DRAFT ENVIRONMENTAL ASSESSMENT

FOR

GENERATOR BUILDING 1 AT MASSACHUSETTS INSTITUTE OF TECHNOLOGY LINCOLN LABORATORY

PREPARED BY:

Department of the Air Force

Hanscom Air Force Base, Massachusetts

December 2021

Letters or other written comments provided may be published in the Final Environmental Assessment (EA). As required by law, substantive comments will be addressed in the Final EA and made available to the public. Any personal information provided will be kept confidential. Private addresses will be compiled to develop a mailing list for those requesting copies of the Final EA. However, only the names of the individuals making comments and their specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the Final EA.

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FINDING OF NO SIGNIFICANT IMPACT (FONSI)
FOR MIT LL GENERATOR BUILDING 1 PROJECT AT
HANSCOM AIR FORCE BASE
BEDFORD, LEXINGTON, AND LINCOLN, MASSACHUSETTS

Pursuant to the Council on Environmental Quality regulations for implementing the procedural provisions of the National Environmental Policy Act (40 Code of Federal Regulations [CFR] 1500-1508), Department of Defense Directive 6050.l and the Air Force Environmental Impact Analysis Process regulations 32 CFR Part 989, the Air Force has prepared an environmental assessment to identify potential effects associated with providing a reliable source of redundant backup electrical power for Massachusetts Institute of Technology (MIT) Lincoln Laboratory (LL) facilities on Hanscom Air Force Base (HAFB), by either constructing a new facility to house replacement generators or replace existing outdated generators "in-kind".

PURPOSE AND NEED FOR THE PROPOSED ACTION (EA §§ 1.1 through 1.6, pages 1-1 to 1-6): HAFB seeks to improve its understanding on the proposed action of providing a reliable source of redundant backup electrical power for MIT LL facilities on HAFB. An environmental impact analysis must be performed for each federal action that has the potential to impact the environment. The United States Air Force (USAF) implements compliance with the National Environmental Policy Act (NEPA) through its Environmental Impact Analysis Process (EIAP).

MIT LL's mission is to apply advanced technology to problems of national security that involve research and development activities, with a focus on long-term technology development. MIT LL's prime contract implies an obligation to provide backup electrical power to protect critical research, in addition to recognized life/safety, building control systems, and security requirements. MIT LL facilities include 25 buildings that need the operation of backup power generation for critical mission equipment as well as life, health, and safety needs to be considered from a holistic perspective.

The purpose of the Proposed Action is to provide a reliable source of redundant backup electrical power, allowing MIT LL to accomplish their mission without disruption to workflow. The Proposed Action will also maintain critical research, security, and building operations functions without interruption during periods of commercial power interruption and during scheduled maintenance of key electrical infrastructure. The Proposed Action is needed to provide a more reliable source of backup electrical power because backup power is currently supplied by the combination of stationary and mobile emergency backup generators located throughout the MIT LL campus. The current emergency generators are well past their useable life and require excessive maintenance due to their age, and have limited parts availability, affecting maintenance and repair and thus jeopardize the ability of MIT LL to protect and conduct critical research during periods of commercial power interruption. The critical research requirements include data preservation, ongoing research or prototype fabrication in clean rooms and special environment laboratory spaces, inspection testing, and certification processes. Interruption of commercial power during these operations can result in thousands of hours of lost, delayed, or compromised research, millions in costs, and long schedule delays in the ongoing research programs.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

ALTERNATIVE 1 - PREFERRED ALTERNATIVE (EA § 2.2 & 2.3.1, pages 2-1 to 2-2 & 2-4 to 2-5): The preferred alternative would involve the construction of a new generator building (Generator Building 1) at MIT LL on HAFB on land the Air Force intends to lease to MIT LL, and the decommissioning of 16 aging and difficult to maintain generators with declining reliability currently in use at MIT LL. The preferred alternative would also include establishing easements to allow MIT LL to install concrete duct banks containing 12 independent electrical feeders to distribute electricity from the generator building to the supported buildings on the MIT LL campus. The preferred alternative meets the purpose and need of the project, provides uninterrupted backup power when needed, and eliminates odor and particulate risk to several sensitive research areas by allowing the decommissioning of the 16 smaller generators located throughout the campus.

Generator Building 1 would consist of three 1,000-kW backup diesel generators with space to add an additional two 1,000-kW diesel generators, if additional backup power capacity is needed in the future as MIT LL continues to replace/renovate aging buildings throughout the campus. The generators would comply with the U.S. Environmental Protection Agency (EPA) Tier-4 Final Standard to satisfy federal standards for non-emergency operation and have been permitted by Massachusetts Department of Environmental Protection (MassDEP) for 500 hours of non-emergency operation annually for each generator. Generator Building 1 would house the generators, automatic transfer switch(s), and the switch gear, and would provide radial feeds from the generators to buildings that require critical backup power.

The diesel generators would be housed in a new one-story building that would include exhaust vent stacks for each generator. The generator building would include individual 3,500-gallon dual-walled, diesel fuel storage tanks for each generator, which would be located inside the building and installed underneath each generator and below grade. The generator building would support year-round maintenance and operations and would provide enough sound-suppression to meet Unified Facilities Criteria (UFC) 3-450-01 (Noise and Vibration Control), Massachusetts (310 CMR 7.10), and local municipality noise requirements. Lexington's noise limits (Chapter 80 of the Code of Lexington) are consistent with the MassDEP noise requirements.

NO-ACTION ALTERNATIVE (EA § 2.5, page 2-6): The CEQ regulation 40 CFR §1502.14(d) requires the inclusion of a No Action Alternative in the NEPA analysis. The No Action Alternative serves as the baseline against which alternatives can be evaluated to identify impacts to the natural and built environments. Under the No Action Alternative, Generator Building 1 would not be built, the generators would not be replaced "in-kind", and MIT LL would continue to rely on a mix of aging stationary generators and mobile generators located throughout the campus to supply emergency backup power during periods of commercial power interruptions and backup power during scheduled maintenance of key electrical infrastructure. This approach would not be as efficient and reliable as the backup power provided by the proposed new generator building and would put MIT LL's critical research mission at risk.

ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION (EA § 2.4, pages 2-5 to 2-6): Four other alternatives were initially considered during the environmental impact analysis process and eliminated from further consideration because they did not meet all of the criteria for the selection standards presented on page 2-4. The following alternatives have been eliminated:

- Alternative 2 – Construct the generator building on land the Air Force would lease to MIT LL on the lawn area just north of Building FA, which is located across the road to the southeast of the proposed location for Alternative 1. This alternative was eliminated from further consideration because as master planning evolved, the area north of Building 1332 (FA Building) was reserved for future buildings per the MIT LL Facilities Master Plan, and a Facilities Master Plan requirement to keep "industrial facilities" (for example, chilled water production, primary electrical service, life safety, backup power generation, and similar) separated where possible from the main research and office facilities.
- Alternative 3 – Purchase or lease property outside HAFB for the construction of the generator building, which would be owned and operated by MIT LL. This alternative was eliminated from further consideration because it would not meet USAF anti-terrorism/force protection requirements (AFI 10-245 and UFC 4-010-01) and increases the possibility of interruption in the generation and distribution of electricity needed to meet MIT LL's critical research mission as required by MIT LL's FFRDC contract with the Office of the Under Secretary of Defense for Research and Engineering.
- Alternative 4 – Replace the 16 existing generators "in-kind", by buying or leasing 16 new generators of the same capacity and in the same locations. This alternative was eliminated from further consideration; it would not eliminate or minimize noise, vibration, odor, and particulate risk to several sensitive research areas, it would not reduce the potential for environmental impacts from possible fuel or oil spills during generator operation and maintenance, and it would not enhance planning for future MIT LL facilities expansion by freeing up the areas where the 16 existing generators are located.
- Alternative 5 – Replace 16 existing generators "in-kind", but also install a second redundant emergency generator at each building to ensure redundant backup power for each building. This alternative was eliminated from further consideration; it would not eliminate or minimize noise, vibration, odor, and particulate risk to several sensitive research areas, it would not reduce the potential for environmental impacts from possible fuel or oil spills during generator operation and maintenance, and it would not enhance planning for future MIT LL facilities expansion by freeing up the areas where the 16 existing generators are located.

ENVIRONMENTAL CONSEQUENCES

The Environmental Assessment (EA), incorporated by reference into this finding, analyzes the potential environmental consequences of activities associated with the construction of a new Generator Building 1 at MIT LL on HAFB and the decommissioning of 16 stationary and mobile emergency backup generators located throughout the MIT LL campus, and provides environmental protection measures to avoid or reduce adverse environmental impacts. The EA considers all potential impacts of Alternative 1 and the No-Action Alternative. The EA also considers cumulative environmental impacts with other projects in the Region of Influence. The analyses of the affected environment and environmental consequences of implementing the Preferred Alternative presented in the EA concluded that by implementing standing environmental protection measures, the USAF would be in compliance with all terms and conditions and reporting requirements stipulated by the United States Fish and Wildlife Service (USFWS), and with the conditions stipulated in the Programmatic Agreement (PA) between the HAFB and the Massachusetts State Historic Preservation Office regarding the management of historic properties at HAFB. The USAF has concluded that implementation of the Preferred Alternative would not affect the following resources:

- Air Installation Compatible Use Zone
- Land Use

- Socioeconomics
- Environmental Justice and Protection of Children
- Public Services

The USAF has concluded that no significant adverse effects would result to the following resources from implementation of the Preferred Alternative:

Noise (EA§ 3.4.1, pages 3-4 to 3-6; § 4.2, pages 4-1 to 4-2): The generator building would provide enough sound-suppression to meet UFC 3-450-01 (Noise and Vibration Control), Massachusetts (310 CMR 7.10), and local municipality noise requirements. Implementation of the Proposed Action is expected to comply with the applicable requirements and has been approved by MassDEP. Short-term increases in noise would occur during construction of Generator Building 1 and the associated electrical feeders. No significant long-term noise impacts would be experienced because of the Proposed Action.

Air Quality (EA § 3.4.2, pages 3-7 to 3-9; § 4.3, pages 4-3 to 4-5): The new backup generators are expected to be more efficient and have more stringent air emission controls than the existing generators. Therefore, implementation of the Proposed Action is expected to result in a net emissions decrease compared to the existing conditions. The short-term emissions from construction of Generator Building 1 would not increase air pollutants to levels that exceed regulatory thresholds in the region, and impacts would be short-term in nature. The emissions would be temporary, localized, and eliminated after the activity is completed. These emissions would quickly dissipate as they are transported from the activity source, thereby preventing significant contribution to cumulative impacts on air quality.

Water Resources and Water Quality (EA § 3.4.3, pages 3-9 to 3-11; § 4.4, pages 4-5 to 4-6): No groundwater features, surface water features, wetland resources, or floodplains are present within the footprint of the Proposed Action. Therefore, it is not anticipated that construction activities would directly affect these resources. However, construction of Generator Building 1 would present a temporary disturbance within a small portion of a 100-foot wetland buffer zone. The area of the wetland buffer zone that would be affected is currently a paved asphalt parking lot; therefore, no natural habitats are present within the area that would be disturbed by the Proposed Action. During construction, all activities would be conducted in accordance with best management practices (BMPs) to prevent adverse effects to the identified wetland north of the Proposed Action site as well as to the receiving water (that is, Shawsheen River) into which the stormwater system discharges.

Hazardous Materials and Solid Waste (EA § 3.4.4, pages 3-11 to 3-14; § 4.5, pages 4-6 to 4-8): Construction of Generator Building 1 would result in minor, short-term, adverse, direct impacts from the temporary storage, use, and generation of hazardous materials. Hazardous materials used or generated during construction that are not recycled, would be collected onsite and turned in regularly to the MIT LL's Hazardous Waste program, to be disposed of through a contracted hazardous waste hauler, in accordance with MIT LL policies and protocols and all applicable state and federal regulations. The Proposed Action would also result in a long-term beneficial impact by reducing the number of refueling points for generators (and thus the possibility for accidental fuel spills) on the MIT LL campus from 16 to 3 locations.

Biological Resources (EA § 3.4.5, pages 3-15 to 3-16; § 4.6, pages 4-8 to 4-9): The Proposed Action will have no known negative impacts on any federal or state threatened or endangered species, in particular the northern long-eared bat (NLEB) found in Massachusetts. Recent acoustical surveys and studies within the boundaries of HAFB failed to indicate presence of the NLEB and showed that no trees that provide habitat, potential maternity roost, or hibernaculum for the NLEB are located within the vicinity. The USAF has determined that proposed undertakings within the boundaries of HAFB

would have "no effect" on the NLEB. This determination is documented in a memorandum for record (USAF, 2018), which is included in Appendix C of the EA. Therefore, no effect on NLEB is anticipated. Moreover, tree removal is not proposed as part of the project; therefore, any potential impacts to NLEB are minimized.

Topography, Geology, and Soils (EA § 3.4.6, pages 3-16 to 3-17; § 4.7, pages 4-9 to 4-10): The Proposed Action would result in negligible, long-term changes in topography from changing the existing grades in the existing parking lot to move the curb cut for the parking lot. The Proposed Action would result in a negligible, long-term impact to subsurface geology from construction activities. Approximately 12,917 square feet of pervious lawn areas would be excavated to allow installation of concrete duct banks containing the electrical feeders to distribute electricity from the generator building to the utility closets in the support facilities. The excavation activities would result in a minor impact on topsoil in these areas. The soils and the vegetation would be restored upon the completion of construction resulting in no long-term impacts.

Energy Use and Infrastructure (EA § 3.4.7, pages 3-17 to 3-18; § 4.8, pages 4-10 to 4-11): The Proposed Action would result in a minimal-medium beneficial impact to the MIT LL campus because the generator consolidation would provide a more reliable source of backup power. Construction activities would result in a short-term increase in demand for electricity, sewage treatment, and water supply. Operation of Generator Building 1 is anticipated to pose a minor increased demand for, and use of, electricity at MIT LL. However, no potable water would be needed, nor would wastewater be generated from operation of Generator Building 1. In addition, no natural gas, chilled water, or steam would be required for operation of the generator building.

Safety and Occupational Health (EA § 3.4.8, page 3-19; § 4.9, pages 4-11 to 4-12): Implementation of the Proposed Action would have beneficial effects by eliminating accumulated odors and particulate risk to several sensitive research areas by allowing the decommissioning of the 16 smaller generators located throughout the MIT LL campus, potentially decreasing the safety risk to personnel. Construction activities would comply with all applicable federal, state, local, and applicable AF regulatory safety standards. Therefore, no significant short-term safety and occupational health concerns would be experienced because of implementing the Proposed Action.

Cultural Resources (EA § 3.4.9, pages 3-19 to 3-20; § 4.10, pages 4-12 to 4-13): No evidence of Native American human remains or associated funerary objects are present at the site of the Proposed Action and there are no known traditional cultural properties present. Because of the location and developed nature of the site, intact deposits are unlikely. Should an inadvertent discovery of unknown cultural resources be found during construction of Generator Building 1, all work at the site would cease and the site would be protected until an evaluation by the HAFB Cultural Resource Manager is completed and any necessary coordination or consultation with the Massachusetts State Historic Preservation Officer (SHPO) and affiliated tribes has taken place. In addition, the Proposed Action would have No Adverse Effect on historical resources.

Transportation and Traffic (EA § 3.4.10, page 3-20; § 4.11, page 4-13): The Proposed Action would have negligible, adverse, long-term, direct impacts on this resource because of the loss of approximately 20 parking spaces in the paved parking area where Generator Building 1 would be constructed. The construction and operation of Generator Building 1 would also result in negligible, short-term, adverse impacts on traffic due to the increased traffic from construction vehicles and trucks during construction activities. However, the Proposed Action (1) would not result in an increase in the workforce population and (2) would not have significant impacts on transportation or traffic on HAFB or the MIT LL main

campus. The Proposed Action does not include any changes to traffic patterns, road access to MIT LL, nor an increase in personnel. Therefore, no impacts are expected.

PUBLIC REVIEW / INTERAGENCY COORDINATION

A notice of availability was published in the The Hansconian, Bedford Minuteman, Lexington Minuteman, and Concord Journal on XX XX, 2021, inviting the public to review the Draft EA and draft Finding of No Significant Impact (FONSI) for a 30-day comment period. In addition, the USAF issued a press release on XX XX, 2021 announcing the availability of the Draft EA & FONSI. Copies were posted to the HAFB public facing website for download and review. The public comment period closed on January 15, 2022 and XX comments were received. In consideration of lengthy closures of local public libraries and other public meeting places as well as challenges associated with an increasingly-overburdened internet due to the coronavirus (COVID-19) pandemic had on the traditional methods of releasing documents for public review, the USAF encouraged members of the public and all interested stakeholders to contact HAFB directly by email or telephone to discuss and resolve issues involving access to the Draft EA & FONSI or the ability to comment. The USAF received no such request(s) for assistance.

FINDING OF NO SIGNIFICANT IMPACT

Based on my review of the facts and analysis summarized above and contained within the findings of the EA, I find the proposed decision to implement the Preferred Alternative will not have a significant impact on the natural or human environment; therefore, an environmental impact statement is not required. This analysis fulfills NEPA, the President's Council on Environmental Quality 40 CFR §§1500 – 1508, the Air Force regulation 32 CFR §989 and Executive Orders 11988, Floodplain Management and 11990, Protection of Wetlands.

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SIGNATORY NAME, Rank/Title DATE

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

$\mu g/m^3$	microgram(s) per cubic meter
AFI	Air Force Instruction
AFMAN	Air Force Manual
AFOSH	Air Force Occupational Safety and Health
amsl	above mean sea level
BMP	best management practices
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	*Code of Federal Regulations*
CMR	Code of Massachusetts Regulations
CO	carbon monoxide
CSL/MIF	Compound Semiconductor Laboratory/Microelectronics Integration Facility
CWA	Clean Water Act
dBA	A-weighted decibels
DoD	Department of Defense
EA	Environmental Assessment
EHS	Environmental Health and Safety
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
ERP	Environmental Restoration Program
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973
ESPR	Environmental Science and Pollution Research
FEMA	Federal Emergency Management Agency
FFRDC	federally funded research and development center
FONSI	Finding of No Significant Impact
GEIR	Generic Environmental Impact Report
GHG	greenhouse gas
HAFB	Hanscom Air Force Base
IPaC	Information for Planning and Conservation
kW	kilowatt
LL	Lincoln Laboratory
MassDEP	Massachusetts Department of Environmental Protection
MassGIS	Massachusetts Geographic Information System
MassWildlife	Massachusetts Division of Fisheries and Wildlife
MHC	Massachusetts Historic Commission
MIT	Massachusetts Institute of Technology
MWRA	Massachusetts Water Resources Authority
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO_2	nitrogen dioxide
NOx	nitrogen oxides
NOA	Notice of Availability
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service

NSR	New Source Review
O_3	ozone
OSHA	Occupational Safety and Health Administration
$PM_{2.5}$	particulate matter less than 2.5 microns in aerodynamic diameter
PM_{10}	particulate matter less than 10 microns in aerodynamic diameter
ppm	part(s) per million, by volume
PV	photovoltaic
ROI	Region of Influence
SARA	Superfund Amendments and Reauthorization Act
SHPO	State Historic Preservation Officer
SO_2	sulfur dioxide
SPCC	Spill Prevention Control and Countermeasure
UFC	Unified Facilities Criteria
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geologic Survey
VHB	Vanasse Hangen Brustlin, Inc.
VOC	volatile organic compound

1.0 PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

The Massachusetts Institute of Technology (MIT) is a private research university located in the Commonwealth of Massachusetts. The MIT Lincoln Laboratory (LL) is a federally funded research and development center (FFRDC), operated and managed by MIT for the U.S. Department of Defense (DoD). MIT operates LL under a prime contract sponsored by the DoD, Office of the Under Secretary of Defense for Research and Engineering.

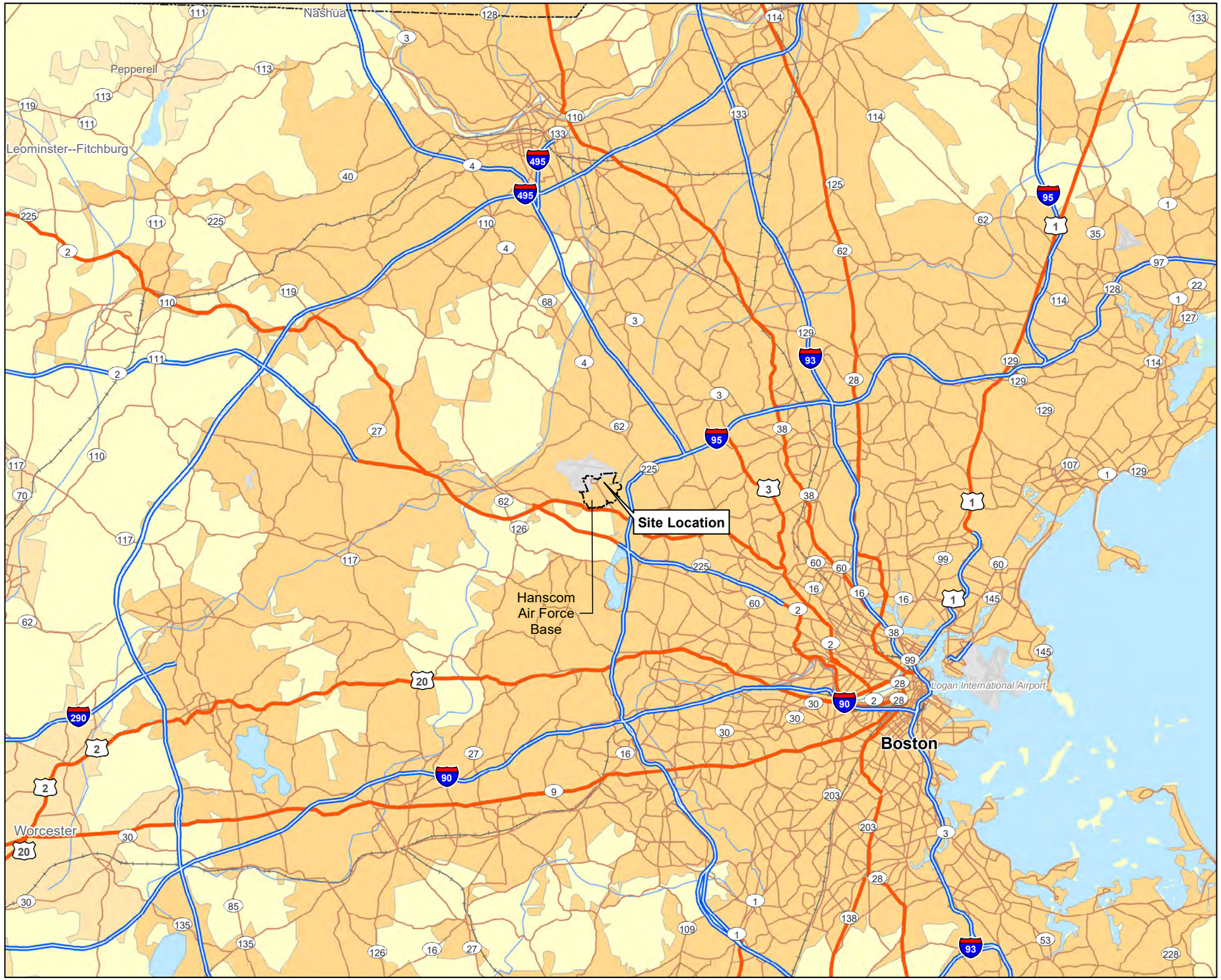
MIT LL's mission is to apply advanced technology to problems of national security that involve research and development activities, with a focus on long-term technology development. Research at MIT LL is aligned within key mission areas, which include projects in air and missile defense, space surveillance technology, tactical systems, biological-chemical defense, homeland protection, communications, and information technology. The areas constituting the core of the work performed at MIT LL involve sensors, information extraction (signal processing and embedded computing), communications, and integrated sensing and decision support, all supported by a broad research base in advanced electronics. MIT LL takes projects from the initial concept stage, through simulation and analysis, to design and prototyping, and finally to field demonstration.

MIT LL's prime contract implies an obligation to provide backup electrical power to protect critical research, in addition to recognized life/safety, building control systems, and security requirements. The critical research requirements include data preservation, ongoing research or prototype fabrication in clean rooms and special environment laboratory spaces, inspection testing, and certification processes. Interruption of commercial power during these operations can result in thousands of hours of lost, delayed, or compromised research, millions in costs, and long schedule delays in the ongoing research programs.

MIT LL is unique among the DoD FFRDCs, operating primarily out of government-owned facilities, with government-owned property and equipment. MIT LL occupies approximately 100 acres on the eastern perimeter of Hanscom Air Force Base (HAFB) in Lexington, Massachusetts, approximately 14 miles northwest of Boston, as shown on Figure 1-1. The majority of MIT LL's facilities are located on U.S. Air Force (USAF) property. The MIT LL property and most of the laboratory's facilities are within the boundaries of Lexington, Massachusetts, as shown on Figure 1-2. Currently, MIT LL facilities include 25 buildings on the Lexington campus, as shown on Figure 1-3.

MIT LL, as a tenant on HAFB, has a mission that has many interrelated parts and thus the operation of backup power generation for critical mission equipment as well as life, health, and safety needs to be considered from a holistic perspective. Depending on the nature of the missions and the need for the laboratory to respond to national needs, different portions of the MIT LL complex are critical at different times. A centralized power generation system that can easily feed the entire complex is needed, rather than the current system of individual building generators that cannot be reconfigured to provide power to the other buildings due to protection relay settings that are not easily reconfigurable. The resiliency of the current backup power system was recently tested in an energy resilience readiness exercise that MIT LL performed in conjunction with HAFB to comply with requirements in Fiscal Years 2019 and 2020 National Defense Authorization Acts and DoD Instruction 4170.11, which requires "full-scale and routine testing of emergency and standby generation systems, infrastructure, equipment, and fuel that support their critical energy requirements. A full-scale test includes operating all associated emergency and standby energy generation systems, infrastructure, equipment, and fuel at full

operational loads while completely separated from the primary source of power." This test, which was done in October 2019, demonstrated instances of generators for critical buildings failing and the power demand could not be provided from generators at other buildings. Centralizing generation assets would allow a lower overall total power output requirement, with a greater redundancy for any particular critical load.



VICINITY MAP

LEGEND

- Hanscom AFB
- State Boundary
- Limited Access
- Highway
- Major Road
- Local Road
- Ramp
- Major Railroad Lines
- Airport Area
- Stream
- Lake
- Reservoir

Urban Areas (Population Density)

- 719 - 241,866
- 241,867 - 1,008,509
- 2,985,723 - 8,299,353

Notes:
Data from ESRI USA Base Map.

N

0 28,000 56,000
Feet

FIGURE 1-1
Site Location
Generator Building 1 MIT Lincoln Laboratory
Environmental Assessment
Hanscom Air Force Base, MA

ch2m

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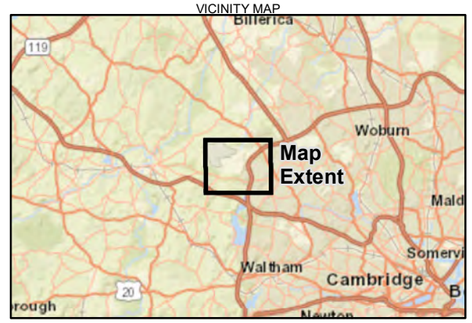
VICINITY MAP



LEGEND

Lincoln Laboratory General Area

Notes:
Imagery from ESRI online map service, Maxar, July 2019.

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0 2,300 4,600
Feet

FIGURE 1-2
Project Location
Generator Building 1 MIT Lincoln Laboratory
Environmental Assessment
Hanscom Air Force Base, MA

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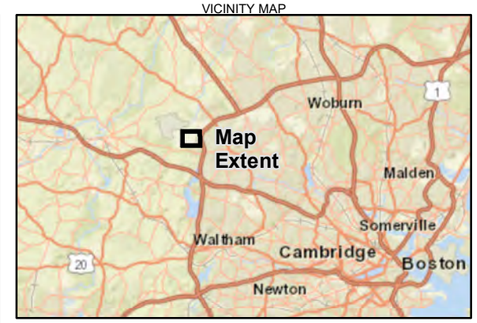
VICINITY MAP



LEGEND

- Hanscom AFB
- Wetland
- MIT buildings

Notes:
Imagery from ArcGIS Online: USGS 1:24,000 topographic maps.

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0 600 1,200
Feet

FIGURE 1-3
MIT Lincoln Laboratory Lexington Campus
Generator Building 1 MIT Lincoln Laboratory
Environmental Assessment
Hanscom Air Force Base, MA

UNK \\BROOKSIDEFILES\GIS_SHARE\ENBG\00_PROJ\M\MIT\MAPS\REPORT\ENVASSESS\FIG01-03_MIT_ENVASSESS_CAMPUS.MXD MCOTTERB 4/3/2020 9:01:24 AM

As an outcome of the tests, it was determined that, a reliable source of backup electrical power is needed because backup power is currently supplied by a combination of stationary and mobile emergency backup generators located throughout the MIT LL campus. The 16 existing generators are scattered throughout the campus at locations near supported facilities. The 16 generators range from 60- to 2000-kilowatt (kW) capacity and have a combined electrical load of approximately 1,900 kW, as shown in Table 1-1; some have been in service for 30 years and the others are nearing 30 years in service. These generators require excessive maintenance due to their age, and have limited parts availability, affecting maintenance and repair and thus jeopardize the ability of MIT LL to protect and conduct critical research during periods of commercial power interruption.

Table 1-1 Standby Loads and Life Safety Loads of the Existing Generators

Building	Number of Existing Generators	Optional Standby Load (kW)	Life Safety Load (kW)	Percentage of Optional Standby Load	Percentage of Life Safety Load
A	1	89	28	76%	24%
B	5	93	20	82%	18%
C	1	234	47	83%	17%
D	2	34	31	52%	48%
E	2	123	10	92%	8%
F	2	787	12	98%	2%
FA	1	42	15	74%	26%
I	0	33	10	77%	23%
J	1	32	20	62%	38%
CWP	1	178	6	97%	3%
Total	**16**	**1645**	**199**	**89%**	**11%**

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to provide a reliable source of redundant backup electrical power, allowing MIT LL to accomplish their mission without disruption to workflow. Please refer to the introduction for description of MIT LL's mission. The Proposed Action will also maintain critical research, security, and building operations functions without interruption during periods of commercial power interruption and during scheduled maintenance of key electrical infrastructure. The Proposed Action is needed to provide a more reliable source of backup electrical power because backup power is currently supplied by the combination of stationary and mobile emergency backup generators located throughout the MIT LL campus.

1.3 ENVIRONMENTAL COMPLIANCE OVERVIEW

1.3.1 National Environmental Policy Act

The National Environmental Policy Act (NEPA) is a federal statute requiring the identification and analysis of potential environmental impacts associated with proposed federal actions before actions are taken. The intent of NEPA is to help make well-informed decisions based on an understanding of the potential environmental consequences, and take actions to protect, restore, or enhance the environment. The Council on Environmental Quality (CEQ) process for implementing NEPA is codified in *Code of Federal Regulations* (CFR) Title 40, Sections 1500–1508 (CEQ, 2020). The USAF's implementing regulation for NEPA is 32 CFR 989, providing a framework for how to implement CEQ regulations and achieve the goals of NEPA within USAF.

In compliance with NEPA, USAF will decide if the preparation of an EA is the appropriate level of USAF's Environmental Impact Analysis Process (EIAP) for the Proposed Action described in Section 2.1. The EA would determine whether the Proposed Action might result in significant impacts. If significant impacts were predicted, USAF would decide whether to mitigate the impacts to less than significant, undertake the preparation of an environmental impact statement (EIS), or abandon the Proposed Action. The EA also would be used to guide USAF in implementing the Proposed Action, in a manner consistent with USAF standards for environmental stewardship should the Proposed Action be approved for implementation.

1.3.2 Interagency and Intergovernmental Coordination and Consultation

Federal, state, and local agencies with jurisdiction possibly affected by the alternative actions were notified and consulted during the development of this EA.

Environmental permitting requirements for all work on HAFB are coordinated through the Civil Engineering - Environmental Department. A Base Civil Engineering Work Clearance Request, known as a dig permit, is necessary for any work that may disrupt vehicular traffic flow, base utility services, protection provided by fire or intrusion alarm systems, or routine activities of the installation.

The Proposed Action may require the following federal and commonwealth permits/approvals:

- Massachusetts Department of Environmental Protection (MassDEP)–National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit: The NPDES stormwater program requires a permit for discharges from construction activities that (1) disturb one or more acres or (2) will disturb less than one acre of land and discharges are part of a larger common plan of development or scale. Construction stormwater permits include effluent limits for erosion and sediment control, pollution prevention, and site stabilization.
- MassDEP–Air Plan Approval: MIT LL currently has a Non-Major Comprehensive Air Quality Plan Approval (NE-14-009) issued by the MassDEP on June 2, 2015. This Plan Approval covers emissions from both combustion equipment and process sources and establishes monthly and annual facility-wide emission limitations for nitrogen oxides (NOx), carbon monoxide (CO), volatile organic compounds (VOCs), hazardous air pollutants, particulate matter, and sulfur dioxide. The Proposed Action is authorized by a new Air Quality Plan Approval (NE-19-014) that was issued on November 5, 2019.
- MassDEP Noise Policy: MassDEP's policy for implementing its noise regulation [Code of Massachusetts Regulations (CMR) Title 310, Section 7.10] is contained in its Air Quality Policy 90-001. This policy states that a source of sound will be considered to be violating the

department's noise regulations if the source: (1) increases the broadband sound level by more than 10 decibels acoustic (dBA) above ambient sound levels (typically assessed by MassDEP using the L_{90} metric, the sound level exceeded 90% of the time); or (2) produces a "pure tone" condition, which is when any octave band center frequency sound pressure level exceeds the 2 adjacent frequency sound pressure levels by 3 decibels or more.

- Massachusetts Historic Commission (MHC)–Project Notification Form.
- Massachusetts Division of Fisheries and Wildlife (MassWildlife): Coordinate review, if state-listed threatened or endangered species are present.
- U.S. Fish and Wildlife Service (USFWS): Coordinate review, if federally listed threatened or endangered species are present.
- Lexington Conservation Commission: Review of the Proposed Action pursuant to the Massachusetts Wetland Protection Act. The Proposed Action was approved by the Conservation Commission on January 6, 2020 and an Order of Conditions for the project was mailed to MIT LL on May 21, 2020.

1.3.3 Applicable Environmental Regulations and Requirements

NEPA requires federal agencies to consider the environmental effects of, and any alternatives to, all proposals for federal actions that could affect the quality of the human and natural environment. Various federal and commonwealth regulatory programs or federal executive orders that may govern activities associated with the Proposed Action include the following:

- 2018 INSTALLATION ENERGY ASSURANCE CAMPAIGN PLAN, *DOING THE RIGHT THINGS FOR THE RIGHT REASONS*
- Air Force Instruction 32-7001, *Environmental Management*
- Air Force Instruction 32-7020, *Environmental Restoration Program*
- Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*
- Air Force Manual 32-7003, *Environmental Conservation*
- Air Force Instruction 32-1015, *Integrated Installation Planning*
- Air Force Instruction 32-1001, *Civil Engineer Operations*
- Air Force Manual 32-1067, *Water and Fuel Systems*
- Air Force Instruction 90-2002, *Air Force Interactions with Federally- Recognized Tribes*
- Air Force Manual 91-203, *Air Force Occupational Safety, Fire and Health Standards*
- Archaeological Resources Protection Act
- Clean Air Act (CAA)
- Clean Water Act (CWA)
- Comprehensive Environmental Response, Compensation, and Liability Act
- Endangered Species Act of 1973 (ESA)
- Executive Order (EO) 11990, Protection of Wetlands
- EO 11988, Floodplain Management

- EO 12372, Intergovernmental Review of Federal Programs, as amended by EO 12416
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks
- Massachusetts Clean Waters Act
- Massachusetts Endangered Species Act
- Massachusetts Wetland Protection Act
- National Historic Preservation Act (jointly administered with the MHC)
- Occupational Safety and Health Administration (OSHA) regulations
- Pollution Prevention Act of 1990
- Resource Conservation and Recovery Act
- Toxic Substances Control Act of 1970

NEPA-implementing regulations require coordination with relevant federal, state, and local agencies to aid in the evaluation of the potential environmental impacts of implementing the Proposed Action. MIT LL and USAF are coordinating with regulatory agencies, including MassWildlife's Natural Heritage and Endangered Species Program, Massachusetts Historical Commission, USFWS, and the Lexington Conservation Commission.

Scoping letters were provided to relevant federal, state, and local agencies, notifying them MIT LL and USAF are preparing an EA and asking them to provide information that should be included as part of the environmental analysis. Appendix A of the EA lists the agencies consulted and provides a copy of the correspondence.

1.3.4 Government-to-Government Consultations

The National Historic Preservation Act Section 106, and its implementing regulations at 36 CFR Part 800 and 54 USC § 300101, et. Seq., requires federal agencies to engage in government-to-government consultation with federally recognized tribes to identify traditional cultural properties present in the project area and resolve adverse effects. Air Force Instruction 90-2002 directs the Air Force to conduct consultation with federally recognized Indian/Alaska Native tribes, bands, nations, pueblos, or communities. To comply with legal mandates, federally recognized tribes affiliated historically with the HAFB geographic region are invited to consult on all proposed undertakings that have a potential to affect properties of tribal cultural, historical, or religious significance. The tribal coordination process is distinct from NEPA consultation or the Interagency/Intergovernmental Coordination for Environmental Planning processes and requires separate notification of all relevant tribes. The timelines for tribal consultation are also distinct from intergovernmental consultations. The HAFB point of contact for Native American tribes is the Installation Commander. The HAFB point of contact for consultation with the Tribal Historic Preservation Officer and the Advisory Council on Historic Preservation is the Cultural Resources Manager.

The Native American tribal governments consulted on regarding this action are listed in Appendix A of the EA.

1.4 PUBLIC AND AGENCY REVIEW OF THE ENVIRONMENTAL ASSESSMENT

NEPA requirements help ensure environmental information is made available to the public during the decision-making process and prior to an action's implementation. A premise of NEPA is that the quality of federal decisions will be enhanced if the public is involved in the planning process. EO 12372, Intergovernmental Review of Federal Programs, requires federal agencies to provide opportunities for consultation by state and local government-elected officials that would be directly affected by a federal proposal.

A Notice of Availability (NOA) for the Draft EA and Finding of No Significant Impact (FONSI) was published in the newspapers of records (listed as follows), announcing the availability of the Draft EA for review on (INSERT DATE). The NOA invited the public to review and comment on the Draft EA. The public and agency review period ended on (January 15, 2022). A copy of the NOA is provided in Appendix B. Public comments received are also provided in Appendix B.

The NOA was published in the following newspapers:

- The Hansconian, HAFB, Bedford, Massachusetts
- Bedford Minuteman, Bedford Massachusetts
- Concord Journal, Concord, Massachusetts
- Lexington Minuteman, Lexington, Massachusetts

Copies of the Draft EA and FONSI were posted to the HAFB public facing website for download and review at the following location:

https://www.hanscom.af.mil/About-Us/Fact-Sheets/Display/article/379486/civil-engineering/

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This chapter presents information on the Proposed Action and alternatives to provide a reliable source of redundant backup electrical power for MIT LL to accomplish their mission without disruption to workflow, and while maintaining critical research, security, and building operations functions without interruption during periods of commercial power interruption and during scheduled maintenance of key electrical infrastructure. The Proposed Action would involve the construction of a new generator building (Generator Building 1) at MIT LL on HAFB and the decommissioning of 16 aging and difficult to maintain generators with declining reliability currently in use at MIT LL.

- Section 2.2 provides a detailed description of the Proposed Action.
- Section 2.3 describes the process used to identify and evaluate potential alternatives to the Proposed Action.
- Section 2.4 describes those alternatives considered and eliminated from further evaluation.
- Section 2.5 discusses the No Action Alternative, which would result in not constructing the new generator building and would require MIT LL to continue to use the mix of old, inefficient generators. While the No Action Alternative would not satisfy the purpose of or need for the Proposed Action, it is included for analysis in accordance with CEQ and USAF regulations for implementing NEPA.

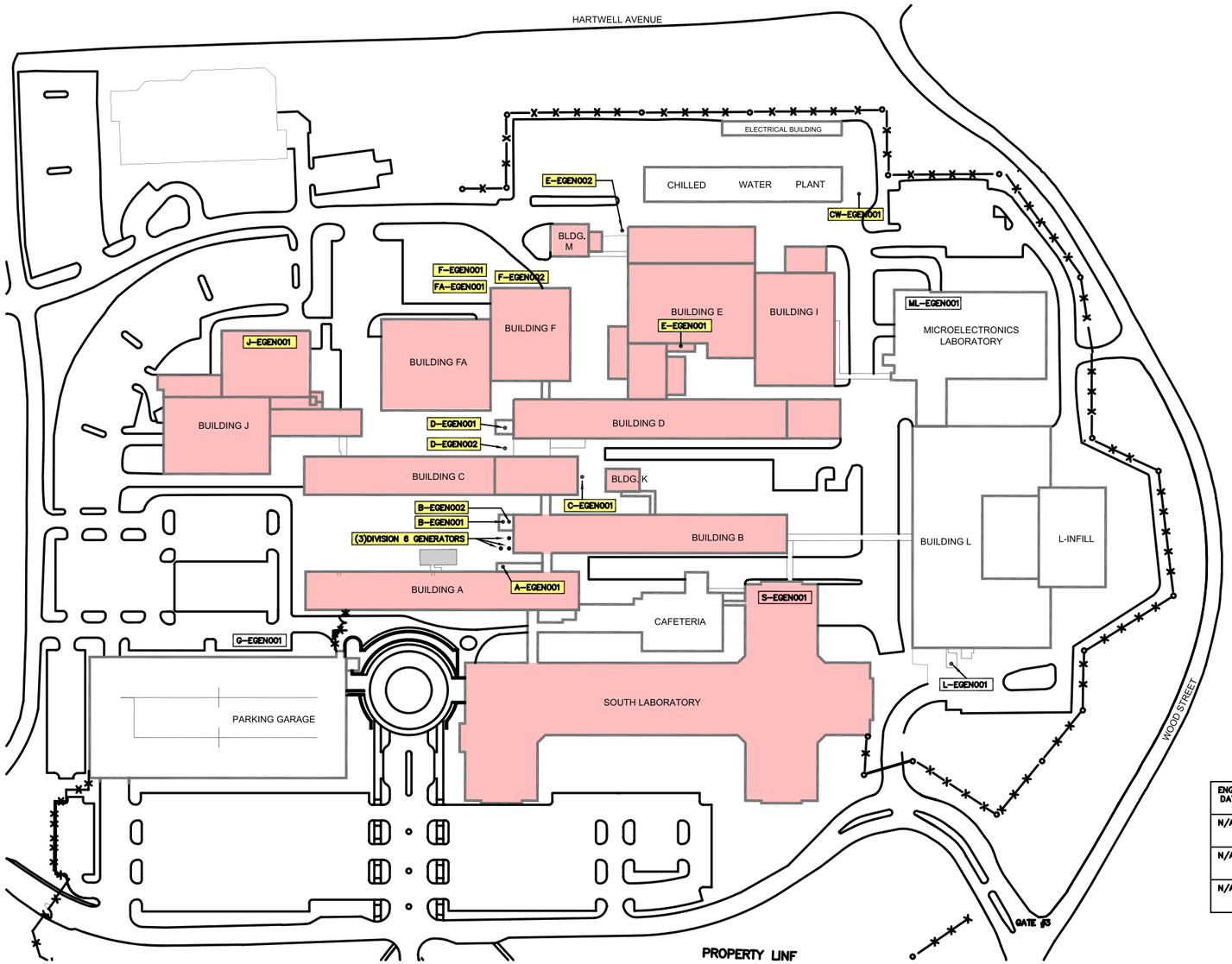
2.2 PROPOSED ACTION

The Proposed Action is to construct Generator Building 1 at MIT LL on land that the Air Force intends to lease to MIT/LL, consolidating backup power capacity in the northern industrial area of the MIT LL complex, near the primary electric service, which would eliminate odor and particulate risk to several sensitive research areas by allowing the decommissioning of the 16 smaller generators located throughout the campus, as shown on Figure 2-1. The Proposed Action would provide the redundant backup power needed by MIT LL to support uninterrupted critical research, security, and building operations functions during periods of commercial power interruption and during scheduled maintenance of key electrical infrastructure. The backup power would be “N+1”, which means that there is power backup in place should any single system component fail.

The generator building would consist of three 1,000-kW backup diesel generators with space to add an additional two 1,000-kW diesel generators, if additional backup power capacity is needed in the future as MIT LL continues to replace/renovate aging buildings throughout the campus. The generators would comply with U.S. Environmental Protection Agency (EPA) Tier-4 Final Standard to satisfy federal standards for non-emergency operation and have been permitted by MassDEP for 500 hours of non-emergency operation annually for each generator. The Proposed Action would include construction of a new building to house the generators, automatic transfer switch(s), and the switch gear, and would provide radial feeds from the generators to buildings that require critical backup power. The generator building would support year-round maintenance and operations and would provide enough sound-suppression to meet Unified Facilities Criteria (UFC) 3-450-01 (Noise and Vibration Control), Massachusetts (310 CMR 7.10), and local municipality noise requirements. Lexington’s noise limits (Chapter 80 of the Code of Lexington) are consistent with the MassDEP noise requirements.

The diesel generators would be housed in a new one-story building that would include exhaust vent stacks for each generator. The generator building would include individual 3,500-gallon dual-walled, diesel fuel storage tanks for each generator, which would be located inside the building and installed underneath each generator and below grade.

Approximately 36,111 square feet of impervious areas (pavement and sidewalks) and 12,917 square feet of pervious lawn areas would be excavated to allow installation of concrete duct banks containing 12 independent electrical feeders to distribute electricity from the generator building to the utility closets in Buildings 1302 (Building A) through 1324 (Building F), 1331 (Building I), 1326 (Building J), and Building 1310 (Building ML). Easements would be established to allow MIT LL to install the concrete duct banks and electrical feeders. The excavated areas would be backfilled with soil from the excavation areas and restored to pre-construction condition, with pavement and sidewalks repaved and lawn areas replanted. Excavation work would be done in accordance with HAFB best management practices (BMPs) for stabilizing soils and minimizing erosion.



MAIN BUILDING GROUP

SCALE: 1" = 100'-0"

EXISTING DIESEL GENERATORS AT MIT/LINCOLN LABORATORY – MAIN BUILDING GROUP

ENGINEERING DATA BASE	SAP EQUIP. NO.	LOCATION CODE	LOCATION DESCRIPTION	AREA SERVED	MANU-FACTURER	SERIAL NO.	MODEL NO.	DATA				INTALL DATE	BATTERY	FUEL FILTER	OIL FILTER	OIL CAP	HOURS	COMMENTS
								KW	KVA	VOLT	AMPS							
A-EGEN001	10004276	A-OU28	A-BSMNT A-0	BLDGS. A, B & CAFE	ONAN	B860799383	250.0DVG-17R/29048A	250	312.5	208/120	868	1985	QTY 2 8D	3522	1669	32	875	
B-EGEN001	10004285	B-110D	B-1	B-110 TELECOM EQUIP.	ONAN	L820643263	100-0DYC-15R/18	100	125	208/120	347	1981	QTY 2 8D	3351	QTY 2 1796	20	989.6	
B-EGEN002	10004286	B-110D	B-1	B-110 TELECOM EQUIP.	ONAN	L820643262	100.0DYC-15R/18	100	125	208/120	347	1981	QTY 2 8D	3351	QTY 2 1796	20	948.6	
C-EGEN001	10004289	C-XGEN	C-X	C-110	ONAN	B940533598	60DGCB	60	75	208/120	208	1993	QTY 2 27-LTV	3357 3358	1602	10	771	
CW-EGEN001	10004290	CW-XGEN	CW-X	CW PLANT	ONAN GENSET	J900355783	250DFEBE/39858F	250	312	480	376	1989	QTY 2 8D	2 3115	1748	38	211	
D-EGEN001	10004291	D-1X10	D-1	BLDGS. C & D	ONAN	B860799382	250.0DVG-17R/29048A	250	312	208	867	1985	QTY 2 8D	3522	1669	30	507	
D-EGEN002	10004340	D-XGEN	D-X	C-409	CUMMINS PWR. GEN.	I020415523	DGFA-5568757	150	187.5	480	225		QTY 2 27-LTV	3357 3358	1748	20	96	
E-EGEN001	10004292	E-1U02	E-1	BLDGS. E & I	ONAN	B860799385	250.0DVG-17R/29	250	312.5	208	867	1985	2 8D-225	3522	1669	32	675	
E-EGEN002	10004293	E-XGEN	E-X	E-118 & E-124 GR. 87	ONAN	B890209616	100DGDBL32427A	100	125	208/120	347	1988	2 27-LYV	3357 3358	1607	20	315	
F-EGEN001	100008163	F-XGEN	F-X	BLDG FA	CUMMINS PWR. GEN.	F030516440	DGFC-5627228	200	250	480	300.7	2004	2 4D	3406	7746XD	38	51	
F-EGEN002	100009019	F-XGEN	F-X	BLDG. F-1 DATA CENTER	CATERPILLER INC.		AA 3516 U04072E	2000	2500	480	3000	2004						
FA-EGEN001	100007894	FA-XGEN	FA-X	LIFE SAFETY BLDG. FA,F	CUMMINS PWR. GEN.	A050735766	DQAF-5701402	300	375	480	451.1	2002	2 31	3357 3358	1748	20	192	
G-EGEN001	10004297	G-XGEN	G-X	PARKING GARAGE	GENERAC CORP.		92A024275	20	25	480	30	1991	1 27-ITV	3166	1334	5	847	
J-EGEN001	10004299	J-031	J-0	BLDG. J	ONAN	A860793695	100.0DVC-15R/29053A	100	125	208/120	347	1985	2 4D	3519	1444	30	396	
L-EGEN001	10004303	L-1X26	L-1	BLDG. L	ONAN	A860793694	100.0DVC-15R/2	100	125	208	347	1985	2 4D	3519	1444	30	570	
ML-EGEN001	10004304	ML-120	ML-1	BLDG. ML	CATERPILLER INC.	81211263	SR4	500	625	480	750	2000	QTY 2 8D	QTY 2 3384	QTY 2 1792	68	192	
S-EGEN001	10004310	S0-654	S-0	BLDG. S	CATERPILLER INC.	5UA01990	SR4	800	1000	480	1200	1999	QTY 2 8D	3384	QTY 2 1792	200	156	

Legend:

Generators that would be decommissioned

EXISTING DIESEL (DIVISION 6) GENERATORS AT MIT/LINCOLN LABORATORY – MAIN BUILDING GROUP

ENGINEERING DATA BASE	SAP EQUIP. NO.	LOCATION CODE	LOCATION DESCRIPTION	AREA SERVED	MANU-FACTURER	SERIAL NO.	MODEL NO.	DATA				INTALL DATE	BATTERY	FUEL FILTER	OIL FILTER	OIL CAP	HOURS	COMMENTS
								KW	KVA	VOLT	AMPS							
N/A	N/A	B-XGEN	B-X	B-109 & B-209	STAMFORD	M05B072203-2	-	56	70	208/120	-	-	-	-	-	-	-	LABELED GENERATOR 1
N/A	N/A	B-XGEN	B-X	B-109 & B-209	STAMFORD	M05B072203-1	-	56	70	208/120	-	-	-	-	-	-	-	LABELED GENERATOR 2
N/A	N/A	B-XGEN	B-X	B-109 & B-209	KATO	55753-1	40 S09E	40	50	208/120	-	-	-	-	-	-	-	LABELED GENERATOR 3

FIGURE 2-1
Locations of Existing Generators
Environmental Assessment for
Generator Building #1 at MIT LL
Hanscom Air Force Base, MA

2.3 SELECTION STANDARDS FOR ALTERNATIVES

The NEPA and the CEQ regulations mandate the consideration of reasonable alternatives for the Proposed Action. "Reasonable alternatives" are those that also could be utilized to meet the purpose of and need for the Proposed Action. Per the requirements of 32 CFR 989, USAF EIAP regulations, selection standards are used to identify alternatives for meeting the purpose and need for USAF action. The Proposed Action alternatives must meet the following selection standards:

1) Provide redundant backup power for mainly backup functions that require N+1 redundant capacity to ensure operational integrity as authorized by Air Force Instruction (AFI) 32-1062 to meet critical required research missions, with a small portion of capacity also dedicated to emergency life safety power.
2) An alternative should comply with the Air Force's anti-terrorism/force protection requirements (AFI 10-245 and UFC 4-010-01) to ensure MIT LL's critical research mission is protected. Any land acquisition must include sufficient buffer space around the entire perimeter of property adjacent to public property.
3) Reduce the impact of generators on sensitive research facilities and employees work environment by eliminating or minimizing noise, vibration, odor, and particulate impacts to sensitive research areas by locating backup power facilities away from sensitive research areas.
4) Reduce potential for environmental impacts associated with generator operations and maintenance.
5) Manage land use to support MIT LL's long-term Facilities Modernization Plan, which envisions segregating selected utilities away from areas earmarked for research and the supporting facilities. These utilities include centralized heating and cooling plants, and backup generators in industrial zones.

2.3.1 Screening of Alternatives

The following potential alternatives that might fulfill the purpose and need for the action to provide backup redundant power for MIT LL's critical research mission were considered:

- Alternative 1 – Construct a new generator building (Generator Building 1) at MIT LL on land that the Air Force intends to lease to MIT/LL, which is on the existing paved parking lot adjacent to the electrical building on the north side of Schilling Circle across from Building F. The generator building would include three 1,000-kW backup diesel generators with space to add an additional two 1,000-kW backup diesel generators when additional backup power capacity is required to serve new buildings specified in the MIT LL Facilities Master Plan. The generator building would include an automatic transfer switch, and the switch gear would provide radial electrical feeds from the generators to buildings that require critical backup power.
- Alternative 2 – Construct the generator building on land that the Air Force would lease to MIT/LL on the lawn area just north of Building FA, which is located across the road to the southeast of the proposed location for Alternative 1.
- Alternative 3 – Purchase or lease property outside HAFB for the construction of the generator building, which would be owned and operated by MIT LL.

- Alternative 4 – Replace the 16 existing generators "in-kind", by buying or leasing 16 new generators of the same capacity and in the same locations.
- Alternative 5 – Replace 16 existing generators "in-kind", but also install a second redundant emergency generator at each building to ensure redundant backup power for each building.

The selection standards described in Section 2.2 were applied to these alternatives to determine which alternative(s) would fulfill the purpose and need for the action. Table 2-1 compares the alternatives to the selection standards to show why the alternatives were either carried forward for further analysis or eliminated from analysis.

Table 2-1 Alternative Screen Using Selection Standards

Alternative	Standard 1	Standard 2	Standard 3	Standard 4	Standard 5
1	Y	Y	Y	Y	Y
2	Y	Y	Y	Y	N
3	Y	N	Y	Y	Y
4	N	Y	N	N	N
5	Y	Y	N	N	N

Green Y = meets selection standard
Red N = does not meet selection standard

2.4 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

Of the six alternatives that were considered, only one (Alternative 1) meets the purpose and need and all the selection standards. The following four alternatives have been eliminated from further consideration:

- Alternative 2 – Construct the generator building on the lawn area just north of Building FA, which is located across the road to the southeast of the proposed location for Alternative 1. This alternative was eliminated from further consideration because as master planning evolved, the area north of Building 1332 (FA Building) was reserved for future buildings per the MIT LL Facilities Master Plan, and a Facilities Master Plan requirement to keep "industrial facilities" (for example, chilled water production, primary electrical service, life safety, backup power generation, and similar) separated where possible from the main research and office facilities.
- Alternative 3 – Purchase or lease property off HAFB for the construction of the generator building. This alternative was eliminated from further consideration because it would not meet USAF anti-terrorism/force protection requirements (AFI 10-245 and UFC 4-010-01) and increases the possibility of interruption in the generation and distribution of electricity needed to meet MIT LL's critical research mission as required by MIT LL's FFRDC contract with the Office of the Under Secretary of Defense for Research and Engineering.
- Alternative 4 – Replace the 16 existing generators "in-kind" with 16 new generators of the same capacity and in the same locations. This alternative was eliminated from further consideration; it would not eliminate or minimize noise, vibration, odor, and particulate risk to several sensitive research areas, it would not reduce the potential for environmental impacts from possible fuel or oil spills during generator operation and maintenance, and it would not

enhance planning for future MIT LL facilities expansion by freeing up the areas where the 16 existing generators are located.

- Alternative 5 – Replace the 16 existing generators "in-kind" with 16 new generators of the same capacity and in the same locations, but also add a second redundant emergency generator at each building to ensure redundant backup power for each building. This alternative was eliminated from further consideration; it would not eliminate or minimize noise, vibration, odor, and particulate risk to several sensitive research areas, it would not reduce the potential for environmental impacts from possible fuel or oil spills during generator operation and maintenance, and it would not enhance planning for future MIT LL facilities expansion by freeing up the areas where the 16 existing generators are located.

These alternatives are not carried forward for analysis in this EA.

2.5 DESCRIPTION OF THE NO ACTION ALTERNATIVE

The No Action Alternative serves as the baseline against which the Proposed Action can be evaluated to identify impacts to the natural and built environments. Under the No Action Alternative, Generator Building 1 would not be built, and MIT LL would continue to rely on a mix of aging stationary generators and mobile generators located throughout the campus to supply emergency backup power during periods of commercial power interruptions and backup power during scheduled maintenance of key electrical infrastructure. This approach would not be as efficient and reliable as the backup power provided by the proposed new generator building and would put MIT LL's critical research mission at risk.

3.0 AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This section describes the environmental components that could potentially affect, or be affected by, the Proposed Action and the No Action Alternative. Information gathered from site visits, interviews, existing documentation, and correspondence with federal, state, and local agencies was used to characterize the affected environment.

3.2 SCOPE OF THE ANALYSIS

The scope of this EA includes the actions proposed, alternatives considered, a description of the existing environment, and an evaluation of direct, indirect, and cumulative impacts. This EA addresses the Proposed Action and the No Action alternatives on affected resource areas. Per CEQ regulations (40 CFR 1501.9(f)(1), only those resource areas that apply to the Proposed Action and alternatives were analyzed (CEQ, 2020). Chapter 4 of this EA includes detailed analyses of the following resource areas for potential impacts from implementation of the Proposed Action and No Action Alternative:

- Noise
- Air Quality
- Water Resources and Water Quality
- Hazardous Materials and Solid Waste
- Biological Resources
- Topography, Geology, and Soils
- Energy Use and Infrastructure
- Safety and Occupational Health
- Cultural Resources
- Transportation and Traffic

Initial review of the Proposed Action has determined that following resources would not be impacted by the Proposed Action and, therefore, are not evaluated in detail in this EA:

- Air Installation Compatible Use Zone
- Land Use
- Socioeconomics
- Environmental Justice and Protection of Children
- Public Services

This EA includes a brief description of each resource area that was eliminated from detailed evaluation, along with reasons why that resource is not analyzed in detail.

The information presented in the EA will serve as the basis for deciding whether the Proposed Action would result in: (1) a significant impact to the human and natural environment, requiring a Notice of Intent to prepare an EIS; or (2) no significant effects occurring, in which case, a FONSI would be appropriate. If the execution of the Proposed Action would involve construction in a wetland, as defined in EO 11990, Protection of Wetlands, or action in a floodplain under EO 11988, Floodplain Management, a finding of no practicable alternative would be prepared in conjunction with the FONSI. If this EA were to determine the Proposed Action would significantly degrade the environment, significantly threaten public health or safety, or generate significant public controversy then an EIS would be completed. An EIS involves a comprehensive assessment of project impacts and alternatives, as well as a high degree of

public input. Alternatively, if this EA results in a FONSI, the action would not be the subject of an EIS. The level and extent of detail and analysis in the EA is commensurate with the importance of the environmental issues involved and with the information needs of both the decision-makers and the general public.

3.3 RESOURCES ELIMINATED FROM FURTHER DETAILED ANALYSIS

Analyses of environmental impacts in an EA typically address numerous resource areas that may be affected by implementing a Proposed Action or No Action Alternative. In accordance with NEPA, CEQ, and USAF guidance and regulations, the analysis in the EA focuses on resources that may be impacted by a Proposed Action or No Action Alternative. The following resources were examined and determined to not warrant further consideration in this EA because of their lack of relevance to the alternatives and because no impacts to these resource areas would result from implementing the Proposed Action.

3.3.1 Air Installation Compatible Use Zone

The purpose of the Air Installation Compatible Use Zone program is to achieve compatibility between air installations and neighboring communities by protecting the health, safety, and welfare of civilians and military personnel by encouraging land use which is compatible with aircraft operations. Because the Proposed Action would not have any effect on airfield usage or aircraft operations, the Air Installation Compatible Use Zone program is not applicable and is not analyzed in this EA.

3.3.2 Land Use

Land use defines real property classification and indicates its natural or anthropogenic conditions. The land use is very often codified by local zoning laws and regulations with no national standards. Changes to the land use occur constantly and at many scales and can have specific and cumulative effects on air and water quality, watershed function, generation of waste, extent and quality of wildlife habitat, climate and human health.

MIT LL occupies approximately 100 acres on the eastern perimeter of HAFB. The majority of MIT LL's facilities are on federal property, while 20 of the acres used are MIT LL property. The MIT LL main campus, as well as Katahdin Hill facilities located south of the main campus, are located within the town boundary of Lexington, Massachusetts. HAFB is located approximately 18 miles northwest of Boston, Massachusetts, just outside the Route 128/Interstate 95 circumferential expressway. HAFB occupies approximately 846 acres of federally owned land within the towns of Bedford, Lexington, and Lincoln, all of which are primarily suburban residential communities with commercial centers (MIT LL, 2019). The predominant land uses within the MIT LL main campus are research and development, administrative, industrial, open space, and outdoor recreation.

Under the Proposed Action, the land use would remain the same and would continue to be designated as an administrative area even with the proposed alterations of adding the generator building and support equipment. Because there is no potential to have changes to land use, it is not further analyzed in this EA.

3.3.3 Socioeconomics

Socioeconomics is the relationship between human, social, and economic factors in a region. Socioeconomic indicators that form a basis for analysis include demographics, employment and housing statistics, economic factors, and community services such as schools

and emergency services. Impacts to socioeconomics would be considered significant if a Proposed Action would result in a substantial change to any of these factors.

There would be neither any change to the population or housing conditions in the region by implementing the Proposed Action, nor would there be any impact to community resources such as emergency services or schools. Under the Proposed Action, the construction industry would experience no short-term job growth and a there would no effect on the revenue generated in the surrounding area. The only potential effects would be positive in nature due to the purchase of construction materials, supplies, and worker meals and incidentals. The Proposed Action would not result in the creation of permanent jobs in the area. As a result, the USAF anticipates no significant short or long-term adverse impacts regardless of the alternative selected, therefore, this resource area was not carried forward for detailed analysis.

3.3.4 Environmental Justice and Protection of Children

Per its instructions for the EIAP (32 CFR Part 989) and in accordance with Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, all federal agencies must identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. Per EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, all federal agencies must assess potential environmental health and safety risks that may disproportionately affect children.

According to Massachusetts Geographic Information System (MassGIS) (2020), the towns encompassing HAFB do contain minority populations. However, implementation of the Proposed Action would only affect property within the boundaries of HAFB. Access to the facility is restricted to credentialed professionals who must first obtain access as the visitor's center. Assisted living centers, childcare facilities, or schools do not exist on MIT LL campus. The nearest sensitive receptor is a residential area on Wood Street. This area is approximately 800 feet east of the MIT LL campus, off Hartwell Avenue in Lexington, Massachusetts. As described under Section 4.3, air emissions are not expected to adversely impact human populations. As described in Section 4.9, the Proposed Action is not expected to have significant safety and occupational health impacts. Standard construction-site safety procedures would be followed to minimize potential risks to children's health and safety. Therefore, there would be no adverse impacts to human populations, including minority, low-income, or children under the Proposed Action and Environmental Justice is eliminated from detailed analysis in this EA.

3.3.5 Public Services

Public services are the services provided by the town, city, or county system that support emergency services for a community. Public services include emergency fire and rescue support, as well as police services.

No impact to public services would be expected from the construction and operation of Generator Building 1 at MIT LL because this new facility would not increase the demand for local public services. Implementation of the Proposed Action would have no impact on the availability, capabilities, or capacity of public services available at the MIT LL campus or HAFB. Therefore, public services are not considered further in this EA.

3.4 RESOURCES CARRIED FORWARD FOR DETAILED ANALYSIS

The following resources were determined to warrant consideration because of their potential relevance to the Proposed Action. This section defines each resource, establishes a region of influence (ROI) that is considered during the analysis, and provides information on existing conditions.

3.4.1 Noise

3.4.1.1 Definition of Resource

Acoustics is the study of sound, and noise is defined as unwanted sound. Airborne sound is a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure creating a sound wave.

