="#">Turner, J.M.</a> , 2019, February 1) (" <a href="#">GSA announces...</a> "; 2019, June 3; <i>The Bedford Citizen</i> ) April 18-19: Quitclaim Deed filed to transfer the NWIRP southern tract from the GSA to Runway Realty Ventures LLC ( <a href="#">See Quitclaim Deed</a> ; 2019, April 19; <a href="#">Middlesex South Registry of Deeds: Book 72479, Page 255</a> ).
2020	Sept: <ul style="list-style-type: none"> <li>Sample from a monitoring well close to the northeast property line of the NWIRP detects that TCE has risen to a level indicating it may have expanded outside the northeast property line and LUC boundary into a residential area. Under supervision of the EPA and MassDEP, the Navy plans an investigation to better map the outline of the "unbounded" TCE plume. Testing is planned to detect and mitigate any possibility of TCE vapor intrusion into a nearby residence that could provide a health risk to the occupants.</li> <li>Dec. 1: Renova-Sovereign Joint Venture states in its annual inspection report on land use controls at the NWIRP that the Navy "is in the process of securing an easement of land adjacent to Site 3 and 4 to further secure restrictions to the [NWIRP] site." (<a href="#">Renova-Sovereign Joint Venture, 2020, December 1, p. 2</a>).</li> </ul>
2020, Aug. 29 – 2024, Aug. 29	<b>Period estimated for completion of Environmental Condition of Property report required before land transfer can take place.</b> <a href="#">[Tetra Tech; 2020, September; Appendix C: Northern tract (Sites 3 and 4) property disposal/disposition schedule, NWIRP Bedford, MA; Item #282, p. 14 of 15]</a>
2020 Aug. 29 – 2024 Sept. 19	<b>Period estimated for "Transfer Property Preparation"</b> <a href="#">[Tetra Tech; 2020, September; Appendix C: Northern tract (Sites 3 and 4) property disposal/disposition schedule, NWIRP Bedford, MA; Item #265, p. 13 of 15]</a>

2022 Jan. 10 – 2024 Sept. 19	<p><b>Period estimated to complete “NAUL, Deed, Covenants, Restrictions, Future Access by GSA”</b></p> <p>[Tetra Tech; 2020, September; Appendix C: Northern tract (Sites 3 and 4) property disposal/disposition schedule, NWIRP Bedford, MA; Item #267, p. 13 of 15]</p> <p>Note: NAUL = Notice of Activity and Use Limitations</p>
2023	<p><b>Dec. 3: Estimated date to “Submit Navy Letter to Excess Property in accordance with FFA Section 26.3.”</b></p> <p>[Tetra Tech; 2020, September; Appendix C: Northern tract (Sites 3 and 4) property disposal/disposition schedule, NWIRP Bedford, MA; Item #266, p. 13 of 15]</p> <p>Note: FFA = Federal Facility Agreement.</p>
2024, Aug. 25- 2024, Aug. 29	<p><b>Period estimated to “Prepare &amp; Issue Final ECP. Draft Final ECP becomes Final (assuming no comments are received in 5 day period)”</b></p> <p>[Tetra Tech; 2020, September; Appendix C: Northern tract (Sites 3 and 4) property disposal/disposition schedule, NWIRP Bedford, MA; Item #296, p. 14 of 15]</p> <p>Note: ECP = Environmental Condition of Property</p>
2024	<p><b>Sept.: “Final Deed Preparation by GSA (estimated, but includes reviews by restoration team &amp; ECP must be final)”</b></p> <p>[Tetra Tech; 2020, September; Appendix C: Northern tract (Sites 3 and 4) property disposal/disposition schedule, NWIRP Bedford, MA; Item #298, p. 15 of 15]</p> <p>Note: ECP = Environmental Condition of Property</p>

[Committee note: The recent expansion of the Site 3 trichloroethylene groundwater plume (Maps 8A, 8B) and potential vapor intrusion threat to some offsite properties (Exhibit L) have triggered more investigation and may push the estimated land transfer to 5 to 10 years from now (2026 – 2031). The additional time may be needed for the Navy and environmental authorities to fully investigate, construct additional remedy components if needed, and then prove any new remedies are operating properly and successfully (Navy communication, November, 2021).]

**EXHIBIT D1: TRANSFER DEEDS RE: HARTWELL'S HILL AREA AND NWIRP LAND  
1942 land taking (p. 55); 1953 land use permit (p. 62); 1977 land transfer (p. 65)**

**1942 land taking and easements transfer deed for some of the land taken by eminent domain from Bedford landowners and the Town of Bedford for an addition to the perimeter of the Bedford Airport:**  
(Source: The Commonwealth of Massachusetts Town of Bedford Taking; 1942, June 24; Middlesex South Registry of Deeds, Book 6611, pp. 182-188; Document located courtesy of Matt Lanefski, Bedford Assessing Department Director).

(1 of 7 pages)

<p>6611 <del>182</del></p>	<p>Murray R. Fine, Trustee of Ridgmont Trust of Boston, Suffolk County, Massachusetts, by instrument dated 1942 and recorded herewith, Registry of Deeds, Book <del>6611</del>, Page <del>182</del> to which reference is hereby made for a more specific description of said easement and right of way, which easement and right of way it is intended hereby to release. No part of the premises in said mortgage other than the easement and right of way above referred to, is released or discharged hereby from said mortgage. WITNESS our hand and seal this twenty-fifth day of June 1942 Home Owners Federal Savings &amp; Loan Association By Samuel Barron Jr. Treas. THE COMMONWEALTH OF MASSACHUSETTS Suffolk ss. June 25, 1942 Then personally appeared the above named Samuel Barron Jr. and acknowledged the foregoing instrument to be the free act and deed, of the Home Owners Federal Savings &amp; Loan Assn. before me Hannah L. Goldberg Notary Public My commission expires 2/23/46 Middlesex ss. June 30, 1942. 3h. 27m. P.M. Rec'd &amp; Recorded.</p>
<p>BLUESTONE to CAMBRIDGE GAS LIGHT CO. PAR. REL.</p>	<p>I, Gertrude Bluestone of Boston, Suffolk County, Massachusetts the owner and present holder of a mortgage by Murray R. Fine, Trustee of Ridgmont Trust to me, dated April 7, 1942 recorded with Middlesex South District Registry of Deeds, Book 6589, Page 176, for consideration paid, release to Cambridge Gas Light Company of Cambridge, Massachusetts all interest acquired under said mortgage in the following described portion of the mortgaged premises, namely, a certain easement and right of way granted to said Cambridge Gas Light Company by Murray R. Fine, Trustee of Ridgmont Trust of Boston, Suffolk County, Massachusetts, by instrument dated and recorded herewith, Registry of Deeds, Book <del>6611</del> Page <del>182</del> to which reference is hereby made for a more specific description of said easement and right of way, which easement and right of way it is intended hereby to release. No part of the premises described in said mortgage other than the easement and right of way above referred to, is released or discharged hereby from said mortgage. WITNESS my hand and seal this 18th day of June 1942 Gertrude Bluestone THE COMMONWEALTH OF MASSACHUSETTS Suffolk ss. June 19th 1942 Then personally appeared the above named Gertrude Bluestone and acknowledged the foregoing instrument to be her free act and deed, before me Harry J. Finkelstein Notary Public (Notarial seal) My commission expires March 26, 1948 Middlesex ss. June 30, 1942. 3h. 27m. P.M. Rec'd &amp; Recorded.</p>
<p>COMMONWEALTH OF MASSACHUSETTS TOWN OF BEDFORD TAKING</p>	<p>THE COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS Acting under authority of Chapter 26B of the</p>

<p>Acts of 1941, the Department of Public Works, on behalf of the Commonwealth of Massachusetts, does hereby take, in fee simple, under the provisions of Chapter 79 of the General Laws, for the purpose of an airport to be constructed by the Federal Government, the following described parcel of land in the town of BEDFORD, county of Middlesex. Parcel No. 44. A parcel of land supposed to be owned by FRANK J. McGOVERN ET AL., located on the northerly side of the Bedford Airport, so called, described as follows:- Beginning at a point on the boundary line of said airport 96.23 feet distant southwesterly of corner No. 6 of said boundary, and extending thence south 69° 50' 00" west 558.77 feet; thence north 85° 40' 00" west 28.04 feet; thence north 28° 25' 19" west 405.00 feet; thence north 69° 12' 48" east 661.36 feet; thence returning south 17° 35' 19" east 420.00 feet to the point of beginning; containing about 5.94 acres. Acting under the provisions of said Chapter 268 of the Acts of 1941, the Department of Public Works, on behalf of said Commonwealth of Massachusetts, does also hereby take easements in certain parcels of land in connection with the construction of said airport in the town of Bedford. Said easements are taken in the following described parcels of land for air rights; the easements consisting of the right to remove all objects, both natural and artificial, any part of which are above a plane extending upward on a slope of 30 feet horizontal to 1 foot vertical from the end of runways No. 2 and No. 3, as shown on the plan hereinafter referred to, together with the right to prohibit the future location of any object upon said parcels which will either at its establishment or at any future time extend above said plane. The right is also taken to enter upon said parcels of land at any time for the purpose of carrying out or maintaining said rights. Note: The bearings hereinafter mentioned are comparable to the calculated lines for the Bedford Airport on file in the office of the Massachusetts Department of Public Works. - - - - -</p>	<p style="text-align: right;">6611 183</p> <p>SEE PLAN NO. 402 OF 402 (G 004) OF 42</p> <p>SEE PLAN NO. 402 OF 402 (H 004) OF 42</p> <p>See plan opposite</p> <p>SEE PLAN NO. 402 OF 402 (C 004) OF 42</p> <p>SEE PLAN NO. 402 OF 402 (D 004) OF 42</p>
<p>Parcel No. AR-1. A parcel of land supposed to be owned by FRANK J. McGOVERN ET AL., located on the southwesterly side of Hartwell Road, so called, described as follows: Beginning at a point on the southwesterly side of Hartwell Road and extending thence by said side of Road, northwesterly about 690 feet; thence south 66° 59' 41" west about 585 feet; thence south 28° 25' 19" east 620.00 feet; thence north 69° 12' 48" east 778.36 feet to the point of beginning; containing about 9.92 acres. - - - - -</p>	
<p>Parcel No. AR-2. A parcel of land supposed to be owned by FRANK J. McGOVERN ET AL, located on the northeasterly side of Hartwell Road, so called, described as follows:- Beginning at a point on the northeasterly side of</p>	

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184	<p>Hartwell Road and extending thence by said side of road, northwesterly about 805 feet; thence north 65° 59' 41" east about 275 feet; thence south 17° 35' 19" east about 565 feet to the point of beginning; containing about 1.74 acres. -----</p> <p>✓ Parcel No. AR-3. A parcel of land supposed to be owned by FRANK P. REYNOLDS, located on the easterly side of South Road, so called, described as follows:- Beginning at a point on the easterly side of South Road and extending thence south 72° 48' 16" east about 65 feet; thence south 83° 35' 14" east 495.03 feet; thence south 6° 59' 29" west 515.00 feet; thence south 62° 02' 10" west 628.34 feet; thence north 84° 03' 36" west about 60 feet to the aforesaid side of South Road; thence returning by said side of South Road, northerly about 880 feet to the point of beginning; containing about 9.47 acres. -----</p> <p>↓ Parcel No. AR-4. A parcel of land supposed to be owned by FRANK P. REYNOLDS, located on the westerly side of South Road, so called, described as follows:- Beginning at a point on the westerly side of South Road and extending thence by said side of road, southerly about 890 feet; thence north 84° 03' 36" west about 355 feet; thence northwesterly by land of Josephine Batakis Daminatis about 600 feet; thence by land of the Bedford Airport northeasterly about 450 feet; thence northeasterly by land Adolph Rungren, town of Bedford, Richard Weinfield and Owner Unknown about 457 feet; thence south 72° 48' 16" east about 250 feet to the point of beginning; containing about 13.20 acres. -----</p> <p>Parcel No. AR-5. A parcel of land supposed to be owned by JOSEPHINE BATAKIS DAMINATIS, located on the southeasterly side of the Bedford Airport, so called, described as follows:- Beginning at a point on the southeasterly boundary of the Bedford Airport 325 feet distant southwesterly of corner No. 19 of said boundary, and extending thence north 78° 25' 06" east 548.41 feet; thence south 84° 03' 36" east about 90 feet to the southwesterly boundary of land of Frank P. Reynolds; thence northwesterly by said boundary about 600 feet to the aforesaid airport boundary; thence southwesterly by said airport boundary about 560 feet to the point of beginning; containing about 3.60 acres. -----</p> <p>+ Parcel No. AR-6. A parcel of land supposed to be owned by RICHARD WEINFELD, located on the southeasterly side of Allen Avenue, so called, bounded as follows: Northwestery by Allen Avenue about 18 feet; northeasterly by remaining land of said Weinfield about 28 feet; and southerly by land now or formerly of Frank P. Reynolds about 36 feet; containing about 0.01 acres. -----</p>

(1942 land taking deed cont., 4 of 7 pages)

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Parcel No. AR-7. A parcel of land supposed to be owned by OWNER UNKNOWN (Allen Avenue), bounded as follows:- Southerly by land now or formerly of Frank P. Reynolds about 54 feet; northwesterly by land now or formerly of the town of Bedford and of Owner Unknown about 46 feet; northeasterly by Allen Avenue about 41 feet; and southeasterly by land now or formerly of Richard Weinfeld about 18 feet; containing about 0.03 acres. - - -	
Parcel No. AR-8. A parcel of land supposed to be owned by OWNER UNKNOWN located on the northwesterly side of Allen Avenue, so called, bounded as follows: Southeasterly by Allen Avenue about 4 feet; southerly by land now or formerly of Frank P. Reynolds about 59 feet; southwestery by land now or formerly of the town of Bedford about 40 feet; northwesterly by land now or formerly of the town of Bedford about 40 feet; and northeasterly by land now or formerly of the town of Bedford about 80 feet; containing about 0.06 acres. - - - - -	
Parcel No. AR-9. A parcel of land supposed to be owned by the TOWN OF BEDFORD, located on the southeasterly side of Byrd Avenue, so called, bounded as follows: northwesterly by Byrd Avenue about 132 feet; northerly by remaining land of said town of Bedford about 173 feet; southeasterly by Allen Avenue about 42 feet; southwestery, southeasterly and northeasterly by land now or formerly of Owner Unknown about 160 feet; and southeasterly by land now or formerly of Frank P. Reynolds about 160 feet; containing about 0.29 acres. - - - - -	
Parcel No. AR-10. A parcel of land supposed to be owned by OWNER UNKNOWN (Byrd Avenue), bounded as follows: southeasterly by land now or formerly of the town of Bedford about 132 feet; southerly by land now or formerly of Frank P. Reynolds about 53 feet; northwesterly by land now or formerly of Adolph Rungen, town of Bedford and Arthur C. Lee about 148 feet; and northerly by Byrd Avenue about 44 feet; containing about 0.13 acres. - -	
Parcel No. AR-11. A parcel of land supposed to be owned by ADOLPH RUNGEN, located on the northwesterly side of Byrd Avenue, so called, bounded as follows:- Southeasterly by Byrd Avenue about 23 feet; southerly by land now or formerly of Frank P. Reynolds about 95 feet; southwestery and southerly by land of the Bedford Airport about 107 feet; northwesterly by Classen Avenue about 117 feet; and northeasterly by land now or formerly of the town of Bedford about 160 feet; containing about 0.29 acres. - -	
Parcel No. AR-12. A parcel of land supposed to be owned by TOWN OF BEDFORD, located on the northwesterly side of Byrd Avenue, so called, bounded as follows:- Southeasterly by Byrd Avenue about 80 feet; southwestery by land now or formerly of Adolph Rungen about 160 feet; northwesterly	

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186	<p>by Classen Avenue about 45 feet; northerly by remaining land of said town of Bedford about 79 feet; and northeasterly by land now or formerly of Adolph Rungren and of Arthur C. Lee about 90 feet; containing about 0.27 acres. - - - - -</p> <p>Parcel No. AR-13. A parcel of land supposed to be owned by ARTHUR C. LEE, located on the northwesterly side of Byrd Avenue, so called, bounded as follows:- Southeasterly by Byrd Avenue about 45 feet; southwesterly by land now or formerly of the town of Bedford about 80 feet; northwesterly by land now or formerly of Adolph Rungren about 5 feet; and northerly by remaining land of said Lee about 90 feet; containing about 0.05 acres.-</p> <p>Parcel No. AR-14. A parcel of land supposed to be owned by ADOLPH RUNGREN, bounded as follows: northerly by remaining land of said Rungren about 11 feet; southeasterly by land now or formerly of Arthur C. Lee about 5 feet; and southwesterly by land now or formerly of town of Bedford about 10 feet; containing about 0.001 acres. - - - - -</p> <p>Parcel No. AR-15. A parcel of land supposed to be owned by OWNER UNKNOWN (Classen Avenue) bounded as follows:- southeasterly by land now or formerly of Town of Bedford and Adolph Rungren about 162 feet; southerly by land of the Bedford Airport about 46 feet; northwesterly by land now or formerly of the town of Bedford about 162 feet; and northerly by Classen Avenue about 46 feet; containing about 0.15 acres. - - - - -</p> <p>Parcel No. AR-16. A parcel of land supposed to be owned by TOWN OF BEDFORD, located on the northwesterly side of Classen Avenue, bounded as follows:- Southeasterly by Classen Avenue about 162 feet; southerly by land now or formerly of the Bedford Airport about 178 feet; northwesterly by Davis Avenue about 160 feet; and northerly by remaining land of said town of Bedford about 179 feet; containing about 0.59 acres. - - - - -</p> <p>Parcel No. AR-17. A parcel of land supposed to be owned by OWNER UNKNOWN (Davis Avenue), bounded as follows:- Southeasterly by land now or formerly of the town of Bedford about 160 feet; southerly by land of the Bedford Airport about 45 feet; northwesterly by land now or formerly of the town of Bedford about 160 feet; and northerly by Davis Avenue about 45 feet; containing about 0.15 acres. - - - - -</p> <p>Parcel No. AR-18. A parcel of land supposed to be owned by TOWN OF BEDFORD, located on the northwesterly side of Davis Avenue bounded as follows:- Southeasterly by Davis Avenue about 160 feet; southerly by land of the Bedford Airport about 177 feet; northwesterly by Essex Avenue about 155 feet; and northerly by remaining land of said town of Bedford about 179 feet; containing about 0.58 acres. - - - - -</p>

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Parcel No. AR-19. A parcel of land supposed to be owned by OWNER UNKNOWN (Essex, Stanley and Fair Avenues) bounded as follows: Southeasterly by land now or formerly of town of Bedford about 155 feet; southerly by land of the Bedford Airport about 266 feet; northwesterly by land of the Bedford Airport about 150 feet; northerly by Fair Avenue about 45 feet; southeasterly by land now or formerly of the town of Bedford about 120 feet; northerly by land of the town of Bedford about 182 feet; northwesterly by land of the town of Bedford and of John J. Williams about 114 feet; and northerly by Essex Avenue about 45 feet; containing about 0.41 acres.

Parcel No. AR-20. A parcel of land supposed to be owned by JOHN J. WILLIAMS, located on the northwesterly side of Essex Avenue, so called, bounded as follows: Southeasterly by Essex Avenue about 28 feet; southwestery by land now or formerly of the town of Bedford about 56 feet; and northerly by remaining land of said Williams about 84 feet; containing about 0.02 acres.

Parcel No. AR-21. A parcel of land supposed to be owned by TOWN OF BEDFORD, located on the northwesterly side of Essex Avenue, so called, bounded as follows: Southeasterly by Essex Avenue about 86 feet; southerly by Stanley Avenue about 182 feet; northwesterly by Fair Avenue about 120 feet; northerly by remaining land of said town of Bedford about 115 feet; and northeasterly by land now or formerly of John J. Williams about 56 feet; containing about 0.41 acres.

The land in which easements are hereby taken and the parcel taken in fee are shown on a plan drawn by R. W. Coburn, Chief Engineer, signed by the Department of Public Works, and on file in its office, said plan being entitled: "The Commonwealth of Massachusetts Plan Showing Land Taking and Easements for Air Rights in the Town of Bedford Middlesex County Taken by the Department of Public Works June 24, 1942. Scales as noted", a certified copy of which is to be recorded with this order of taking in the Registry of Deeds for Middlesex County, Southern District, at Cambridge. For damages sustained by persons in their property by reason of the aforesaid takings the following awards are made; said awards to be paid by the Commonwealth:

Parcel No.	Supposed Owners	Area Acres	Award
44	Frank J. McGovern et al.	5.94	\$1.00
AR-1	Frank J. McGovern et al.		1.00
AR-2	Frank J. McGovern et al.		1.00
AR-3	Frank P. Reynolds		1.00
AR-4	Frank P. Reynolds		1.00

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	Parcel No.	Supposed Owners	Area Acres	Award
	AR-5	Josephine Batakis Daminatis		\$1.00
	AR-6	Richard Weinfield		1.00
	AR-7	Owner Unknown		1.00
	AR-8	Owner Unknown		1.00
	AR-9	Town of Bedford		1.00
	AR-10	Owner Unknown		1.00
	AR-11	Adolph Rungren		1.00
	AR-12	Town of Bedford		1.00
	AR-13	Arthur C. Lee		1.00
	AR-14	Adolph Rungren		1.00
	AR-15	Owner unknown		1.00
	AR-16	Town of Bedford		1.00
	AR-17	Owner unknown		1.00
	AR-18	Town of Bedford		1.00
	AR-19	Owner unknown		1.00
	AR-20	John J. Williams		1.00
	AR-21	Town of Bedford		1.00
	All names of owners herein given, although supposed to be correct, are such only as matters of opinion and belief. Dated at Boston this twenty-fourth day of June, 1942.			
	Approved:	Herman A. MacDonald	} Department	
	M.A.R.	George W. Schryver	} of	
	O K 6/19 42 R.E.S.	Charles E. Furnans	} Public Works	
	G.H.D.			
	THE COMMONWEALTH OF MASSACHUSETTS OFFICE OF THE SECRETARY Boston, June 24, 1942 I hereby certify that at the date of this attestation hereto annexed Herman A. MacDonald, George W. Schryver, and Charles E. Furnans were duly qualified as Commissioner and Associate Commissioners, respectively, of the Department of Public Works, and that to their acts and attestations as such, full faith and credit are and ought to be given in and out of Court, and, further, that their signatures to the annexed instrument are genuine. In testimony of which I have hereunto affixed the Great Seal of the Commonwealth the date above written. F. W. Cook Secretary of the Commonwealth (Commonwealth seal)			
	Middlesex ss. June 30, 1942. 3h. 30m. P.M. Rec'd & Recorded.			
	"A" & "5" over erasure.			
	THE COMMONWEALTH OF MASSACHUSETTS			
	DEPARTMENT OF PUBLIC WORKS			
	Acting under the provisions of Chapter 268 of the Acts of 1941, the De-			
COMMONWEALTH OF MASSACHUSETTS				
TOWN OF CONCORD				
TAKING				

**1944 Amended judgement on the declaration of taking: 46.06 acres Bedford, Middlesex County J. Peterson, et al. (p. 1 of 4).**

[Document provided courtesy of Matt Lanefski, Bedford Assessing Department Director]

<p>terior angle of 96 degrees, 45 minutes, with said last-mentioned line and runs 500 feet to the point of beginning, said zone embracing said Tract No. 90. A true copy: Attest: James S. Allen Clerk. (Court seal) ----- Middlesex ss. April 27, 1944. 9h. 41m. A.M. Rec'd &amp; Recorded. One word &amp; "A" over erasure.</p>	<p>6759 495</p>		
<p>IN THE DISTRICT COURT OF THE UNITED STATES FOR THE DISTRICT OF MASSACHUSETTS</p> <table border="0"> <tr> <td> <p>UNITED STATES OF AMERICA, Petitioner, v. 46.06 ACRES OF LAND, MORE OR LESS, SITUATE IN BEDFORD, COUNTY OF MIDDLESEX, COMMONWEALTH OF MASSACHUSETTS, AND JOHN A. PETERSON, ET AL., Defendants.</p> </td> <td style="vertical-align: middle;"> <p>MISC. CIVIL NO. 6861</p> </td> </tr> </table> <p>AMENDED JUDGMENT ON THE DECLARATION OF TAKING (April 12, 1944.)</p> <p>Wyanski, J. This cause coming on for hearing upon motion of Edmund J. Brandon, United States Attorney in and for the District of Massachusetts, and Philip P. A. O'Connell, Special Assistant to the United States Attorney in and for the said District, attorneys for the petitioner herein, to enter a Judgment on the Declaration of Taking and amendment thereto filed herein and upon consideration thereof and of the petition and the declaration of taking filed herein and statutes in such cases made and provided, and it appearing to the satisfaction of the Court: FIRST, that the United States of America is entitled to acquire property by condemnation under judicial process for the purposes as set forth and prayed for in said petition; SECOND, that the declaration of taking and amendment thereto filed herein contains or has annexed thereto a statement of the authority under which and the public use for which the lands hereinafter described are taken, a description of the said lands taken sufficient for the identification thereof, a statement of the estate or interest taken for the said public use, a plan showing the lands taken, and a statement of the sum of money estimated by the Secretary of War of the United States to be just compensation for the land taken in the sum of \$710.00 and that said amount has been deposited into the registry of the Court for the use and benefit of the persons entitled thereto; THIRD, that the said declaration of taking and amendment thereto filed herein contains a statement that the Secretary of War of the United States head of the acquiring agency, is of the opinion that the ultimate award of just compensation will be within the limits prescribed by Congress as the price to be paid therefor; NOW, THEREFORE, it is ORDERED, ADJUDGED and</p>	<p>UNITED STATES OF AMERICA, Petitioner, v. 46.06 ACRES OF LAND, MORE OR LESS, SITUATE IN BEDFORD, COUNTY OF MIDDLESEX, COMMONWEALTH OF MASSACHUSETTS, AND JOHN A. PETERSON, ET AL., Defendants.</p>	<p>MISC. CIVIL NO. 6861</p>	<p>UNITED STATES OF AMERICA DECREE OF CT., AMENDED, JUDGMENT ON THE DECL. OF TAKING &amp;c.</p>
<p>UNITED STATES OF AMERICA, Petitioner, v. 46.06 ACRES OF LAND, MORE OR LESS, SITUATE IN BEDFORD, COUNTY OF MIDDLESEX, COMMONWEALTH OF MASSACHUSETTS, AND JOHN A. PETERSON, ET AL., Defendants.</p>	<p>MISC. CIVIL NO. 6861</p>		