Table 3-1 Definitions of Acoustical Terms

Term	Definition
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise or sound at a given location. The ambient level is typically defined by the Leq level.
Background Noise Level	The underlying ever-present lower level noise that remains in the absence of intrusive or intermittent sounds. Distant sources, such as traffic, typically make up the background. The background level is generally defined by the L90 percentile noise level.
Sound Pressure Level Decibel	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
A-Weighted Sound Pressure Level (dBA)	The sound level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighted filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
Equivalent Noise Level (Leq)	The average A-weighted noise level, on an equal energy basis, during the measurement period.
Percentile Noise Level (Ln)	The noise level exceeded during n percent of the measurement period, where n is a number between 0 and 100 (for example, L_{90}).

The most common metric is the overall A-weighted sound level measurement that has been adopted by regulatory bodies worldwide. The A-weighting network measures sound in a similar fashion to the way in which a person perceives or hears sound. General consensus indicates A-weighting is appropriate for estimation of the hazard of noise-induced hearing loss. With respect to other effects, such as annoyance, A-weighting is acceptable if largely middle and high frequency noise is present, but if the noise is unusually high at low frequencies, or contains prominent low frequency tones, the A-weighting may not give a valid measure.

A-weighted sound levels are typically measured or presented as equivalent sound pressure level (L_{eq}), which is defined as the average noise level, on an equal energy basis for a stated period of time, and is commonly used to measure steady-state sound or noise that is usually dominant. Statistical methods are used to capture the dynamics of a changing acoustical

environment. Statistical measurements are typically denoted by $L_{xx,}$ where xx represents the percentile of time the sound level is exceeded. The L_{90} is a measurement that represents the noise level that is exceeded during 90% of the measurement period. Similarly, the L_{10} represents the noise level exceeded for 10% of the measurement period.

The effects of noise on people can be listed in three general categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities, such as speech, sleep, and learning
- Physiological effects, such as startling and hearing loss

In most cases, environmental noise produces effects in the first two categories only. However, workers in industrial plants may experience noise effects in the last category. No completely satisfactory way exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of a common standard is primarily due to the wide variation in individual thresholds of annoyance and habituation to noise. Thus, an important way of determining a person's subjective reaction to a new noise is by comparing it to the existing or "ambient" environment to which that person has adapted. In general, the more the level or the tonal (frequency) variations of a noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

Table 3-2 provides noise levels associated with common construction equipment as reported at 50 feet and extrapolated to 100 and 1000 feet (Federal Transit Administration, 2018). Sound from a single piece of equipment, a point source, will drop at a rate of approximately 6 decibels per doubling of distance.

Table 3-2 Common Construction Equipment Noise Levels

Equipment	Typical Noise Level 50 feet from Source, dBA	Typical Noise Level 100 feet from Source, dBA	Typical Noise Level 1,000 feet from Source, dBA
Air Compressor	80	74	54
Backhoe	80	74	54
Ballast Equalizer	82	76	56
Ballast Tamper	83	77	57
Compactor	82	76	56
Concrete Mixer	85	79	59
Concrete Pump	82	76	56
Concrete Vibrator	76	70	50
Crane, Derrick	88	82	62
Crane, Mobile	83	77	57
Dozer	85	79	59
Generator	82	76	56
Grader	85	79	59
Impact Wrench	85	79	59

Equipment	Typical Noise Level 50 feet from Source, dBA	Typical Noise Level 100 feet from Source, dBA	Typical Noise Level 1,000 feet from Source, dBA
Jack Hammer	88	82	62
Loader	80	74	54
Paver	85	79	59
Pile-driver (Impact)	101	95	75
Pile-driver (Sonic)	95	89	69
Pneumatic Tool	85	79	59
Pump	77	71	51
Rail Saw	90	84	64
Rock Drill	95	89	69
Roller	85	79	59
Saw	76	70	50
Scarifier	83	77	57
Scraper	85	79	59
Shovel	82	76	56
Spike Driver	77	71	51
Tie Cutter	84	78	58
Tie Handler	80	74	54
Tie Inserter	85	79	59
Truck	84	78	58

Source: Table 7-1, Federal Transit Administration, 2018.

The ROI for noise includes the proposed site for Generator Building 1 and adjacent properties within 1,500 feet.

3.4.1.2 Existing Conditions

Ambient sound level measurements were conducted during a typical weekday for approximately 24 hours from July 31 to August 1, 2018 at two locations around the proposed project site (VHB, 2019a). The nearest noise sensitive receptor is a residential area located along Wood Street, approximately 800 feet from the site of the proposed Generator Building 1, in Lexington. The existing sound sources in the area were identified to include the existing cooling tower building, mechanical equipment associated with the Microelectronics Laboratory, and traffic traveling within the facility and along Hartwell Avenue and Wood Street. The existing measured hourly L_{90} sound levels ranging from approximately 53 dBA to 67 dBA at the two measurement locations. The lowest L_{90} sound levels range from approximately 53 dBA near the Ruiz Gate (formerly Hartwell Gate) to approximately 57 dBA near the Wood Street property line.

3.4.2 Air Quality

3.4.2.1 Definition of Resource

Federal air quality policies are regulated through the federal CAA. Pursuant to this act, EPA has established National Ambient Air Quality Standards (NAAQS) for the following air pollutants (termed "criteria" pollutants): CO, ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter defined as particulate matter less than 10 microns in aerodynamic diameter (PM_{10}), fine particulate matter defined as particulate matter less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$), and lead (EPA, 2018, 2020a). Similarly, the MassDEP also has established ambient air quality standards for the Commonwealth of Massachusetts. These requirements, which are found in 310 CMR 6.00, are consistent with the federal NAAQS, except as noted in Table 3-3.

Table 3-3 Ambient Air Quality Standards, MIT LL Generator Building 1

Criteria Pollutant	Federal Standard (Averaging Period)[a]	Federal Attainment Status
CO	35 ppm (1 hour)	Attainment
	9 ppm (8 hours)	Attainment
NO_2	0.100 ppm (1 hour)	Attainment
	0.053 ppm (annual arithmetic mean)	Attainment
O_3	0.070 ppm (8 hours)	Nonattainment (1997 8-hr O_3 Standard, revoked)
$PM_{2.5}$	12 μg/m^3 (annual arithmetic mean)	Attainment
	35 μg/m^3 (24 hours)[b]	Attainment
	15.0 μg/m^3 (state, secondary standard)	Attainment
PM_{10}	150 μg/m^3 (24 hours)	Attainment
SO_2	0.5 ppm (3 hours, secondary standard)	Attainment
	0.075 ppm (1 hour) [b]	Attainment
Lead[e]	0.15 μg/m^3 (rolling 3-month average)	Attainment

Source: EPA, 2018; EPA 2020a.

[a] National standards other than O_3, particulate matter, and those based on annual averages or annual arithmetic means are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m^3 is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, is equal to or less than the standard.

[b] To attain this standard, the three-year average of the 99th percentile of the daily maximum one-hour average at each monitor within an area must not exceed 75 parts per billion.

μg/m^3 = microgram(s) per cubic meter
ppm = part(s) per million, by volume

Under the CAA, the country is classified into attainment, nonattainment, and maintenance areas. Any area not meeting the NAAQS is designated as nonattainment for the specific pollutant or pollutants, whereas areas that meet the NAAQS are designated as attainment areas. Maintenance areas are those areas that were previously designated as nonattainment and subsequently redesignated as attainment, subject to development of a maintenance plan.

Under the EPA New Source Review (NSR) program, stationary sources of air pollution are required to have permits before construction of the source begins. NSR Prevention of Significant Deterioration permit approval would be required if the proposed project was either: (1) a new source, with the potential to emit 250 tons per year or more of an attainment pollutant; or (2) an existing major source of emissions, making a major modification in an attainment area, and resulting in a net emission increase above specified levels. Nonattainment NSR approval would be required if the proposed project were a new, stationary or major source of emissions that made a major modification in a nonattainment area, with potential to emit nonattainment pollutants exceeding the NSR thresholds. The MassDEP has established similar regulations and review thresholds in 301 CMR 11.00.

The CAA General Conformity Rule (40 CFR, Parts 6, 51, and 93) requires federal agencies to make written conformity determinations for federal actions in or affecting nonattainment or maintenance areas. If the emissions of a criteria pollutant (or its precursors) do not exceed the *de minimis* level, then the federal action has minimal air quality impact and the action is determined to conform for the pollutant under study; therefore, no further analysis is necessary. The ROI for impacts to air quality considered in this EA includes Middlesex County.

3.4.2.2 Existing Conditions

Criteria Pollutants. Middlesex County, where the MIT LL is located, is in attainment for all criteria air pollutants (EPA, 2020b) except as listed:

8-Hour Ozone (1997) Boston-Lawrence-Worcester (E. MA), MA - (Moderate) - Note: This standard was revoked by EPA on April 5, 2015. However, a 2018 court decision requires that subject states maintain maintenance plans to ensure the area maintains the standard for 20 years after redesignation. The year in parentheses indicates when the NAAQS was established for the pollutant. In each case only the portion of the county listed is the designated nonattainment area.

HAFB maintains a Title V Operating Permit, as the base is considered a major stationary source due to its potential to emit NOx emissions exceeding 50 tons per year; however, MIT LL facilities are not directly included within this permit. Most of MIT LL's existing facilities receive their heating from the HAFB Central Heat Plant, which is regulated as part of HAFB's Title V permit. MIT LL does not currently have a Title V permit, as it does not exceed the thresholds for being considered a major stationary source. Instead, MIT LL currently has Non-major Comprehensive Air Plan Approval from MassDEP (Approval No. NE-14-009 issued June 2015) and a permit for the MIT LL scrubber system. The primary sources of emissions at MIT LL include diesel fuel combustion for standby generators and natural gas combustion for heating water. Emissions from laboratory fume hoods are negligible, in part due to the relatively small quantity of chemicals used and due to controls in place to minimize emissions (AECOM, 2014).

MIT LL's Air Plan Approval establishes maximum allowable facility-wide emission limitations for NOx, CO, VOC, PM, and SO_2 in tons per month and in tons per rolling 12-month period. The facility-wide emission limitations were established based on 31 emergency diesel engines each smaller than 450 kW (totaling 2,985 kW), two emergency diesel engines rated at 500 kW and 800 kW respectively, one 2,000 kW diesel generator, and nine natural gas boilers each rated

below 3 million British thermal units per hour (totaling 5,643,000 British thermal units per hour) heat input capacity. Annual reporting of NOx, CO, VOC, PM, and SO2 emissions to MassDEP is required (AECOM, 2014).

3.4.3 Water Resources and Water Quality

The CWA establishes the basic structure for regulating discharges of pollutants into the waters of the United States, and quality standards for surface waters.

3.4.3.1 Definition of Resource

Groundwater. Groundwater is water that exists underground in saturated zones beneath the land surface. The upper surface of the saturated zone is called the water table. Groundwater fills the pores and fractures in underground materials such as sand, gravel, and other rock. If groundwater flows naturally out of rock materials or if it can be removed in useful amounts by pumping, the rock materials are called aquifers (USGS, 1998).

Groundwater includes subsurface hydrologic resources. Groundwater properties are often described in terms of depth to aquifer or water table, water quality, and surrounding geologic composition. The Safe Drinking Water Act is the federal law that protects public drinking water supplies throughout the nation. Under the Safe Drinking Water Act, EPA sets standards for drinking water quality, and implements various technical and financial programs to ensure drinking water safety (EPA, 2017).

Surface Water. Surface water is any body of water above ground, including streams, rivers, lakes, wetlands, reservoirs, and creeks. The ocean, despite being saltwater, is also considered surface water. Surface water participates in the hydrologic cycle, or water cycle, which involves the movement of water to and from the Earth's surface.

Three types of surface water exist: perennial, ephemeral, and man-made. Perennial, or permanent, surface water persists throughout the year and is replenished with groundwater when minimal precipitation exists. Ephemeral, or semi-permanent, surface water exists for only part of the year. Ephemeral surface water includes small creeks, lagoons, and water holes. Man-made surface water is found in artificial structures, such as dams and constructed wetlands.

Surface water is relied on for many human uses. It is an important source of drinking water and is used for the irrigation of farmland. In 2015, almost 80% of all water used in the United States came from surface water. Wetlands with surface water are also important habitats for aquatic plants and wildlife (USGS, 1998).

Wetlands. Wetlands are an important natural system and habitat because of the diverse biological and hydrological functions they perform. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat provision, and erosion protection.

Wetlands are protected under the CWA Sections 401 and 404 and Section 10 of the Rivers and Harbors Act of 1899. In addition, the Natural Resources Conservation Service has a process in place to identify wetlands for compliance with the Food Security Act of 1985, and the National Wetlands Inventory has developed a classification system for identifying wetlands.

For the Proposed Action, the Massachusetts Wetlands Protection Act (Massachusetts General Laws Chapter 131, Section 40) protects wetlands and the public interests they serve, including

flood control, prevention of pollution and storm damage, and protection of public and private water supplies, groundwater supply, fisheries, land containing shellfish, and wildlife habitat.

Stormwater. Under the CWA, EPA's NPDES permit program controls discharges. Industrial, municipal, and other facilities must obtain permits if their discharges go directly to regulated surface waters (EPA, 2009). The NPDES stormwater program regulates some stormwater discharges from three potential sources: municipal separate storm sewer systems, construction activities, and industrial activities. Operators of these sources might be required to obtain a NPDES permit before they can discharge stormwater. This permitting mechanism is designed to prevent stormwater runoff from washing harmful pollutants into local regulated surface waters.

Massachusetts is a non-delegated state for the NPDES permit, that is, EPA has not delegated the authority to issue NPDES permits to MassDEP. A NPDES permit issued by EPA Region 1 regulates stormwater at HAFB and therefore, at MIT LL. MIT LL is a co-permittee, with HAFB and Massport, on a NPDES multi-sector general permit. This permit relates to the hangar MIT LL occupies on the airfield at HAFB. Stormwater drainage from the MIT LL campus enters into the HAFB drainage network (AECOM, 2014). The goal of the stormwater permit is to limit pollution by establishing BMPs and promoting on-base outreach and education. The BMPs would vary depending on the classification of the site: industrial, construction, or municipal. The focus for the BMPs would be on general housekeeping and spill prevention. Construction sites have additional specific BMP requirements that govern the control of erosion and sediment wash out.

Floodplains. A floodplain is flat or nearly flat land adjacent to stream channels, rivers, or coastal waters and adjacent areas that carry flood flows that experience occasional flooding. Federal Emergency Management Agency (FEMA) evaluates the flood potential within the 100-year floodplain. The 100-year floodplain is the area that has a 1% chance of inundation by a flood event in a given year (FEMA, 2020).

The ROI for impacts to water resources and water quality considered in this EA includes the eastern portion of HAFB, specifically the MIT LL main campus.

3.4.3.2 Existing Conditions

Groundwater. Groundwater at HAFB averages 10 to 20 feet below ground surface and shallower near wetlands at 3 to 7 feet below ground surface. The aquifer located under HAFB flows to the northeast and consists of an upper, unconfined aquifer with lacustrine deposits of glacial origin. The unconfined aquifer is underlain by a semiconfined lower aquifer above bedrock. Groundwater contributes to baseflow of the Shawsheen River, so that river flow is not entirely dependent on rainfall (Departments of the Army and Air Force, 2019).

Surface Water. HAFB is primarily located in the Shawsheen River Watershed within the Merrimack River Basin. The majority of surface runoff from HAFB enters a subterranean system of eight, 5-foot diameter culverts and ultimately discharges into the Shawsheen River, located along the northeastern boundary of HAFB. Surface runoff from the eastern portion of the base drains eastward into Kiln Brook, eventually discharging into the Shawsheen River, which flows northeasterly to converge with the Merrimack River. The southern portion of HAFB drains beneath the fenced boundary of the base, under Airport Road, through the Battle Road Unit of Minute Man National Park, and under Route 2A (North Great Road) before ultimately discharging into one of the reservoirs that serves as water supply for the City of Cambridge. A number of detention basins on HAFB exist for the settling and storage of stormwater runoff prior to it entering the storm drain system (AECOM, 2014).

Wetlands. Wetlands range from wet meadow to mature forested swamp and occupy approximately 43 acres of the base. A 1997 base-wide wetlands survey (updated in 2007) identified and delineated 35 wetlands on HAFB and MIT LL (AECOM, 2014). A small bordering vegetated wetland is located approximately 80 feet north of the proposed site of Generator Building 1 (Figure 3-1). The wetland is located along Hartwell Avenue to the north of the existing electrical building. The wetland borders an intermittent stream which crosses beneath Hartwell Ave and continues offsite to the northeast. Dominant wetland plant species within the wetland include red maple *(Acer rubrum*), multiflora rose (*Rosa multiflora*), glossy buckthorn (*Frangula alnus*), horsetail (*Equisetum sp.*), iris (*Iris sp*.), sedge (*Carex sp*.) and poison ivy (*Toxicodendron radicans*) (VHB, 2019b).

Stormwater. The stormwater network at HAFB and MIT LL conveys surface runoff around HAFB property to the Shawsheen River and Kiln Brook, one of its tributaries. MIT LL drains to Kiln Brook, part of the headwaters of the Shawsheen River (Massachusetts Executive Office of Environmental Affairs, 2003).

MassDEP has developed a total maximum daily load for bacteria for the entire length of the river and a draft total maximum daily load for stormwater pollutants for the headwaters (Limno-Tech, 2002; Massachusetts Executive Office of Environmental Affairs, 2003). The draft stormwater total maximum daily load calls for stormwater and watershed controls, which would mitigate the peaks in runoff from storms through promotion of infiltration of stormwater into the ground.

Floodplains. The National Flood Insurance Rate Map indicates that a portion of the Shawsheen River's 100-year floodplain is located in the northeast area of the base, from the headwaters of the river to where it crosses the HAFB boundary and not located in the area of the Proposed Action on the MIT LL main campus (FEMA, 2020).

3.4.4 Hazardous Materials and Solid Waste

3.4.4.1 Definition of Resource

A hazardous material is any item or agent (biological, chemical, radiological, and/or physical), which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. Hazardous material professionals are responsible for and properly qualified to manage such materials. This includes managing and/or advising other managers on hazardous materials at any point in their life-cycle, from process planning and development of new products; through manufacture, distribution and use; and to disposal, cleanup and remediation.

Hazardous materials are defined and regulated in the United States primarily by laws and regulations administered by the EPA, the U.S. OSHA, the U.S. Department of Transportation, and the U.S. Nuclear Regulatory Commission. Each has its own definition of a hazardous material. The ROI for impacts to hazardous materials and solid waste considered in this EA includes the MIT LL campus and HAFB.

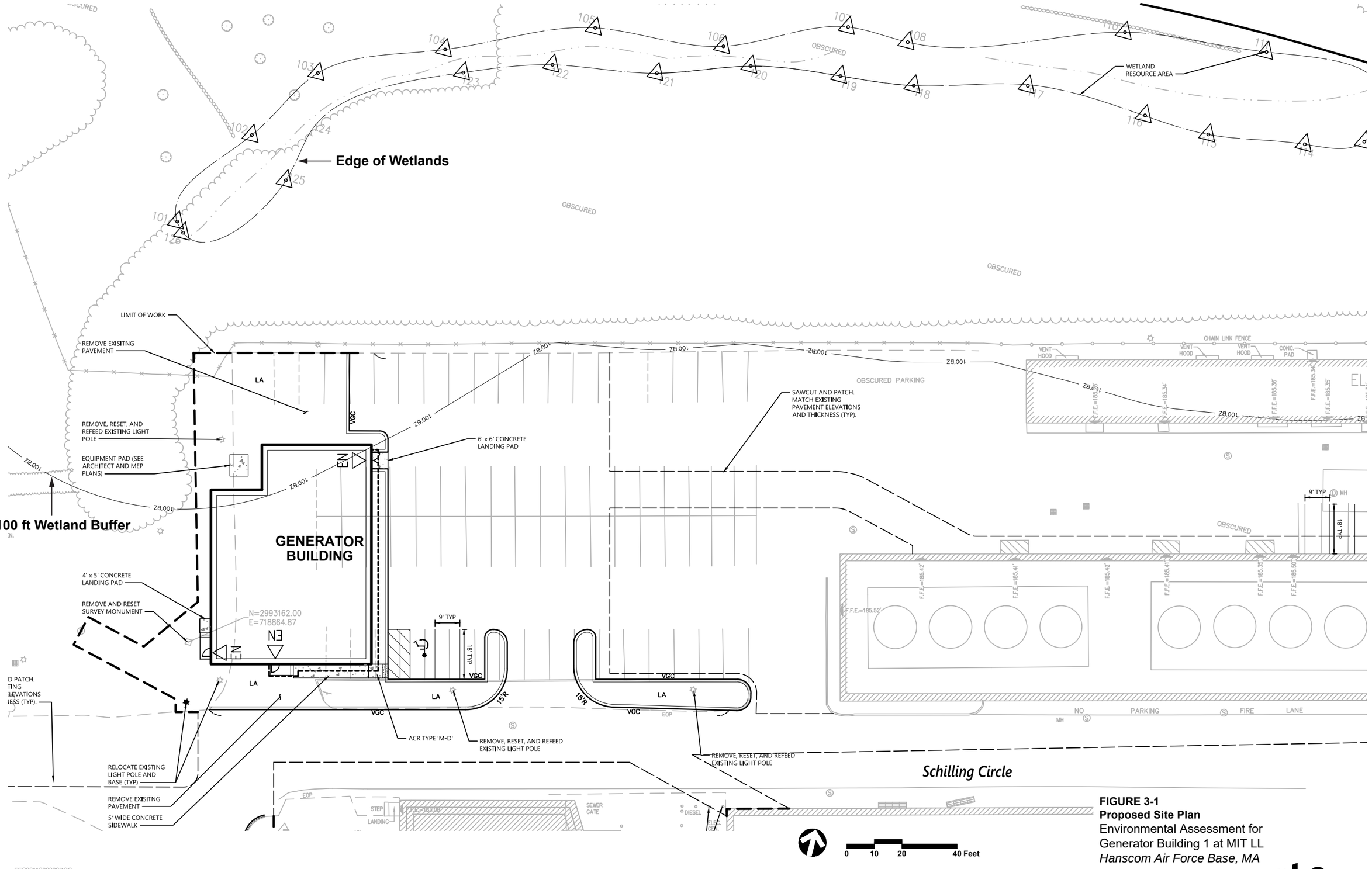


FIGURE 3-1
Proposed Site Plan
Environmental Assessment for
Generator Building 1 at MIT LL
Hanscom Air Force Base, MA

FES0211200033BOS

3.4.4.2 Existing Conditions

Currently, separate Integrated Waste Management Programs are in place on HAFB and MIT LL. These programs include a Waste Management Plan, a Qualified Recycling Plan, a Pollution Prevention Plan, and a Hazardous Waste Management Plan (AECOM, 2014; Departments of the Army and Air Force, 2019). Concerning the disposal of nonhazardous waste, HAFB has developed the Integrated Solid Waste Management Plan. This plan provides guidance for managing and properly disposing of nonhazardous solid waste, including municipal solid waste, compost material, construction and demolition debris, and industrial solid waste, to ensure compliance with applicable requirements for solid waste disposal, waste minimization, recycling, and reuse. In lieu of federal or state requirements, Air Force Manual (AFMAN) 32-7002, *Environmental Compliance and Pollution Prevention*, acts as the main driver for the Integrated Solid Waste Management Plan.

Gasoline, diesel fuel, waste oil, kerosene, propane, No. 6 fuel oil, and No. 2 fuel oil are stored in permitted underground storage tanks and aboveground storage tanks on HAFB (AECOM, 2014; Departments of the Army and Air Force, 2019). The only bulk aboveground storage tanks on base are used to store No. 6 fuel at the central heat plant (Building 1201) located just west of the MIT LL campus. The primary fuel stored on MIT LL is No. 2 diesel fuel oil used to supply the campus's emergency generators (AECOM, 2014). There is a total of 14 diesel fuel storage tanks associated with the 16 existing generators that would be decommissioned. The tanks range in size from 125 to 2,000 gallons, with a combined total storage capacity of 9,905 gallons. The tanks locations and storage capacities are identified in MIT LL's Spill Prevention Control and Countermeasure (SPCC) Plan (Cooperstown Environmental LLC, 2015). A use permit from the Office of the State Fire Marshall is required for aboveground storage tanks and the permit must be renewed every five years.

MIT LL's Hazardous Waste Facility personnel coordinates disposal of all MIT LL facility hazardous wastes**.** The receipt, storage, issuance, procurement, use, and disposal of hazardous materials at MIT LL are in accordance with all applicable laws and regulations. A list of hazardous chemicals for each work area is compiled and updated annually. When new hazardous chemicals are received, they are added to the list, and chemicals no longer in use for that work area are deleted. The list includes the names of the chemical as given on the label and Safety Data Sheets, the manufacturer, the use/storage location, Chemical Abstracts Service Registry Number if assigned, and the planned maximum quantity to be kept in inventory (AECOM, 2014; Departments of the Army and Air Force, 2019). A copy of the annual update is maintained by MIT LL's Environmental Health and Safety (EHS) Office.

Superfund Amendments and Reauthorization Act (SARA) Title III Hazardous Chemical Inventory reporting is conducted annually at MIT LL for regulated SARA chemicals to meet the requirements of the EPA's Emergency Planning and Community Right-to-Know Act. Inventory location and quantity information is updated for the chemicals on this list and submitted to the local fire departments and local emergency planning committees. This inventory is coordinated with the Group EHS and SARA representatives for each lab area by the Laboratory EHS Office (AECOM, 2014; Departments of the Army and Air Force, 2019).

Hazardous chemicals, biological materials, and toxic gases are purchased through the MIT LL EHS Office for review and approval and delivered to a single receiving area in Building 1302M. Trained personnel then coordinate and handle deliveries to user-laboratories within MIT LL using approved delivery procedures and transport containers/carts (AECOM, 2014; Departments of the Army and Air Force, 2019). Hazardous chemicals, biological materials, and toxic gases are tracked and monitored by detection systems which are connected to the

building/facility emergency evacuation (fire alarm) alarm system and supervised by the MIT LL Security Department.

Because of the age of facilities at HAFB and MIT LL, asbestos-containing materials and lead-based paints are commonly encountered and estimated to be present in a majority of the buildings on HAFB and on MIT LL campus (AECOM, 2014; Departments of the Army and Air Force, 2019).

Solid wastes are generated at MIT LL and HAFB. The major sources of waste include community operations, offices, and industrial areas. The types of solid waste generated and diverted from the waste stream for recycling and reuse include food waste, various grades of general recyclables (that is, office paper, newspaper, cardboard, cans, glass and plastic containers), wood waste (that is, pallets and packaging), scrap metals, computer/electronics, as well as significant quantities of compost/organic materials (tree trunks and yard waste) and construction and demolition debris.

Some of these wastes are reused on base, but the majority is removed from HAFB by private contractors and disposed of off base by incineration with heat recovery or directly hauled to materials recovery facilities for recycling (AECOM, 2014; Departments of the Army and Air Force, 2019). Compostable materials are collected by the Base Civil Engineering Roads and Grounds section.

All other non-recyclable solid waste is collected by a private contractor and disposed at an off-base incinerator facility within Massachusetts.

3.4.4.3 Environmental Restoration Program

HAFB has historically used, generated, and disposed of numerous hazardous substances, including fuel, aromatic solvents, PCBs, and chlorinated solvents. In 1984, environmental studies identified 13 sites, related to past practices at HAFB, warranting further investigation and potential cleanup through the Installation Restoration Program, now known as the Environmental Restoration Program (ERP). Subsequent discoveries increased the number of sites to 22. Each site was evaluated using the Air Force Hazard Assessment Rating Methodology, which evaluates potential receptors, waste characteristics, and migration pathways in order to determine the relative potential of uncontrolled hazardous waste disposal facilities to cause health or environmental damage. Hazard Assessment Rating Methodology scores ranged from 86 (high hazard potential) to 6 (small hazard potential). Of the 22 identified potentially contaminated sites, 8 are still active and are either regulated by the EPA under the Comprehensive Environmental Response, Compensation, and Liability Act, known also as Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or Superfund, or by the Commonwealth of Massachusetts (AECOM, 2014).

No ERP sites are located within the MIT LL main campus. However, ERP Site 10 was a mercury spill at Building 1128; and ERP Sites 17 and 18 were underground storage tanks at Buildings 1103 and 1102C, respectively, within the former Air Force Research Laboratory, which were made available for MIT LL's use as part of the DOD's Base Realignment and Closure program. Response actions have been completed at all three of these ERP sites (AECOM, 2014).

3.4.5 Biological Resources

3.4.5.1 Definition of Resource

Biological resources consist of plants and animals, and their habitats. These resources provide aesthetic, recreational, and socioeconomic benefits to society. This subsection describes plant and animal species that occur, or are likely to occur, in the project area.

The three laws that are applicable to the analysis of biological resources for the project:

- The Migratory Bird Treaty Act of 1918, as amended, implements various treaties and conventions between the United States and Canada, Japan, Mexico, and Russia for the protection of migratory birds. Under the Migratory Bird Treaty Act, taking, killing, or possessing listed birds is unlawful, unless permitted by regulation.
- The Bald and Golden Eagle Protection Act of 1940 provides for the protection of bald eagles and golden eagles by prohibiting, except under certain specified conditions, the taking, possession, and commerce of such birds.
- The ESA regulates the protection of federally listed species. Section 7 of the ESA dictates that federal actions should not jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species.

The ROI for impacts to biological resources considered in this EA includes HAFB, specifically the MIT LL main campus area.

3.4.5.2 Existing Conditions

Vegetation. Most of the native vegetation on HAFB has been modified from earthmoving activities since construction of the base in the early 1940s. Undisturbed remnant grasslands comprise less than 5% of uplands and occur adjacent to developed areas on HAFB. The areas of forested uplands comprise 22% of HAFB. The dominant forest cover includes mixed hardwood/softwood forests and American beech (*Fagus grandiflora*) stands. Vegetation present on HAFB is generally representative of species present within the region (Massachusetts Port Authority and Epsilon Associates, Inc., 2018).

Much of the developed areas of HAFB are dominated by rye, fescue, and bluegrass grassland species, and planted with other shrubs and trees for aesthetics and erosion control. Plant selection, fertilization, and terracing techniques are techniques used as part of the maintenance program to ensure successful plantings and minimize soil exposure and erosion (Massachusetts Port Authority and Epsilon Associates, Inc., 2018).

Invasive plants at HAFB include Tartarian honeysuckle (*Lonicera tartarica*), European buckthorn (*Rhamnus frangula*), multiflora rose (*Rosa multiflora*), garlic mustard (*Alliaria officinalis*), purple loosestrife (*Lythrum salicaria*), Oriental bittersweet (*Celastrus orbiculatus*), Japanese knotweed (*Polygonum cuspidatum*), and common reed (*Phragmites communis*) (AECOM, 2014; Massachusetts Port Authority and Epsilon Associates, Inc., 2018). Most of these species are interspersed throughout the upland and wetland systems.

The site proposed for construction of Generator Building 1 is primarily a paved parking area, and therefore lacks natural vegetation. However, there is an adjacent mown lawn area with a scattering of small landscaping shrubs and trees exists. The site proposed for construction of Generator Building 1 is fairly level, with a gentle slope from the northeast to the southwest. It contains no wetlands or water bodies.

Wildlife. HAFB, including the MIT LL portion of the base, has created a favorable environment for bird species, mammals, amphibians, and macroinvertebrates well adapted to humans and development, however wildlife abundance and species diversity are relatively low at HAFB, principally due to extensively developed areas, habitat fragmentation, and/or degraded natural habitats.

Wildlife species that may live in the area include larger mammals such as whitetail deer (*Odocoileus virginianus*), Eastern coyote (*Canis latrans var.*), and red fox (*Vulpes vulpes*), and smaller mammals such as racoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), opossum (*Didelphis virginiana*), eastern gray squirrel (*Sciurus carolinensis*), and various species of mice, voles, and moles. Bird species near the Proposed Action may include various insectivorous and seed-eating passerines such as American robin (*Turdus migratorius*), ground-oriented species, and predators such as red-tailed hawk (*Buteo jamaicensis*). Various reptiles and amphibians, such as snakes, turtles, and frogs, as well as various macroinvertebrates such as insects, worms, and snails may be located near the site of the Proposed Action (AECOM, 2014; Massachusetts Port Authority and Epsilon Associates, Inc., 2018).

In general, certain undeveloped areas of MIT LL may provide suitable habitat for a number of wildlife species common to Massachusetts.

Threatened and Endangered Species. The USFWS Information for Planning and Conservation (IPaC) website was searched to identify the potential presence of any listed or proposed threatened or endangered species within the site for the Proposed Action (see IPaC USFWS Consistency Letter in Appendix C). The USFWS IPaC website search provided results indicating one federally listed species exists, the Northern Long-eared Bat (*Myotis septentrionalis*) with potential to occur at the site in the MIT LL main campus portion of HAFB (USFWS, 2020). No critical habitats exist for the Northern Long-eared Bat in the site area of the MIT LL main campus.

The Eastern longhorn elderberry beetle (*Desmocerus palliatus*) and the spotted turtle (*Clemmys guttata*) were both previously listed as a state Species of Special Concern but were removed from the protection list in 2006 and are no longer state threatened species. Measures remain in place on HAFB to protect the beetle habitat by preserving areas where elderberry bushes (the primary food source) occur. Both species use wetlands, and both continue to be inherently protected as part of HAFB wetland protection efforts (AECOM, 2014; Massachusetts Port Authority and Epsilon Associates, Inc., 2018). There are no wetlands within the proposed construction area.

3.4.6 Topography, Geology, and Soils

3.4.6.1 Definition of Resource

Geological resources consist of the Earth’s surface and subsurface materials. These resources typically are described in terms of geology, topography, and soils. Where applicable, minerals and paleontology are sometimes described.

Topography is a broad term used to describe the detailed study of the earth's land surface, both natural and man-made. This includes relief features or surface configuration changes in the surface such as mountains and valleys, as well as features such as rivers and roads.

Soils are complex mixtures of unconsolidated minerals, water, air, organic matter, and countless organisms that are the decaying remains of once-living things situated on the immediate surface of the Earth that serves as a natural medium for the growth of land plants. Hydric soils are

defined as soils that formed under the conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the subsurface. In addition, hydric soils are typically associated with wetland areas. The ROI for impacts to topography, geology, and soils considered in this EA includes MIT LL and HAFB.

3.4.6.2 Existing Conditions

Middlesex County is located in the New England physiographic province of the Appalachian Highlands physiographic division, with most of the county lying within the Seaboard lowland section. From west to east, the county is in three major physiographic areas: the Central Uplands, the Coastal Lowlands, and the Boston Basin (USDA-NRCS, 2009). HAFB is located in Middlesex County within the Coastal Lowlands and Boston Basin physiographic areas (AECOM, 2014; Departments of the Army and Air Force, 2019).

The topography in the area of HAFB is characterized by gentle, low lying, easterly slopes. The average elevation of most of HAFB is approximately 125 to 130 feet above mean sea level (amsl). The MIT LL main campus is located at a slightly higher elevation, generally ranging from 185 feet to 225 feet amsl. Several low hills are also located in or adjacent to HAFB, including Katahdin Hill (300 feet amsl), the adjacent MIT LL property.

The bedrock of Middlesex County is a complex of many types of igneous and metamorphic rocks (USDA-NRCS, 2009). The primary bedrock formations underlying and exposed on HAFB are Siluro-Ordovician intrusive igneous rocks. Andover granite is the most common bedrock underlying the base. Assabet quartz diorite and Shawsheen gneiss are also present in the northeast portion of HAFB (AECOM, 2014). Depth to bedrock in the vicinity of the MIT LL campus ranges from as little as approximately 7 feet (in the west) to over approximately 20 feet (in the south and southwest).

Soils at HAFB, including the MIT LL main campus area, are generally assumed to be formed in glacial till/outwash, or ground moraines, with the eastern side (higher elevations) of HAFB, including MIT LL main campus, formed primarily in glacial till and the remainder of the base's soils formed in glacial outwash (USDA-NRCS, 2009; AECOM, 2014). Most of the soils at HAFB have been identified as a combination of Udorthents (that is, soils altered by earthmoving activities) and/or Urban Land (that is, soils mostly covered by impervious surfaces). The soils on MIT LL are substantially disrupted and modified by construction and earthmoving activities, and are now classified as urban land, and areas on HAFB, and MIT LL campus, which still maintain the original soil are primarily comprised of sandy loam or loamy sand associated with glaciofluvial deposits. Most of the soils at HAFB are not designated prime farmland, but there are three small areas of the base that are designated prime farmland, with a combined area of approximately 9.3 acres. There are also several areas of the base designated as farmland of statewide importance. However, none of the soils within the proposed construction area are designated as prime farmland or farmland of statewide importance (USDA-NRCS, 2020).

3.4.7 Energy Use and Infrastructure

3.4.7.1 Definition of Resource

Utilities described in this section include constructed systems to provide electricity, natural gas, sewer, water, and telecommunications to users served within a specific area. The ROI for impacts to utilities considered in this EA includes the HAFB, specifically the MIT LL main campus.

3.4.7.2 Existing Conditions

The existing campus buildings are served utilities from a variety of sources. Some small onsite solar photovoltaic (PV) arrays exist, but the majority of the electric load is met by the local electric utility, Eversource (Waldron Engineering & Construction, Inc., 2020).

Currently for heating and cooling, steam and chilled water distribution systems are on campus, but not all buildings are served by them. All steam conveyed by the steam distribution system comes from the HAFB Boiler Plant. Buildings that are not fed steam by this system have stand-alone building heating systems. Based on the available data, 85% of the campus is supplied steam by the distribution system (AECOM, 2019). The steam distribution system is owned, at least in part, by HAFB.

Natural gas is supplied to the base by UGI Utilities, Inc. and is distributed by National Grid and Kinder Morgan via an 8-inch high pressure main. Interruptible natural gas is provided to the central heat plant for steam and chilled water production. There is currently no existing gas main within the vicinity of the sites considered for the Proposed Action on the MIT LL campus.

All the chilled water supplied to the distribution system is generated in the Chilled Water Plant located on the north end of the campus. The plant serves the cooling load for approximately 85% of the MIT LL campus (AECOM, 2019).

The majority of the MIT LL campus electric supply is currently provided by three 10 megavolt-amp feeders, all from the Eversource Hartwell Substation. The MIT LL campus electric demand in 2018 was 13 megawatts (Waldron Engineering & Construction, Inc., 2020).

Renewable energy sources were not specifically considered for the Proposed Action because they would not meet the redundancy/uninterrupted delivery of energy necessary for critical MIT missions. However, MIT LL does have some solar PV on campus: two parking garages, roof-mounted solar PV arrays, rated at 720 kW and 180 kW respectively, for a total nominal rating of 900 kW. Solar PV electric generation accounts for approximately 1.4% of the 2025 total campus electric load (Waldron Engineering & Construction, Inc., 2020). In addition, in February 2016, the USAF evaluated 11 sites (33 acres) on HAFB for the installation of solar PV. HAFB proposes to lease up to 33 acres of non-excess Air Force property to a private-sector solar energy developer for the development, operation, and maintenance of a solar PV system. These two long-term efforts meet the intent of the Air Force Materiel Command(s) Energy Assurance Campaign.

The wastewater system on HAFB includes two pumping stations. The lower station at Building 1539 collects approximately 75% of the daily flow on base, and the upper station at Building 1306, located adjacent to the MIT LL campus, collects the remaining daily flow. HAFB discharges wastewater to the Massachusetts Water Resources Authority (MWRA) sewerage system through a 12- to 15-inch force main on Hartwell Avenue. MIT LL has a Sewer Use Discharge Permit issued jointly by the MWRA and Lexington, since MIT LL discharges wastewater to the MWRA sewerage system via the Lexington sewerage system (AECOM, 2014). The permit includes self-monitoring, discharge limitations, mandated sampling locations, analysis, reporting/notification, and other requirements.

Much of the potable water supply to HAFB, as well as MIT LL, is provided by Lexington via the MWRA from the Quabbin Reservoir, through a 10-inch main along Hartwell Avenue and a 12-inch main along Wood Street (AECOM, 2014).

3.4.8 Safety and Occupational Health

3.4.8.1 Definition of Resource

Safety and occupational health is defined as any issue with a potential to increase health risks to military or DoD civilian personnel, developer personnel, or the general public. These health risks can include the potential for death, serious bodily injury or illness, and property damage. Other potential safety concerns associated with the Proposed Action could include fire, police security, and related considerations. Detailed analyses of the potential impact on safety resulting from construction activities are analyzed in this EA.

3.4.8.2 Existing Conditions

AFMAN 91-203, *Air Force Occupational Safety, Fire and Health Standards*, consolidates the Air Force Occupational Safety and Health (AFOSH) program. The purpose of AFOSH Program is to minimize loss of Air Force resources and to protect Air Force personnel from injuries, illnesses, and death by managing risk. AFOSH applies to all Air Force activities.

Industrial hygiene and emergency response are supported by the Bioenvironmental Engineering Office of the Aerospace/Operational Medicine Flight of the 66th Medical Squadron on HAFB. The Public Health Office of the Aerospace/Operational Medicine Flight of the 66th Medical Squadron provides support for community health and force occupational health training and organizes and manages the Occupational and Environmental Health Working Group. The Occupational and Environmental Health Working Group is chaired by physicians from Flight Medicine. Flight Medicine handles occupational physicals (including audiograms) and work-related injury care for government workers (Departments of the Army and Air Force, 2019). Contractor operations on HAFB are not supported by the HAFB occupational health programs. Contractors are required to manage their own occupational health programs including industrial hygiene surveillance, worker health and safety training, hazard abatement, and medical surveillance. All contractors and their employees must adhere to OSHA laws and regulations.

The fire station at HAFB is located on Robbins Street in Building 1721, northwest of the MIT LL campus (AECOM, 2014). The HAFB Fire Department performs firefighting and/or rescue for all structures and aircraft, both military and civilian. The Fire Department also performs hazardous material response and stabilization, and confined space rescue.

For everyday health care on HAFB, the 66th Medical Group's Medical Treatment Facility is available for sick call appointments, as well as dental, pediatrics, mental health, and gynecology services. The nearest major hospital to HAFB is located at 200 Trapelo Road in Waltham, Massachusetts, and offers inpatient care and emergency room services.

3.4.9 Cultural Resources

3.4.9.1 Definition of Resource

Cultural resources are associated with many heritage-related resources such as prehistoric and historic sites, buildings, structures, districts, artifacts, or any other physical evidence of human activity that is considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Cultural resources can provide insight into cultural practices of previous civilizations or can also retain cultural religious significance to modern groups. Analysis in this EA focuses on eligible sites, structures, and districts that could be impacted.

3.4.9.2 Existing Conditions

The HAFB region contains areas of prominent prehistoric and historic importance (USAF, 2017). There are hundreds of properties listed in the records of the MHC for the four surrounding towns alone. HAFB is adjacent to Minute Man National Historic Park. In addition, there are other significant places, located within HAFB, that served as naturally fortified positions from which the militia fired on the British. Four prehistoric archaeological sites are located adjacent to the base, and several small prehistoric sites (temporary camps, chipping stations, and lithic workshops) have been reported in the vicinity of the base. However, the 1997 Phase I Archaeological Survey concluded that no areas of HAFB contain prehistoric resources (USAF, 2017).

3.4.10 Transportation and Traffic

3.4.10.1 Definition of Resource

Transportation and traffic resources generally include the roadway and street systems surrounding the project area, and includes the movement of vehicles, pedestrian, and bicycle traffic, and mass transit.

3.4.10.2 Existing Conditions

Vehicular traffic previously entered HAFB and/or MIT LL via one of the following control points: Gate 1 (Sartain Gate); Gate 2 (off Airport Road and Route 2); Gate 3 (Wood Street); Gate 3A (Schilling Gate); and Gate 4 (Ruiz Gate). Gates 2 and 3A are no longer open. Visitors to MIT LL can either access MIT LL directly through Gate 1 or Gate 4. Gate 4, the Ruiz Gate (formerly Hartwell Gate), located on Hartwell Avenue, is the only 24-hour gate on HAFB. Gate 1, Sartain Gate (formerly Vandenberg Gate), is located near the Visitor Control Center and is open between 5:30 a.m. and 7:00 p.m. daily (24-hour Gate Swap EA) (HAFB, 2021). HAFB is currently working on transitioning the 24-hour gate from Gate 4/Ruiz Gate to Gate 1/Sartain Gate and expects this to be implemented in 2021.

Traffic congestion in the vicinity of the base primarily occurs during the peak morning and late afternoon/early evening, as workers arrive and depart via the local and regional highway system. Although most buildings have a parking lot nearby, parking spaces are not always located in areas coinciding with the highest number of employees (MIT LL, 2019).

3.5 CUMULATIVE EFFECTS ANALYSIS

This EA also considers the effects of cumulative impacts as required in 40 CFR 1508.7 and concurrent actions as required in 40 CFR 1508.25[1]. A cumulative impact, as defined by the CEQ (40 CFR 1508.7) is the "…impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (CEQ, 1997). Resources that were eliminated from further consideration, as detailed in Section 3.3, and resources determined to have no impacts resulting from the Proposed Action, based on the analysis presented in Section 3.4, were not analyzed for cumulative effects.

USAF actions announced for the ROI for this project that could occur during the same time period as the Proposed Action are:

- MIT LL Facilities Replacement on HAFB Phase I (Compound Semiconductor Laboratory/Microelectronics Integration Facility [CSL/MIF])
- Vandenberg Gate Complex Construction Dorm Construction and Demolition (Note: Vandenberg Gate is now referred to as the Main Sartain Gate)

The MIT LL Phase I Facilities Replacement project includes construction of a 145,000 to 175,000 square feet replacement facility, depending on the site selected. The facility will include clean rooms with mechanical, electrical, and plumbing support rooms and office space. The replacement space will allow MIT LL to vacate and then repurpose or demolish some of the existing building within the aging MIT LL campus (AECOM, 2014).

The purpose of the Vandenberg (Sartain) Gate Complex Construction and Dorm Construction/Demolition project is three-fold: 1) to make near-term improvements to base infrastructure; 2) to improve base access and security while reducing delays; and 3) to upgrade facilities and Airmen quality of life. The project involves the construction of the Sartain Gate Complex and the demolition of the old Sartain Gate.

The projects listed herein have completed NEPA review that ensured that environmental impacts have been identified and avoided and/or minimized. In addition, careful planning, monitoring, and communication between involved area agencies ensured area growth and avoidance of cumulative adverse impacts.

The potential for cumulative effects on the environment from ongoing and planned projects in the vicinity of the Proposed Action that could affect the same environmental resources as the Proposed Action was also evaluated by reviewing Massachusetts Environmental Policy Act records. Projects considered included construction projects that are underway or programmed to occur in the future. This includes:

- Massport Hanscom Field/Generic Environmental Impact Report (GEIR)/Environmental Status and Planning Report (ESPR): The original 1985 GEIR and 1995 GEIR Update, and the 2000 ESPR, the 2005 ESPR, the 2012 ESPR, and the 2017 ESPR provide a retrospective analysis of the environmental effects of Hanscom Field while including analyses for potential future conditions. The ESPR process provides a public forum, primarily with the towns of Bedford, Lexington, and Lincoln, to assess the cumulative environmental effects of airport operations and informs Massport and the communities regarding the implications of those environmental effects.

For this EA analysis, the announced future actions would be evaluated under separate NEPA actions conducted by the appropriate involved federal agency. Based on the best available information for these proposals by others, the USAF cumulative impact analysis does consider them. As such, the cumulative impacts on all assessed resources in the EA are summarized within each resource area discussed in Section 4.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter describes the potential environmental consequences that are likely to occur as a result of implementation of the Proposed Action and the No Action Alternative that are being considered and analyzed. Unless otherwise noted, short-term impacts are those that would result from the activities associated with a project's construction and/or demolition phase, and that would end upon the completion of those phases. Long-term impacts are generally those resulting from the operation of a proposed project.

Three categories of potential environmental consequences (impacts or effects) were evaluated: direct, indirect, and cumulative. A direct impact is the result of the Proposed Action and occurs at the same time and place as the action. Indirect impacts are caused by the Proposed Action and "are later in time or farther removed in distance but are still reasonably foreseeable" (40 CFR Part 1508). Cumulative effects result from incremental impacts of the Proposed Action, when added to other past, present, and reasonably foreseeable future actions, regardless of which agency, person, or private entity undertakes such actions.

In the following sections, the duration of each impact is described either as short term, such as with construction-related impacts, or long-term, such as with impacts related to the operation of the proposed facility. Types of impacts can be beneficial or adverse. Beneficial impacts improve the resource or issue analyzed. Adverse impacts negatively affect the resource or issue analyzed. The intensity of a potential impact refers to its severity and accounts for: whether the action establishes a precedent for further actions with significant effects; the level of uncertainty about projected impacts; and the extent to which the action threatens to violate federal, state, or local environmental protection laws, or constrain future activities. Potentially beneficial impacts are discussed separately from potentially adverse impacts. The thresholds of change for the intensity of impacts are defined as follows:

- Negligible: When the impact is localized and not measurable at the lowest level of detection
- Minor: When the impact is localized and slight, but detectable
- Moderate: When the impact is readily apparent and appreciable
- Major: When the impact is severely or significantly disruptive to current conditions

Intensities that are classified as negligible, minor, or moderate are considered as less than significant impacts in this analysis. Significant impacts are classified as major. Measures that would be implemented to avoid or minimize potential impacts to the environment, including those that would otherwise be significant, are also presented.

4.2 NOISE

Proposed Action

Vanasse Hangen Brustlin, Inc. or VHB, a civil engineering consulting and design firm, developed an acoustical model of the proposed generators based on expected performance specifications (VHB, 2019a). In addition to emergency use, the generators are permitted for up to 500 hours per year for non-emergency use (see the Air Quality Plan Approval in Appendix C). The generator building will be designed and constructed to support year-round maintenance and operations and would provide enough sound-suppression to meet UFC 3-450-01 (Noise and Vibration Control), Massachusetts (310 CMR 7.10), and local municipality noise requirements (see Air Quality Plan Approval in Appendix C). Lexington's noise limits (Chapter 80 of the Code of Lexington) are consistent with the MassDEP noise requirements. The

predicted sound levels from operation of the generators with the proposed noise attenuation measures, range from approximately 43 dB(A) at the Wood Street property line (representative of the closest noise sensitive residential use) to approximately 55 dB(A) at the property line near the Ruiz Gate (formerly Hartwell Gate). The future (existing plus the generator) sound levels at the nearest property line and residential use were determined to both be 57 dB(A). VHB also determined that the future sound levels result in an increase of up to 4 decibels at the property line and that the tonal noise requirements were not exceeded, thus demonstrating compliance with Lexington's noise limits which are consistent with the MassDEP noise requirement (VHB, 2019a). VHB's analysis found that implementation of the Proposed Action is expected to comply with the applicable requirements and has been approved by MassDEP (see Air Quality Plan Approval in Appendix C). In addition, the DoD has criteria and guidance (UFC 3-450-0) that provides standards required for design of new construction and major alteration of existing structures related to noise and vibration control of mechanical equipment systems most commonly encountered in military facilities (Department of Defense, 2003). The UFC 3-450-01 guidance does not provide compliance thresholds for outdoor noise, but rather is focused on guidelines for sound and vibration within occupied rooms. The project proponent will ensure the project complies with the applicable regulations. Therefore, the resulting noise levels from the Proposed Action would not pose significant impacts.

Short term increases in noise would occur during construction of Generator Building 1 and the associated electrical feeders. Implementation of the Proposed Action would require grading, paving, and construction that would require the use of equipment, such as earth moving, or impact equipment. Pile driving, typically the loudest single construction activity, is very limited in duration, lasting approximately a week and will also be restricted to daytime hours. Table 3-2 present typical construction equipment sound levels at a reference distance of 50 feet and extrapolated to 100 and 1,000 feet. The town of Lexington prohibits the use of "equipment engaged in construction... between the hours of 8:00 p.m. and 7:00 a.m., or as otherwise restricted by a Lexington permit." Noisy construction activity is expected to be limited to regular working hours (between 7:00 a.m. and 5:00 p.m.) on regular workdays (Monday through Friday, excluding federal holidays).

Cumulative Impacts

When taking into consideration the other undertakings within the region as discussed in Section 3.5, there would be no significant incremental adverse cumulative effects on the noise environment. Construction-related activities would result in a temporary increase in noise and would be conducted in accordance with local requirements. In the event that construction schedules coincide with another project, the resulting increase is 3 dBA, generally considered to be the indicator of a perceivable difference. The Vandenberg Gate (now referred to as the Sartain Gate) Complex Dorm project is located a substantially larger distance than the closest residential area analyzed above. At the time of preparation of this analysis, the CSL/MIF construction is expected to begin in January 2021 with an estimated completion in December 2023. There may be some time periods where construction activities associated with the Proposed Action are conducted during the same time periods. The Proposed Action is anticipated to be operational prior to the completion of the CSL/MIF. Additionally, operations associated with the Proposed Action represents a limited duration noise source, with hours limited by the air permit to less than 10% of the year and/or in response to emergencies. Therefore, implementing the Proposed Action would have no significant incremental adverse cumulative effect on the noise environment.

No Action Alternative

Under the No Action Alternative, the project would not be constructed and temporary increases in sound level from construction and operation of the generators would not occur.

4.3 AIR QUALITY

Proposed Action

Criteria Pollutants. The threshold level of significance for air quality is defined as a violation of an ambient air quality standard or regulatory threshold.

Air quality impacts associated with the Proposed Action were evaluated based on whether emissions would be localized, and whether a reasonable potential exists for a violation of an ambient air quality standard or regulatory threshold. An estimate is provided to show the Proposed Action's emissions would be less than the *de minimis* levels established in the conformity regulation. Implementation of the Proposed Action at MIT LL would result in minor, direct, short-term, adverse impacts on overall air quality from construction activities. The operation of various pieces of equipment during construction activities would create exhaust emissions, and generate dust and other particles in the air, during the execution of the Proposed Action. Mobile source emissions also would be generated from vehicular traffic. Operational emissions following implementation of the Proposed Action would result in beneficial impacts on the overall air quality.

Construction and operational emissions were estimated using the U.S. Air Force's Air Conformity Applicability Model (version 5.0.16), in compliance with the AFMAN 32-7002, *Environmental Compliance and Pollution Prevention*. Construction activities would include grading, trenching/excavation, building new facilities, architectural coating, and paving. Construction was assumed to begin in January 2021 and last through December 2021.

Table 4-1 Estimated Emissions from the Construction of Generator Building 1

	Emissions for 2021 (Tons Per Year)						
Emission Source	**VOC**	**CO**	**NO_X**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
2021 Construction Emissions	0.18	0.97	0.80	0.002	0.26	0.033	227
de minimis levels (tons per year)	50	250	100	250	250	250	
Thresholds Exceeded for Any Activity?	No	No	No	No	No	No	No
	Operational Emissions (tons per year)						
Emission Source	**VOC**	**CO**	**NO_X**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
Proposed Backup Generators	0.18	2.99	1.35	0.006	0.001	0.001	1,219
Emissions Reduction – Removal of Existing Generators	1.80	5.20	25.8	0.012	1.58	1.58	1,219
Net Operating Emissions	-1.62	-2.22	-24.4	-0.006	-1.58	-1.58	0
de minimis levels (tons per year)	50	250	100	250	250	250	
Thresholds Exceeded for Any Activity?	No	No	No	No	No	No	No

Source: Appendix C, Air Quality Emission Estimates and Record of Non-Applicability

BMPs would be implemented to reduce potential impacts to air quality from construction activities. These control measures could include applying water to, or using other stabilization measures on areas of bare soil or soil piles; creating wind breaks; and covering dump trucks that transport materials that could become airborne. Additionally, contractors would maintain construction equipment in accordance with manufacturers' specifications to reduce exhaust emissions and minimize unnecessary noise impacts.

HAFB, and where the proposed site for the generator building is located, is in the Northeast Ozone Transport Region. HAFB is subject to general conformity for ozone only, and the significance determinations for the other pollutants are Prevention of Significant Deterioration thresholds. A general conformity determination is not required because the ozone precursor pollutant levels are below the *de minimis* thresholds applicable to HAFB. Based on the estimated emissions listed in Table 4-1, the emissions from construction activities associated the Proposed Action would be below regulatory thresholds. Therefore, the Proposed Action would not be subject to a Prevention of Significant Deterioration permit or NSR requirements, or Environmental Notification Form and Mandatory Environmental Impact Report requirements. Analysis indicates that emissions would be below the *de minimis* thresholds. A Record of Non-applicability is provided in Appendix C to document that the Proposed Action is exempt from general conformity requirements. Appendix C also contains detailed emission calculations.

The Proposed Action would result in installation of three new backup diesel generators and the elimination of 16 existing backup generators. The new backup generators are expected to be more efficient and have more stringent air emission controls than the existing generators. Therefore, implementation of the Proposed Action is expected to result in a net emissions decrease compared to the existing conditions. The estimated emissions associated with operation of the Proposed Action are presented in Table 4-1. A copy of the calculations used to develop these estimates is provided in Appendix C.

MIT LL applied for a Non-major Comprehensive Air Plan Approval from MassDEP for the proposed construction and operation of the three 1,000 kW generators. MassDEP granted approval of the Plan on November 5, 2019 (Authorization No. AQ02F-0000042). A copy of the approval letter from MassDEP is included in Appendix C.

The short-term emissions from construction of Generator Building 1 would not increase air pollutants to levels that exceed regulatory thresholds in the region, and impacts would be short term in nature. The emissions would be temporary, localized, and eliminated after the activity is completed. These emissions would quickly dissipate as they are transported from the activity source, thereby preventing significant contribution to cumulative impacts on air quality.

Cumulative Impacts

The Proposed Action would result in short-term cumulative effects to air quality from the generation of fugitive dust when added to those from recently completed and planned construction projects. Impacts would not be significant because dust suppression techniques would be used during construction and operation to minimize impacts from dust.

Climate Change and Greenhouse Gases. The Proposed Action would generate greenhouse gas (GHG) emissions from construction-related activities. Construction of Generator Building 1 would result in a short-term, insignificant increase in GHG emissions. Estimated peak GHG emissions would be 227 tons of CO_2e for construction activities in 2021. Therefore, short-term, minor, adverse impacts to climate change as a result of GHG emissions at MIT LL would be expected from implementation of the Proposed Action.

Review of the Net Operating Emissions for the Proposed Action indicates that implementation of the Proposed Action has a net zero impact on GHG emissions and, therefore, has no impact to air quality. The estimated GHG emissions are based on potential fuel usage in the backup generators. Current estimates of future fuel usage are the same for the Proposed Action and the No Action Alternative. Therefore, the potential GHG emissions are the same for both scenarios.

Estimated GHG emissions from the Proposed Action are expected to be equal to GHG emissions that would result from the No Action Alternative. Therefore, implementation of the Proposed Action would not contribute significantly to climate change.

No Action Alternative

Implementation of the No Action Alternative would not result in a change in current conditions. However, because the Proposed Action is expected to result in a net emissions decrease, the No Action Alternative potentially has a more significant adverse impact on air quality than does the Proposed Action.

4.4 WATER RESOURCES AND WATER QUALITY

Proposed Action

No groundwater features, surface water features, wetland resources, or floodplains are present within the footprint of the Proposed Action. Therefore, it is not anticipated that construction activities would directly affect these resources.

Groundwater. Construction of the replacement facility would have the potential to intersect the groundwater table due to seasonally high groundwater levels throughout the base. Therefore, dewatering may be necessary, and the construction contractor would be required to include provisions for dewatering. It is anticipated that the excess groundwater within the construction site would be pumped to an upland location and, if necessary, conveyed to a stilling basin (to remove suspended solids) and/or energy dissipating device, then allowed to flow overland and re-infiltrate the ground.

Surface Water and Wetlands. There would be no direct impacts to surface waters or the identified wetland north of the of the Proposed Action site. However, construction of Generator Building 1 would present a temporary disturbance within a small portion of the 100-foot wetland buffer zone, where the northern part of the building would be constructed (Figure 3-1). The area of the wetland buffer zone that would be affected is currently a paved asphalt parking lot; therefore, no natural habitats are present within the area that would be disturbed by the Proposed Action. Notification of disturbance in the 100-foot wetland buffer zone was coordinated with the Lexington Conservation Commission and approved. The Order of Conditions for the project was issued on January 6, 2020 and mailed to MIT LL on May 21, 2020. There would be no direct impacts to floodplains because no portion of the Proposed Action site is within a Federal Emergency Management Agency-designated floodway or state-designated 100-year floodplain.

Stormwater. Because the Proposed Action would require surface disturbance and there would be periods of bare soil exposed, the potential exists for the ground to erode and potentially be carried into the stormwater system. During construction, all activities would be conducted in accordance with BMPs to prevent adverse effects to the identified wetland north of the Proposed Action site as well as to the receiving water (that is, Shawsheen River) into which the stormwater system discharges. Since the construction would result in the disturbance of greater than one acre, MIT LL would obtain and comply with the NPDES General Permit for Stormwater Discharges from Construction Activities. The Proposed Action was reviewed and approved by

the Lexington Conservation Commission for compliance with Massachusetts Stormwater Management Standards, in addition to compliance with the Massachusetts Wetlands Protection Act, as described herein. The Order of Conditions was issued on January 6, 2020.

Floodplains. There would be no impacts to floodplains because no portion of the Proposed Action site is within a Federal Emergency Management Agency-designated floodway or state-designated 100-year floodplain.

Cumulative Impacts

The Proposed Action would not be expected to pose adverse cumulative effects to water resources and water quality because there would be no direct impacts from the temporary disturbance within a small portion of the 100-foot wetland buffer zone of the identified wetland area north of the paved parking area. Therefore, there are no impacts that would add to those identified for recently completed and planned construction projects on MIT LL campus and on HAFB. The construction of the CSL/MIF facility may intersect the groundwater table due to seasonally high groundwater levels throughout the base. MIT LL's design of the replacement facility must comply with HAFB's stormwater runoff requirements, pursuant to the CWA and the impaired status of the Shawsheen River and therefore, this potential intersection with groundwater was determined not to be significant.

No Action Alternative

Under the No Action Alternative, no changes to the current conditions relating to the water resources would take place; therefore, no impact to water resources and water quality would occur.

4.5 HAZARDOUS MATERIALS AND SOLID WASTE

Proposed Action

Construction of Generator Building 1 would result in minor, short-term, adverse, direct impacts from the temporary storage, use, and generation of hazardous materials. The hazardous material and waste likely to be stored, used, and generated would include equipment fuel, engine oil, hydraulic oil, grease, and other equipment operation and maintenance materials and lubricants, used to maintain construction equipment. Hazardous materials used or generated during construction that are not recycled, would be collected onsite and turned in regularly to the MIT LL's Hazardous Waste program, to be disposed of through a contracted hazardous waste hauler, in accordance with MIT LL policies and protocols and all applicable state and federal regulations. No onsite disposal of these materials would occur. The volume of hazardous wastes generated is not anticipated to place a measurable burden on regional disposal sites.

The construction of Generator Building 1 would also result in a long-term beneficial impact by reducing the number of refueling points for generators (and thus the possibility for accidental fuel spills) on the MIT LL campus from 16 to 3 locations. The three 3,500 gallon dual-walled diesel fuel storage tanks would have secondary levels of containment (concrete containment walls) and would be located inside the building underneath each generator. The fuel storage tanks would be considered above ground storage tanks and would require a use permit from the Office of the State Fire Marshall. Accidental releases would be minimized by containment and cleanup measures detailed in the SPCC Plan. Containment and cleanup equipment and materials would be available onsite. No indirect impacts associated with hazardous materials or wastes are expected to occur as a result of implementing the Proposed Action.

MIT LL's existing SPCC Plan (Cooperstown Environmental LLC, 2015) would be updated to include Generator Building 1 and followed to minimize occurrences of spills and provide procedures for cleaning up spills if they occur. Staff members would be trained in proper spill prevention, as well as spill handling and containment. As specified in the SPCC Plan, the general strategy for preventing releases is to contain any spill of oil in the general area until the material can be removed. In rooms with existing storage tanks near open floor drains, storm drains, or sensitive receptors, the drains are permanently plugged, capped, or covered (if possible) or temporarily covered during refilling operations. Containment measures, such as the placement of curbs, berms, or spill pillows at doors or other exits, are used to contain spills within the rooms in which they occur. MIT LL mechanical service shop personnel are responsible for visual inspections of tanks monthly and for documenting inspections. EHS personnel review all inspection logs.

MIT LL's fuel oil delivery contractor performs fuel deliveries in compliance with U.S. Department of Transportation's unloading regulations and is required to follow MIT LL's established spill prevention guidelines. MIT LL personnel accompany delivery drivers during the fuel delivery. The fuel delivery is manned, fuel is directed to proper tanks, and the delivered fuel volume and liquid level in the receiving tank are monitored. The fuel delivery contractor maintains absorbent and spill containment materials on each oil delivery truck. The delivery contractor is also responsible for providing drip trays under each loading pipe to prevent spillage or leakage of oil into the environment. Delivery of oil and hazardous materials is regulated by MIT LL and is only allowed during regular business hours, except for emergency deliveries.

Removal of asbestos-containing building materials, if encountered during installation of the electrical feeders to the supported facilities, must be done by a licensed asbestos contractor. Additionally, full containment and a licensed project monitor may be required. The asbestos abatement contractor, if required, must comply with all state and federal regulations.

Construction would result in a short-term increase in solid wastes and construction debris during construction of Generator Building 1. The volume of solid waste generated is not anticipated to place a measurable burden on regional disposal sites. To the extent practicable, construction would use reused or recycled materials. It is anticipated that comprehensive measures, in accordance with applicable federal, state, and local laws, would be implemented prior to and during construction to avoid, minimize, and mitigate impacts related to trash and debris disposal. Good housekeeping practices would be implemented to minimize trash and debris in the work areas.

The site of the Proposed Action is not located within or adjacent to any ERP sites. Therefore, it is not anticipated that construction activities would encounter contaminated soils or groundwater; however, if soil or groundwater is observed to have an odor or sheen, it would be tested prior to disposal or discharge. Construction and operation of Generator Building 1 are not expected to have an adverse effect on HAFB's ongoing remediation activities.

Cumulative Impacts

The Proposed Action would not result in, or contribute to, significant negative cumulative impacts to hazardous materials on MIT LL, HAFB, or in the region. The Proposed Action, combined with other ongoing or proposed activities at MIT LL and HAFB, however, does have the potential to result in minor, short-term cumulative increases in solid waste generation; however, the effects will generally be limited to the construction timeframe of each project and be proportional to the size of the building being constructed or renovated. The short term increases in solid waste during construction for the projects identified in Section 3.5 would be

minor because reusable/recycled material would be utilized, and efficient building technologies were incorporated into the building designs. No cumulative changes in the accumulation, transport, and disposal of hazardous wastes are anticipated.

No Action Alternative

Under the No Action Alternative, no changes to the current conditions relating to the hazardous material and solid waste resources would take place; therefore, no impact to hazardous material and solid waste resources would occur. There would also be no long-term beneficial effect by reducing the number of refueling points for generators (and thus the possibility for accidental fuel spills) on the MIT LL campus from 16 to 3 locations.

4.6 BIOLOGICAL RESOURCES

Proposed Action

Construction of Generator Building 1 and the associated electrical feeders would result in moderate, short-term, adverse impacts to approximately 12,917 square feet of lawn areas that would be excavated to allow installation of the concrete duct banks containing the 12 independent electrical feeders to distribute electricity from the generator building. Restoration activities would be implemented such that no long-term impacts would be realized.

Coordination with the Massachusetts Natural Heritage and Endangered Species Program on May 11, 2020 (Appendix A) indicated that no state-listed species of areas of priority habitat exist at the site of the Proposed Action. Therefore, the Proposed Action is expected to have No Adverse Effect to state-listed species.

The USAF has determined that proposed undertakings within the boundaries of HAFB would have “no effect” on the Northern Long-eared Bat, a federally listed species. This determination is documented in a memorandum for record (USAF, 2018), which is included in Appendix C. Coordination with the USFWS on June 11, 2020 (Appendix C) indicated that the only federally listed species that may be present in the action area is the threatened Northern Long-eared Bat. As specified in the coordination letter; no critical habitats are identified within the project area.

The project is consistent with activities analyzed in the Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions. Since no mature trees would be removed by implementing the Proposed Action, the project is unlikely to affect the Northern Long-eared Bat, however, any take that may occur as a result of the action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR Section 17.40(o). The Biological Opinion concludes that “conservation of the Northern Long-eared Bat as a threatened species is best served by limiting the full suite of prohibitions applicable to endangered species under Section 9 of the Act to its most vulnerable life stages, that is, while in hibernacula or in maternity roost trees”. Since the Proposed Action is 9.3 miles away from the closest hibernaculum and/or maternity roost tree (Appendix C), no special protective measures are necessary while implementing the Proposed Action. Therefore, HAFB concludes that there would be no significant impacts to the Northern Long-eared Bat as a result of implementing the Proposed Action.

The Lexington Select Board requested that any loss of trees as it relates to climate resiliency and land disturbance and erosion control be evaluated in the EA. The Proposed Action does not include the removal of any trees; therefore, no impacts are expected.

Cumulative Impacts

When taking into consideration the other undertakings within the region as discussed in Section 3.5, no negative cumulative impacts of biological resources are anticipated. All construction projects have the potential for adverse effects on wildlife from habitat alteration and from noise and human activity during construction. The relevant past and future actions generally occur in areas of marginal wildlife habitat. The construction of the CSL/MIF facility would require grading and excavation that would result in the loss of existing vegetation. However, once the proposed building superstructure is in place, a landscaped buffer would be created around the perimeter of the building, thereby establishing an approximately 80-foot wide green space with grass, shrubs, and small trees around the building, and somewhat offsetting the vegetation lost during construction. The majority of vegetation to be cleared from the Proposed Action site is maintained lawn areas. As a result, there would be no significant incremental adverse cumulative effects on biological resources from implementation of the Proposed Action.

No Action Alternative

Under the No Action Alternative, no changes to the current conditions relating to the biological resources would take place; therefore, no impact to biological resources would occur. No changes to any threatened or endangered species would occur as there would be no changes to habitat as a result of construction.

4.7 TOPOGRAPHY, GEOLOGY, AND SOILS

Proposed Action

The Proposed Action would result in negligible, long-term changes in topography from changing the existing grades in the existing parking lot to move the curb cut for the parking lot. Because the Proposed Action would have negligible, long-term impacts on topography, when taking into consideration the other undertakings within the region as discussed in Section 3.5, the Proposed Action would not contribute to significant incremental adverse cumulative effects.

Excavation necessary to construct Generator Building 1 is expected to be no deeper than approximately 10 feet to install the depressed slab where the diesel fuel tanks would be located, which would be 5 feet lower than the generator level. Excavation necessary to install the electrical feeders is expected to be no deeper than approximately 5 to 8 feet, depending on the existing elevations. To minimize disturbance to subsurface geology, the foundation system would consist of drilled mini-piles, pile caps, grade beams, and a structured concrete slab. Therefore, the Proposed Action would result in a negligible, long-term impact to subsurface geology. Because the Proposed Action would have a negligible, long-term impact on geology, when taking into consideration the other undertakings within the region as discussed in Section 3.5, the Proposed Action would not contribute to significant incremental adverse cumulative effects.

Soil impacts are anticipated to be short-term and minor as a result of excavation and construction activities. The footprint for the proposed generator building is a paved parking lot, so no impact to soils is anticipated in this area. Approximately 12,917 square feet of pervious lawn areas would be excavated to allow installation of concrete duct banks containing the electrical feeders to distribute electricity from the generator building to the utility closets in the support facilities. The excavation activities would result in a minor impact on topsoil in these areas. The soils and the vegetation would be restored upon the completion of construction resulting in no long-term impacts.

Cumulative Impacts

While construction activities associated with the projects described in Section 3.5 would alter the soils, the work would proceed in accordance with HAFB BMPs for stabilizing soils and minimizing erosion, and they are not anticipated to result in long-term impacts to geology or soils. Therefore, because the Proposed Action would have negligible, long-term impacts to topography and geology, and no long-term impacts on soils as a result of restoration, when taking into consideration the other undertakings within the region as discussed in Section 3.5, the Proposed Action would not contribute to significant incremental adverse cumulative effects.

No Action Alternative

Under the No Action Alternative, no changes to the current conditions relating to the topography, geology, and soil resources would take place; therefore, no impact to topography, geology, and soil resources would occur.

4.8 ENERGY USE AND INFRASTRUCTURE

Proposed Action

The construction of Generator Building 1 would result in a minimal-medium beneficial impact to the MIT LL campus because the generator consolidation would provide a more reliable source of backup power for the MIT LL campus.

Construction activities would result in a short-term increase in demand for electricity, sewage treatment, and water supply. Some existing utilities may need to be relocated prior to construction. Construction activities may result in short-term impacts to the storm drainage system due to ground disturbance and temporarily exposed soils that may be carried to the drainage system during heavy storms.

The only new utility that would need to be installed to connect Generator Building 1 to existing distribution and service lines on MIT LL campus would be electricity. The operation of the Generator Building 1 is anticipated to pose a minor increased demand for, and use of, electricity at MIT LL. However, no potable water would be needed, nor would wastewater be generated from operation of Generator Building 1. In addition, no natural gas, chilled water, or steam would be required for operation of the generator building.

The Lexington Select Board commented that the scope of the EA should include realistic sources for funding for Lexington to mitigate the anticipated impacts to infrastructure, including but not limited to utilities, roadway, water, sewer, emergency response. In addition, Lexington requested that the scope include a requirement that HAFB and MIT LL actively pursue this funding on behalf of the town. The town also requested that the projected volume of additional water and wastewater use, and downstream capacity of the sewer system be evaluated. The Proposed Action does not include any changes to these infrastructure components. Therefore, no impacts are expected.

The Lexington Select Board further requested that sustainability, net zero, and energy conservation measures in design; and water conservation measures be evaluated in the EA. The Proposed Action would follow all USAF regulations regarding these sustainability and energy conservation, and no additional water use, other than during construction activities is anticipated. Therefore, no impacts are expected.

Cumulative Impacts

The operation of the proposed CSL/MIF replacement facility would increase the demand for, and use of, electricity at MIT LL; however, HAFB's electrical demand is well below the capacity of the transmission lines on base. Additionally, the design of the proposed replacement facility is anticipated to incorporate energy conservation technologies, such as high efficiency lighting and/or motion-activated sensors/timers for room lighting, consistent with DoD guidance for energy efficiency. The Vandenberg Gate Complex Construction Dorm Construction and Demolition project was not anticipated to result in a substantial increase in electricity use. Therefore, because the Proposed Action would result in a minimal-medium beneficial impact to the MIT LL campus, when taking into consideration the other undertakings within the area as discussed in Section 3.5, the Proposed Action would not result in a significant cumulative impact on energy use and infrastructure.

No Action Alternative

Under the No Action Alternative, no changes to the current conditions relating to energy use and infrastructure resources would take place; therefore, no impact to energy use and infrastructure resources would occur.

4.9 SAFETY AND OCCUPATIONAL HEALTH

Proposed Action

Consolidation of the distributed backup power capacity and generation into a single purpose-built facility designed to safely handle and support complex electric generation and service functions would have beneficial effects by eliminating accumulated odors and particulate risk to several sensitive research areas by allowing the decommissioning of the 16 smaller generators located throughout the MIT LL campus. Construction of the new electric generation facilities, Generator Building 1, potentially decreases the safety risk to personnel and assists with MIT LL's ability to support the future needs of the DoD. No indirect impacts would be anticipated from the Proposed Action.

Construction activities would comply with all applicable federal, state, local, and USAF regulatory safety standards. It is expected that the construction workers would be trained to identify and avoid safety hazards, such as those common to working around/with heavy equipment and electrically-powered hand tools. A temporary chain link fence would be installed around the perimeter of the construction area, and only authorized personnel with appropriate personal protective equipment would be allowed to enter the construction zone.

The design of the proposed facility, where feasible, is anticipated to incorporate elements that account for employee health, such as using non-toxic materials for building interiors, including adhesives, sealants, carpets, and furnishings. Operation of the proposed facility would comply with MIT LL EHS policy to ensure that the activities conducted, as well as the products and services provided and used, are safe for MIT LL employees, other users, and the general public. In accordance with this policy, all individuals who engage in, or oversee, activities (for example, work with potentially hazardous materials, equipment, or processes) that are regulated because of potential risks to the environment, health, or safety would continue to receive training appropriate to the regulated activity. To optimize safety and health in the workplace, personnel would continue to have access to all pertinent safety and health information related to any federal, state, MIT, applicable HAFB, or general-industry safety and health information, consistent with current practice at MIT LL. Personnel discovering an emergency situation are responsible for immediately reporting such status by the most expeditious means available as

the conditions may dictate in order to protect personnel and minimize damage to equipment and to facilities. If an employee is injured while working, MIT Medical Department personnel, MIT LL Security, and the Hanscom Fire Department emergency medical technician responders would assist with medical first-aid treatment and coordinate medical transport to a local hospital or clinic, if necessary.

Cumulative Impacts

Because the Proposed Action would result in a negligible and beneficial impact to the MIT LL campus, when taking into consideration the other undertakings within the area as discussed in Section 3.5, the Proposed Action would not result in a significant cumulative impact on safety and occupational health.

No Action Alternative

Under the No Action Alternative, no changes to the current conditions relating to safety and occupational health would take place and the16 smaller generators located throughout the MIT LL campus would not be decommissioned. Therefore, there would be no beneficial effects of eliminating accumulated odors and particulate risk to several sensitive research areas.

4.10 CULTURAL RESOURCES

Proposed Action

No evidence of Native American human remains or associated funerary objects are present at the site of the Proposed Action (USAF, 2017) and there are no known traditional cultural properties present. Because of the location and developed nature of the site, intact deposits are unlikely. Should an inadvertent discovery of unknown cultural resources be found during construction of Generator Building 1, all work at the site would cease and the site would be protected until an evaluation by the HAFB Cultural Resource Manager is completed and any necessary coordination or consultation with the Massachusetts State Historic Preservation Officer (SHPO) and affiliated tribes has taken place. The HAFB Cultural Resource Manager would work with the Massachusetts SHPO and the DoD Tribal Liaison Office, using procedures dependent on whether human remains, or funerary items are discovered, to identify federally recognized Native American tribes, with ancestral affiliations to HAFB lands. Adverse impacts on cultural resources would be avoided to the maximum extent possible. Therefore, cultural resources are not considered further in this EA.

In addition, the USAF determined that the Proposed Action would have No Adverse Effect on historical resources. As part of the preliminary EA process, MIT LL, in conjunction with the USAF, contacted the Massachusetts SHPO and the Lexington Historical Commission to obtain information regarding the Proposed Action's impact on any known cultural resource sites at or in the vicinity of the proposed site for Generator Building 1 on the MIT LL campus area of HAFB. The Massachusetts SHPO concurred with the USAF's determination of No Adverse Effect on historical resources. A copy of this correspondence is included in Appendix A.

Cumulative Impacts

The preferred site for the CSL/MIF project is not anticipated to have an adverse impact on cultural resources, nor was the Vandenberg Gate Complex Construction Dorm Construction and Demolition anticipated to have any impacts to cultural resources. The Massport Hanscom Field GEIR/ESPR report identified areas of high pre-contact archaeological sensitivity as those previously undisturbed, dry, level areas located adjacent to the natural brooks and wetlands in the peripheral portions of Hanscom Field. However, the project described herein, and the site of

the Proposed Action are previously disturbed areas. Therefore, because the Proposed Action would be unlikely to impact cultural resources because there is no evidence of cultural resources at the site and considering the developed nature of the site, when taking into consideration the other undertakings within the area as discussed in Section 3.5, the Proposed Action would not result in a significant cumulative impact on cultural resources.

No Action Alternative

Under the No Action Alternative, no changes to the current conditions would occur. Therefore, there would be no potential impacts to cultural resources.

4.11 TRANSPORTATION AND TRAFFIC

Proposed Action

The Proposed Action would have negligible, adverse, long-term, direct impacts on this resource because of the loss of approximately 20 parking spaces in the paved parking area in the northern industrial area (see Figure 3-1). The construction and operation of Generator Building 1 would also result in negligible, short-term, adverse impacts on traffic due to the increased traffic from construction vehicles and trucks during construction activities. However, the Proposed Action (1) would not result in an increase in the workforce population and (2) would not have significant impacts on transportation or traffic on HAFB or the MIT LL main campus. The Lexington Select Board commented that traffic congestion and mitigating impacts of additional traffic from additional employees and reviewing road access to MIT LL should be evaluated in the EA. Upon review of the Proposed Action and these comments, the USAF has determined that these impacts are beyond the scope of the EA. The Proposed Action does not include any changes to traffic patterns, road access to MIT LL, nor an increase in personnel. Therefore, no impacts are expected.

Cumulative Impacts

The Lexington Select Board commented that HAFB conduct an evaluation of any projected increase or decrease in parking demand in light of the removal of parking spaces to accommodate the generator building site and the addition of other buildings besides the generator building. Because the Proposed Action would result in the loss of approximately 20 parking spaces, when taking into consideration the other undertakings within the area as discussed in Section 3.5, the Proposed Action would contribute to the cumulative impact of lost parking spaces at MIT LL that would result from construction of the CSL/MIF project, which would result in the loss of 205 parking spaces. However, the cumulative impact from the Proposed Action would be negligible because the EA for the CSL/MIF project identified a surplus of 850 parking spaces on the MIT LL campus (AECOM, 2014).

No Action Alternative

Under the No Action Alternative, no changes to the current conditions would occur. Therefore, there would be no impacts to transportation and traffic.

4.12 CUMULATIVE IMPACTS TO RESOURCES ELIMINATED FROM FURTHER DETAILED ANALYSIS

Cumulative impacts would not exist for those resource areas that were determined to not have potential for adverse impacts described in Section 3.3. Because no impacts from the Proposed Action to these resource areas exist, no potential for cumulative impacts with the other actions described in Section 3.5 exists.

4.13 OTHER NEPA CONSIDERATIONS

4.13.1 Unavoidable Adverse Effects

This EA identifies any unavoidable adverse impacts that would be required to implement the Proposed Action and the significance of the potential impacts to resources and issues. 40 CFR 1508.27 specifies that a determination of significance requires consideration of context and intensity. The construction of Generator Building 1 at MIT LL would impact the local project area at the MIT LL campus. The severity of potential impacts would be limited by regulatory compliance for the protection of the human and natural environment.

Unavoidable short-term adverse impacts associated with implementing the Proposed Action would include: temporary erosion and sedimentation from soils disturbance, a temporary increase in fugitive dust and air emissions during construction, intermittent noise, and minor alterations to local traffic patterns. However, these effects are considered minor and would be confined to the immediate area. Use of environmental controls and implementing controls required in permits and approvals obtained would minimize these potential impacts. No unavoidable, long-term, adverse impacts to wetlands would occur.

For the Proposed Action to be accomplished, these impacts would occur. The action is required to provide a reliable source of redundant backup electrical power, allowing MIT LL to accomplish their mission without disruption and maintain critical research, security, and building operations functions without interruption during periods of commercial power interruption and during scheduled maintenance of key electrical infrastructure. No other alternatives would provide the engineering solution to meet this need.

4.13.2 Relationship of Short-term Uses and Long-Term Productivity

The relationship between short-term uses and enhancement of long-term productivity from implementation of the Proposed Action is evaluated from the standpoint of short-term effects and long-term effects. Short-term effects would be those associated with construction activities to build Generator Building 1. The long-term enhancement of productivity would be those effects associated with operation and maintenance of Generator Building 1 after implementation of the Proposed Action.

The Proposed Action represents an enhancement of long-term productivity for operations associated with Generator Building 1. The negative effects of short-term operational changes during construction of the building and decommissioning of the existing generators would be minor compared to the positive benefits from replacement of the existing generators with the new Generator Building 1. Immediate and long-term benefits would be realized for operation and maintenance after completion of the Proposed Action.

4.13.3 Irreversible and Irretrievable Commitments of Resources

This EA identifies any irreversible and irretrievable commitments of resources that would be involved in the Proposed Action if implemented. An irreversible effect results from the use or destruction of resources (for example, energy) that cannot be replaced within a reasonable time. An irretrievable effect results from loss of resources (for example, endangered species) that cannot be restored as a result of the Proposed Action. The short-term irreversible commitments of resources that would occur would include planning and engineering costs, building materials costs, labor, generation of fugitive dust emissions, and creation of temporary construction noise. All energy and materials used during construction and operation of the project would be long-term irreversible and irretrievable. The short-term irretrievable commitment of resources that

would occur include land use for the footprint of the generator building. However, after the operational life of the generator building is over and the building has been decommissioned, the land would again be available for other uses. Therefore, during the lifespan of the project, land use would experience an irretrievable impact.

5.0 LIST OF PREPARERS

The Environmental Office (66ABG/CEIE), along with MIT LL and Jacobs Engineering, prepared this document to fulfill the requirements of NEPA for the construction of Generator Building 1 at the MIT LL campus. The following persons authored and provided direct oversight for the preparation of this EA:

Table 5-1 List of Preparers

Name/Organization	Education	Resource Area	Years of Experience
John Burgess/Jacobs	M.S. Zoology, University of Maine, 1997 B.A. Biology, University of Southern Maine, 1994	Task Lead	22
Robbie Gray/Jacobs	Bachelor of Chemical Engineering, Auburn University, 1995	Air Quality	25
Mark Bastasch/Jacobs	B.S., M.S. Environmental Engineering, INCE Board Certified, Registered Professional Acoustical, Environmental and Civil Engineer (OR)	Noise	22
Rick Zeroka/Jacobs	M.A., Energy and Environmental Studies (Ecology), 1990, Boston University B.S., Biology, B.A. Physical Geography, University of Delaware, 1980	Various Resource Areas	29
Stephen Petron/Jacobs	Ph.D., Zoology, Washington State University, 1987 M.S., Natural and Environmental Resources, University of New Hampshire, 1981 B.S., Wildlife Management, University of Minnesota, 1978	Senior Review	35
Taylor O'Brien/HAFB	B.S., Civil Engineering, University of Massachusetts Lowell, 2014	Base Review	5

6.0 PERSONS AND AGENCIES CONSULTED/COORDINATED

The following Persons and Agencies were contacted in the preparation of this EA:

Table 6-1 Persons and Agencies Consulted/Coordinated

Federal Agencies	
USFWS New England Ecological Services Field Office	Response received and included in Appendix A.
EPA, New England Region	Response received and included in Appendix A.
State Agencies	
Massachusetts Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program	Response received and included in Appendix A.
Massachusetts Historical Commission, State Historic Preservation Officer	Response received and included in Appendix A.
Local Agencies	
Town of Bedford, Massachusetts Board of Selectmen	No response received.
Town of Lexington, Massachusetts Board of Selectmen	Response received and included in Appendix A.
Town of Concord, Massachusetts Board of Selectmen	No response received.
Town of Lincoln, Massachusetts Board of Selectmen	No response received.
Tribal Agencies	
Mashpee Wampanoag Tribe	No response received.
Wampanoag Tribe of Gay Head (Aquinnah)	No response received.
Massachusetts Commission on Indian Affairs	No response received.

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APPENDIX A

Interagency/Intergovernmental Coordination
and Public Participation

APPENDIX A1

Notice of Intent – Generator Building 1

Massachusetts Institute of Technology – Lincoln Laboratory

Electrical Building Modifications

Generator Building #1

PREPARED FOR

Massachusetts Institute of Technology
Lincoln Laboratory
Lexington, Massachusetts 02421

PREPARED BY

101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

August 2019

August 2, 2019

Lexington Conservation Commission
1625 Massachusetts Avenue
Lexington, Massachusetts 02421

Re: Notice of Intent – Generator Building #1
Massachusetts Institute of Technology – Lincoln Laboratory
244 Wood Street
Lexington, Massachusetts 02421

Dear Commissioners:

On behalf of Massachusetts Institute of Technology Lincoln Laboratory (MIT LL), Vanasse Hangen Brustlin, Inc. (VHB) is submitting this Notice of Intent pursuant to the Massachusetts Wetlands Protection Act (MGL Chapter 131, Section 40), and its implementing regulations (310 CMR 10.00). The Lexington Wetlands Protection Code is not applicable to this facility as it is Federal property.

This project is one of three independent projects that will improve the electrical infrastructure for MIT Lincoln Laboratory. It involves construction of a new building that will house up to five (5) 1-megawatt tier 4 generators, associated switchgear and distribution infrastructure and removal of 16 individual generators from various locations around the MIT LL Campus. This project also includes construction of stormwater management infrastructure designed to exceed the requirements of the Massachusetts Stormwater Standards.

Some of the project components and related work will occur in the 100-foot buffer zone to wetland resources. As such, a comprehensive erosion and sedimentation control program will be implemented to prevent construction-related impacts.

One copy of the NOI and all accompanying plans have been filed with the Northeast Regional Office of the Massachusetts Department of Environmental Protection (DEP). In accordance with the requirements of the Wetlands Protection Act, abutters within 100 feet of the property have been notified. A copy of the abutter notification form and list of abutters are enclosed with the NOI.

Included with this submittal is a check in the amount of $262.50 for the Town's share of the WPA filing fee. The state share of the WPA filing fee $237.50 has been sent to the DEP lock box in Boston.

On behalf of MIT LL, VHB respectfully requests that the Commission issue an Order of Conditions for the project presented herein.

Please schedule this for review at your next regular Commission meeting. Should you have any questions concerning this submittal or require additional information, please contact me at your convenience at 617-607-2599 or by email at cnowak@vhb.com.

Sincerely,

Christopher Nowak, PE

Principal

CC: Hanscom Air Force Base
MIT LL
MassDEP NERO

Electrical Building Modifications

Generator Building #1

PREPARED FOR

Massachusetts Institute of Technology
Lincoln Laboratory
244 Wood Street
Lexington, Massachusetts 02421

PREPARED BY

101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

June 2019

Table of Contents

Notice of Intent Forms

- WPA Form 3
- Fee Transmittal Form
- Copy of Filing Fee Checks

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

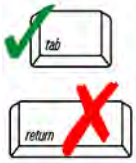
Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Lexington
City/Town

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



Note: Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

244 Wood Street (a. Street Address) | Lexington (b. City/Town) | 02421 (c. Zip Code)

Latitude and Longitude: 42.46163 (d. Latitude) | -71.26627 (e. Longitude)

74 (f. Assessors Map/Plat Number) | 5 (g. Parcel /Lot Number)

2. Applicant:

John (a. First Name) | Barszewski (b. Last Name)

Massachusetts Institute of Technology Lincoln Laboratory (c. Organization)

244 Wood Street (d. Street Address)

Lexington (e. City/Town) | MA (f. State) | 02421 (g. Zip Code)

781-981-9502 (h. Phone Number) | (i. Fax Number) | John.Barszewski@ll.mit.edu (j. Email Address)

3. Property owner (required if different from applicant): ☐ Check if more than one owner

c/o Thomas J. (a. First Name) | Schluckebier, PE, CFM, LEED AP (b. Last Name)

Base Civil Engineer, Hanscom Air Force Base, United States Air Force (c. Organization)

120 Grenier Street (d. Street Address)

Hanscom AFB (e. City/Town) | Massachusetts (f. State) | 01731 (g. Zip Code)

781-225-2999 (h. Phone Number) | 781-225-2230 (i. Fax Number) | thomas.schluckebier.1@us.af.mil (j. Email address)

4. Representative (if any):

Christopher (a. First Name) | Nowak, PE (b. Last Name)

Vanasse Hangen Brustlin, Inc. (c. Company)

101 Walnut Street (d. Street Address)

Watertown (e. City/Town) | MA (f. State) | 02471 (g. Zip Code)

617-607-2599 (h. Phone Number) | 617-924-2286 (i. Fax Number) | cnowak@vhb.com (j. Email address)

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

$500.00 (a. Total Fee Paid) | $237.50 (b. State Fee Paid) | $262.50 (c. City/Town Fee Paid)

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A. General Information (continued)

6. General Project Description:

Proposed modifications to existing electrical infrastructure. See attached narrative for details.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

1. ☐ Single Family Home
2. ☐ Residential Subdivision
3. ☐ Commercial/Industrial
4. ☐ Dock/Pier
5. ☒ Utilities
6. ☐ Coastal engineering Structure
7. ☐ Agriculture (e.g., cranberries, forestry)
8. ☐ Transportation
9. ☐ Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☐ Yes ☒ No

If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

a. County	b. Certificate # (if registered land)
Middlesex	
c. Book	**d. Page Number**
7902	29

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

1. ☒ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
2. ☐ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Bank	1. linear feet	2. linear feet
b. ☐ Bordering Vegetated Wetland	1. square feet	2. square feet
c. ☐ Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☐ Bordering Land Subject to Flooding	1. square feet	2. square feet
	3. cubic feet of flood storage lost	4. cubic feet replaced
e. ☐ Isolated Land Subject to Flooding	1. square feet	
	2. cubic feet of flood storage lost	3. cubic feet replaced

f. ☐ Riverfront Area

1. Name of Waterway (if available) - **specify coastal or inland**

2. Width of Riverfront Area (check one):

☐ 25 ft. - Designated Densely Developed Areas only

☐ 100 ft. - New agricultural projects only

☐ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: _____ square feet

4. Proposed alteration of the Riverfront Area:

a. total square feet _____ b. square feet within 100 ft. _____ c. square feet between 100 ft. and 200 ft. _____

5. Has an alternatives analysis been done and is it attached to this NOI? ☐ Yes ☐ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☐ Yes ☐ No

3. ☐ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f**. above.

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. ☐ Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above 1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	

4. ☐ Restoration/Enhancement

If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

5. ☐ Project Involves Stream Crossings

a. number of new stream crossings

b. number of replacement stream crossings

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C. Other Applicable Standards and Requirements

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

   a. ☐ Yes ☒ No

   If yes, include proof of mailing or hand delivery of NOI to:

   Natural Heritage and Endangered Species Program
   Division of Fisheries and Wildlife
   1 Rabbit Hill Road
   Westborough, MA 01581

   August 2017
   b. Date of map

   If *yes*, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

   c. Submit Supplemental Information for Endangered Species Review*

      1. ☐ Percentage/acreage of property to be altered:

         (a) within wetland Resource Area _____ percentage/acreage

         (b) outside Resource Area _____ percentage/acreage

      2. ☐ Assessor's Map or right-of-way plan of site

2. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

   (a) ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)

   (b) ☐ Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.

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C. Other Applicable Standards and Requirements (cont'd)

(c) ☐ MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_fee_schedule.htm). Make check payable to "Commonwealth of Massachusetts - NHESP" and ***mail to NHESP*** at above address

*Projects altering **10 or more acres** of land, also submit:*

(d) ☐ Vegetation cover type map of site

(e) ☐ Project plans showing Priority & Estimated Habitat boundaries

(f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_exemptions.htm; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing. a. NHESP Tracking # b. Date submitted to NHESP

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

a. ☒ Not applicable – project is in inland resource area only b. ☐ Yes ☐ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: DMF.EnvReview-South@state.ma.us

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: DMF.EnvReview-North@state.ma.us

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.

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C. Other Applicable Standards and Requirements (cont'd)

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

   a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.

   b. ACEC

5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

   a. ☐ Yes ☒ No

6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

   a. ☐ Yes ☒ No

7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

   a. ☒ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

      1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)

      2. ☒ A portion of the site constitutes redevelopment

      3. ☒ Proprietary BMPs are included in the Stormwater Management System.

   b. ☐ No. Check why the project is exempt:

      1. ☐ Single-family house

      2. ☐ Emergency road repair

      3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)

2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

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D. Additional Information (cont'd)

3. ☒ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

Electrical Building Modifications: Generator Building #1, MIT Lincoln Laboratory
Lexington, MA Sheets C-00, C-1.0, C-2.0, C-3.1, C-3.2, C-3.3, C-3.4, C-4.1, C-4.2

VHB	Christopher Nowak, PE
b. Prepared By	c. Signed and Stamped by
8/2/2019	As noted
d. Final Revision Date	e. Scale

Sv-1 Existing Conditions Plan of Land prepared by VHB	May 28, 2019
f. Additional Plan or Document Title	g. Date

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.

6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8. ☒ Attach NOI Wetland Fee Transmittal Form

9. ☒ Attach Stormwater Report, if needed.

E. Fees

1. ☐ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

2. Municipal Check Number	3. Check date
4. State Check Number	5. Check date
6. Payor name on check: First Name	7. Payor name on check: Last Name

Massachusetts Department of Environmental Protection
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F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

1. Signature of Applicant	2. Date
3. Signature of Property Owner (if different)	4. Date
5. Signature of Representative (if any)	6. Date

For Conservation Commission:
Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:
If the applicant has checked the “yes” box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

Massachusetts Department of Environmental Protection
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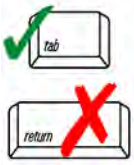
NOI Wetland Fee Transmittal Form

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

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



A. Applicant Information

1. Location of Project:

a. Street Address	b. City/Town
244 Wood Street	Lexington
c. Check number	**d. Fee amount**
	$237.50

2. Applicant Mailing Address:

a. First Name	b. Last Name
John	Barszewski

c. Organization: Massachusetts Institute of Technology Lincoln Laboratory

d. Mailing Address: 244 Wood Street

e. City/Town	f. State	g. Zip Code
Lexington	MA	02421

h. Phone Number	i. Fax Number	j. Email Address
781-981-9502		John.Barszewski@ll.mit.edu

3. Property Owner (if different):

a. First Name	b. Last Name
c/o Thomas J.	Schluckebier, PE, CFM, LEED AP

c. Organization: Base Civil Engineer, Hanscom Air Force Base, United States Air Force

d. Mailing Address: 120 Grenier Street

e. City/Town	f. State	g. Zip Code
Hanscom AFB	MA	01731

h. Phone Number	i. Fax Number	j. Email Address
781-225-2999		thomas.schluckebier.1@us.af.mil

B. Fees

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).

Fee should be calculated using the following process & worksheet. ***Please see Instructions before filling out worksheet.***

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract $12.50. To calculate the city/town share of the fee, divide the total fee in half and add $12.50.

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Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

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

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
2J	1	$500	$500

Step 5/Total Project Fee: $500.00

Step 6/Fee Payments:

Total Project Fee:	$500 a. Total Fee from Step 5
State share of filing Fee:	$237.50 b. 1/2 Total Fee **less $**12.50
City/Town share of filling Fee:	$262.50 c. 1/2 Total Fee **plus** $12.50

C. Submittal Requirements

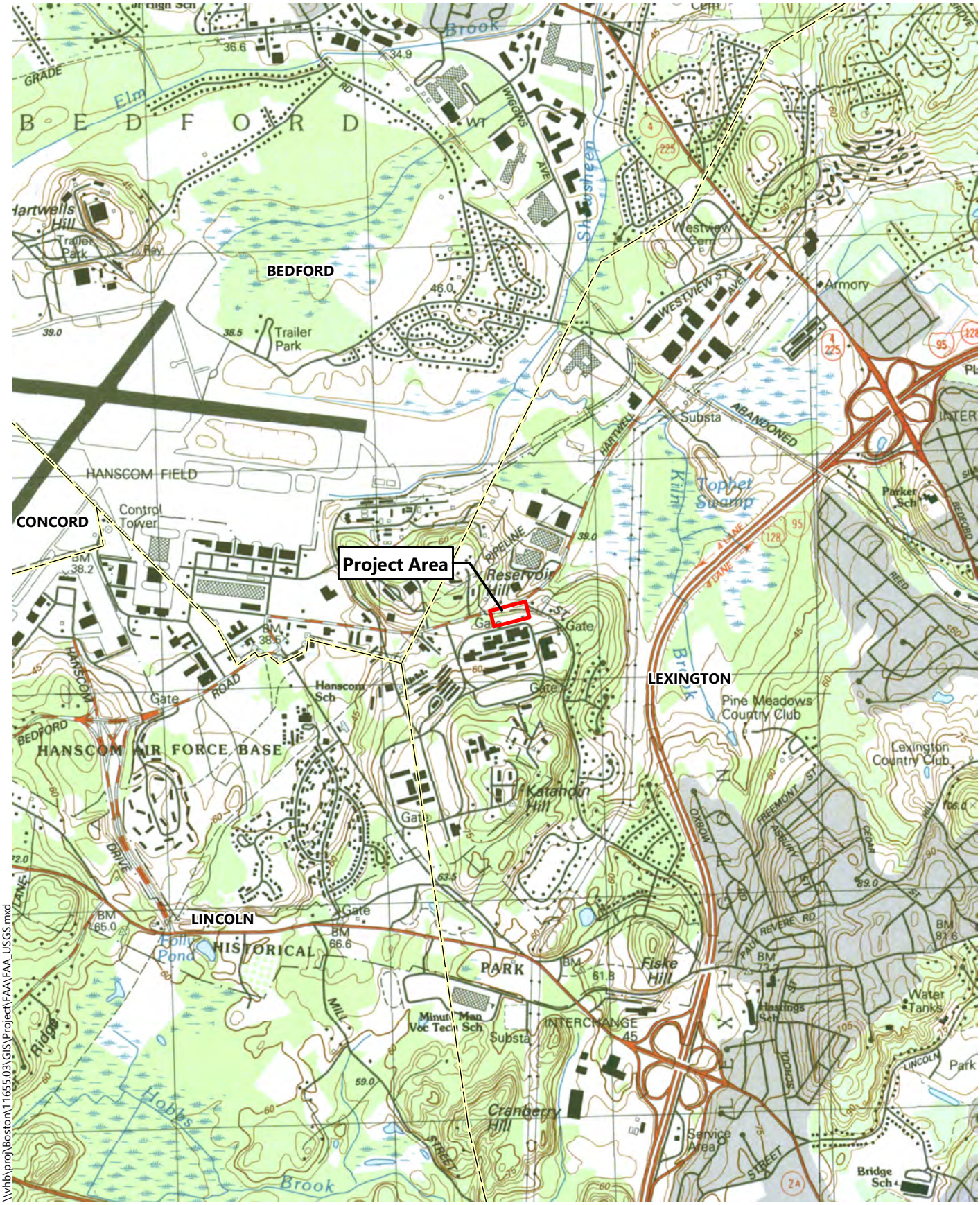
a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

Notice of Intent Figures



\\vhb\proj\Boston\11655.03\GIS\Project\FAA\FAA_USGS.mxd

0 1000 2000 4000 Feet

Legend

Project Area

Town Boundaries

Electrical Building Modifications | Lexington, Massachusetts
Generator Consolidation Cluster #1

USGS Map

Source: MassGIS, VHB

\\vhb\proj\Boston\11655.03\GIS\Project\FAA\FAA_Aerial.mxd

0 300 600 1200 Feet

Legend

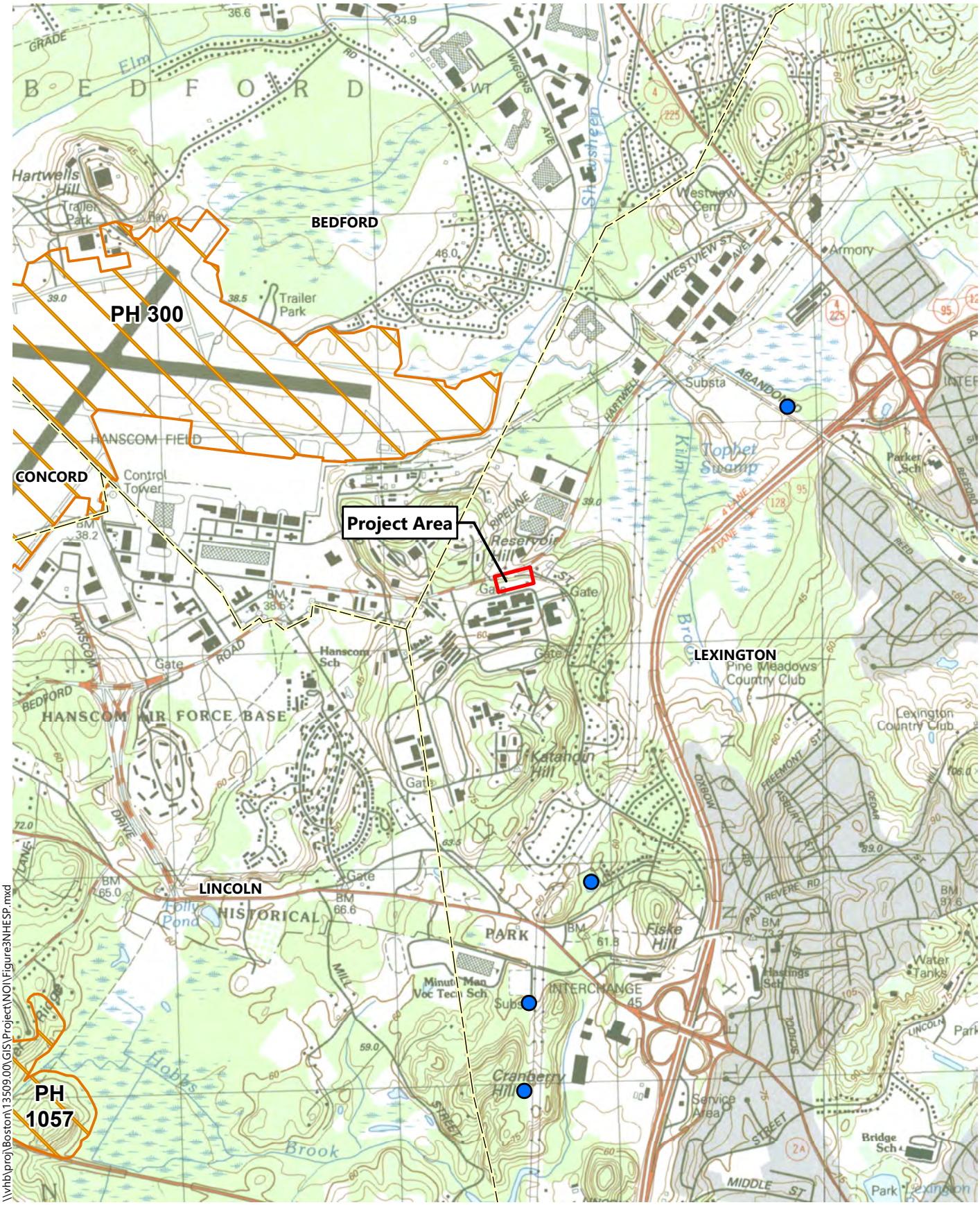
Project Area

Town Boundaries

Electrical Building Modifications | Lexington, Massachusetts
Generator Consolidation Cluster #1

Aerial Map

Source: MassGIS (2013/21014 Imagery), VHB



\\vhb\proj\Boston\13509.00\GIS\Project\NOI\Figure3NHESP.mxd

0 1000 2000 4000 Feet

Legend

- Project Area
- Town Boundaries
- Certified Vernal Pool
- NHESP Priority & Estimated Habitat

Electrical Building Modifications | Lexington, Massachusetts
Generator Consolidation Cluster #1

NHESP Map

Source: MassGIS, VHB

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0 300 600 1200 Feet

Legend

Project Area

Town Boundaries

100-Year Floodplain (FEMA)

Electrical Building Modifications | Lexington, Massachusetts
Generator Consolidation Cluster #1

FEMA Map

Source: MassGIS (2013 Imagery), VHB

Attachment A - Notice of Intent Narrative

This Notice of Intent (NOI) is being filed pursuant to the Massachusetts Wetlands Protection Act (MGL Chapter 131, Section 40) and its implementing regulations (310 CMR 10.00). The Lexington Wetlands Protection Code is not applicable to this facility as it is Federal property.

Introduction

The Applicant, Massachusetts Institute of Technology Lincoln Laboratory (MIT LL), is submitting this NOI for proposed modifications to the existing electrical infrastructure that serves their Campus located on Hanscom Air Force Base (the Project).

MIT LL is a federally funded research and development center (FFRDC). FFRDCs assist the U.S. government with scientific research and analysis, systems development, and systems acquisition to provide novel, cost-effective solutions to complex government problems. MIT Lincoln Laboratory's government sponsor is the Department of Defense and their mission is to research and develop a broad array of advanced technologies to meet critical national security needs.

This project is one of three independent projects that will improve the electrical infrastructure for the Laboratory. Collectively, the Projects are known as the Electrical Building Modifications. This Project is referred to as Project #2 or Generator Building #1 (GB#1). It involves construction of a new building on the northern portion of the property at 244 Wood Street, which will house up to five (three initially, with expansion space for two future) 1-megawatt Tier 4 generators, associated switchgear and distribution infrastructure. GB#1 will replace 17 individual generators of various sizes in various locations around Campus. The 17 existing generators will be removed from service upon activation of GB#1.

This project also includes construction of stormwater management infrastructure designed to exceed the requirements of the Massachusetts Stormwater Standards for the full buildout of the Electrical Building Modifications Projects #1, 2, and 3.

The two other projects included in the Electrical Building Modifications are:

- **Project #1 - 4th feeder improvements:** Eversource driven electrical improvements (new duct bank and switchgear) to improve overall service to area. A Notice of Intent for this project was submitted to the Lexington Conservation Commission for Review in December of 2018. The project was approved and an Order of Conditions was issued August XX, 2019.

- **Project #3 - Chilled Water Plant (CWP) Expansion and Electrical Improvements**: This project will add an addition to the existing Chilled Water Plant, extend two new electrical feeders to Campus, install associated switch gear and distribution infrastructure necessary to support a clean room laboratory.

The Chilled Water Plant Expansion & Electrical Improvement and the 4th Feeder Projects are outside the scope of this work. This NOI is specific to the Generator Building #1 Project as described in greater detail below.

All work has been designed to avoid impacts to jurisdictional wetland resource areas on the property. The wetland resource area will be protected from impacts during construction through the implementation of an erosion and sedimentation control program. This program includes provisions to minimize areas of disturbance, limit erosion through stabilization, and prevent sediment from leaving the site by installing structural controls.

Site Description

The MIT LL Campus occupies about 75 acres on the eastern perimeter of Hanscom Air Force Base. The Project Site is limited to the area in and around the existing Electrical Building parking lot on the northeast corner of Campus (immediately south of the Wood Street/Hartwell Avenue intersection) in Lexington, Massachusetts (see Figure 1 – Locus Map and Figure 2 – Aerial Image).

According to the regional soil survey,[1] soils mapped at the property are Montauk fine sandy loam and Urban Land. There are no Priority Habitats of Rare Species, Estimated Habitats of Rare Wildlife, or Certified Vernal Pools on or near the property (Figure 3) [2]. According to the Flood Insurance Rate Map (FIRM)[3] produced for the Town of Lexington (Figure 4), the site does not lie within an area that is subject to flooding during a 100-year storm event.

Wetland Resource Areas

The wetland resources on the property were delineated in spring 2018 by the Army Corp of Engineers in accordance with methods developed by the Department of Environmental Protection (DEP)[4] and the U.S. Army Corps of Engineers.[5] The boundaries were marked with plastic surveying tape (flags) affixed to vegetation. The flags were located in the field by survey and were plotted on the site plans included with this NOI. State-regulated wetland resource areas identified in the vicinity of the proposed work areas include Bordering Vegetated Wetland (BVW).

[1] USDA Soil Conservation Service, 1989. *Middlesex County Soil Survey*.
[2] NHESP, 2017. *Massachusetts Natural Heritage Atlas: 13th Edition.*
[3] Federal Emergency Management Agency, 1980. *FIRM, Town of Weston, Massachusetts, Middlesex County.* Community Panel Number 250226 0003B.
[4] DEP, 1995. *Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act.*
[5] Environmental Laboratory, 1987. *Corps of Engineers Wetlands Delineation Manual.*

As defined by 310 CMR 10.55(2)(a) and (c), BVWs are *"freshwater wetlands that border on creeks, rivers, streams, ponds, and lakes."* The boundary of BVW is determined by the presence of 50 percent or more of wetland indicator plants and saturated or inundated conditions.

Wetland 1 is located along Hartwell Avenue to the north of the existing electrical building. Wetland 1 borders an intermittent stream which crosses beneath Hartwell Ave and continues offsite to the northeast. Dominant wetland plant species within Wetland 1 include red maple *(Acer rubrum*), multiflora rose (*Rosa multiflora*), glossy buckthorn (*Frangula alnus*), horsetail (*Equisetum sp.*), iris (*Iris sp.*), sedge (*Carex sp.*) and poison ivy (*Toxicodendron radicans*). Wetland 1 was demarcated by flags 101 through 126. The WPA establishes a 100-foot buffer zone from the limits of Wetland 1.

Project Description

The proposed project consists of the following elements:

- Constructing a new building that will house up to five new 1-megawatt generators. The generators will be Tier 4 compliant, significantly reducing emissions;
- Constructing switchgear and distribution infrastructure;
- Removing 17 individual generators in various locations around Campus;
- Constructing stormwater management infrastructure designed to exceed the requirements of the Massachusetts Stormwater Standards for the full buildout of Projects #1, 2, and 3;
- Relocating a curb cut on Schilling Circle (Hanscom AFB Road); and,
- Removing approximately 1,700 square feet of impervious surfaces within the 100-foot buffer zone.

Most of the proposed work will be conducted in upland areas located outside of the 100-foot buffer zone and within the footprint of existing development. The project avoids direct impacts to WPA regulated resource areas. Portions of the proposed work will be conducted within the previously disturbed 100-foot buffer zone, including:

- Constructing a portion of the proposed building (550± square feet), including clearing and trenching (excavating and backfilling) for foundation installation;
- Constructing a pad mounted 1,000 KW load bank;
- Removing 1,700± square feet of bituminous pavement; and
- Reseeding areas of pavement removal.

The proposed stormwater management system improvements are designed to capture and treat runoff from new and existing impervious surfaces in the utility yard where the three Electrical Improvement projects are located. The stormwater management system will provide infiltration as well as water quality treatment and connect to the existing Hanscom Drainage system.

Mitigation Measures

The Applicant is proposing to implement appropriate mitigation measures to offset impacts to wetland resource areas, namely a sediment and erosion control program consisting of structural and non-structural practices. These mitigation measures are described in detail below.

Erosion and Sedimentation Control

An erosion and sedimentation control program will be implemented to minimize temporary impacts to wetland resource areas prior to and during the construction phase of the project. The program incorporates Best Management Practices (BMPs) specified in guidelines developed by the DEP[6] and the U.S. Environmental Protection Agency (EPA)[7].

Proper implementation of the erosion and sedimentation control program will:

- Minimize exposed soil areas through sequencing and temporary stabilization;
- Place structures to manage stormwater runoff and erosion; and
- Establish a permanent vegetative cover or other forms of stabilization as soon as practicable.

The following sections describe the controls that will be used and practices that will be followed during construction. These practices comply with criteria contained in the NPDES General Permit for Discharges from Large and Small Construction Activities issued by the EPA.

Non-Structural Practices

Non-structural practices to be used during construction include pavement sweeping and dust control. These practices will be initiated as soon as practicable in appropriate areas at the Project Site. Additional discussion of erosion control measures can be found in the stormwater report for the Project, included as part of this submission.

Pavement Sweeping

The portion of the street that fronts the Project Site shall be swept as needed during construction. The sweeping program will remove sediment and other contaminants directly from paved surfaces before their release into stormwater runoff. Pavement sweeping has been demonstrated to be an effective initial treatment for reducing pollutant loading into stormwater[8].

[8] U.S. Environmental Protection Agency, 1979. *Demonstration of Nonpoint Pollution Abatement Through Improved Street Cleaning Practices.*

Dust Control

The erosion and sediment control program includes provisions to minimize the generation of dust during dry and windy conditions. When necessary, larger areas of exposed soil will be wetted to prevent wind-borne transport of fine grained sediment. Enough water shall be applied to wet the upper 0.5 inches of soil. The water will be applied as a fine spray in order to prevent erosion. A water truck will be kept at a nearby location to facilitate this practice.

Structural Practices

Structural erosion and sedimentation controls to be used on the Project Site include erosion control barriers and catch basin inlet protection. Refer to the Project Plans for details of the structural controls.

Erosion Control Barriers

Prior to any ground disturbance, an approved erosion control barrier system consisting of staked composite socks and silt fencing will be installed at the down gradient limit of work as specified in the attached drawings. As construction progresses, additional barriers may be installed around the base of stockpiles and other erosion prone areas, as needed. The barriers will be entrenched into the substrate to prevent underflow.

If sediment has accumulated to a depth which impairs proper functioning of the barrier, it will be removed by hand or by machinery operating upslope of the barriers. This material will be either reused in the Project area or disposed of at a suitable off-site location. Any damaged sections of the barrier will be repaired or replaced immediately upon discovery.

Catch Basin Inlet Protection

The inlets of existing and proposed catch basins will be protected from sediment inflow during the work period by surrounding them with a barrier of staked straw bales or by installing Silt Sacks®. If straw bales are used, a layer of non-woven filter fabric shall be placed beneath the grate of each basin. If sediment has collected behind the barrier or in the Silt Sack® to a point where it impairs proper functioning, it will be removed and will be either reused onsite or disposed of at a suitable offsite location.

Regulatory Compliance

As demonstrated below, the project fully complies with applicable performance standards contained in the WPA regulations and other applicable local/state/federal laws governing work in wetlands. The project avoids direct impacts to WPA regulated resource areas.

Buffer Zone

As identified in 310 CMR 10.53(1) of the WPA regulations, *"the issuing authority should consider the characteristics of the buffer zone, such as the presence of steep slopes, that may increase the potential for adverse impacts on resource areas. Conditions may include limitations on the scope and location of work in the buffer zone as necessary to avoid alteration of resource areas. The issuing authority may require erosion and sedimentation controls during construction, a clear limit of work, and the preservation of natural vegetation adjacent to the resource area and/or other measures commensurate with the scope and location of the work within the buffer zone to protect the interests of the Act."*

The proposed project has been designed to address these requirements to the extent possible. Portions of the buffer zone are steep slopes. The Project will use appropriate construction techniques and mitigation measures to ensure that the work does not cause sediment to be discharged to adjacent wetlands. The proposed work will not alter groundwater or surface water quality. All disturbance will be temporary, and the Project includes provisions to restore any disturbed areas upon completion of work.

Stormwater Management

Under existing conditions, the electrical building and surrounding parking lot drain overland towards Schilling Circle to the Hanscom Drainage system which discharges northerly to the wetland along Hartwell Ave. The Project will locate a new Generator building within the existing parking lot on areas that are primarily bituminous pavement. Runoff generated from impervious surfaces associated with the Project will be directed to a subsurface infiltration system that will provide infiltration and water quality treatment. In addition, the project will relocate the existing curb cut into the electrical building parking lot. Overall, the project results in a slight decrease in impervious area at the Project Site.

Full details on the existing system and the proposed enhancements are included in the accompanying Stormwater Management Report (bound separately). Compliance with the 10 stormwater management standards cited in Section 310 CMR 10.05(6)(k) of the WPA Regulations is evaluated in the included stormwater report.

Summary

The Applicant is proposing modifications to the existing electrical infrastructure that serves the MIT LL Campus in Lexington, MA. The project is located on the northern portion of the property at 244 Wood Street and includes constructing a portion of a building, constructing a pad mounted load bank, and removing 1,700 square feet of pavement within the 100-foot buffer zone to BVW.

The project has been designed to fully comply with the WPA and the Massachusetts Stormwater Management Standards. A comprehensive erosion and sedimentation control program will be implemented to prevent construction-related impacts. The project also includes provisions to restore buffer zone through removing pavement and reseeding.

The Applicant respectfully requests that the Lexington Conservation Commission find these measures adequately protective of the interests identified in the WPA and issue an Order of Conditions approving the work described in this NOI and shown on the accompanying plans.

Attachment B – Project Plans

› *Project Plans (Bound Separately)*

Attachment C – Abutter Information

- *Abutter Notification Form*
- *Abutters List*

Notification to Abutters Under the
Massachusetts Wetlands Protection Act
&
Lexington Wetland Protection Code

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, and Section 130-3 of the Code of the Town of Lexington, you are hereby notified of the following:

The Conservation Commission will hold a public hearing in the Parker Room, Town

Office Building, 1625 Massachusetts Avenue, Lexington, on (January 7, 2018)

at 7:00 pm in accordance with the provisions of the Massachusetts Wetlands Protection

Act (M.G.L. Ch. 131, S. 40, as amended) and the Lexington Protection Code (Ch. 130, as amended), for a Notice of Intent filed by MIT Lincoln Labs, for Proposed Electrical Building Modifications within the 100-foot buffer zone at 244 Wood Street, Lexington, MA, on Assessor's Property Map(s) # 74, Lot(s) # 5.

Plans are available for inspection in Room G-8, Town Office Building weekdays from 8:30 a.m. to 4:30 p.m. and at Vanasse, Hangen, Brustlin, Inc, 101 Walnut Street, Watertown, MA from 8:00 am to 5:00 pm. If this hearing is not closed, it will be continued to a date requested by the applicant without further abutter notification.

For more information call the consultant (Chris Nowak, VHB) at 617-607-2599 or the Lexington Conservation Commission at 781-698-4531 or the DEP Northeast Regional Office, 978-661-7600.

NOTE: Notice of the Public Hearing will be published at least five (5) days in advance in the Lexington Minuteman and will be posted not less than 48 hours in advance of the public hearing in the Lexington Town Hall.

Town of Lexington, MA Abutters Report

100ft. Abutters of property 74-5 at 244 WOOD ST

Please be aware that the abutters list reflects mailing address for the real estate tax bills as requested by the property owners. Mortgage companies, banks and other financial institutions may be receiving the notification and not the homeowner as required. Please be sure you are complying with notification requirements. Property data updated 5/30/2018.

Abutter	Street Address	Account No.	Tax Bill Address
60-1A USA NATIONAL PARK	MARRETT ST	8409	USA NATIONAL PARK MARRETT ST LEXINGTON, MA 02421
59-60M OLDE SMITH FARM CONDOMINIUM ASSOCIATION	CHESTNUT LN	100248	OLDE SMITH FARM CONDOMINIUM ASSOCIATION 12 DAMON MILL SQUARE CONCORD, MA 01742
60-5 GAUT NORMAN E &	25 MARRETT ST	8395	GAUT NORMAN E & 25 MARRETT ST LEXINGTON, MA 02421
60-6 BRADY KENDALL J &	29 MARRETT ST	8396	BRADY KENDALL J & 29 MARRETT ST LEXINGTON, MA 02421
67-28 MIT	238 WOOD ST	9349	MIT 77 MASS AVE CAMBRIDGE, MA 02139
67-29 USA CAMB RESEARCH CENTRE	290 WOOD ST	9350	USA CAMB RESEARCH CENTRE 290 WOOD ST LEXINGTON, MA 02421
67-3 ROFFI KEVIN M &	259 WOOD ST	9326	ROFFI KEVIN M & 259 WOOD ST LEXINGTON, MA 02421
67-4 REPPUCCI JOSEPH A	253 WOOD ST	9327	REPPUCCI JOSEPH A 253 WOOD ST LEXINGTON, MA 02421
67-5 KUMAR VINEET &	251 WOOD ST	9328	KUMAR VINEET & 251 WOOD ST LEXINGTON, MA 02421

Town of Lexington, MA Abutters Report

100ft. Abutters of property 74-5 at 244 WOOD ST

Please be aware that the abutters list reflects mailing address for the real estate tax bills as requested by the property owners. Mortgage companies, banks and other financial institutions may be receiving the notification and not the homeowner as required. Please be sure you are complying with notification requirements. Property data updated 5/30/2018.

Abutter	Street Address	Account No.	Tax Bill Address
67-6 BEAULIEU RONALD J &	243 WOOD ST	9329	BEAULIEU RONALD J & 243 WOOD ST LEXINGTON, MA 02421
67-7 GUPTA ATUL &	2 BATES RD	9330	GUPTA ATUL & 2 BATES RD LEXINGTON, MA 02421
74-10 125 HARTWELL TRUST	125 HARTWELL AVE	10506	125 HARTWELL TRUST 24 HARTWELL AVE LEXINGTON, MA 02421
74-1C CLPF KATAHDIN WOODS LP	307 WOOD ST	10507	CLPF KATAHDIN WOODS LP 1 KATAHDIN DR LEXINGTON, MA 02421
74-2 CONNECTICUT GENERAL LIFE INSUR	128 HARTWELL AVE	10502	CONNECTICUT GENERAL LIFE INSUR ONE KATAHDIN DR LEXINGTON, MA 02421
74-6A WLC THREE VI LLC	131 HARTWELL AVE	10508	WLC THREE VI LLC PO BOX 209225 AUSTIN, TX 78720
74-8A KING 113 HARTWELL LLC	113-115 HARTWELL AVE	10509	KING 113 HARTWELL LLC 200 CAMBRIDGE PARK DR CAMBRIDGE, MA 02140
74-9 AGILENT TECHNOLOGIES INC	121 HARTWELL AVE	10510	AGILENT TECHNOLOGIES INC 12100 ANDREWS PLACE PLAIN CITY, OH 43064
80-10C 85 HARTWELL AVENUE TRUST	91 HARTWELL AVE	11244	85 HARTWELL AVENUE TRUST 800 BOYLSTON ST, STE 1900 BOSTON, MA 02199

Town of Lexington, MA Abutters Report

100ft. Abutters of property 74-5 at 244 WOOD ST

Please be aware that the abutters list reflects mailing address for the real estate tax bills as requested by the property owners. Mortgage companies, banks and other financial institutions may be receiving the notification and not the homeowner as required. Please be sure you are complying with notification requirements. Property data updated 5/30/2018.

Abutter	Street Address	Account No.	Tax Bill Address
80-10D KING 4 HARTWELL PLACE LP	4 HARTWELL PL	11245	KING 4 HARTWELL PLACE LP 200 CAMBRIDGE PARK DR CAMBRIDGE, MA 02140

Attachment D – Wetland Delineation Sheets

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: 244 Wood Street City/County: Lexington Sampling Date: 6/1/18

Applicant/Owner: Massachusetts Institue of Technology Lincoln Laboratory State: MA Sampling Point:

Investigator(s): Michael Narcisi (US Army Corp of Engineers) Section, Township, Range:

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): Convex Slope (%): 8-15

Subregion (LRR or MLRA): LRR K Lat: Long: Datum: NAD 83

Soil Map Unit Name: Montauk fine sandy loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks.)

Are Vegetation no , Soil no , or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes x No

Are Vegetation no , Soil no , or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x	No	**Is the Sampled Area**	
Hydric Soil Present?	Yes x	No	**within a Wetland?**	**Yes** x **No**
Wetland Hydrology Present?	Yes x	No	If yes, optional Wetland Site ID:	M (found on OLIVER)

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- x Surface Water (A1)
- ___ High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- x Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No x	Depth (inches):
Water Table Present?	Yes	No x	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes x	No	Depth (inches): 0-1"

Wetland Hydrology Present? **Yes** X **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Soils saturated to surface

VEGETATION – Use scientific names of plants. Sampling Point: _____

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*			FAC
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. *Frangula alnus*			FAC
2. *Rosa multiflora*			FACU
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Herb Stratum (Plot size: _____)			
1. *Equisetum*			
2. *Iris*			
3. *Carex*			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	=Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks: (Include photo numbers here or on a separate sheet.)
Wetland data gathered downgradient of structure 1.

SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** _____

Remarks:

Wetland data gather at northern fence line of substation.

Attachment E – Stormwater Management Report

› *Stormwater Management Report (Bound Separately)*

APPENDIX A2

Stormwater Management Report – Electrical Infrastructure Modifications – Generator Building 1

Electrical Infrastructure Modifications

Generator Building #1

PREPARED FOR

Massachusetts Institute of Technology
Lincoln Laboratory

244 Wood Street
Lexington, Ma, 02421

PREPARED BY

101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

August 2019

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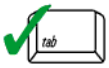
Checklist for Stormwater Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

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



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

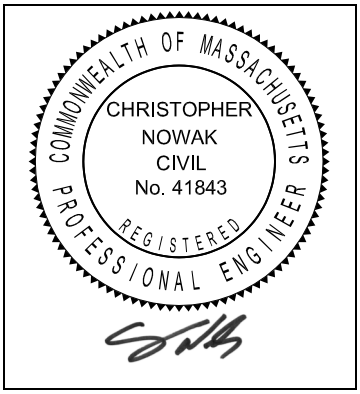
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☒ Reduced Impervious Area (Redevelopment Only)
- ☐ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of “country drainage” versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☒ Other (describe): Subsurface infiltration

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☐ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☒ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☒ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☒ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☐ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☐ Operation and Maintenance Log Form.

☒ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Stormwater Report Narrative

Project Description

The Applicant, Massachusetts Institute of Technology Lincoln Laboratory (MIT LL), is proposing to modify the backup power infrastructure that serves their Campus located on Hanscom Air Force Base (the Project).

MIT LL is a federally funded research and development center (FFRDC). FFRDCs assist the U.S. government with scientific research and analysis, systems development, and systems acquisition to provide novel, cost-effective solutions to complex government problems. MIT Lincoln Laboratory's government sponsor is the Department of Defense and their mission is to research and develop a broad array of advanced technologies to meet critical national security needs.

The proposed improvements will consolidate the function of 17 stand-alone generators scattered around the campus into one consolidated enclosed location. As proposed, the Project consists of the construction of a new building to house up to 5 new 1-megawatt generators, associated switchgear and distribution infrastructure. The new building is proposed in an existing parking lot near the Electrical Building and Chilled Water Plant. Once the project is constructed, the various individual generators will be taken offline as buildings are crossed over to the new units.

This project is one of three independent projects that will improve the electrical utility infrastructure for the Laboratory in the immediate vicinity of the Electrical Building. The two other projects are:

- **Project #1 – Electrical Building Modifications (4th Feeder Project):** This project includes the installation of a new electric manhole near Wood Street, installation of new pad mounted switchgear west of the Electrical Building, installation of new duct bank from Wood Street to the new switchgear, and new duct bank to connect the new switchgear to the existing site distribution infrastructure.

- **Project #2 - Chilled Water Plant Expansion and Electrical Improvements:** This project will add a 46'x52' addition to the Chilled Water Plant, extend two new electrical feeders to Campus, install associated switch gear and distribution infrastructure necessary to support a clean room laboratory.

This project includes construction of a subsurface stormwater infiltration system designed to meet the requirements of the full buildout of Projects 1, 2 and 3. The

proposed improvements associated with this Project result in no new impervious area. The project is a redevelopment and combined with Projects #1 and #2, results in a decrease in impervious surface on Campus.