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496	<p>DECREED that an easement for a term of fifteen years, in and over those portions of the land described in Schedule "A" attached hereto and made a part hereof, which lies within a trapezoidal zone having the shape and location described in Schedule "Z" attached hereto and made a part hereof, for the establishment and use of a glide angle plane for the flight of aircraft at an angle of forty to one with the ground, including the continuing right in the United States to cut timber, remove buildings and clear the zone of any and all obstructions extending above the glide angle plane and including the right of ingress and egress to this land, to effect the necessary clearance, reserving, however, to the land owner and his heirs and assigns all such rights and privileges as may be used and enjoyed without interfering with or abridging the easement acquired by the United States, vested in the United States of America upon the filing of the said declaration of taking and the depositing into the registry of this Court of the amount of estimated just compensation, which land is situate in the Town of Bedford, County of Middlesex and Commonwealth of Massachusetts, and more particularly described in Schedule "A" attached hereto and made a part hereof, and defined in map marked Schedule "B" attached to and made a part of the declaration of taking herewith filed. Said land is deemed to be condemned and taken for the United States of America, and the right to just compensation for the property so taken is vested in the persons entitled thereto; and the amount of such just compensation shall be ascertained and awarded in this proceeding and established by judgment herein pursuant to law, and This cause is held open for such further and other orders, judgments and decrees as may be necessary in the premises. Entered this 12th day of April, 1944 at Boston, Massachusetts. - - - - -</p> <p style="text-align: center;">             ENTERED: <span style="float: right;">BY THE COURT:</span>              Charles E. Wyzanski, Jr., J. <span style="float: right;">Jane D. Fahey</span>              4/12/44 12.50 P.M. <span style="float: right;">Deputy Clerk</span> </p> <p style="text-align: center;">SCHEDULE "A"</p> <p>The land which is the subject matter of this Declaration of Taking and of this condemnation, aggregates 46.06 acres, more or less, situate and being in the County of Middlesex, Commonwealth of Massachusetts. A description of the land taken, together with the names of the purported owners thereof, is as follows: - - - - -</p> <p style="text-align: center;">             Tract No. 91              NORTHEAST APPROACH ZONE         </p> <p>Description: An easement over a certain parcel of land located on the Southeasterly side of Hartwell Road, situated in the Town of BEDFORD,</p>

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County of Middlesex, and the Commonwealth of Massachusetts, bounded and described as follows: Beginning at a point on the Southeasterly side line of Hartwell Road, said point being the extreme Westerly corner of land of Alfred H. and Alden W. Webber; thence South 26 degrees, 20 minutes East, along land of said Webber and land of the Town of Bedford 544.5 feet, more or less, to a point; thence South 12 degrees, 10 minutes, East, along said Town land, 650 feet, more or less, to a point; thence South 35 degrees, 15 minutes, West, through land of the grantor, 990 feet, more or less, to land of the United States of America; thence North 54 degrees, 45 minutes, West, along said Government land 1000 feet, more or less, to a point; thence North 27 degrees, 10 minutes, East, through land of the grantor, 1140 feet, more or less, to a point on said Southeasterly side line of Hartwell Road; thence Northeasterly along said side line 630 feet, more or less, to the point of beginning. Containing 35.5 acres, more or less. - - - - -

Name of purported owner            John A. Petersen  
 Address of purported owner        Bedford, Massachusetts

Tract No. 102  
 NORTHWEST APPROACH ZONE

Description: An easement over a certain parcel of land located on the Southwesterly side of Hartwell Road, situated in the Town of Bedford, County of Middlesex, and the Commonwealth of Massachusetts, being bounded and described as follows: Beginning at a point on the Southwesterly side line of Hartwell Road, said point being the center of a ditch at land of J. W. Laffin et al; thence Southeasterly by said Hartwell Road, 790 feet, more or less, to land of the United States of America; thence South 44 degrees, 50 minutes, West, along said Government Land, 680 feet, more or less, to a point; thence North 87 degrees, 10 minutes, West, along said Government Land, 60 feet, more or less, to a point; thence North 32 degrees, 50 minutes, West, through land of the grantor, 695 feet, more or less, to the center of said ditch and land of said Laffin; thence Northeasterly along said ditch 510 feet, more or less, to the point of beginning. Containing 10.56 acres, more or less. - - - - -

Name of purported owner            Katherine C. McGovern  
 Address of purported owner        Hartwell Road  
    Bedford, Massachusetts

SCHEDULE "Z"

The avigation easements for the establishment of glide angle planes at an angle of forty to one with the ground sought to be imposed on the lands described in Schedule "A", are more particularly described as to shape

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498	<p>and location as follows: - - - - -</p> <p style="text-align: center;">NORTHEAST APPROACH ZONE</p> <p>A runway approach zone commencing at a point in a line in prolongation of the center line of the North-east South-west runway of the Bedford Airfield, level with, and 1000 feet distant from the North-east end of said runway; thence turns to the right forming an angle of 90 degrees with the line in prolongation of the center line of the runway and runs 500 feet to a point; thence turns to the left forming an interior angle of 98 degrees, 05 minutes with the last-mentioned line and runs 10,665.9 feet to a point; thence turns to the left again, forming an interior angle of 81 degrees, 55 minutes with the line last mentioned and runs 4000 feet to a point; thence turns left again forming an interior angle of 80 degrees, 35 minutes, 30 seconds, with the line last mentioned and runs 9,174.7 feet to the point; thence turns to the right forming an interior angle of 189 degrees, 24 minutes, 30 seconds, with the last-mentioned line and runs 1,508.8 feet to a point, 500 feet from the point of beginning; thence turns left again, forming an interior angle of 90 degrees with the last-mentioned line and runs 500 feet to the point of beginning, said zone embracing Tract No. 91. - - - - -</p> <p style="text-align: center;">NORTHWEST APPROACH ZONE</p> <p>A glide angle plane commencing at a point in a line in prolongation of the center line of the Northwest-Southeast runway of the Bedford Airfield, level with and 1000 feet distant from the Northwest end of said runway; thence turns to the right forming an angle of 90 degrees with the line in prolongation of the center line of the runway and runs 750 feet to a point; thence turns to the left forming an interior angle of 96 degrees, 45 minutes with the last-mentioned line and runs 10,633.6 feet to a point; thence turns left again forming an interior angle of 83 degrees, 15 minutes with the line last mentioned and runs 4000 feet to a point; thence turns left again forming an interior angle of 83 degrees, 15 minutes with the line last mentioned and runs 10,633.6 feet to a point 750 feet from the point of beginning; thence turns left again forming an interior angle of 96 degrees 45 minutes with said last-mentioned line and runs 750 feet, more or less, to the point of beginning, said zone embracing Tract No. 102. A true copy: Attest: James S. Allen Clerk. (Court seal) - - - - -</p> <p style="text-align: center;">Middlesex ss. April 27, 1944. 9h. 41m. A.M. Rec'd &amp; Recorded.</p> <hr/> <p style="text-align: center;">We, John G. Brackett and Louise C. Brackett, husband and wife</p>
BRACKETT et ux to PHELAN et ux	

**1953 Land Use Permit (Granted by the Air Force to the Navy)**

Note: This document was shared with our committee courtesy of the HAFB Civil Engineering Division and Public Affairs Office, December 9, 2019. It has notations on it of Amendments 1 and 2. Descriptions of Amendments 3-5 can be seen in Refs: Dept. of the Air Force; 1958, 1959, 1967.

(1 of 3 pages)

153 (20.9 acres)

DEPARTMENT OF THE AIR FORCE  
PERMIT  
FOR USE OF PROPERTY ON HANSCOM AIR FORCE BASE

No DA 19-016 Eng - 5782  
DK 19-0160 - ENC -  
5782

The DEPARTMENT OF THE NAVY is hereby granted a permit beginning as of the date hereof and continuing as long as the current Raytheon contract for missile and radar testing (No. a-1147) is in effect, but revocable at will by the Secretary of the Air Force, to use and occupy a certain area of land, being a portion of Hanscom Air Force Base, Bedford, Massachusetts, consisting of approximately 20.9 acres as shown in green and red cross hatch on the map attached hereto and made a part hereof marked Exhibit "A" and further identified as Plot Plan, Utilities and Paved Areas, together with the use of flying facilities located at said installation in common with others, for its operation in connection with the use of said premises.

THIS PERMIT is granted subject to the following provisions and conditions:

1. That the use of said flying facilities shall not exceed one hundred (100) aircraft movements per month, nor 10 per day, by the Department of the Navy and/or its contractor. Night flying is not contemplated. Permission granted herein shall in no event include any extended use of the runways, taxiways, or other flight facilities, and it is specifically agreed by the parties hereto that the entire aircraft operational and supporting facilities of the Permittee are reserved for its exclusive use, except such use as is specifically made available hereunder.
2. That the use and occupation of the said premises shall be without cost or expense to the Department of the Air Force, under the general supervision and subject to the approval of the office having immediate jurisdiction over the premises, and subject also to such rules and regulations as he may from time to time prescribe.
3. That the permittee shall, at its own expense and without cost or expense to the Department of the Air Force, maintain and keep in good repair and condition the premises herein authorized to be used.

*See amendments 1, 2, 3, 4, 5 to permit*

4. That any interference with or damage to property under control of the Department of the Air Force incident to the exercise of the privileges herein granted shall be promptly corrected by the permittee to the satisfaction of the said officer.

5. No demand will be made on the Air Force for sewage, water, power, telephone or other utilities. However, should such utilities or other services be furnished by the Department of the Air Force or through Department of the Air Force facilities for use of the Permittee or its contractor, the Permittee shall pay the cost, as determined by the said officer or producing and/or supplying such utilities and other services.

6. That no additions to or alterations of the premises shall be made without the prior consent of the said officer.

7. That if for any reason it should be deemed necessary or expedient for the Department of the Air Force to perform functions and/or render services which are the responsibility of the permittee, the said officer may, in lieu of reimbursement, require the permittee to furnish the personnel and/or materials required for the performance of said functions and/or for the rendering of said service. In addition to furnishing personnel and/or materials, the permittee shall reimburse the Department of the Air Force for any costs incurred by the Department of the Air Force in connection with said functions and/or services, such as for supervision and/or equipment furnished. Selection of such personnel will be subject to the approval of the said officer.

8. That facilities and improvements affixed to the premises shall become the property of the Department of the Air Force upon the expiration, relinquishment or revocation of this permit. On or before the date of expiration of this permit or its relinquishment by the Permittee, the Permittee shall vacate the said premises and remove its moveable equipment therefrom, and restore the premises to a condition satisfactory to the said officer, ordinary wear and tear and damage beyond the control of the Permittee excepted. If, however, this permit is revoked, the Permittee shall vacate the premises, remove its moveable equipment therefrom, and restore the premises as aforesaid within such time as the Secretary of the Air Force may designate.

9. The land area permitted shall be devoted exclusively to the operational and technical requirements of the Raytheon Corporation in connection with its contract.

10. Permittee will reimburse the Permitter the pro-rata share of the costs of maintenance and upkeep of any joint use facilities, such as, but not limited to, roads, streets, sidewalks, buildings interiors and the amount and method of reimbursement shall be agreed upon by the parties hereto.

11. The local commanding officers of the Permitter and Permittee shall come into agreement as to rules regarding security, jurisdiction and administration as may be necessary to implement joint use of the facilities of the Base.

*changed by Amend #1 No. of personnel 1400 Amendment #2 Removes this restriction*

12. The maximum number of personnel to be employed by the Permittee and/or its contractor will be limited to 750, with an average of under 200 per year.

*changed to 600 by Amend #1*

13. Automobile parking facilities will be limited to 450 cars.

*Amend #2 Removes this restriction*

14. This transaction is not affected by Section 601 of the Act of Congress approved 28 September 1951; Public Law 155, 82nd Congress, First Session.

IN WITNESS WHEREOF I have hereunto set my hand by authority of the Secretary of the Air Force and under the direction of the Chief of Engineers this 16th day of February, 1953.

L. H. Hewitt  
L. H. HEWITT  
Colonel, Corps of Engineers  
Division Engineer

*Note  
Par 12 and 13  
Restrictions removed  
by Amendment No. 2*

1977 Transfer of ownership of some of the NWIRP land from Hanscom Air Force Base to the Department of the Navy (Hanscom Air Force Base. (1977, May 18). Transfer and acceptance of military real property to Dept. of the Navy, Philadelphia, Pennsylvania. Property Voucher # 77-0100). This document was shared with our committee courtesy of the HAFB Civil Engineering Division and the Public Affairs Office, December 9, 2019.

TRANSFER AND ACCEPTANCE OF MILITARY REAL PROPERTY											PAGE 1 OF 1 PAGES	
1. FROM (Installation/Activity/Service) HANSCOM AFB BEDFORD, MASSACHUSETTES			2. OPERATING UNIT		3. DISTRICT CODE	4. OPERATING AGENCY	5. DATE		6. JOB NUMBER 77-0100	7. SERIAL NUMBER	8. CONTRACT NUMBER	
9. TO: (Installation/Activity/Service) DEPT. OF THE NAVY PHILADELPHIA, PENNSYLVANIA 19112			10. OPERATING UNIT		11. DISTRICT CODE	12. OPERATING AGENCY	13. AC. COUNTING NUMBER	14. AC-COUNTABLE OFFICE NUMBER	15. TYPE OF TRANSACTION <input type="checkbox"/> NEW CONSTR. <input type="checkbox"/> UENP/O <input checked="" type="checkbox"/> EXISTING FAC. <input type="checkbox"/> PHYSICAL COM. <input type="checkbox"/> CAPITAL IMP. <input type="checkbox"/> FINAN. COM. <input type="checkbox"/> OTHER (Specify) <input type="checkbox"/> OTHER (Specify)			16. PROJECT NUMBER
ITEM NO.	CATEGORY CODE	FACILITY (Category description)	NO. OF UNITS	TYPE	UNIT OF MEAS.	TOTAL QUANTITY	COST	DRAWING NUMBERS	REMARKS			
17	18	19	20	21	22	23	24	25	25			
1.	842245	Water distribution main 6" cast iron with 2 hydrants & service lines to facilities in area being transferred. These service lines are not shown in total area of 1072 linear feet of main.	1		LF	1,072	\$5,360.00					
2.	911127	A parcel of land described on exhibit "A" portion of tract A-101.	1		ACRE	36.65 +	ZERO		This land was originally acquired by donation. An estimated value is \$89,598.25			
17. STATEMENT OF COMPLETION: The facilities listed herein are in accordance with maps, drawings, and specifications and change orders approved by the authorized representative of the using agency except for the deficiencies listed on the reverse side.					18. ACCEPTED BY (Signature) <i>D. A. Morton</i> D. A. Morton Director Facilities Administration Industrial Resources Div.					19. DATE 15 AUG 1977		
20. TRANSFERRED BY (Signature) <i>Earl E. Milner</i> Earl E. Milner Commander, 3245th Civ Engrg Sq					21. DATE 18 MAY 1977					22. PROPERTY VOUCHER NUMBER 77-0100		

The committee notes:

- The document states "This land was originally acquired by donation. An estimated value is \$89,598.25."

## EXHIBIT E: PHOTOS OF SOLAR FARMS NEAR AIRFIELDS

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Ameresco Airport Solar Projects:

### **Logan Int'l Airport Ameresco Solar Installation**



Image courtesy of Ameresco 2021. All rights reserved.

### **Minneapolis-St. Paul Int'l Airport Ameresco Solar Farm**



Image courtesy of Ameresco 2021. All rights reserved.

## Other Massachusetts Airport Solar Projects:

### Barnstable Municipal Airport



Credit: Imagery Google, ©2021 CNES/Airbus, MassGIS, Commonwealth of Massachusetts EOE, Maxar Technologies, USDA Farm Service Agency, Map data ©2021.

[Committee note: Yellow arrows added here to indicate the airport solar arrays.]

Many other U.S. airports have extensive solar installations, including:

- Chattanooga Airport Indianapolis International Airport (largest airport-based solar farm in US)
- Denver International Airport (four solar farms)
- Indianapolis International Airport (largest airport-based solar farm in US)
- Sacramento Int'l Airport
- Tucson International Airport

EXHIBIT F: PHOTOS OF SOLAR FARMS ON LOCAL LANDFILL SITES

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**Acton Landfill Solar Farm  
(Ameresco)**



Credit: Image courtesy of Ameresco, 2021.

**Concord Landfill Solar Farm  
(Kearsarge Energy)**



Credit: Image used permission of Steven Ng, former Concord Select Board member.  
Cover of Town of Concord Energy Future Task Force Final Report (2017, March 16).  
Photo caption: Aerial view of the solar array located at the closed and capped landfill on Route 126 and Route 2 looking west

**Lexington Landfill/Compost Facility Solar Farm  
(SolarCity, Renova Partners, Brightfields, Syncarpha Capital)**



This photo captioned, “A solar array at a landfill in Lexington, Massachusetts. Credit: Renova Partners/Brightfields Development,” originally appeared in an article by McGowan, E. (2018, March 18). Why Massachusetts is the best state for landfill solar arrays. *Energy News Network: Northeast*. <https://energynews.us/2018/03/28/why-massachusetts-is-the-best-state-for-landfill-solar-arrays/>

**Lowell Landfill Solar Farm  
(Ameresco)**



Credit: Image courtesy of Ameresco 2021. All rights reserved.

**Sudbury Landfill Solar Farm  
(Ameresco)**



Credit: Image courtesy of Ameresco, 2021. All rights reserved.

**Weston Landfill Solar Farm  
(Ameresco)**



Credit: Image courtesy of Ameresco, 2021. All rights reserved.

EXHIBIT G: PHOTOS OF SOLAR FARMS ON ASHLAND AND BILLERICA  
SUPERFUND LANDFILL SITES

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**Ashland Superfund Landfill Solar Farm  
(Ashland Solar LLC)**



This photo captioned, “50 MBTA Access Road – Ashland, MA,” originally appeared in the article, “Aldon Electric completes 5.8MW Ashland, Mass. solar landfill project” (2020, April 17) in *New England Real Estate Journal*.  
<https://nerej.com/aldon-electric-completes-5-8mw-ashland-mass-solar-landfill-project>

**Billerica Superfund Landfill Solar Installation  
(UGT Renewable Energy, 7 LLC)**



Credit: Photo by Gregg Shupe. Used by permission of Interstate Electrical Services Corp.

## EXHIBIT H: STATE SUPPORT FOR RENEWABLE ENERGY PROJECTS ON CONTAMINATED LAND

State goals and contaminated land solar projects chart excerpted from MassDEP’s most recent (2018) annual report on state-supported clean energy projects.

<https://www.mass.gov/doc/clean-energy-results-2018-annual-report/download>

### Renewable Energy on Contaminated Sites

#### **Goal 1: Renewable Energy on Contaminated Land**

BWSC’s efforts to develop 50 MW’s of renewable energy/solar PV on contaminated land by 2020.

The Department of Environmental Protection’s (MassDEP) Bureau of Waste Site Cleanup (BWSC) continued its [national leadership](#) role in ongoing stewardship around the Commonwealth of the support for development of solar photovoltaic renewable energy generation units on closed landfills and contaminated land such as Brownfield’s. The state currently leads the nation in the number of operational units per site and is number two in total energy capacity produced. The goal to achieve 50 MW of solar generating capacity on contaminated sites by 2020 has been exceeded.

Capacity as of February 12, 2019 (see attached “MA CL Installed Solar PV Sites List”):

	<b>Operational (MW)</b>	<b>Proposed (MW)</b>	<b>TOTAL (MW)</b>
<b>Solar Photovoltaics</b>	84.01	51.80	<b>141.11</b>
<b>Wind</b>	6.5	0.0	<b>6.5</b>
<b>Total</b>	<b>90.51</b>	<b>51.80</b>	<b>147.61</b>

#### **Goal 2: Green Remediation/Greener Cleanups**

BWSC’s efforts toward the promotion and application of green approaches for the assessment and remediation of oil and hazardous disposal sites is consistent with the Commonwealth’s mandates to improve energy efficiency, reduce emissions and expand the use of renewable energy resources where practicable through a *reduction in the Net Environmental Footprint* of cleanup assessment and remediation activities to the maximum extent possible.

(Committee note: Goal 3 seems to be missing from the online MassDEP 2018 Clean Energy Report)

#### **Goal 4: BWSC CERP Climate Change and Resilience within Sustainable Remediation**

In conjunction with the Commonwealth’s Executive Order 569 – “Establishing an Integrated Climate Change Strategy for the Commonwealth” and the Sustainable Remediation Forum’s Technical Initiative for Climate Resilience with Sustainable Remediation, BWSC is assessing the vulnerability of its universe of waste sites to the impacts of climate change and evaluating its adaptation options with an emphasis on improving energy efficiency, reducing emissions and expanding the use of renewable energy resources where practicable

## EXHIBIT I: EPA SUPPORT FOR SUPERFUND SITE REDEVELOPMENT

### SUPERFUND REDEVELOPMENT PROGRAM

*Helping people participate in the Superfund cleanup process and supporting community efforts to safely reuse sites are vital parts of the program's mission to protect public health and the environment. 2019 marks the 20th anniversary for Superfund Redevelopment. This program develops cutting-edge tools and resources to address evolving community priorities and tackle new challenges.*

Quote from EPA; 2019; Superfund redevelopment: 20th anniversary report, p. 1

The screenshot shows the EPA website's Superfund Redevelopment Program page. At the top is the EPA logo and navigation menu. The main heading is 'Superfund Redevelopment Basics'. A sidebar on the left lists various program resources. The main content area includes a list of links under 'On this page:', a section titled 'The Program' with a paragraph about site reclamation, and a section titled 'Getting Started with Superfund Redevelopment' with a paragraph about site considerations. A green callout box on the right lists 'More Information on Superfund Redevelopment' with links to PDF documents.

**Superfund Redevelopment Program** CONTACT US

Superfund Redevelopment Program Home

**What is Superfund Redevelopment?**

- What's New in Superfund Redevelopment?
- Superfund Redevelopment Basics**
- Find Superfund Sites in Reuse
- Community Support
- Frequent Questions
- SRP 20th Anniversary
- Benefits of Redevelopment
- Reuse Success Stories
- Training & Tools
- Site-Specific Reuse Support
- Redevelopment Contacts

**Superfund Redevelopment Basics**

On this page:

- [The Program](#)
- [Getting Started with Superfund Redevelopment](#)
- [Site-Specific Reuse Support](#)
- [Partnerships](#)
- [Reuse Success Stories](#)
- [Policy, Guidance & Resources](#)

**The Program**

Superfund Redevelopment has helped communities reclaim and reuse thousands of acres of formerly contaminated land. Through an array of tools, partnerships, and activities, Superfund Redevelopment continues to provide local communities with new opportunities to grow and prosper.

**Getting Started with Superfund Redevelopment**

Becoming involved in the redevelopment of a Superfund site requires considerations different from other contaminated sites (e.g., brownfields). However, successful Superfund site redevelopment projects from around the country demonstrate that the barriers and challenges can be overcome.

**More Information on Superfund Redevelopment**

- [Superfund Redevelopment: Planning for the Future, Protecting Public Health and the Environment 2018 \(PDF\)](#) (32 pp, 19 MB, [About PDF](#))
- [2018 Superfund Redevelopment Program Overview Brochure \(PDF\)](#) (2 pp, 2.5 MB)
- [2013 Superfund Redevelopment Brochure \(PDF\)](#) (20 pp, 11.2 MB)
- [2011 Superfund Redevelopment Brochure \(PDF\)](#) (20 pp, 1.3 MB)

Chart excerpted from EPA webpage:

<https://www.epa.gov/superfund-redevelopment/superfund-redevelopment-basics> (Retrieved 10/23/21)

## Community Support at Superfund Sites

Community engagement is a win-win for EPA and the communities they work with. Community engagement:

- Strengthens community and agency relationships and partnerships.
- Enhances protectiveness of site remedies through coordination of remedy and reuse.
- Promotes long-term stewardship of sites by local partners.
- Reduces site stigma through education and outreach.
- Creates opportunity for reduced cleanup and remedy maintenance costs.

EPA identifies Superfund sites that can benefit from reuse-related engagement and assistance. EPA provides initial investments that help move sites toward reuse. As reuse efforts gain momentum, communities leverage these investments.