The Stormwater Management Report is written in association with all three projects: 4th Feeder, Chilled Water Plant Expansion & Electrical Improvements and the Generator Building #1 Projects. The following information is intended to demonstrate compliance with the Massachusetts Stormwater Management Standards in accordance with the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00) and Water Quality Certification Regulations (314 CMR 9.00). The Lexington Wetlands Protection Code is not applicable to this facility as it is Federal property.

Site Description

The MIT LL Campus occupies about 75 acres on the eastern perimeter of Hanscom Air Force Base, in Lexington, Massachusetts.

The Project Site is limited to the northern portion of Campus, consisting of the existing Electrical Building parking lot, portions of Schilling Circle, and the area surrounding existing Buildings A, B, C, D, E, F, FA, I, J, and East Lab (see Figure 1).

The Site lies within the surface watershed of Shawsheen River. See Figure 1, Site Locus Map.

There is a Wetland Resource Areas north of the project site and south of Hartwell Ave. The wetland was flagged by the US Army Corp of Engineers in the Spring of 2018.

Table 1
Wetland Resource Areas

Name	*Critical Area*	*Zone 1 or Zone A*	*ORW or SRW*	*Zone II or IWPA*	*TMDL*
Wetland 1	*No*	*No*	*No*	*No*	*Flow (Draft)*

According to the National Resources Conservation Service (NRCS), surface soils on the Site include urban land, udorthents-urban land complex, Windsor loamy sand, and Montauk fine sandy loam. On-site soils are classified as Hydrologic Soil Groups (HSG) C.

Existing Drainage Conditions

Under existing conditions, the Electrical Building and surrounding parking lot drain overland towards the Hanscom drainage infrastructure in Schilling Circle which discharges to a swale west of the site which then flows north to the wetland along Hartwell Ave. Figure 2 illustrates the existing drainage patterns on the Site. Currently, the Site is entirely located in 1 drainage area as stormwater runoff flows to 1 Design Point, the north wetland. Table 2 below provides a summary of the existing conditions hydrologic data.

Table 2
Existing Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Design Point*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
EX-1	North Wetland	DP-1	0.9	96	5.6

Proposed Drainage Conditions

Figure 3 illustrates the proposed "post construction" drainage conditions for the project. As shown, the Site will be divided into 2 drainage areas that discharge treated stormwater to the Design Point. Table 3 below provides a summary of the proposed conditions hydrologic data.

Table 3
Proposed Conditions Hydrologic Data

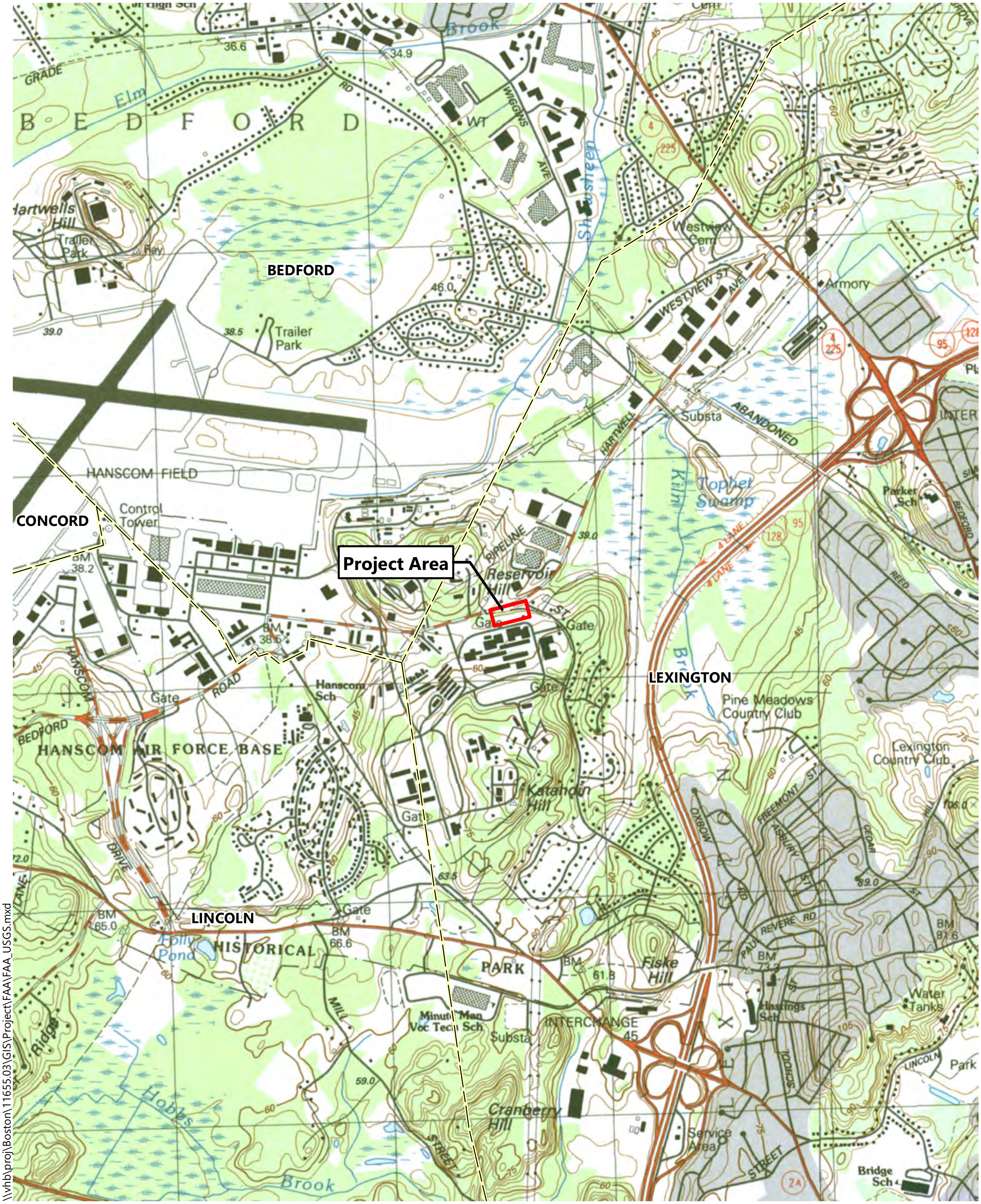
Drainage Area	*Discharge Location*	*Design Point*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
PR-10	North Wetland	DP-1	0.2	90	8.3
PR-11	North Wetland	DP-1	0.7	97	5

Environmentally Sensitive and Low Impact Development (LID) Techniques

Low Impact Development (LID) techniques and stormwater Best Management Practices (BMPs) implemented into the site design include reduction of impervious area, deep sump catch basins, and a subsurface infiltration system with isolator rows. In general, stormwater from the Project Area will be captured in a closed drainage

system and directed to the infiltration system. This system will treat, and infiltrate the surface runoff from the Project area. In larger storms, water runoff will bypass the infiltration area and get directed to the Schilling Circle infrastructure, maintaining the existing drainage pattern.

Figure 1: Site Locus Map



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Electrical Infrastructure Modifications | Lexington, Massachusetts

USGS Map

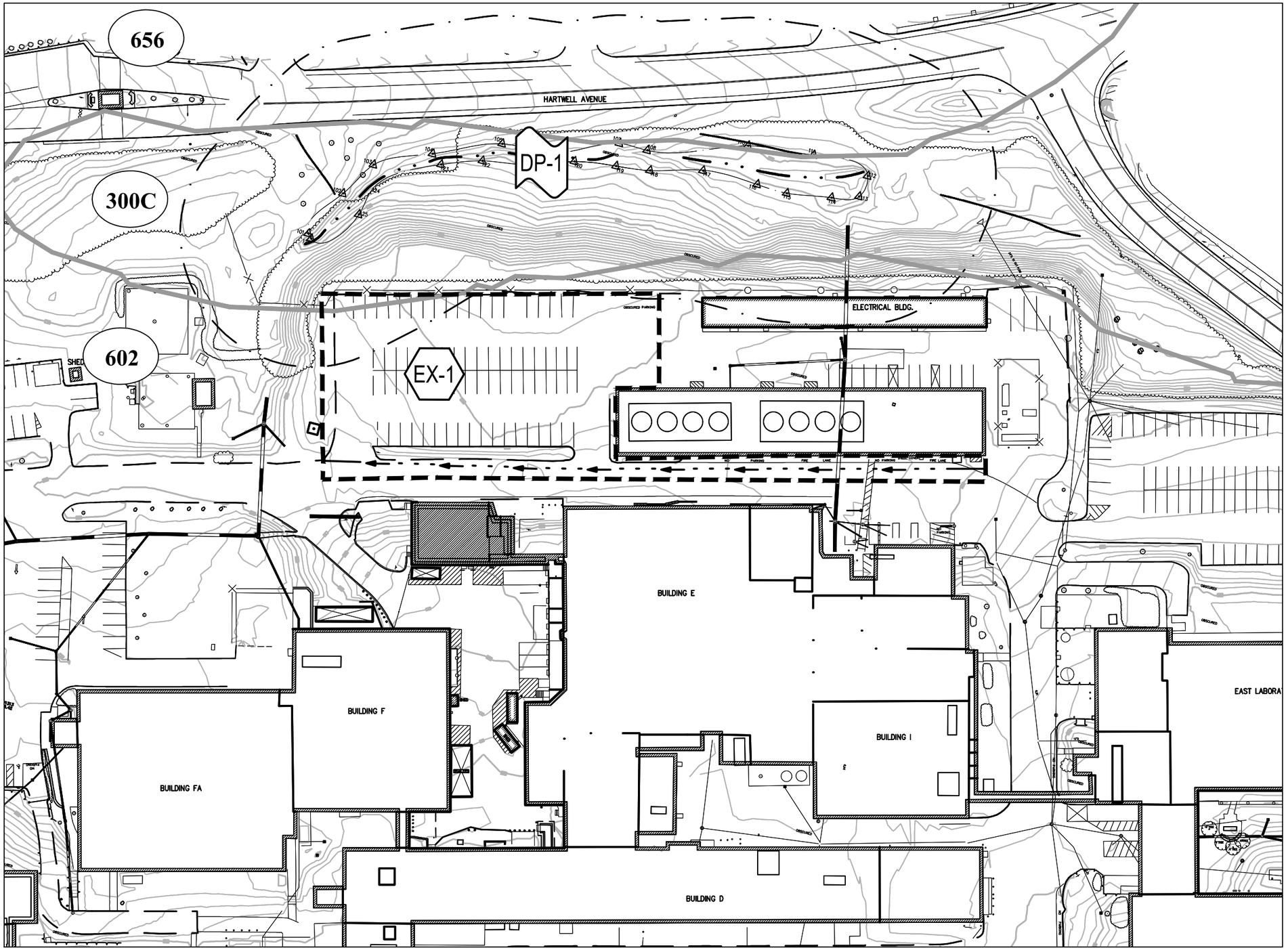
Legend

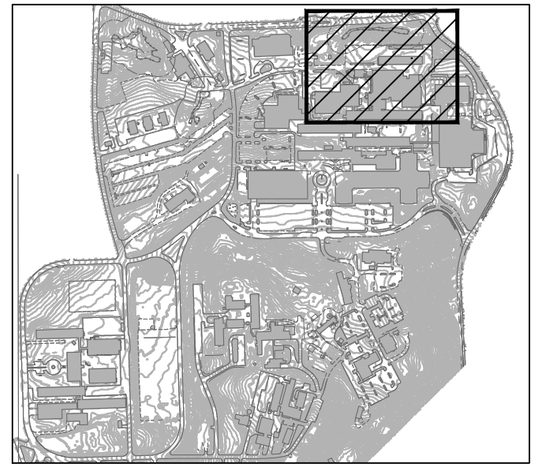
Project Area

Town Boundaries

Source: MassGIS, VHB

Figure 2: Existing Drainage Areas





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SYMBOLS

- DESIGN POINT
- DRAINAGE AREA DESIGNATION
- POND

LINETYPES

- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- SOIL TYPE BOUNDARY
- 100′ BUFFER ZONE
- WETLAND BOUNDARY (101 — 126)

SCS SOIL CLASSIFICATIONS

- 300C — MONTAUK FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES, HSG C
- 602 — URBAN LAND
- 656 — UDORTHENTS–URBAN LAND COMPLEX

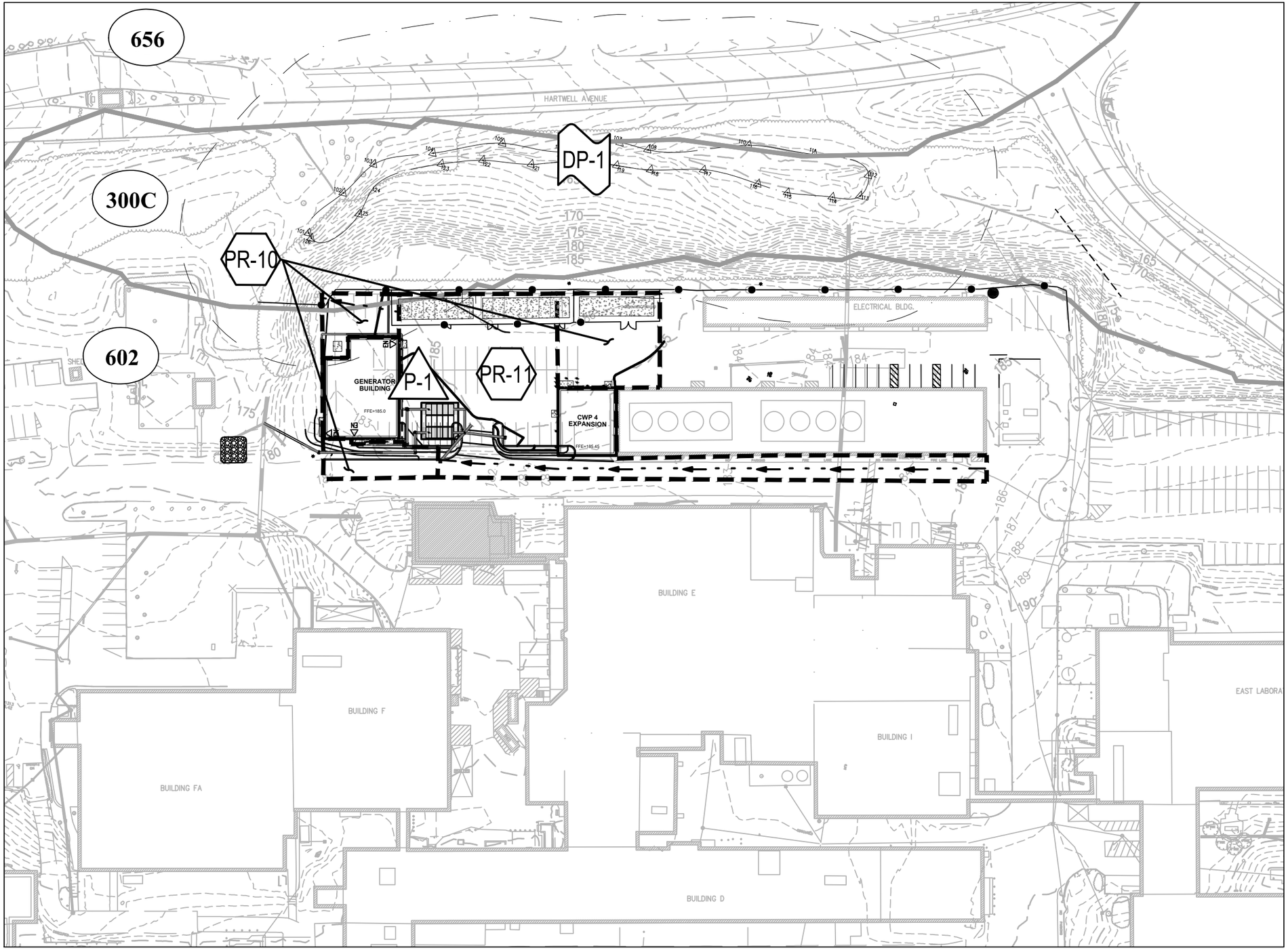
0 40 80 160 Feet

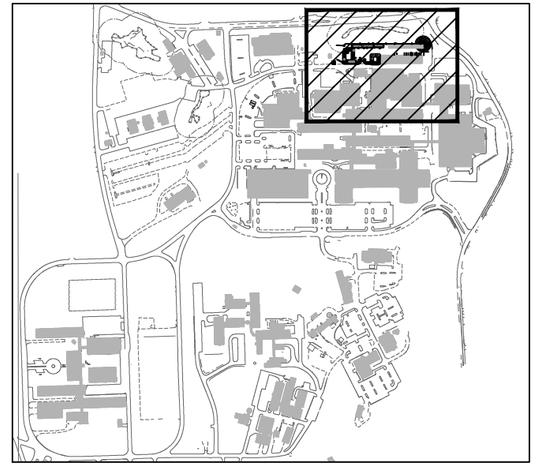
Existing Drainage Conditions **Figure 2**

Electrical Infrastructure Modifications 09/05/2018
MIT LL, Lexington, MA Rev 05/29/2019

Figure 3: Proposed Drainage Areas

\\vhb\gbl\proj\Wat-LD\13259.09\cad\ld\Eng\Stormwater\13259.09 Impervious Areas-PR.dwg





Legend

SYMBOLS

- X — DESIGN POINT
- X — DRAINAGE AREA DESIGNATION
- X — POND

LINETYPES

- DRAINAGE AREA BOUNDARY
- TIME OF CONCENTRATION FLOW LINE
- SOIL TYPE BOUNDARY
- 100′ BUFFER ZONE
- 101 — 126 — WETLAND BOUNDARY

SCS SOIL CLASSIFICATIONS

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0 40 80 160 Feet

Proposed Drainage Conditions **Figure 3**

Electrical Infrastructure Modifications 09/05/2018
MIT LL, Lexington, MA Rev 05/29/2019

Regulatory Compliance

Massachusetts Department of Environmental Protection (DEP) - Stormwater Management Standards

As demonstrated below, the proposed Project fully complies with the DEP Stormwater Management Standards.

Standard 1: No New Untreated Discharges or Erosion to Wetlands

The Project has been designed to fully comply with Standard 1.

The Best Management Practices (BMP's) included in the proposed stormwater management system have been designed in accordance with the Massachusetts Stormwater Handbook. Supporting information and computations demonstrating that no new untreated discharges will result from the Project are presented through compliance with Standards 4 through 6.

Standard 2: Peak Rate Attenuation

The Project has been designed to fully comply with Standard 2.

The rainfall-runoff response of the Site under existing and proposed conditions was analyzed for storm events with recurrence intervals of 2, 10, 25 and 100-years. The results of the analysis, as summarized in Table 4 below, indicate that there is no increase in peak discharge rates between the existing and proposed conditions.

Table 4
Peak Discharge Rates (cfs*)

Design Point	*2-year*	*10-year*	*25-year*	*100-year*
Design Point: DP-1 North Wetland				
Existing	2.5	3.8	4.8	6.7
Proposed	1.8	2.8	3.4	5.3

Standard 3: Stormwater Recharge

In accordance with the Stormwater Handbook, the Required Recharge Volume for the Project is *366* cubic feet.

Recharge of stormwater has been provided through the use of a subsurface infiltration chamber system, which has been sized using the Static method. Each infiltration BMP has been designed to drain completely within 72 hours. Table 5 below provides a summary of the proposed infiltration BMP utilized for the Project.

Table 5
Summary of Recharge Calculations

Infiltration BMP	*Provided Recharge Volume (cubic feet)*
Subsurface Infiltration System	1,437
Total Provided Recharge	1,437
Total Required Recharge	366

Standard 4: Water Quality

The Project is considered a redevelopment for the purpose of the Stormwater Management Standards and as such complies with Standard 4 to the maximum extent practicable.

The project proposes to construct a subsurface infiltration system designed to provide 80% TSS removal of stormwater runoff from tributary areas of the existing Electrical Building parking lot, proposed CWP addition, and proposed generator building.

The project is located at the headwaters of the Shawsheen River basin. The Massachusetts DEP lists two Total Maximum Daily Load (TMDL's) for Stormwater for this watershed. They are Draft Storm Water Pollutant TMDL for Headwaters of the Shawsheen River and Final TMDL of Bacteria for Shawsheen River Basin. This project has considered both of these TMDL's in the design of the project and has provided water quality and infiltration measures as appropriate.

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

The Project is limited to a small parking lot within the boundary of a larger campus. The project area is not considered a LUHPPL.

Standard 6: Critical Areas

The Project will not discharge stormwater near or to a critical area.

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the Maximum Extent Practicable

The Project is considered a redevelopment but has been designed to meet all 10 Stormwater Management Standards.

Refer directly to each Standard for applicable computations and supporting information demonstrating compliance with each.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Controls

The Project will disturb more than 1 acre of land and is therefore required to obtain coverage under the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit. As required under this permit, a Stormwater Pollution Prevention Plan (SWPPP) will be developed and submitted before land disturbance begins. Recommended construction period pollution prevention and erosion and sedimentation controls to be finalized in the SWPPP are included in Appendix D.

Standard 9: Operation and Maintenance Plan

In compliance with Standard 9, a Post Construction Stormwater Operation and Maintenance (O&M) Plan has been developed for the Project. The O&M Plan is included in Appendix as part of the Long Term Pollution Prevention Plan.

Standard 10: Prohibition of Illicit Discharges

The design plans submitted with this report have been designed so that the components included therein are in full compliance with current standards. No statement is made with regard to the drainage system in portions of the site not included in the redevelopment project area. The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges.

Local Municipal Rules and Regulations

The Project is located on Federal property (Hanscom Air Force Base) and therefore the Lexington Stormwater Management Regulations are not applicable.

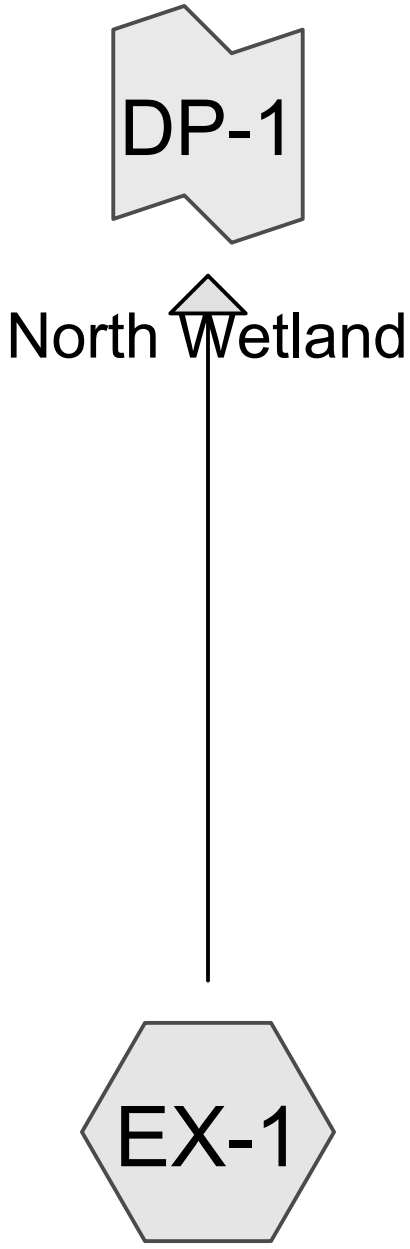
The proposed Project complies with the Hanscom Air Force Base Stormwater Best Management Practices and Improvements Policy.

The 24-hour rainfall amounts used in the hydrologic modeling is based on the Northeast Regional Climate Center "Atlas of Precipitation Extremes for the Northeastern United States and Southeastern Canada."

Appendix A
Standard 2 Computations and Supporting Information

Rainfall volumes used for this analysis were based on the Northeast Regional Climate Center "Atlas of Precipitation Extremes for the Northeastern United States and Southeastern Canada." Runoff coefficients for the existing and proposed conditions, as previously shown in Tables 1 and 2 respectively, were determined using NRCS Technical Release 55 (TR-55) methodology as provided in HydroCAD. The HydroCAD model is based on the NRCS Technical Release 20 (TR-20) Model for Project Formulation Hydrology.

HydroCAD Analysis: Existing Conditions



Subcat Reach Pond Link

Routing Diagram for 13259.09 EX
Prepared by VHB, Printed 5/20/2019

2-Year Storm Event – Existing

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX-1: Runoff Area=40,740 sf 92.75% Impervious Runoff Depth=2.36"
Flow Length=515' Tc=5.6 min CN=96 Runoff=2.46 cfs 7,997 cf

Link DP-1: North Wetland Inflow=2.46 cfs 7,997 cf
Primary=2.46 cfs 7,997 cf

Total Runoff Area = 40,740 sf Runoff Volume = 7,997 cf Average Runoff Depth = 2.36"
7.25% Pervious = 2,955 sf 92.75% Impervious = 37,785 sf

Summary for Subcatchment EX-1:

Runoff = 2.46 cfs @ 12.08 hrs, Volume= 7,997 cf, Depth= 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=2.80"

	Area (sf)	CN	Description
	0	98	Roofs, HSG C
*	0	98	Walkways, HSG C
*	37,785	98	Parking, HSG C
	2,955	74	>75% Grass cover, Good, HSG C
	40,740	96	Weighted Average
	2,955		7.25% Pervious Area
	37,785		92.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.20		**Sheet Flow, Shallow** Smooth surfaces n= 0.011 P2= 3.21"
4.9	465	0.0060	1.57		**Shallow Concentrated Flow, Shallow Conc - Paved** Paved Kv= 20.3 fps
5.6	515	Total			

Summary for Link DP-1: North Wetland

Inflow Area = 40,740 sf, 92.75% Impervious, Inflow Depth = 2.36" for 2-Year event
Inflow = 2.46 cfs @ 12.08 hrs, Volume= 7,997 cf
Primary = 2.46 cfs @ 12.08 hrs, Volume= 7,997 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

10-Year Storm Event – Existing

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX-1: Runoff Area=40,740 sf 92.75% Impervious Runoff Depth=3.74"
Flow Length=515' Tc=5.6 min CN=96 Runoff=3.80 cfs 12,692 cf

Link DP-1: North Wetland Inflow=3.80 cfs 12,692 cf
Primary=3.80 cfs 12,692 cf

Total Runoff Area = 40,740 sf Runoff Volume = 12,692 cf Average Runoff Depth = 3.74"
7.25% Pervious = 2,955 sf 92.75% Impervious = 37,785 sf

Summary for Subcatchment EX-1:

Runoff = 3.80 cfs @ 12.08 hrs, Volume= 12,692 cf, Depth= 3.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.20"

	Area (sf)	CN	Description
	0	98	Roofs, HSG C
*	0	98	Walkways, HSG C
*	37,785	98	Parking, HSG C
	2,955	74	>75% Grass cover, Good, HSG C
	40,740	96	Weighted Average
	2,955		7.25% Pervious Area
	37,785		92.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.20		**Sheet Flow, Shallow** Smooth surfaces n= 0.011 P2= 3.21"
4.9	465	0.0060	1.57		**Shallow Concentrated Flow, Shallow Conc - Paved** Paved Kv= 20.3 fps
5.6	515	Total			

Summary for Link DP-1: North Wetland

Inflow Area = 40,740 sf, 92.75% Impervious, Inflow Depth = 3.74" for 10-Year event
Inflow = 3.80 cfs @ 12.08 hrs, Volume= 12,692 cf
Primary = 3.80 cfs @ 12.08 hrs, Volume= 12,692 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

25-Year Storm Event – Existing

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX-1: Runoff Area=40,740 sf 92.75% Impervious Runoff Depth=4.73"
Flow Length=515' Tc=5.6 min CN=96 Runoff=4.75 cfs 16,063 cf

Link DP-1: North Wetland Inflow=4.75 cfs 16,063 cf
Primary=4.75 cfs 16,063 cf

Total Runoff Area = 40,740 sf Runoff Volume = 16,063 cf Average Runoff Depth = 4.73"
7.25% Pervious = 2,955 sf 92.75% Impervious = 37,785 sf

Summary for Subcatchment EX-1:

Runoff = 4.75 cfs @ 12.08 hrs, Volume= 16,063 cf, Depth= 4.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.20"

	Area (sf)	CN	Description
	0	98	Roofs, HSG C
*	0	98	Walkways, HSG C
*	37,785	98	Parking, HSG C
	2,955	74	>75% Grass cover, Good, HSG C
	40,740	96	Weighted Average
	2,955		7.25% Pervious Area
	37,785		92.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.20		**Sheet Flow, Shallow** Smooth surfaces n= 0.011 P2= 3.21"
4.9	465	0.0060	1.57		**Shallow Concentrated Flow, Shallow Conc - Paved** Paved Kv= 20.3 fps
5.6	515	Total			

Summary for Link DP-1: North Wetland

Inflow Area = 40,740 sf, 92.75% Impervious, Inflow Depth = 4.73" for 25-Year event
Inflow = 4.75 cfs @ 12.08 hrs, Volume= 16,063 cf
Primary = 4.75 cfs @ 12.08 hrs, Volume= 16,063 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

100-Year Storm Event – Existing

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEX-1: Runoff Area=40,740 sf 92.75% Impervious Runoff Depth=6.82"
Flow Length=515' Tc=5.6 min CN=96 Runoff=6.74 cfs 23,163 cf

Link DP-1: North Wetland Inflow=6.74 cfs 23,163 cf
Primary=6.74 cfs 23,163 cf

Total Runoff Area = 40,740 sf Runoff Volume = 23,163 cf Average Runoff Depth = 6.82"
7.25% Pervious = 2,955 sf 92.75% Impervious = 37,785 sf

Summary for Subcatchment EX-1:

Runoff = 6.74 cfs @ 12.08 hrs, Volume= 23,163 cf, Depth= 6.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.30"

	Area (sf)	CN	Description
	0	98	Roofs, HSG C
*	0	98	Walkways, HSG C
*	37,785	98	Parking, HSG C
	2,955	74	>75% Grass cover, Good, HSG C
	40,740	96	Weighted Average
	2,955		7.25% Pervious Area
	37,785		92.75% Impervious Area

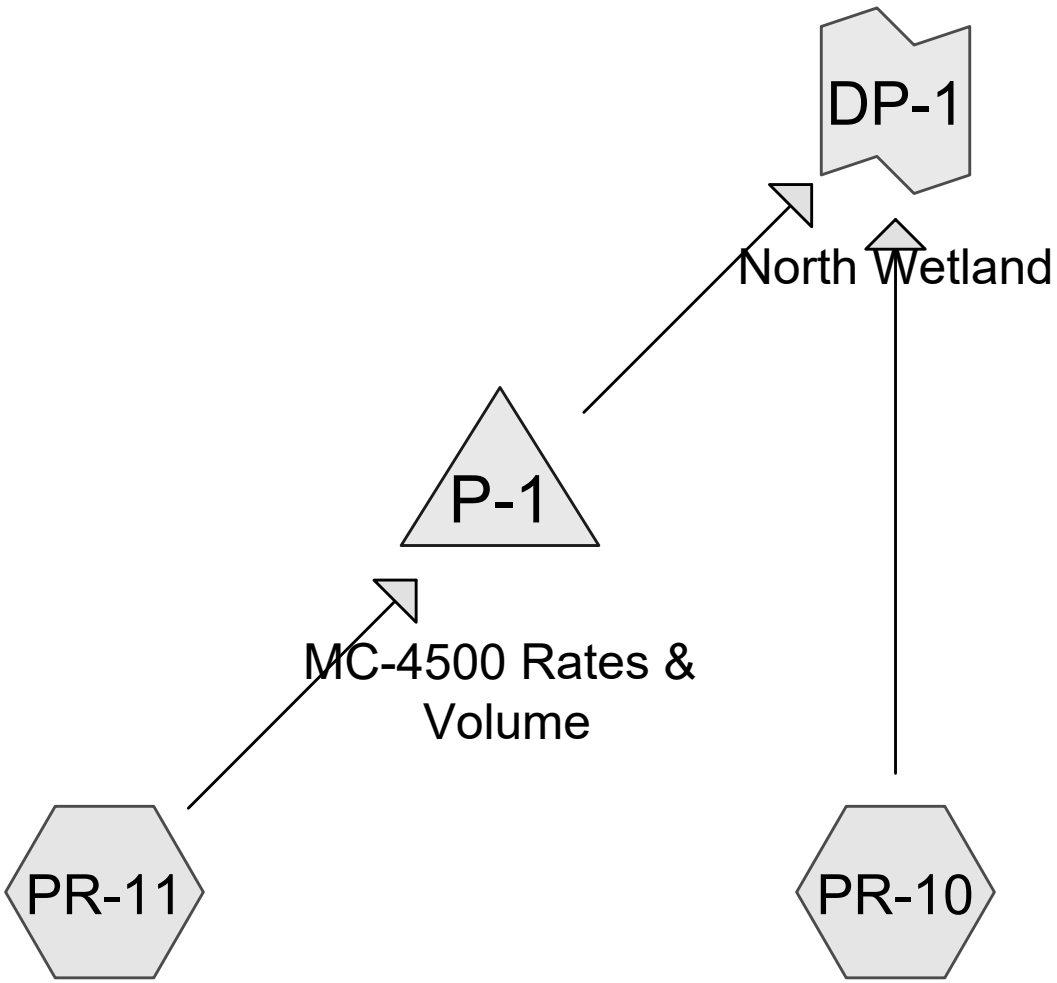
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.20		**Sheet Flow, Shallow** Smooth surfaces n= 0.011 P2= 3.21"
4.9	465	0.0060	1.57		**Shallow Concentrated Flow, Shallow Conc - Paved** Paved Kv= 20.3 fps
5.6	515	Total			

Summary for Link DP-1: North Wetland

Inflow Area = 40,740 sf, 92.75% Impervious, Inflow Depth = 6.82" for 100-Year event
Inflow = 6.74 cfs @ 12.08 hrs, Volume= 23,163 cf
Primary = 6.74 cfs @ 12.08 hrs, Volume= 23,163 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

HydroCAD Analysis: Proposed Conditions



Subcat Reach Pond Link

Routing Diagram for 13259.09 PR
Prepared by VHB, Printed 5/20/2019

2-Year Storm Event – Proposed

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR-10: Runoff Area=10,670 sf 65.93% Impervious Runoff Depth=1.80"
Flow Length=60' Slope=0.0200 '/' Tc=8.3 min CN=90 Runoff=0.48 cfs 1,602 cf

Subcatchment PR-11: Runoff Area=30,070 sf 97.81% Impervious Runoff Depth=2.46"
Flow Length=425' Tc=5.0 min CN=97 Runoff=1.90 cfs 6,165 cf

Pond P-1: MC-4500 Rates & Volume Peak Elev=178.98' Storage=1,989 cf Inflow=1.90 cfs 6,165 cf
Discarded=0.02 cfs 2,058 cf Primary=1.35 cfs 3,459 cf Outflow=1.37 cfs 5,517 cf

Link DP-1: North Wetland Inflow=1.82 cfs 5,061 cf
Primary=1.82 cfs 5,061 cf

Total Runoff Area = 40,740 sf Runoff Volume = 7,767 cf Average Runoff Depth = 2.29"
10.54% Pervious = 4,295 sf 89.46% Impervious = 36,445 sf

Summary for Subcatchment PR-10:

Runoff = 0.48 cfs @ 12.12 hrs, Volume= 1,602 cf, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=2.80"

	Area (sf)	CN	Description
	0	98	Roofs, HSG C
*	0	98	Walkways, HSG C
*	7,035	98	Parking, HSG C
	3,635	74	>75% Grass cover, Good, HSG C
	10,670	90	Weighted Average
	3,635		34.07% Pervious Area
	7,035		65.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0200	0.10		**Sheet Flow, Shallow** Grass: Dense n= 0.240 P2= 3.21"
0.1	10	0.0200	2.28		**Shallow Concentrated Flow, Shallow Conc - Unpaved** Unpaved Kv= 16.1 fps
8.3	60	Total			

Summary for Subcatchment PR-11:

Runoff = 1.90 cfs @ 12.07 hrs, Volume= 6,165 cf, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=2.80"

	Area (sf)	CN	Description
	7,555	98	Roofs, HSG C
*	0	98	Walkways, HSG C
*	21,855	98	Parking, HSG C
	660	74	>75% Grass cover, Good, HSG C
	30,070	97	Weighted Average
	660		2.19% Pervious Area
	29,410		97.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.20		**Sheet Flow, Sheet** Smooth surfaces n= 0.011 P2= 3.21"
4.0	375	0.0060	1.57		**Shallow Concentrated Flow, Shallow Conc - Paved** Paved Kv= 20.3 fps
4.7	425	Total, Increased to minimum Tc = 5.0 min			

Summary for Pond P-1: MC-4500 Rates & Volume

Inflow Area = 30,070 sf, 97.81% Impervious, Inflow Depth = 2.46" for 2-Year event
Inflow = 1.90 cfs @ 12.07 hrs, Volume= 6,165 cf
Outflow = 1.37 cfs @ 12.14 hrs, Volume= 5,517 cf, Atten= 28%, Lag= 4.2 min
Discarded = 0.02 cfs @ 11.99 hrs, Volume= 2,058 cf
Primary = 1.35 cfs @ 12.14 hrs, Volume= 3,459 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 178.98' @ 12.14 hrs Surf.Area= 789 sf Storage= 1,989 cf

Plug-Flow detention time= 239.8 min calculated for 5,517 cf (89% of inflow)
Center-of-Mass det. time= 189.0 min (957.5 - 768.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	175.25'	1,372 cf	**28.50'W x 27.24'L x 6.75'H Field A** 5,241 cf Overall - 1,812 cf Embedded = 3,429 cf x 40.0% Voids
#2A	176.00'	1,812 cf	**ADS_StormTech MC-4500 +Cap** x 15 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 3 Rows of 5 Chambers Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf
#3	178.40'	75 cf	**4.00'D x 6.00'H Vertical Cone/Cylinder**
		3,259 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**12.0" Round Culvert** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 178.00' / 176.80' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	182.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	178.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#4	Discarded	175.25'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.02 cfs @ 11.99 hrs HW=178.42' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.35 cfs @ 12.14 hrs HW=178.98' (Free Discharge)
└**1=Culvert** (Passes 1.35 cfs of 2.08 cfs potential flow)
  ├**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Orifice Controls 1.35 cfs @ 3.86 fps)

Summary for Link DP-1: North Wetland

Inflow Area = 40,740 sf, 89.46% Impervious, Inflow Depth = 1.49" for 2-Year event
Inflow = 1.82 cfs @ 12.13 hrs, Volume= 5,061 cf
Primary = 1.82 cfs @ 12.13 hrs, Volume= 5,061 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

10-Year Storm Event- Proposed

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR-10: Runoff Area=10,670 sf 65.93% Impervious Runoff Depth=3.11"
Flow Length=60' Slope=0.0200 '/' Tc=8.3 min CN=90 Runoff=0.81 cfs 2,765 cf

Subcatchment PR-11: Runoff Area=30,070 sf 97.81% Impervious Runoff Depth=3.85"
Flow Length=425' Tc=5.0 min CN=97 Runoff=2.90 cfs 9,648 cf

Pond P-1: MC-4500 Rates & Volume Peak Elev=179.70' Storage=2,368 cf Inflow=2.90 cfs 9,648 cf
Discarded=0.02 cfs 2,165 cf Primary=1.97 cfs 6,820 cf Outflow=1.99 cfs 8,985 cf

Link DP-1: North Wetland Inflow=2.75 cfs 9,585 cf
Primary=2.75 cfs 9,585 cf

Total Runoff Area = 40,740 sf Runoff Volume = 12,413 cf Average Runoff Depth = 3.66"
10.54% Pervious = 4,295 sf 89.46% Impervious = 36,445 sf

Summary for Subcatchment PR-10:

Runoff = 0.81 cfs @ 12.11 hrs, Volume= 2,765 cf, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.20"

	Area (sf)	CN	Description
	0	98	Roofs, HSG C
*	0	98	Walkways, HSG C
*	7,035	98	Parking, HSG C
	3,635	74	>75% Grass cover, Good, HSG C
	10,670	90	Weighted Average
	3,635		34.07% Pervious Area
	7,035		65.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0200	0.10		**Sheet Flow, Shallow** Grass: Dense n= 0.240 P2= 3.21"
0.1	10	0.0200	2.28		**Shallow Concentrated Flow, Shallow Conc - Unpaved** Unpaved Kv= 16.1 fps
8.3	60	Total			

Summary for Subcatchment PR-11:

Runoff = 2.90 cfs @ 12.07 hrs, Volume= 9,648 cf, Depth= 3.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.20"

	Area (sf)	CN	Description
	7,555	98	Roofs, HSG C
*	0	98	Walkways, HSG C
*	21,855	98	Parking, HSG C
	660	74	>75% Grass cover, Good, HSG C
	30,070	97	Weighted Average
	660		2.19% Pervious Area
	29,410		97.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.20		**Sheet Flow, Sheet** Smooth surfaces n= 0.011 P2= 3.21"
4.0	375	0.0060	1.57		**Shallow Concentrated Flow, Shallow Conc - Paved** Paved Kv= 20.3 fps
4.7	425	Total, Increased to minimum Tc = 5.0 min			

Summary for Pond P-1: MC-4500 Rates & Volume

Inflow Area = 30,070 sf, 97.81% Impervious, Inflow Depth = 3.85" for 10-Year event
Inflow = 2.90 cfs @ 12.07 hrs, Volume= 9,648 cf
Outflow = 1.99 cfs @ 12.15 hrs, Volume= 8,985 cf, Atten= 32%, Lag= 4.6 min
Discarded = 0.02 cfs @ 11.71 hrs, Volume= 2,165 cf
Primary = 1.97 cfs @ 12.15 hrs, Volume= 6,820 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 179.70' @ 12.15 hrs Surf.Area= 789 sf Storage= 2,368 cf

Plug-Flow detention time= 168.4 min calculated for 8,985 cf (93% of inflow)
Center-of-Mass det. time= 130.9 min (889.5 - 758.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	175.25'	1,372 cf	**28.50'W x 27.24'L x 6.75'H Field A** 5,241 cf Overall - 1,812 cf Embedded = 3,429 cf x 40.0% Voids
#2A	176.00'	1,812 cf	**ADS_StormTech MC-4500 +Cap** x 15 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 3 Rows of 5 Chambers Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf
#3	178.40'	75 cf	**4.00'D x 6.00'H Vertical Cone/Cylinder**
		3,259 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**12.0" Round Culvert** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 178.00' / 176.80' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	182.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	178.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#4	Discarded	175.25'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.02 cfs @ 11.71 hrs HW=178.40' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.97 cfs @ 12.15 hrs HW=179.70' (Free Discharge)
└**1=Culvert** (Passes 1.97 cfs of 3.27 cfs potential flow)
  ├**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Orifice Controls 1.97 cfs @ 5.63 fps)

Summary for Link DP-1: North Wetland

Inflow Area = 40,740 sf, 89.46% Impervious, Inflow Depth = 2.82" for 10-Year event
Inflow = 2.75 cfs @ 12.13 hrs, Volume= 9,585 cf
Primary = 2.75 cfs @ 12.13 hrs, Volume= 9,585 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

25-Year Storm Event- Proposed

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PR-10: Runoff Area=10,670 sf 65.93% Impervious Runoff Depth=4.07"
Flow Length=60' Slope=0.0200 '/' Tc=8.3 min CN=90 Runoff=1.04 cfs 3,618 cf

Subcatchment PR-11: Runoff Area=30,070 sf 97.81% Impervious Runoff Depth=4.85"
Flow Length=425' Tc=5.0 min CN=97 Runoff=3.62 cfs 12,144 cf

Pond P-1: MC-4500 Rates & Volume Peak Elev=180.31' Storage=2,653 cf Inflow=3.62 cfs 12,144 cf
Discarded=0.02 cfs 2,208 cf Primary=2.36 cfs 9,265 cf Outflow=2.38 cfs 11,473 cf

Link DP-1: North Wetland Inflow=3.37 cfs 12,883 cf
Primary=3.37 cfs 12,883 cf

Total Runoff Area = 40,740 sf Runoff Volume = 15,763 cf Average Runoff Depth = 4.64"
10.54% Pervious = 4,295 sf 89.46% Impervious = 36,445 sf

Summary for Subcatchment PR-10:

Runoff = 1.04 cfs @ 12.11 hrs, Volume= 3,618 cf, Depth= 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.20"

	Area (sf)	CN	Description
	0	98	Roofs, HSG C
*	0	98	Walkways, HSG C
*	7,035	98	Parking, HSG C
	3,635	74	>75% Grass cover, Good, HSG C
	10,670	90	Weighted Average
	3,635		34.07% Pervious Area
	7,035		65.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0200	0.10		**Sheet Flow, Shallow** Grass: Dense n= 0.240 P2= 3.21"
0.1	10	0.0200	2.28		**Shallow Concentrated Flow, Shallow Conc - Unpaved** Unpaved Kv= 16.1 fps
8.3	60	Total			

Summary for Subcatchment PR-11:

Runoff = 3.62 cfs @ 12.07 hrs, Volume= 12,144 cf, Depth= 4.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.20"

	Area (sf)	CN	Description
	7,555	98	Roofs, HSG C
*	0	98	Walkways, HSG C
*	21,855	98	Parking, HSG C
	660	74	>75% Grass cover, Good, HSG C
	30,070	97	Weighted Average
	660		2.19% Pervious Area
	29,410		97.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.20		**Sheet Flow, Sheet** Smooth surfaces n= 0.011 P2= 3.21"
4.0	375	0.0060	1.57		**Shallow Concentrated Flow, Shallow Conc - Paved** Paved Kv= 20.3 fps
4.7	425	Total, Increased to minimum Tc = 5.0 min			

Summary for Pond P-1: MC-4500 Rates & Volume

Inflow Area = 30,070 sf, 97.81% Impervious, Inflow Depth = 4.85" for 25-Year event
Inflow = 3.62 cfs @ 12.07 hrs, Volume= 12,144 cf
Outflow = 2.38 cfs @ 12.15 hrs, Volume= 11,473 cf, Atten= 34%, Lag= 4.9 min
Discarded = 0.02 cfs @ 11.65 hrs, Volume= 2,208 cf
Primary = 2.36 cfs @ 12.15 hrs, Volume= 9,265 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 180.31' @ 12.15 hrs Surf.Area= 789 sf Storage= 2,653 cf

Plug-Flow detention time= 142.0 min calculated for 11,470 cf (94% of inflow)
Center-of-Mass det. time= 110.7 min (864.7 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	175.25'	1,372 cf	**28.50'W x 27.24'L x 6.75'H Field A** 5,241 cf Overall - 1,812 cf Embedded = 3,429 cf x 40.0% Voids
#2A	176.00'	1,812 cf	**ADS_StormTech MC-4500 +Cap** x 15 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 3 Rows of 5 Chambers Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf
#3	178.40'	75 cf	**4.00'D x 6.00'H Vertical Cone/Cylinder**
		3,259 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**12.0" Round Culvert** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 178.00' / 176.80' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	182.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	178.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#4	Discarded	175.25'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.02 cfs @ 11.65 hrs HW=178.40' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=2.36 cfs @ 12.15 hrs HW=180.31' (Free Discharge)
└**1=Culvert** (Passes 2.36 cfs of 4.02 cfs potential flow)
  ├**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Orifice Controls 2.36 cfs @ 6.77 fps)

Summary for Link DP-1: North Wetland

Inflow Area = 40,740 sf, 89.46% Impervious, Inflow Depth = 3.79" for 25-Year event
Inflow = 3.37 cfs @ 12.13 hrs, Volume= 12,883 cf
Primary = 3.37 cfs @ 12.13 hrs, Volume= 12,883 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

100-Year Storm Event – Proposed

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPR-10: Runoff Area=10,670 sf 65.93% Impervious Runoff Depth=6.12"
Flow Length=60' Slope=0.0200 '/' Tc=8.3 min CN=90 Runoff=1.53 cfs 5,439 cf

SubcatchmentPR-11: Runoff Area=30,070 sf 97.81% Impervious Runoff Depth=6.94"
Flow Length=425' Tc=5.0 min CN=97 Runoff=5.10 cfs 17,394 cf

Pond P-1: MC-4500 Rates & Volume Peak Elev=182.13' Storage=3,230 cf Inflow=5.10 cfs 17,394 cf
Discarded=0.02 cfs 2,262 cf Primary=3.85 cfs 14,451 cf Outflow=3.87 cfs 16,713 cf

Link DP-1: North Wetland Inflow=5.34 cfs 19,890 cf
Primary=5.34 cfs 19,890 cf

Total Runoff Area = 40,740 sf Runoff Volume = 22,834 cf Average Runoff Depth = 6.73"
10.54% Pervious = 4,295 sf 89.46% Impervious = 36,445 sf

Summary for Subcatchment PR-10:

Runoff = 1.53 cfs @ 12.11 hrs, Volume= 5,439 cf, Depth= 6.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.30"

	Area (sf)	CN	Description
	0	98	Roofs, HSG C
*	0	98	Walkways, HSG C
*	7,035	98	Parking, HSG C
	3,635	74	>75% Grass cover, Good, HSG C
	10,670	90	Weighted Average
	3,635		34.07% Pervious Area
	7,035		65.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	50	0.0200	0.10		**Sheet Flow, Shallow** Grass: Dense n= 0.240 P2= 3.21"
0.1	10	0.0200	2.28		**Shallow Concentrated Flow, Shallow Conc - Unpaved** Unpaved Kv= 16.1 fps
8.3	60	Total			

Summary for Subcatchment PR-11:

Runoff = 5.10 cfs @ 12.07 hrs, Volume= 17,394 cf, Depth= 6.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=7.30"

	Area (sf)	CN	Description
	7,555	98	Roofs, HSG C
*	0	98	Walkways, HSG C
*	21,855	98	Parking, HSG C
	660	74	>75% Grass cover, Good, HSG C
	30,070	97	Weighted Average
	660		2.19% Pervious Area
	29,410		97.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.20		**Sheet Flow, Sheet** Smooth surfaces n= 0.011 P2= 3.21"
4.0	375	0.0060	1.57		**Shallow Concentrated Flow, Shallow Conc - Paved** Paved Kv= 20.3 fps
4.7	425	Total, Increased to minimum Tc = 5.0 min			

Summary for Pond P-1: MC-4500 Rates & Volume

Inflow Area = 30,070 sf, 97.81% Impervious, Inflow Depth = 6.94" for 100-Year event
Inflow = 5.10 cfs @ 12.07 hrs, Volume= 17,394 cf
Outflow = 3.87 cfs @ 12.14 hrs, Volume= 16,713 cf, Atten= 24%, Lag= 3.9 min
Discarded = 0.02 cfs @ 11.44 hrs, Volume= 2,262 cf
Primary = 3.85 cfs @ 12.14 hrs, Volume= 14,451 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 182.13' @ 12.14 hrs Surf.Area= 789 sf Storage= 3,230 cf

Plug-Flow detention time= 109.8 min calculated for 16,713 cf (96% of inflow)
Center-of-Mass det. time= 86.0 min (833.7 - 747.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	175.25'	1,372 cf	**28.50'W x 27.24'L x 6.75'H Field A** 5,241 cf Overall - 1,812 cf Embedded = 3,429 cf x 40.0% Voids
#2A	176.00'	1,812 cf	**ADS_StormTech MC-4500 +Cap** x 15 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 3 Rows of 5 Chambers Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf
#3	178.40'	75 cf	**4.00'D x 6.00'H Vertical Cone/Cylinder**
		3,259 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	178.00'	**12.0" Round Culvert** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 178.00' / 176.80' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	182.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 1	178.00'	**8.0" Vert. Orifice/Grate** C= 0.600
#4	Discarded	175.25'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.02 cfs @ 11.44 hrs HW=178.40' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=3.78 cfs @ 12.14 hrs HW=182.12' (Free Discharge)
└**1=Culvert** (Passes 3.78 cfs of 5.68 cfs potential flow)
  ├**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.51 cfs @ 1.11 fps)
  └**3=Orifice/Grate** (Orifice Controls 3.27 cfs @ 9.36 fps)

Summary for Link DP-1: North Wetland

Inflow Area = 40,740 sf, 89.46% Impervious, Inflow Depth = 5.86" for 100-Year event
Inflow = 5.34 cfs @ 12.14 hrs, Volume= 19,890 cf
Primary = 5.34 cfs @ 12.14 hrs, Volume= 19,890 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Appendix B
Standard 3 Computations and Supporting Information

- Groundwater Recharge Calculations
- Soil Evaluation and Analysis

Groundwater Recharge Calculations

Recharge Calculations

Project Name: MIT LL 4th Feeder
Proj. No.: 13259.09
Date: 5/20/2019
Project Location: Lexington, MA
Calculated by: DT

Proposed Impervious Surface Summary

Net Proposed Impervious Areas by Hydrologic Soil Group (HSG) in acres

Subcatchment	HSG A	HSG B	HSG C	HSG D	Total Area
11			0.40		0.40
TOTAL	**0.00**	**0.00**	**0.40**	**0.00**	**0.40**

Required Recharge Volume (Cubic Feet)

HSG	Area (acres)	Recharge Depth* (in.)	Volume (c.f.)
A	0.0	0.60	0
B	0.0	0.35	0
C	0.4	0.25	366
D	0.0	0.10	0
TOTAL			**366**

Assumptions:

* Massachusetts DEP Infiltration requirement: HSG A = 0.60 in; HSG B = 0.35 in; HSG C = 0.25 in; HSG D = 0.10 in.

Recharge Calculations

Project Name: MIT LL 4th Feeder **Proj. No.:** 13259.09
Date: 5/20/2019
Project Location: Lexington, MA **Calculated by:** DT

Provided Recharge Volume and Drawdown Times

DRAINAGE AREA 10

Stone Infiltration Swale
Infiltration Volumes beneath lowest outlet
Stormtech MC-4500 chambers on 9" crushed stone base

Basin Volume Below Overflow Weir

Elevation	Bottom Area (s.f.)	Volume below 178.0 (c.f.)	Description
175.25	776	1,437	Volume of stone around chambers & Volume of MC-4500 chambers embedded
TOTAL		**1,437**	

Assumptions:
Recharge Rate: 1.02 in/hr* * Based on available geotechnical information

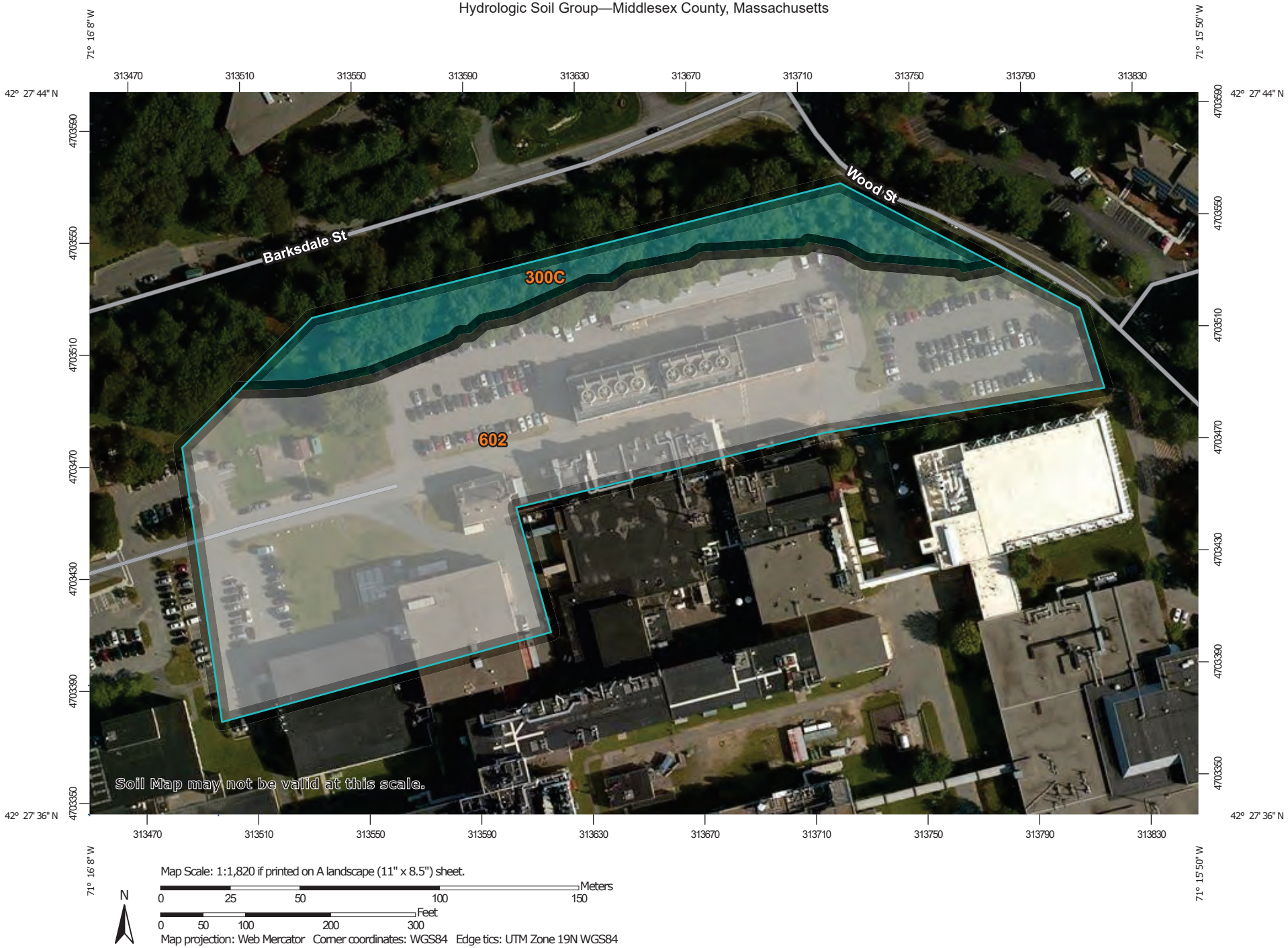
Total Drawdown Time: **21.8 hours**

Total Recharge Volume: **1,437 c.f.**

Recharge Summary

Adjusted Required Recharge Volume:	**366 c.f.**
Total Recharge Volume Provided:	**1,437 c.f.**
Drawdown Time:	**22 hours**

Soil Evaluation and Analysis



Map Scale: 1:1,820 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Lines

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Points

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 17, Oct 6, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 10, 2014—Aug 25, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
300C	Montauk fine sandy loam, 8 to 15 percent slopes	C	1.1	14.9%
602	Urban land		6.4	85.1%
Totals for Area of Interest			**7.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

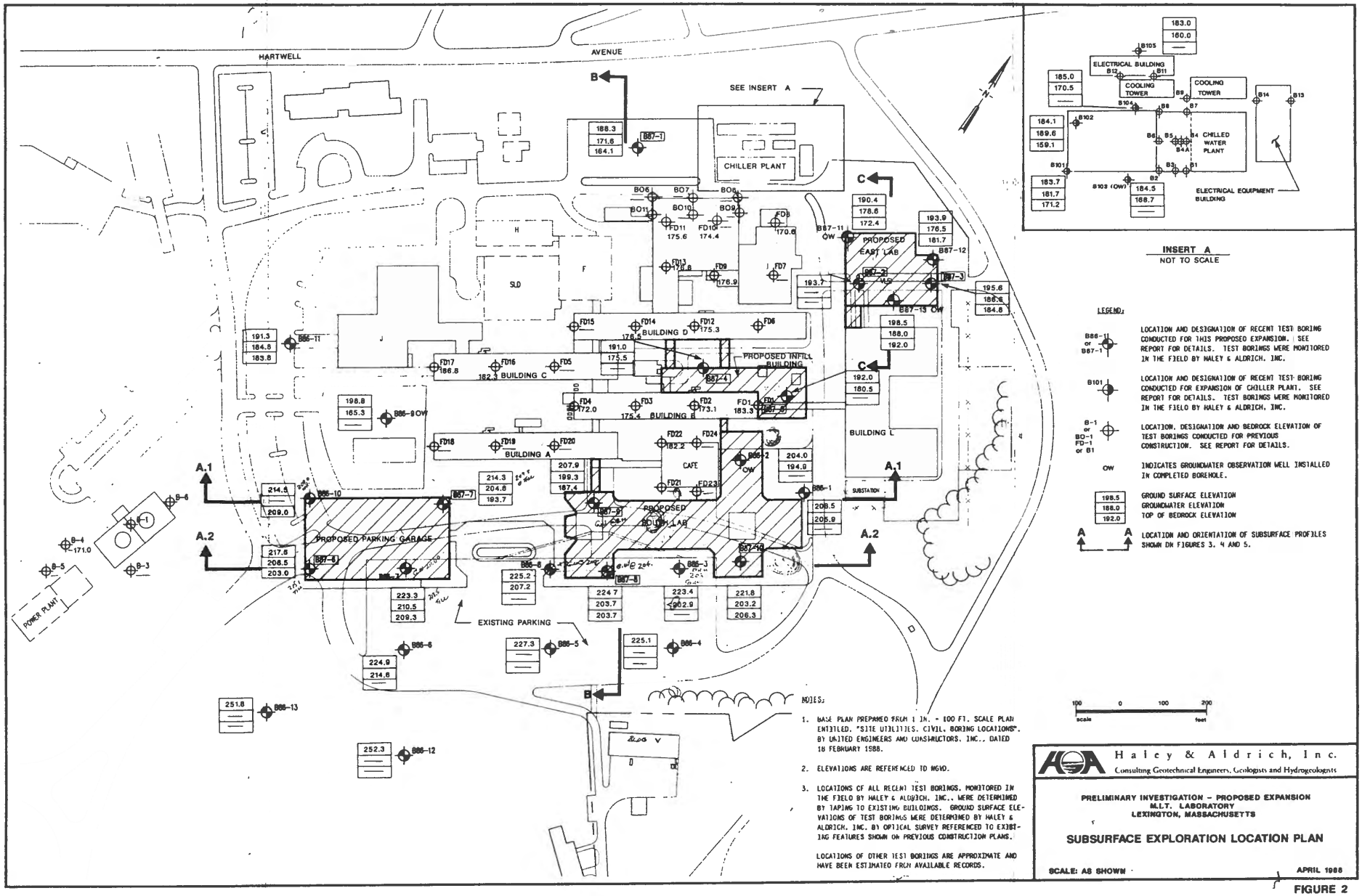
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



Haley & Aldrich, Inc.
Consulting Geotechnical Engineers, Geologists and Hydrogeologists

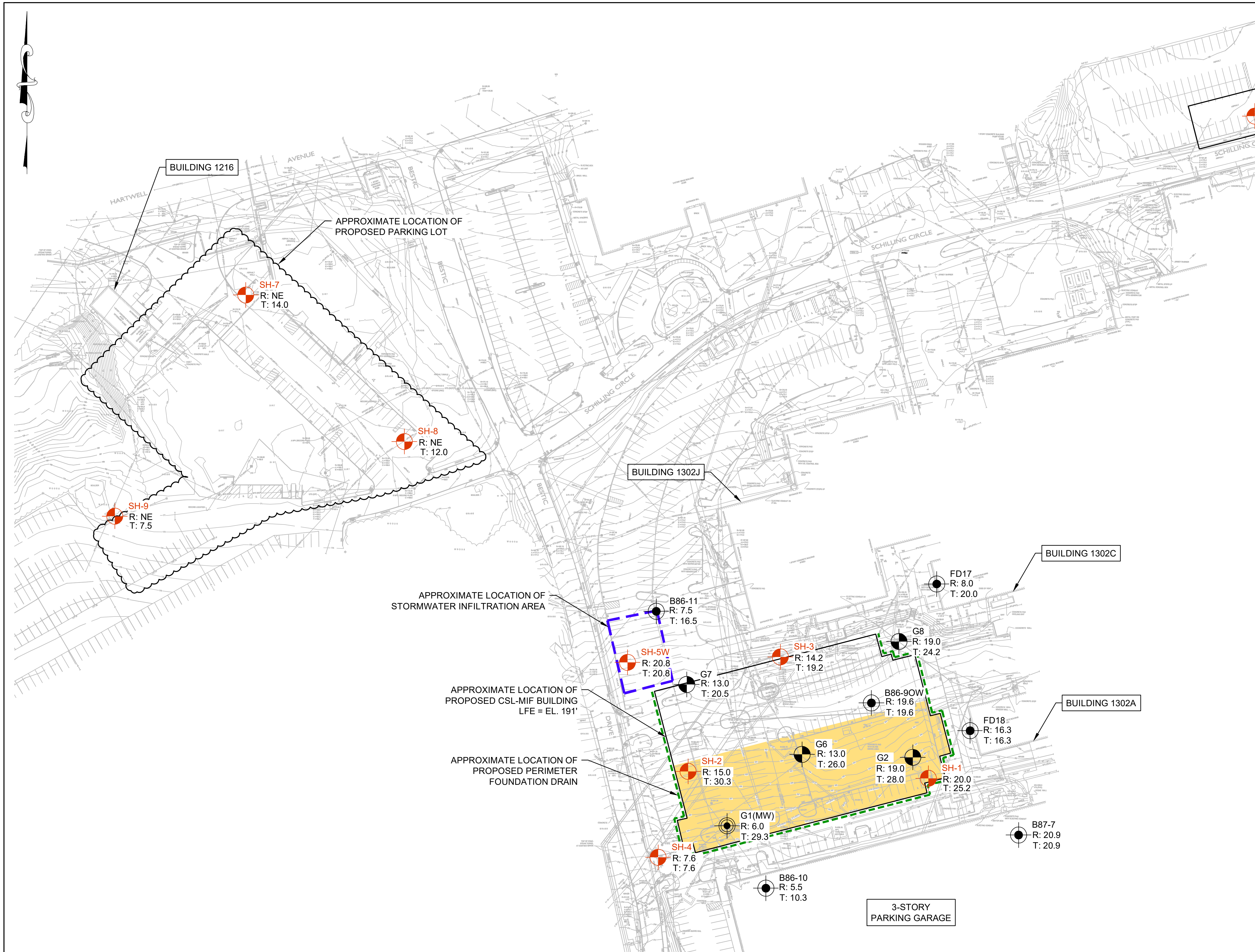
PRELIMINARY INVESTIGATION – PROPOSED EXPANSION
M.I.T. LABORATORY
LEXINGTON, MASSACHUSETTS

SUBSURFACE EXPLORATION LOCATION PLAN

SCALE: AS SHOWN APRIL 1988

FILE NO. 6129 02 D7

FIGURE 2



NOTES:

1. THE BASE MAP WAS DRAWN FROM A PLAN ENTITLED, "EXISTING CONDITIONS SURVEY", PREPARED BY NITSCH ENGINEERING (NITSCH) OF BOSTON, MA, DATED DECEMBER 27, 2017 WITH AN ORIGINAL SCALE OF 1" = 20'.
2. EXPLORATIONS DESIGNATED SH-1 THROUGH SH-9 WERE ADVANCED BY SOIL EXPLORATION CORPORATION OF LEOMINSTER, MA AND OBSERVED BY SANBORN HEAD BETWEEN JANUARY 15 AND 18, 2018.
3. EXPLORATIONS OBSERVED BY GEI CONSULTANTS, INC (GEI) OF WOBURN, MA WERE TAKEN FROM AN ELECTRONIC PLAN ENTITLED, "BORING LOCATION PLAN", PREPARED BY GEI, DATED NOVEMBER 2013.
4. EXPLORATIONS OBSERVED BY HALEY & ALDRICH (H&A) OF BURLINGTON, MA WERE TAKEN FROM AN ELECTRONIC PLAN ENTITLED, "SUBSURFACE EXPLORATION LOCATION PLAN", PREPARED BY H&A, DATED APRIL 1988.
5. APPROXIMATE LOCATIONS OF EXPLORATIONS OBSERVED BY SANBORN HEAD ARE BASED ON TAPED MEASUREMENTS MADE IN THE FIELD RELATIVE TO PROMINENT SITE FEATURES. THIS DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

LEGEND:

SH-1	APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING OBSERVED BY SANBORN HEAD (JANUARY 2018)
G2	APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING BY GEI (2012-2013)
G1(MW)	APPROXIMATE LOCATION AND DESIGNATION OF MONITORING WELL BY GEI (2012)
B86-7	APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING BY H&A (1988)
R: 20	DEPTH TO TOP OF WEATHERED ROCK, IN FEET
T: 25.2	DEPTH TO BORING TERMINATION, IN FEET
NE	NOT ENCOUNTERED
	PROPOSED UNDERDRAIN SYSTEM
	PROPOSED PERIMTER FOUNDATION DRAIN (SEE FIGURE 5)

SANBORN HEAD

GRAPHICAL SCALE
60' 30' 0' 60' 120'

NO.	DATE	DESCRIPTION	BY

DRAWN BY: C.GREEN
DESIGNED BY: A.BLOMEKE
REVIEWED BY: K.STETSON
PROJECT MGR: A.BLOMEKE
PIC: S.SADKOWSKI
DATE: JULY 2018

GEOTECHNICAL ENGINEERING REPORT
CSL - MIF FOR MIT LL
LEXINGTON, MASSACHUSETTS

EXPLORATION LOCATION PLAN

PROJECT NUMBER: 4284.00

SHEET NUMBER: 2

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: CSL - MIF for MIT LL
Location: Lexington, MA
Project No.: 4284.00

Log of Boring SH-6

Ground Elevation: Not Available

Drilling Method: Truck Mounted Drill Rig with 4.5" O.D., Hollow Stem Auger and NQ Core Equipment

Sampling Method: 2" O.D. Split Spoon, 140 lb Automatic Hammer

Drilling Company: Soil Explorations Corp.