### Removing Barriers to Reuse

SRP helps to remove barriers and encourages the appropriate reuse of sites. Tools and strategies include:

- [issuing Ready for Reuse \(RfR\) determinations](#);
- [clarifying site information](#);
- [working with the community to assess reuse potential](#); and
- [building partnerships](#).

### Community Engagement

Reuse planning enhances community engagement during Superfund cleanups by proactively including communities in the decision-making process. [Learn more about the reuse planning process](#).

### Community Well-Being

Safe and appropriate Superfund site reuse supports community health and well-being. Reuses include new and accessible healthcare services to meet community needs, as well as recreational amenities that promote healthy lifestyles, such as athletic fields, walking trails, parks, playgrounds and open space.

- [Healthcare Uses at Superfund Sites: Providing Access, Restoring Communities \(PDF\)](#) (3 pp, 2.6 MB, [About PDF](#))
- [Recreation: Supporting Healthy, Fun Activities](#)

### Renewable Energy and Green Remediation

SRP supports the exploration of [opportunities for renewable energy](#) to power site cleanups and supply energy to the electrical power grid.

### Sustainable Communities

SRP provides assistance to communities as they [build their long-term capacities](#), identifying redevelopment resources, bringing diverse stakeholders to the table, and addressing site stigma through education and outreach.

Chart excerpted from EPA webpage 10/23/2021:

<https://www.epa.gov/superfund-redevelopment/community-support-superfund-sites>

## SUPPORT FOR ALTERNATIVE ENERGY PROJECTS AT SUPERFUND SITES



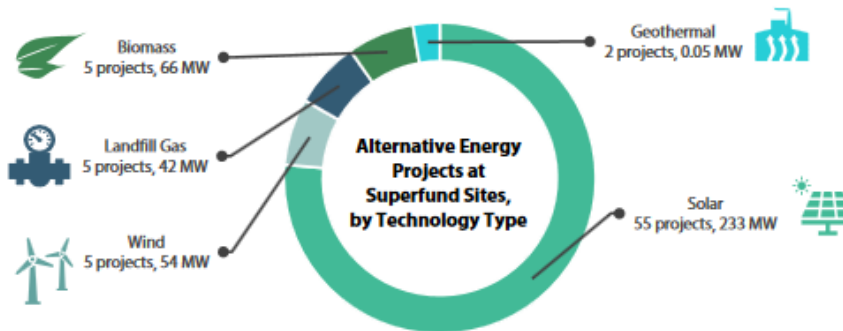
### Alternative Energy Projects at Superfund Sites Status Update and Highlights from Across the Country September 2020

EPA's Superfund Redevelopment Program helps communities reclaim and return contaminated lands to productive use. Many Superfund sites are well suited to support alternative energy production, including solar, wind, landfill-gas-to-energy, geothermal and biomass projects.

#### Alternative Energy at Superfund Sites

Number of Superfund Sites	69
Number of Projects	72
Installed Capacity (MW)	395
Estimated Annual Output (MW hours)	1,044,293

As of September 2020, alternative energy facilities are located at 69 Superfund sites.<sup>1</sup> They support 72 alternative energy projects with an installed capacity of about 395 megawatts (MW), enough to power more than 98,000 homes per year.<sup>2-3</sup> Of these projects, 76% are solar projects and 7% are wind projects. Biomass, landfill gas and geothermal facilities make up the remaining 17% of the projects. In total, 63% of these efforts have an installed capacity of 1 MW or more. The largest alternative energy facility is a 37.5-MW biomass energy plant at the Gallup's Quarry site in Connecticut. About 26% of these projects offset on-site energy demands of cleanup efforts or directly power site-related cleanup activities.



Planning for additional alternative energy projects is underway. An 8.75-MW solar project is under development at the Yeoman Creek Landfill site in Illinois. A 3-MW solar and 2-MW battery storage system project received state approval to begin construction at the Sutton Brook Disposal Area site in Massachusetts in June 2020.

<sup>1</sup> Alternative energy is defined here as non-fossil-fuel-based and non-nuclear-based sources of energy.

<sup>2</sup> Installed capacity information available for 66 out of 72 projects. Estimated annual output information available for 56 of the 72 projects. These figures are estimates, based on publicly available information, direct communication with EPA staff and feedback from project stakeholders.

<sup>3</sup> Based on average annual electricity consumption of 10,649 kilowatt-hours (kWh) per month:  
<https://www.eia.gov/tools/faqs/faq.php?id=97&t=3>.

September 2020

Credit: Chart excerpted from EPA website: <https://semspub.epa.gov/work/HQ/100002778.pdf>

## What is RE-Powering?

EPA's RE-Powering America's Land Initiative encourages renewable energy development on current and formerly contaminated lands, landfills, and mine sites when such development is aligned with the community's vision for the site. The Initiative identifies the renewable energy potential of these sites and provides other useful resources for communities, developers, industry, state and local governments or anyone interested in reusing these sites for renewable energy development.

Potentially contaminated land includes sites where contamination is suspected but has not been confirmed and sites where contamination has been identified. Targeted sites include brownfields, superfund sites, sites subject to corrective action under the Resource Conservation and Recovery Act (RCRA), mining sites, and landfills.

RE-Powering has facilitated redevelopment efforts to reuse abandoned industrial sites for wind farms and former landfills for solar arrays. These projects generate returns nationwide from Georgia to Massachusetts, New York to California. These projects not only advance cleaner and more cost effective energy technologies and but also reduce the environmental impacts of energy systems.

Want more information on RE-Powering? [Contact a member of the RE-Powering Response Team.](#)

## Why Site Renewable Energy on Contaminated Lands?

Potentially contaminated land, landfills, and mine sites can offer significant advantages over other sites, such as open space, for renewable energy development. Some of these sites have unique attributes that can lower development costs and shorten development timeframes. Many of these properties can offer developers a unique value proposition for renewable energy deployment and the ability to:

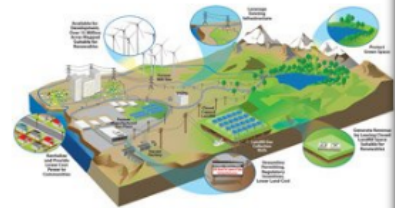
- Leverage existing infrastructure
- Reduce project cycle times through streamlined permitting and zoning
- Improve project economics with reduced land costs and tax incentives
- Gain community support through land revitalization efforts
- Protect open space

The [Potential Advantages of Reusing Potentially Contaminated Land for Renewable Energy](#) document describes many of these potential benefits in detail.

### Related Information about RE-Powering

Learn more by reading:

- [RE-Powering Program Overview](#)



[Check out potential advantages of reusing potentially contaminated land for renewable energy.](#)

Chart from EPA website: <https://www.epa.gov/re-powering/what-re-powering>

## BENEFITS OF SITING RENEWABLE ENERGY PROJECTS ON CONTAMINATED PROPERTIES

### What are the Benefits of these Projects?

Besides providing a pollution-free source of energy, siting renewable energy projects on contaminated properties can have a number of environmental and economic benefits. Through reuse of these sites, communities see a property that had been vacant or underutilized for many years turned into a facility that may help improve the local tax base, create jobs, and turn blight into an economic opportunity.

This approach not only reuses the land, but turns a potential liability into an asset that will serve the community for decades to come. Publicly available, stakeholder-reported information indicates that communities, private site-owners, and consumers have saved millions of dollars in energy costs, created construction jobs, and received new property tax revenue as a result of reusing these sites for renewable energy. The economic benefits most commonly touted for renewable energy on contaminated land are electricity cost savings, additional land lease revenue to the town or city site owner, and increased tax payments for the land and/or renewable energy systems to the local municipality and/or state.

Cost savings can vary across installations, since they are determined by tax and renewable energy incentives, renewable energy policies such as Renewable Portfolio Standards, local electricity rates, and power purchase agreement terms. In some cases, the site owner agrees to lease the land to the renewable energy developer at a low rate in exchange for substantially reduced electricity charges or for other terms, creating win-win situations that benefit all parties. Other benefits associated with developing renewable energy on contaminated lands include job creation and the use of local businesses to construct these projects.

Here are a few examples of some of the economic benefits realized through this type of development:

#### Related Information about Benefits

- Using publicly available information, EPA maintains a list of completed projects where renewable energy systems have been installed on contaminated lands, landfills, and mine sites.
- EPA also tracks the economic and environmental benefits associated with completed sites, as identified and reported by parties directly involved with their respective projects.
- For more information, see the [RE-Powering Benefits Matrix](#).

Credit: Chart excerpted from EPA website: <https://www.epa.gov/re-powering/what-re-powering>

See also: <https://www.epa.gov/re-powering>

## EXHIBIT J: MILITARY INTEREST IN COMMUNITY INFRASTRUCTURE AND ENERGY RESILIENCE PROJECTS

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### Department of Defense Office of Local Defense Community Cooperation Infrastructure Grants

Abstract - This is a new 10-year pilot program for grants administered through the DoD Office of Local Defense Community Cooperation, formerly known as Office of Economic Adjustment. Military installations and the surrounding civilian communities can partner to apply for DoD grants to build or improve off-installation infrastructure projects of mutual benefit to the civilian and military communities. Individual community infrastructure grants range from \$250,000 to \$20,000,000, with total estimated funding for 2021 at \$60,000,000. The first grants, totaling \$50,000,000, were awarded in August 2020.

To learn more, see:

- <https://www.defense.gov/News/Releases/Release/Article/2785120/dod-approves-60-million-in-grants-under-defense-community-infrastructure-pilot/>
- <https://www.grants.gov/web/grants/view-opportunity.html?oppId=333641>
- DoD Defense Community Infrastructure Program June 2, 2021 public webinar

Our committee's question was submitted during the webinar:

*Could a new, off-base solar farm with energy production to be shared between the host town and military installation be eligible as a proposal?*

DCIP officials' answer:

*Yes, proposers are specifically encouraged to highlight how / whether the project proposed supports broader efforts towards minimizing potential interruptions to the mission, including energy resiliency and other efforts to better sustain the local mission. However, the title for improvements funded with Defense Community Infrastructure Program funding will vest with the grantee, which must be one entity only, (Question 29).*

### Hanscom Air Force Base Community Interest in Energy Resilience Projects

Eleven potential solar PV project sites near the airfield that are under consideration by HAFB are described here:

MA Department of Energy Resources/MassDevelopment. (2014, Dec. 17). Clean Energy Assessment and Strategic plan for Massachusetts military installations. [See Figure 3-3: Solar PV sites studied at Hanscom, p. 21; and Tables 3-8, 3-9,3-10: pp. 22-23.] <https://www.mass.gov/doc/military-bases-strategic-energy-plan/download>

Two of the eleven sites – the original NWIRP parcel and a parcel of land west of the Navy Hangar – are on the North Airfield. During a preliminary evaluation,

*Hanscom AFB conducted an analysis using FAA-approved Solar Glare Hazard Analysis Tool (SGHAT) to identify any potential solar glare hazards from the PV system to aircraft or the air traffic control tower at Hanscom Field. Hanscom AFB completed an analysis of the 11 proposed solar PV sites using the SGHAT and determined that all sites will comply with FAA*

**standards.** Hanscom AFB also completed and submitted FAA Form 7460-1 Notice of Proposed Construction or Alteration to FAA for approval, (2015 Environmental Assessment of HAFB proposed solar photovoltaic system installation).

The HAFB Public Affairs Office and the Civil Engineering Division noted (November 2021):

*The FAA will not approve the Form 7460-1 until there are more details regarding the equipment, which necessitates holding approval in abeyance until we have a proposal.*

In answer to a query about why the solar PV projects have been on hold, the Public Affairs Office and Civil Engineering Division explained (November 2021),

*Solar PV initiatives have been largely awaiting scoping determinations for the Energy-as-a Service (EaaS) pilot program. If EaaS does not use some of the proposed solar PV sites, Hanscom may pursue separate solar PV projects at some or all of the unused sites.*

Note: Hanscom Air Force Base is one of two Air Force Bases that have been selected as pilot sites for the EaaS program.

*With EaaS, the Air Force will leverage the expertise of those whose business is built around energy, allowing us the ability to define when and where we need power to carry out our mission," said Deputy Assistant Secretary of the Air Force for Environment, Safety and Infrastructure Mark A. Correll in a Request for Information article earlier this month. "Turning to industry to generate world-class thinking around this new approach to installation energy will help ensure the readiness and resilience of our bases, (66th Air Base Group Public Affairs; 2019, May 31; paragraph 8)*  
<https://www.hanscom.af.mil/News/Article-Display/Article/1862907/hanscom-selected-as-pilot-site-for-energy-as-a-service-concept/>

To learn more about HAFB interest in solar and microgrid projects, see:

Hanscom Air Force Base. (2015, September 23). Press release: Public comments on Hanscom solar project invited.

<https://www.hanscom.af.mil/News/Article-Display/Article/846916/public-comments-on-hanscom-solar-project-invited/>

Massachusetts Clean Energy Center. 2018, Feb. 21. Press release for Community Microgrids Program: Baker-Polito administration awards over \$1 million in funding for energy projects.

<https://www.masscec.com/about-masscec/news/baker-polito-administration-awards-over-1-million-funding-energy-projects>

Silverstein, K. (2019, May 6). Air Force issues RFI for energy-as-a-service at Massachusetts base. *Microgrid Knowledge*.

<https://microgridknowledge.com>

**EXHIBIT K: BEDFORD NWIRP HARTWELL'S HILL SUPERFUND SITES 1-4**

**GENERAL CONTAMINATION AND REMEDIATION HISTORY**

**Bedford NWIRP Northern Tract Superfund Sites 1-4 Summary**

<b>Site Name</b>	<b>Site Description</b>	<b>Current Status</b>
Site 1- Old Incinerator Ash Disposal Area	Classified documents and small quantities of paint and film wastes were incinerated and disposed of in this area. Heavy metals from paint and film wastes were potential sources of contamination to soil and groundwater. The site is divided into two areas: a 5,000-square-foot area at the base of the Old Incinerator, which is mostly covered by pavement; and an 8,000-square-foot area to the east of the Old Incinerator, which is covered with fill and is partially revegetated.	No Further Action Committee Site 1 note of caution: two incinerator ash deposits with heavy metal contaminants seem to have been left in place rather than excavated and removed. The larger ash deposit is mixed with construction debris, household trash, and old furniture that were discarded on the northern slope of Hartwell's Hill from 1953 to 1973. At least once empty drums and cans were discovered on the slope and then removed offsite (Rogers et al., 1986, p. 8-1). Although the ash deposits are mapped, the presence of the actual hillside mixed debris dump site itself appears to have fallen off maps.
Site 2 – Components Laboratory Fuel Tank	20,000-gallon underground storage tank (UST) supplied fuel for boilers from 1953 to 1982. After leaking 200 gallons of No. 6 fuel oil to the surrounding soil, the UST was drained, cleaned, and abandoned in place. The UST was later removed along with 50 to 75 cubic yards of oil-contaminated soil.	No Further Action
Site 3 – Chlorinated Solvent Groundwater Plume, Northern Plume	Chlorinated volatile organic compounds (VOCs) were detected in groundwater at the northern portion of NWIRP Bedford near the Facility Storage Building and the Components Laboratory. There was one documented release of 1,1,1-trichloroethane in the loading dock area. The chlorinated VOC plume extends northwest toward an off-property wetland area.	Groundwater extraction and treatment, in-situ enhanced biodegradation, and LUCs are implemented; Semi-annual Groundwater Monitoring; Remedial Action in Process
Site 4 – Benzene, Toluene, Ethylbenzene, Xylene Plume	The benzene, toluene, ethylbenzene, and xylene (BTEX) plume is associated with releases from the former Transportation Building and its 7,600-gallon UST. Investigations identified the BTEX plume in groundwater that has migrated to the north of NWIRP Bedford, to an off-property wetland area. Most of the Site 4 plume is comingled with the Site 3 plume.	LUCs are implemented; Annual Groundwater Monitoring Committee Site 4 note of caution: contaminated soil may have been left in place under the Transportation Building footprint.

Information in this table was taken from the Navy's Environmental Restoration Program public website and was current as of 6/22/21.

For the Navy's full site descriptions, go directly to the website at:

[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/installation\\_map/navfacatlantic/midlant/nwirp\\_bedford/site\\_descriptions.html](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/installation_map/navfacatlantic/midlant/nwirp_bedford/site_descriptions.html)

Committee notes that this table does not yet include information on the emerging contaminant of concern 1,4-dioxane which is co-mingled with the Site 3 TCE groundwater contaminant plume.

EPA summary of how chlorinated solvent spills and general disposal practices at the NWIRP contributed to the present TCE-contaminated groundwater plume on the northern NWIRP tract:

*There has been one documented release of 1,1,1-trichloroethane in the loading dock area, but there have been no other documented releases identified to explain the source of the other chlorinated VOCs in the subsurface. Potential sources of releases, which contributed to the Site 3 plume include: the Components Laboratory, the Facility Storage Building print shop, a storm drain connected to the Facility Storage Building, the Antenna Range, the Transportation Building, the AMRAD building, the hazardous waste storage area, and the Old Incinerator. Trichloroethene (TCE) and 1,1,1-trichloroethane were both reportedly used in the Components Laboratory, and could have been released to the ground in this area. Waste liquids, including chlorinated solvents, from the Facility Storage Building print shop could have been disposed directly on the ground or to an upgradient septic system and then released to the groundwater.*

*The storm drain system could have provided a route of migration for chlorinated solvents from any of the buildings connected to this drainage system. Solvents could have been discharged directly to the ground at the Old Incinerator. Solvents also could have been released from the Components Laboratory through a drainage tile field located beneath the northeast corner of the building. Floor drains and, prior to 1980, the sink drains in the AMRAD building, were connected to a storm drain that runs beneath this building. Solvents used during painting could have been discharged to these lines and leaked into the groundwater or spilled directly onto the ground. The hazardous waste storage area is located 100 feet southeast of the AMRAD Building. This site formerly was the storage area for new solvents and was the location of a 250-gallon diesel spill.*

(Quote from EPA. Superfund site: Naval Weapons Industrial Reserve Plant, Bedford, MA. Cleanup activities webpage. Retrieved October 9, 2021.

<https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=0102032>)

## SITE 1 DETAILS

### Site 1 location: north and northwest edge of Hartwell's Hill



Credit: NAVFAC Environmental website: Naval Weapons Industrial Reserve Plant (NWIRP), Bedford.  
Site 1 – Old incinerator ash disposal area. [Retrieved 11/26/21]

[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/installation\\_map/navfac\\_atlantic/midlant/nwirp\\_bedford/site\\_descriptions/site01.html](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/installation_map/navfac_atlantic/midlant/nwirp_bedford/site_descriptions/site01.html)

[The committee notes: The larger (8000 square feet), more easterly contaminated Site 1 ash deposit is mixed with debris from an NWIRP-era disposal area described as in operation from 1953 to 1973. The hillside dump for mixed debris itself is not labeled as such on Navy maps.]

- *Grading for the Components Laboratory, parking areas, and access roads created a semicircular embankment in this area. Construction debris and incinerator ash were discarded over this embankment between 1953 and 1973. As this area was graded and fill materials were added, a plateau was created that was gradually extended to the north. Household trash, including old furniture, was placed in this disposal area by way of a road along the foot of the slope. Once, in the mid-1970s empty cans and drums were found on the open face of the disposal area. These cans and drums were found to be empty and were removed off-activity for disposal. There is no record to indicate that hazardous wastes or any wastes other than the incinerator ash were ever placed in this disposal area. (Rogers et al., 1986, p. 8-1).*

[Committee note: The last sentence of the above quote does not align with its second sentence about construction debris, household trash, and old furniture also being discarded on the hillside; however, the information in the last sentence is what was repeated in the 2000 Record of Decision for Site 1. It is possible this oversight may have led to the existence of the hillside dump area for construction debris, household trash and old furniture falling out of later records.]

- Although Site 1 is classified as “No Further Action”, apparently no removal or treatment action took place. A decision was made to leave the ash deposits in place in 2000, after they were judged not to be a risk to human health or the environment as long as they were left undisturbed (ENSR; 2000a, September; Record of Decision, Site 1- old incinerator ash disposal area, Naval Weapons Industrial Reserve Plant, Bedford, MA).
- At least some of the incinerator ash disposed of on the hillside was assumed to have moved downslope into wetlands to the north: “There are no demonstrable migration pathways for these heavy metal pollutants, other than down the short slope to the muck soils,” (Rogers, et al.; 1986; p. 8-3).]


**Site 1 Compounds of concern: heavy metals from incinerator ash**

Compound of Concern:	Amount estimated to be present in the ash deposits
<b>Heavy metals</b>	
Lead	570 lbs
Chromium	190 lbs
Silver	2 lbs
Zinc	380 lbs

Metals and amounts estimated to have contaminated the incinerator ash between 1953 and 1973 are taken from (Rogers et al., 1986; p. 8-1).

SITE 3: PROJECTED CLEANUP TIME


## SITE OVERVIEW & ONGOING CLEANUP ACTIONS



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### Site 3 – Chlorinated Solvent Groundwater Northern Plume

- Record of Decision (ROD) in 2010
- Groundwater Extraction & Treatment (GWETS) to Contain Plume
- In-situ Enhanced Bioremediation in Source Area
- Semi-Annual Monitored Natural Attenuation
- Land Use Controls
- Five-Year Reviews
- Cleanup by 2090



Credit: NAVFAC Presentation slide from the Bedford NWIRP Restoration Advisory Board (RAB) meeting of October 27, 2021.

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## SITE 3: LAND USE CONTROLS

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Special focus is warranted on Site 3 because it is still undergoing active remediation, its TCE and 1,4-dioxane groundwater contaminant plumes are quite extensive, as are its LUC boundaries.

Also of concern is the finding last year that both the TCE and 1,4-dioxane plume fronts may have become “unbounded” at several areas along the LUC perimeter.

### **Site 3 LUC purposes:**

(From [Resolution Consultants, 2017, December 1; Section 3.1, p. 6](#))

[Committee note: this report defines COC as contaminant of concern]

- *Prevent use of Site 3 groundwater as a drinking water supply until COC concentrations in groundwater achieve cleanup goals.*
- *Prevent occupancy of current and future Site 3 structures until COC concentrations allow for industrial use of the property.*
- *Prevent residential development of the Site 3 area until COC concentrations allow for unlimited use and unrestricted exposure.*
- *Maintain the integrity of the current or future remedial and monitoring systems, such as extraction and treatment wells, monitoring wells, and in-situ enhanced bioremediation.*

### **Site 3 prohibited activities:**

(From [Resolution Consultants, 2017, December 1; Section 3.3, p. 8](#))

*The following activities and uses are inconsistent with the Site 3 and SFTA LUC performance objectives and are prohibited.*

- *Installation of groundwater supply (extraction) wells at Site 3/SFTA, including public and private drinking water wells and irrigation wells.*
- *Any use of groundwater as potable (drinking water) at Site 3/SFTA.*
- *Occupancy of current and future structures at Site 3 prior to confirmation via CERCLA risk assessment that vapor intrusion from Site 3 poses no unacceptable risks.*
- *Redevelopment of property for residential use at Site 3/SFTA.*
- *Any use or activity that would interfere with the implementation, effectiveness, integrity, operation, or maintenance of the required remedy components at Site 3/SFTA, including but not limited to interference with the implementation of the long-term monitoring plan.*

**Site 3 allowed activities:**

(From [Resolution Consultants, 2017, December 1; Section 3.4, pp. 8-9](#))

*The following activities and uses are consistent with the Site 3 and SFTA LUC performance objectives and will be allowed in the Site 3 LUC Area and the SFTA LUC Area shown on Figure 2:*

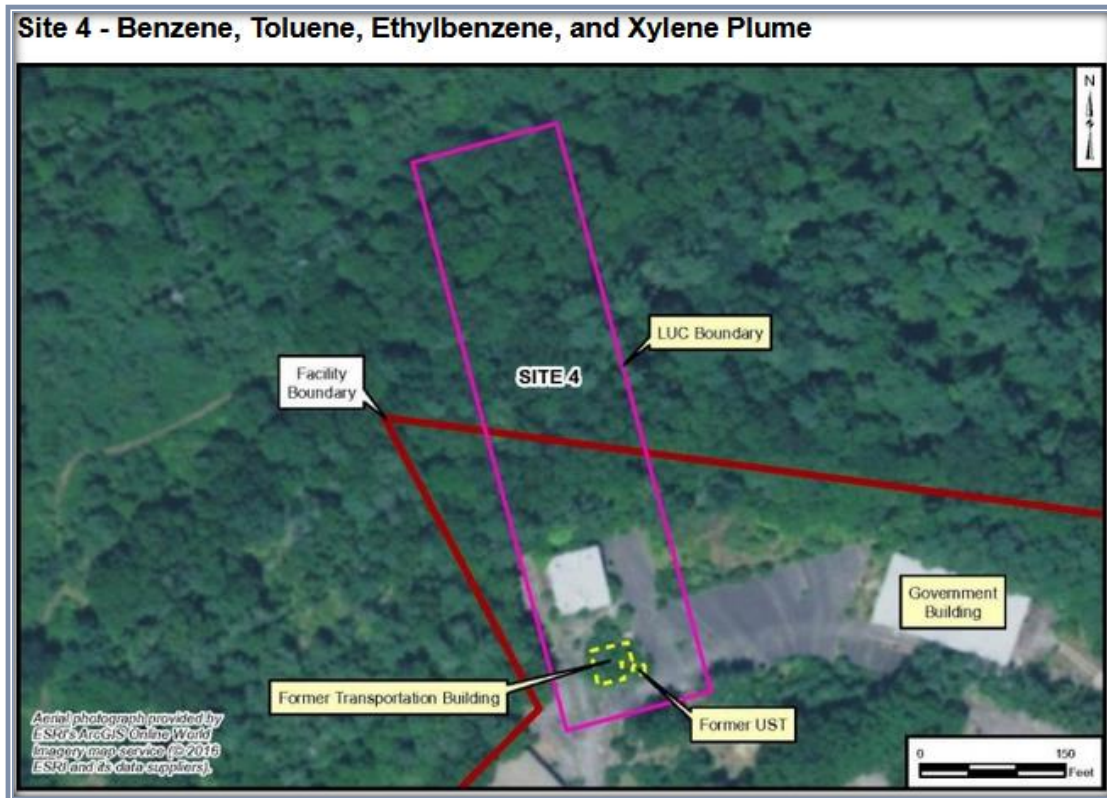
- *Remedy operation and maintenance (O&M) activities conducted in accordance with the approved Sampling and Analysis Plan (SAP) or other approved work plan to provide for the sampling, inspection, and installation of groundwater monitoring wells or other O&M actions.*
- *Environmental investigations and/or remedial actions conducted in accordance with an approved work plan.*
- *Vehicular and pedestrian traffic.*
- *Facility maintenance activities such as snow plowing, brush clearing, pest control, paving, and utility repair.*
- *Construction activities relating to the industrial use of the property, such as excavation and building repair, demolition, and construction.*
- *Equipment storage, including vehicle parking.*
- *Continuation of current private property use within the Site 3 LUC Area as undeveloped wetland and wooded land.*
- *Installation of any other systems to ensure that the remedial action remains effective and is protective of human health and the environment.*

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## SITE 4 DETAILS

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**Site 4 location: northern edge of Hartwell's Hill extending north northwest through privately owned wooded and wetland areas towards Elm Brook**



Credit: NAVFAC environmental website: Bedford NWIRP Site 4  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/installation\\_map/navfac\\_atlantic/midlant/nwirp\\_bedford/site\\_descriptions/site04.html](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/installation_map/navfac_atlantic/midlant/nwirp_bedford/site_descriptions/site04.html)

### **Site 4 information:**

The Navy noted in 2009 that of these Site 4 contaminants, “Benzene, toluene, ethylbenzene, and 2-methylnaphthalene are the primary contributors to the unacceptable risks associated with groundwater.” (Tetra Tech NUS; 2009; September 1; Part 2, p. 2019)

The leaking fuel tank and piping were removed in 1988-89 and contaminated soil was excavated to the edge of the Transportation Building. (Resolution Consultants; 2014, September 1; p. 4-6).

*The excavation did not extend beneath the building and it is likely that contaminated soil remained below the foundation, (Tetra Tech NUS; 2009, September 1; Part 2, p. 2-1).*

*In an effort to enhance treatment in the vicinity of the source area, the Transportation Building was demolished in November 2001...” (Resolution Consultants; 2014, September 1; p. 4-7).*

After demolition, the Navy used a combination of chemical and thermal remediation treatments on in situ contaminated soil between 2001 and 2003, which reduced groundwater levels of VOCs, but not to target levels. One well between the Antenna Range Building and the footprint of the Transportation Building had also been reported to yield a “strong petroleum odor and black material (assumed to be fuel) at a depth of 18-20 feet” (Tetra Tech NUS; 2009, September 1; Part 2, p. 2-17, paragraph 3).

By 2009, the Navy believed that residual contamination in soil near the source area and under the footprint of the demolished Transportation Building was “providing a continuing source of COCs to Site 4 groundwater,” (Tetra Tech NUS; 2009, September; Part 2, p. 2-17, paragraph 2) and also suggested, “Additional excavation of the source area will remove the residual COCs trapped in soil, thereby allowing natural attenuation processes in groundwater to achieve remediation goals within 5 to 10 years,” (Tetra Tech NUS; 2009, September 1; Part 2, p. 2-16, paragraph 2). The Navy proposed to restore the excavation site by, “Installation of stabilization layer to bottom of excavation, then backfill with stored clean soil and clean treated soil. Repaving or reseed surface area,” (Tetra Tech NUS ; 2009, September 1; Part 2, p. 2-34).

However, by 2011, the excavation remedy option was canceled because “soil concentrations of COCs were low, groundwater contamination had a decreasing trend, and groundwater RGs [remediation goals] were nearly achieved,” (Resolution Consultants; 2014, September 1; p. 4-1). The Navy has since then only monitored BTEX contaminant levels and is relying on natural attenuation to gradually reduce contaminant levels at Site 4 (Resolution Consultants; 2014, September 1; pp. 4-6 through 4-8). As of 2019, the Navy stopped monitoring chemical of concern concentrations in Site 4 groundwater except for benzene (Renova-Sovereign JV; 2020, October 5; p.1)

## EXHIBIT L: 2020-2021 POTENTIAL TCE VAPOR INTRUSION INTO OFF-SITE RESIDENTIAL AREA

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In 2020, an unexpectedly high TCE level was detected in a groundwater sample from a well in close proximity to the eastern property line of the NWIRP tract on Hartwell's Hill. That finding has triggered a more intensive investigation into possible safety hazards to residents of a nearby home from potential CVOC vapor intrusion; taking steps to more accurately determine the extent of the TCE and associated 1,4-dioxane groundwater contaminant plumes; and to replace older hybrid monitoring wells that the Navy believes may have inadvertently contributed to the spread of the contaminant plumes.

### **Tetra Tech Project Name: CVOC and 1,4-Dioxane Investigation - Soil Gas and Vapor Intrusion Investigation (Tetra Tech; 2021, April 1)**

#### **Project quotes about potential TCE vapor intrusion into a residential area:**

- *Discussions between the Navy and the regulators (MassDEP and USEPA) began in(sic) September 9, 2020 concerning a limited field investigation to evaluate the vapor intrusion pathway at a nearby residence due to the chlorinated groundwater plume (detection of TCE of 18PPB in MW-26S[well name] approximately 65 feet from the home) at former NWIRP Bedford, (Tetra Tech; 2021, April 1; SAP Worksheet #9, Comments/Decisions, p. 2 of 73).*
- *The regulators indicted (sic) that the soil gas work would provide good information but that the health of the residents in the nearby house required the vapor intrusion investigation to be completed first, (Tetra Tech; 2021, April 1; SAP Work sheet #9, Comments/Decisions, p. 2 of 73).*
- *The eastern boundary of the Former NWIRP Bedford property is comprised of a few residential homes and forest land. Potential receptors include residential homeowners exposed to contaminated groundwater and exposure to CVOCs through VI [vapor intrusion] into their homes, (Tetra Tech; 2021, April 1; Section 10.1.4; p. 7 of 73).*
- *Additional investigation is needed on the north, northeast, east, southeast and southern part of the site in order to refine the groundwater TCE and 1,4-dioxane plumes in these areas. Additional investigation is also needed in eastern area of the site to determine the potential for VI [vapor intrusion] concerns, (Tetra Tech; 2021, April 1; Section 10.1.2; , p. 7 of 73).*
- *Intrusion of VOC contaminants, including CVOCs, into buildings from VOC sources under the buildings (e.g., groundwater plumes and soil vapor) may also be a significant pathway because of the high migration potential of these chemicals in the gas phase, (Tetra Tech; 2021, April 1; Section 10.1.3; p. 7 of 73).*
- *The Site 3 contaminant source area contains high concentrations of dissolved-phase chlorinated volatile organic compounds (CVOCs) in groundwater. Based on the results of the 2010 Source Area Investigation, and 2020 additional post-Record of Decision (ROD) investigations, elevated CVOC concentrations have been detected throughout the compact, saturated, sandy, and silty till units in the Components Laboratory shipping and receiving area, generally from 30 to 50 feet below ground surface (bgs) and extending to 60 feet bgs in some areas and has expanded to the east, southeast, and south, (Tetra Tech; 2021, April 1; SAP Worksheet #10, p. 5 of 73).*

**Project quotes about unbounded TCE and 1,4-dioxane groundwater plumes:**

- *The extent of TCE and 1,4-dioxane contamination is unbounded at the east side of Site 3 where MW-26S is located, it appears that the TCE plume has expanded to the south, and the 1,4-dioxane plume is unbounded in the north, northeast, and east. Therefore, additional field work is required to address data gaps associated with the TCE and 1,4-dioxane plume, as agreed upon by the Bedford Project Team (Navy, EPA, Massachusetts Department of Environmental Protection [MassDEP], and Tetra Tech) ... (Tetra Tech; 2021, April 1; Section 11.1; p. 8 of 73).*
- *The 1,4-dioxane source is expected to be collocated with the CVOC source and extend beyond the CVOC plume due to its high mobility and origin (industrial use as stabilizer with 1,1,1-trichloroethane), (Tetra Tech; 2021, April 1; Section 10.1.1, p. 6 of 73).*
- *The 1,4-dioxane extent is at or beyond the land use control (LUC) boundary to the north and east for the shallow zone ... Concentrations of 1,4-dioxane in the shallow monitoring wells exceed the Massachusetts Department of Environmental Protection Office of Research and Standards (ORS) Guideline of 0.3 ug/L ... the plume for the bedrock zone extends to the northwest and southeast and beyond the LUC boundary to the east... (Tetra Tech; Section 10.1.2; p. 6 of 73).*
- *Groundwater containing dissolved contaminants may migrate laterally then discharge to surface water or adsorb onto sediments. Contaminants could then be transported via suspended solids, although due to the volatile nature of contaminants, they would be expected to dissipate quickly once they are exposed to open air, (Tetra Tech; 2021, April 1; Section 10.1.3; p. 7 of 73).*

**Public notice regarding construction activities for Navy's continuation of cleanup actions NWIRP, Bedford, MA :**

[Notice was published posted on the Bedford Town website on June 22, 2021 and published in *The Bedford Minuteman*, p. 3A, on July 1, 2021 ("Clean up action legal notice: Notice of construction activities ..."; 2021, July 1; p. 3A).]

Committee notes: The Navy made no mention of how this construction relates to the investigation of potential TCE vapor intrusion into a residential area, or of the unbounded TCE and 1,4-dioxane groundwater contaminant plumes.

**Part 1:**

**CLEAN UP ACTION  
LEGAL NOTICE  
NOTICE OF CONSTRUCTION  
ACTIVITIES FOR  
NAVY'S CONTINUATION OF  
CLEANUP ACTIONS AT FORMER  
NAVAL WEAPONS INDUSTRIAL  
RESERVE PLANT (NWIRP)  
BEDFORD, MA**

Construction activities specific to the ongoing environmental cleanup activities for the Navy's Environmental Restoration Program (ERP) at the former Naval Weapons Industrial Reserve Plant (NWIRP) Bedford, Massachusetts at Site 3 (Chlorinated Solvent Groundwater Plume) are scheduled to resume in late-June 2021 through September 2021. Construction activities include modification of the Groundwater Extraction and Treatment System; and the installation of new monitoring wells. Work hours will be limited from 7 a.m. to 5 p.m. Truck traffic is anticipated to occur during off-peak hours (9 a.m. to 3 p.m.) for equipment deliveries.

The Groundwater Extraction and Treatment System in place at the former NWIRP Bedford, to treat and contain the chlorinated solvent groundwater plume, will be shut down for five weeks to modify the treatment system to include treatment of 1,4-dioxane present in groundwater. A temporary treatment system on a tractor trailer will be delivered mid-to-late June to treat the groundwater during the temporary shut down.

The construction to modify the Groundwater Extraction and Treatment System to treat 1,4-dioxane present in groundwater will be conducted indoors. Construction will begin late June, and will span approximately five weeks until completion.

Additional monitoring wells are being installed to monitor the chlorinated solvent groundwater plume at Site 3. The monitoring wells will be installed in the central, southern, and eastern portions of the Navy property. Well installation will resume in early July 2021 and will extend into August/September 2021.

**Part 2:**

A Restoration Advisory Board (RAB) public meeting to update the community on the ongoing environmental cleanup activities for the ERP sites at the former NWIRP Bedford is expected to occur during Fall 2021. Notice of the RAB meeting will be advertised closer to the date in local newspapers (*The Bedford Citizen*, *Bedford Minuteman*, and *Lexington Minuteman*), posted on the Town of Bedford Events Calendar, and listed on the NWIRP Bedford ERP public website at <https://go.usa.gov/x6Ksr>. Current RAB members will be notified via email and will receive monthly field updates during these construction and field events. If anyone wishes to become a RAB member, so they can be contacted directly regarding future field events and RAB meetings, please send your contact info to the Navy's Public Affairs Officer (PAO) email or address shown below.

Reports on environmental actions are made available to the public through the Navy's Administrative Record (AR) file for the former NWIRP Bedford. The AR file contains data and documentation supporting past site decisions regarding the Navy's ERP cleanup of former NWIRP Bedford. The AR file is available electronically at <https://go.usa.gov/x6Ksr>, under "Community Outreach." For those with no internet and/or computer access, a copy of the AR file is kept in the "AR File CD Binder," updated yearly, and made available at the Bedford Public Library at 7 Mudge Way, Bedford, MA 01730.

For questions, please contact: Naval Facilities Engineering Systems Command, Mid-Atlantic Public Affairs  
9324 Virginia Avenue Norfolk, VA  
23511-3095

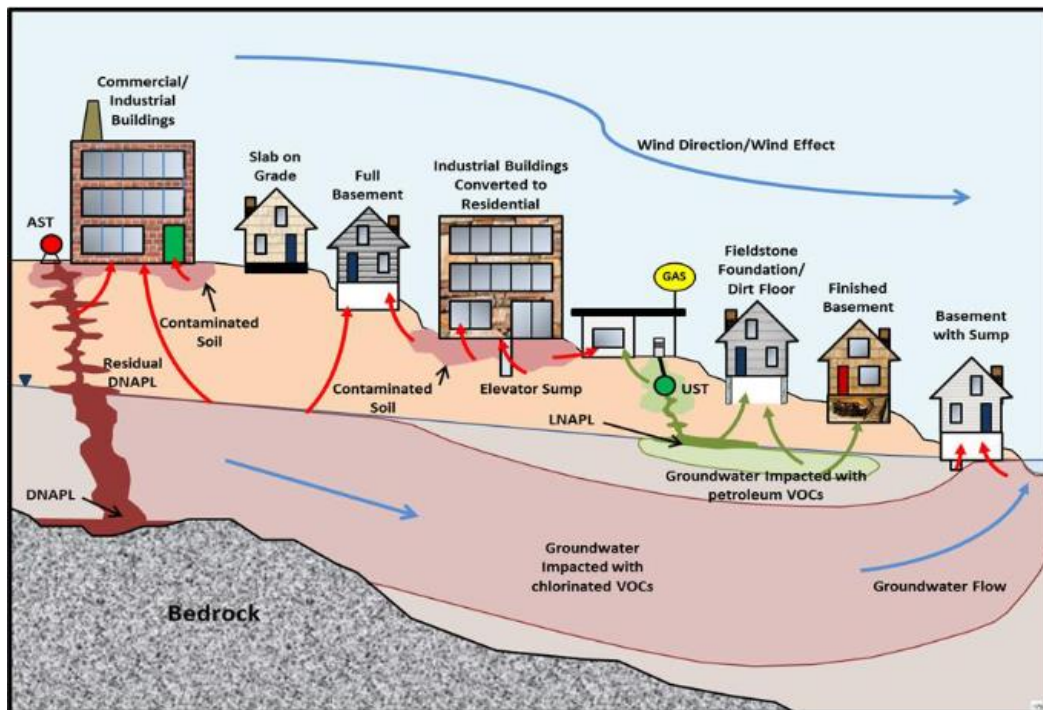
PAO Phone: (757) 341-1410/11 or  
email: [NAVFAC\\_ML\\_PAO@navy.mil](mailto:NAVFAC_ML_PAO@navy.mil)

AD#13968290  
Bedford Minuteman 7/1/21

## EXHIBIT M: HAZARDS/HEALTH RISKS OF VOC VAPOR INTRUSION

### HOW DOES VAPOR INTRUSION OCCUR?

Vapor intrusion occurs when vapor-forming chemicals migrate from a subsurface source into an overlying building -- similar to radon gas seeping into homes, (EPA; 2021, March 9).



Credit: MassDEP. (2016, October 14). Vapor intrusion guidance: Site assessment, mitigation and closure. Figure 2-1: Examples of the vapor intrusion pathway.

### WHAT ARE THE VAPOR INTRUSION CHEMICALS OF CONCERN?

The chemicals of greatest concern with respect to vapor intrusion are chlorinated solvents such as trichloroethylene (TCE), commonly used as a metal degreaser, and tetrachloroethylene (also known as perchloroethylene, or "perc"), another degreasing agent widely used in dry cleaning. Petroleum-derived compounds – for instance, what you would see with gasoline and motor oil contamination – are considered somewhat less of a threat than TCE and perc, says Eric Suuberg, co-director of the Superfund Research Program at Brown University. That's because these compounds [petroleum compounds] are much more prone to biodegradation in the soil, compared with more stable chlorinated solvents, (Cernansky, 2016; p. A142).

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## MITIGATIONS FOR VAPOR INTRUSION

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See:

- MassDEP. (2017, October 18). Fact sheet: TCE contamination, Nonantum area of Newton, MA.  
<https://www.newtonma.gov/home/showpublisheddocument/26365/6372599510804700>  
[A summary of the MassDEP investigation, risk mitigation, and communication to community members of the discovery of vapor intrusion and potential vapor intrusion into homes and businesses near a TCE groundwater plume source in the Nonantum area of Newton.]
- MassDEP. (2016, October 14). Vapor intrusion guidance: Site assessment, mitigation and closure: Chapter 3 – Mitigation of the Vapor Intrusion Pathways, pp. 45-71.  
<https://www.mass.gov/doc/wsc-16-435-vapor-intrusion-guidance-site-assessment-mitigation-and-closure/download>  
[Excellent and clear-cut summary of the vapor intrusion protection and prevention measures the state recommends, ranging from simple, easy to implement, inexpensive, and immediate solutions to more complex, expensive and long-term solutions.]
- Cernansky, R. (2016, August 1). It came from beneath: Detecting and mitigating vapor intrusion. *Environmental Health Perspectives*, Vol. 124, No. 8, pp. A141-A146.  
<https://ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.124-A141>  
*The good news is that once vapor intrusion is discovered – and acknowledged – mitigating the problem is often relatively straightforward, (p. A143).*

*Some experts and regulators support the approach of installing a mitigation system at any new construction site near areas with known groundwater contamination. That reduces potential risks and costs from day one, rather than having to assess and mitigate – or worry about overlooking – problems later, (p. A145).*

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## PREFERENTIAL PATHWAYS MAY ALLOW VAPOR INTRUSION BEYOND GROUNDWATER CONTAMINANT PLUME FRONTS

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See:

- Department of Defense. (2020, September). DoD Vapor Intrusion Handbook fact sheet update No. 010: Vapor intrusion preferential pathways.  
[https://www.denix.osd.mil/irp/vaporintrusion/unassigned/vipp-fact-sheet/508C\\_Final%20VI%20Preferential%20Pathway%20Fact%20Sheet%20September%202020.pdf](https://www.denix.osd.mil/irp/vaporintrusion/unassigned/vipp-fact-sheet/508C_Final%20VI%20Preferential%20Pathway%20Fact%20Sheet%20September%202020.pdf)

*For conventional VI investigations, the area for building testing is typically designated as the area above the footprint of subsurface impacts plus a buffer, commonly 100 feet, (United States Environmental Protection Agency [USEPA], 2015). ... At sites where contaminated groundwater enters the sewer, the potential VIPP risk area can include the sewer line downstream of the VOC plume in groundwater. This downstream area may extend beyond the 100 ft screening distance commonly used to identify buildings at risk for VI ... (Department of Defense; 2020, September; p. 4)*

- McHugh, T., Loll, P., and Eklund, B. (2017, December 15; online February 22). Recent advances in vapor intrusion site investigations. *Journal of Environmental Management*, Vol. 204, p. 785.  
<https://doi.org/10.1016/j.jenvman.2017.02.015>

*For example, dry wells or cisterns can act as vertical preferential pathways enhancing the transport of VOC vapors into a building from a groundwater source located below the building. In addition, sewers or utility tunnels can serve as preferential pathways for vertical and lateral migration of VOC vapors (Fig. 2). Sewers or utility tunnels are of greatest concern when they pass directly through contaminated groundwater or vadose zone non-aqueous phase liquid (NAPL) sources.*

- MassDEP. (2016, October 14). Vapor intrusion guidance: Site assessment, mitigation and closure.  
<https://www.mass.gov/doc/wsc-16-435-vapor-intrusion-guidance-site-assessment-mitigation-and-closure/download>

*Contamination may travel from source areas to receptors along preferential pathways such as utility corridors, which could include, but not be limited to, sewer and septic system piping, drains, water and gas lines, electrical conduits, and dry wells. Backfill material in utility corridors is often more porous and permeable than the adjacent native soil. Releases of VOCs in the vicinity of utilities may result in contamination migrating preferentially along these pathways and entering buildings and structures of concern, regardless of the depth to groundwater, (MassDEP; 2016, October 14; p. 8).*

- Cernansky, R. (2016, August 1). It came from beneath: Detecting and mitigating vapor intrusion. *Environmental Health Perspectives*, Vol. 124, No. 8, pp. A141-A146.

*“For example, we normally don’t see impacts more than about a hundred feet beyond the edge of a groundwater plume,” says Folkes. “But there’s been concern that what we call preferential pathways – which might be a sewer, or maybe a real high-permeability gravel layer or ... fractures in rock – could cause vapors to go further, faster, and in higher concentrations than our rules of thumb would say,” (Cernansky, 2016; p. A145, quoting Dave Folkes, senior principal of Geosyntec Consultants, Colorado).*

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## OPEN COMMUNICATION WITH THE COMMUNITY AND PUBLIC INVOLVEMENT

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See:

- MassDEP. (2016, October 14). Vapor intrusion guidance: Site assessment, mitigation and closure, p. 119.  
<https://www.mass.gov/doc/wsc-16-435-vapor-intrusion-guidance-site-assessment-mitigation-and-closure/download>  
*MassDEP’s experience confirms that providing information to the public in a timely and straight-forward manner is a key element of a successful project and building trust with the public. Delayed communication with the community may result in an erosion of trust. Information that is respectful of and understandable by non-technical audiences and anticipates likely questions can be effective in addressing concerns and fostering cooperation during the response action process.*
- Pohle, A. (2016, October 5). State points finger at Northrop Grumman for groundwater contamination in Newton. *The Boston Globe* webpage, last two paragraphs.  
<https://www.bostonglobe.com/metro/regionals/west/2016/10/05/state-likely-sources-groundwater-contamination-newton/RuafWkefc773A53qEY0kyM/story.html>  
*Terry Sauro , chairwoman of the Nonantum Neighborhood Association, said the department has been helpful and informative about the condition of the groundwater at every step of the way.*  
  
*“Our last meeting with them last May was very informative and didn’t cause panic to Nonantum residents once they were aware that different parts of Nonantum might have high levels of TCE in their area,” she said, [Note: “department” refers to MassDEP].*

## EXHIBIT N: INVENTORY OF HARTWELL'S HILL BUILDINGS AND STRUCTURES

### PHOTOS OF DETERIORATING HARTWELL'S HILL BUILDINGS & INFRASTRUCTURE

The committee notes that these photographs show that young trespassers can access the building interiors through broken windows (Photos 1, 2, 6) or places where boards have fallen off or been removed (Photo 7) and be exposed to danger within the unmaintained and deteriorating buildings, which the Navy has described as structurally unsound and containing high levels of mold. Any manholes with lids moved to one side (as seen in Photo 4) present a serious hazard to youth and adults as well – especially if they should explore Hartwell's Hill at night, or alone. We also observe that wells with missing covers (as seen in Photo 5) present a hazard to wildlife and pets that may enter the NWIRP hilltop property. **These buildings have been deemed too dangerous for Navy personnel to enter since 2006 (Navy RPM communication, November 2021).**

#### Photo 1: The Components Laboratory Building, 2019



Credit: Renova-Sovereign Joint Venture. (Submitted to the Naval Facilities Engineering Command Mid-Atlantic, February 3, 2020). Land use control annual inspection for 2019, Revision 1, NWIRP, Bedford, MA. Attachment C, Photo Log: Photo 4. Caption: "Date – 9/24/2019. Direction – South. Description – View of vandalism on the Components Lab."

**Photo 2: The NWIRP Components Laboratory, 2020**



Credit: Renova-Sovereign Joint Venture. (Submitted to the Naval Facilities Engineering Command Mid-Atlantic December 1, 2020). Land use control annual inspection for 2020, NWIRP, Bedford, MA. Attachment C, Photo Log: Photo #4. Caption: "Date - 8/28/2020. Direction - South. Description -View of vandalism on the Components Lab."

**Photo 3: The NWIRP Components Laboratory, 2018**



Photo taken October 29, 2018 during Five Year Review site inspection.

Credit: Tetra Tech. (September, 2019). Final Second Five Year Review: NWIRP, Bedford, MA. Submitted to the Naval Facilities Engineering Command Mid-Atlantic. Appendix D: Site Photographs, p. 196 of 215. Caption: "Site 3 Former Components Laboratory Building".