Foreman: K. Rival/T. Flores

Date Started: 01/12/18 **Date Finished: 01/16/18**

Logged By: D. DeWolfe **Checked By: A. Blomeke**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
01/12/18	---	No Groundwater Encountered				

Depth (ft)	Drill Rate (min/ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Remarks
0								-----0'-----		
								ASPHALT	(0 to 0.5'): ASPHALT.	
								-----0.5'-----		
		G-1	0.5 - 7		---	PID: ND			G-1A (0.5 to 6'): Brown, fine to coarse SAND, some Gravel, little Silt. Moist. FILL.	
2										
4										
								FILL		
6						PID: ND			G-1B (6 to 7'): Red/brown, fine to coarse SAND and Gravel, trace Silt. Moist. FILL.	
		S-1	7 - 9	9 12 9 6	24/10	PID: ND			S-1 (7 to 9'): Medium dense, brown, fine to coarse SAND, some Gravel, very few Root fragments. Moist. FILL.	
8										
10								-----10'-----		
		S-2	10 - 12	2 1 2 2	24/12	PID: ND			S-2 (10 to 12'): Very loose, brown, fine to coarse SAND, little Gravel, little Silt, very few Root fragments. Moist. FILL.	
								FILL		
12		S-3	12 - 13.2	2 66 50/2"	14/12	PID: ND PID: ND		-----12.5'-----	S-3A (12 to 12.5'): Very dense, dark brown, fine to coarse SAND, some Gravel, little Silt, very few Root fragments. Moist. FILL.	
								WEATHERED BEDROCK	S-3B (12.5 to 13.2'): Very dense, gray, fine to coarse SAND and Gravel, trace Silt. Moist. WEATHERED BEDROCK.	Increased drilling effort at approximately 13 feet.
14	4	C-1	14 - 19		60/29			-----14'-----	C-1 (14 to 19'): Moderately hard, severely weathered, moderately fractured, gray, medium grained, GRANITE. REC=48%. RQD=14%.	Increased drilling effort at approximately 14 feet.
	3.75									
16	6.75									
	4.75									
18	4.5									
	3.25	C-2A	19 - 20.5		60/60			BEDROCK	C-2A (19 to 20.5'): Moderately hard, severely weathered, slightly fractured, gray, medium grained, GRANITE, with closely spaced horizontal to moderatley dipping fractures. REC=100%. RQD=22%.	
20	3.75									
		C-2B	20.5 - 24		60/60				C-2B (20.5 to 24'): Moderately hard, severely weathered, slightly fractured, gray, fine grained, BASALT. REC=100%. RQD=29%.	
	7									
22	6									
	3									
24								-----24'-----	Boring terminated at 24 feet.	

BORING LOG P:\4200S\4284.00\WORK\LOGS\4284.00 LOGS.GPJ 2017 SANBORN HEAD V1.GLB 2017 SANBORN HEAD V1.GDT 2/20/18

SANBORN HEAD

Sanborn, Head & Associates, Inc.

Project: CSL - MIF for MIT LL
Location: Lexington, MA
Project No.: 4284.00

Log of Boring SH-6

Ground Elevation: Not Available

Drilling Method: Truck Mounted Drill Rig with 4.5" O.D., Hollow Stem Auger and NQ Core Equipment

Sampling Method: 2" O.D. Split Spoon, 140 lb Automatic Hammer

Drilling Company: Soil Explorations Corp.

Foreman: K. Rival/T. Flores

Date Started: 01/12/18 **Date Finished: 01/16/18**

Logged By: D. DeWolfe **Checked By: A. Blomeke**

Groundwater Readings

Date	Time	Depth to Water	Ref. Pt.	Depth of Casing	Depth of Hole	Stab. Time
01/12/18	---	No Groundwater Encountered				

Depth (ft)	Drill Rate (min/ft)	Sample Information: Sample No.	Depth (ft)	Spoon Blows per 6 in	Pen/ Rec (in)	Field Testing Data	Stratum: Log	Description	Geologic Description	Remarks
26									NOTES: 1. Soil samples were screened for volatile organic compounds (VOCs) using a MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp, calibrated to a 100 parts per million by volume (ppmv) isobutylene-in-air standard using a response factor of 1.0. Results are presented in ppmv; the typical detection limit is 1 ppmv. ND indicates not detected. NA indicates not available. The PID measures relative levels of VOCs. Although PID screening cannot be used directly to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator for the presence of VOCs. 2. Vacuum extraction completed on 1/12/2018 to a depth of approximately 7 feet. Geologic description based on visual observations of excavated soil and excavation sidewalls. 3. Upon completion, the borehole was backfilled with soil cuttings and finished to existing grade with an asphalt patch.	
28										
30										
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Appendix C
Standard 4 Computations and Supporting Information

- Water Quality Volume Calculations
- TSS Removal Worksheets
- Long-Term Pollution Prevention Plan

Water Quality Volume Calculations

Water Quality Volume Calculations

Project Name:	Electrical Infrastructure Modifications	**Proj. No.:**	13259.09
		Date:	5/20/2019
Project Location:	MIT LL, Lexington, MA	**Calculated by:**	VHB
		Checked by:	

Subsurface Infiltration Basin 1 (DP-1)

WQV:

Total Impervious Area (sq.ft.) = **21,855**

Required:

Runoff Depth to be Treated (in.)	Required Volume (cu.ft.)
0.5	**911**

Provided:

	Cumulative Volume (cu.ft.)
Cumulative Storage below lowest outlet =	**1437**

TSS Removal Worksheets

TSS Removal Calculation Worksheet

VHB, Inc..
101 Walnut Street
Post Office Box 9151
Watertown, MA 02471
P 617.924.1770

Project Name:	**Electrical Infrastructure**	Sheet:	**1 of 1**
Project Number:	**13259.09**	Date:	**May. 2019**
Location:	**MIT LL, Lexington, MA**	Computed by:	**DT**
Discharge Point:	**DP-1**	Checked by:	
Drainage Area(s):	**PR-11**		

A	B	C	D	E
BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (C*D)	Remaining Load (D-E)
StormTech Isolator Rows* **	**80%**	**1.00**	**0.80**	**0.20**
Subsurface Infiltration Structure	**80%**	**0.20**	**0.16**	**0.04**
	0%	**0.04**	**0.00**	**0.04**
	0%	**0.04**	**0.00**	**0.04**
	0%	**0.04**	**0.00**	**0.04**

Treatment Train TSS Removal = **96%**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1. Removal rates for proprietary devices are from approved studies and/or manufacturer data.

** Equals remaining load from previous BMP (E)

*** StormTech Isolator Rows sizing calculation gives a TSS removal rate of 84%. To be conservative, 80% removal is used for this calculation.

Long –Term Pollution Prevention Plan

Long-Term Pollution Prevention Plan

This Long-Term Pollution Prevention Plan has been developed to establish site management practices that improve the quality of stormwater discharges from the Project.

Description of Pollutant Sources

Potential pollutant sources from the Site include the impervious areas surrounding the switchgear. In order to reduce the likelihood of pollution entering stormwater discharges from the Site, the following measures should be implemented.

Pollutant Control Approach

Maintenance of Pavement Systems

Standard Asphalt Pavement

Regular maintenance of pavement surfaces will prevent pollutants such as oil and grease, trash, and sediments from entering the stormwater management system. The following practices should be performed:

- Check areas frequently for pavement staining and clean as necessary
- Routinely pick up and remove litter from the parking areas, islands, and perimeter landscaping.

Maintenance of Vegetated Areas

Proper maintenance of vegetated areas can prevent the pollution of stormwater runoff by controlling the source of pollutants such as suspended sediments, excess nutrients, and chemicals from landscape care products. Practices that should be followed under the regular maintenance of the vegetated landscape include:

- Inspect lawn areas on a regular basis and remove any litter.
- Maintain vegetated areas adjacent to pavement to prevent soil washout.
- Immediately clean any soil deposited on pavement.

- Re-seed bare areas; install appropriate erosion control measures when native soil is exposed or erosion channels are forming.
- Plant alternative mixture of grass species in the event of unsuccessful establishment.
- The grass vegetation should be cut to a height between three and four inches.
- Pesticide/Herbicide Usage – No pesticides are to be used unless a single spot treatment is required for a specific control application.
- Fertilizer usage should be avoided. If deemed necessary, slow release fertilizer should be used. Fertilizer may be used to begin the establishment of vegetation in bare or damaged areas, but should not be applied on a regular basis unless necessary.

Management of Snow and Ice

Storage and Disposal

Snow storage and disposal will be consistent with the overall MIT Lincoln Laboratory snow storage and removal plan. Key practices for the safe storage and disposal of snow include:

- Under no circumstances shall snow be disposed or stored in wetland resource areas.
- Under no circumstances shall snow be disposed or stored on the infiltration trench.

Salt and Deicing Chemicals

Salt and deicing chemical use on site will be in accordance with MIT Lincoln Laboratory protocols. In general, the amount of salt and deicing chemicals used on the site shall be the minimum amount needed to provide safe pedestrian and vehicle travel. The following practices should be followed to control the amount of salt and deicing materials that come into contact with stormwater runoff:

- Devices used for spreading salt and deicing chemicals should be capable of varying the rate of application based on the site-specific conditions.
- Sand and salt stockpiles should be covered to prevent precipitation and adjacent runoff from coming in contact with the deicing materials.

Spill Prevention and Response Plan

Spill prevention equipment and training will be provided by MIT Lincoln Laboratory.

Initial Notification

In the event of a spill the facility and/or construction manager or supervisor will be notified immediately.

FACILITY MANAGER

Name: _____ Home Phone: _____

Phone: _____ E-mail: _____

CONSTRUCTION MANAGER

Name: _____ Home Phone: _____

Phone: _____ E-mail: _____

The supervisor will first contact the Fire Department and then notify the Police Department, the Public Health Commission and the Conservation Commission. The Fire Department is ultimately responsible for matters of public health and safety and should be notified immediately.

Further Notification

Based on the assessment from the Fire Chief, additional notification to a cleanup contractor may be made. The Massachusetts Department of Environmental Protection (DEP)/Department of Environmental Services (DES) and the EPA may be notified depending upon the nature and severity of the spill. The Fire Chief will be responsible for determining the level of cleanup and notification required. The attached list of emergency phone numbers shall be posted in the main construction/facility office and readily accessible to all employees. A hazardous waste spill report shall be completed as necessary using the attached form.

Emergency Notification Phone Numbers

1. FACILITY MANAGER

Name: _____ Home Phone: _____

Phone: _____ E-mail: _____

ALTERENATE

Name: _____ Home Phone: _____

Phone: _____ E-mail: _____

2. FIRE DEPARTMENT

Emergency: **911**

Business: (781) 862-0272

POLICE DEPARTMENT

Emergency: **911**

Business: _____

3. CLEANUP CONTRACTOR:

Address: _____

Phone: _____

4. MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

Emergency: (888) 304-1133

Northeast Region – Wilmington Office: (978) 694-3200

5. NATIONAL RESPONSE CENTER

Phone: (800) 424-8802

ALTERNATE: U.S. ENVIRONMENTAL PROTECTION AGENCY

Emergency: (617) 223-7265

Business: (617) 860-4300

6. CONSERVATION COMMISSION

Contact: _____

Phone: (781) 698-4531

BOARD OF HEALTH

Contact: _____

Phone: (781) 698-4533

Hazardous Waste / Oil Spill Report

Date _____ Time _____ AM / PM

Exact location (Transformer #) _____

Type of equipment _____ Make _____ Size _____

S / N _____ Weather Conditions _____

On or near Water ☐ Yes If Yes, name of body of Water _____

☐ No

Type of chemical/oil spilled _____

Amount of chemical/oil spilled _____

Cause of Spill _____

Measures taken to contain or clean up spill _____

Amount of chemical/oil recovered _____ Method _____

Material collected as a result of cleanup:

_____ Drums containing _____

_____ Drums containing _____

_____ Drums containing _____

Location and method of debris disposal

_____

Name and address of any person, firm, or corporation suffering damages:

_____

Procedures, method, and precautions instituted to prevent a similar occurrence from recurring:

_____

Spill reported to General Office by _____ Time _____ AM / PM

Spill reported to DEP / National Response Center by _____

DEP Date _____ Time _____ AM / PM Inspector _____

NRC Date _____ Time _____ AM / PM Inspector _____

Additional comments: _____

Assessment - Initial Containment

The supervisor or manager will assess the incident and initiate containment control measures with the appropriate spill containment equipment included in the spill kit kept on-site. A list of recommended spill equipment to be kept on site is included on the following page.

Fire / Police Department	911
Lexington Public Health Department	(781) 698-4533
Lexington Conservation Commission:	(781) 698-4531

Emergency Response Equipment

The following equipment and materials shall be maintained at all times and stored in a secure area for long-term emergency response need.

Supplies		***Recommended Suppliers***
SORBENT PILLOWS/"PIGS"	**2**	http://www.newpig.com
SORBENT BOOM/SOCK	**25 FEET**	Item # KIT276 — mobile container with two pigs,
SORBENT PADS	**50**	26 feet of sock, 50 pads, and five pounds of
LITE-DRI® ABSORBENT	**5**	absorbent (or equivalent)
POUNDS		http://www.forestry-suppliers.com
SHOVEL	**1**	Item # 43210 — Manhole cover pick (or
PRY BAR	**1**	equivalent)
GOGGLES	**1 PAIR**	Item # 33934 — Shovel (or equivalent)
GLOVES – HEAVY	**1 PAIR**	Item # 90926 — Gloves (or equivalent)
		Item # 23334 — Goggles (or equivalent)

Stormwater Operation and Maintenance Plan

Project Information

Site

Electrical Infrastructure Modifications
MIT Lincoln Laboratory
Lexington, Massachusetts

Owner

Hanscom Air Force Base
Lexington, Massachusetts

Operator

Massachusetts Institute of Technology Lincoln Laboratory
244 Wood Street
Lexington, Massachusetts

Site Supervisor

Name: _____

Address 1: _____

Address 2: _____

Phone: _____

Supervisor Contact Info:

Name: _____

Telephone: _____

Cell phone: _____

Email: _____

Description of Stormwater Maintenance Measures

The following Operation and Maintenance (O&M) program is proposed to ensure the continued effectiveness of the stormwater management system. The operator shall be responsible for the operation and maintenance procedures described in the program. Attached to this plan are a Stormwater Best Management Practices Checklist and Maintenance Figure for use during the long term operation and maintenance of the stormwater management system.

The operator shall be responsible for retention of inspection and maintenance records for a period of three years, on an ongoing basis.

Catch Basins

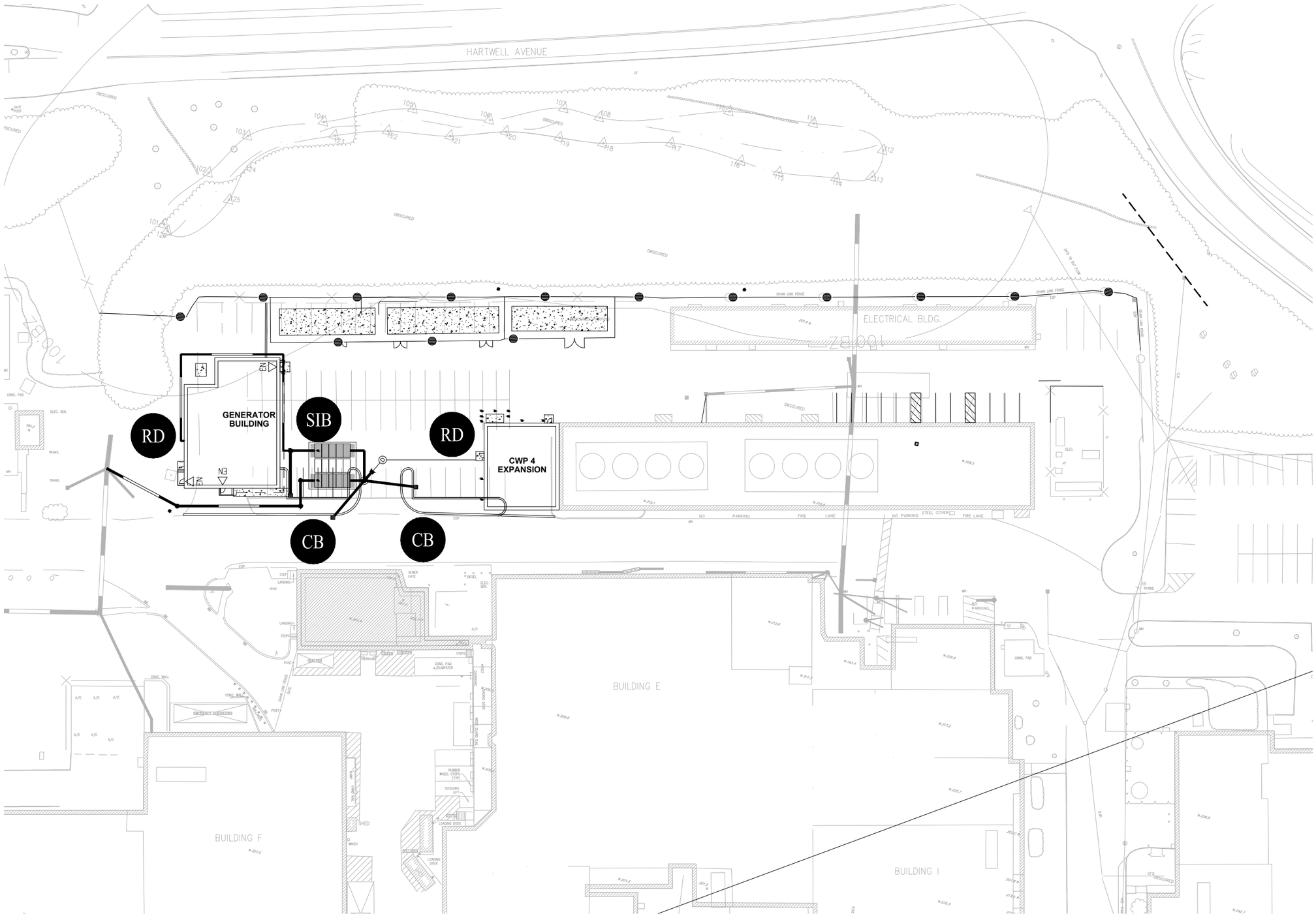
- All catch basins shall be inspected and cleaned a minimum of at least once per year.
- Sediment (if more than six inches deep) and/or floatable pollutants shall be pumped from the basin and disposed of at an approved offsite facility in accordance with all applicable regulations.
- If inspection encounters evidence of petroleum products, the owner shall immediately employ measures to remove these materials and legally dispose of them.
- Any structural damage or other indication of malfunction will be reported to the site manager and repaired as necessary
- During colder periods, the catch basin grates must be kept free of snow and ice.
- During warmer periods, the catch basin grates must be kept free of leaves, litter, sand, and debris.

Subsurface Infiltration System

- The subsurface infiltration systems will be inspected at least once each year by removing the manhole/access port covers and determining the thickness of sediment that has accumulated in the sediment removal row.
- If inspection encounters evidence of petroleum products, the owner shall immediately employ measures to remove these materials and legally dispose of them.
- If sediment is more than six inches deep, it must be suspended via flushing with clean water and removed using a vactor truck.
- Manufacturer's specifications and instructions for cleaning the sediment removal row is provided as an attachment to this section.
- Emergency overflow pipes will be examined at least once each year and verified that no blockage has occurred.
- System will be observed after rainfalls to see if it is properly draining.

- If water is observed standing in the system longer than 72 hours following a storm event, the owner shall retain a qualified stormwater professional to assess the cause of this condition and develop a corrective action plan for restoring infiltration. The owner shall immediately implement the corrective action plan to restore infiltration. Documentation of these actions shall be maintained in the Operation and Maintenance records.

\\vhb\gbl\proj\Wat-LD\13259.09\cad\ld\Eng\Stormwater\13259.09 BMP Location Plan.dwg



LEGEND

- CB — Catch Basin
- RD — Roof Drain Leader
- SIB — Subsurface Infiltration Basin

0 30 60 120 Feet

Stormwater BMP Location Plan
Electrical Infrastructure Modifications
MIT Lincoln Laboratory
Lexington, Massachusetts

Figure C1

5/29/2019

MIT LL – Electrical Infrastructure Modifications, Lexington, Massachusetts
Long Term Best Management Practices – Maintenance/ Evaluation Checklist

Best Management Practice	Inspection Frequency (unless otherwise stated in Order of Conditions)	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed (List Items)	Date of Cleaning/Repair	Performed by
StormTech Isolator Row® and Subsurface Infiltration System	Not less than twice within the first year, and not less than annually thereafter			• Depth of solids collected in the Isolator Row • Remove sediment and other trapped pollutants once the sediment depth reaches 6 inches • Check for standing water in system.	☐yes ☐no		
Deep Sump and Hooded Catch basins	Quarterly			• Clean a minimum of once per year • Clean accumulated sand and sediment whenever sediment is more than six inches deep • Remove floatables	☐yes ☐no		
Street Sweeping	N/A			• Sweep or vacuum pavement surfaces at least two times a year with a commercial cleaning unit and dispose of removed materials. A sweeping should be conducted in March, after the snowy season but before significant spring rain events.	☐yes ☐no		
Outlet Control Structures	Bi-annually			• The outlet control structures associated with the infiltration system shall be inspected at least twice a year by removing the cover and determining the thickness of sediment that has accumulated in the sump of the manhole. • If sediment is more than six inches deep, it must be removed using a vactor truck. • One inspection and cleanout (if sediment depths warrant) should occur in March after snowfall events have ceased.	☐yes ☐no		
Vegetated Areas Maintenance	N/A			• Complete twice per year • Reseed bare areas and general upkeep	☐yes ☐no		

Stormwater Control Manager _____

Appendix D
Standard 8 Supporting Information

- List of recommended Construction Period BMPs
- Recommended construction period maintenance checklist

Recommended Construction Period BMPs

Recommended Construction Period Pollution Prevention and Erosion and Sedimentation Controls

The following erosion and sedimentation controls are for use during the earthwork and construction phases of the project. The following controls are provided as recommendations for the site contractor and do not constitute or replace the final Stormwater Pollution Prevention Plan that must be fully implemented by the Contractor and Owner in compliance with EPA NPDES regulations.

Straw Bale Barriers

Straw bale barriers will be placed to trap sediment transported by runoff before it reaches the drainage system or leaves the construction site. Bales will be set at least four inches into the existing ground to minimize undercutting by runoff. Where necessary or where shown on the plans, two rows of bales may be used to provide enhanced protection for erosion prone areas.

Silt Fencing

In areas where high runoff velocities or high sediment loads are expected, straw bale barriers will be backed up with silt fencing. This semi-permeable barrier made of a synthetic porous fabric will provide additional protection. The silt fences and straw bale barrier will be replaced as determined by periodic field inspections.

Catch Basin Protection

Newly constructed and existing catch basins will be protected with straw bale barriers (where appropriate) or silt sacks throughout construction.

Construction Entrance/Exit

A temporary crushed-stone construction entrance/exit will be constructed. A cross slope will be placed in the entrance to direct runoff to a protected catch basin inlet or settling area. If deemed necessary after construction begins, a wash pad may be included to wash off vehicle wheels before leaving the project site.

Diversion Channels

Diversion channels will be used to collect runoff from construction areas and discharge to either sedimentation basins or protected catch basin inlets.

Temporary Sediment Basins

Temporary sediment basins will be designed either as excavations or bermed stormwater detention structures (depending on grading) that will retain runoff for a sufficient period of time to allow suspended soil particles to settle out prior to discharge. These temporary basins will be located based on construction needs as determined by the contractor and outlet devices will be designed to control velocity and sediment. Points of discharge from sediment basins will be stabilized to minimize erosion.

Vegetative Slope Stabilization

Stabilization of open soil surfaces will be implemented within 14 days after grading or construction activities have temporarily or permanently ceased, unless there is sufficient snow cover to prohibit implementation. Vegetative slope stabilization will be used to minimize erosion on slopes of 3:1 or flatter. Annual grasses, such as annual rye, will be used to ensure rapid germination and production of root mass. Permanent stabilization will be completed with the planting of perennial grasses or legumes. Establishment of temporary and permanent vegetative cover may be established by hydro-seeding or sodding. A suitable topsoil, good seedbed preparation, and adequate lime, fertilizer and water will be provided for effective establishment of these vegetative stabilization methods. Mulch will also be used after permanent seeding to protect soil from the impact of falling rain and to increase the capacity of the soil to absorb water. Erosion control blankets shall be used in all areas where slopes exceed 3:1.

Maintenance

- The contractor or subcontractor will be responsible for implementing each control shown on the Sedimentation and Erosion Control Plan. In accordance with EPA regulations, the contractor must sign a copy of a certification to verify that a plan has been prepared and that permit regulations are understood.

- The on-site contractor will inspect all sediment and erosion control structures periodically in accordance with the compliance path chosen during the NPDES CGP Notice of Intent (NOI) process. Records of the inspections will be prepared and maintained on-site by the contractor.

- Sediment shall be removed from behind barriers if buildup exceeds half the bale height.

- Damaged or deteriorated items will be repaired immediately after identification.

- The underside of straw bales should be kept in close contact with the earth and reset as necessary.

- Sediment that is collected in structures shall be disposed of properly and covered if stored on-site.

- Erosion control structures shall remain in place until all disturbed earth has been securely stabilized. After removal of structures, disturbed areas shall be regraded and stabilized as necessary.

Recommended Construction Period Maintenance Checklist

MIT LL – Electrical Infrastructure Modifications, Lexington, Massachusetts
Construction Best Management Practices – Maintenance/ Evaluation Checklist

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed ☐yes ☐no (List Items)	Date of Cleaning/Repair	Performed by:
Erosion Control Barrier	Weekly and after storm events of ½ inch or greater			• Accumulated sediment • Separation of silt socks or silt fences with the earth and each other • Damaged or broken silt socks or silt fences	☐yes ☐no		
Crushed Stone Construction Exits	Weekly and after storm events of ½ inch or greater			• Inspect for Breakdown for crushed stone. Reapply stone is necessary to depths specified in construction documents	☐yes ☐no		
Catch Basin Protection	Weekly and after storm events of ½ inch or greater			• Accumulated sediment within silt sacks • Rips or torn silt sacks	☐yes ☐no		
Swale Slope Blanket	Weekly and after storm events of ½ inch or greater			• Accumulated sediment • Rips, tears, general damage	☐yes ☐no		
Temporary Diversion Channels and Sedimentation Basins	Weekly and after ½" storm events or greater			• Inspect for proper function. Correct if necessary.	☐yes ☐no		
Street Sweeping	Weekly and after ½" storm events or greater			• Inspect adjacent streets. Remove sediment as necessary.	☐yes ☐no		

Stormwater Control Manager _____

Appendix E
Hydraulic Analysis

The proposed closed drainage system has been designed to convey runoff from the 10-year storm event. Drainage pipes were sized using Manning's equation for full-flow capacity and the Rational Method for estimating runoff.

- Hydraulic Analysis

101 Walnut Street
Post Office Box 9151
Watertown, MA 02471
P 617.924.1770

Storm Drainage Computations

Name: MIT LL Electrical Improvements
Lexington, MA
Client: MIT LL

Proj. No.: **13259.09**
Date: **5/23/2019**
Computed by: **VHB**
Checked by: **VHB**

Design Parameters:
10 **Year Storm** Boston, MA **IDF Curve**
k_e= **0.5**

DESCRIPTION	LOCATION		AREA	C	C x A	SUM	FLOW TIME (MIN)		i*	DESIGN					CAPACITY		PROFILE							INLET CONTROL		OUTLET CONTROL			JUNCTION LOSSES		
	FROM	TO	(AC.)			C x A	PIPE	CONC TIME		Q	V	n	PIPE	SLOPE	Q full	V full	LENGTH	FALL	RIM	INV	INV	W.S.E.	Freeboard	HW/D	HW	H	TW or h_o	HW	K_m	K_d	H loss
										cfs	fps		SIZE		ft^3/s	ft/s	ft	ft		UPPER	LOWER	ft	ft	ft	ft	ft	ft	junction	junction	junction
CB-103	CB-103	DMH-7	0.12	0.90	0.11	0.11	0.16	5.0	5.3	0.6	2.9	0.012	12	0.0110	4.0	5.2	27	0.30	183.8	179.8	179.5	179.7	4.1	0.00	0.00	0.0	0.0	0.00	0.20	0.00	0.03
Gen Bldg	Gen Bldg	DMH-7	0.17	0.90	0.16	0.16	1.12	5.0	5.3	0.8	2.7	0.012	8	0.0050	0.9	2.7	182	0.91	185.0	180.0	179.0	179.9	5.1	0.00	0.00	0.0	0.0	0.00	0.20	0.00	0.02
DMH-7	DMH-7	Inf System	0.00	0.00	0.00	0.26	0.05	5.0	5.3	1.4	4.3	0.012	12	0.0140	4.6	5.8	14	0.20	184.2	176.2	176.0	176.0	8.2	0.00	0.00	0.0	0.0	0.00	0.20	0.00	0.06
CB-104	CB-104	DMH-105	0.26	0.84	0.22	0.22	0.13	5.0	5.3	1.1	3.6	0.012	12	0.0100	3.9	4.9	29	0.29	181.7	177.7	177.4	177.5	4.2	0.00	0.00	0.0	0.0	0.00	0.20	0.00	0.04
CB-106	CB-106	DMH-105	0.09	0.90	0.08	0.08	0.19	5.0	5.3	0.4	2.7	0.012	12	0.0120	4.2	5.4	31	0.37	184.8	180.2	179.8	180.1	4.7	0.00	0.00	0.0	0.0	0.00	0.20	0.00	0.02
CWP	CWP	DMH-105	0.06	0.90	0.05	0.05	0.05	5.0	5.3	0.3	2.2	0.012	12	0.0130	4.4	5.6	7	0.09	183.8	178.3	178.2	178.2	5.6	0.00	0.00	0.0	0.0	0.00	0.20	0.00	0.02
DMH-105	DMH-105	Inf System	---	---	---	0.35	0.06	5.0	5.3	1.8	4.8	0.012	12	0.0160	4.9	6.2	18	0.29	183.8	176.5	176.2	176.2	7.6	0.00	0.00	0.0	0.0	0.00	0.20	0.00	0.07
OCS-102	OCS-102	DMH-101	---	---	---	0.61	0.04	5.0	5.3	3.2	6.0	0.012	12	0.0190	5.3	6.8	16	0.29	184.1	178.0	177.7	177.5	6.6	0.00	0.00	0.0	0.0	0.00	0.20	0.00	0.11
DMH-101	DMH-101	DMH-100	---	---	---	0.61	0.26	5.0	5.3	3.2	4.9	0.012	12	0.0100	3.9	4.9	75	0.75	183.0	177.6	176.8	177.3	5.7	0.00	0.00	0.0	0.0	0.00	0.20	0.00	0.07
DMH-100	DMH-100	EX-DMH-1	---	---	---	0.61	0.16	5.0	5.3	3.2	4.9	0.012	12	0.0100	3.9	4.9	48	0.48	183.0	174.1	173.6	173.8	9.2	0.00	0.00	0.0	0.0	0.00	0.20	0.00	0.07

APPENDIX A3

Letter to Bedford Board of Selectmen

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 66TH AIR BASE GROUP
HANSCOM AIR FORCE BASE MASSACHUSETTS

May 7, 2020

Mr. Charles N. Strickland III, P.E.
66 ABG/CEI
120 Grenier Street
Hanscom AFB, MA 01731-1910

Bedford Board of Selectmen
Mr. William S. Moonan, Chair
10 Mudge Way
Bedford, MA 01730-2193

Dear Mr. Moonan,

In accordance with the National Environmental Policy Act of 1969 (NEPA) and the Air Force Environmental Impact Analysis Process (32 Code of Federal Regulations 989 et seq.), the United States Air Force (USAF) is preparing an Environmental Assessment (EA) to evaluate potential environmental impacts associated with a Proposed Action to construct a new facility on Hanscom Air Force Base (HAFB) to support future research and development activities of Massachusetts Institute of Technology Lincoln Laboratory (MIT LL). We respectfully request your input on the proposed action.

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Mr. Taylor O'Brien, NEPA Program Manager
66 ABG/CEIE
120 Grenier Street, B1825
Hanscom AFB, MA 01731-1910

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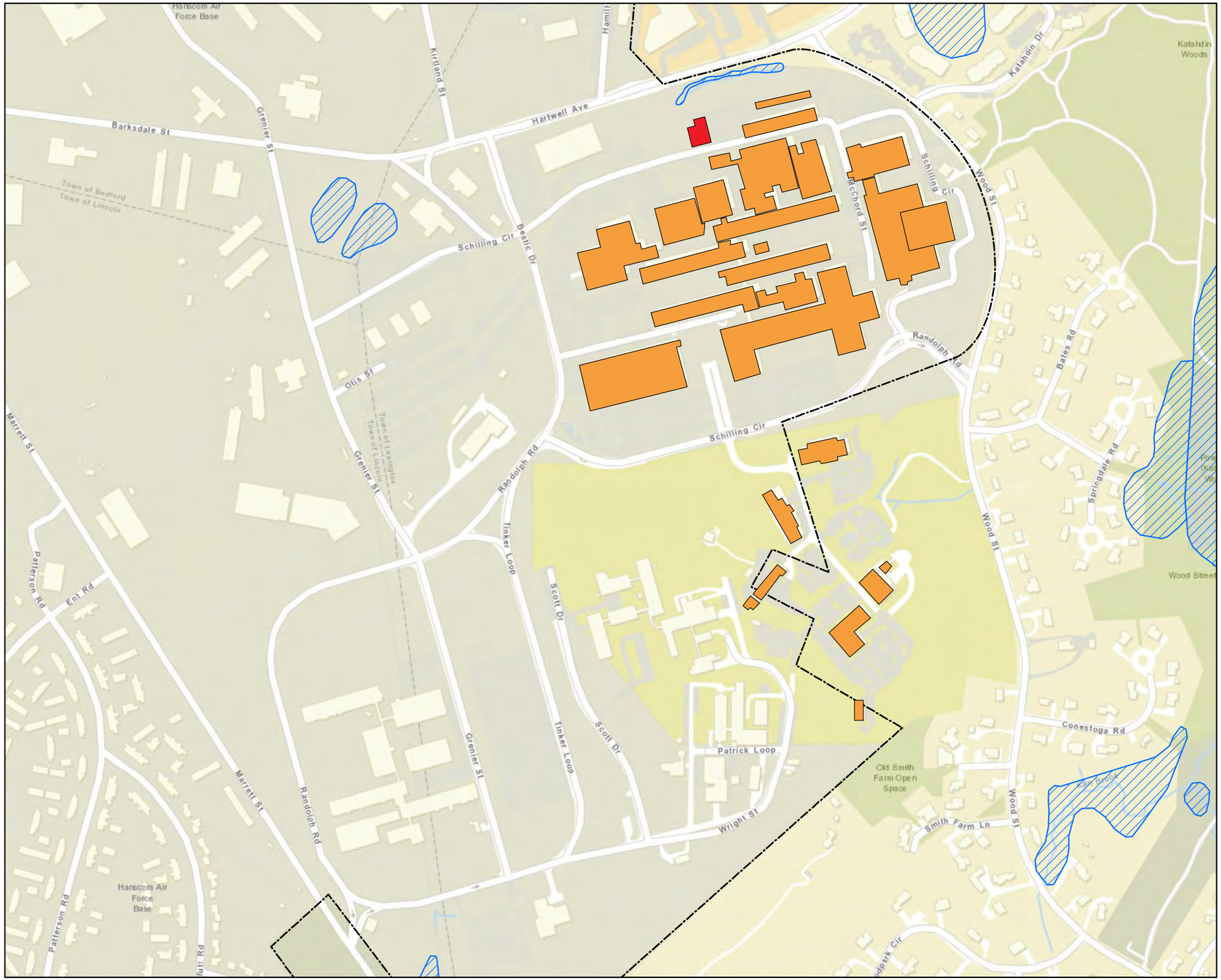
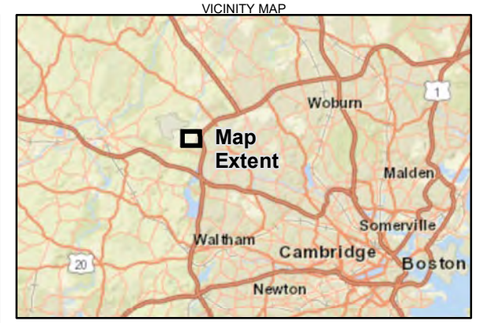
Sincerely

CHARLES N. STRICKLAND III, P.E.
Installation Management Flight Chief

2 Attachments:
1. Project Location Map
2. List of Parties Contacted



VICINITY MAP



LEGEND

- Hanscom AFB
- Wetland
- MIT buildings
- Proposed Location of Generator Building 1

Notes:
Imagery from ArcGIS Online: USGS 1:24,000 topographic maps.

N

0 600 1,200
Feet

FIGURE 1-3
MIT Lincoln Laboratory Lexington Campus
Generator Building 1 MIT Lincoln Laboratory
Environmental Assessment
Hanscom Air Force Base, MA

Attachment 2

EIAP-EA
MIT LL GENERATOR BUILDING #1
Hanscom Air Force Base, MA

PRELIMINARY LIST OF CONTACTS

Per 32 CFR Part 989.14(l), "The Air Force will involve other federal agencies, state, Tribal, and local governments, and the public in the preparation of EAs (40 CFR 1501.4(b) and 1506.6)."

COMMUNITY LEADERSHIP

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Attn: Mr. William S. Moonan, Chair
10 Mudge Way
Bedford, MA 01730-2193
Email: selectmen@bedfordma.gov
Phone: 781-275-1111

Concord Select Board
Attn: Mr. Michael Lawson, Chair
22 Monument Square
Concord, MA 01742-0535
Email: amara@concordma.gov (Mr. Andrew Mara, Sr Admin Asst.)
Phone: 781-318-3000

Lexington Select Board
Attn: Mr. Douglas M. Lucente, Chair
1625 Massachusetts Avenue
Lexington, MA 02420-3801
Email: selectmen@lexingtonma.gov
Phone: 781-698-4580

Lincoln Board of Selectmen
Attn: Ms. Jennifer Glass, Chairperson
16 Lincoln Road
Lincoln, MA 01773-2009
Email: elderp@lincolntown.org (Ms. Peggy Elder, Sr. Admin Asst)
Phone: 781-259-2601

Attachment 2

HISTORIC PRESERVATION

Commonwealth of Massachusetts
Attn: Ms. Brona Simon, Executive Director
Massachusetts Historical Commission
State Historic Preservation Officer
220 Morrissey Boulevard
Boston, MA 02125-3314

With copy to Lexington Historical Commission

TRIBAL CONSULTATION

Wampanoag Tribe of Gay Head (Aquinnah)
Attn: Ms. Bettina Washington
Tribal Historic Preservation Officer
20 Black Brook Road
Aquinnah MA 02535-9701
508-645-9265, ext. 175
bettina@wampanoagtribe.net

Mashpee Wampanoag Tribe
Attn: Ms. Ramona Peters
Tribal Historic Preservation Officer
483 Great Neck Road South
Mashpee, MA 02649-3707
508-477-0208 Ext. 101
ramona.peters@mwtribe-nsn.gov

ENVIRONMENTAL PROTECTION AGENCY

Environmental Protection Agency, New England Region
Office of Environmental Review
Attn: Mr. Timothy L. Timmerman, Associate Director
5 Post Office Square, Suite 100
Mail Code ORA-17-1
Boston, Massachusetts 02109-3946
Email: Timmermann.Timothy@epa.gov
Phone: 617-918-1025

Attachment 2

BIOLOGICAL RESOURCES (T&E SPECIES)

Natural Heritage & Endangered Species Program
Attn: Project Reviewer
Massachusetts Division of Fisheries & Wildlife
One Rabbit Hill Road
Westborough, MA 01581-3336

WETLANDS - FLOODPLAINS

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(Notice of Intent sent on August 2nd, 2019)

APPENDIX A4

Letter to Concord Select Board

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 66TH AIR BASE GROUP
HANSCOM AIR FORCE BASE MASSACHUSETTS

May 7, 2020

Mr. Charles N. Strickland III, P.E.
66 ABG/CEI
120 Grenier Street
Hanscom AFB, MA 01731-1910

Concord Select Board
Mr. Michael Lawson, Chair
P.O. Box 535
Concord, MA 01742-0535

Dear Mr. Lawson,

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66 ABG/CEIE
120 Grenier Street, B1825
Hanscom AFB, MA 01731-1910

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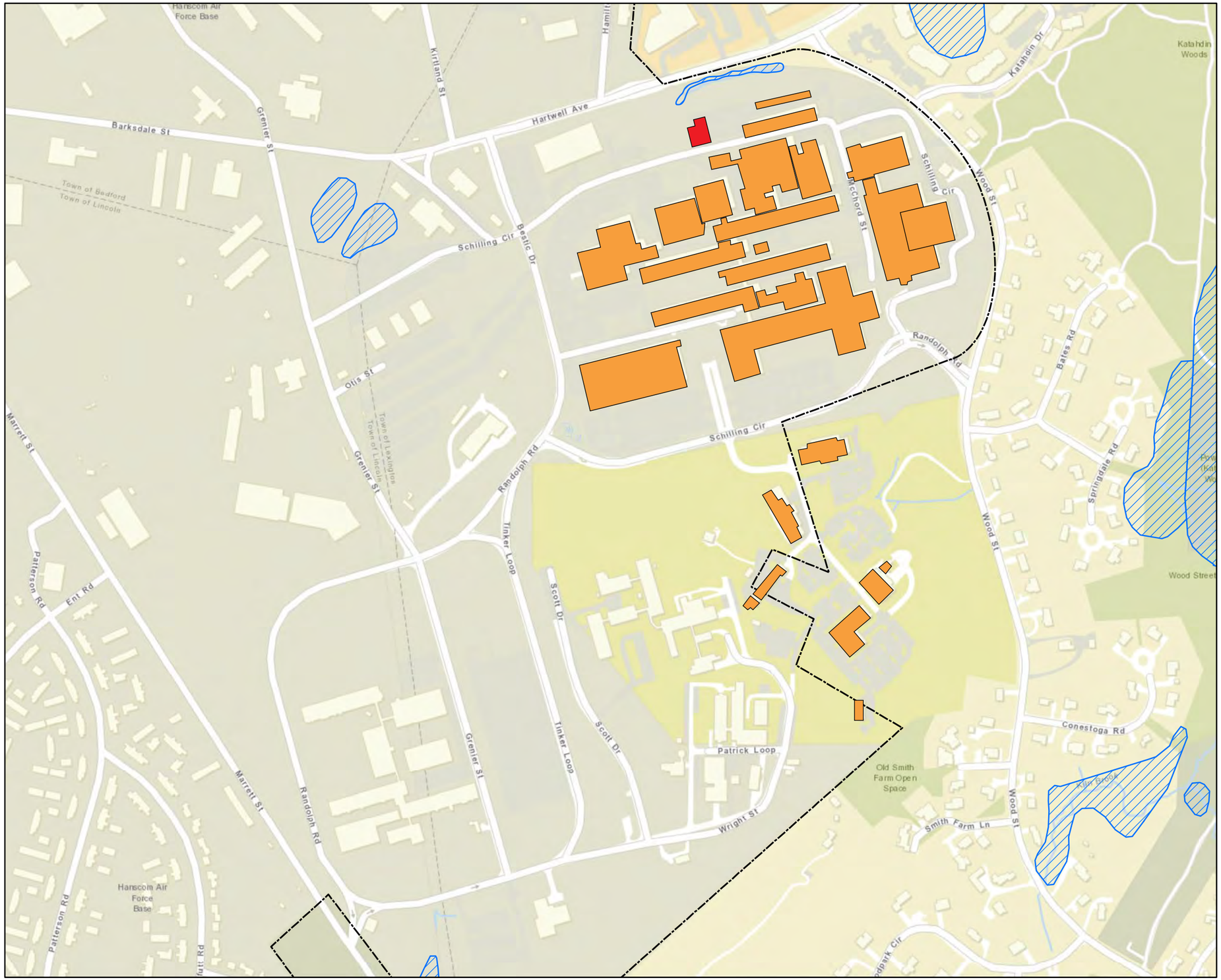

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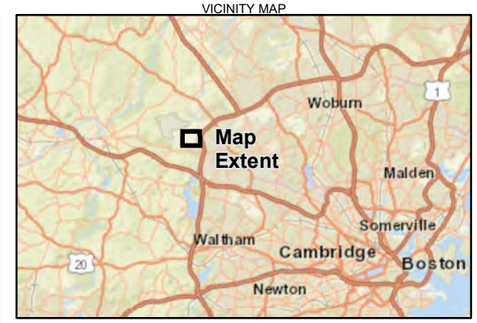

LEGEND

- Hanscom AFB
- Wetland
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Notes:
Imagery from ArcGIS Online: USGS 1:24,000 topographic maps.

N

0 600 1,200
Feet

FIGURE 1-3
MIT Lincoln Laboratory Lexington Campus
Generator Building 1 MIT Lincoln Laboratory
Environmental Assessment
Hanscom Air Force Base, MA

Attachment 2

EIAP-EA
MIT LL GENERATOR BUILDING #1
Hanscom Air Force Base, MA

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Phone: 781-318-3000

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Lexington, MA 02420-3801
Email: selectmen@lexingtonma.gov
Phone: 781-698-4580

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Attn: Ms. Jennifer Glass, Chairperson
16 Lincoln Road
Lincoln, MA 01773-2009
Email: elderp@lincolntown.org (Ms. Peggy Elder, Sr. Admin Asst)
Phone: 781-259-2601

Attachment 2

HISTORIC PRESERVATION

Commonwealth of Massachusetts
Attn: Ms. Brona Simon, Executive Director
Massachusetts Historical Commission
State Historic Preservation Officer
220 Morrissey Boulevard
Boston, MA 02125-3314

With copy to Lexington Historical Commission

TRIBAL CONSULTATION

Wampanoag Tribe of Gay Head (Aquinnah)
Attn: Ms. Bettina Washington
Tribal Historic Preservation Officer
20 Black Brook Road
Aquinnah MA 02535-9701
508-645-9265, ext. 175
bettina@wampanoagtribe.net

Mashpee Wampanoag Tribe
Attn: Ms. Ramona Peters
Tribal Historic Preservation Officer
483 Great Neck Road South
Mashpee, MA 02649-3707
508-477-0208 Ext. 101
ramona.peters@mwtribe-nsn.gov

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Environmental Protection Agency, New England Region
Office of Environmental Review
Attn: Mr. Timothy L. Timmerman, Associate Director
5 Post Office Square, Suite 100
Mail Code ORA-17-1
Boston, Massachusetts 02109-3946
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(Notice of Intent sent on August 2nd, 2019)

APPENDIX A5

Letter to Lexington Board of Selectman

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 66TH AIR BASE GROUP
HANSCOM AIR FORCE BASE MASSACHUSETTS

May 7, 2020

Mr. Charles N. Strickland III, P.E.
66 ABG/CEI
120 Grenier Street
Hanscom AFB, MA 01731-1910

Lexington Board of Selectman
Mr. Douglas M. Lucente, Chair
1625 Massachusetts Avenue
Lexington, MA 02420-3801

Dear Mr. Lucente,

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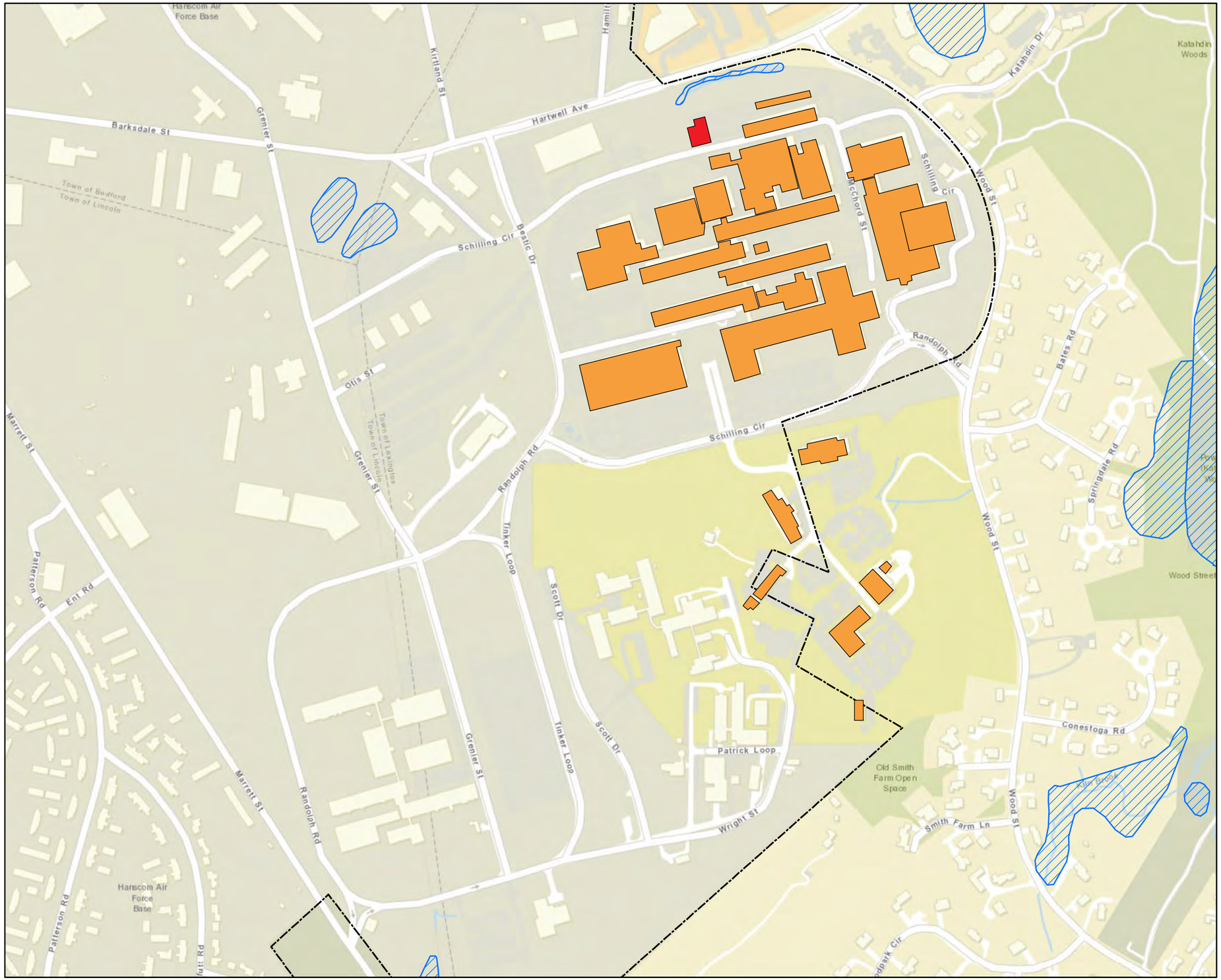
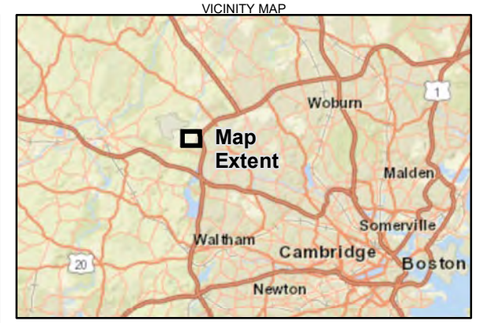


VICINITY MAP



LEGEND

- Hanscom AFB
- Wetland
- MIT buildings
- Proposed Location of Generator Building 1

Notes:
Imagery from ArcGIS Online: USGS 1:24,000 topographic maps.

N

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Feet

FIGURE 1-3
MIT Lincoln Laboratory Lexington Campus
Generator Building 1 MIT Lincoln Laboratory
Environmental Assessment
Hanscom Air Force Base, MA

Attachment 2

EIAP-EA
MIT LL GENERATOR BUILDING #1
Hanscom Air Force Base, MA

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Email: elderp@lincolntown.org (Ms. Peggy Elder, Sr. Admin Asst)
Phone: 781-259-2601

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Commonwealth of Massachusetts
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Massachusetts Historical Commission
State Historic Preservation Officer
220 Morrissey Boulevard
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APPENDIX A6

Letter to Lincoln Board of Selectman

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 66TH AIR BASE GROUP
HANSCOM AIR FORCE BASE MASSACHUSETTS

May 7, 2020

Mr. Charles N. Strickland III, P.E.
66 ABG/CEI
120 Grenier Street
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Ms. Jennifer Glass, Chairperson
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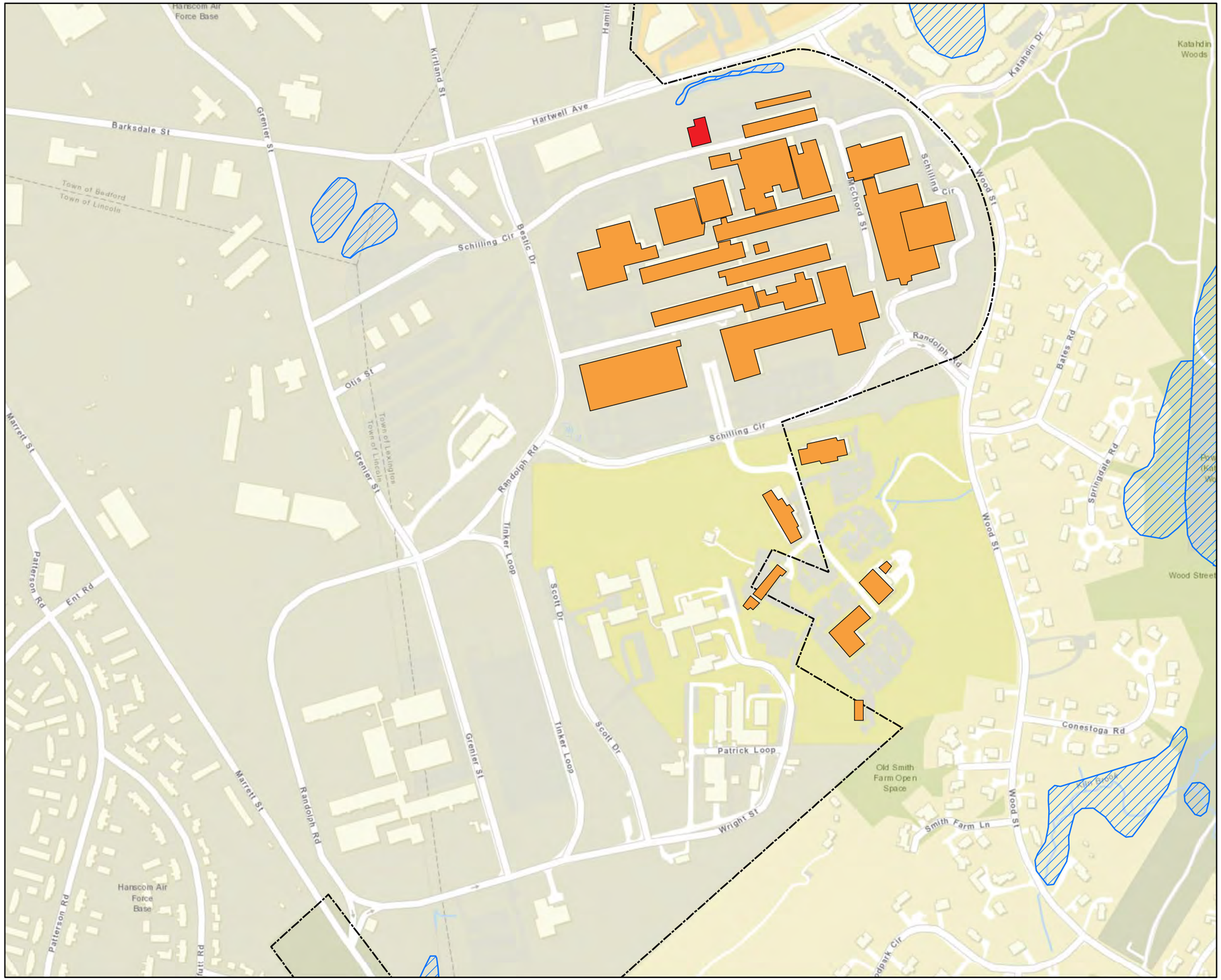
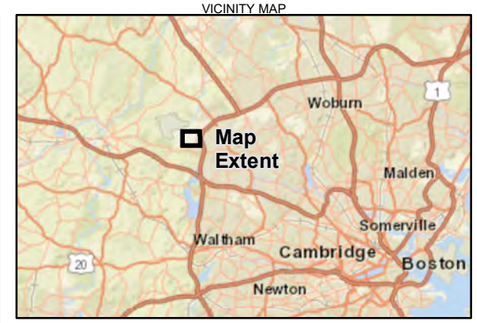


VICINITY MAP



LEGEND

- Hanscom AFB
- Wetland
- MIT buildings
- Proposed Location of Generator Building 1

Notes:
Imagery from ArcGIS Online: USGS 1:24,000 topographic maps.

N

0 600 1,200
Feet

FIGURE 1-3
MIT Lincoln Laboratory Lexington Campus
Generator Building 1 MIT Lincoln Laboratory
Environmental Assessment
Hanscom Air Force Base, MA

Attachment 2

EIAP-EA
MIT LL GENERATOR BUILDING #1
Hanscom Air Force Base, MA

PRELIMINARY LIST OF CONTACTS

Per 32 CFR Part 989.14(l), "The Air Force will involve other federal agencies, state, Tribal, and local governments, and the public in the preparation of EAs (40 CFR 1501.4(b) and 1506.6)."

COMMUNITY LEADERSHIP

Bedford Board of Selectmen
Attn: Mr. William S. Moonan, Chair
10 Mudge Way
Bedford, MA 01730-2193
Email: selectmen@bedfordma.gov
Phone: 781-275-1111

Concord Select Board
Attn: Mr. Michael Lawson, Chair
22 Monument Square
Concord, MA 01742-0535
Email: amara@concordma.gov (Mr. Andrew Mara, Sr Admin Asst.)
Phone: 781-318-3000

Lexington Select Board
Attn: Mr. Douglas M. Lucente, Chair
1625 Massachusetts Avenue
Lexington, MA 02420-3801
Email: selectmen@lexingtonma.gov
Phone: 781-698-4580

Lincoln Board of Selectmen
Attn: Ms. Jennifer Glass, Chairperson
16 Lincoln Road
Lincoln, MA 01773-2009
Email: elderp@lincolntown.org (Ms. Peggy Elder, Sr. Admin Asst)
Phone: 781-259-2601

Attachment 2

HISTORIC PRESERVATION

Commonwealth of Massachusetts
Attn: Ms. Brona Simon, Executive Director
Massachusetts Historical Commission
State Historic Preservation Officer
220 Morrissey Boulevard
Boston, MA 02125-3314

With copy to Lexington Historical Commission

TRIBAL CONSULTATION

Wampanoag Tribe of Gay Head (Aquinnah)
Attn: Ms. Bettina Washington
Tribal Historic Preservation Officer
20 Black Brook Road
Aquinnah MA 02535-9701
508-645-9265, ext. 175
bettina@wampanoagtribe.net

Mashpee Wampanoag Tribe
Attn: Ms. Ramona Peters
Tribal Historic Preservation Officer
483 Great Neck Road South
Mashpee, MA 02649-3707
508-477-0208 Ext. 101
ramona.peters@mwtribe-nsn.gov

ENVIRONMENTAL PROTECTION AGENCY

Environmental Protection Agency, New England Region
Office of Environmental Review
Attn: Mr. Timothy L. Timmerman, Associate Director
5 Post Office Square, Suite 100
Mail Code ORA-17-1
Boston, Massachusetts 02109-3946
Email: Timmermann.Timothy@epa.gov
Phone: 617-918-1025

Attachment 2

BIOLOGICAL RESOURCES (T&E SPECIES)

Natural Heritage & Endangered Species Program
Attn: Project Reviewer
Massachusetts Division of Fisheries & Wildlife
One Rabbit Hill Road
Westborough, MA 01581-3336

WETLANDS - FLOODPLAINS

Lexington Conservation Commission
Lexington Town Offices Building
1625 Massachusetts Ave
Lexington, MA 02420
Phone: (781) 698-4531
(Notice of Intent sent on August 2nd, 2019)

APPENDIX A7

Letter to Environmental Protection Agency,
New England Region

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 66TH AIR BASE GROUP
HANSCOM AIR FORCE BASE MASSACHUSETTS

May 7, 2020

Mr. Charles N. Strickland III, P.E.
66 ABG/CEI
120 Grenier Street
Hanscom AFB, MA 01731-1910

Environmental Protection Agency, New England Region
Mr. Timothy L. Timmerman, Associate Director
Mail Code ORA-17-1
5 Post Office Square, Suite 100
Boston, MA 02109-3946

Dear Mr. Timmerman,

In accordance with the National Environmental Policy Act of 1969 (NEPA) and the Air Force Environmental Impact Analysis Process (32 Code of Federal Regulations 989 et seq.), the United States Air Force (USAF) is preparing an Environmental Assessment (EA) to evaluate potential environmental impacts associated with a Proposed Action to construct a new facility on Hanscom Air Force Base (HAFB) to support future research and development activities of Massachusetts Institute of Technology Lincoln Laboratory (MIT LL). We respectfully request your input on the proposed action.