**Photo 4: Uncovered manhole near Components Laboratory Building, 2018**



Photo taken October 29, 2018 during Five Year Review site inspection.

Credit: Tetra Tech. (September, 2019). Final Second Five Year Review: NWIRP, Bedford, MA. Submitted to the Naval Facilities Engineering Command Mid-Atlantic. Appendix D: Site Photographs, p. 197 of 215. Caption: "Site 3 Former Components Laboratory Building" **Caption: "Lid moved off of manhole near the Former Components Laboratory Building due to vandalism".**

**Photo 5: One of the uncovered wells on Hartwell's Hill, 2018**



Photo taken October 29, 2018 during Five Year Review site inspection.

Credit: Tetra Tech. (September, 2019). Final Second Five Year Review: NWIRP, Bedford, MA. Submitted to the Naval Facilities Engineering Command Mid-Atlantic. Appendix D: Site Photographs, p. 197 of 215. Caption: "Site 3 Former Components Laboratory Building". **Some wells were missing covers near the Former Components Laboratory Building due to vandalism**.

**Photo 6: The Antenna Range Building, 2020**



Credit: Renova-Sovereign Joint Venture. (2020, December 1). Land use control annual inspection for 2020, NWIRP, Bedford MA. Attachment C, Photo Log: Photo #2. Caption: View of vandalism on the Antenna Range Building on August 28, 2020. Submitted to the Naval Facilities Engineering Command Mid-Atlantic.

[Committee note: Rogers, et al., 1986 (p. 5-11) stated that, "Other than the spent cobalt, this facility generates only paper and sanitary wastes." The authors explained that the building had a Cobalt-60 radiation source and that the radioactive cobalt waste was shipped to Hanford, WA for disposal.]

**Photo 7: The NWIRP Government Building, 2020**



Credit: Renova-Sovereign Joint Venture. (Submitted to the Naval Facilities Engineering Command Mid-Atlantic December 1, 2020). Land use control annual inspection for 2020, NWIRP, Bedford MA. Attachment C, Photo Log: Photo #3. Caption: "Date - 8/28/2020. Direction - Northeast. Description - View of vandalism on the Government Building".

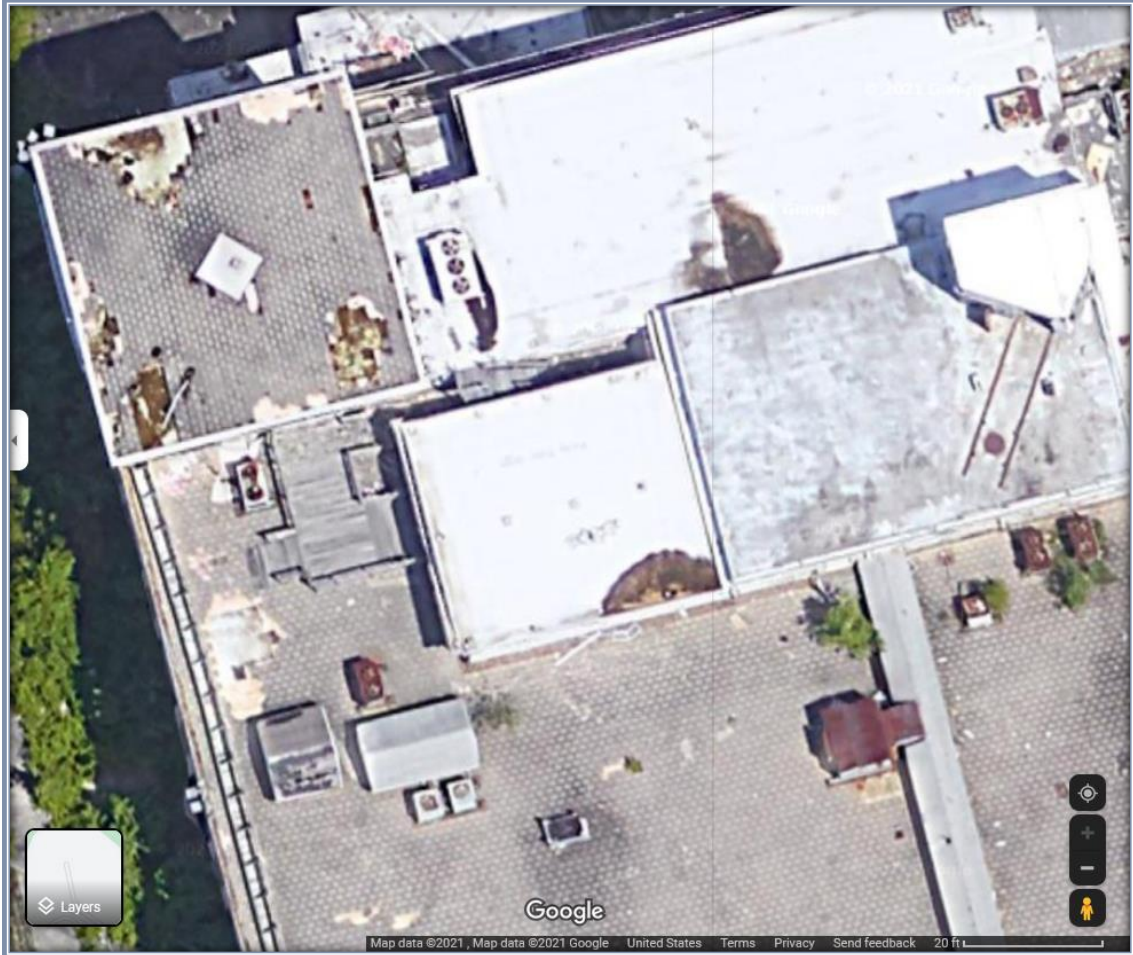
**Photo 8: Components Laboratory Building apparent rooftop damage**



Credit: Imagery ©2021 MassGIS, Commonwealth of Massachusetts EOE, Maxar Technologies, Map data ©2021 Google, United States.

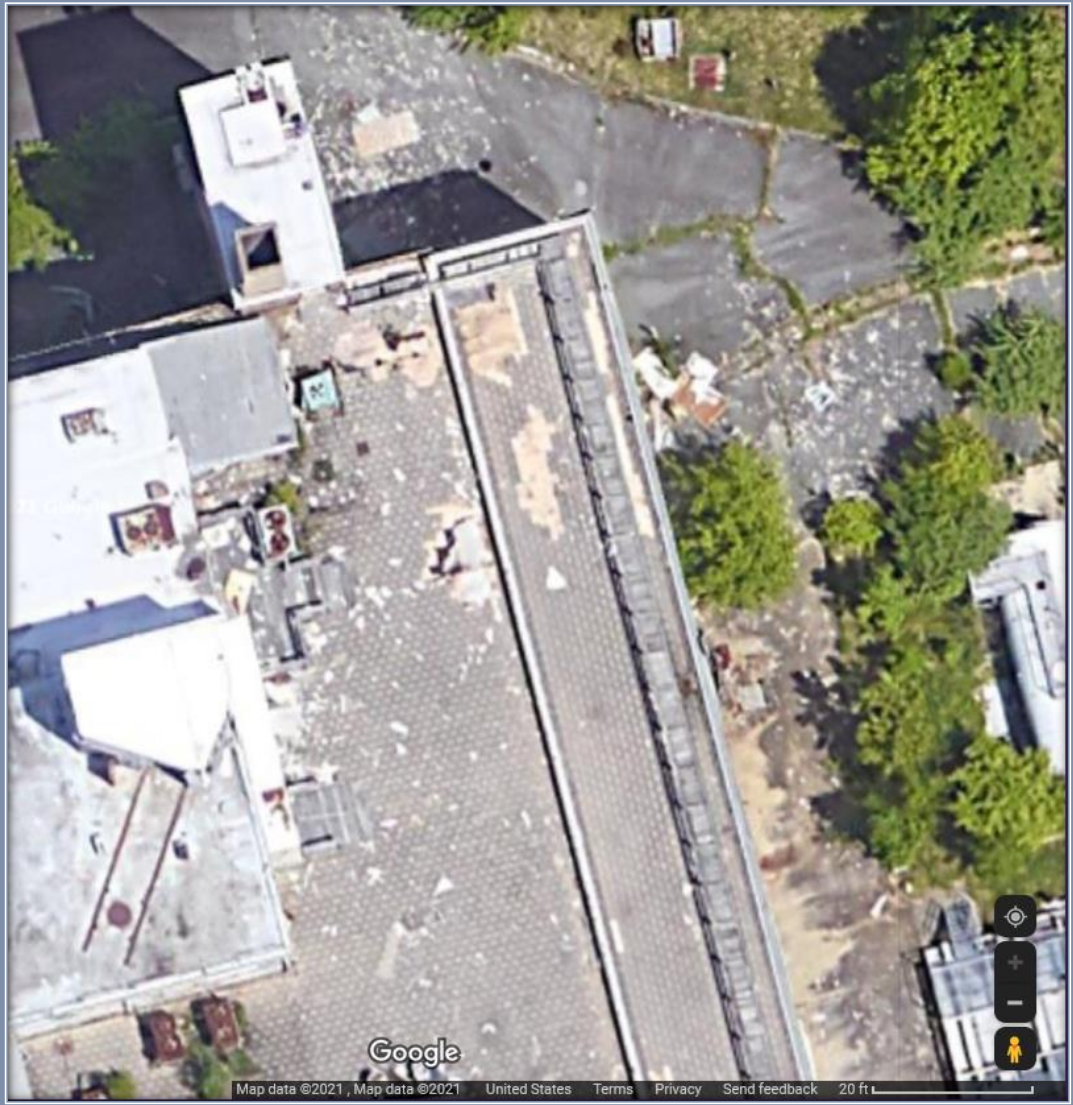
[Committee note: Because of its height (2 to 3+ stories, counting the penthouse tower), and signs of damage, the Components Laboratory rooftop may be particularly dangerous for youth to explore. The previous photos show that juveniles have been tagging the Components Lab penthouse and other rooftop structures with graffiti.]

**Photo 9: Close up of Components Laboratory Building rooftop damage at northwest penthouse tower corner**



Credit: Imagery ©2021 MassGIS, Commonwealth of Massachusetts EOE, Maxar Technologies, Map data ©2021 Google, United States.

**Photo 10: Close-up of Components Laboratory rooftop damage at northeast corner**



Credit: Imagery ©2021 MassGIS, Commonwealth of Massachusetts EOE, Maxar Technologies, Map data ©2021 Google, United States.

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## LIST OF EXISTING BUILDINGS AND STRUCTURES

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Building numbers are those assigned by the Navy in recent years ([Navy communication, November 2021](#)). All descriptions are based on the source cited next to the building or structure name unless otherwise noted.

**Building 1: Components Laboratory, 165 Hartwell Road** ([NAVFAC, Env.; 2020, March; Helping to Win the Cold War; p. 17](#))

Built 1952-1954

Function - engineering, labs, R&D

Description - 2 stories, basement and penthouse; 172,094 square feet floor area; constructed of reinforced concrete with brick and block exterior; foundation of piles covered with a concrete slab.

[Committee notes with concern that the penthouse structure of the Components Building is actually 3 stories tall and in the above photos, the penthouse and another roof structure along the north wall are covered with graffiti from trespassing juveniles who have risked accessing the deteriorating roof by entering the building or by climbing the exterior wall.]

**Building 2: Guardhouse 1** ([Navy communication, November 2021](#))

Attached to the west side of the Components Laboratory Building, near the covered stairs.

Built - about 1954

**Building 4: New Incinerator** ([Navy communication, November 2021](#))

Built - about 1974

**Building 8: Air Conditioning Room** to east of Components Lab ([Navy communication, November, 2021](#))

Built - 1962

**Building 12: Antenna Range Building** ([Rogers et al., 1986, p. 5-11](#))

Built - 1970

Function - control center for antenna range work

Waste generated - had a cobalt-60 radiation source; radioactive cobalt was shipped to Hanford, WA for disposal. "Other than the spent cobalt, this facility generates only paper and sanitary wastes."

**Building 13: Facility Storage Building, 163 Hartwell Road** ([Rogers et al., 1986, p. 5-12](#))

Built - 1969

Function of east end - vehicle and missile launcher maintenance

Function of center section - fitting and mounting equipment

Function of west end - warehouse for storage (of what unspecified) until 1981; converted to print shop in 1981, used inks, photo developer chemicals including solvents and cyanide solutions

**Building 14: Emergency Generator Building** ([Navy communication, November, 2021](#))

Built - about 1970

**Building 16: Ammunition/Ordnance Storage Bunker**

Location - "This building is an earth-covered bunker, located to the east of the Advanced Medium Range Air-to-Air Missile Development (AMRAD) Building," ([Rogers et al., 1986: Section 6.1.1 Ordnance Storage, page 6-1](#)). [Committee Note: the AMRAD Building has been demolished, but originally stood due east of the Components Laboratory Building.]

Location - NE of the former AMRAD Building ([Navy communication, November, 2021](#))

Built – 1958 (Sydla, M.C.; 2020, April 28; p. 1)

Also referred to as Building 16 in a recent Navy document (Sydla, M.C., Naval Sea Systems Command (04I); 2020, April 28; Letter to B. Simon, Massachusetts State Historic Preservation Officer re: Navy proposed amendment to 2018 MOA)]

Function – ordnance storage: “The only ordnance stored in this bunker are starter charges for test engines. Because experiments are underway on the long-term stability of these starting charges, several are being stored beyond their rated expiration date,” (Rogers et al., 1986, p. 6-1)

[Committee note: The Navy found in 2020 that it had mistakenly documented the demolition of the ammunition bunker, but that the bunker still exists.]

Recent Navy quotes about the ammunition bunker:

“WHEREAS, the Navy originally documented Building 16 as previously demolished and subsequent field verification determined the building is extant ...”

(Within the Navy’s proposed amendment to the 2018 MOA between the Navy and the Massachusetts State Historic Preservation Officer for the demolition of buildings at the northern tract of NWIRP, Bedford, MA, page 1. Attached to Navy cover letter cited below, dated 4/28/20)

“In addition, the Navy initially believed Building 16 (Ammunition Bunker) was demolished previously and as such, the building was not included in the original MOA [MHC RC# 191793, execution date 11/15/18]. Recently a field inspection determined the building was still there,”

(Cover letter dated April 28, 2020 from Michael C. Sydla, Naval Sea Systems Command (04I) to Brona Simon, Massachusetts State Historic Preservation Officer).

**Building 22: Hazardous Waste Storage Facility/Shed (Rogers et al., 1986, p. 6-6)**

Location – east of former AMRAD Building

[Note: This building’s location has been incorrectly depicted in most recent Navy publications (Navy RPM communication, November 2021).]

Built – 1981 (Rogers et al., 1986, p. 6-6)

Function – temporary storage for all chemical waste generated at the northern NWIRP tract (Rogers et al., 1986, p. 6-6)

**Building 23: Government Building, 159 Hartwell Road**

Built 1968, 10,512 square feet (Rogers et al., 1986, p. 5-12)

Function - originally packing/shipping; later - engineering, R&D, maintenance, model shop (NAVFAC, Env.; 2020, March; Helping to Win the Cold War, p. 19)

**Generator Pad Storage Area southeast of the AMRAD Building (Rogers et al., 1986; p. 6-3)**

Built - prior to 1981

Function – open air walled paved surface for generators; until 1981, also functioned as storage for drums of new solvents

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## LIST OF DEMOLISHED BUILDINGS AND STRUCTURES

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Building numbers are those assigned by the Navy in recent years ([Navy communication, November 2021](#)). All descriptions are based on the source cited next to the building or structure name unless otherwise noted.

[Committee note: Foundation slabs of some of these structures still exist. At least one ([the Transportation Building](#)) may cover contaminated soil ([Resolution Consultants; 2014, September 1; p. 4-6](#)).]

**Building 3?: Bulk Chemical Storage Shed** ([Rogers et al., 1986, p. 6-1](#)) Adjacent to the Components Lab  
Built - 1954?

Function - storage of inflammables, acids, gas cylinders

Demolition date - about 2008 ([Navy communication, November 2021](#))

**Building 9: AMRAD (Advanced Medium Range Air-to-Air Missile Development)/Compact Test Range Building** ([NAVFAC, Env.; 2020, March; Helping to Win the Cold War; p. 15](#))

Built - 1962

Function - R&D functional labs

Demolition date - about 2000 ([Navy communication, November 2021](#))

**Building 11: Hawk Van Building** ([NAVFAC, Env.; 2020, March; Helping to Win the Cold War; p. 15](#))

Built - 1955

Function - R&D prototype fabrication

Function - Furniture storage, welding, metal cleaning with acid, storage of acid waste in barrels for offsite disposal. Acid waste disposal practice in use since 1954. ([Rogers et al., 1986, p. 5-11](#))

Demolition date - about 2008 ([Navy communication, November 2021](#))

**Building 15?: Chemical Storage Building** ([Navy communication, November 2021](#))

Location -

Built - about 1958

Function - chemical storage

Demolition - about 2008

**Building 17: Scrap Metal Storage Shed** ([Rogers et al., 1986, p. 6-7](#)) 120' east of the northeast corner of the Components Lab.

Began to be used about 1965 ([Navy communication, November 2021](#))

Function - temporary storage of scrap metal in 55 gallon barrels

Demolition date - about 2008 ([Navy communication, November 2021](#))

**Building 18: Vitro Tower** ([Navy communication, November 2021](#))

Began to be used about 1958

Function -

Demolition - about 2003

**Building 19: Transportation Building** ([Resolution Consultants; 2014, September 1; p. 4-6](#))

Built - 1961

Function – Equipment storage, vehicle maintenance

Demolished – November 2001

**Building 20: Short-Range 90' Tower** ([NAVFAC, Env.; 2020, March; Helping to Win the Cold War; p. 15](#))

Built 1970

Function – antenna R&D

Demolition – about 2000 ([Navy communication, November 2021](#))

**Building 21: Intermediate-Range 50' Tower** ([NAVFAC, Env.; 2020, March; Helping to Win the Cold War; p. 15](#))

Built 1975

Function – antenna R&D

Demolition – about 2000 ([Navy communication, November 2021](#))

**Balloon Building/Pad?** ([Rogers et al., 1986, Figure 2-3](#)) [Note: Some sources label this as the Balloon Pad Building]

Built –

Function -

Demolished -

**Guardhouse 2** ([Rogers et al., 1986, Figure 2-3](#))

Location – northwest of the Components Laboratory in 1986

Built -

Demolition date -

**Old Barrel Storage Area** ([Rogers et al., 1986, p. 6-6](#)). Located 100 west of the Government Building

Built – prior to late 1960s

Function – from the late 1960s until 1981 this served as the collection point for hazardous waste of the NWIRP until Hazardous Waste Storage Shed was built. Barrels of northern tract waste oils and solvents were stored here

**Old Incinerator** ([Rogers et al.; 1986; pp. 2-4 to 2-6](#))

Built –1954

Function - Burn classified paper and film waste.

Operated from 1954-1973

Demolition date – about 1974 ([Navy communication, November 2021](#))

**Range House** ([Rogers et al., 1986, Figure 2-3](#))

Function -

Built -

Demolition date -

**Scrap Metal Storage Pile** ([Rogers et al., 1986, p. 6-7](#)) east of Scrap Metal Storage Shed

Function – temporary storage of aluminum, steel, copper, brass, lead

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NAVY INFORMATION RE: HARTWELL'S HILL BUILDINGS'  
DETERIORATING, HAZARDOUS CONDITION

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- *I am writing to notify your organization of a proposed Department of the Navy action to demolish historic buildings and structures that pose severe risks to human health and safety located at the northern tract of Naval Weapons Industrial Reserve Plant (NWIRP) Bedford, Massachusetts, [2018, June 8; Letter from Michael C. Sydla, Division Director, Naval Sea Systems Command (04I) to Bedford Historic Preservation Commission, p. 1].*
- *The Navy has no alternative use for these buildings. Trespassing juveniles and adults, however, have found a use, entering these buildings, despite various Navy security measures like signage, fencing, boarding up openings, and routine patrols. This ongoing trespass poses not only a security concern but continuing significant safety and health risks since these unmaintained buildings are structurally unsound and contain unacceptably high levels of mold, [2018, June 8; Michael C. Sydla, Division Director, Naval Sea Systems Command (04I), 2018, June 8, pp. 1,2]*
- *WHEREAS, Buildings 1, 2, 4, 8, 12, 13, 14, 16, 22, and 23 are no long considered mission-essential and have been vacant since 2000 with no foreseeable use, and are in a deteriorating condition ... (Navy proposed amendment to 2018 MOA between the Navy and Massachusetts State Historic Preservation Officer).*
- *There is very likely asbestos in the Components Laboratory Building (May 8, 2019 Navy RAB meeting discussion).*

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NAVY INFORMATION RE: THE SECURITY OF THE NWIRP NORTHERN TRACT:

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- *Recent damage to window boards was identified on the Antennae Range Building (Site 4), Components Laboratory and Government Building (both Site 3); however, there were no signs of human occupancy in any of the Site 3 or Site 4 buildings. NAVSEA is working to repair the recent damage. A security system, including exterior security cameras on the Pump House and Groundwater Treatment Plant, was installed in the fall of 2018 at the property to increase security at the site and 24/7 live video monitoring is anticipated to begin by the end of September 2020. Additionally, NAVSEA has requested that the Bedford Police Department increase their patrols at Site 3 and Site 4 to minimize trespassing, (Renova-Sovereign Joint Venture; 2020, December 1; p. 1). [Note: This is the write-up of the Annual LUC Inspection, which took place on August 28, 2020. The Navy RPM confirmed in November, 2021 that the 24/7 live video monitoring from those two cameras was activated as planned.]*
- *“Additionally, NAVFAC is in the process of securing an easement of land adjacent to Site 3 and Site 4 to further secure restrictions to the site,” (Renova-Sovereign Joint Venture; 2020, December 1; p. 2). [Note: The Navy communicated in November, 2021 that the easement was for utilities to its groundwater extraction and treatment system and for access to the NWIRP.]*
- *A 2020 report for the Navy shows an aerial map of the Site 4 BTEX contamination source area on top of Hartwell’s Hill with a fence marked, but the fence seems to be incomplete. (Renova-Sovereign Joint Venture; 2020, October 5; Figures 2 and 3). [Note however, that the Navy*

confirmed in November, 2021 that the entire northern NWIRP tract perimeter is fenced, but there is no fencing or signage around the entire perimeter of the LUC zone. The LUC zone extends across private land all the way to Elm Brook and contains a number of active and inactive groundwater monitoring wells)].

- *The chain link fence has been cut near the pump house and along the western side of the site in the undeveloped area that allowed access to the site. The Navy continually accesses and repairs damage to address trespasser activities including fixing damaged fencing and re-boarding up buildings to deter entry when the buildings have been broken into. In addition, demolition of several buildings at Site 3 is being planned to reduce the likelihood of trespassers accessing the site.* (Tetra Tech; 2019, September 1; p. 2-17).
- *Installation of Security Cameras: 100% Complete, 5 days Duration, Start Mon 6/4/18, Actual Start Mon 6/4/18, Finish Fri 6/8/18,* (Tetra Tech; 2020, Sept 1; Appendix C: Facility wide schedule, p. 2, Task #121). [Note: Tetra Tech is referring to the Water Treatment Plant Building and Pump House cameras, at the base of Hartwell's Hill. There are no hilltop cameras.]

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#### IS VOC VAPOR INTRUSION A RISK TO LOCAL JUVENILES TRESPASSING IN HARTWELL'S HILL BUILDINGS?

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Committee notes it may be hard to say. An older 2005 study says "probably not" (ATSDR, 2005, August 19; p. 33), but no testing has ever been carried out (Tetra Tech; 2019, September 1; Section 2.1.1, pp. 2-3). However, the buildings do sit above the highest concentrations of groundwater contaminants in the NWIRP northern tract and:

- the Components Laboratory Building has an extensive basement complex
- young trespassers apparently have been accessing the interior of at least three of the Hartwell's Hill buildings for years
- research has shown that that empty sink/shower/toilet traps can become preferential pathways for TCE vapor intrusion into buildings with deteriorating or damaged sewer lines passing through or near contaminated groundwater (See Exhibit M)
- there has been no running water in the vacant and unmaintained buildings on Hartwell's Hill since 2000 (confirmed by the Navy in November, 2021)

Two quotes about past assessments of vapor intrusion into Hartwell's Hill buildings:

- *A quantitative vapor intrusion (VI) study was not performed for any of the buildings located in proximity to contamination at Site 3; therefore, the land use control (LUC) Remedial Design (RD) for Site 3 prohibits building occupancy in the northern section of NWIRP Bedford,* (Tetra Tech; 2019, September 1; Section 2.1.1, pp. 2-3).
- In 2005, EPA's Agency for Toxic Substances and Disease Registry (ATSDR) discussed the possibility of VOC vapor intrusion into the Hartwell's Hills buildings from the contaminated groundwater (and in some cases soil) that lies beneath them. Although the ATSDR estimated that VOC vapors "probably did not seep into and accumulate to harmful levels inside NWIRP Bedford buildings," the agency admitted, "no indoor air sampling has been

conducted,” (ATSDR, 2005, August 19; p. 33). [Note: The ATSDR’s 2005 estimate of risk was based strictly on modeling, while research in the mid-2010s indicates that sampling is important to rule out vapor intrusion (McHugh, T. et al., 2017, pp. 783-794). The ATSDR study also did not address the possibility of preferential pathways for vapor migration (Exhibit M).]