MIT LL occupies approximately 100 acres on the eastern perimeter of HAFB. The majority of MIT LL's facilities are on federal property, while 20 of the acres utilized are MIT property, commonly referred to as the "Katahdin Hill" area, adjacent to HAFB. The MIT property and most of the Laboratory's facilities are within the town boundaries of Lexington. The original buildings that MIT LL occupied in the early 1950s are still in use. In the early 1990s MIT LL, which had expanded into nearby rental properties (in Lexington), undertook a construction project to consolidate its facilities. This resulted in the approximately 500,000 square-foot South Laboratory (Building 1330) and an adjacent parking garage, with additional new facilities currently proposed under design. Currently, MIT LL occupies and maintains 26 buildings with a total interior area of approximately 1,884,500 square feet (SF). Since the inception of the MIT LL campus in the early 1950s, numerous renovations have been completed, often constrained by aging building and systems infrastructure. Many buildings reflect a sharp contrast to the sophisticated equipment and technologies of the research that is being accomplished.

The purpose of the proposed action is to provide a reliable source of redundant backup electrical power, allowing MIT LL to accomplish their mission of providing research and development services to the Department of Defense (DoD). Locating Generator Building #1 at the proposed site allows for 12 independent electrical feeders to distribute electricity from the generator building to the utility closets in Buildings 1302 (Building A) through 1324 (Building F), 1331

(Building I), 1326 (Building J), and Building 1310 (Building ML). This infrastructure is needed to support MIT LL as a state-of-the-art federally funded research and development center.

The Preferred Alternative is to construct a new one-story generator building (Generator Building #1) on the existing paved parking lot adjacent to the Electrical Building on the north side of Schilling Circle across from Building F. The footprint of the proposed structure would be approximately 4,310 SF and provide roughly the same SF of usable floor space. Total project area, which includes the building footprint and the excavation for concrete duct banks for electrical feeders, would be approximately 69,100 SF (1.59 acre). The Preferred Alternative most effectively and cost efficiently addresses MIT LL's ongoing and future mission requirements. The proposed project would house three 1,000-kW backup diesel generators with space to add an additional two 1,000-kW diesel generators. Finish materials for Generator Building #1 would be similar to those of recently constructed buildings on the MIT LL campus. The one-story facility would include a new building to house the generators, automatic transfer switch(s), and switch gear, and would provide radial feeds from the generators to buildings that require critical backup power. If approved, construction for SW-1 could begin in early 2021 and be completed within 18 months.

With this letter, we seek your input on the proposed action in order to assist the Air Force in fully developing the range of issues to consider in conducting a comprehensive environmental review, particularly issues for which the USAF may be unaware. Once completed, the Draft EA will be made available for public review and comment. We currently expect this to occur in mid- to late-2020. For the purposes of this scoping effort, we request that you send any written input you may have at this time to:

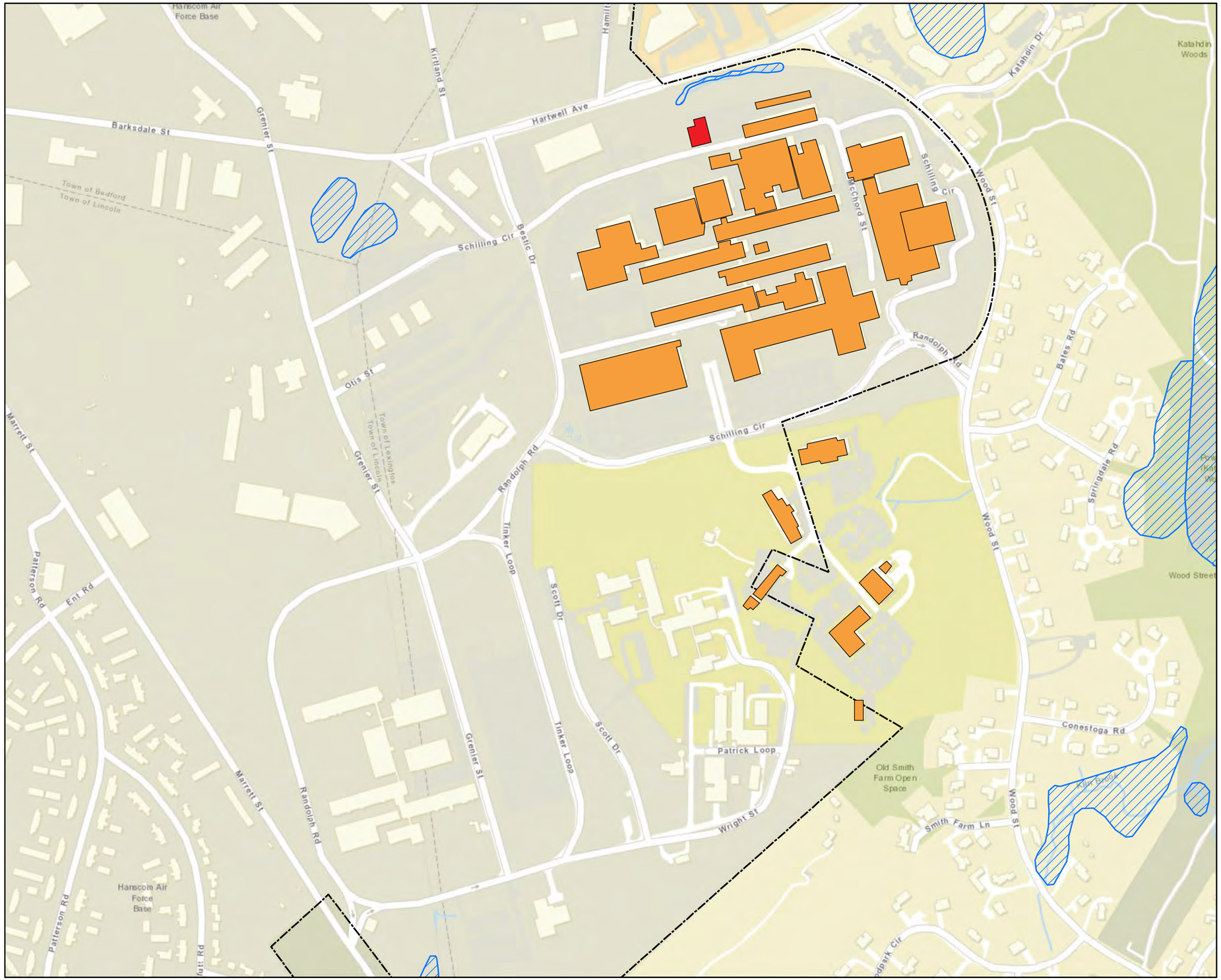
Mr. Taylor O'Brien, NEPA Program Manager
66 ABG/CEIE
120 Grenier Street, B1825
Hanscom AFB, MA 01731-1910

Included in this letter are a project location map (attachment 1) and a listing of agencies we are offering an opportunity to provide input into this scoping effort (attachment 2). If you choose to provide input at this time, we respectfully request you respond within 30 days from receipt of this letter. If you have any questions please feel free to contact Mr. Taylor O'Brien at (781) 225-6150 or taylor.obrien@us.af.mil.

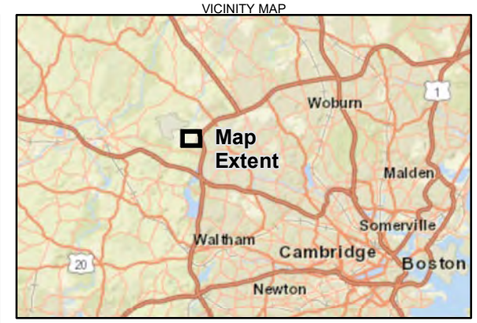
Sincerely

CHARLES N. STRICKLAND III, P.E.
Installation Management Flight Chief

2 Attachments:
1. Project Location Map
2. List of Parties Contacted



VICINITY MAP



LEGEND

- Hanscom AFB
- Wetland
- MIT buildings
- Proposed Location of Generator Building 1

Notes:
Imagery from ArcGIS Online: USGS 1:24,000 topographic maps.

N

0 600 1,200
Feet

FIGURE 1-3
MIT Lincoln Laboratory Lexington Campus
Generator Building 1 MIT Lincoln Laboratory
Environmental Assessment
Hanscom Air Force Base, MA

Attachment 2

EIAP-EA
MIT LL GENERATOR BUILDING #1
Hanscom Air Force Base, MA

PRELIMINARY LIST OF CONTACTS

Per 32 CFR Part 989.14(l), "The Air Force will involve other federal agencies, state, Tribal, and local governments, and the public in the preparation of EAs (40 CFR 1501.4(b) and 1506.6)."

COMMUNITY LEADERSHIP

Bedford Board of Selectmen
Attn: Mr. William S. Moonan, Chair
10 Mudge Way
Bedford, MA 01730-2193
Email: selectmen@bedfordma.gov
Phone: 781-275-1111

Concord Select Board
Attn: Mr. Michael Lawson, Chair
22 Monument Square
Concord, MA 01742-0535
Email: amara@concordma.gov (Mr. Andrew Mara, Sr Admin Asst.)
Phone: 781-318-3000

Lexington Select Board
Attn: Mr. Douglas M. Lucente, Chair
1625 Massachusetts Avenue
Lexington, MA 02420-3801
Email: selectmen@lexingtonma.gov
Phone: 781-698-4580

Lincoln Board of Selectmen
Attn: Ms. Jennifer Glass, Chairperson
16 Lincoln Road
Lincoln, MA 01773-2009
Email: elderp@lincolntown.org (Ms. Peggy Elder, Sr. Admin Asst)
Phone: 781-259-2601

Attachment 2

HISTORIC PRESERVATION

Commonwealth of Massachusetts
Attn: Ms. Brona Simon, Executive Director
Massachusetts Historical Commission
State Historic Preservation Officer
220 Morrissey Boulevard
Boston, MA 02125-3314

With copy to Lexington Historical Commission

TRIBAL CONSULTATION

Wampanoag Tribe of Gay Head (Aquinnah)
Attn: Ms. Bettina Washington
Tribal Historic Preservation Officer
20 Black Brook Road
Aquinnah MA 02535-9701
508-645-9265, ext. 175
bettina@wampanoagtribe.net

Mashpee Wampanoag Tribe
Attn: Ms. Ramona Peters
Tribal Historic Preservation Officer
483 Great Neck Road South
Mashpee, MA 02649-3707
508-477-0208 Ext. 101
ramona.peters@mwtribe-nsn.gov

ENVIRONMENTAL PROTECTION AGENCY

Environmental Protection Agency, New England Region
Office of Environmental Review
Attn: Mr. Timothy L. Timmerman, Associate Director
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Mail Code ORA-17-1
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Phone: 617-918-1025

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Attn: Project Reviewer
Massachusetts Division of Fisheries & Wildlife
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Westborough, MA 01581-3336

WETLANDS - FLOODPLAINS

Lexington Conservation Commission
Lexington Town Offices Building
1625 Massachusetts Ave
Lexington, MA 02420
Phone: (781) 698-4531
(Notice of Intent sent on August 2nd, 2019)

APPENDIX A8

Letter to Massachusetts Historical Commission

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 66TH AIR BASE GROUP
HANSCOM AIR FORCE BASE MASSACHUSETTS

May 8, 2020

Mr. Scott E. Sheehan
66 ABG/CEIE
120 Grenier Street
Hanscom AFB, MA 01731-1910

Ms. Brona Simon
Commonwealth of Massachusetts
Executive Director, Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125-3314

SUBJECT: Hanscom Air Force Base (AFB), Proposed Undertaking –New Generator Building and Electrical Infrastructure Upgrade

Dear Ms. Simon

In accordance with Section 306108 of the National Historic Preservation Act (NHPA) and its implementing regulations at 36 CFR Part 800, the Air Force, Hanscom AFB, is advising you of a proposed undertaking that has the potential to affect historic properties. The undertaking would upgrade electrical infrastructure by consolidating the function of 17 stand-alone generators scattered around the MA Institute of Technology Lincoln Laboratory campus into one consolidated enclosed location. As proposed, the project would consists of the construction of a new building to house up to 5 new 1-megawatt generators, associated switchgear and distribution infrastructure. The new building is proposed in an existing parking lot near the existing electrical building and chilled water plant. Once the project is constructed, the various individual generators would be taken offline as buildings are crossed over to the new units. Most of the work would occur in previously disturbed areas.

The Area of Potential Effect (APE) for this undertaking is defined as the boundaries of the project area including areas were ground disturbance is occurring, staging areas, easements, etc. as well as areas that are being indirectly affected (noise, vibration, etc.) Included at attachment 1 are three figures that provide additional details on the project location and the APE. Included at attachment 2 is the project design document identifying the scope and locations of the new generator building and trenching required for the installation of new electrical infrastructure. No direct impacts to existing facilities are expected to occur as the extent of the new electrical infrastructure would be only to making connections at existing connection points which already exist on the exterior of the facilities.

Hanscom AFB has conducted both archaeological and architectural surveys within the APE and determined no archaeological sites exist in the APE and one building within the APE is eligible for the National Register of Historic Places (NRHP). Building 1332 (formerly designated as 1302FA) was surveyed and evaluated for NRHP eligibility in June 2003. This evaluation,

"Architectural Building and Inventory Survey Hanscom Air Force Base Volume II", on file in your office, determined that the facility was eligible for listing in the NRHP. Archaeological surveys of Hanscom AFB between 1998 and 2007 have identified 11 areas of archaeological sensitivity on Hanscom AFB. None of these surveys have identified any potential archaeological sensitivity near the APE. However, as is standard with all Hanscom AFB projects, the Air Force will incorporate provisions into the design and execution of the project to address any inadvertent discovery of archaeological resources.

Hanscom AFB has reviewed the Criteria of Adverse Effect and have determined that none apply to the activities that would be carried out in this undertaking. As such, the Air Force has determined that there would be no adverse effect to historic properties by implementing to proposed action.

We request your comment and/or concurrence on the finding of *No Adverse Effect* within 30 days from receipt of this letter. Please feel free to contact me via e-mail at scott.sheehan.1@us.af.mil or at (781) 225-6144 with any questions or if you need additional information.

Sincerely,

SCOTT E. SHEEHAN, GS-12, DAF
Hanscom AFB Cultural Resources Manager

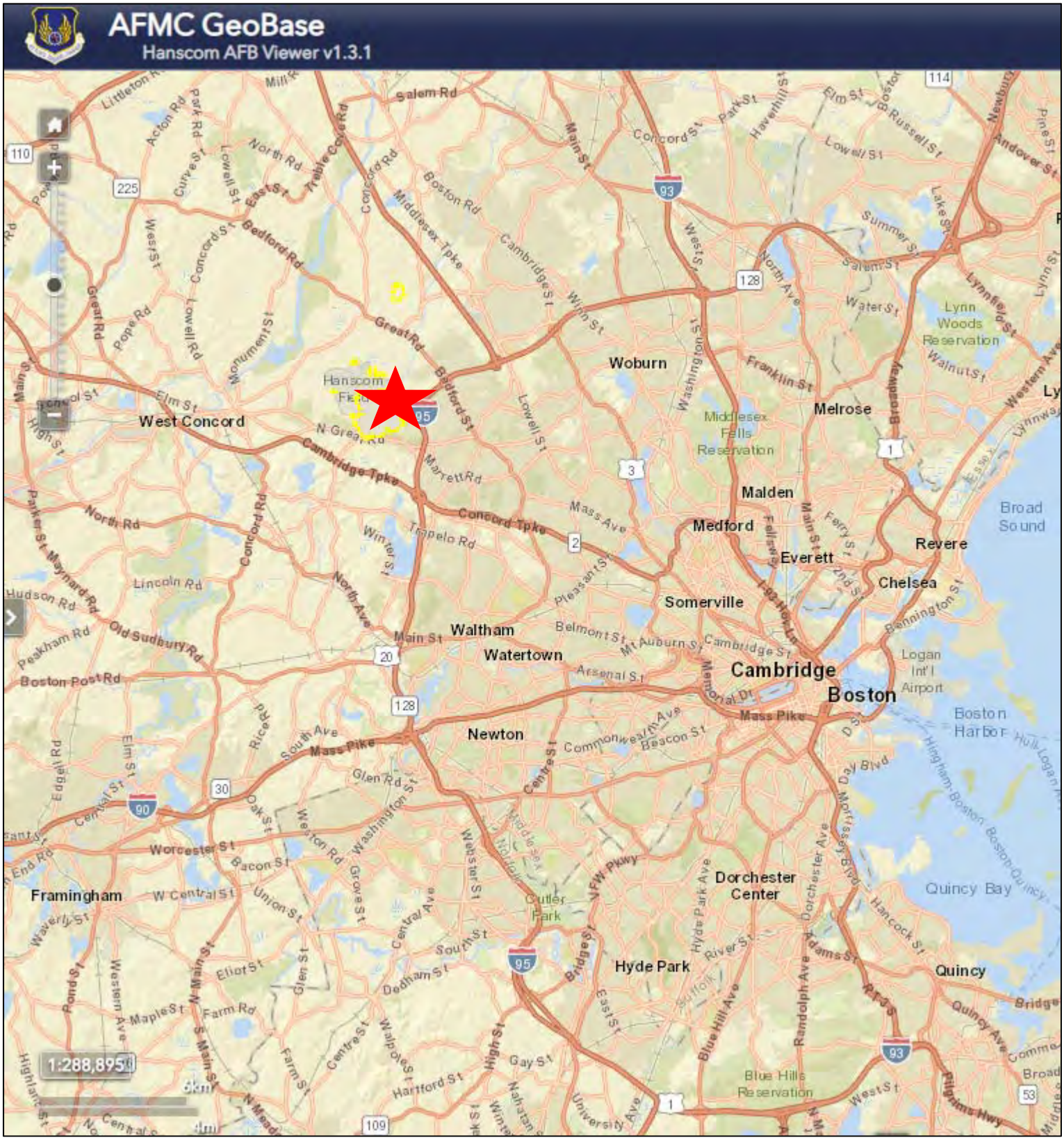
2 Attachments:
1. Project Location and APE Figures
2. Project Design Document

cc:
Lexington Historical Commission

Attachment 1

MIT LINCOLN LABORATORY GENERATOR PROJECT AT HANSCOM AFB. MA

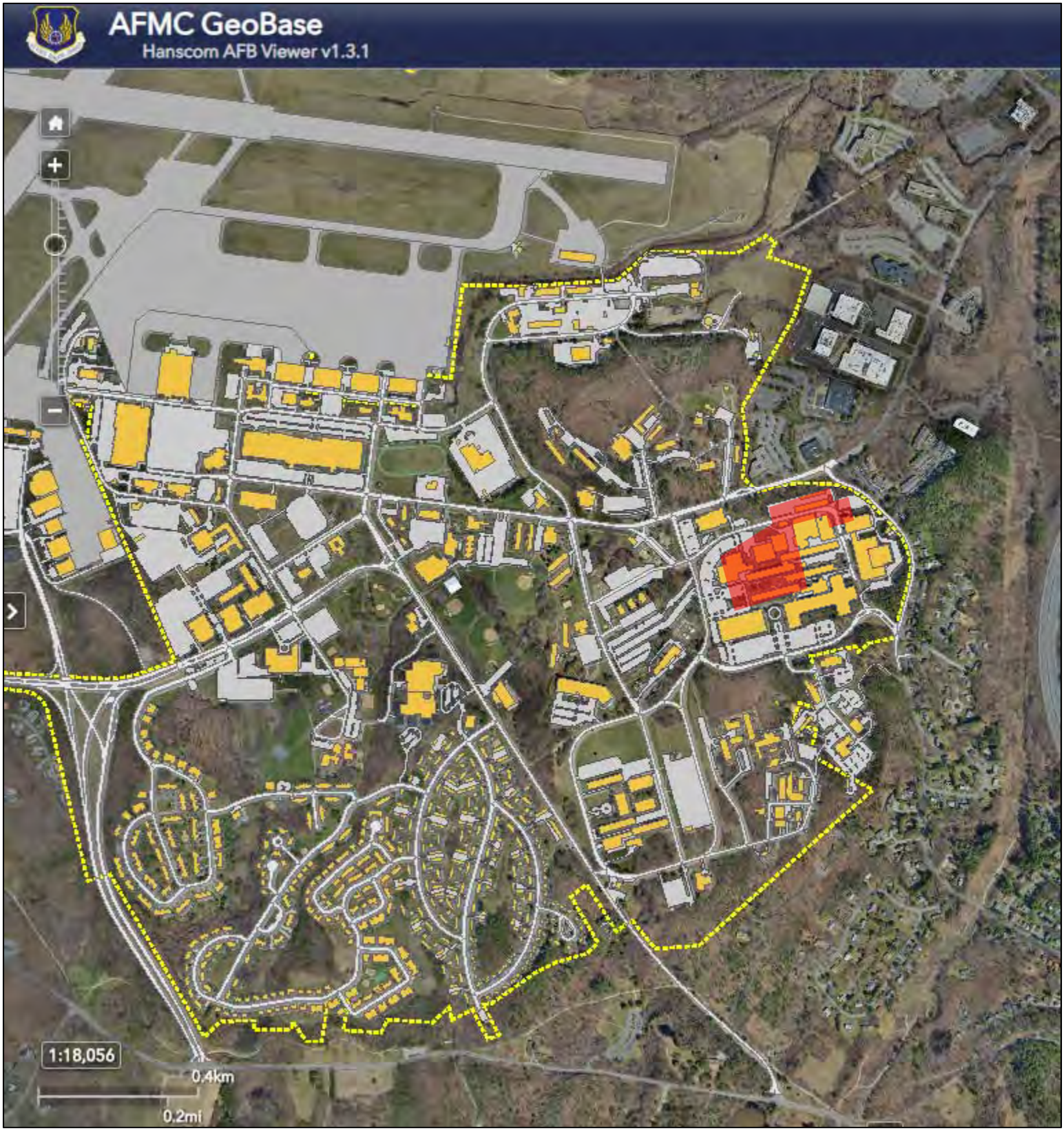
FIGURE 1 – REGIONAL LOCATION MAP



Project Location

MIT LINCOLN LABORATORY GENERATOR PROJECT AT HANSCOM AFB. MA

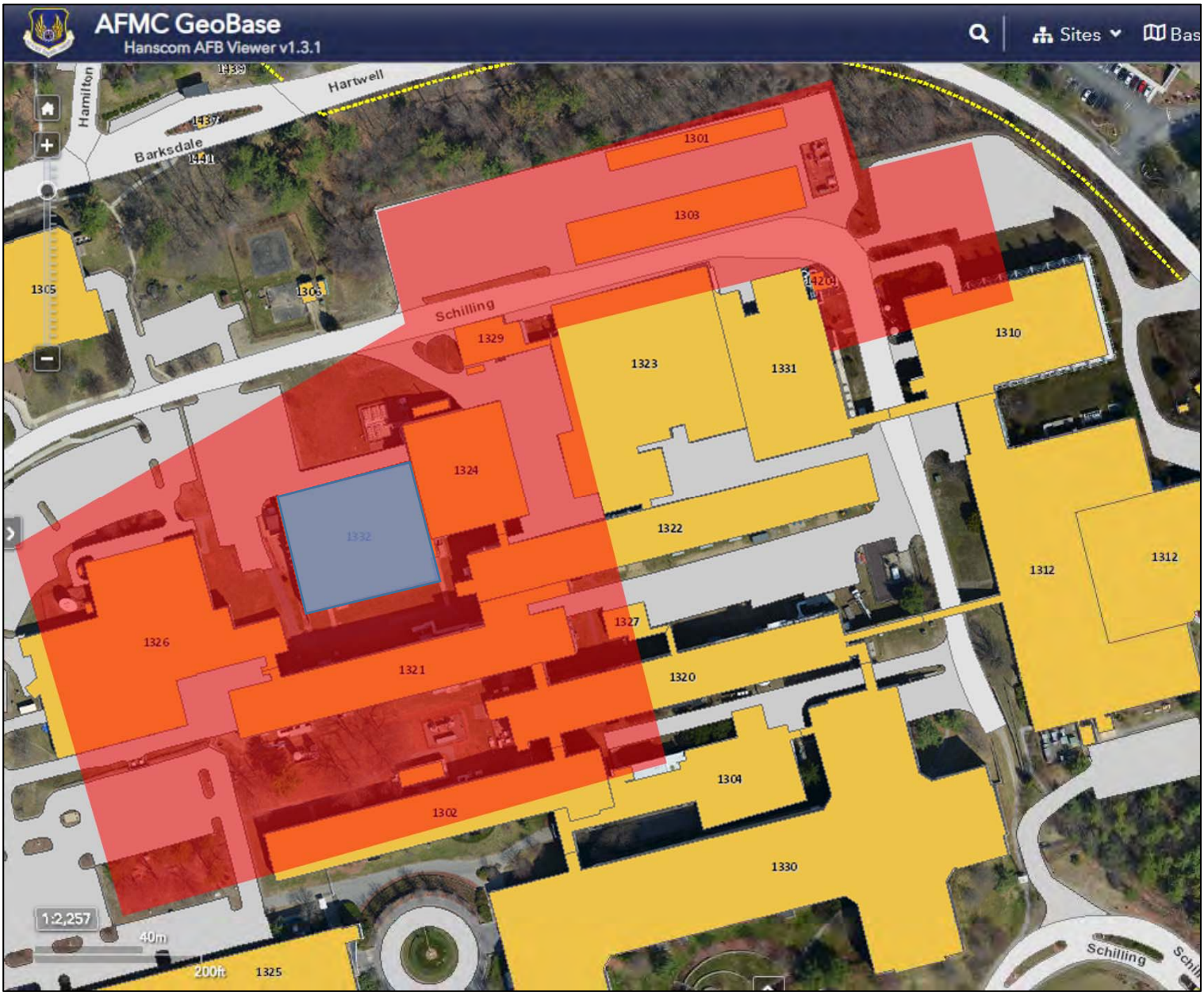
FIGURE 2 – PROJECT LOCATION



Project Location

MIT LINCOLN LABORATORY GENERATOR PROJECT AT HANSCOM AFB. MA

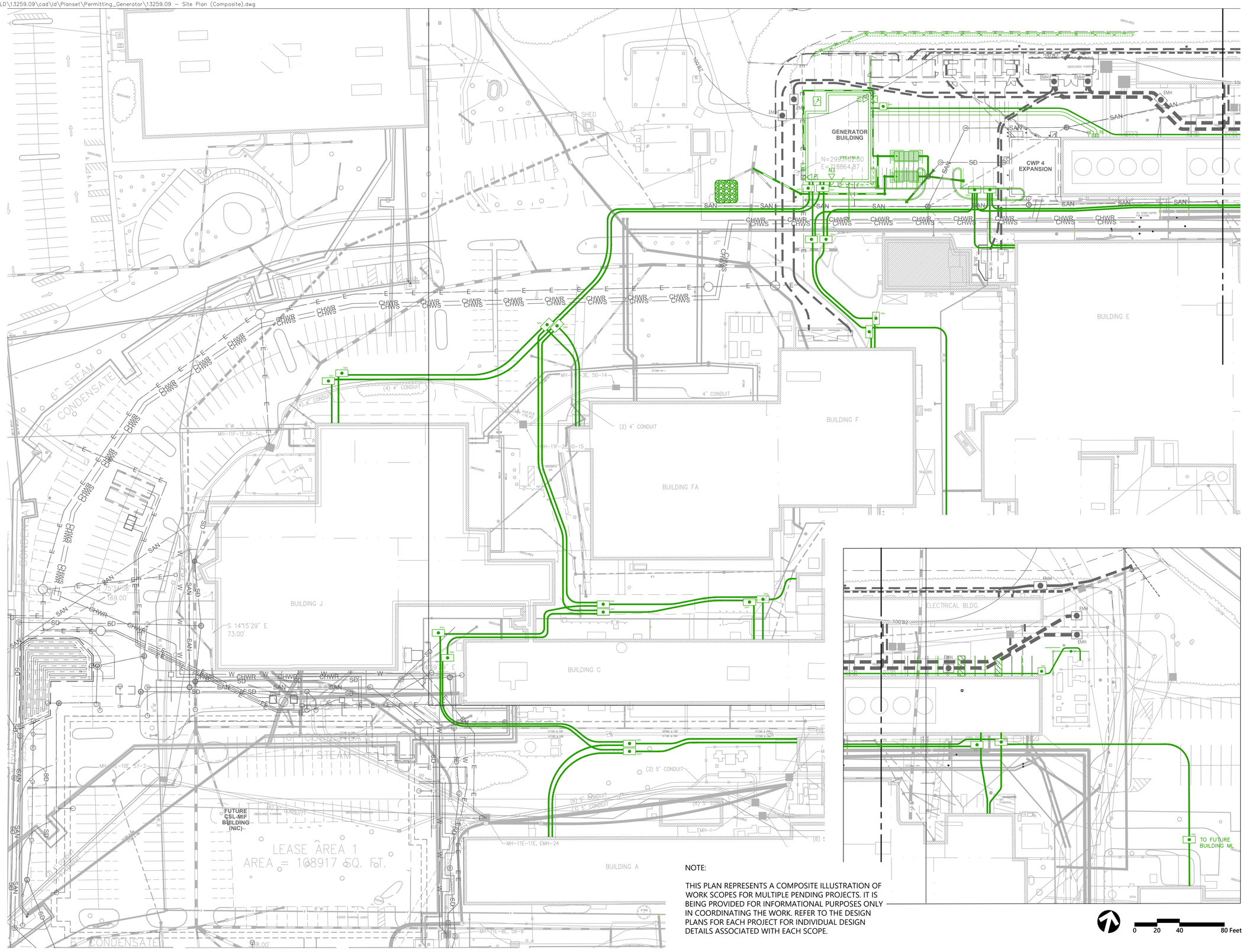
FIGURE 3 – AREA OF POTENTIAL EFFECT



Area of Potential Effect

NRHP Eligible Properties

Attachment 2



NOTE:

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101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

MIT Lincoln Laboratory Generator Project

Lexington, Massachusetts

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

May 20, 2019

Not Approved for Construction

Drawing Title

Site Plan (Composite)

Drawing Number

C-2.0

Sheet 3 of 10

Project Number 13259.09

APPENDIX A9

Letter to Massachusetts Historical Commission

2019-0501-09

Copy of SHPO Package (2019-0501-08) to Lexington Historical Commission

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 66TH AIR BASE GROUP
HANSCOM AIR FORCE BASE MASSACHUSETTS

May 8, 2020

Mr. Scott E. Sheehan
66 ABG/CEIE
120 Grenier Street
Hanscom AFB, MA 01731-1910

Ms. Brona Simon
Commonwealth of Massachusetts
Executive Director, Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125-3314

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SCOTT E. SHEEHAN, GS-12, DAF
Hanscom AFB Cultural Resources Manager

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Lexington Historical Commission

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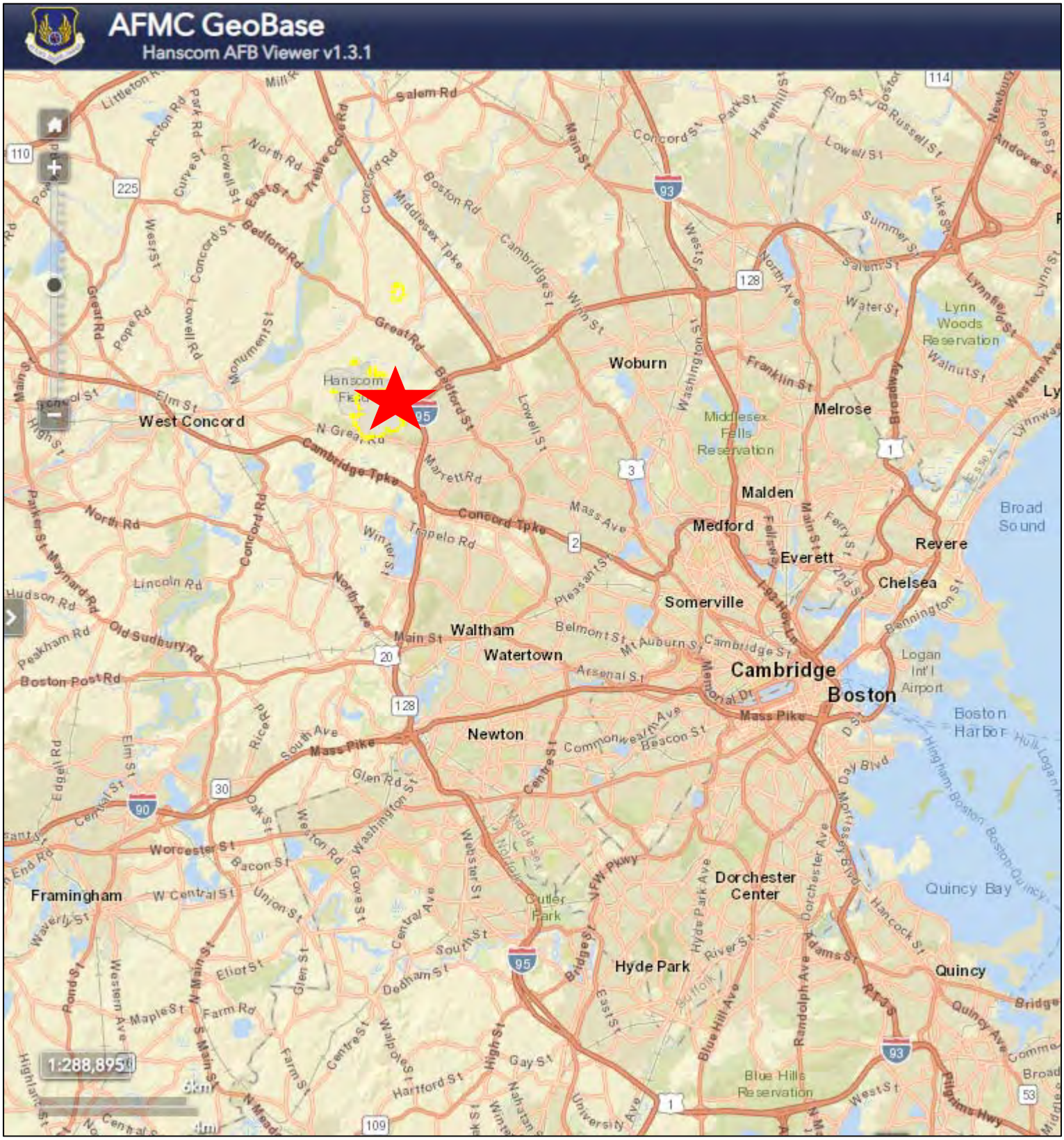

Project Location

MIT LINCOLN LABORATORY GENERATOR PROJECT AT HANSCOM AFB. MA

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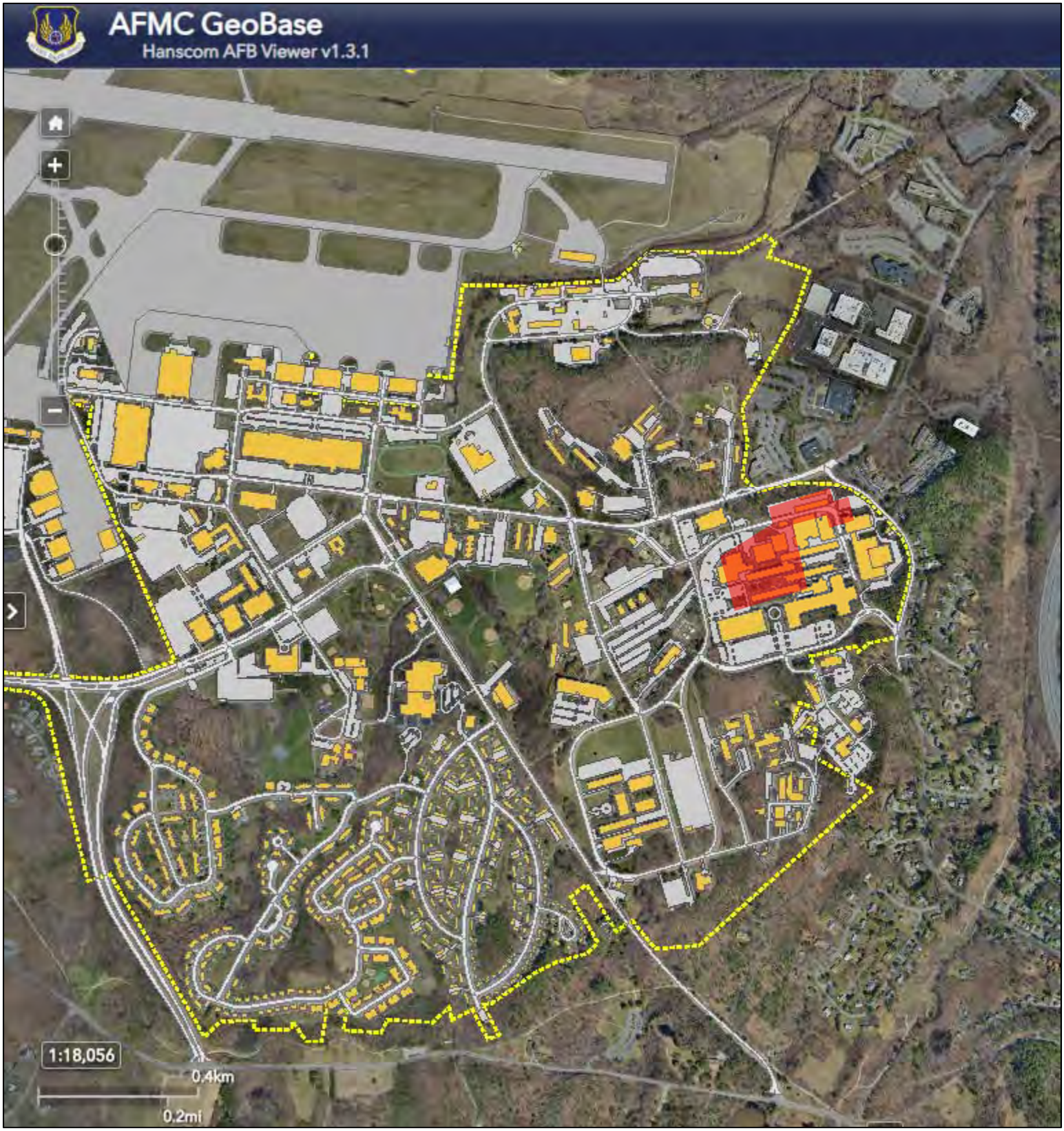

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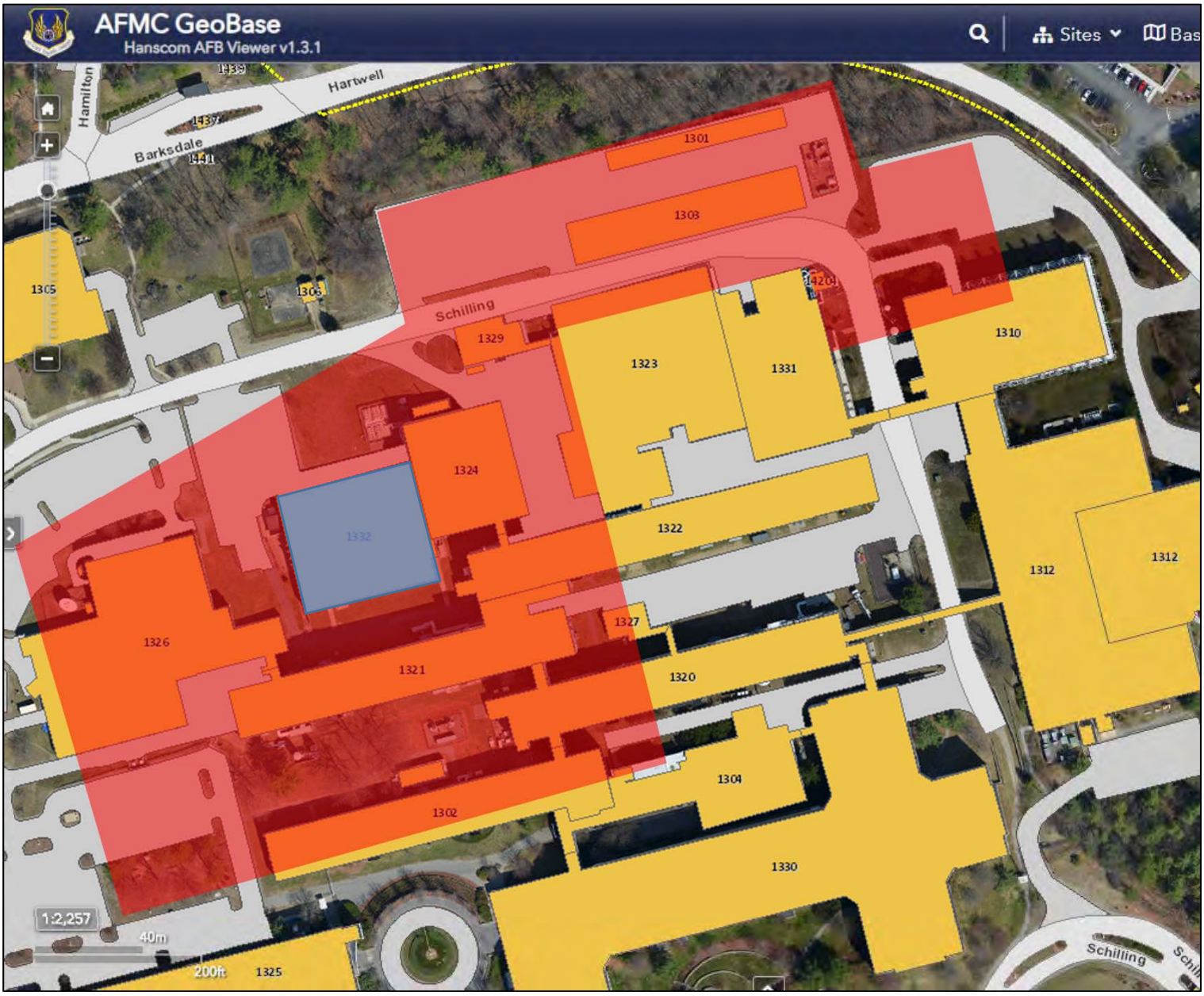

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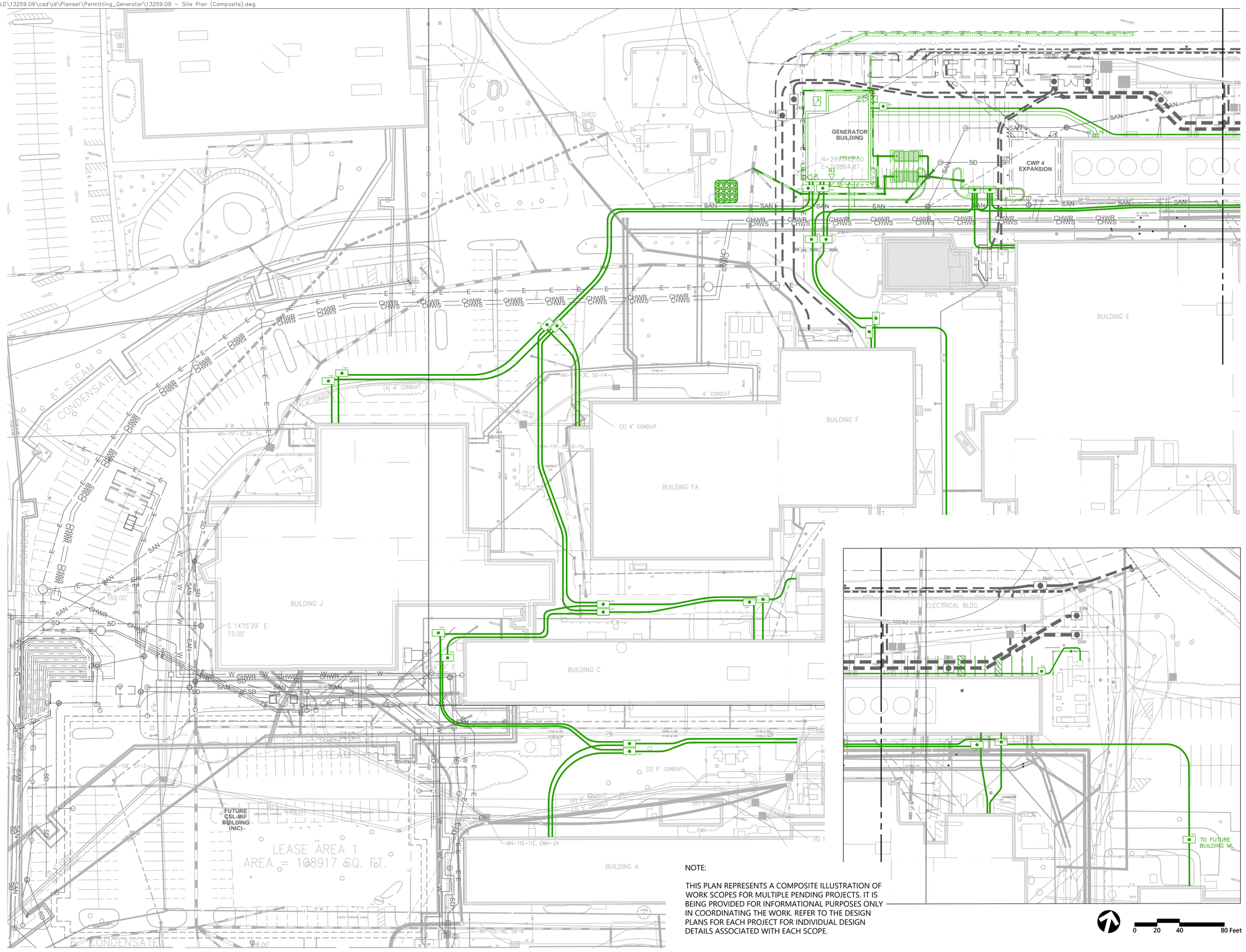

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101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

MIT Lincoln Laboratory Generator Project

Lexington, Massachusetts

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

May 20, 2019

Not Approved for Construction

Drawing Title

Site Plan (Composite)

Drawing Number

C-2.0

Sheet 3 of 10

Project Number 13259.09

APPENDIX A10

Letter to Mashpee Wampanoag Tribe

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 66TH AIR BASE GROUP
HANSCOM AIR FORCE BASE MASSACHUSETTS

May 8, 2020

Mr. Randy K. Robertson
Installation Tribal Liaison Officer
20 Schilling Circle, Bldg 1305
Hanscom AFB MA 01731-2800

Mr. David Weeden
Tribal Historic Preservation Officer
Mashpee Wampanoag Tribe
483 Great Neck Road South
Mashpee MA 02649-3707

Dear Mr. Weeden

The United States Air Force (USAF) is preparing an environmental impact analysis under the National Environmental Policy Act to evaluate potential environmental impacts associated with the construction of a generator building and upgrade of electrical infrastructure at the Massachusetts Institute of Technology (MIT) Lincoln Laboratory (LL) campus on Hanscom Air Force Base (AFB) in Lexington, MA. Per Section 306108 of the National Historic Preservation Act (NHPA) of 1966, as amended, and 36 CFR Part 800, Protection of Historic Properties, the USAF is engaging early with tribal governments as it formulates the undertaking.

The proposed undertaking would upgrade electrical infrastructure by consolidating the function of 17 stand-alone generators scattered around the MIT LL campus into one consolidated enclosed location. As proposed, the project would consists of the construction of a new building to house up to 5 new 1-megawatt generators, associated switchgear and distribution infrastructure. The new building is proposed in an existing parking lot near the existing electrical building and chilled water plant. Once the project is constructed, the various individual generators would be taken offline as buildings are crossed over to the new units.

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into the design and execution of the project to address any inadvertent discovery of archaeological resources.

NHPA requires that Federal agencies consult with tribes when an agency action might affect historic properties of religious and cultural significance to the tribes. Hanscom AFB is unaware of any such properties on the installation, nevertheless, in order to help us fulfill that obligation, we ask for your assistance in identifying any such properties on Hanscom AFB, and particularly, within the project's APE that may be of significance to the Mashpee Wampanoag Tribe. This would include, but not be limited to, archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural properties and landscapes, plant and animal communities, and buildings and structures with significant tribal association. Your input would not affect the handling or disposition of human remains, funerary objects, sacred objects, or objects of cultural patrimony under the Native American Graves Protection and Repatriation Act. In the event such items are discovered, we will contact you regarding their handling and disposition.

If you have any questions or would like to provide input, please feel free to contact the Hanscom AFB Cultural Resources Manager, Mr. Scott Sheehan at (781) 225-6144 or scott.sheehan.1@us.af.mil.

Sincerely,

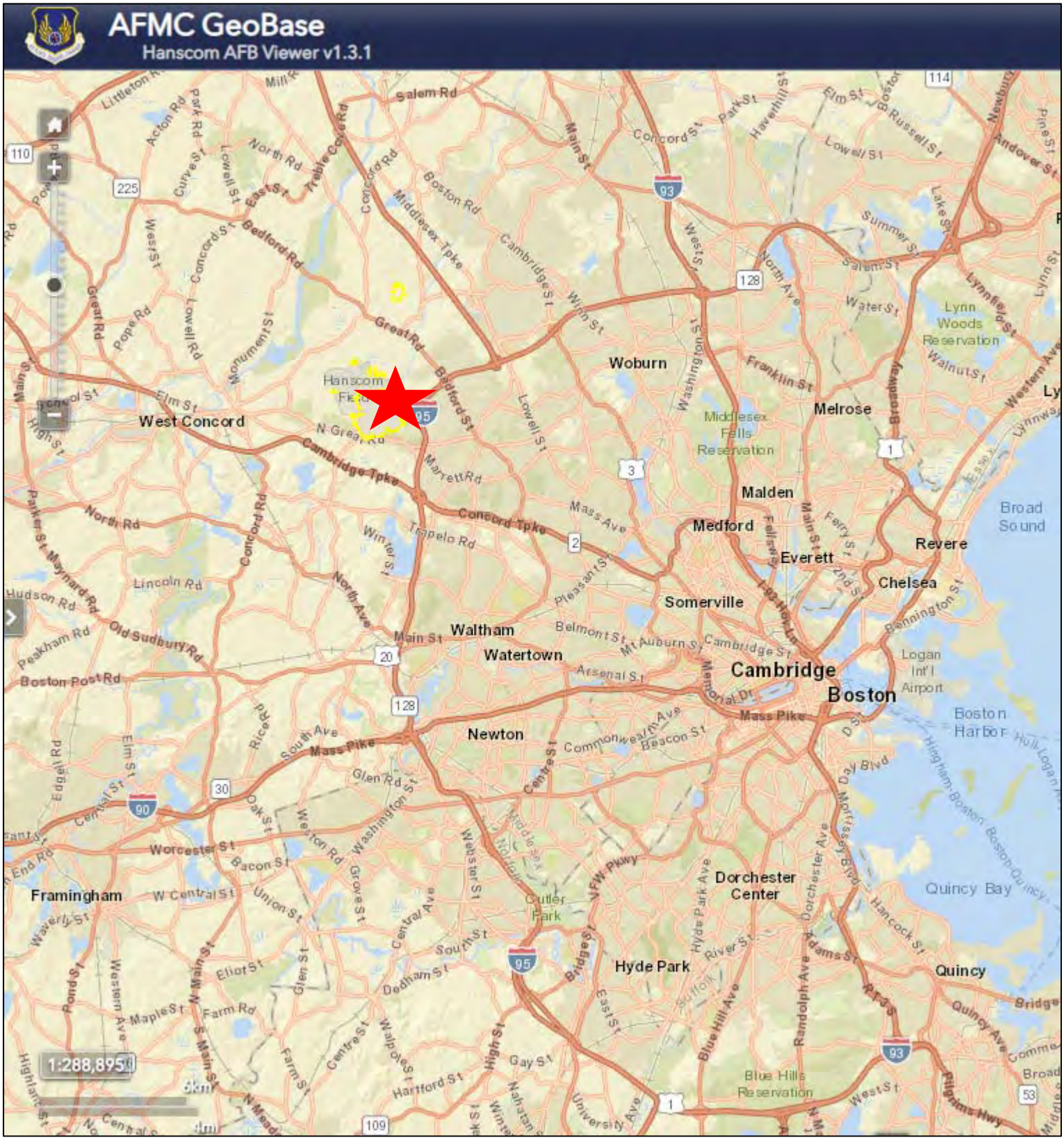
RANDY K. ROBERTSON, NH-04
Installation Tribal Liaison Officer

2 Attachments:
1. Project Location and APE Figures
2. Project Design Document

Attachment 1

MIT LINCOLN LABORATORY GENERATOR PROJECT AT HANSCOM AFB. MA

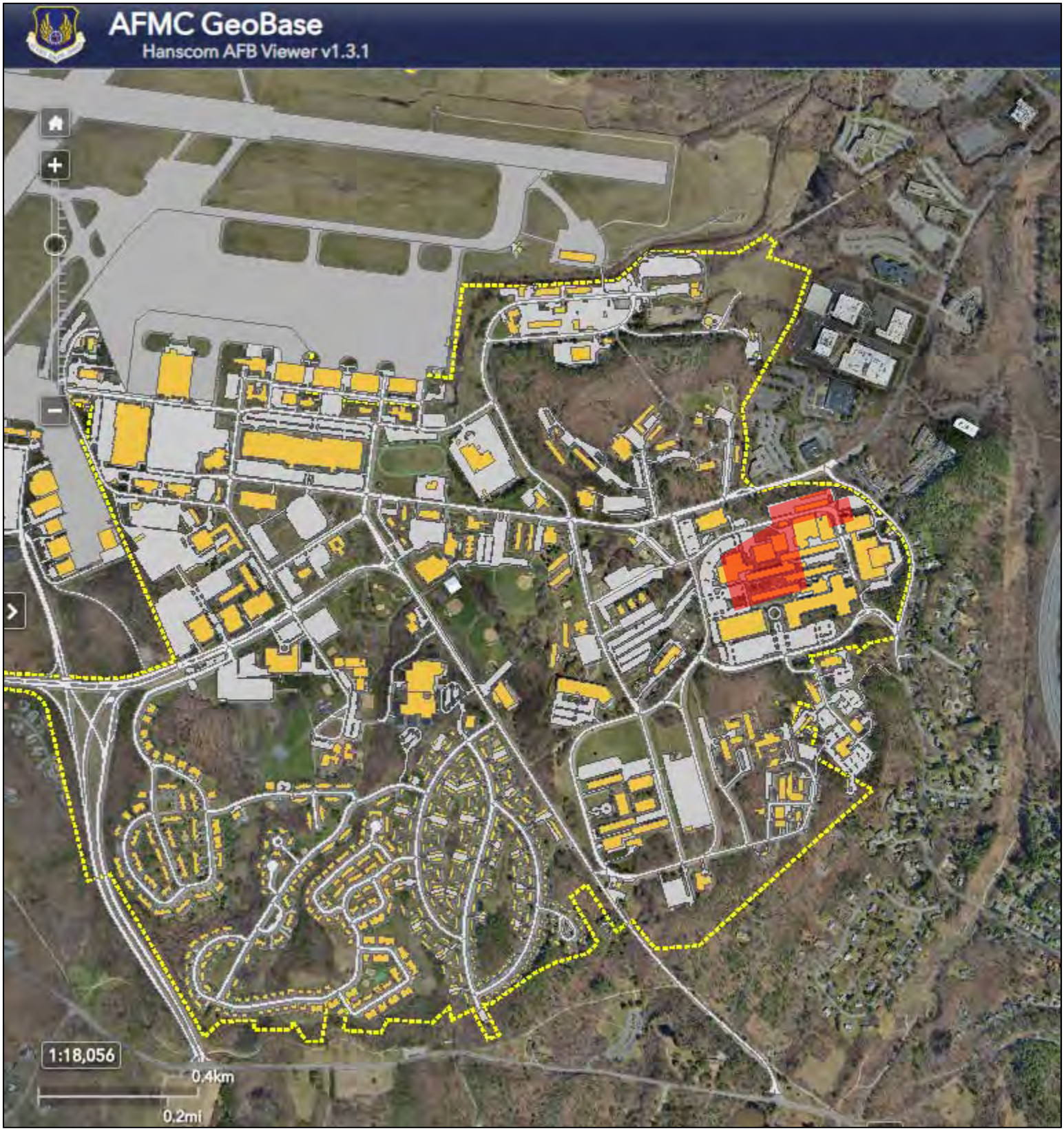
FIGURE 1 – REGIONAL LOCATION MAP



Project Location

MIT LINCOLN LABORATORY GENERATOR PROJECT AT HANSCOM AFB. MA

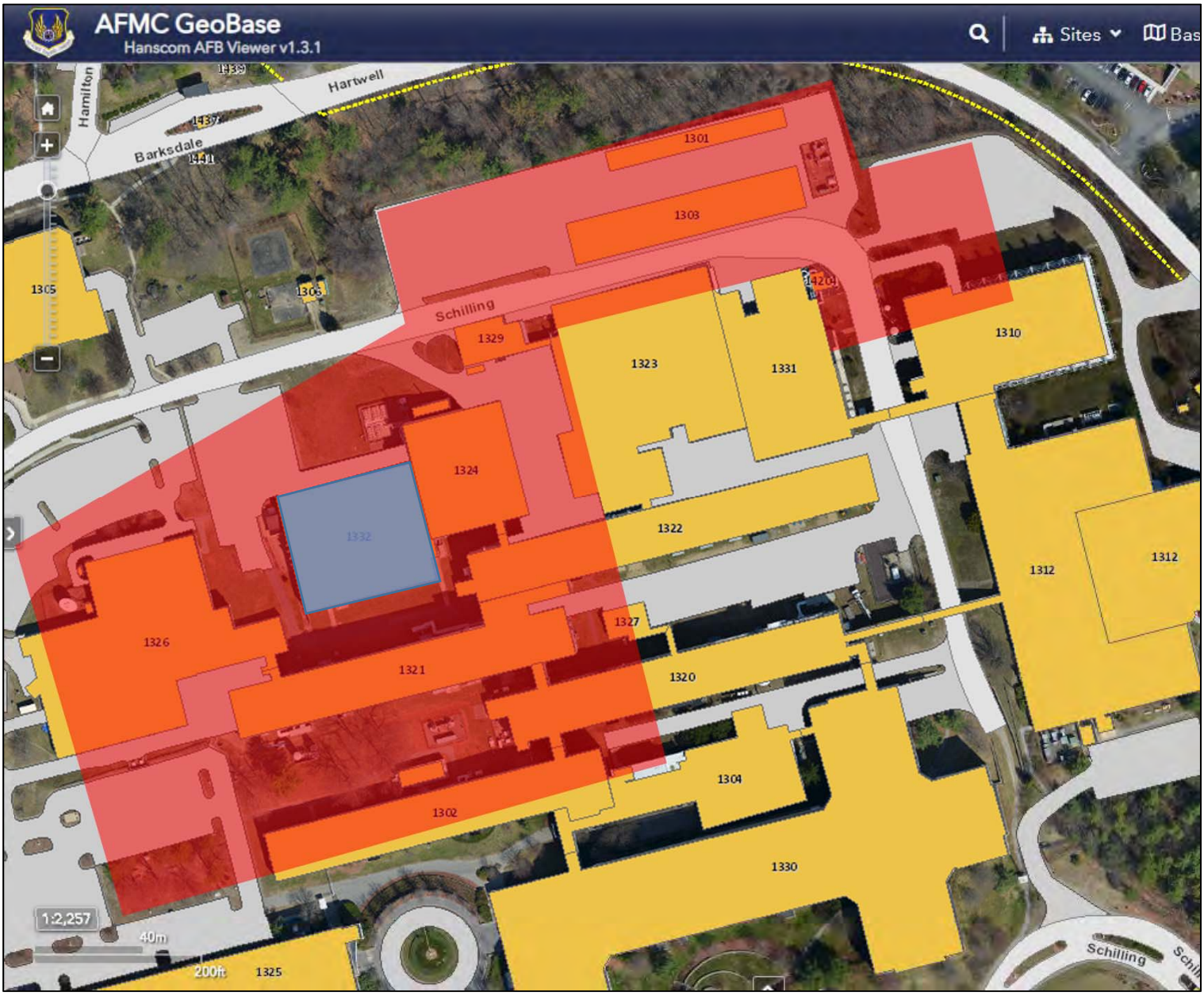
FIGURE 2 – PROJECT LOCATION



Project Location

MIT LINCOLN LABORATORY GENERATOR PROJECT AT HANSCOM AFB. MA

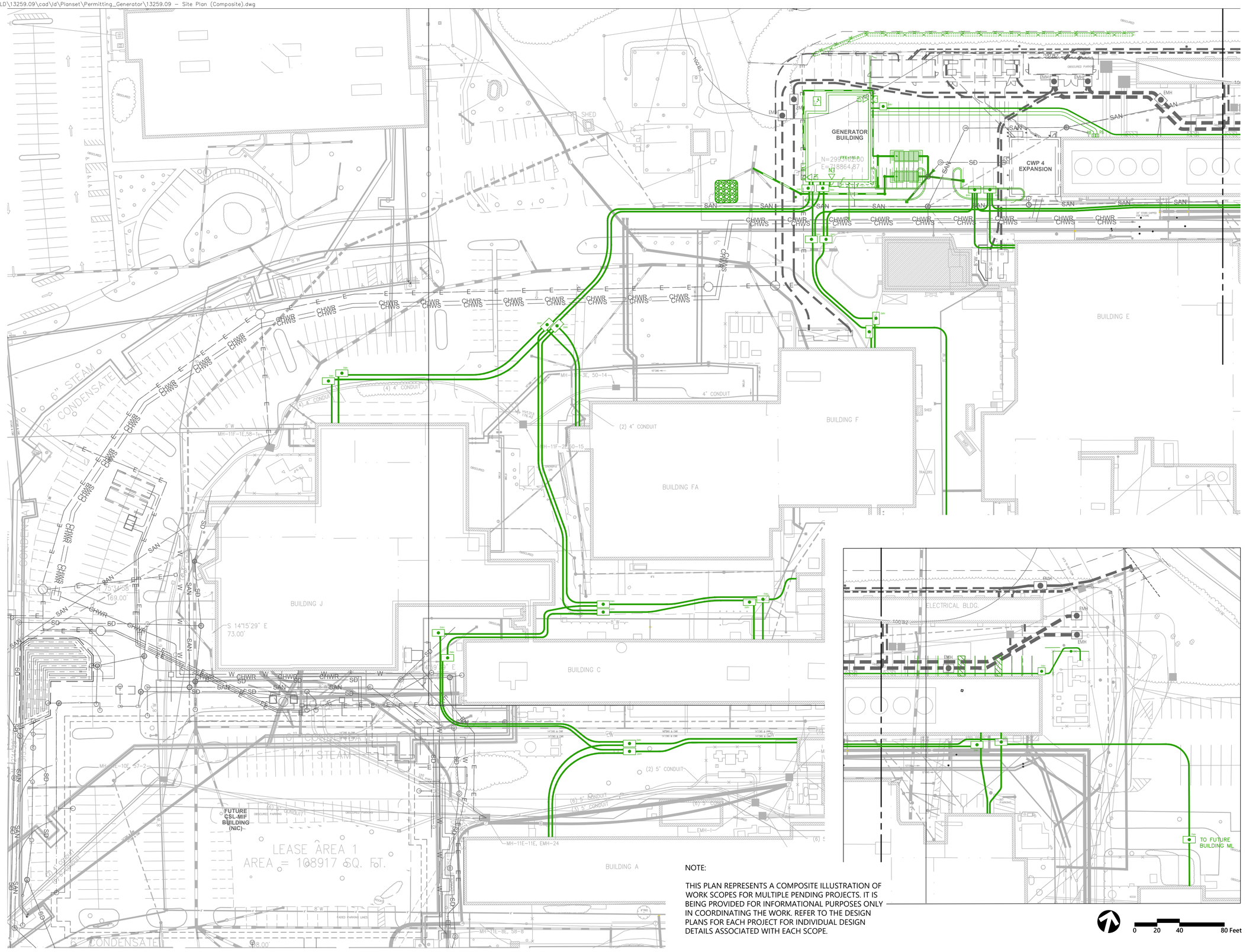
FIGURE 3 – AREA OF POTENTIAL EFFECT



Area of Potential Effect

NRHP Eligible Properties

Attachment 2



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PO Box 9151
Watertown, MA 02471
617.924.1770

MIT Lincoln Laboratory Generator Project

Lexington, Massachusetts

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

May 20, 2019

Not Approved for Construction

Drawing Title

Site Plan (Composite)

Drawing Number

C-2.0

Sheet 3 of 10

Project Number 13259.09

O'BRIEN, TAYLOR M GS-12 USAF AFMC 66 ABG/CEIE

From: SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE
Sent: Tuesday, January 12, 2021 1:36 PM
To: 106Review@mwtribe-nsn.gov; David.Weeden@mwtribe-NSN.gov
Cc: O'BRIEN, TAYLOR M GS-12 USAF AFMC 66 ABG/CEIE
Subject: FW: Hanscom AFB - New Generator Building Proposed for MIT LL (Section 106)
Attachments: 2019-0501-10 - Gen Bldg 1 EA Section 106.pdf
Signed By: scott.sheehan.1@us.af.mil

Dear Mr. Weeden,

We wanted to follow up with you to see if you had any input or concerns with the proposed project at Hanscom AFB. If you wish to provide input, please let me know

Kind regards,

//signed//
SCOTT E. SHEEHAN, GS-12, DAF
Environmental Engineer, 66 ABG/CEIE
Phone – 781.367.7168

From: SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE
Sent: Thursday, May 07, 2020 7:03 PM
To: 106Review@mwtribe-nsn.gov; David.Weeden@mwtribe-NSN.gov
Cc: WELCH, RENATA N NH-03 USAF AFMC 66 ABG/CEIE <renata.welch@us.af.mil>; ROBERTSON, RANDY K NH-04 USAF AFMC 66 ABG/XP <randy.robertson.4@us.af.mil>; O'BRIEN, TAYLOR M GS-12 USAF AFMC 66 ABG/CEIE <taylor.obrien@us.af.mil>; Ng, Tayson <Tayson.Ng@stvinc.com>
Subject: Hanscom AFB - New Generator Building Proposed for MIT LL (Section 106)

Dear Mr. Weeden,

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) to evaluate potential environmental impacts associated with a Proposed Action to construct a new generator building and associated electrical upgrades on Hanscom Air Force Base (HAFB) to support future research and development activities of Massachusetts Institute of Technology Lincoln Laboratory (MIT LL). We are preparing an Environmental Assessment (EA) to evaluate the potential impacts of such an undertaking and expect to publish it in late 2020. Attached is a scoping letter with additional information, which we have sent to your office in hardcopy, initiating Government to Government Section 106 consultation. We are providing this email copy to you as a courtesy. With this letter, we seek input on the proposed action in order to assist the Air Force in fully developing the range of issues to consider. If you choose to provide input, we ask that you respond within 30 days from the receipt of this letter. If you have any questions or need any additional information, please do not hesitate to contact me or our National Environmental Policy Act (NEPA) Program Manager, Mr. Taylor O'Brien, at (781) 225-6150 or at taylor.obrien@us.af.mil.

Kind regards,

//signed//

SCOTT E. SHEEHAN, GS-12, DAF
Hanscom AFB Cultural Resources Manager
66 ABG/CEIE
120 Grenier Street, B1825
Hanscom AFB. MA 01731-1910
Commercial 781.225.6144

APPENDIX A11

Letter to Wampanoag Tribe of Gay Head (Aquinnah)

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 66TH AIR BASE GROUP
HANSCOM AIR FORCE BASE MASSACHUSETTS

May 8, 2020

Mr. Randy K. Robertson
Installation Tribal Liaison Officer
20 Schilling Circle, Bldg 1305
Hanscom AFB MA 01731-2800

Ms. Bettina Washington
Tribal Historic Preservation Officer
Wampanoag Tribe of Gay Head (Aquinnah)
20 Black Brook Road
Aquinnah MA 02535-9701

Dear Ms. Washington

The United States Air Force (USAF) is preparing an environmental impact analysis under the National Environmental Policy Act to evaluate potential environmental impacts associated with the construction of a generator building and upgrade of electrical infrastructure at the Massachusetts Institute of Technology (MIT) Lincoln Laboratory (LL) campus on Hanscom Air Force Base (AFB) in Lexington, MA. Per Section 306108 of the National Historic Preservation Act (NHPA) of 1966, as amended, and 36 CFR Part 800, Protection of Historic Properties, the USAF is engaging early with tribal governments as it formulates the undertaking.

The proposed undertaking would upgrade electrical infrastructure by consolidating the function of 17 stand-alone generators scattered around the MIT LL campus into one consolidated enclosed location. As proposed, the project would consists of the construction of a new building to house up to 5 new 1-megawatt generators, associated switchgear and distribution infrastructure. The new building is proposed in an existing parking lot near the existing electrical building and chilled water plant. Once the project is constructed, the various individual generators would be taken offline as buildings are crossed over to the new units.

The Area of Potential Effect (APE) for this undertaking is defined as the boundaries of the project area including areas were ground disturbance is occurring, staging areas, easements, etc. as well as areas that are being indirectly affected (noise, vibration, etc.) Included at attachment 1 are three figures that provide additional details on the project location and the APE. Included at attachment 2 is the project design document identifying the scope and locations of the new generator building and trenching required for the installation of new electrical infrastructure.

Hanscom AFB has conducted both archaeological and architectural surveys within the APE and determined no archaeological sites exist in the APE and one building within the APE is eligible for the National Register of Historic Places (NRHP). Archaeological surveys of Hanscom AFB between 1998 and 2007 have identified 11 areas of archaeological sensitivity on Hanscom AFB. None of these surveys have identified any potential archaeological sensitivity near the APE. However, as is standard with all Hanscom AFB projects, the Air Force will incorporate provisions

into the design and execution of the project to address any inadvertent discovery of archaeological resources.

NHPA requires that Federal agencies consult with tribes when an agency action might affect historic properties of religious and cultural significance to the tribes. Hanscom AFB is unaware of any such properties on the installation, nevertheless, in order to help us fulfill that obligation, we ask for your assistance in identifying any such properties on Hanscom AFB, and particularly, within the project's APE that may be of significance to the Wampanoag Tribe of Gay Head (Aquinnah). This would include, but not be limited to, archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural properties and landscapes, plant and animal communities, and buildings and structures with significant tribal association. Your input would not affect the handling or disposition of human remains, funerary objects, sacred objects, or objects of cultural patrimony under the Native American Graves Protection and Repatriation Act. In the event such items are discovered, we will contact you regarding their handling and disposition.

If you have any questions or would like to provide input, please feel free to contact the Hanscom AFB Cultural Resources Manager, Mr. Scott Sheehan at (781) 225-6144 or scott.sheehan.1@us.af.mil.

Sincerely,

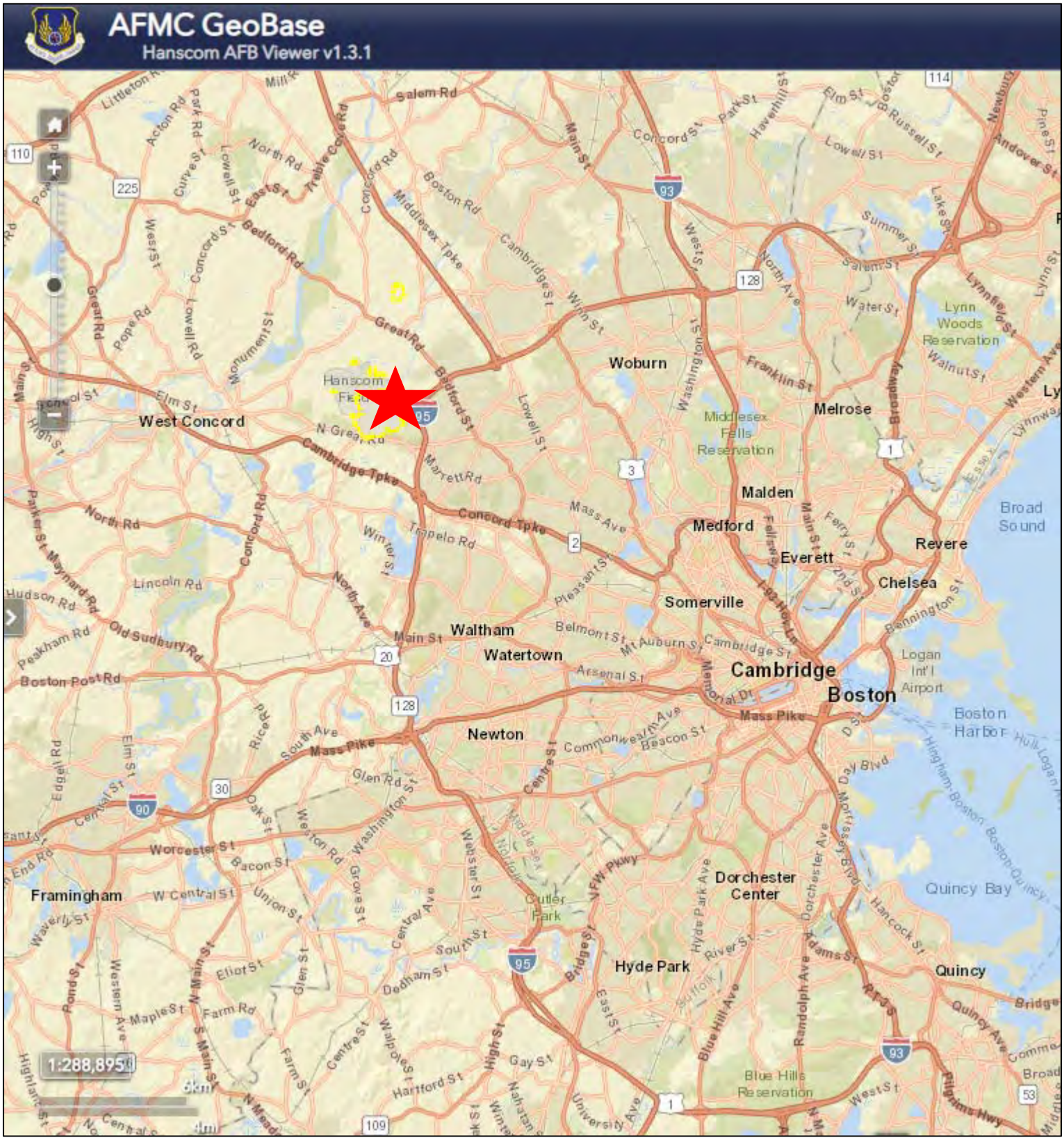
RANDY K. ROBERTSON, NH-04
Installation Tribal Liaison Officer

2 Attachments:
1. Project Location and APE Figures
2. Project Design Document

Attachment 1

MIT LINCOLN LABORATORY GENERATOR PROJECT AT HANSCOM AFB. MA

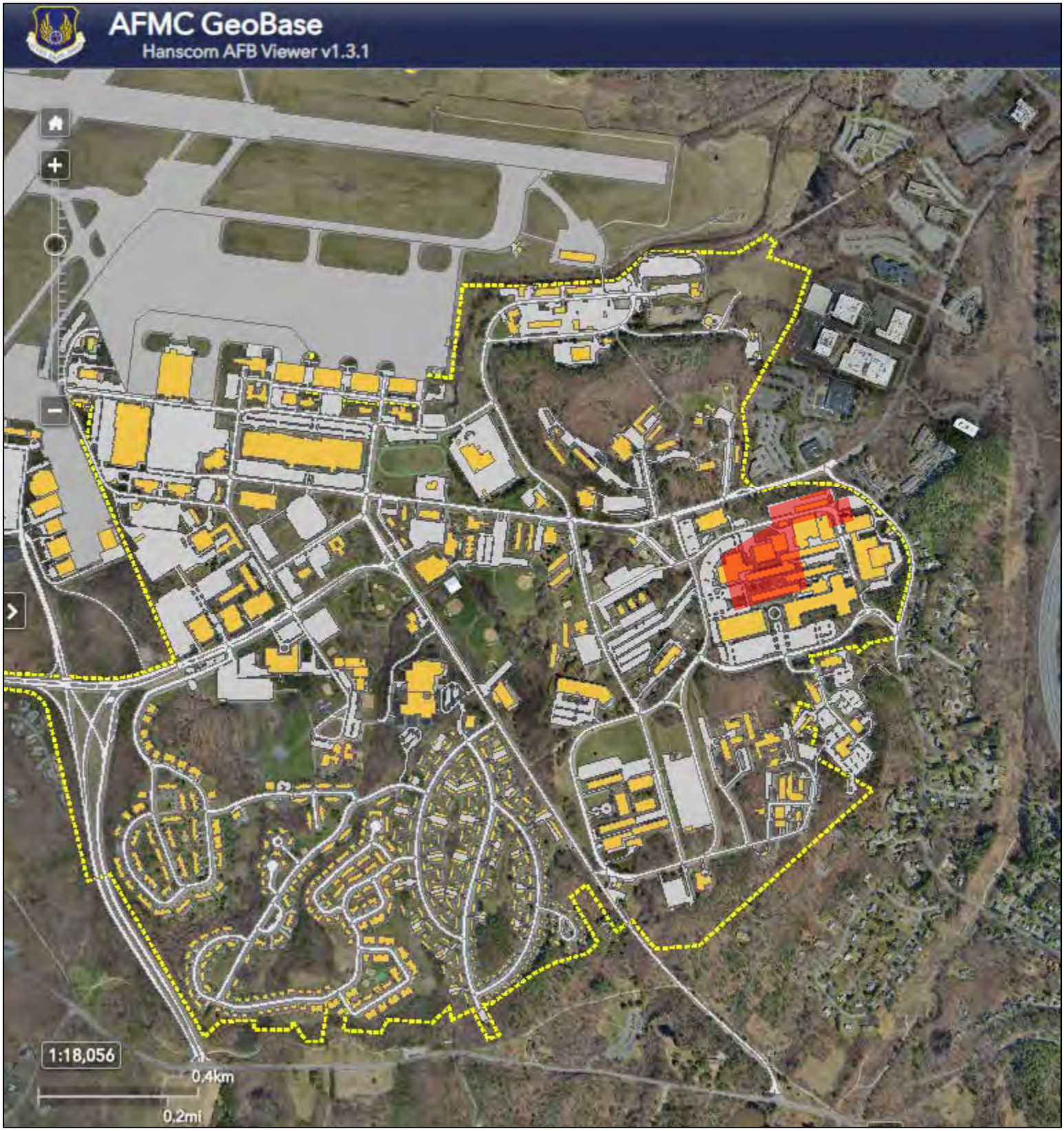
FIGURE 1 – REGIONAL LOCATION MAP



Project Location

MIT LINCOLN LABORATORY GENERATOR PROJECT AT HANSCOM AFB. MA

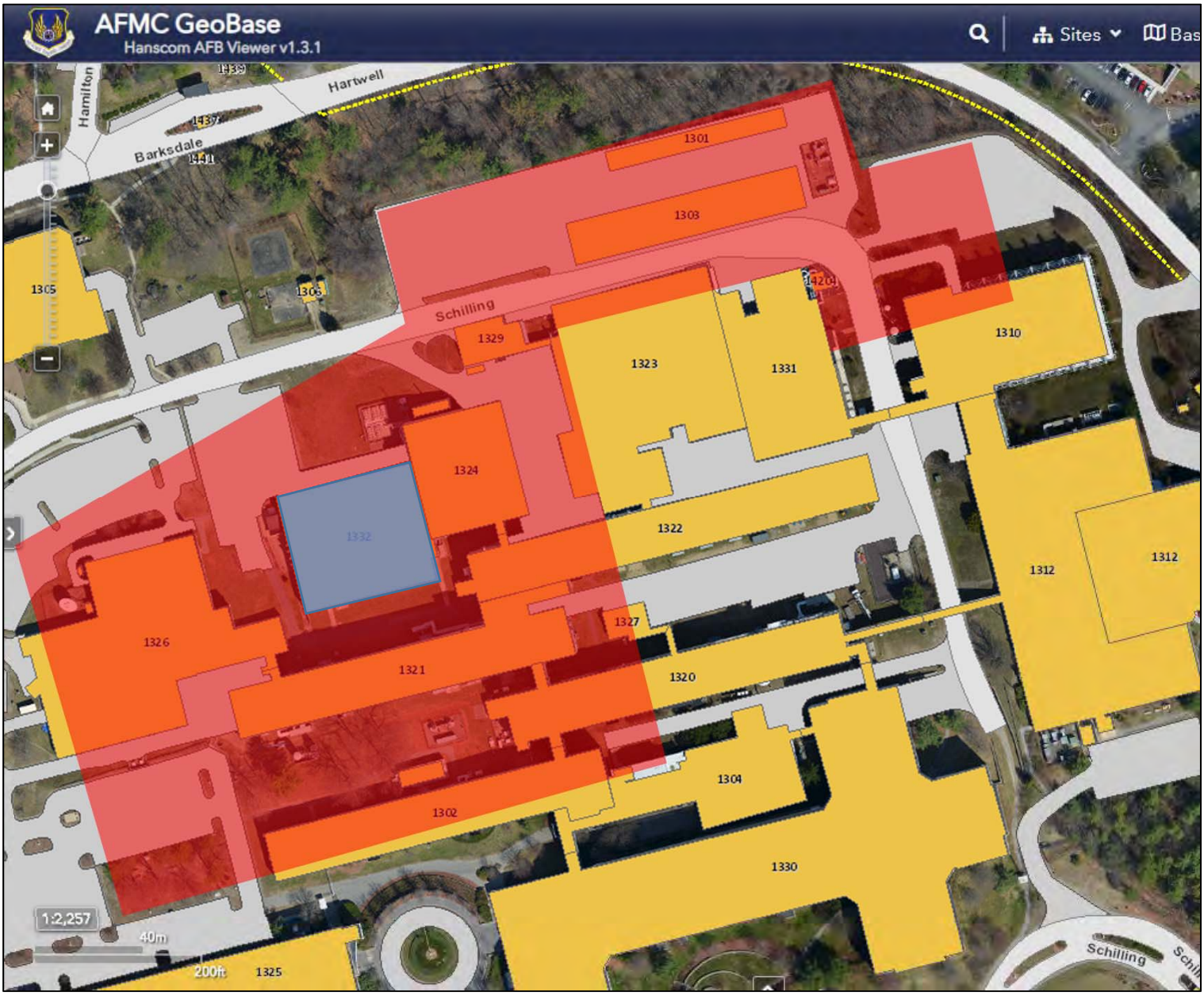
FIGURE 2 – PROJECT LOCATION



Project Location

MIT LINCOLN LABORATORY GENERATOR PROJECT AT HANSCOM AFB. MA

FIGURE 3 – AREA OF POTENTIAL EFFECT



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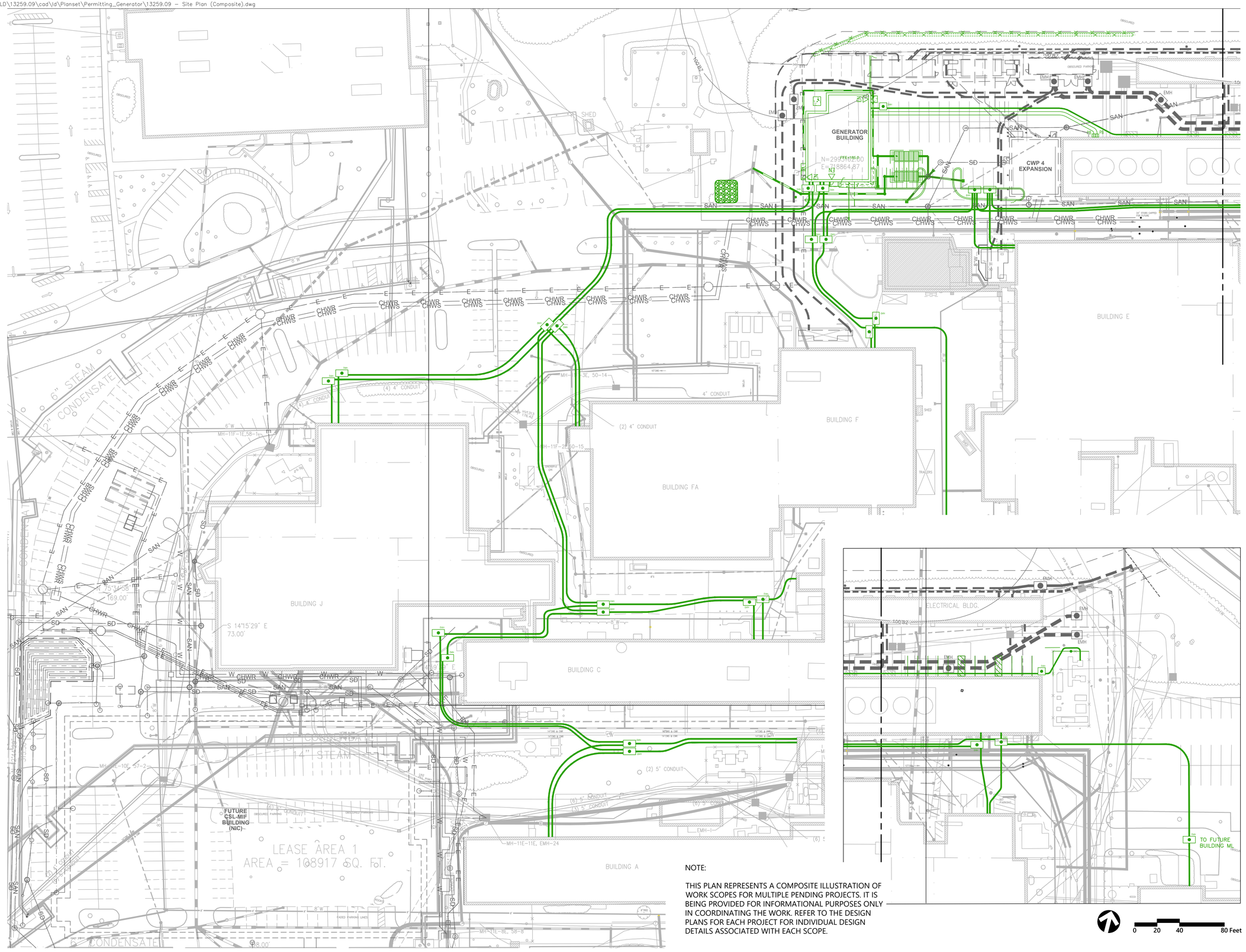

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Watertown, MA 02471
617.924.1770

MIT Lincoln Laboratory Generator Project

Lexington, Massachusetts

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

May 20, 2019

Not Approved for Construction

Drawing Title

Site Plan (Composite)

Drawing Number

C-2.0

Sheet 3 of 10

Project Number 13259.09

O'BRIEN, TAYLOR M GS-12 USAF AFMC 66 ABG/CEIE

From: SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE
Sent: Tuesday, January 12, 2021 1:40 PM
To: bettina@wampanoagtribe.net
Cc: O'BRIEN, TAYLOR M GS-12 USAF AFMC 66 ABG/CEIE
Subject: FW: Hanscom AFB - New Generator Building Proposed for MIT LL (Section 106)
Attachments: 2019-0501-11 - Gen Bldg 1 EA Section 106.pdf
Signed By: scott.sheehan.1@us.af.mil

Follow Up Flag: Follow up
Due By: Friday, February 12, 2021 8:00 AM
Flag Status: Flagged

Dear Ms. Washington,

We wanted to follow up with you to see if you had any input or concerns with the proposed project at Hanscom AFB. If you wish to provide input, please let me know.

Kind regards,

//signed//
SCOTT E. SHEEHAN, GS-12, DAF
Environmental Engineer, 66 ABG/CEIE
Phone – 781.367.7168

From: SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE
Sent: Thursday, May 07, 2020 7:10 PM
To: bettina@wampanoagtribe.net
Cc: ROBERTSON, RANDY K NH-04 USAF AFMC 66 ABG/XP <randy.robertson.4@us.af.mil>; WELCH, RENATA N NH-03 USAF AFMC 66 ABG/CEIE <renata.welch@us.af.mil>; O'BRIEN, TAYLOR M GS-12 USAF AFMC 66 ABG/CEIE <taylor.obrien@us.af.mil>; Ng, Tayson <Tayson.Ng@stvinc.com>
Subject: Hanscom AFB - New Generator Building Proposed for MIT LL (Section 106)

Dear Ms. Washington,

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Kind regards,

//signed//
SCOTT E. SHEEHAN, GS-12, DAF
Hanscom AFB Cultural Resources Manager
66 ABG/CEIE
120 Grenier Street, B1825
Hanscom AFB. MA 01731-1910
Commercial 781.225.6144

APPENDIX A12

Letter to National Heritage and Endangered Species Program – Massachusetts Division of Fisheries and Wildlife

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 66TH AIR BASE GROUP
HANSCOM AIR FORCE BASE MASSACHUSETTS

May 8, 2020

Mr. Scott E. Sheehan
66 ABG/CEIE
120 Grenier Street
Hanscom AFB, MA 01731-1910

Regulatory Review Program
Natural Heritage and Endangered Species Program (NHESP)
Massachusetts Division of Fisheries & Wildlife
1 Rabbit Hill Road
Westborough MA 01581-3336

Dear Sir or Ma'am

The United States Air Force (Air Force) is pursuing an undertaking at Hanscom Air Force Base (AFB) in Lexington, Massachusetts to upgrade electrical infrastructure supporting the Massachusetts Institute of Technology Lincoln Laboratory campus. In support of this undertaking, the Air Force is preparing an Environmental Assessment (EA) pursuant to the National Environmental Policy Act to assess the environmental impacts of the proposed undertaking. I respectfully request your review and comment on the proposed action and our conclusion that no adverse effect to state-protected biological resources are expected to occur.

The Area of Potential Effect (APE) for this undertaking is defined as the boundaries of the project area including areas where ground disturbance is occurring, staging areas, easements, etc. as well as areas that are being indirectly affected (noise, vibration, etc.) Included at attachment 1 are three figures that provide additional details on the project location and the APE. Included at attachment 2 is the project design document identifying the scope and locations of the new generator building and trenching required for the installation of new electrical infrastructure.

The project site geographic coordinates are as follows:
Latitude: 42.461461
Longitude: -71.266708

Upon review of the NHESP Regulatory Maps and available GIS datalayers, we conclude that the project limits are within neither an Estimated Habitat of Rare Wildlife nor a Priority Habitat of Rare Species. We also conclude, through further review of data, there are no certified or potential vernal pools within the project limits. Related to federally-protected species, Hanscom AFB, along with the entirety of Massachusetts, is within the potential habitat zone for the threatened Northern long-eared bat (Myotis Septentrionalis) (NLEB). In 2018, Hanscom AFB conducted an acoustical bat survey over 90 days and determined that the NLEB is not present within the installation boundaries. These results were shared with U.S. Fish and Wildlife Service, New England Field Office, and they concurred that any work on Hanscom AFB that does not include tree removal is expected to have no effect to this federally threatened species. No other federally-listed species have been identified on Hanscom AFB.

The purpose of this letter is three fold: (1) to request your review of the information provided to determine if any new state-listed species information pertinent to the project site is available, (2) offer you the opportunity to comment on the proposed action, and (3) seek your concurrence with our conclusion that the proposed action is not likely to have an adverse effect on state-protected biological resources. We respectfully request that if you have additional information to provide for our consideration or have comments on the proposed action, that you respond within 30 days from receipt of this letter. If you have any questions, please feel free to contact me anytime at (781) 225-6144 or by email at scott.sheehan.1@us.af.mil.

Sincerely,

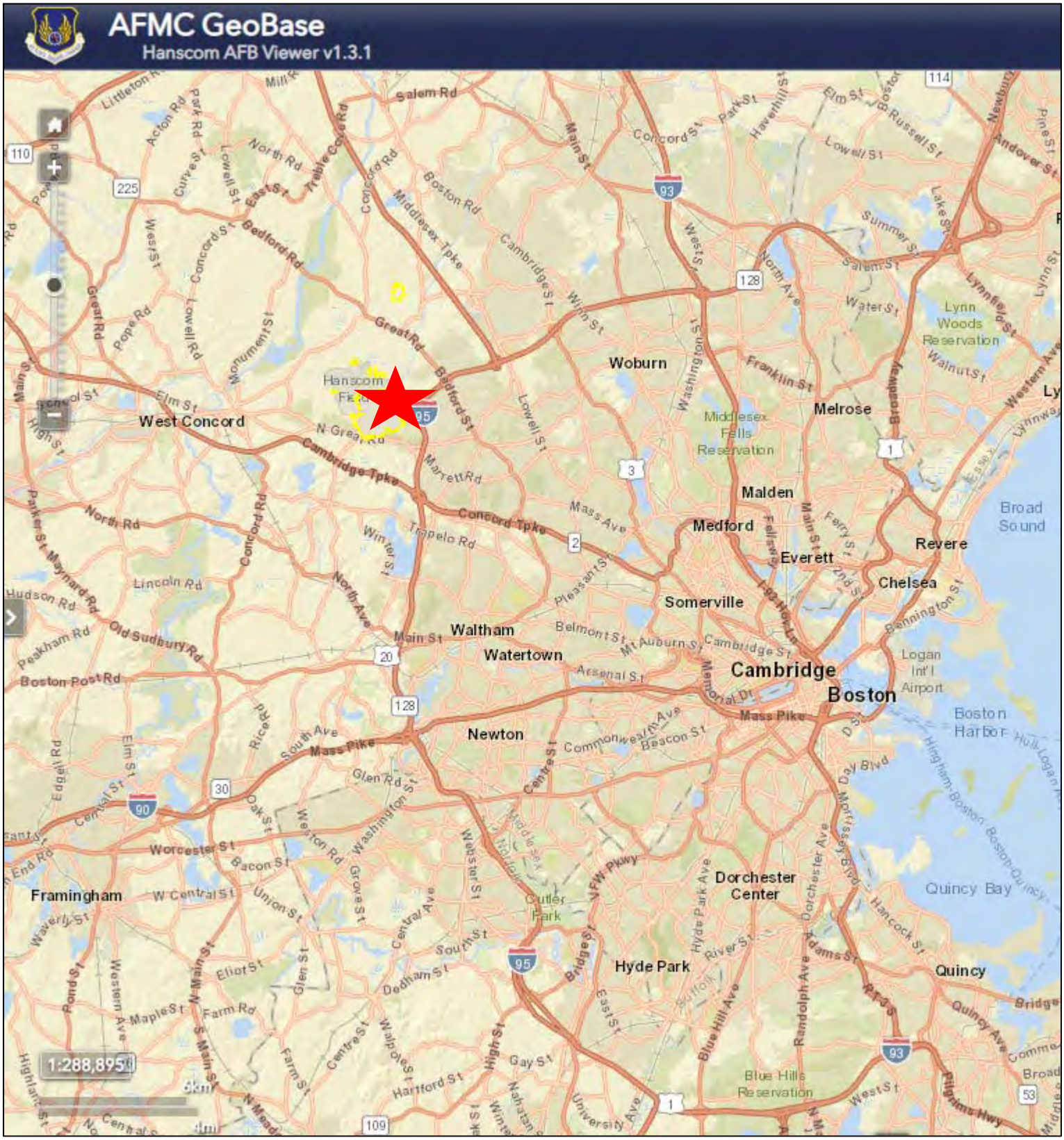
SCOTT E. SHEEHAN, GS-12, DAF
Hanscom AFB Cultural Resources Manager

2 Attachments:
1. Project Location and APE Figures
2. Project Design Document

Attachment 1

MIT LINCOLN LABORATORY GENERATOR PROJECT AT HANSCOM AFB. MA

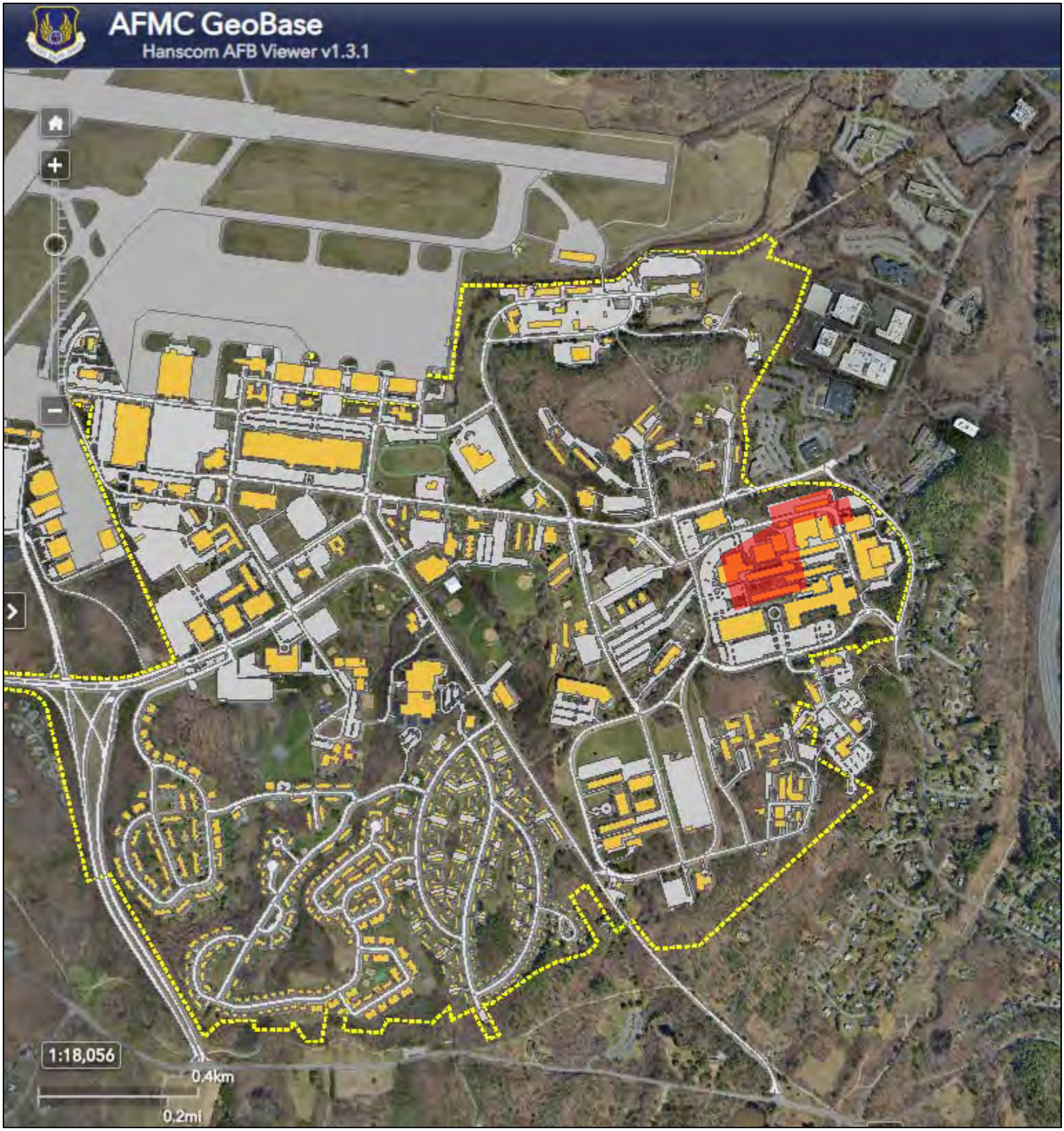
FIGURE 1 – REGIONAL LOCATION MAP



Project Location

MIT LINCOLN LABORATORY GENERATOR PROJECT AT HANSCOM AFB. MA

FIGURE 2 – PROJECT LOCATION



Project Location

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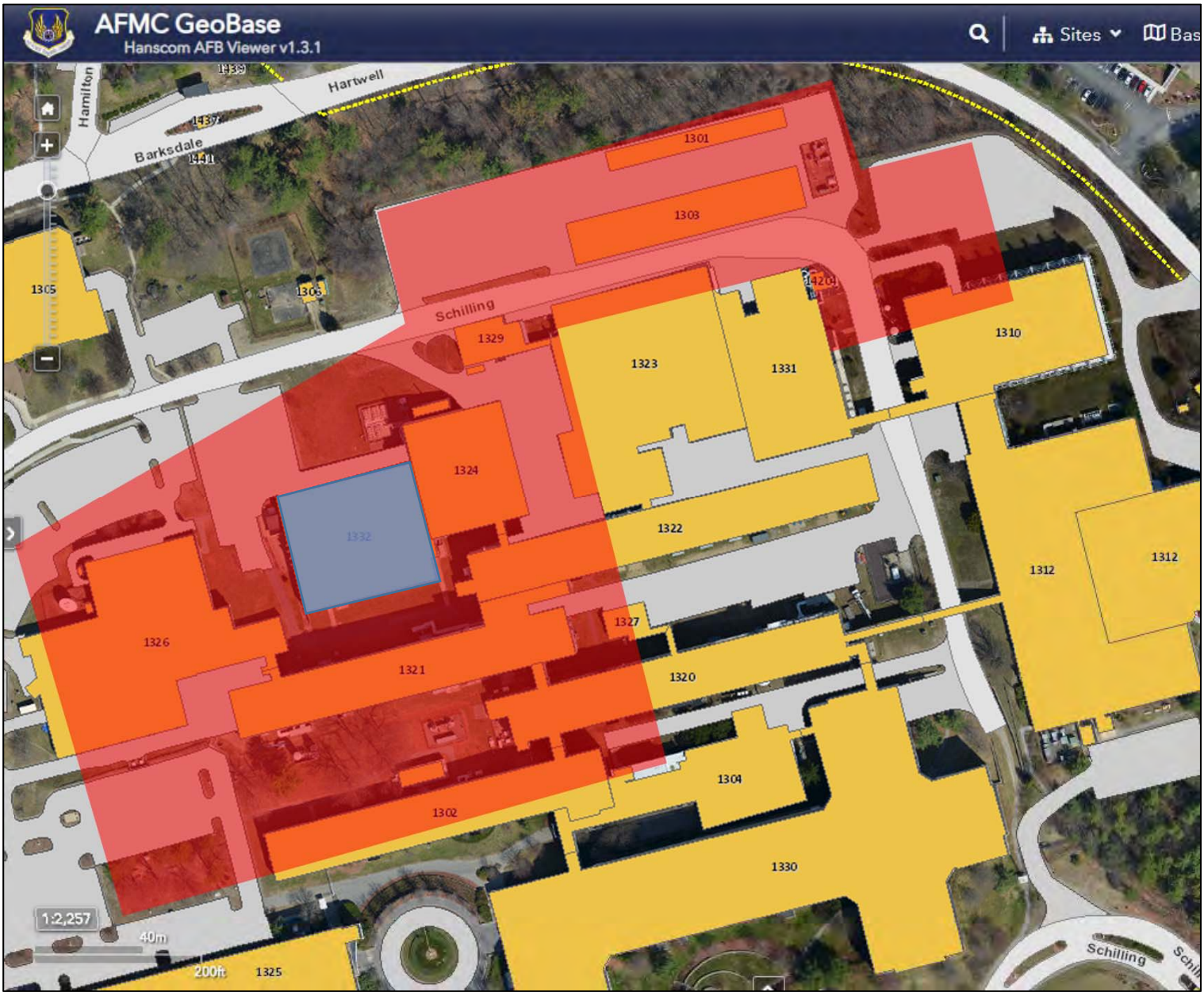
FIGURE 3 – AREA OF POTENTIAL EFFECT



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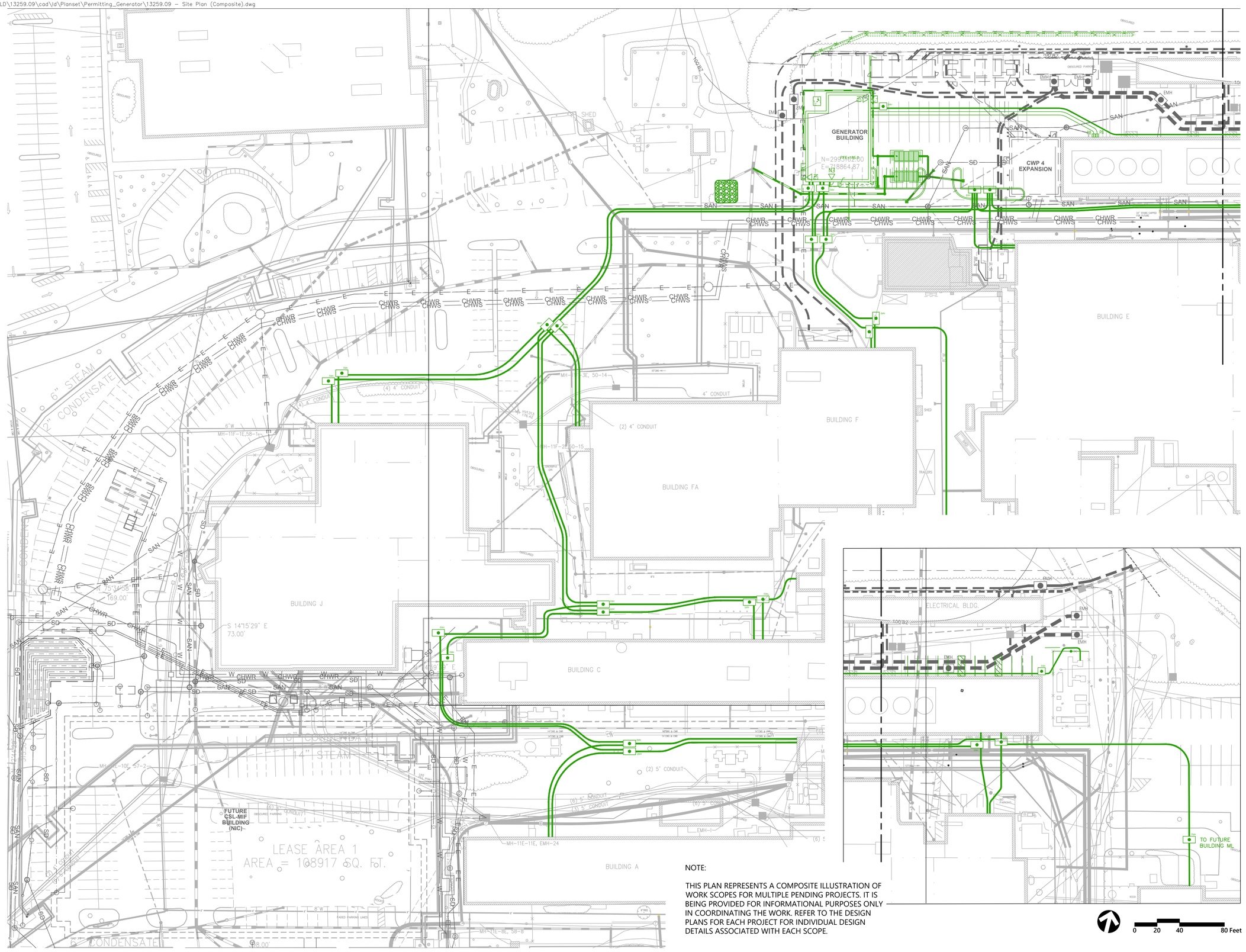

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PO Box 9151
Watertown, MA 02471
617.924.1770

MIT Lincoln Laboratory Generator Project

Lexington, Massachusetts

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

May 20, 2019

Not Approved for Construction

Drawing Title

Site Plan (Composite)

Drawing Number

C-2.0

Sheet 3 of 10

Project Number 13259.09

APPENDIX A13

Email to Mashpee Wampanoag Tribe

SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE

From: SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE
Sent: Thursday, May 07, 2020 7:02 PM
To: '106Review@mwtribe-nsn.gov'; 'David.Weeden@mwtribe-NSN.gov'
Cc: WELCH, RENATA N NH-03 USAF AFMC 66 ABG/CEIE; ROBERTSON, RANDY K NH-04 USAF AFMC 66 ABG/XP; O'BRIEN, TAYLOR M GS-12 USAF AFMC 66 ABG/CEIE; 'Ng, Tayson'
Subject: Hanscom AFB - New Generator Building Proposed for MIT LL (Section 106)
Attachments: 2019-0501-10 - Gen Bldg 1 EA Section 106.pdf
Signed By: scott.sheehan.1@us.af.mil

Dear Mr. Weeden,

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Kind regards,

//signed//
SCOTT E. SHEEHAN, GS-12, DAF
Hanscom AFB Cultural Resources Manager
66 ABG/CEIE
120 Grenier Street, B1825
Hanscom AFB. MA 01731-1910
Commercial 781.225.6144

APPENDIX A14

Email to Wampanoag Tribe

SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE

From: SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE
Sent: Thursday, May 07, 2020 7:10 PM
To: bettina@wampanoagtribe.net
Cc: ROBERTSON, RANDY K NH-04 USAF AFMC 66 ABG/XP; WELCH, RENATA N NH-03 USAF AFMC 66 ABG/CEIE; O'BRIEN, TAYLOR M GS-12 USAF AFMC 66 ABG/CEIE; Ng, Tayson
Subject: Hanscom AFB - New Generator Building Proposed for MIT LL (Section 106)
Attachments: 2019-0501-11 - Gen Bldg 1 EA Section 106.pdf
Signed By: scott.sheehan.1@us.af.mil

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Kind regards,

//signed//
SCOTT E. SHEEHAN, GS-12, DAF
Hanscom AFB Cultural Resources Manager
66 ABG/CEIE
120 Grenier Street, B1825
Hanscom AFB. MA 01731-1910
Commercial 781.225.6144

APPENDIX A15

Email from Mashpee Wampanoag Tribe and Tribal Historic Preservation Department

SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE

From: 106Review <106Review@mwtribe-nsn.gov>
Sent: Thursday, May 07, 2020 7:05 PM
To: SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE
Subject: [Non-DoD Source] Automatic reply: Hanscom AFB - New Generator Building Proposed for MIT LL (Section 106)

The Mashpee Wampanoag Tribe (MWT) and the Tribal Historic Preservation Department (THPD) have implemented suggested COVID-19 procedures. Currently the Chairman and Tribal Council have declared a "state of emergency". Consequently all MWT tribal operations, a side from essential services are working remotely; in light of the ongoing coronavirus COVID-19 outbreak.

When you call or e-mail the THPO, we will be as accessible as always and will be working the same schedules remotely from home. In coming weeks do not expect or schedule in person meeting until after March 27th, 2020; our office has committed to significantly less travel and will only conduct meetings via teleconference or video conference unless impracticable and or absolutely necessary.

While department and organizational staff is checking regular mail, we ask that you conduct your formal communications with us by electronic mail as much as possible during this time. All calls are being forwarded to respective cell phones and we are available for telecommunications.

Section 106 reviews. We do not at present envision any changes in managing project reviews. The deadlines in the Section 106 process as set forth in 36 C.F.R. Part 800 will remain the same, with the exception that during this current state of emergency.

The Section 106 deadlines for our Tribal Historic Preservation Officer (THPO) response will be considered tolled while, due to the coronavirus outbreak, our office is physically closed and work conditions are such that the THPO is unable to carry out all of the Section 106 duties (e.g., precautionary staff unavailability and some minimized access to relevant records). The THPO is notifying federal agencies and the ACHP about the current state of affairs. This tolling of the usual turnaround deadline will be lifted once the state of emergency conditions are lifted and no longer in effect.

The encourage federal agencies to be flexible with Section 106 deadlines due to COVID-19 measures being implemented across the country. All relevant consulting parties may be facing challenges in meeting such deadlines as well, due to the outbreak.

Our Tribe and THPO will continue to conduct business as best we can with the limited capacities. Under normal conditions the time frames are at times challenging due to limited internal resources.

APPENDIX A16

Email from Natural Heritage and Endangered Species Program – Massachusetts Division of Fisheries and Wildlife

SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE

From: Cheeseman, Melany (FWE) <melany.cheeseman@state.ma.us>
Sent: Monday, May 11, 2020 12:55 PM
To: SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE
Subject: [Non-DoD Source] RE: Hanscom AFB (Lexington) - Generator Building Consultation

Scott,
Thank you for submitting information about the electrical infrastructure upgrades to the Massachusetts Insititute of Technologisy Lincoln Laboratory campus. Based on a review of the information that was provided (letter dated May 8, 2020, Aerial Site Map with designated project location) and the information that is currently contained in our database, the Division has determined that this project, as currently proposed, does not occur within Estimated Habitat of Rare Wildlife or Priority Habitat as indicated in the Massachusetts Natural Heritage Atlas (14th Edition). Therefore, the project is not required to be reviewed for compliance with the rare wildlife species section of the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.37, 10.59 & 10.58(4)(b)) or the MA Endangered Species Act Regulations (321 CMR 10.18). Any additional work beyond that shown on the site map may require a filing with the Division.
As proposed, the current work does not occur within the mapped Priority habitat of the Northern Long-eared bat. The most up-to-date information about the location of Maternity Roost Trees and Hibernacula can be found on our website's interactive map, which is searchable by project location and available online here: https://www.mass.gov/service-details/the-northern-long-eared-bat .
Please let me know if you have any additional questions or need any additional information for your assessment. Thank you,

Melany Cheeseman
Endangered Species Review Assistant
Natural Heritage & Endangered Species Program
Massachusetts Division of Fisheries & Wildlife
1 Rabbit Hill Road, Westborough, MA 01581
melany.cheeseman@mass.gov | www.mass.gov/nhesp

***Important:** Please note that all non-essential state employees are currently working remotely and response timelines may be somewhat delayed. Thank you for your patience. I will respond to your inquiry as quickly as possible.
Updates about NHESP can be found at:https://www.mass.gov/orgs/masswildlifes-natural-heritage-endangered-species-program
Statewide: https://www.mass.gov/resource/information-on-the-outbreak-of-coronavirus-disease-2019-covid-19

From: SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE [mailto:scott.sheehan.1@us.af.mil]
Sent: Thursday, May 07, 2020 6:49 PM
To: Cheeseman, Melany (FWE)
Cc: O'BRIEN, TAYLOR M GS-12 USAF AFMC 66 ABG/CEIE
Subject: Hanscom AFB (Lexington) - Generator Building Consultation

APPENDIX A17

Email from EPA New England - Region 1

O'BRIEN, TAYLOR M GS-12 USAF AFMC 66 ABG/CEIE

From: Timmermann, Timothy <Timmermann.Timothy@epa.gov>
Sent: Friday, June 5, 2020 1:52 PM
To: O'BRIEN, TAYLOR M GS-12 USAF AFMC 66 ABG/CEIE
Cc: Timmermann, Timothy; Wintrob, Paul
Subject: [Non-DoD Source] EA for proposed generator building at the MIT Lincoln Laboratory on the Hanscom Air Force Base

Dear Mr. Obrien:

As I noted in my recent voicemail, I am sending this email in response to Department of the Air Force May 7, 2020 correspondence regarding the United States Air Force plans to prepare an Environmental Assessment (EA) to support the construction of a new generator building at the Massachusetts Institute of Technology Lincoln Laboratory facility on the Hanscom Air Force Base. Your letter requested scoping input for the EA being prepared for the proposed facility.

Based on our review of the information provided we recommend that the EA describe fuel storage associated with the proposed generator facility and the specific protocols that will be in place to address fuel spills during refueling or in the case of an emergency.

We appreciate your request for input and remain available to answer any questions you may have at your convenience.

Regards,

Timothy L. Timmermann, Director
Office of Environmental Review
EPA New England-Region 1
5 Post Office Square, Suite 100
Mail Code 06-3
Boston, MA 02109-3912

Email: timmermann.timothy@epa.gov
Telephone: 617-918-1025
E-Fax: 617-918-0025

APPENDIX A18

Email from United States Department of the Interior,
Fish and Wildlife Service

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To: June 11, 2020
Consultation Code: 05E1NE00-2020-SLI-2903
Event Code: 05E1NE00-2020-E-08811
Project Name: MIT-LL/Generator Bldg #1

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2020-SLI-2903

Event Code: 05E1NE00-2020-E-08811

Project Name: MIT-LL/Generator Bldg #1

Project Type: DEVELOPMENT

Project Description: The purpose of the Proposed Action is to provide a reliable source of redundant backup electrical power, allowing MIT LL to accomplish their mission without disruption to workflow. The Proposed Action is to construct Generator Building 1 at MIT LL, consolidating backup power capacity in the northern industrial area of the MIT LL complex, near the primary electric service, which would eliminate odor and particulate risk to several sensitive research areas by allowing the decommissioning of the 16 smaller generators located throughout the campus. The generator building would consist of three 1,000-kW backup diesel generators with space to add an additional two 1,000-kW diesel generators. The generators would comply with U.S. Environmental Protection Agency (EPA) Tier-4 Final Standard to satisfy federal standards for non-emergency operation and have been permitted by MassDEP for 500 hours of non-emergency operation annually for each generator. The Proposed Action would include construction of a new building to house the generators, automatic transfer switch(s), and the switch gear, and would provide radial feeds from the generators to buildings that require critical backup power.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/42.46022923179106N71.26641173781613W

Counties: Middlesex, MA

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

APPENDIX A19

Letter from Lexington Board of Selectman

Town of Lexington, Massachusetts

SELECT BOARD OFFICE

DOUGLAS M. LUCENTE, CHAIR
JOSEPH N. PATO
SUZANNE E. BARRY
JILL I. HAI
MARK D. SANDEEN

TEL: (781) 698-4580
FAX: (781) 863-9468

August 3, 2020

Mr. Taylor O'Brien
NEPA Project Manager
66 ABG/CEIE
120 Grenier Street, B1825
Hanscom AFB, MA 01731-1910

RE: **Proposed MIT LL Generator Building 1 Environmental Assessment scope**

Dear Mr. O'Brien:

This letter is to provide formal comment on the proposed scope for MIT Lincoln Labs Generator Building 1 Environmental Assessment scoping in response to the request for comment dated May 7, 2020 from Mr. Charles Strickland III, P.E. We note that the proposed building is to be followed with one or more additional new buildings.

As with our fall 2019 comment letter on Building SW1, we ask that the following issues be included in the scope of the required Environmental Assessment.

Hartwell Avenue Revitalization

The Town of Lexington is in the process of planning for the revitalization of the Hartwell Avenue commercial district, and is expected to consider zoning that will allow an increase in development, a greater mix of uses, and increased building square footage. There is a related planning effort to design transportation improvements for Hartwell Avenue, Bedford Street part of Wood Street and Route 2A to ease existing and projected traffic congestion. The Environmental Assessment for the Generator Building must take this intended additional projected commercial development and traffic into consideration in the scope, and conversely, we request that the details of the long term master plan for Hanscom AFB and Lincoln Labs be provided to the Town without delay in order that we may adequately plan for the safe mobility of all projected commuters, employees and occupants of Hanscom AFB, Lincoln Labs, and the commercial district.

Overall projected additional employees

It is critical that the Environmental Assessment scope consider the overall projected population for Lincoln Labs, Hanscom Air Force Base, and the Towns of Lexington and Bedford. We request that the Town be provided with the current staffing level and the overall projected staffing level forecast for both Lincoln Labs today and at full build-out of the master plan, as well as the current and projected increase in personnel for Hanscom Air Force Base.

Funding to Lexington to Address Impacts to Infrastructure

We request that the Environmental Impact scope include realistic sources for funding to the Town of Lexington to mitigate the anticipated impacts to infrastructure, including but not limited to utilities, roadway, water, sewer, emergency response. We further request that the scope include a requirement that Hanscom/Lincoln Labs actively pursue this funding on behalf of the Town of Lexington.

Traffic and Transportation

Traffic congestion and mitigating impacts of additional traffic from additional employees. The increase in transportation demand resulting from additional employees should be matched with increased bus, transit, walking, dedicated carpooling and cycling services, infrastructure and options on Wood Street, Hartwell Ave, Route 2A and Bedford Street.

Access/Egress

We understand that an additional access point may be contemplated either informally or as part of the master plan for Lincoln Labs or Hanscom AFB. The Town requests that the scope require reviewing road access to MIT Lincoln Labs. The main entrance is currently on Wood Street, a local residential street in which the Town has made commitments to calm traffic. It would dramatically improve overall transportation flow if the main access is moved to Hartwell Ave. This should be part of the overall Hartwell Infrastructure improvements. Rep. Michelle Ciccolo is interested in following up on this.

Site Plan Review

The Board requests that the MIT Lincoln Labs agree to voluntarily apply for the Town's Limited Site Plan review process with the Lexington Planning Board.

Utilities

The Board requests that the scope recognize that the projected additional volume of wastewater needs to be provided for review, along with the methodology used to arrive at the volume. In addition, downstream capacity of the sanitary sewer system should be evaluated, depending on the anticipated volumes. Also, please note that the sewer regulations have been updated and special attention should be paid to Chapter 181 section G.

The Board requests that the existing and proposed water usage be provided, including the anticipated diurnal curve for the usage. This may need to be applied to the town model to ensure proper flow and pressure is available and that there are no negative impacts to Lexington's existing customers.

Traffic should be reviewed as well. Evaluation of any projected increase or decrease in parking demand in light of the removal of parking spaces to accommodate the generator building site, and the addition of other buildings besides the generator building, should be conducted. This further underscores the need to disclose and discuss the LL/Hanscom master plans, which seems to include further expansion. Additionally, it appears there has been an increase in vehicle congestion on the roads that access Hanscom AFB and MIT LL, causing delays and potentially affecting air quality. It is recommended a full traffic analysis be performed, including reviewing previous expansions and internal circulation alterations (changes to gate access that may affect traffic on public roadways), to identify mitigation measures necessary to alleviate some of the issues this corridor faces.

Natural Resource and Energy Conservation

The Board notes that Lexington Conservation Commission previously received and reviewed two Notices of Intent and issued Orders of Conditions for different phases of this project and the Board appreciates compliance with the Orders of Conditions.

The Board requests that any loss of trees as it relates to climate resiliency (losing a carbon storage area in Lexington) and land disturbance and erosion control be included in the scope.

The Board further requests that any change of cover and addition of impervious surfaces as it relates to stormwater management and water quality measures be evaluated in the scope.

We further request that sustainability, net zero and energy conservation measures in design; and water conservation measures both internally and externally in landscaping, be included in the scope.

Additional comments

In conclusion, the Board requests that the foregoing issues all be included in the scope that is to be considered in conducting the comprehensive environmental review per the required Environmental Assessment. Thank you for the opportunity to comment.

Sincerely,

Doug Lucente
Chair, Select Board

cc: Lexington Planning Board/Department;
Lexington Assistant Town Manager for Development

APPENDIX A20

Concurrence from the Massachusetts Historical Commission

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 66TH AIR BASE GROUP
HANSCOM AIR FORCE BASE MASSACHUSETTS

May 8, 2020
RC.52118

Mr. Scott E. Sheehan
66 ABG/CEIE
120 Grenier Street
Hanscom AFB, MA 01731-1910

Ms. Brona Simon
Commonwealth of Massachusetts
Executive Director, Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125-3314

SUBJECT: Hanscom Air Force Base (AFB), Proposed Undertaking –New Generator Building and Electrical Infrastructure Upgrade

Dear Ms. Simon

In accordance with Section 306108 of the National Historic Preservation Act (NHPA) and its implementing regulations at 36 CFR Part 800, the Air Force, Hanscom AFB, is advising you of a proposed undertaking that has the potential to affect historic properties. The undertaking would upgrade electrical infrastructure by consolidating the function of 17 stand-alone generators scattered around the MA Institute of Technology Lincoln Laboratory campus into one consolidated enclosed location. As proposed, the project would consists of the construction of a new building to house up to 5 new 1-megawatt generators, associated switchgear and distribution infrastructure. The new building is proposed in an existing parking lot near the existing electrical building and chilled water plant. Once the project is constructed, the various individual generators would be taken offline as buildings are crossed over to the new units. Most of the work would occur in previously disturbed areas.

The Area of Potential Effect (APE) for this undertaking is defined as the boundaries of the project area including areas were ground disturbance is occurring, staging areas, easements, etc. as well as areas that are being indirectly affected (noise, vibration, etc.) Included at attachment 1 are three figures that provide additional details on the project location and the APE. Included at attachment 2 is the project design document identifying the scope and locations of the new generator building and trenching required for the installation of new electrical infrastructure. No direct impacts to existing facilities are expected to occur as the extent of the new electrical infrastructure would be only to making connections at existing connection points which already exist on the exterior of the facilities.

Hanscom AFB has conducted both archaeological and architectural surveys within the APE and determined no archaeological sites exist in the APE and one building within the APE is eligible for the National Register of Historic Places (NRHP). Building 1332 (formerly designated as 1302FA) was surveyed and evaluated for NRHP eligibility in June 2003. This evaluation,

"Architectural Building and Inventory Survey Hanscom Air Force Base Volume II", on file in your office, determined that the facility was eligible for listing in the NRHP. Archaeological surveys of Hanscom AFB between 1998 and 2007 have identified 11 areas of archaeological sensitivity on Hanscom AFB. None of these surveys have identified any potential archaeological sensitivity near the APE. However, as is standard with all Hanscom AFB projects, the Air Force will incorporate provisions into the design and execution of the project to address any inadvertent discovery of archaeological resources.

Hanscom AFB has reviewed the Criteria of Adverse Effect and have determined that none apply to the activities that would be carried out in this undertaking. As such, the Air Force has determined that there would be no adverse effect to historic properties by implementing to proposed action.

We request your comment and/or concurrence on the finding of *No Adverse Effect* within 30 days from receipt of this letter. Please feel free to contact me via e-mail at scott.sheehan.1@us.af.mil or at (781) 225-6144 with any questions or if you need additional information.

Sincerely,

Scott E. Sheehan

SCOTT E. SHEEHAN, GS-12, DAF
Hanscom AFB Cultural Resources Manager

2 Attachments:
1. Project Location and APE Figures
2. Project Design Document

cc:
Lexington Historical Commission

CONCURRENCE: Brona Simon
6/9/20
BRONA SIMON
STATE HISTORIC
PRESERVATION OFFICER
MASSACHUSETTS
HISTORICAL COMMISSION

RC.52118

APPENDIX A21

Follow-up Email to Mashpee Wampanoag Tribe

SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE

From: SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE
Sent: Tuesday, January 12, 2021 1:36 PM
To: 106Review@mwtribe-nsn.gov; David.Weeden@mwtribe-NSN.gov
Cc: O'BRIEN, TAYLOR M GS-12 USAF AFMC 66 ABG/CEIE
Subject: FW: Hanscom AFB - New Generator Building Proposed for MIT LL (Section 106)
Attachments: 2019-0501-10 - Gen Bldg 1 EA Section 106.pdf
Signed By: scott.sheehan.1@us.af.mil

Dear Mr. Weeden,

We wanted to follow up with you to see if you had any input or concerns with the proposed project at Hanscom AFB. If you wish to provide input, please let me know

Kind regards,

//signed//
SCOTT E. SHEEHAN, GS-12, DAF
Environmental Engineer, 66 ABG/CEIE
Phone – 781.367.7168

From: SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE
Sent: Thursday, May 07, 2020 7:03 PM
To: 106Review@mwtribe-nsn.gov; David.Weeden@mwtribe-NSN.gov
Cc: WELCH, RENATA N NH-03 USAF AFMC 66 ABG/CEIE <renata.welch@us.af.mil>; ROBERTSON, RANDY K NH-04 USAF AFMC 66 ABG/XP <randy.robertson.4@us.af.mil>; O'BRIEN, TAYLOR M GS-12 USAF AFMC 66 ABG/CEIE <taylor.obrien@us.af.mil>; Ng, Tayson <Tayson.Ng@stvinc.com>
Subject: Hanscom AFB - New Generator Building Proposed for MIT LL (Section 106)

Dear Mr. Weeden,

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) to evaluate potential environmental impacts associated with a Proposed Action to construct a new generator building and associated electrical upgrades on Hanscom Air Force Base (HAFB) to support future research and development activities of Massachusetts Institute of Technology Lincoln Laboratory (MIT LL). We are preparing an Environmental Assessment (EA) to evaluate the potential impacts of such an undertaking and expect to publish it in late 2020. Attached is a scoping letter with additional information, which we have sent to your office in hardcopy, initiating Government to Government Section 106 consultation. We are providing this email copy to you as a courtesy. With this letter, we seek input on the proposed action in order to assist the Air Force in fully developing the range of issues to consider. If you choose to provide input, we ask that you respond within 30 days from the receipt of this letter. If you have any questions or need any additional information, please do not hesitate to contact me or our National Environmental Policy Act (NEPA) Program Manager, Mr. Taylor O'Brien, at (781) 225-6150 or at taylor.obrien@us.af.mil.

Kind regards,

//signed//

SCOTT E. SHEEHAN, GS-12, DAF
Hanscom AFB Cultural Resources Manager
66 ABG/CEIE
120 Grenier Street, B1825
Hanscom AFB. MA 01731-1910
Commercial 781.225.6144

APPENDIX A22

Follow-up Email to Wampanoag Tribe of Gay Head (Aquinnah)

SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE

From: SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE
Sent: Tuesday, January 12, 2021 1:40 PM
To: bettina@wampanoagtribe.net
Cc: O'BRIEN, TAYLOR M GS-12 USAF AFMC 66 ABG/CEIE
Subject: FW: Hanscom AFB - New Generator Building Proposed for MIT LL (Section 106)
Attachments: 2019-0501-11 - Gen Bldg 1 EA Section 106.pdf
Signed By: scott.sheehan.1@us.af.mil

Dear Ms. Washington,

We wanted to follow up with you to see if you had any input or concerns with the proposed project at Hanscom AFB. If you wish to provide input, please let me know.