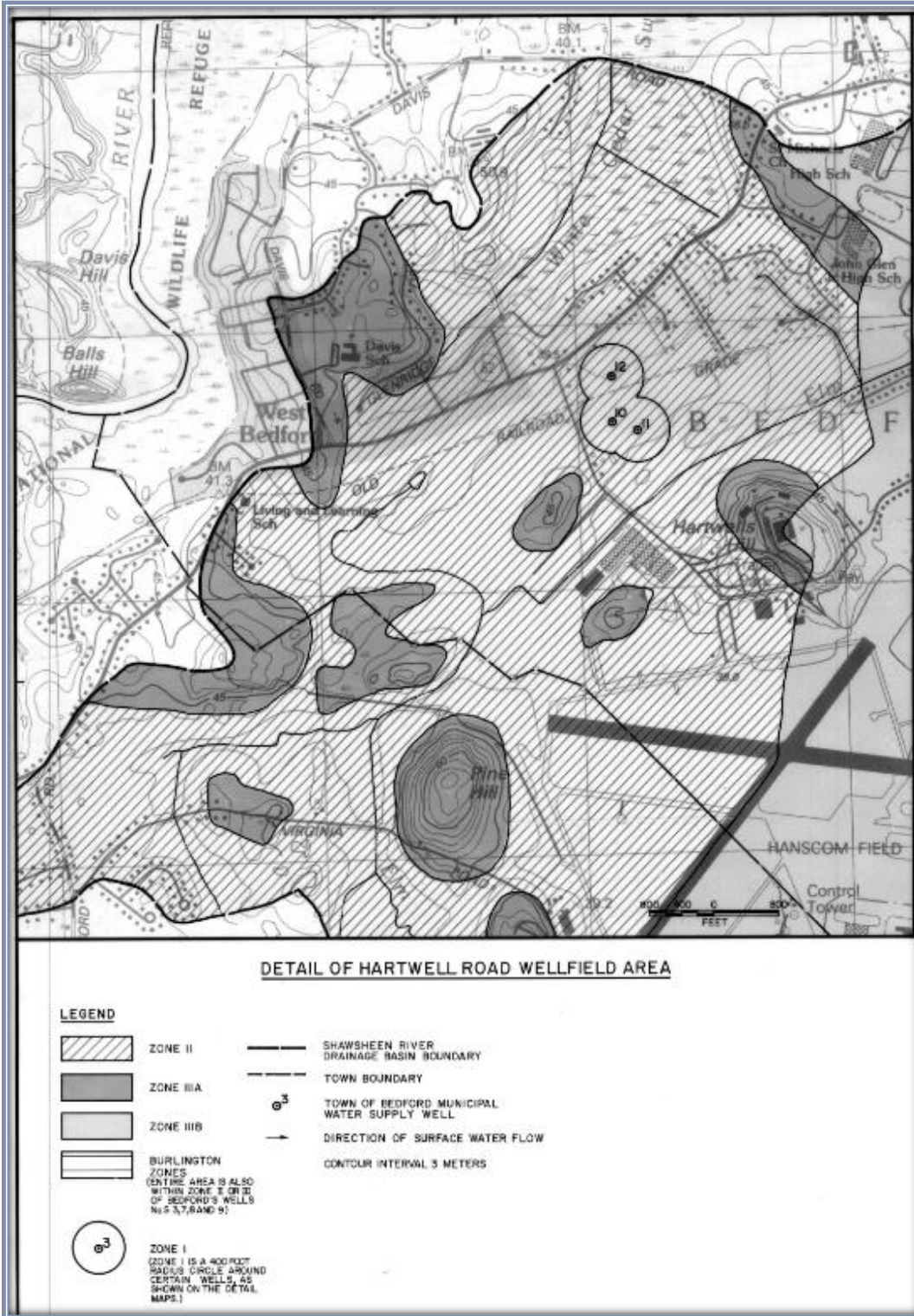
## EXHIBIT O: CONTAMINATION OF HARTWELL ROAD MUNICIPAL WELLFIELD

By 1977, Bedford was routinely supplementing its municipal wellfield water supply by buying water from Burlington, Concord and the Metropolitan District Commission (MDC). The director of groundwater services in a consulting firm hired by Bedford recommended the MDC as ultimately, “the sole answer to the town’s water supply problem.” But as an interim measure he suggested the town try to expand production of its existing wells.

To make matters much, much worse, in 1978, the industrial solvents trichloroethylene and dioxane were detected in the Town’s water supply (by pure chance, since routine testing for those compounds was not the standard at that time). The contaminants were traced to the Middlesex Turnpike municipal wellfield (and eventually to a number of nearby businesses). Those wells were closed, resulting in the loss of 80% of Bedford’s already inadequate municipal well water supply.

Several years later, the Town sought to augment its critically reduced water supply by drilling the ill-fated Hartwell Road municipal wellfield on land located about 500 yards northwest of Hartwell’s Hill in southwest Bedford. (See Wells 10,11, and 12 in map below)

**Hartwell Road municipal wellfield and Hartwell's Hill  
(Closed municipal wells #10, 11, and 12)**



Extract from Camp, Dresser & McKee, Inc. (1995, July) Town of Bedford, Massachusetts. Figure 1: Hydrogeologic zones for Bedford water supply wells. ([Archived on the Bedford Town website; DPW, 2013; https://www.bedfordma.gov/sites/g/files/vyhlf6866/f/file/file/hydrogeologic\\_zones\\_map\\_-\\_1995.pdf](https://www.bedfordma.gov/sites/g/files/vyhlf6866/f/file/file/hydrogeologic_zones_map_-_1995.pdf))

Three new production wells and a treatment plant went on line in March 1983. In October 1983, a tap water sample from Town Hall tested positive for several volatile organic compounds.

An initial investigation identified seven different VOCs in Bedford's tap water, with two of the principal contaminants being trichloroethylene and benzene. The contaminants were traced to the new Hartwell Road wellfield, and in April 1984, all three new wells were shut down. Bedford replaced the lost water source by purchasing additional MWRA water from Lexington on an emergency basis.

The Town hired GEI Consultants, Inc., who found evidence that the contaminants in the Hartwell Road municipal wellfield could be traced to groundwater contamination originating from the NWIRP facility on Hartwell's Hill and from the Raytheon Missile Systems Division (RMSD) site at 180 Hartwell Road.

GEI noted, "All of these compounds are present in ground water at the NWIRP Components Laboratory Area on Hartwell's Hill, and the RMSD, and at HAFB (Hanscom Air Force Base). These contaminants were not detected elsewhere in the study area except downgradient from these properties." However, GEI observed that it was very unlikely that the HAFB contaminants could have reached the municipal wellfield during the 1983-1984 well operation period, but would have eventually been drawn into the wellfield if pumping had continued.

#### **Litigation over Hartwell Road wellfield contamination**

The Town brought suit during the mid-80's against Raytheon, the Navy, the Air Force and local parties.

In August 1993, the *Boston Globe* reported, "Bedford has reached a \$4.7 million out-of-court settlement with Raytheon Corp. and the federal government, which were implicated in the contamination of the Hartwell Road wells. Raytheon and the Navy Department have not admitted tainting the wells, but have agreed to pay for their cleanup," ([Sullivan, M.; 1993, August 29; The Boston Globe, p. 296](#)).

According to the newspaper, "The cost to Bedford of joining the MWRA and tying into the Lexington pipe system is \$7.15 million, \$4.7 million of which will be offset by the settlement in the Hartwell Road wellfield-contamination suit," ([Sullivan, M.; 1993, August 29; The Boston Globe, p. 296](#)).

A 1991 study prepared for the Bedford DPW by consulting firm Camp, Dresser and McKee had projected that the actual cost to the Town of shutting down the Hartwell Road wellfield and treatment plant and purchasing replacement water from the MWRA going forward to 2025 would be \$9.2 million, almost double the awarded settlement.

EXHIBIT P: OTHER POTENTIAL OPPORTUNITIES RE:  
FEDERAL AND STATE-OWNED LAND NEAR THE AIRFIELD

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- The remaining Air Force-owned 6.23-acre parcel north of Hartwell Road (former HAFB Minuteman Village site) adjacent to the NWIRP Hartwell's Hill tract.

The land may have potential for open space purposes such as a park, recreation, or wildlife conservation use. The Air Force took care to preserve trees and landscaping during the removal of Minuteman Village, anticipating that the land would return to an attractive grassy meadow, overgrown pasture type habitat. The committee recommends approaching the Air Force to inquire about the land.

- The Air Force FamCamp recreational campground on South Road at the northeastern edge of the airfield.

The Air Force FamCamp land lease agreement with Massport is due to expire in 2027. Massport has indicated during public meetings in the last two years that it is uncertain if the lease will be renewed. The committee recommends the Town stay in touch with the Air Force about its plans for the FamCamp.

- Future aviation hangar complex developments planned along the south side of Hartwell Road.

Increasing aviation air and ground noise, leaded avgas emissions from prop planes, aircraft ramp and parking apron snow removal, construction vehicles, jet fuel and leaded avgas fuel tanker traffic all have the potential to negatively impact residential neighborhoods and recreational areas along Hartwell Road.

Towns impacted by Logan Airport and its development projects routinely proactively negotiate with Massport and its tenants for mitigations to help buffer, protect, and/or compensate their airfield neighborhoods from negative impacts of aviation-related maintenance/improvement/development projects. Bedford should consider doing the same going forward.

## EXHIBIT Q: THE TROUBLE WITH HARTWELL ROAD

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### Part 1: Big trucks on a little residential road

Many factors in the Hartwell Road area make heavy traffic and especially heavy truck traffic difficult and risky for drivers, for residents, for pedestrians, and for bicyclists – along *all* of Hartwell Road, not just one half or the other, including:

- The narrow, curving, hilly nature of the middle segment of Hartwell Road creates poor sightlines at several points (Note: the *entire* road is narrow from South Road to Concord Road – not just the section adjacent to Hartwell’s Hill)
- Hartwell Road’s shoulders are either narrow or non-existent
- Most of Hartwell Road West does not have a sidewalk so pedestrians are forced to walk in the street when the roadside is covered with snow, puddles, or overgrown vegetation
- **90 families along Hartwell Road West** (the Hartwell Farms neighborhood, Sorens Way, and Hartwell Road) only have egress through Hartwell Road
- **55 families along the Hartwell Road East** (Bagley Avenue, Athena Lane, Beacon Street, and Hartwell Road) only have egress through Hartwell Road
  - Note: An additional 51 families on Independence Road and Patriot Circle have closer egress through Hartwell Road, but also have the option of egress through Washington Street

Heavy truck traffic does not mix well or safely with the families, shoppers, sports enthusiasts, hikers, bikers, and gardeners using Hartwell Road to access popular local attractions such as:

- The Hartwell Town Forest (with hiking trails and a picnic area)
- The Community Gardens
- The Jordan Conservation area
- The Edge Sports Center ice rinks and playing fields
- Chip-In Farm and Farm Store, (fresh eggs, local produce and foods; friendly farm animals, classes, parties)
- The Minuteman Bikeway Extension
- The Elm Brook Conservation Area

The issues which occurred when large numbers of 2017 Massport runway repaving project trucks were diverted onto Hartwell Road West clearly demonstrate the trouble that heavy truck traffic on a small residential road bring, such as:

- truck noise and vibration, jake-braking, honking
- traffic congestion
- safety issues like:
  - being unable to leave a safe margin to pass by cyclists, pedestrians, or oncoming traffic
  - being unable to turn into or out of the Hartwell Road at the Concord Road intersection without blocking both sides of both roads and endangering other motorists, as well as bicyclists and pedestrians

Other chronic safety issues already existing on Hartwell Road West, which are worsened by heavy truck traffic include:

- 18-wheeler delivery trucks swinging wide into the oncoming traffic lane in order to turn into or out of the Werfen/Instrumentation Lab parking lot entrance
- Again, the lack of sidewalks along most of Hartwell Road West at times forcing pedestrians to share the road with large trucks.

## **Part 2: Confusion over who owns and maintains Hartwell Road**

Hartwell Road has more than one owner. The Town owns some parts, the Air Force owns the road frontage along the NWIRP northern and southern tracts, some homeowners used to (or perhaps still do) own parts of Hartwell Road, and even Massport has been reported to own a piece of Hartwell Road ([MacPhail, 2012, \*The Bedford Citizen\*](#)). The Town may own a little more of Hartwell Road now than when that *Bedford Citizen* article was written, but multiple owners complicate basic matters like road repair and building sidewalks. The Navy has indicated that the segment of Hartwell Road owned by the Air Force will be donated to Bedford in the near future and that's a good thing.

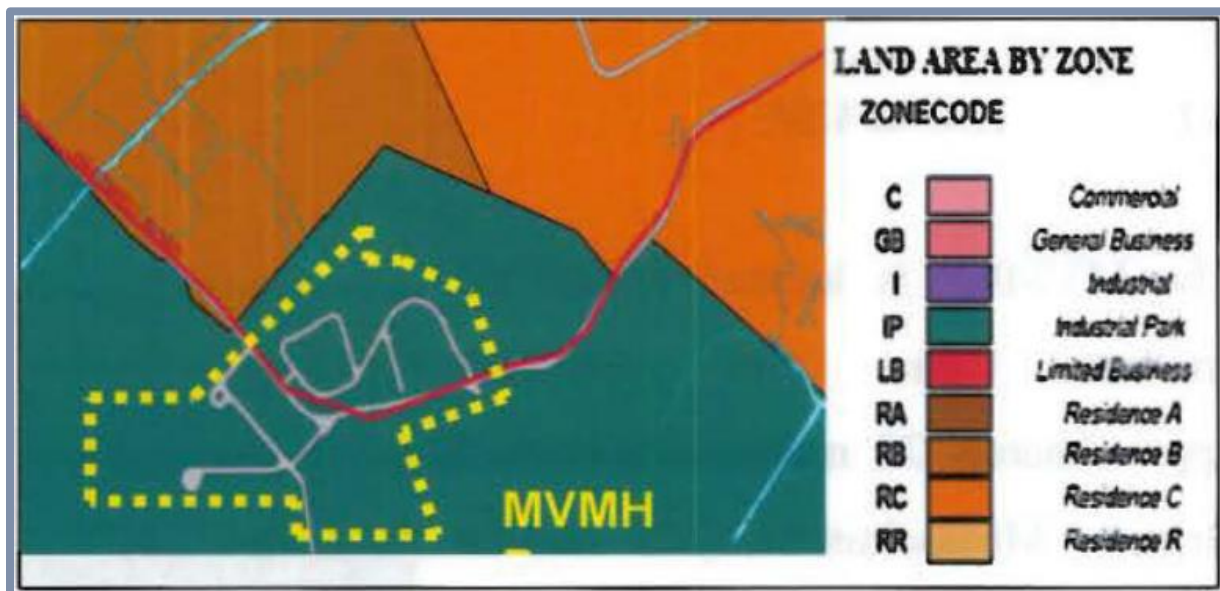
## EXHIBIT R: HAFB MINUTEMAN VILLAGE MOBILE HOME PARK (1961-2009)

HAFB Minuteman Village was a 44-acre mobile home park with housing space for 98 families. The Village, which extended across both sides of Hartwell Road, with several acres directly abutting Hartwell's Hill, was created by the Air Force in 1961 to provide affordable housing for HAFB airmen and their families. 6.23 acres of the Village acreage was (and still is) owned by the Air Force, while 37.5 acres was leased from Massport (Metcalf and Eddy/AECOM, 2009, p. 1).

The Air Force 2009 final environmental assessment notes, "Despite its residential nature, the MVMHP is situated within a portion of Bedford zoned for Industrial Parks. The nearest residentially zoned areas include the Residence B district (30,000 square foot minimum lot size) bordering to the north and the Residence C district (25,000 square foot minimum lot size) bordering to the northeast (EOEA, 2001)." (Metcalf and Eddy/AECOM, 2009, p. 8)

The 2009 report further emphasizes that the Minuteman Village land is "an area that has been residential for nearly 50 years." (Metcalf and Eddy/AECOM, 2009, p. 20)

"The developed residential portions of the MVMHP have been maintained as a lawn and/or landscaped area for almost 50 years. Vegetation within the parcel consists of short, routinely mown lawns, interspersed with occasional common landscape deciduous and evergreen tree/shrub species on the individual lots. A row of deciduous and evergreen trees lines the perimeter of the developed regions, and functions as a buffer to the more industrial surrounding land uses." (quote from Metcalf and Eddy/AECOM, 2009, p. 16)



Minuteman Village zoning map from "Decommissioning of the Minuteman Village Mobile Home Park and Restoration of the Site": Final Environmental Assessment prepared by Metcalf & Eddy/AECOM for Hanscom AFB, 29 April, 2009. (Metcalf and Eddy/AECOM, 2009, p. 8)

## EXHIBIT S: SURROUNDINGS OF THE NWIRP

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The northern Hartwell's Hill NWIRP tract is largely zoned Industrial A, but about a third of the northern third of the tract is zoned residential (part is Residence B, and part is Residence C, Maps 5A, 5B).

The surroundings of the northern NWIRP tract can be seen in Maps 1, 4 and 5A and include:

- privately-owned woods and wetlands extending to Elm Brook to the northwest and north
  - NWIRP land here is abutted by 193 Hartwell Road (mostly zoned Residence B, with some Residence C) and 155 Bagley Avenue (mostly zoned Residence C with some Residence C )
- homes and woods to the northeast and east
  - NWIRP land here is abutted by 155/157 Bagley Avenue and 153 Hartwell Road (both zoned Residence C), with 151 Bagley Avenue (zoned Residence C ) in very close proximity
- Hartwell Road to the south and southeast
  - Note that the section of Hartwell Road fronting the northern and southern NWIRP tracts is still owned by the federal government
- the now privately-owned 16-acre southern tract of the original NWIRP property, which is directly across Hartwell Road to the southeast and south
  - this tract is aka as the Navy Hangar parcel or the Southern Flight Test Area (SFTA)
  - its street address is 154 Hartwell Road and it is zoned Industrial A
- Massport-owned and operated Hanscom airfield farther to the southeast and south and southwest of the northern NWIRP tract.
  - Massport property does not directly abut the northern NWIRP tract except at 189 Hartwell Road, which is leased to The Edge Sports Center for athletic playing fields, and at one point at the very northeast tip of 154 Hartwell Road
  - The airfield is zoned Industrial A.
- 2 large athletic playing fields built, operated and maintained by The Edge Sports Center to the west and southwest on land leased from Massport
- the privately-owned land leased by The Edge Sports Center for its main building, north of the playing fields, does not directly abut the northern NWIRP tract, but it is in very close proximity - about 200 feet to the west of NWIRP land
  - 191 Hartwell Road is zoned Residence B

### Important notes on the surrounding area:

- Massport has included most or all of the acreage of the former HAFB Minuteman Village mobile home park of Hartwell Road in its August 31 RFP to expand aviation facilities into the North Airfield
- The 44-acre former Minuteman Village residential site runs along both sides of Hartwell Road and continues past Werfen/Instrumentation Laboratory along the airfield perimeter.

- Some of the acreage of the former HAFB Minuteman Village mobile home park site may abut the SFTA parcel. The committee is attempting to clarify the exact boundary lines of the Minuteman Village in that area.
- The Town has disagreed with Massport in the past about regulatory control of zoning and development for nearby land abutting the northern NWIRP tract. In 2012 Massport leased 7 acres of former Minuteman Village land at 189 Hartwell Road zoned industrial to The Edge Sports Center to be used as recreational playing fields ([The Edge Sports Center press release; 2012](#)).

*Initially, Massport claimed that the lease of the land to The Edge would provide beneficial income to the agency, and that, since it provides ‘an essential government function,’ Massport would hold the dominant claim. The Town, on the other hand, supported the concept of expansion but reasoned that The Edge’s activities on the land would not be in keeping with the purpose of the airfield, and that therefore the project would be subject to town zoning and development bylaws.*

*Ultimately, a legal agreement to this effect between Massport and the Town was reached and announced at the July 2<sup>nd</sup> Selectmen’s meeting. **The agreement further stipulated that this one-time waiver of the town’s jurisdiction rights did not constitute a precedent for potential future property disputes, with either Massport or with any other entity,** (MacPhail, K.S; 2012).*

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[Note:

- Amendment 5 adds “0.85 acres of AF leased land at L G Hanscom Field” to be made available to the Navy for use as an additional parking area.”
- The amendment is accompanied by a notice dated September 22, 1967 (File 10B-H HAB) which states “The area presently outgranted consists of 32.00 acres.” The bottom of the notice is labeled “Robert S. Cruikshank, Major, USAF, Director/Base Civil Engineering Division”.
- This document was shared with our committee courtesy of the HAFB Civil Engineering Division and Public Affairs Office, December 9, 2019.]

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[Note:

- Amendment 4 includes “approximately 5 additional acres of land” for Navy use.”
- This document was shared with our committee courtesy of the HAFB Civil Engineering Division and Public Affairs Office, December 9, 2019.]

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[Note:

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- This document was shared with our committee courtesy of the HAFB Civil Engineering Division and Public Affairs Office, December 9, 2019.]

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[Note:

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*The Bedford Citizen.*

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[Educational presentation to the ad hoc Hartwell Road Committee re: special issues for solar installations near airfields and on land undergoing environmental remediation.

More details on Mr. Jackson’s January 2020 solar energy presentation to the committee and the follow-up Q&A session can be seen here:

[https://www.bedfordma.gov/sites/g/files/vyhlf6866/f/minutes/approved\\_minutes\\_for\\_jan\\_23\\_2020\\_ahhrc\\_meeting.pdf](https://www.bedfordma.gov/sites/g/files/vyhlf6866/f/minutes/approved_minutes_for_jan_23_2020_ahhrc_meeting.pdf) ]

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The references within each topic heading are in alphabetical order, except for certain historic topics, which have references ordered chronologically.

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## DOD GRANTS FOR CIVILIAN/MILITARY SHARED OFF-INSTALLATION INFRASTRUCTURE IMPROVEMENT PROJECTS

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- Department of Defense. (2020) Office of Local Defense Community Cooperation fiscal year 2020 DCIP grant awardees.  
<https://oldcc.gov/defense-community-infrastructure-program-dcip#block2>
- Department of Defense. (2021, May 18). Local Defense Community Cooperation announcement: Final federal funding opportunity for Defense Community Infrastructure Program.  
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Department of Defense, Defense Community Infrastructure Pilot Program federal funding opportunity notice FY21 questions and answers – part I  
[https://oldcc.gov/sites/default/files/DCIP/2021-07-02%20DCIP%20FY21%20FFO%20QAs%20-%20Part%201%20\(006.1\)%20FINAL.pdf](https://oldcc.gov/sites/default/files/DCIP/2021-07-02%20DCIP%20FY21%20FFO%20QAs%20-%20Part%201%20(006.1)%20FINAL.pdf)

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## HANSCOM AIR FORCE BASE COMMUNITY ENERGY RESILIENCE PROJECTS

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<https://www.masscec.com/about-masscec/news/baker-polito-administration-awards-over-1-million-funding-energy-projects>
- Silverstein, K. (2019, May 6). Air Force issues RFI for energy-as-a-service at Massachusetts base. *Microgrid Knowledge*.  
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## DIVESTITURE

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### GSA DOCUMENTS ABOUT DIVESTITURE

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- GSA webpage. Finding federal property.  
<https://www.gsa.gov/real-estate/real-estate-services/real-property-utilization-disposal/finding-federal-property>
- GSA webpage. Public benefit conveyance questions.  
<https://disposal.gsa.gov/s/faq>
- GSA webpage. Real property utilization and disposal: resources for state, local and public body customers.  
<https://www.gsa.gov/real-estate/real-estate-services/real-property-utilization-disposal>
- “GSA Chart for Public Conveyance Authorities and General Information.”  
<https://disposal.gsa.gov/s/stateandlocal> (See *Federal Property for Public Use*)
- GSA webpage: Your Guide to Acquiring Federal Real Estate for Public Uses, p. 5.  
<https://disposal.gsa.gov/resource/1530028366000/AcquiringFederalRealEstateForPublicUses>

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## BEDFORD NWIRP DIVESTITURE HISTORY

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Arranged by chronology:

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*The Department of the Navy intends on transferring the Naval Weapons Industrial Reserve Plant (NWIRP), located on Hartwell Road in Bedford, Massachusetts, to a public and/or private entity. This notice is to provide the public an opportunity to submit written comments on the suitability of the property for transfer.*
- Dubé, D. (2003, November 6). Business tenant sought to keep base open. *The Boston Globe: Globe NorthWest*, pp. NW1, NW 5 (pp. 225, 229).  
*My understanding is the Navy has been pretty aggressively trying to get out of the land ownership business," Macdonald said. "There's no point in owning land if it's not its military function. They are not going to be launching any major sea battles from there, (p. NW 5).*  
[Alan MacDonald was the MassDevelopment senior vice president of legislative and military affairs in 2003, and was speaking about the closed NWIRP facility.]
- Massport Hanscom Field projects and third party development report (2018, April).  
Presented to the Hanscom Field Advisory Commission (HFAC), p. 2. [Massport Hanscom Field archives]
- Laferriere, J. (2018, May 3). HFAC and HATS: April meeting updates. *The Bedford Citizen*, paragraph 11.
- Oleksinski, B. (2018, July 27). Planning Board continues Navy hangar hearing to Monday, June 30 at 6:30pm. *The Bedford Citizen*.  
<https://www.thebedfordcitizen.org/2018/07/planning-board-continues-navy-hangar-hearing-to-monday-june-30-at-630-pm/>
- GSA. (2018, October 1). Sale of government real property: Former Navy aviation hangar, Southern Flight Test Area, 154 Hartwell Road, Bedford, Massachusetts.  
<https://realestatesales.gov/ATTACHMENT/REGNB/BOSTN118005001/SFTAIFBRevisedOctober1.2018.pdf>
- Turner, J.M. (2019, February 1). GSA auction closed on February 1 with no last-minute bid. *The Bedford Citizen*.  
<https://www.thebedfordcitizen.org/2019/02/gsa-auction-closed-on-february-1-with-no-last-minute-bid/>
- Staking Bedford's Claim for a Seat at the Table in Future Navy Land Divestiture Discussions. (2019, February 9). *The Bedford Citizen*.  
<https://www.thebedfordcitizen.org/2019/02/staking-bedfords-claim-for-a-seat-at-the-table-in-future-navy-land-divestiture-discussions/>
- GSA announces that Bedford hangar sale has been completed. (2019, June 3). *The Bedford Citizen*.  
<https://www.thebedfordcitizen.org/2019/06/gsa-announces-that-bedford-hangar-sale-has-been-completed/>

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## MCGREGOR, TX, NWIRP DIVESTITURE EXPERIENCE

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Navy divestiture deep in the heart of Texas: Collaboration leads to successful remediation and redevelopment of McGregor Property. (2007, Summer). *Currents: The Navy's Environmental Magazine*, pp. 1-18.

<https://documents.pub/document/sum07-navy-divestiture-deep-in-the-heart-of-deep-in-the-heart-of-divestiture.html>

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## GROUNDWATER CONTAMINATION

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### CONTAMINANTS OF CONCERN FOUND IN NWIRP NORTHERN TRACT GROUNDWATER

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Agency for Toxic Substances and Disease Registry (ATSDR), Centers for Disease Control and Prevention. (2019, June). Trichloroethylene [aka TCE] - ToxFAQs™

<https://www.atsdr.cdc.gov/toxfaqs/tfacts19.pdf>

ATSDR, Centers for Disease Control and Prevention. (2019, June). Tetrachloroethylene [aka PCE or perc] - ToxFAQs™

<https://www.atsdr.cdc.gov/toxfaqs/tfacts18.pdf>

ATSDR, Centers for Disease Control and Prevention. (2006, July). Vinyl Chloride – ToxFAQs™

<https://www.atsdr.cdc.gov/toxfaqs/tfacts20.pdf>

ATSDR, Centers for Disease Control and Prevention. (2015, August). 1,1-Dichloroethane – ToxFAQs™

<https://www.atsdr.cdc.gov/toxfaqs/tfacts133.pdf>

ATSDR, Centers for Disease Control and Prevention. (2011, October).

ToxFAQs™ for 1,1-Dichloroethene [aka 1,1-Dichloroethylene or 1,1-DCE]

<https://wwwn.cdc.gov/TSP/ToxFAQs/ToxFAQsDetails.aspx?faqid=721&toxid=130>

ATSDR, Centers for Disease Control and Prevention ToxFAQs. (1997, September).

1,2-Dichloroethene [aka 1,2-Dichloroethylene. Has two forms: cis and trans. The Navy's September 2020 NWIRP northern tract groundwater measurement was for the cis form]

<https://www.atsdr.cdc.gov/toxfaqs/tfacts87.pdf>

ATSDR, Centers for Disease Control and Prevention. (2012, April). 1,4-Dioxane – ToxFAQs™

<https://www.atsdr.cdc.gov/toxfaqs/tfacts187.pdf>

MassDEP. (2017, October 18). Fact sheet: TCE contamination, Nonantum area of Newton, MA.

<https://www.newtonma.gov/home/showpublisheddocument/26365/6372599510804700>

EPA. (2017, November). Technical Fact Sheet – 1,4-Dioxane: “This fact sheet ... provides a summary of the emerging contaminant 1,4-dioxane, including physical and chemical properties; environmental and health impacts; existing federal and state guidelines; detection and treatment methods; and additional sources of information.”

[Note: there seems to be a discrepancy on the EPA webpage between the 2017 date on the document and 2014 date of the pdf]

[https://www.epa.gov/sites/default/files/2014-](https://www.epa.gov/sites/default/files/2014-03/documents/ffrro_factsheet_contaminant_14-dioxane_january2014_final.pdf)

[03/documents/ffrro\\_factsheet\\_contaminant\\_14-dioxane\\_january2014\\_final.pdf](https://www.epa.gov/sites/default/files/2014-03/documents/ffrro_factsheet_contaminant_14-dioxane_january2014_final.pdf)

Hogue, C. (2020, November 8). 1,4-Dioxane: Another forever chemical plagues drinking-water utilities.

<https://cen.acs.org/environment/pollution/14-Dioxane-Another-forever-chemical/98/i43>

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## VAPOR INTRUSION

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- Cernansky, R. (2016, August 1). It came from beneath: Detecting and mitigating vapor intrusion. *Environmental Health Perspectives*, Vol. 124, No. 8, pp. A141-A146.  
[Discussion of changing view of risk of vapor intrusion from chlorinated chemicals of concern such as TCE.  
“The good news is that once vapor intrusion is discovered – and acknowledged – mitigating the problem is often relatively straightforward.” (p. A143)]  
<https://ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.124-A141>
- Department of Defense. (2020, September). DoD Vapor Intrusion Handbook fact sheet update No. 010: Vapor intrusion preferential pathways.  
[https://www.denix.osd.mil/irp/vaporintrusion/unassigned/vipp-fact-sheet/508C\\_Final%20VI%20Preferential%20Pathway%20Fact%20Sheet%20September%202020.pdf](https://www.denix.osd.mil/irp/vaporintrusion/unassigned/vipp-fact-sheet/508C_Final%20VI%20Preferential%20Pathway%20Fact%20Sheet%20September%202020.pdf)
- EPA. Vapor intrusion.  
<https://www.epa.gov/vaporintrusion>
- EPA. Vapor intrusion at Superfund sites.  
<https://www.epa.gov/vaporintrusion/vapor-intrusion-superfund-sites#tri>
- MassDEP. (2017, October 18). Fact sheet: TCE contamination, Nonantum area of Newton, MA. [A summary of MassDEP investigation, risk mitigation, and communication to community members of potential vapor intrusion into homes and businesses near a TCE groundwater plume source in the Nonantum area of Newton.]  
<https://www.newtonma.gov/home/showpublisheddocument/26365/6372599510804700>
- MassDEP. (2016, October 14). Vapor intrusion guidance: Site assessment, mitigation and closure. [Excellent description of vapor intrusion issues, including assessment of pathways, risks, mitigation, how to communicate with property owners and the public, and suggested public involvement opportunities. Encourages early and open communication with the community to maintain trust.]  
<https://www.mass.gov/doc/wsc-16-435-vapor-intrusion-guidance-site-assessment-mitigation-and-closure/download>
- McHugh, T., Loll, P., and Eklund, B. (2017, December 15; online February 22). Recent advances in vapor intrusion site investigations. *Journal of Environmental Management*, Vol. 204, pp. 783-792.  
<https://doi.org/10.1016/j.jenvman.2017.02.015>
- Pohle, A. (2016, October 5). State points finger at Northrop Grumman for groundwater contamination in Newton. *The Boston Globe* webpage.  
<https://www.bostonglobe.com/metro/regionals/west/2016/10/05/state-likely-sources-groundwater-contamination-newton/RuafWkefc773A53qEY0kyM/story.html>
- Richardson, R. H., United States Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation, Acting Director. (2014, August 27). Letter to Superfund Division Directors, EPA Regions 1-10. Memorandum: Compilation of information relating to early/interim actions at Superfund sites and the TCE/IRIS assessment. [Information on toxicity of TCE and support for decision-making at Superfund sites with actual or potential inhalation exposure to TCE]  
<https://semspub.epa.gov/work/HQ/174044.pdf>

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## BEDFORD NWIRP HISTORY OF ENVIRONMENTAL CONTAMINATION & REMEDIATION

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Arranged by chronology:

Rogers, Golden and Halpern in association with BCM Eastern, Inc. (1986, April).

Initial Assessment Study of Naval Weapons Industrial Reserve Plant, Bedford, MA. Prepared for Environmental Restoration Department, Naval Energy and Environmental Support Activity, Port Hueneme, CA. [This useful reference is also duplicated in Bibliography: History, location, and condition of NWIRP structures on Hartwell's Hill. NAVFAC Bedford NWIRP Record #000002]

[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=000002&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=000002&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)

EPA. (1993, June 22). Environmental news press release: EPA proposes four New England Sites to Superfund National Priorities List. [EPA Bedford NWIRP Record# 465756]

<https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.scs&id=0102032&doc=Y&colid=35214&region=01&type=SC>

[The proposed sites for 1993 were:

- Portsmouth Naval Shipyard in Kittery, ME
- **Naval Weapons Industrial Reserve Plant in Bedford, MA**
- South Weymouth Naval Air Station in South Weymouth, MA
- U.S. Army Materials Technology Laboratory in Watertown, MA]

Mass. bases cited for polluter list. (1993, June 23). *The Boston Globe*, p. 64.

EPA. (1994, May 31). Environmental news press release: EPA finalizes seven New England sites to the Superfund list. [EPA Bedford NWIRP Record# 289431]

<https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.scs&id=0102032&doc=Y&colid=35214&region=01&type=SC>

[The New England contamination sites which made the Superfund National Priorities List in 1994 were:

- Natick Laboratory Army research, Development, and Engineering Center in Natick, MA
- **Hanscom Field/Hanscom Air Force Base in Bedford, Lincoln, Concord & Lexington, MA**
- **Naval Weapons Industrial Reserve Plant in Bedford, MA**
- South Weymouth Naval Air Station in South Weymouth, Abington, and Rockland
- U.S. Army Materials Technology Laboratory in Watertown, MA
- Blackburn and Union Privileges site in Walpole, MA
- Portsmouth Naval Shipyard in Kittery, ME

Six of the seven sites were owned by the Navy, Army, or Air Force.]

Allen, S. (1994, June 1). 6 defense sites in N.E. go on Superfund list. *The Boston Globe*, p. 21.

Contaminated sites in state added to the Superfund list. (1994, June 1).

*The North Adams Transcript*, p. 18.

Agency for Toxic Substances and Disease Registry (ATSDR). (1994, June). Naval Weapons Industrial Reserve Plant site summary, Bedford, Massachusetts. (Attached to letter from Sandra Isaacs, Department of Health and Human Services, ATSDR, Federal Facilities Assessment Branch, Acting Branch Chief to Mark Chrisos, Raytheon Missile Systems Division Environmental Director (1994, September 9).

[NAVFAC Bedford NWIRP Record #000143]

[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=000143&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=000143&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)

- Bushnell, D. (1994, July 17). Seven of state's 30 hazardous waste sites in NorthWest. *The Boston Sunday Globe*, pp. 47, 52.
- EPA. (1995, June). Land use in the CERCLA remedy selection process: Memorandum from US EPA Office of Solid Waste and Emergency Response, May 25, 1995. OSWER Directive No. 9355.7-04.
- ATSDR. (2005, August 19). Public Health Assessment: Naval Weapons Industrial Reserve Plant, Bedford, Massachusetts. [NAVFAC Bedford NWIRP Record #000788]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=000788&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=000788&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)
- Tetra Tech NUS. (2009, September 1). Record of Decision: Site 4 Operable Unit 4 – BTEX plume. NWIRP, Bedford MA. [NAVFAC Record #000741]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=000741&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=000741&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)
- Resolution Consultants. (2014, September). Final five year review: Naval Weapons Industrial Reserve Plant, Bedford, MA. Prepared for the Department of the Navy, Naval Facilities Engineering Command, Mid-Atlantic. [NAVFAC Bedford NWIRP Record #001222][not so final]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=001222&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=001222&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)
- EPA. (2014, November 25). News releases from Region 1: EPA completes reviews of 25 New England site cleanups during FY2014. [EPA Bedford NWIRP Record #568499]  
<https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.scs&id=0102032&doc=Y&colid=35214&region=01&type=SC>  
 [Notice to the public that the EPA Five Year Review for the Bedford NWIRP is among the 25 NE Superfund site reviews that were completed in 2014.]
- Resolution Consultants. (2017, December 1). Final land use control remedial design, revision 2: Site 3 – chlorinated solvent groundwater plume and Southern Flight Test Area, Naval Weapons Industrial Reserve Plant, Bedford, Massachusetts. Prepared for the Department of the Navy, Naval Facilities Engineering Command, Mid-Atlantic. [NAVFAC Bedford NWIRP Record #001378]
- EPA. (2019, February 21). News releases from Region 1: EPA begins 14 reviews of Massachusetts Superfund site cleanups this year. [EPA Bedford NWIRP Record #632574]  
<https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.scs&id=0102032&doc=Y&colid=35214&region=01&type=SC>  
 [Notice to the public that the EPA is beginning comprehensive five year reviews of 14 MA Superfund National Priorities List sites, including the Bedford NWIRP.]
- Tetra Tech. (2019, May 8). Restoration Advisory Board meeting minutes for NWIRP, Bedford, MA. [NAVFAC Bedford NWIRP Record #001381] [This includes the presentation slides, posters, and Q&A session]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=001381&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=001381&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)
- Cleanup continues of Superfund site at former Naval Weapons Industrial Reserve Plant in

Bedford. (2019, July 5). *The Bedford Citizen*.

<https://www.thebedfordcitizen.org/2019/07/cleanup-continues-of-superfund-site-at-former-naval-weapons-industrial-reserve-plant-in-bedford/>

- Hartwell Hill to be sold as soon as environmental restoration remedy designated 'Operating Properly and Successfully'.  
<https://www.thebedfordcitizen.org/wp-content/uploads/2019/07/1-FORMATTED-2-LINK.pdf>
- Naval Weapons Industrial Reserve Plant facility on Hartwell Hill to be demolished.  
<https://www.thebedfordcitizen.org/wp-content/uploads/2019/07/2-FORMATTED-2-TO-LINK.pdf>
- Navy says land use controls at all sites are protective of human health and the environment.  
<https://www.thebedfordcitizen.org/wp-content/uploads/2019/07/4-FORMATTED-2-TO-LINK.pdf>
- New owner of Southern Flight Test Area must coordinate with Navy when construction disturbs earth below 3-foot depth.  
<https://www.thebedfordcitizen.org/wp-content/uploads/2019/07/5-FORMATTED-2-TO-LINK.pdf>
- 80-year target date for TCE groundwater decontamination using vegetable oil bioremediation.  
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Tetra Tech. (2019, September 1). Final second five year review: Naval Weapons Industrial Reserve Plant, Bedford, MA. Submitted to the Department of the Navy, Naval Facilities Engineering Command, Mid-Atlantic. [NAVFAC Bedford NWIRP Record #001384]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=001384&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=001384&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)

EPA. (2019, December 20). News releases from Region 01: EPA completes reviews of 12 Superfund site cleanups in Massachusetts during 2019. [EPA Bedford NWIRP Record# 642586]  
<https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.scs&id=0102032&doc=Y&colid=35214&region=01&type=SC>

[Notice to the public that the EPA has completed 12 of its planned 2019 reviews of 14 National Priorities List Superfund sites in Massachusetts, including the Bedford NWIRP. Note that the timing of the September 2020 detection of the expanded TCE plume on Hartwell's Hill that may threaten vapor intrusion into at least one nearby home on Bagley Avenue means that the discovery will be reported in the next EPA comprehensive Five Year Review of the Bedford NWIRP, which, if it takes place, may occur in 2024 at the earliest.]

Tetra Tech. (2020, March 1). Final addendum to the 2016 risk evaluation technical memorandum residential soil scenario Site 3 and Site 4 NWIRP Bedford, MA. [NAVFAC Bedford NWIRP Record #001451]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=001451&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=001451&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)

- Tetra Tech. (2020, September). Final fiscal year 2021 site management plan: Naval Weapons Industrial Reserve Plant, Bedford, MA. Submitted to the Department of the Navy, Naval Facilities Engineering Command, Mid-Atlantic. [NAVFAC Bedford NWIRP Record #001448]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=001448&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=001448&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)
- Renova-Sovereign Joint Venture. (2020, October 5). June 2020 Groundwater monitoring report: Site 4 –BTEX plume. Naval Weapons Industrial Reserve Plant, Bedford, MA. Prepared for Department of the Navy, Naval Facilities Engineering Command Mid-Atlantic. [NAVFAC Bedford NWIRP Record #001470]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=001470&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=001470&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)
- Renova-Sovereign Joint Venture. (2020, December 15). September 2020 semiannual groundwater monitoring report: Site 3 chlorinated solvent plume, NWIRP, Bedford, MA.  
[https://www.navfac.navy.mil/niris/MID\\_ATLANTIC/BEDFORD\\_NWIRP/N93880\\_001472.pdf](https://www.navfac.navy.mil/niris/MID_ATLANTIC/BEDFORD_NWIRP/N93880_001472.pdf)
- Tetra Tech. (2021, April 1). Field task modification request form regarding uniform [regarding] uniform federal policy sampling and analysis plan addendum for vapor intrusion, soil gas and additional groundwater investigation of chlorinated volatile organic compounds and 1,4-dioxane. Naval Weapons Station(sic) Industrial Reserve Plant, Bedford, MA [Site 3]. Submitted to the Department of the Navy, Naval Facilities Engineering Command, Mid-Atlantic. [NAVFAC Bedford NWIRP Record #001476]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=001476&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=001476&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)
- Clean up action legal notice: Notice of construction activities for Navy’s continuation of cleanup actions at former Naval Weapons Industrial Reserve Plant (NWIRP) Bedford, MA. (2021, July 1). *The Bedford Minuteman*, p. 3A.  
 [Archived in NAVFAC Administrative Records as Bedford NWIRP Record #001482]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=001482&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=001482&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)  
 [This public notice mentions construction activity will take place during June through August/September relating to modification of the Navy’s groundwater treatment plant (on Hartwell Road) to begin treating 1,4-dioxane, and also relating to installation of new monitoring wells in the central, southern and eastern areas of the NWIRP land.  
 It also mentions that a Restoration Advisory Board (RAB) meeting will take place for the public sometime during Fall, 2021 and that, “If anyone wishes to become an RAB member , so they can be contacted directly regarding future field events and RAB meetings, please send your contact info. to the Navy’s Public Affairs Officer (PAO) email or address shown below.”]
- Email: NAVFAC\_ML\_ [PAO@navy.mil](mailto:PAO@navy.mil)
  - Naval Facilities Engineering Systems Command, Mid-Atlantic, Public Affairs  
 9324 Virginia Avenue  
 Norfolk, VA 23511-3095]

NAVFAC Bedford NWIRP Restoration Advisory Board (RAB) presentation slides for the meeting of October 27, 2021. Presenter: Maritza Montegross –NAVFAC Mid-Atlantic Remedial Project Manager. [Note: the presentation slides will be posted on the NAVFAC Administrative Records webpage in the future, but meantime an image of one slide can be seen at Exhibit K: Site 3 projected cleanup time.]

EPA. Superfund site: Naval Weapons Industrial Reserve Plant, Bedford, MA. Cleanup activities webpage.

<https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=0102032>

Naval Facilities Engineering Systems Command. Environmental: Naval Weapons Industrial Reserve Plant, Bedford website.

[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/installation\\_map/navfac\\_atlantic/midlant/nwirp\\_bedford.html](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/installation_map/navfac_atlantic/midlant/nwirp_bedford.html)

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## BEDFORD'S QUEST FOR CLEAN DRINKING WATER 1971-1993

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Arranged by chronology:

O'Keefe, J. (1971, May 19). Bedford will fight land opening. *The Lowell Sun*, p. 58.

[Bedford selectmen prepared to do battle with Burlington to protect the Town's Middlesex Turnpike wellfield from contamination by runoff from future industrial development of Burlington land on the Bedford town-line near Vine Brook and the Middlesex Turnpike.

Quotes from the article:

- *They are concerned about possible pollution of Bedford's water supply from run-off into the Vine Brook watershed, if a large industrial complex should be built on the Burlington land...*
- *Donald Corey, head of Bedford's Water Resource Committee, contends that the wellfields would become contaminated by salt runoff or industrial wastes that might flow into groundwater, eventually finding their way into the town water supplies.*

Mr. Corey's fear for the Town's Middlesex Turnpike wellfield was later realized in 1978, after analysis revealed the wellfield water had indeed become contaminated with the industrial solvents TCE and dioxane from area businesses, forcing the closure and loss of the wellfield.]

Porter, L. (1973, February 9). Bedford's dilemma: Plenty of water in which to sink but not enough of which to drink. *The Sun* (Lowell, MA), p. 31.

Shanley, E. (1974, June 18). Town battle over water supply. *The Sun* (Lowell, MA), p. 9.

Selectmen to draw article seeking water exploration. (1977, December 13). *The Lowell Sun*, p. 38.

Bedford: "Voters passed the last in a long series of articles concerning the town's water supply..." (1979, May 9). *The Boston Globe*, p. 46.

Love, N. (1982, October 2). The search for fresh water. *The Boston Globe*, p. 15.

Bedford moves to join MWRA in hopes of lowering water costs. (1993, March 28). *The Boston Globe*, p. 48.

Sullivan, M. (1993, August 29). As new member of MWRA, Bedford can control costs. *The Boston Globe*, pp. 291, 296.

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## BEDFORD MIDDLESEX TURNPIKE MUNICIPAL WELLFIELD TCE CONTAMINATION

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The loss of this northwest Bedford wellfield in 1978 due to contamination with industrial solvents drastically reduced Bedford's already stressed water supply and triggered the development of the Hartwell Road municipal wellfield to help replace the lost Middlesex Turnpike wells. The contaminants were traced back to several nearby businesses between Route 3 and the Middlesex Turnpike.

Ackerman, J. (1979, February 25). Chemicals on tap: Possibly harmful agents taint water of two towns, stir expensive fears. *The Boston Globe*, page 129.

[An account of the loss of the Bedford Middlesex municipal wellfield due to trichloroethylene and dioxane contamination.]

Gatto, P. (1979, June 3). Towns finding water contaminated. *The Boston Globe*, p. 25.

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## BEDFORD HARTWELL ROAD MUNICIPAL WELLFIELD CONTAMINATION LINK TO THE NWIRP AND RMSD

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The Hartwell municipal well field became tainted with industrial solvent contaminants shortly after it went online in 1983 and was forced to shut down. A few years before, similar contaminants had also forced the closure of the Middlesex Turnpike municipal wellfield that the Hartwell Road wellfield was intended to replace. The 1991 GEI study helped trace the contaminants found in the Hartwell Road wellfield back to the NWIRP northern tract and to the Raytheon Missile Systems Division (RMSD) facility at 180 Hartwell Road. Although both the Navy and Raytheon denied liability for the contamination of the well field, the Navy assumed responsibility for the cleanup of the contaminated groundwater originating from the NWIRP.

Arranged by chronology:

Roy F. Weston, Inc. (1983, April). Final report: Hydrogeologic investigation

Hanscom Field, Bedford, Massachusetts. Prepared for United States Air Force Occupational and Environmental Health Laboratory (OEHL) Brooks Air Force Base, Texas.

[Air Force Administrative Record #2 for Hanscom AFB, MA]

[It is a little more difficult to use the Air Force environmental administrative records archives than those of the Navy. Searches require several additional steps. But this document is worth it.]

To access, view and download this document from the US Air Force Civil Engineer Center Administrative Record website:

1. Open this Air Force link: <https://ar.afcec-cloud.af.mil/Search.aspx>
2. Tap "Continue to site"
3. Tap "Hanscom AFB, MA" in the Installation List at left
4. Enter Hydrogeologic Investigation in one of the first three Search boxes (Subject/Full Metadata/Full Document) to the right
5. Tap Search button below
6. Tap View in Records Returned box

- Camp, Dresser & McKee, Inc. (1984, August). Town of Bedford, Massachusetts, Hartwell Road wellfield contamination study – Phase II. [NAVFAC Bedford NWIRP Record #000001]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=000001&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=000001&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)
- GEI Consultants, Inc. (1991, October 2). Draft report: Hartwell Road well field remedial investigation. Town of Bedford, MA. Submitted to Town of Bedford, MA.
- Vol. I –Text and Tables. [NAVFAC Bedford NWIRP Record #000069]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=000069&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=000069&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)
  - Vol. II – Book 1 of 3, Figures 1-10 [NAVFAC Bedford NWIRP Record #000068; Note: Figures 2 and 3 seemed to be missing from the document during late 2021 archives searches]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=000068&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=000068&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)
  - Vol. III – [Note: Seemed to be missing from NAVFAC Bedford NWIRP administrative records during late 2021 searches]
  - Vol. IV – Appendices B-F [NAVFAC Bedford NWIRP Record #000791]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=000791&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=000791&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)
  - Vol. V – Book 1 of 2, Appendix G: Chemical Data [NAVFAC Bedford NWIRP Record #000053]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=000053&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=000053&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)
  - Vol. V – Book 2 of 2, Appendix G: Chemical Data [NAVFAC Bedford NWIRP Record #000054]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=000054&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=000054&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)
- Camp, Dresser & McKee, Inc. (1991, November 1). Draft feasibility study report Hartwell Road well field, NWIRP, Bedford, MA. Prepared for Bedford Department of Public Works. [NAVFAC Bedford NWIRP Record #000077]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=000077&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=000077&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)
- Gaseau, M. (1992, June 25). Residents pressuring Raytheon for cleanup. *The Bedford Minuteman*.
- Sullivan, M. (1993, August 29). As new member of MWRA, Bedford can control costs. *The Boston Sunday Globe: Northwest Weekly*, p. 1.
- Camp, Dresser & McKee, Inc. (1995, July). Town of Bedford, Massachusetts: Hydrogeologic zones for Bedford water supply wells, Figure 1  
[https://www.bedfordma.gov/sites/g/files/vyhlf6866/f/file/file/hydrogeologic\\_zones\\_map\\_-\\_1995.pdf](https://www.bedfordma.gov/sites/g/files/vyhlf6866/f/file/file/hydrogeologic_zones_map_-_1995.pdf)

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FORMER RAYTHEON MISSILE SYSTEMS DIVISION, 180 HARTWELL ROAD:  
1987- 1988 ENVIRONMENTAL ASSESSMENT

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Goldberg-Zoino & Associates, Inc. (1987, September). Preliminary environmental assessment: Raytheon Systems Laboratory, Bedford, MA. Prepared for Raytheon Company, Lexington, MA.

[NAVFAC Bedford NWIRP Record #000004]

[https://www.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=000004&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=000004&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)

[This short report contains an account of the early history of the Raytheon Missile Systems Division building and land at 180 Hartwell Road. It includes early lease and purchase history, and mentions a Raytheon lease of land on the other side of Hartwell Road. The report provides a good summary on the site history and research and development operations based on interviews with Raytheon personnel.

It includes an extremely brief description of Raytheon waste disposal practices and accidents at 180 Hartwell Road; an even shorter description of environmental problems at the nearby NWIRP (which was operated by Raytheon personnel for the Navy); and interestingly, a much more extensive summary of previous studies on Hancom Air Force Base waste disposal practices.

The consulting firm's conclusions about the Raytheon facility's environmental history were fairly tentative, but its disclaimer was not.

The disclaimer emphasized the GZA study was limited in scope by:

- the client's time and budgetary constraints (Appendix A: #1)
- lack of independent verification of accuracy or completeness of information received (Appendix A: #2)
- restricted or unavailable access to the complete site (Appendix A: #3).
- "In addition, GSZ renders no opinion as to the presence of hazardous material or oil, or to the presence of indirect evidence relating to hazardous material or oil, where direct observation of the interior walls, floor, or ceiling of a structure on a site was obstructed by objects or coverings on or over these surfaces." (Appendix A: #3).

Goldberg-Zoino & Associates, Inc. (1988, December). Geohydrologic Study: Systems Laboratory, Raytheon, Bedford. Volumes I and II. Prepared for the Raytheon Company of Lexington, Massachusetts.

[NAVFAC Bedford NWIRP Record #000020]

[https://www.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=000020&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=000020&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)

## BEDFORD NWIRP LAND USE/OWNERSHIP HISTORY

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Arranged by chronology:

The Bedford Historical Society, Bedford Town Archives, and The Bedford Free Public Library have extensive collections of documents pertaining to the pre-1941 history of the land that later became the NWIRP.

Brown, L.K. (1975). *A revolutionary town*. Phoenix Publishing. (Published in cooperation with the Bedford Historical Society, Inc.).

[Note: This volume by former Town Historian and resident Louise K. Brown has photographs of two historic homes near Hartwell's Hill built in the 1700s: the Joseph Hartwell home – one of the first homes demolished in 1941 after the land taking for the Bedford Airport; and the Samuel Hartwell/McGovern home - demolished in 1959 “by further airfield development,” as well as accounts of the Hartwell family members. See pp. 264 and 275.]

Sale of estate of John W. McGovern to John F. McGovern, 46 acres. (1908). Middlesex South Registry of Deeds: Book 3362, pp. 86 – 88.

Del Papa, E.M. and Warner, M.P.; History Office, Electronic Systems Division, Hanscom Air Force Base. Defense Technical Information Center. (1987, November). A historical chronology of Hanscom Air Force Base: 1941-1986.

[Accession number ADA206567]

<https://apps.dtic.mil/sti/citations/ADA206567>

The Commonwealth of Massachusetts Town of Bedford Taking. (1942, June 24). Middlesex South Registry of Deeds: Book 6611, pp. 182-188.

U.S. Engineer, New England Division. (1942, September). Construction Division, Real Estate Branch: Land acquisition map, Addition to Bedford Airport. Drawn by A.L. Hurd: September 12, 1942; Checked by A.E. Glow; Revised: September 18, 1942. Repository: Bedford Town Archives. [Map shared courtesy of Dan Silverman; John Linz; and Al Bartovics, former Bedford Town Archivist ([See Map 10](#)).]

The Department of Public Works. (1942). Map plan showing land taking and easements for air rights in the Town of Bedford, Middlesex County. Drawn by Chief Engineer R.W. Coburn. [This map was cited on page 187 of the 1942 Commonwealth of Massachusetts land taking deed ([See Exhibit D1](#)) and said to be on file with the Department of Public Works. It may be similar to the 1942 land acquisition map cited above – which was drawn by A.L. Hurd. We have not located this Coburn drawn map].

Department of the Air Force. (1953, February 16). Permit #DA19-016 ENG 5782 for use of property on Hanscom Air Force Base granted to the Department of the Navy by the Secretary of the Air Force.

[Committee notes:

- The permit grants the Navy permission beginning February 16, 1953, *and continuing as long as the current Raytheon contract for missile and radar testing (No. a-1147) is in effect, but revocable at will by the Secretary of the Air Force, to use and occupy a certain area of land, being a portion of Hanscom Air Force Base, Bedford, Massachusetts, consisting of approximately 20.9 acres as shown in green and red cross hatch on the map attached hereto ...* ([page 1 of the document](#)).

- Above Item #12, p. 3: *The maximum number of personnel to be employed by the Permittee and/or its contractor will be limited to 750, with an average of under 700 per year.* There is a handwritten note stating *changed by Amend. #1. No. of personnel 1400.* **Amendment #2** removes this restriction.
- Item #13, p. 3: *Automobile parking facilities will be limited to 450 cars.* This also has a handwritten notation. It states, *“changed to 600 by Amend. #1. Amend. #2 removes this restriction.”*
- This document was shared with our committee courtesy of the HAFB Civil Engineering Division and the Public Affairs Office, December 9, 2019 ([See Exhibit D1 for document image](#).)

Department of the Air Force. (1958, August 12). Amendment No. 3 to 1953 Permit #DA19-016 ENG 5782 for use of property on Hanscom Air Force Base.

[Notes:

- **adds 6.1 acres of land for Navy use**].
- This document was shared with our committee courtesy of the HAFB Civil Engineering Division and the Public Affairs Office, December 9, 2019.]

Kline, N.L., *Globe* Military Editor. (1958, December 7). Massachusetts know-how gives us Guardian in the air: Missile produced in Andover plant our top weapon against low-altitude air attack. *The Boston Globe*, p. 208.

Department of the Air Force. (1959, July 6). Amendment No. 4 to 1953 Permit #DA19-016 ENG 5782 for use of property on Hanscom Air Force Base.

[Notes:

- **Includes “approximately 5 additional acres of land” for Navy use.**
- This document was shared with our committee courtesy of the HAFB Civil Engineering Division and the Public Affairs Office, December 9, 2019.]

Missile lab dedicated by Navy at Hanscom. (1959, September 17). *The Boston Globe*, p. 12.

Department of the Air Force. (1967, September 29). Amendment No. 5 to 1953 Permit #DA19-016 ENG 5782 for use of property on Hanscom Air Force Base.

[Notes:

- This amendment **adds “0.85 acres of AF leased land at L G Hanscom Field” to be made available for Navy use as an additional parking area.**
- The amendment is accompanied by a notice dated September 22, 1967 (File 10B-H HAB) which states “The area presently outgranted consists of 32.00 acres.” The bottom of the notice is labeled “Robert S. Cruikshank, Major, USAF, Director/Base Civil Engineering Division.”
- These documents were shared with our committee courtesy of the HAFB Civil Engineering Division and the Public Affairs Office, December 9, 2019.]

Boatright, J.F., Deputy Assistant Secretary of the Air Force (Installations). (1977, March 11). Memorandum for the Secretary of the Navy. Subject: Transfer of a 36.65 ± Acre Portion of Hanscom Air Force Base, Massachusetts, to the Department of the Navy.

[Note:

- *the Department of the Air Force hereby transfers to the Department of the Navy, without reimbursement, approximately 36.65 acres of land in fee, together with a 1,072 lineal foot water main thereon.*
- *The requirements of Title 10, United States Code, Section 2662, as amended, were satisfied by Department of the Air Force Disposal Report No. 391, September 28, 1973 (Attachment 3).*

Transfer and acceptance of military real property from Hanscom AFB, Bedford, Massachusetts to Dept. of the Navy, Philadelphia, Pennsylvania. Property Voucher # 77-0100. (1977, May 18).

[Note:

- This document records the 1977 transfer of 36.65 acres of land originally donated to the Air Force to the Navy for the NWIRP. It estimates the value of the land in 1977 to be \$89,598.25 and an accompanying water distribution system to be \$5,360.00.
- This document was shared with our committee courtesy of the HAFB Civil Engineering Division and the Public Affairs Office, December 9, 2019 (See Exhibit D1 for document image).]

Dodge, R. (1980, January 1). Cornfields displaced to build instruments of war. *The Boston Globe: Editorial*, p. 30.

Raytheon Missile Systems Division Manufacturing. (1981, March 30). Hiring ad text: "Raytheon's largest manufacturing facility, located in Andover, MA, is responsible for production of the Improved Hawk and the new Patriot missile defensive systems," *The Boston Globe*, p. 47.

Bedford NWIRP RAB Meeting Minutes: May 2, 2001

[https://www.navfac.navy.mil/niris/MID\\_ATLANTIC/BEDFORD\\_NWIRP/BASEWIDE/ADMIN%20RECORD/N93880\\_000847.pdf](https://www.navfac.navy.mil/niris/MID_ATLANTIC/BEDFORD_NWIRP/BASEWIDE/ADMIN%20RECORD/N93880_000847.pdf)

Bedford NWIRP RAB Meeting Minutes: Jan 31, 2001

[https://www.navfac.navy.mil/niris/MID\\_ATLANTIC/BEDFORD\\_NWIRP/BASEWIDE/ADMIN%20RECORD/N93880\\_000848.pdf](https://www.navfac.navy.mil/niris/MID_ATLANTIC/BEDFORD_NWIRP/BASEWIDE/ADMIN%20RECORD/N93880_000848.pdf)

DGT Survey Group – North Shore. (2011, October 3). Subdivision Naval Weapons Industrial Reserve Plan[t] (NWIRP) Plan of Land in Bedford, MA, Middlesex County. Prepared for the United States General Services Administration.

[Note:

- This Plan of Land was Exhibit B, p. 17 within the GSA public auction invitation for bids on sale of the former Navy aviation hangar, Southern Flight test Area, 154 Hartwell Road, Bedford, MA posted online during the auction in 2018.
- It also appears in the Quitclaim Deed (dated 2019, April 18; filed 2019, April 19) transferring the Former Navy Southern Flight Test Area from the Administrator of the General Services Administration to Runway Realty Ventures LLC for the sum of \$9,040,000.00, p. 41 of 53. Middlesex South Registry of Deeds: Book 72479, Page 255.
- It is also used as the base map for Map 5B in this report.]

Quitclaim Deed. (dated 2019, April 18; filed 2019, April 19). Administrator of the General Services Administration grants the Former Navy Southern Flight Test Area, 154 Hartwell Road, Town of Bedford, MA to Runway Realty Ventures LLC for the sum of \$9,040,000.00. Middlesex South Registry of Deeds: Book 72479, Page 255.

Naval Facilities Engineering Systems Command. Environmental: Navy Base

Cultural Resource Stories. (2020, March). Helping to win the Cold War: Radar and missile guidance systems development at Naval Weapons Industrial Reserve Plant (NWIRP) Bedford, Massachusetts. (open pdf file title: Final history of NWIRP, Bedford, MA, March 2020).

[Excellent background and history of the NWIRP and its predecessor programs (Raytheon Lab 16 and the Naval Industrial Reserve Aircraft Plant, aka NIRAP), from the beginning of the Cold War in 1946 to the 1952 ground-breaking of Hartwell's Hill for the Components Laboratory in 1952, through the many years of Raytheon/NWIRP research on missile systems, the end of the Cold War with the fall of the Soviet Union in 1991, and the final closing of the Bedford NWIRP in 2000.]

[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/cultural\\_resources/navy\\_base\\_cultural\\_resource\\_stories.html](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/cultural_resources/navy_base_cultural_resource_stories.html)

## BEDFORD NWIRP AND RAYTHEON MISSILE SYSTEMS DIVISION (180 HARTWELL ROAD) PROPERTY USE DESCRIPTIONS (1987-2020)

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### **NWIRP property use descriptions:**

Agency for Toxic Substances and Disease Registry (ATSDR). (1994, June). Naval Weapons Industrial Reserve Plant site summary, Bedford, Massachusetts. (Contained as an attachment to correspondence between Department of Health and Human Services ATSDR and Raytheon Missile Systems Division Environmental Director: Isaacs/Chrisos letter of 9/23/1994. [NAVFAC Bedford NWIRP Record #000143] [https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/ev\\_restoration/administrative\\_records.html?basic=000143&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/ev_restoration/administrative_records.html?basic=000143&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP) [Quote: *NWIRP is not a production facility but used strictly for research and development. Research is conducted in two main structures: the Components Laboratory, built in the mid-1950s, and the Flight Test Facility, built in 1959,* (ATSDR; 1994, June; p. 1).]

ENSR Consulting, Engineering, Remediation. (2000a, September). Record of Decision: Site 1 – Old Incinerator Ash Disposal Area, Naval Weapons Industrial Reserve Plant, Bedford. Prepared for the Naval Facilities Engineering Command. [NAVFAC Bedford NWIRP Record #000466] [https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/ev\\_restoration/administrative\\_records.html?basic=000466&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/ev_restoration/administrative_records.html?basic=000466&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP) [Quote: *The mission of NWIRP Bedford is to design, fabricate, and test prototype weapons equipment, such as missile guidance and control systems. Activities at NWIRP Bedford are conducted in two main structures: the Components Laboratory and the Flight Test Facility,* (ENSR; 2000a, September; p. 3 of 33, paragraph 4).]

Renova-Sovereign Joint Venture. (2020, December 15). September 2020 semiannual groundwater monitoring report: Site 3 chlorinated solvent plume, NWIRP, Bedford, MA.

[NAVFAC Bedford NWIRP Record #001472]

[https://www.navfac.navy.mil/niris/MID\\_ATLANTIC/BEDFORD\\_NWIRP/N93880\\_001472.pdf](https://www.navfac.navy.mil/niris/MID_ATLANTIC/BEDFORD_NWIRP/N93880_001472.pdf)

[Quote: *The mission of NWIRP Bedford was to design, fabricate, and test prototype equipment for missile guidance and control systems*, (Renova-Sovereign Joint Venture; 2020, December 15; p. 1).]

### **Raytheon Missile Systems Division, 180 Hartwell Road, property use description:**

Goldberg-Zoino & Associates, Inc. (1987, September). Preliminary environmental assessment: Raytheon Systems Laboratory, Bedford, MA. Prepared for Raytheon Company, Lexington, MA.

[NAVFAC Bedford NWIRP Record #000004]

[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/ev\\_restoration/administrative\\_records.html?basic=000004&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&pinstln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/ev_restoration/administrative_records.html?basic=000004&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&pinstln_id=BEDFORD_NWIRP)

[Quote: *“The facility serves as headquarters to Raytheon’s Missile Systems Division and is primarily an office/research and development facility.”* (Goldberg-Zoino & Associates, Inc.; 1987, September; p. 17)]

Raytheon unit’s Bedford site sells for \$12.5M. (2005, January 24; updated January 27). *Boston Business Journal*.

<https://www.bizjournals.com/boston/stories/2005/01/24/daily50.html>

[Quote: *“The Raytheon complex, located at 180 Hartwell Road, is a 401,663-square-foot office/R&D complex.”*]

### **Where actual Raytheon missile manufacture took (takes) place:**

Kline, N.L., *Globe* Military Editor. (1958, December 7). Massachusetts know-how gives us guardian in the air: *Missile produced in Andover plant* our top weapon against low-altitude air attack. *The Boston Globe*, p. 208.

Raytheon Company Advertisement. (1981, March 30). *The Boston Globe*, p. 47.

[Quote: *MSD: Missile Systems Division Manufacturing. Raytheon’s largest manufacturing facility located in Andover, MA, is responsible for production of the Improved Hawk and the new Patriot defensive missile systems.*]

Muller, J. (1998, October 10). Raytheon gets \$1.45b pact from Greece. Order for Patriots lifts Andover plant. *The Boston Globe: Business*, pp. F1, F2, (pp. 79, 80).

[Quote: *The Patriot missile, made famous during the Gulf War for intercepting Iraq’s Scud missiles, is built at Raytheon’s Andover plant ...* (p. F1).

The article also mentions that *Hawk missiles were being manufactured at the Andover plant* and that *AMRAAM (Advanced Medium-Range Air-to-Air Missile) missiles* were manufactured there until production was transferred to Tucson, Arizona earlier in 1998.

## NWIRP BUILDINGS ON HARTWELL'S HILL: HISTORY AND CONDITION

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Arranged by chronology:

- Rogers, Golden and Halpern in association with BCM Eastern, Inc. (1986, April). Initial Assessment Study of Naval Weapons Industrial Reserve Plant, Bedford, MA. Prepared for Environmental Restoration Department, Naval Energy and Environmental Support Activity, Port Hueneme, CA. [This useful reference is also duplicated in Bibliography: Bedford NWIRP history of environmental contamination and remediation. NAVFAC Bedford NWIRP Record #000002]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=000002&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=000002&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)
- Simon, B., Massachusetts Historical Commission State Historic Preservation Officer and Executive Director. (2017, July 28). Letter to Richard Doucette, Federal Aviation Administration Environmental Program Manager and copied to GSA, Navy, Massport, three officials of federal Advisory Council on Historic Preservation, and Bedford Historical(sic) [Preservation] Commission.  
[Notes that historic covenant on southern NWIRP tract requires all future owners to maintain and preserve the property, and that complete demolition is not allowed. States historic preservation covenant should be attached to property conveyance of both southern and northern NWIRP tracts.]
- Sydla, M.C., Department of the Navy, Naval Sea Systems Command (041) Division Director. (2018, June 8). Letter copied to Bedford Town Manager; Bedford Selectmen. Enclosures: project information, draft proposed Memorandum of Agreement.  
*[I am writing to notify your organization of a proposed Department of the Navy (Navy) action to demolish historic buildings and structures that pose severe risks to human health and safety located at the northern tract of Naval Weapons Industrial Reserve Plant (NWIRP Bedford, Massachusetts, (Quote from p. 1).]*
- Bedford Historic Preservation Commission Chair (2018, July 12). Letter to Heather Robbins, Department of the Navy, Naval Sea Systems Command Cultural Resources Team Lead. Copied to Brona Simon, Massachusetts Historical Commission; Bedford Town Manager; and Bedford Board of Selectmen.  
[Concurrence of the BHPC with Navy proposal to demolish NWIRP buildings on Hartwell's Hill.]
- Renova-Sovereign Joint Venture. (2020, February 3). Land use control annual inspection for 2019, NWIRP, Bedford, MA. Submitted to the Naval Facilities Engineering Command, Mid-Atlantic. [NAVFAC Bedford NWIRP Record #001394]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=001394&fromDate=01-01-2020&toDate=12-31-2020&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=001394&fromDate=01-01-2020&toDate=12-31-2020&p_instln_id=BEDFORD_NWIRP)
- [Contains photo log with September 24, 2019 photographs of two vandalized NWIRP buildings on Hartwell's Hill with broken windows that could allow trespassers to enter the deteriorating, mold-contaminated structures]
- Sydla, M.C., Department of the Navy, Naval Sea Systems Command (041), Ship Shore Maintenance PMO-IT Division Director. (2020, April 28). Cover letter to B. Simon, Massachusetts State Historic Preservation Officer and Massachusetts Historical Commission Executive Director. Copied to Town of Bedford Historic Preservation

Commission. Enclosure: Amendment to the Memorandum of Agreement between the Department of the Navy and the Massachusetts State Historic Preservation Officer. Renova-Sovereign Joint Venture. (2020, June 17). Land use control annual inspection for 2019, Revision 1, NWIRP, Bedford, MA. Submitted to the Naval Facilities Engineering Command, Mid-Atlantic. [NAVFAC Bedford NWIRP Record #001464]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=001464&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=001464&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)  
[Same comment as highlighted above in February 2020 Renova-Sovereign JV report]  
Renova-Sovereign Joint Venture. (2020, December 1). Land use control annual inspection For 2020, NWIRP, Bedford, MA. Submitted to the Naval Facilities Engineering Command, Mid-Atlantic. [NAVFAC Bedford NWIRP Record #001463]  
[Committee note to the Select Board: This reference contains the August 28, 2020 photographs of vandalized NWIRP buildings on Hartwell's Hill. Broken windows are apparent on the Antenna Range Building, the Government Building, and the Components Laboratory. Just as in 2019, the broken windows could allow trespassers entry into the deteriorating, mold-contaminated buildings that the Navy has described as structurally unsound. The 3+ story Components Laboratory may be of special concern because of the height to which the trespassers have climbed, as shown by the extensive graffiti left along the exterior wall of the third floor. New graffiti has been added to that third floor wall and to the Government Building since the 2019 photos from the Renova-Sovereign JV inspection were taken.]  
[https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/administrative\\_records.html?basic=001463&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p\\_instln\\_id=BEDFORD\\_NWIRP](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/administrative_records.html?basic=001463&fromDate=MM-DD-YYYY&toDate=MM-DD-YYYY&p_instln_id=BEDFORD_NWIRP)

#### HAFB MINUTEMAN VILLAGE MOBILE HOME PARK, HARTWELL RD (1961-2009)

Metcalf and Eddy/AECOM. (2009). Decommissioning of the Minuteman Village Mobile Home Park and restoration of the site: Final environmental assessment. Prepared for Hanscom Air Force Base.  
<https://apps.dtic.mil/sti/pdfs/ADA611143.pdf>

[Note: The Edge Sports Center playing fields were constructed on some of the acreage of the former HAFB Minuteman Village site.]

Agreement reached for The Edge Sport Center expansion. (2012, July 6). *The Bedford Citizen*.

<https://www.thebedfordcitizen.org/2012/07/agreement-reached-for-the-edge-sports-center-expansion/> [Note: The Edge artificial turf playing fields were built on top of land formerly occupied by the Hanscom AFB Minuteman Village mobile home park until 2009.]

The Edge Sports Center. (2012, February 10). Press release: The Edge Sports Center is expanding!

<http://files.leagueathletics.com/Text/Documents/2184/32523.pdf>

## HISTORIC NEWSPAPER ARTICLES ABOUT THE CREATION OF BEDFORD AIRPORT/L.G. HANSCOM FIELD

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Land that later became the NWIRP was part of these early airport land-takings by the State. All entries except that of February 10, 1941, are selections from historic articles shared with the committee courtesy of Mr. John Linz.

Arranged by chronology:

Bedford folks and officials oppose airport. (1941, January 7). *The Boston Globe*.

W.P.A. funds for proposed Bedford airport approved. (1941, January 31).

*The Boston Globe*.

Owen, M.C. (1941, January 16). Letters from the Editor's mail: The Bedford Airport.

*The Boston Globe*.

Plane crash: Reporter, doctor killed at Saugus while stunting. (1941, February 10). *The Boston Daily Globe*, pp. 1-2.

[Laurence G. Hanscom Field was named in 1943 to honor this reporter, who was an amateur pilot and aviation enthusiast (See [Del Papa and Warner, 1987, p. 1](#)). The *Boston Daily Globe* article explains that Laurence Hanscom and his passenger/copilot Dr. Anthony Carbone were killed during aerobatics practice over Saugus when their plane's engine failed during a loop dive, and they crashed into the backyard of Mr. and Mrs. Harry Butler.]

Harris, J.G. (1941, February 26). Bedford airport urged to obviate Boston accidents.

*The Boston Globe*, p. 4. [Note: See February 10, 1941 *Boston Globe* article above titled "Plane crash ..."]

Hints at Land Scandal. (1941, March 31). *The Boston Globe*, p. 7. 1941.

Ways and Means balks on airport at Bedford: Contends primary purpose of project isn't for defense. (1941, April 29). *The Boston Globe*, p. 7.

Land for Bedford airport is sought. (1941, May 9). *The North Adams Transcript*, p. 1.

Notice: "Public works engineers will begin survey and public works agents will begin meeting land owners early next week in the work of beginning the Bedford ..." (1941, May 16). *The Boston Globe*, p. 13.

Surveying is started for Bedford airport. (1941, May 20). *The Boston Globe*, p. 2.

Photograph with caption: "Governor at controls of steam shovel turns first earth for Bedford airport as John Di Mattio offers expert coaching." (1941, July 18). *The Boston Globe*, p. 13.

Truck drivers join Bedford airport strike. (1941, August 30). *The Boston Globe*, p. 2.

Bedford airport strike is settled: Men return today. (1941, September 5).

*The Boston Globe*, p. 32.