Kind regards,

//signed//
SCOTT E. SHEEHAN, GS-12, DAF
Environmental Engineer, 66 ABG/CEIE
Phone – 781.367.7168

From: SHEEHAN, SCOTT E GS-12 USAF AFMC 66 ABG/CEIE
Sent: Thursday, May 07, 2020 7:10 PM
To: bettina@wampanoagtribe.net
Cc: ROBERTSON, RANDY K NH-04 USAF AFMC 66 ABG/XP <randy.robertson.4@us.af.mil>; WELCH, RENATA N NH-03 USAF AFMC 66 ABG/CEIE <renata.welch@us.af.mil>; O'BRIEN, TAYLOR M GS-12 USAF AFMC 66 ABG/CEIE <taylor.obrien@us.af.mil>; Ng, Tayson <Tayson.Ng@stvinc.com>
Subject: Hanscom AFB - New Generator Building Proposed for MIT LL (Section 106)

Dear Ms. Washington,

The United States Air Force (USAF) is preparing an Environmental Assessment (EA) to evaluate potential environmental impacts associated with a Proposed Action to construct a new generator building and associated electrical upgrades on Hanscom Air Force Base (HAFB) to support future research and development activities of Massachusetts Institute of Technology Lincoln Laboratory (MIT LL). We are preparing an Environmental Assessment (EA) to evaluate the potential impacts of such an undertaking and expect to publish it in late 2020. Attached is a scoping letter with additional information, which we have sent to your office in hardcopy, initiating Government to Government Section 106 consultation. We are providing this email copy to you as a courtesy. With this letter, we seek input on the proposed action in order to assist the Air Force in fully developing the range of issues to consider. If you choose to provide input, we ask that you respond within 30 days from the receipt of this letter. If you have any questions or need any additional information, please do not hesitate to contact me or our National Environmental Policy Act (NEPA) Program Manager, Mr. Taylor O'Brien, at (781) 225-6150 or at taylor.obrien@us.af.mil.

Kind regards,

//signed//

SCOTT E. SHEEHAN, GS-12, DAF
Hanscom AFB Cultural Resources Manager
66 ABG/CEIE
120 Grenier Street, B1825
Hanscom AFB. MA 01731-1910
Commercial 781.225.6144

APPENDIX A23

Email from United States Department of the Interior, Fish and Wildlife Service

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To: October 27, 2021
Consultation Code: 05E1NE00-2020-SLI-2903
Event Code: 05E1NE00-2022-E-01049
Project Name: MIT-LL/Generator Bldg #1

Subject: Updated list of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2020-SLI-2903
Event Code: Some(05E1NE00-2022-E-01049)
Project Name: MIT-LL/Generator Bldg #1
Project Type: DEVELOPMENT
Project Description: The purpose of the Proposed Action is to provide a reliable source of redundant backup electrical power, allowing MIT LL to accomplish their mission without disruption to workflow. The Proposed Action is to construct Generator Building 1 at MIT LL, consolidating backup power capacity in the northern industrial area of the MIT LL complex, near the primary electric service, which would eliminate odor and particulate risk to several sensitive research areas by allowing the decommissioning of the 16 smaller generators located throughout the campus. The generator building would consist of three 1,000-kW backup diesel generators with space to add an additional two 1,000-kW diesel generators. The generators would comply with U.S. Environmental Protection Agency (EPA) Tier-4 Final Standard to satisfy federal standards for non-emergency operation and have been permitted by MassDEP for 500 hours of non-emergency operation annually for each generator. The Proposed Action would include construction of a new building to house the generators, automatic transfer switch(s), and the switch gear, and would provide radial feeds from the generators to buildings that require critical backup power.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.46022923179106,-71.26641173781613,14z

Counties: Middlesex County, Massachusetts

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

APPENDIX B

Notice of Availability

PUBLIC NOTICE

NOTICE OF AVAILABILITY

DRAFT ENVIRONMENTAL ASSESSMENT AND

PROPOSED FINDING OF NO SIGNIFICANT IMPACT

FOR GENERATOR BUILDING 1 AT MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT) LINCOLN LABORATORY (LL) AT HANSCOM AIR FORCE BASE (AFB), MASSACHUSETTS (MA)

The U.S. Air Force announces the availability of a draft Environmental Assessment and Finding of No Significant Impact for the Generator Building 1 project at MIT LL on Hanscom AFB.

MIT LL's mission is to apply advanced technology to problems of national security that involve research and development activities, with a focus on long-term technology development. MIT LL's prime contract implies an obligation to provide backup electrical power to protect critical research, in addition to recognized life/safety, building control systems, and security requirements.

The purpose of the Proposed Action is to provide a reliable source of redundant backup electrical power, allowing MIT LL to accomplish their mission without disruption to workflow. The Proposed Action will also maintain critical research, security, and building operations functions without interruption during periods of commercial power interruption and during scheduled maintenance of key electrical infrastructure. The Proposed Action is needed to provide a more reliable source of backup electrical power because backup power is currently supplied by the combination of stationary and mobile emergency backup generators located throughout the MIT LL campus. The current emergency generators are well past their useable life and require excessive maintenance due to their age, and have limited parts availability, affecting maintenance and repair and thus jeopardize the ability of MIT LL to protect and conduct critical research during periods of commercial power interruption. The preferred alternative would involve the construction of a new generator building (Generator Building 1) at MIT LL on Hanscom AFB on land the Air Force intends to lease to MIT LL, and the decommissioning of 16 aging and difficult to maintain generators with declining reliability currently in use at MIT LL. The preferred alternative would also include establishing easements to allow MIT LL to install concrete duct banks containing 12 independent electrical feeders to distribute electricity from the generator building to the supported buildings on the MIT LL campus.

The EA, prepared in accordance with the National Environmental Policy Act, Council on Environmental Quality regulations, and Air Force instructions implementing NEPA evaluates potential impacts of the Proposed Action and alternatives on the environment including the No Action Alternative.

Based on this analysis, the Air Force has prepared a proposed FONSI. The Air Force seeks public comments on the draft EA and draft FONSI and will consider all input received before reaching a final decision.

Copies of the Draft EA and Draft FONSI are available for review and can be downloaded at the following internet link:

https://www.hanscom.af.mil/About-Us/Fact-Sheets/Display/Article/379486/civil-engineering.

Civil engineering officials recommend individuals without internet access visit a local library or city hall for assistance in downloading the document. Requests for hardcopies will be considered on a case-by-case basis.

The Air Force is aware of the potential impact of the ongoing coronavirus pandemic on the usual methods of access to information and ability to communicate, such as the closure of local public libraries and challenges with internet access. The Air Force seeks to implement appropriate measures to ensure that the public and all interested stakeholders have the opportunity to participate fully in this Environmental Assessment process. Accordingly, do not hesitate to contact civil engineers directly at the email address or telephone number provided. Officials are available to discuss and help resolve issues involving access to the draft EA and proposed FONSI, or the ability to comment.

For further information, contact the Environmental Office at Hanscom AFB at 978-835-5895.

Written comments will be received through January 15, 2022 and may be either emailed to Jim Maravelias at james.maravelias@us.af.mil or mailed to: 66 ABG/CEIE; 120 Grenier Street; Hanscom AFB, MA 01731-1910.

PRIVACY ADVISORY NOTICE

Public comments on this Draft EA are requested pursuant to NEPA, 42 United States Code 4321, et seq. All comments received during the comment period will be made available to the public and considered during the final EA preparation. Providing private address information with your comment is voluntary and such personal information will be kept confidential unless release is required by law. However, address information will be used to compile the project mailing list and failure to provide it will result in your name not being included on the mailing list.

APPENDIX C

Supporting Documents

APPENDIX C1

Air Quality Plan Approval

MassDEP
Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Kathleen A. Theoharides
Secretary

Martin Suuberg
Commissioner

November 5, 2019
Charles S. Anderson
MIT Lincoln Laboratory
244 Wood Street
Hanscom AFB
Lexington, MA 02173

RE: LEXINGTON
Application No.: NE-19-014
Authorization No. AQ02F-0000042
Class: *SM79-7*
FMF No.: 131532
Authorization Type: Plan Approval

Dear Mr. Anderson:

The Massachusetts Department of Environmental Protection (MassDEP), Bureau of Air and Waste, has reviewed your Non-major Comprehensive Plan Application (Application) listed above. This Application concerns the proposed construction, and/or operation of three 1,000 kilowatt (kW) ultra-low sulfur diesel (ULSD) fired, Reciprocating Internal Combustion Engines (RICE) at MIT Lincoln Laboratory located at 244 Wood Street in Lexington, Massachusetts (Facility). The three proposed new RICE, identified as Emission Unit (EU) Nos. GC1-EGEN001, GC1-EGEN002, and GC1-EGEN003, will replace seventeen existing ULSD-fired RICE at the Facility as part of its Facilities Modernization Plan Project (Project). The Application bears the seal and signature of Eric Pearson, Massachusetts Registered Professional Engineer Number 39741.

This Application was submitted in accordance with 310 CMR 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 "Air Pollution Control" regulations adopted by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-O, Chapter 21C, Section 4 and 6, and Chapter 21E, Section 6. MassDEP's review of your Application has been limited to air pollution control regulation compliance and does not relieve you of the obligation to comply with any other regulatory requirements.

MassDEP has determined that the Application is administratively and technically complete and that the Application is in conformance with the Air Pollution Control regulations and current air pollution control engineering practice, and hereby grants this **Plan Approval** for said Application, as submitted, subject to the conditions listed below.

Please review the entire Plan Approval, as it stipulates the conditions with which the Facility owner/operator (Permittee) must comply in order for the Facility to be operated in compliance with this Plan Approval.

On October 2, 2019, a public notice was published on the MassDEP website for public review and comment on the proposed Non-Major Comprehensive Plan Approval. The comment period ended on November 4, 2019. No comments were submitted.

1. DESCRIPTION OF FACILITY AND APPLICATION

MIT Lincoln Laboratory conducts research and development including government sponsored defense projects such as air and missile defense, space surveillance technology, tactical systems, biological and chemical defense, and homeland security. Non-defense projects conducted at the Facility include the fields of air-traffic control and safety, weather surveillance, and space science missions. The Facility's research and development takes projects from the initial concept stage, through simulation and analysis, to design and prototyping, and finally to field demonstration.

MassDEP issued Plan Approval No. NE-14-009 in June of 2015 for the purpose of the consolidation of previously issued Plan Approvals for the Facility. In said 2015 Plan Approval, the facility-wide emissions were restricted below major source thresholds for nitrogen oxides (NO_X), carbon monoxide (CO), volatile organic compounds (VOC), hazardous air pollutants (HAP), particulate matter (PM), and sulfur dioxides (SO_2). As such the Facility is considered a minor source of air emissions. It is advised that the Permittee file a Consolidated Plan Approval Application with MassDEP to clarify applicable emission limits and requirements from previously issued Plan Approval(s) in conjunction with those contained in the subject Approval.

The Permittee has proposed to install and operate three 1.0 megawatt electrical output (MW_e), Cummins Tier 4-certified, compression ignition Reciprocating Internal Combustion Engines (RICE) with associated generator sets as replacements for seventeen existing RICE at the Facility. It is expected that each proposed new RICE will be operated for up to 500 hours per consecutive twelve month period for non-emergency purposes as well as unrestricted operation during emergency situations. The Permittee has proposed to operate any of the three proposed RICE for longer than 500 hours per consecutive twelve month period in non-emergency use, provided that the total non-emergency run time for all three proposed RICE, combined, shall at no time exceed 1,500 hours per any consecutive twelve month period. Non-emergency usage is expected to include: providing electrical backup power for planned maintenance shutdowns and participating in forward capacity and demand management programs.

The three proposed Cummins diesel engine-generator sets are certified for conformance with the United States Environmental Protection Agency (EPA) Tier 4 final emission standards per 40 CFR 60, Subpart IIII and 40 CFR 1039 and use after treatment emissions controls consisting of Selective Catalytic Reduction for control of Nitrogen Oxides (NO_X) and a diesel particulate filter for control of particulate matter (PM) emissions.

Sound Suppression Equipment, Sound Modeling, and Sound Monitoring:

Operation of the proposed equipment will result in sound emissions that may cause a condition of air pollution due to noise. The Application describes the proposed sound emitting equipment and associated sound suppression and sound transmission prevention features:

All three of the proposed EUs will be located within a single building to be constructed on the Facility property. The North, West and South facing walls of said building will be constructed of solid concrete at the bottom portions with acoustical louvers on the top. The East facing wall will be constructed with a combination of solid concrete on the top and acoustical louvers on the bottom portion. Said concrete wall construction is rated with a Sound Transmission Class (STC) of 50 dB(A) and the acoustical louvers have a rating of up to STC 13. The manufacturer exhaust after-treatment will provide 25 dBA of overall reduction. Should any change be made to the wall structure at any time, the Permittee shall conduct a sound survey (Table 3, Condition 9).

The Permittee conducted background sound level monitoring and established the ambient sound levels at two locations of interest based on these measurements. The Permittee provided modeled predicted sound impacts from the measured ambient sound levels and project sound emissions. The monitoring program was performed for an approximately twenty-four hour period from July 31 through August 1, 2018. Said modeling was performed using the Cadna-A computer sound modeling program. Table A summarizes the predicted sound levels at the following locations, for all three proposed engines operating simultaneously at full load:

Table A

Sound Modeling Locations	Lowest Background Sound Level (L_{90}, dBA)[1]	Predicted Maximum Sound Level from Project (dBA)	Total Predicted sound Level (dBA)	Predicted Sound Level Change (dBA)
Location 1[2]	53	60	61	+8.0
Location 2[3]	57	44	57	+0.0

Notes:

1. The lowest background A-weighted sound levels in decibels (dBA) observed during either daytime or nighttime where the noise level is exceeded 90 percent of the time (L_{90})
2. Location 1: Nearest property line – at Hartwell Gate, Northwest of proposed engines' location
3. Location 2: Nearest residential use location, Wood Street - East of proposed engines' location

Based on review of the engineering design of the Facility including sound mitigation measures and predicted Project sound level impacts, MassDEP has determined that the Project incorporates sound suppression and sound transmission prevention elements that constitute necessary equipment, service and maintenance, and necessary precautions to prevent unnecessary sound emissions, as required by 310 CMR 7.10.

After the approved equipment commences operation, the Permittee shall conduct a sound survey (Table 3, Condition 9). The sound survey shall be performed in accordance with a protocol to have been reviewed and approved by MassDEP.

Applicable Regulatory Requirements

New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAPS)

The three proposed new 1.111 MW mechanical output (MW_m) Cummins Model Number QST30-G17 diesel fired stationary compression ignition RICE are subject to federal regulation under NSPS at 40 CFR Part 60, Subpart IIII and under NESHAPS at 40 CFR Part 63, Subpart ZZZZ. These engines satisfy the NESHAPs requirements by meeting the applicable requirements in 40 CFR 60, Subpart IIII. There are no other applicable requirements in 40 CFR Part 63 for these engines in accordance with 40 CFR §63.6590(c)(1).

Nonattainment New Source Review (NNSR) and Prevention of Significant Deterioration of Air Quality (PSD)

As described above, MIT Lincoln Laboratory is not a major stationary source as defined in 310 CMR 7.00 Appendix A and 40 CFR 52.21(b) and the maximum potential emissions from the Project will be less than the significant emissions thresholds pertaining to these regulations. As such, the Facility shall remain a minor source of air emissions and is not subject to NNSR or PSD review for this Project.

Best Available Control Technology (BACT) Analysis

The Massachusetts Air Regulations require that BACT be applied for any source requiring plan approval under 310 CMR 7.02. In lieu of performing a top-down BACT assessment for the Project, Top-Case BACT may be proposed as referenced in 310 CMR 7.02(8)(a)2a. The proposed three new engines shall be equipped with Selective Catalytic Reduction (SCR) for control of NO_X as well as Diesel Particulate Filters (DPF) for the control of particulate matter (PM). For determining Top-Case BACT under 310 CMR 7.02(8)(a)2.a, the Permittee relied on recent MassDEP-permitting and cited the Williams College Plan Approval, No. WE-17-003, which allows for up to 500 hours of non-emergency usage per consecutive twelve month period for proposed new engines. The Permittee has shown that for all criteria pollutants of concern with the exception of CO, emission rates in pounds per megawatt-hour (lb/MWh) from the proposed three new RICE are equal to or less than those described in the recently-issued Williams College Approval, No. WE-17-003. The Permittee documented, via a Top-Down BACT analysis, that the emission limits for CO represent BACT for the Project. Per MassDEP recommendations the pound per hour emissions limits for CO, NO_X, and PM reflect the "Potential Site Variation" values from the engine manufacturer for 100 percent load.

2. EMISSION UNIT IDENTIFICATION

Each Emission Unit ("EU") identified in Table 1 is subject to and regulated by this Plan Approval:

Table 1

EU	Description	Design Capacity	Pollution Control Device (PCD)
GC1-EGEN001	Cummins Model QST30-G17, Tier 4F- Certified ULSD-Fired CI Engine	9.9 MMBtu/hr heat input 1.111 MW output$_{(mechanical)}$ 1.0 MW output$_{(electrical)}$	Selective Catalytic Reduction, Diesel Particulate Filter
GC1-EGEN002	Cummins Model QST30-G17, Tier 4F- Certified ULSD-Fired CI Engine	9.9 MMBtu/hr heat input 1.111 MW output$_{(mechanical)}$ 1.0 MW output$_{(electrical)}$	Selective Catalytic Reduction, Diesel Particulate Filter
GC1-EGEN003	Cummins Model QST30-G17, Tier 4F- Certified ULSD-Fired CI Engine	9.9 MMBtu heat input 1.111 MW output$_{(mechanical)}$ 1.0 MW output$_{(electrical)}$	Selective Catalytic Reduction, Diesel Particulate Filter

Table 1 Key:
EU = Emission Unit Number
CI = Compression Ignition
MW = 1,000,000 watts
ULSD = Ultra Low Sulfur Diesel
MMBtu/hr = 1,000,000 British Thermal Units Per Hour

3. APPLICABLE REQUIREMENTS

A. OPERATIONAL, PRODUCTION and EMISSION LIMITS

The Permittee is subject to, and shall not exceed the Operational, Production, and Emission Limits as contained in Table 2:

Table 2

EU	Operational / Production Limit	Air Contaminant	Emission Limit[1,2]		
			lbs/MWh	lbs/hr, each unit	TPY, Project total[4]
GC1-EGEN001, GC1-EGEN002, GC1-EGEN003	1. ULSD[3] shall be the only fuel fired. ≤ 1,500 hours per consecutive 12-month period for **non-emergency** purposes, **total for all three EUs** 2. As specified in 40 CFR Part 60.4211(c), each engine must be installed and configured according to the manufacturer's emission related specifications.	NO_X	1.63	1.80	1.82[5]
		CO	3.62	3.98	2.99
		VOC	0.208	0.229	0.171
		$PM/PM_{10}/PM_{2.5}$	0.001	0.0016	0.0012
		SO_2	0.007	0.008	0.006
		CO_2	1,457	1619	1214
		NH_3[7]	0.085	0.094	0.070
		HAP[6]	0.0013	0.0014	0.001
		Smoke and Opacity	Not to exceed 10% opacity during normal operation. Comply with 310 CMR 7.06(1) (a) and (b) during start-up and shut down.		

Table 2 Notes:

1: The lbs/MWh emission limits are based on the power output (mechanical) of the engine.
2: The lb/MWh and lbs/hr emission limits do not apply during the first 11 minutes after start-up.
3: ULSD shall have a sulfur content that does not exceed 0.0015% by weight.
4: The TPY emission limits are for all three engines, combined, and apply only for periods of operation for non-emergency purposes.
5: TPY NO_X emission limit includes an allowance for 149 cold start-ups per consecutive twelve month period, for each engine, during which NOx emissions will be higher than when the SCR has attained its operational temperature of 428 ^{0}F. There is no limit on the number of cold start-ups.
6. Nominal NH_3 emission rate is 10 ppm@ 15% O_2 based on EPA guidance for average emissions from Tier 4 engine utilizing SCR NOx controls over test cycles. PSV for NH_3 is estimated as 1.2 times nominal.
7: PSV for HAP is estimated as 2 times nominal Cummins data for formaldehyde, the prevalent HAP in engine exhaust.

Table 2 Key:

EU = Emission Unit Number
CFR = Code of Federal Regulations
CMR = Code of Massachusetts Regulations
CO = Carbon Monoxide
lbs/MWh = pounds per Megawatt-hour
NH_3 = Ammonia
NO_x = Nitrogen Oxides
PM = Total Particulate Matter
PM_{10} = Particulate Matter less than or equal to 10 microns in diameter
$PM_{2.5}$ = Particulate Matter less than or equal to 2.5 microns in diameter
EPA = United States Environmental Protection Agency
CO_2 = Carbon Dioxide
HAP = Hazardous Air Pollutant(s), as listed in the 1990 Clean Air Act (CAA) Amendments, Section 112(b).
lbs/hr = pounds per hour
SO_2 = Sulfur Dioxide
VOC = Volatile Organic Compound(s)
TPY = tons per consecutive 12-month period
ULSD = Ultra Low Sulfur Diesel
≤ = less than or equal to
% = percent
SCR = Selective Catalytic Reduction
PSV = Potential Site Variation

B. COMPLIANCE DEMONSTRATION

The Permittee is subject to, and shall comply with, the monitoring, testing, record keeping, and reporting requirements as contained in Tables 3, 4, and 5:

Table 3

EU	Monitoring and Testing Requirements
GC1-EGEN001, GC1-EGEN002, GC1-EGEN003	1. The Permittee shall install and operate, on each engine, a non-resettable hour meter to monitor run hours for each month and each consecutive twelve-month period.
	2. The Permittee shall monitor fuel use in each engine for each month and each consecutive twelve-month period.
	3. The Permittee shall monitor the power output in megawatts (electrical) of each emission unit for each run hour.
	4. The Permittee shall perform inspections of the subject engines and control equipment as recommended by the manufacturer.
	5. The Permittee shall monitor fuel oil purchases such that only fuel oil containing a sulfur content no greater than 0.0015 percent by weight is purchased for use in each unit.
	6. The Permittee shall monitor sulfur content of each new shipment of fuel oil received. Sulfur content of the fuel can be demonstrated through fuel analysis by the Permittee or by the fuel Transporter or Supplier or by a certification from the fuel Supplier. The analysis of sulfur content of the fuel shall be in accordance with the applicable American Society for Testing Materials (ASTM) test methods or any other method approved by the MassDEP and EPA. Fuel sulfur information may be provided by fuel suppliers.
	7. The Permittee shall test the SCR catalyst, as specified by the manufacturer's recommendation, in order to ensure proper operation of the SCR control system.
	8. The Permittee shall monitor engine operation including but not limited to the date, run time, and purpose (i.e. non-emergency, maintenance, testing, emergency) to demonstrate compliance with the operating hour restrictions in Table 2.
	9. The Permittee shall conduct a sound survey during daytime and nighttime operations in accordance with a MassDEP-approved protocol. The survey shall be conducted within 120 days of the commencement of operation or modification to the building's concrete walls.
	10. The Permittee shall monitor all operations to ensure sufficient information is available to comply with 310 CMR 7.12 Source Registration.
	11. If and when MassDEP requires it, the Permittee shall conduct emission testing in accordance with EPA Reference Test Methods and Regulation 310 CMR 7.13.
	12. At least 30 days prior to emission testing, the Permittee shall submit to MassDEP for approval a stack emission pretest protocol.
	13. Within 45 days after emission testing, the Permittee shall submit to MassDEP a final stack emission test results report.

Table 3 Key:
CMR = Code of Massachusetts Regulations
EU = Emission Unit Number
EPA = United States Environmental Protection Agency
SCR = Selective Catalytic Reduction

Table 4	
EU	**Record Keeping Requirements**
GC1-EGEN001, GC1-EGEN002, GC1-EGEN003	1. The Permittee shall maintain a copy of the EPA Certificate of Conformity with the NSPS and manufacturer's requirements for Tier 4 certification and the unit-Specific Operation and Maintenance Procedures for the engines.
	2. The Permittee shall, for each engine, maintain a record to document monthly and consecutive twelve-month period hours of operation and the purpose (i.e. non-emergency, maintenance, testing, emergency) for each period of operation.
	3. The Permittee shall for each engine, maintain a record of the fuel consumed for each month and consecutive twelve-month period.
	4. The Permittee shall maintain records of fuel purchases and oil analysis results or fuel supplier certifications used to demonstrate compliance with fuel oil sulfur content requirements.
	5. The Permittee shall maintain adequate records on-site to demonstrate compliance status with all operational, production, and emission limits contained in Table 2 above. Records shall also include the calculated actual emissions of air contaminant(s) emitted for each calendar month and for each consecutive twelve-month period (current month plus prior eleven months). These records shall be compiled no later than the 15th day following each month. An electronic version of the MassDEP approved record keeping form, in Microsoft Excel format, can be downloaded at http://www.mass.gov/eea/agencies/massdep/air/approvals/limited-emissions-record-keeping-and-reporting.html#WorkbookforReportingOn-SiteRecordKeeping.
	6. The Permittee shall maintain records of monitoring and testing as required by Table 3.
	7. The Permittee shall maintain a copy of this Plan Approval, underlying Application and the most up-to-date SOMP for the EU(s) and PCD(s) approved herein on-site.
	8. The Permittee shall maintain a record of routine maintenance activities performed on the approved EU(s), PCD(s) and monitoring equipment. The records shall include, at a minimum, the type or a description of the maintenance performed and the date and time the work was completed.
	9. The Permittee shall maintain a record of all malfunctions affecting air contaminant emission rates on the approved EU(s), PCD(s) and monitoring equipment. At a minimum, the records shall include: date and time the malfunction occurred; description of the malfunction; corrective actions taken; the date and time corrective actions were initiated and completed; and the date and time emission rates and monitoring equipment returned to compliant operation.
	10. The Permittee shall maintain records to ensure sufficient information is available to comply with 310 CMR 7.12 Source Registration.
	11. The Permittee shall maintain records required by this Plan Approval on-site for a minimum of five (5) years.
	12. The Permittee shall make records required by this Plan Approval available to MassDEP and EPA personnel upon request.

Table 4 Key:
EU = Emission Unit Number
SOMP = Standard Operating and Maintenance Procedure
NSPS = New Source Performance Standards
PCD = Pollution Control Device
EPA = United States Environmental Protection Agency

Table 5	
EU	**Reporting Requirements**
GC1-EGEN001, GC1-EGEN002, GC1-EGEN003	1. The Permittee shall notify this Office (attn.: AQ Permit Chief), in writing, within 14 days of commencement of operation of the subject EUs.
	2. The Permittee shall submit the Final Standard Operating and Maintenance Procedures (SOMP) for the subject EUs to this Office (attn.: AQ Permit Chief) within 60 days of commencement of operation of the subject EUs. Any subsequent changes to the SOMP shall be submitted to this Office (attn: AQ Permit Chief), within 15 days of said revision(s).
Facility-wide	3. The Permittee shall provide a copy to MassDEP of any record required to be maintained by this Plan Approval within 30 days from MassDEP's request.
	4. The Permittee shall submit to MassDEP all information required by this Plan Approval over the signature of a "Responsible Official" as defined in 310 CMR 7.00 and shall include the Certification statement as provided in 310 CMR 7.01(2)(c).
	5. The Permittee shall notify the Northeast Regional Office of MassDEP, BAW Permit Chief by telephone: 978-694-3289, email: edward.braczyk@mass.gov and NERO.Air@mass.gov, or fax : 978-694-3499, as soon as possible, but no later than three (3) business days after discovery of an exceedance(s) of Table 2 requirements. A written report shall be submitted to this Office (attn.: Permit Chief), within ten (10) business days thereafter and shall include: identification of exceedance(s), duration of exceedance(s), reason for the exceedance(s), corrective actions taken, and action plan to prevent future exceedance(s).
	6. The Permittee shall report annually to MassDEP, in accordance with 310 CMR 7.12, all information as required by the Source Registration/Emission Statement Form. The Permittee shall note therein any minor changes which did not require Plan Approval, but are required under 310 CMR 7.02(2)(e), 7.03(5), 7.26 (etc.) to be reported with the Source Registration.

Table 5 Key:
EU = Emission Unit Number
CMR = Code of Massachusetts Regulations

4. SPECIAL TERMS AND CONDITIONS

A. The Permittee is subject to, and shall comply with, the Special Terms and Conditions as contained in Table 6 below:

Table 6	
EU	**Special Terms and Conditions**
GC1-EGEN001, GC1-EGEN002, GC1-EGEN003	1. The Permittee has indicated that the proposed Reciprocating Internal Combustion Engines are subject to 40 CFR 60 Subpart IIII – *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines* and 40 CFR 63 Subpart ZZZZ – *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*. Since MassDEP has not accepted delegation for Subparts IIII or ZZZZ for facilities such as this, the Permittee is advised to consult with EPA for additional information regarding applicable requirements that may apply to the Facility. EPA's address is: US EPA Region 1, 5 Post Office Square – Suite 100, Boston, MA 02109-3912, attention: Susan Lancey.

Table 6	
EU	**Special Terms and Conditions**
GC1-EGEN001, GC1-EGEN002, GC1-EGEN003	2. Sound impacts shall not exceed 10 dB(A) above background and shall not cause a pure tone condition as defined in the Division of Air Quality Control Noise Policy No. 90-001.
Facility-wide	3. Any prior applicable Plan Approvals issued under 310 CMR 7.02 shall remain in effect unless specifically changed or superseded by this Plan Approval.

Table 6 Key:
EPA = United States Environmental Protection Agency
CFR = Code of Federal Regulations
dB(A) = Decibels measured using A-weighted system
EU = Emission Unit Number

B. The Permittee shall install and use an exhaust stack, as required in Table 7, on each of the Emission Units that is consistent with good air pollution control engineering practice and that discharges so as to not cause or contribute to a condition of air pollution. Each exhaust stack shall be configured to discharge the gases vertically and shall not be equipped with any part or device that restricts the vertical exhaust flow of the emitted gases, including, but not limited to, rain protection devices known as "shanty caps" and "egg beaters."

C. The Permittee shall install and utilize exhaust stacks with the following parameters, as contained in Table 7, for the Emission Units that are regulated by this Plan Approval:

Table 7				
EU	**Stack Height Above Ground** *(feet)*	**Stack Inside Exit Diameter** *(feet)*	**Stack Gas Exit Velocity Range**[1] *(feet per second)*	**Stack Gas Exit Temperature Range**[1] *(Degrees Fahrenheit)*
GC1-EGEN001	42	1.52	70	890
GC1-EGEN002	42	1.52	70	890
GC1-EGEN003	42	1.52	70	890

Table 7 Notes
1: The stack gas exit velocity and temperature ranges are based on operating conditions. These are not monitored parameters.
Table 7 Key:
EU = Emission Unit Number

5. GENERAL CONDITIONS

The Permittee is subject to, and shall comply with, the following general conditions:

A. Pursuant to 310 CMR 7.01, 7.02, 7.09 and 7.10, should any nuisance condition(s), including but not limited to smoke, dust, odor or noise, occur as the result of the operation of the Facility, then the Permittee shall immediately take appropriate steps including shutdown, if necessary, to abate said nuisance condition(s).

B. If asbestos remediation/removal will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that all removal/remediation of asbestos shall be done in accordance with 310 CMR 7.15 in its entirety and 310 CMR 4.00.

C. If construction or demolition of an industrial, commercial or institutional building will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that said construction or demolition shall be done in accordance with 310 CMR 7.09(2) and 310 CMR 4.00.

D. Pursuant to 310 CMR 7.01(2)(b) and 7.02(7)(b), the Permittee shall allow MassDEP and / or USEPA personnel access to the Facility, buildings, and all pertinent records for the purpose of making inspections and surveys, collecting samples, obtaining data, and reviewing records.

E. This Plan Approval does not negate the responsibility of the Permittee to comply with any other applicable Federal, State, or local regulations now or in the future.

F. Should there be any differences between the Application and this Plan Approval, the Plan Approval shall govern.

G. Pursuant to 310 CMR 7.02(3)(k), MassDEP may revoke this Plan Approval if the construction work is not commenced within two years from the date of issuance of this Plan Approval, or if the construction work is suspended for one year or more.

H. This Plan Approval may be suspended, modified, or revoked by MassDEP if MassDEP determines that any condition or part of this Plan Approval is being violated.

I. This Plan Approval may be modified or amended when in the opinion of MassDEP such is necessary or appropriate to clarify the Plan Approval conditions or after consideration of a written request by the Permittee to amend the Plan Approval conditions.

J. Pursuant to 310 CMR 7.01(3) and 7.02(3)(f), the Permittee shall comply with all conditions contained in this Plan Approval. Should there be any differences between provisions contained in the General Conditions and provisions contained elsewhere in the Plan Approval, the latter shall govern.

6. MASSACHUSETTS ENVIRONMENTAL POLICY ACT

MassDEP has determined that the filing of an Environmental Notification Form (ENF) with the Secretary of Energy & Environmental Affairs, for air quality control purposes, was not required prior to this action by MassDEP. Notwithstanding this determination, the Massachusetts Environmental Policy Act (MEPA) and 301 CMR 11.00, Section 11.04, provide certain "Fail-

Safe Provisions," which allow the Secretary to require the filing of an ENF and/or an Environmental Impact Report (EIR) at a later time.

7. APPEAL PROCESS

This Plan Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this Plan Approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts, which are the grounds for the request, and the relief sought. Additionally, the request must state why the Plan Approval is not consistent with applicable laws and regulations.

The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars ($100.00) and a completed Adjudicatory Hearing Fee Transmittal Form, http://www.mass.gov/eea/docs/dep/service/adr/adjherfm.doc must be mailed to:

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

This request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

MassDEP may waive the adjudicatory hearing-filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Should you have any questions concerning this Plan Approval, please contact Susan McConnell by telephone at (978) 694-3292 or in writing at the letterhead address.

Susan McConnell
Permit Writer

Edward J. Braczyk
Acting Permit Chief
Bureau of Air and Waste

copy: Board of Health, Lexington
Fire Department, Lexington
MassDEP - Yi Tian, Ed Braczyk, Martha Bolis, Mary Persky

APPENDIX C2

Air Quality Emissions Calculations

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:

Base: HANSCOM AFB
State: Massachusetts
County(s): Middlesex
Regulatory Area(s): Boston-Lawrence-Worcester (E. MA), MA

b. Action Title: Generator Building 1 - MIT Lincoln Laboratory

c. Project Number/s (if applicable):

d. Projected Action Start Date: 1 / 2021

e. Action Description:

The Proposed Action is to construct Generator Building 1 at MIT LL, consolidating backup power capacity in the northern industrial area of the MIT LL complex, near the primary electric service, which would eliminate odor and particulate risk to several sensitive research areas by allowing the decommissioning of the 16 smaller generators located throughout the campus. The Proposed Action would provide the redundant backup power needed by MIT LL to support uninterrupted critical research, security, and building operations functions during periods of commercial power interruption and during scheduled maintenance of key electrical infrastructure. The backup power would be "N+1", which means that there is power backup in place should any single system component fail.

The Generator Building would consist of three 1,000-kW backup diesel generators with space to add an additional two 1,000-kW diesel generators. The generators would comply with U.S. Environmental Protection Agency Tier-4 Final Standard to satisfy federal standards for nonemergency operation and have been permitted by MassDEP for 500 hours of non-emergency operation annually for each generator. The Proposed Action would include construction of a new building to house the generators, automatic transfer switch(s), and the switch gear, and would provide radial feeds from the generators to buildings that require critical backup power. The generator building would support year-round maintenance and operations and would provide enough sound-suppression to meet UFC 3-450-01 (Noise and Vibration Control), Massachusetts (310 CMR 7.10), and local municipality noise requirements. The Town of Lexington's noise limits (Chapter 80 of the Code of Lexington) are consistent with the MassDEP noise requirements.

f. Point of Contact:

Name: Robbie Gray
Title: Contractor
Organization: Jacobs Engineering
Email: Robbie.gray@jacobs.com
Phone Number: 334-215-9038

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: _____ applicable

AIR CONFORMITY APPLICABILITY MODEL REPORT
RECORD OF CONFORMITY ANALYSIS (ROCA)

__X__ not applicable

Conformity Analysis Summary:

2021

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Boston-Lawrence-Worcester (E. MA), MA			
VOC	0.177	50	No
NOx	0.804	100	No
CO	0.971		
SOx	0.002		
PM 10	0.259		
PM 2.5	0.033		
Pb	0.000		
NH3	0.001		
CO2e	227.0		

2022 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Boston-Lawrence-Worcester (E. MA), MA			
VOC	0.008	50	No
NOx	0.000	100	No
CO	0.000		
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Robbie Gray, Contractor _____ DATE

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: HANSCOM AFB
State: Massachusetts
County(s): Middlesex
Regulatory Area(s): Boston-Lawrence-Worcester (E. MA), MA

- Action Title: Generator Building 1 - MIT Lincoln Laboratory

- Project Number/s (if applicable):

- Projected Action Start Date: 1 / 2021

- Action Purpose and Need:

The purpose of the Proposed Action is to provide a reliable source of redundant backup electrical power, allowing MIT LL to maintain critical research, security, and building operations functions without interruption during normal operations and during scheduled maintenance of key electrical infrastructure.

A reliable source of backup electrical power is needed because backup power is currently supplied by a combination of stationary and mobile emergency backup generators located throughout the MIT LL campus. The existing generators are scattered throughout the campus at locations near supported facilities. The 16 generators range from 60- to 2000-kilowatt (kW) capacity; some have been in service for 30 years and the others are nearing 30 years in service. These generators require excessive maintenance due to their age, and have limited parts availability, affecting maintenance and repair and thus jeopardize the ability of MIT LL to protect and conduct critical research during periods of commercial power interruption.

Therefore, the action is needed to replace the existing 16 generators (which have a combined electrical load of approximately 1,900 kW) with a new, more reliable, and redundant source of backup power. The new backup power source would serve the existing backup load and provide redundant backup power capacity that is currently lacking.

- Action Description:

The Proposed Action is to construct Generator Building 1 at MIT LL, consolidating backup power capacity in the northern industrial area of the MIT LL complex, near the primary electric service, which would eliminate odor and particulate risk to several sensitive research areas by allowing the decommissioning of the 16 smaller generators located throughout the campus. The Proposed Action would provide the redundant backup power needed by MIT LL to support uninterrupted critical research, security, and building operations functions during periods of commercial power interruption and during scheduled maintenance of key electrical infrastructure. The backup power would be “N+1”, which means that there is power backup in place should any single system component fail.

The Generator Building would consist of three 1,000-kW backup diesel generators with space to add an additional two 1,000-kW diesel generators. The generators would comply with U.S. Environmental Protection Agency Tier-4 Final Standard to satisfy federal standards for nonemergency operation and have been permitted by MassDEP for 500 hours of non-emergency operation annually for each generator. The Proposed Action would include construction of a new building to house the generators, automatic transfer switch(s), and the switch gear, and would provide radial feeds from the generators to buildings that require critical backup power. The generator building would support year-round maintenance and operations and would provide enough sound-suppression to meet UFC 3-450-01 (Noise and Vibration Control), Massachusetts (310 CMR 7.10), and local municipality noise requirements. The Town of Lexington’s noise limits (Chapter 80 of the Code of Lexington) are consistent with the MassDEP noise requirements.

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Point of Contact

Name: Robbie Gray
Title: Contractor
Organization: Jacobs Engineering
Email: Robbie.gray@jacobs.com
Phone Number: 334-215-9038

- Activity List:

Activity Type		Activity Title
2.	Construction / Demolition	Generator Building 1 Construction
3.	Tanks	Generator Fuel Tanks

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location

County: Middlesex
Regulatory Area(s): Boston-Lawrence-Worcester (E. MA), MA

- Activity Title: Generator Building 1 Construction

- Activity Description:

The Generator Building would be constructed on the existing paved parking lot adjacent to the Electrical Building on the north side of Schilling Circle across from Building F. The diesel generators would be housed in a new building that measures 58-feet-2-inches by 84-feet. The building would include exhaust vent stacks for each generator. The Generator Building would include individual 3,500-gallon dual-walled, diesel fuel storage tanks for each generator, which would be located inside the building and installed underneath each generator.

- Activity Start Date

Start Month: 1
Start Month: 2021

- Activity End Date

Indefinite: False
End Month: 11
End Month: 2021

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.175929
SO_x	0.002350
NO_x	0.803815
CO	0.971374
PM 10	0.259118

Pollutant	Total Emissions (TONs)
PM 2.5	0.032545
Pb	0.000000
NH_3	0.000689
CO_2e	227.0

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Phase Start Date
Start Month: 1
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 0
Number of Days: 10

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information
Area of Site to be Graded (ft^2): 20039
Amount of Material to be Hauled On-Site (yd^3): 200
Amount of Material to be Hauled Off-Site (yd^3): 0

- Site Grading Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2e

Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2e**
LDGV	000.275	000.002	000.208	003.078	000.009	000.008		000.023	00321.751
LDGT	000.344	000.003	000.367	004.228	000.011	000.010		000.024	00416.075
HDGV	000.689	000.005	001.063	015.719	000.026	000.023		000.045	00765.298
LDDV	000.125	000.003	000.133	002.438	000.004	000.004		000.008	00310.607
LDDT	000.269	000.004	000.383	004.203	000.007	000.007		000.008	00442.096
HDDV	000.419	000.013	004.563	001.553	000.164	000.151		000.027	01459.762
MC	002.220	000.003	000.794	012.935	000.028	000.025		000.054	00400.093

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.2 Trenching/Excavating Phase

2.2.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date

Start Month: 1
Start Quarter: 3
Start Year: 2021

- Phase Duration

Number of Month: 0
Number of Days: 10

2.2.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information

Area of Site to be Trenched/Excavated (ft^2): 49028
Amount of Material to be Hauled On-Site (yd^3): 200
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC

POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Trenching / Excavating Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.275	000.002	000.208	003.078	000.009	000.008		000.023	00321.751
LDGT	000.344	000.003	000.367	004.228	000.011	000.010		000.024	00416.075
HDGV	000.689	000.005	001.063	015.719	000.026	000.023		000.045	00765.298
LDDV	000.125	000.003	000.133	002.438	000.004	000.004		000.008	00310.607
LDDT	000.269	000.004	000.383	004.203	000.007	000.007		000.008	00442.096
HDDV	000.419	000.013	004.563	001.553	000.164	000.151		000.027	01459.762
MC	002.220	000.003	000.794	012.935	000.028	000.025		000.054	00400.093

2.2.4 Trenching / Excavating Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)

2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.3 Building Construction Phase

2.3.1 Building Construction Phase Timeline Assumptions

- Phase Start Date

Start Month: 2
Start Quarter: 1
Start Year: 2021

- Phase Duration

Number of Month: 10
Number of Days: 0

2.3.2 Building Construction Phase Assumptions

- General Building Construction Information

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Building Category: Office or Industrial
Area of Building (ft^2): 4886
Height of Building (ft): 25
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cranes Composite	1	4
Forklifts Composite	2	6
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40 (default)

- Vendor Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

2.3.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0845	0.0013	0.6033	0.3865	0.0228	0.0228	0.0076	128.82
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0293	0.0006	0.1458	0.2148	0.0056	0.0056	0.0026	54.462
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.275	000.002	000.208	003.078	000.009	000.008		000.023	00321.751
LDGT	000.344	000.003	000.367	004.228	000.011	000.010		000.024	00416.075

HDGV	000.689	000.005	001.063	015.719	000.026	000.023		000.045	00765.298
LDDV	000.125	000.003	000.133	002.438	000.004	000.004		000.008	00310.607
LDDT	000.269	000.004	000.383	004.203	000.007	000.007		000.008	00442.096
HDDV	000.419	000.013	004.563	001.553	000.164	000.151		000.027	01459.762
MC	002.220	000.003	000.794	012.935	000.028	000.025		000.054	00400.093

2.3.4 Building Construction Phase Formula(s)

- Construction Exhaust Emissions per Phase
$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase
$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Vender Trips Emissions per Phase

VMT_{VT} = BA * BH * (0.38 / 1000) * HT

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

2.4 Architectural Coatings Phase

2.4.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 11
Start Quarter: 1
Start Year: 2021

- Phase Duration
Number of Month: 0
Number of Days: 3

2.4.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 3200
Number of Units: N/A

- Architectural Coatings Default Settings
Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Worker Trips
Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.4.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.275	000.002	000.208	003.078	000.009	000.008		000.023	00321.751
LDGT	000.344	000.003	000.367	004.228	000.011	000.010		000.024	00416.075
HDGV	000.689	000.005	001.063	015.719	000.026	000.023		000.045	00765.298

LDDV	000.125	000.003	000.133	002.438	000.004	000.004		000.008	00310.607
LDDT	000.269	000.004	000.383	004.203	000.007	000.007		000.008	00442.096
HDDV	000.419	000.013	004.563	001.553	000.164	000.151		000.027	01459.762
MC	002.220	000.003	000.794	012.935	000.028	000.025		000.054	00400.093

2.4.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase

$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

2.5 Paving Phase

2.5.1 Paving Phase Timeline Assumptions

- Phase Start Date

Start Month: 11
Start Quarter: 1
Start Year: 2021

- Phase Duration

Number of Month: 0
Number of Days: 2

2.5.2 Paving Phase Assumptions

- General Paving Information

Paving Area (ft^2): 36111

- Paving Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	1	8
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.5.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0860	0.0014	0.5212	0.5747	0.0247	0.0247	0.0077	132.93
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0533	0.0012	0.3119	0.3497	0.0121	0.0121	0.0048	122.61
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.2015	0.0024	1.4660	0.7661	0.0581	0.0581	0.0181	239.53
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2e**
Emission Factors	0.0407	0.0007	0.2505	0.3606	0.0112	0.0112	0.0036	66.890

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2e
LDGV	000.275	000.002	000.208	003.078	000.009	000.008		000.023	00321.751
LDGT	000.344	000.003	000.367	004.228	000.011	000.010		000.024	00416.075
HDGV	000.689	000.005	001.063	015.719	000.026	000.023		000.045	00765.298
LDDV	000.125	000.003	000.133	002.438	000.004	000.004		000.008	00310.607
LDDT	000.269	000.004	000.383	004.203	000.007	000.007		000.008	00442.096
HDDV	000.419	000.013	004.563	001.553	000.164	000.151		000.027	01459.762
MC	002.220	000.003	000.794	012.935	000.028	000.025		000.054	00400.093

2.5.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area (ft^2)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd^3 / 27 ft^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$VMT_{WT} = WD * WT * 1.25 * NE$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

$VOC_P = (2.62 * PA) / 43560$

VOC_P: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area (ft^2)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)^2 / acre)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

3. Tanks

3.1 General Information & Timeline Assumptions

- Add or Remove Activity from Baseline? Add

- Activity Location
County: Middlesex
Regulatory Area(s): Boston-Lawrence-Worcester (E. MA), MA

- Activity Title: Generator Fuel Tanks

- Activity Description:
The Generator Building would be constructed on the existing paved parking lot adjacent to the Electrical Building on the north side of Schilling Circle across from Building F. The Generator Building would contain three 1,000-kW backup diesel generators with space to add an additional two 1,000-kW diesel generators. The The building would include exhaust vent stacks for each generator. The Generator Building would include individual 3,500-gallon dual-walled, diesel fuel storage tanks for each generator, which would be located inside the building and installed underneath each generator.

- Activity Start Date
Start Month: 12
Start Year: 2021

- Activity End Date
Indefinite: Yes
End Month: N/A
End Year: N/A

- Activity Emissions:

Pollutant	Emissions Per Year (TONs)
VOC	0.008101
SO_x	0.000000
NO_x	0.000000
CO	0.000000
PM 10	0.000000

Pollutant	Emissions Per Year (TONs)
PM 2.5	0.000000
Pb	0.000000
NH_3	0.000000
CO_2e	0.0

3.2 Tanks Assumptions

- Chemical
Chemical Name: Fuel oil no. 2
Chemical Category: Petroleum Distillates
Chemical Density: 7.1
Vapor Molecular Weight (lb/lb-mole): 130
Stock Vapor Density (lb/ft^3): 0.000129553551395334
Vapor Pressure: 0.0055
Vapor Space Expansion Factor (dimensionless): 0.068

- Tank
Type of Tank: Horizontal Tank
Tank Length (ft): 15.06
Tank Diameter (ft): 6.35
Annual Net Throughput (gallon/year): 108000

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

3.3 Tank Formula(s)

- Vapor Space Volume

VSV = (PI / 4) * D^2 * L / 2

VSV: Vapor Space Volume (ft^3)
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)
2: Convertion Factor (Vapor Space Volume is assumed to be one-half of the tank volume)

- Vented Vapor Saturation Factor

VVSF = 1 / (1 + (0.053 * VP * L / 2))

VVSF: Vented Vapor Saturation Factor (dimensionless)
0.053: Constant
VP: Vapor Pressure (psia)
L: Tank Length (ft)

- Standing Storage Loss per Year

SSL_{VOC} = 365 * VSV * SVD * VSEF * VVSF / 2000

SSL_{VOC}: Standing Storage Loss Emissions (TONs)
365: Number of Daily Events in a Year (Constant)
VSV: Vapor Space Volume (ft^3)
SVD: Stock Vapor Density (lb/ft^3)
VSEF: Vapor Space Expansion Factor (dimensionless)
VVSF: Vented Vapor Saturation Factor (dimensionless)
2000: Conversion Factor pounds to tons

- Number of Turnovers per Year

NT = (7.48 * ANT) / ((PI / 4.0) * D * L)

NT: Number of Turnovers per Year
7.48: Constant
ANT: Annual Net Throughput
PI: PI Math Constant
D^2: Tank Diameter (ft)
L: Tank Length (ft)

- Working Loss Turnover (Saturation) Factor per Year

WLSF = (18 + NT) / (6 * NT)

WLSF: Working Loss Turnover (Saturation) Factor per Year
18: Constant
NT: Number of Turnovers per Year
6: Constant

- Working Loss per Year

WL_{VOC} = 0.0010 * VMW * VP * ANT * WLSF / 2000

0.0010: Constant
VMW: Vapor Molecular Weight (lb/lb-mole)
VP: Vapor Pressure (psia)
ANT: Annual Net Throughput

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

WLSF: Working Loss Turnover (Saturation) Factor
2000: Conversion Factor pounds to tons

RECORD OF NON-APPLICABILITY (RONA) FOR GENERAL CONFORMITY

NAME OF PROJECT: Generator Building 1, Hanscom AFB, MA

PROJECT ID NUMBER: _____

POINT OF CONTACT: _____

PHONE/EMAIL: _____

START DATE: 2021

General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the project described above according to the requirements of 40 CFR 93, Subpart B. The requirements of the rule are not applicable to this project/action because:

The project/action qualifies as an exempt action. The applicable exemption citation is 40 CFR 93.153: _____.

OR

Total direct and indirect emissions from this project/action have been estimated at *(only include information for the applicable pollutants):*

1.35 tons/yr of NO_x

0.18 tons/yr of VOC

0.001 tons/yr of PM_{10}

2.99 tons/yr of carbon monoxide (CO)

0.006 tons/yr of sulfur dioxide (SO_2)

These levels are below the conformity threshold values established at the 40 CFR 93.153 (b).

Supporting documentation and emission estimates are:

Attached Environmental Assessment for Ground Training Activities

Appear in NEPA Documentation _____ *(cite reference)*

Other _____ *(cite reference)*

_____

Environmental Coordinator *(Title and Signature)* Date

CFR 93.153

Overall Operational Emissions

Ground Training Operations

Constituent	Estimated Annual Storage Tank Operating Emissions [1] (ton/yr)	Estimated Annual Generator Operating Emissions (ton/yr)	Total Annual PTE for New Generators (ton/yr)	Emissions Reduction - Removal of Existing Generators (ton/yr)	Net Operating Emissions (ton/yr)	Threshold Levels [2] (tons/year)
CO	0.000	2.99	**2.99**	**5.20**	**-2.22**	**100**
NO_x	0.000	1.35	**1.35**	**25.8**	**-24.4**	**50**
PM_{10}	0.000	0.00	**0.001**	**1.58**	**-1.58**	**100**
$PM_{2.5}$	0.000	0.0	**0.001**	**1.58**	**-1.58**	**100**
SO_x	0.000	0.006	**0.006**	**0.012**	**-0.006**	**100**
VOC	0.008	0.17	**0.18**	**1.80**	**-1.62**	**50**
CO_2e	0.000	1,219	**1,219**	**1,219**	**0.00**	**100,000**

(1) Calculated in ACAM

(2) Review thresholds from 301 CMR 11.03(8).

Table 3. MIT Lincoln Laboratory Emissions Factors and Calculations - Generator Cluster 1 vs. Existing Emergency Generators

sulfur content of diesel fuel = 0.0015%

Unit	SCCode	Units	Load	Fuel	CO	NO_x	PM	SO_2	VOC	Note				HAP	NH3		
Engines < 450 kW	20200102	lb/1000 gal	100%	ULSD	130	604	42.5	n/a[1]	49.3	Factors from WebFire							
450 kW ≤ Engines < 2 MW	20200401	lb/1000 gal	100%	ULSD	116	438	9.55	n/a[1]	11.5	Factors from WebFire							
2 MW ≤ Engines (CAT 3615)	20200401-10	lb/hr	10%	ULSD	1.59	7.38	0.42	n/a[1]	0.57	Manufacturer specific emission factors							
2 MW ≤ Engines (CAT 3615)	20200401-100	lb/hr	100%	ULSD	3.86	32.36	0.79	n/a[1]	0.64	Manufacturer specific emission factors							
2 MW ≤ Engines (CAT 3615)	20200401-25	lb/hr	25%	ULSD	1.41	10.34	0.47	n/a[1]	0.64	Manufacturer specific emission factors							
2 MW ≤ Engines (CAT 3615)	20200401-50	lb/hr	50%	ULSD	1.46	16.96	0.55	n/a[1]	0.9	Manufacturer specific emission factors							
2 MW ≤ Engines (CAT 3615)	20200401-75	lb/hr	75%	ULSD	1.71	26.05	0.51	n/a[1]	1.27	Manufacturer specific emission factors							
Cummins 1000kW Tier 4 model QST30-G17	Nominal Emissions	grams/HP-hour	100%	ULSD	0.61	0.42	0.0002	n/a[1]	0.04			1482	max HP	0.000219	0.0239	Manufacturer specific emission factors	Cummins Exhaust Emission Data Sheet DQFAH, full standby BHP=1482
Cummins 1000kW Tier 4 model QST30-G17	Nominal Emissions	lb/hr	100%	ULSD	1.9912	1.3710	0.0007	n/a[1]	0.1306					0.0007149	0.0780		
Cummins 1000kW Tier 4 model QST30-G17	Potential Site Variation	grams/HP-hour	100%	ULSD	1.22	0.55	0.0005	n/a[1]	0.07					0.000438	0.0287		
Cummins 1000kW Tier 4 model QST30-G17	Potential Site Variation	lb/hr	100%	ULSD	3.9825	1.7954	0.0016	n/a[1]	0.2285					0.0014298	0.0936		

Notes: HAP is based on Cummins data for formaldehyde, the prevalent HAP in engine exhaust. Nominal NH3 emission rate is 10 ppm@ 15% O2 based on EPA guidance for a average emissions from Tier 4 engine utilizing SCR NOx controls over test cycles. PSV for HAP and NH3 are estimated as 1.2x nominal.

Total Emissions from Generators to be replaced by Cluster 1

	Fuel use (gal/hr)	Max hr/year	Fuel use/year	Max Permitted Emissions -- lbs per Year CO	NOx	PM	$SO2$ [1]	VOC		Max Permitted Emissions -- tons per Year CO	NOx	PM	SO2	VOC
Engines <450 kW	228.7	300	68610	8919.3	41440.44	2915.925	15.05	3382.473		4.460	20.720	1.458	0.008	1.691
FEPOC engines	15	300	4500	522	1971	42.975	0.99	51.75		0.261	0.986	0.021	0.000	0.026
2 kW CAT 3615	140.2	250	35050	965	8090	197.5	7.69	160		0.4825	4.045	0.09875	0.003843233	0.08
			108160	10406.3	51501.44	3156.4	23.719488	3594.223	**TOTAL:**	**5.203**	**25.751**	**1.578**	**0.012**	**1.797**

Max Permitted Emissions -- lbs per Year: HAP | NH3

Max Permitted Emissions -- tons per Year: HAP | NH3

Total Emissions from proposed Cluster 1 Generators

															controlled emissions with SCR operating, 1500 hours/yr				
Cummins 1000kW Tier 4 model QST30-G17	72	1500	108000	5973.70	2693.06	2.45	11.84	342.75		2.987	1.347	0.001	0.0059	0.1714		2.14	140.43	0.001072	0.0702
	cold start hours	82							% Reduction	42.60%	94.77%	99.92%	50.10%	90.46%					
											0.472 **				total excess NOX emissions during cold start-up, allowing 149 cold starts per generator annually				
											1.819				Total NOX emissions				
									% Reduction		92.94%								

Footnote

[1] SO2 emissions are calculated by mass balance based on sulfur content of the fuel (ULSD = 15ppm S) and fuel usage rate.

Change in Potential Emissions (tons/year)	**-2.216**	**-23.932**	**-1.577**	**-0.006**	**-1.626**
% reduction	42.60%	92.94%	99.92%	50.10%	90.46%

**** cold startup calcs:**

duration of each startup	11 min	from Cummins NOx time to compliance chart
number of annual startups	149	per engine
total time without NOx control	1639 min/yr	per engine
	27.32 hrs/yr	per engine
	82.0 hrs/yr	all three engines
Cold Start NOx emission rate	12.9 lb/hr	from data provided by Cummins for air contaminant loading at inlet to SCR
Total Cold Start NOx emissions	1057 lb/yr	all three engines
	0.529 tons/yr	all three engines
Excess NOx emissions during cold starts	11.53 lb/hr	Cold start uncontrolled emission rate (12.9 lb/hr) - controlled emission rate (1.37 lb/hr)
Total excess NOx emissions for cold startups	0.472 tons/yr	all three engines

Table 4. Emissions Comparison - MIT Lincoln Laboratory Generator Cluster 1 vs. permitted facilities and standards

ULSD

Density = 7.31 lb/gal

	Emissions (lbs per MWH)[2,3] CO	NOx	PM	$SO2$ [1]	VOC	CO2	HAP	NH3	Total Emissions (TPY)[4,5] CO	NOx	PM	SO2	VOC	CO2	HAP	NH3	Total Emissions (tons/month) CO	NOx	PM	SO2	VOC	CO2	HAP	NH3
MIT LL Generator Cluster 1 (proposed)	3.620	1.632	0.001	0.00717	0.208	1457	0.00129979	0.08511	2.987	1.82	0.00122	0.0059	0.171	1,093	0.00107	0.0702	2.240	1.364	0.0009	0.0044	0.129	820	0.001	0.053
Williams College - WE-17-003	0.37	1.85	0.09	0.013	0.2	1650	0.015	0.13	0.42	2.54	0.1	0.015	0.22	1,810	0.017	0.15								
Taunton Municipal Light Plant - SE-15-001	0.37	1.34	0.09	0.015	0.22	1430	0.014	0.13	1.01	5.08 [4]	0.2	0.04	0.6	3,866	0.01	0.09								
Non-emergency Engine ERP, 310 CMR 7.26(43)	1	0.15	0.03	only ULSD	n/a	1650																		
Tier 4F emissions limits	7.72	1.48	0.066		0.42		n/a	n/a																

Footnotes

[1] SO2 emissions are calculated by mass balance based on sulfur content of the fuel (ULSD = 15 ppm S) and fuel usage rate

[2] The lb/MWH emission limits are based on the power output (mechanical) of the engine. Cummins model QST30-G17 is rated 1000 kWe and 1,111 kWm

[3] The lb/MWH and lb/hr emission limits do not apply during the first 20 minutes after start-up for the Williams College (WE-17-003) and Taunton Municipal Light Plant (SE-15-001) Caterpillar generators; Emission limits do not apply during the first 11 minutes after start-up for proposed MIT Lincoln Laboratory Generator Cluster 1 Cummins generators. The Cummins Tier 4F engine heats the exhaust directly with immersion heating elements, so their temperature for DEF injection is achieved rather quickly relative to the Caterpillar engine.

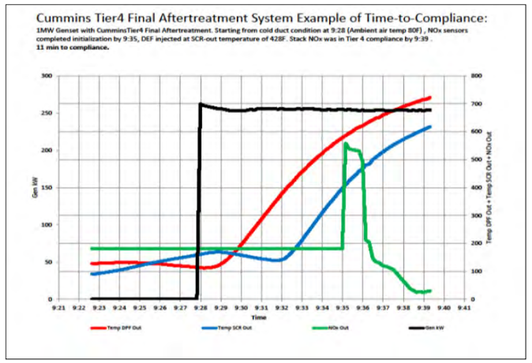
[4] TPY NOx emissions for Williams College and Taunton Municipal Light Plant include allowance for up to 35 cold starts for each engine per consecutive 12 month period

[5] TPY NOx emissions for MIT LL Generator Cluster 1 (proposed) include allowance for up to 149 cold starts for each engine per consecutive 12 month period

[6] Operating hour restrictions do not apply to engine operations for actual emergencies as defined in 310 CMR 7.26(41)

MIT Lincoln Laboratory Generator Cluster 1
Annual
Genset Cold
Starts

Run Category	Total Generators	Genset Starts - each generator per month	Starts per year -each generator	Starts per year - 3 generators	minutes per year	hours per year	% of non-emergency run time with Nox uncontrolled
Maintenance Test Runs	3	1	12	36			
Maintenance and Repairs	3		3	9			
Forward Capacity Management	3		10	30			
Facility Maintenance Support - planned shutdowns	3		4	12			
Demand Management (Peak Shaving)	3	10	120	360			
		Total	149	447	4,917	82	5%



Operational Emissions From ACAM

Diesel Fuel Storage Tank Emissions

2022 Emissions (tons/yr)

Activities	**VOC**	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NH_3**	**CO_2e**
Ground Training Activities	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total, Ground Training Activities, tons/year	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Greenhouse Gas Emissions from Generators

MIT LL Generator Building 1

27-Apr-20

Annual Fuel Use = 108,000 gal/yr

From air emissions calculations for permit application (accompanying worksheet)

Constituent	Emission Factor (lb/MMBtu)	High Heat Value (MMBtu/gal)	Annual PTE (lb/yr)	Annual PTE (ton/yr)	Global Warming Potential	CO_2 Equivalent (ton/yr)
CO_2	163.1	0.138	2,430,152	1,215	1	1,215
CH_4	0.0066	0.138	99	0.05	25	1.23
N_2O	0.0013	0.138	20	0.010	298	2.94
Total						**1,219**

GHG emission factors and Global Warming Potentials obtained from U.S. EPA Mandatory Reporting of GHGs, Final Rule, 40 CFR 98; Tables C-1 and C-2

APPENDIX C3

USFWS IPaC Form

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To: October 27, 2021
Consultation Code: 05E1NE00-2020-SLI-2903
Event Code: 05E1NE00-2022-E-01049
Project Name: MIT-LL/Generator Bldg #1

Subject: Updated list of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2020-SLI-2903
Event Code: Some(05E1NE00-2022-E-01049)
Project Name: MIT-LL/Generator Bldg #1
Project Type: DEVELOPMENT
Project Description: The purpose of the Proposed Action is to provide a reliable source of redundant backup electrical power, allowing MIT LL to accomplish their mission without disruption to workflow. The Proposed Action is to construct Generator Building 1 at MIT LL, consolidating backup power capacity in the northern industrial area of the MIT LL complex, near the primary electric service, which would eliminate odor and particulate risk to several sensitive research areas by allowing the decommissioning of the 16 smaller generators located throughout the campus. The generator building would consist of three 1,000-kW backup diesel generators with space to add an additional two 1,000-kW diesel generators. The generators would comply with U.S. Environmental Protection Agency (EPA) Tier-4 Final Standard to satisfy federal standards for non-emergency operation and have been permitted by MassDEP for 500 hours of non-emergency operation annually for each generator. The Proposed Action would include construction of a new building to house the generators, automatic transfer switch(s), and the switch gear, and would provide radial feeds from the generators to buildings that require critical backup power.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.46022923179106,-71.26641173781613,14z

Counties: Middlesex County, Massachusetts

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

APPENDIX C4

ESA "No Effect" Determination for the Northern Long-eared Bat at Hanscom AFB

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 66TH AIR BASE GROUP
HANSCOM AIR FORCE BASE MASSACHUSETTS

2 Oct 2018

MEMORANDUM FOR RECORD

SUBJECT: ESA "No Effect" Determination for the NLEB at Hanscom AFB

1. Upon review of the best available science, Hanscom AFB has determined that proposed undertakings within the boundaries of Hanscom AFB main base and within the boundaries of Fourth Cliff in Scituate, Massachusetts will have "no effect" on the federally listed Northern Long-eared Bat (*Myotis septentrionalis*) (NLEB). This determination is effective for a period of 5 years and is valid for undertakings which commence on or after 2 Oct 2018 and are completed on or prior to 1 Oct 2023 unless subsequently rescinded based on newly acquired science or information. A "No Effect" determination is appropriate because:

a. Recent acoustical surveys conducted in 2018 have failed to indicate presence of the NLEB within the areas of Hanscom AFB main base and Fourth Cliff. Results of this study, "*Natural Resource Program, Multiple Installations, U.S. Air Force Bat Acoustic Survey Project AFCE50979317*" are on file at Hanscom AFB, 66 ABG/CEIE Administrative Record File number 14-1-2018-0901-01.

b. Undertakings in these areas do not have the potential to remove any trees within an area known to provide habitat for the NLEB nor within the vicinity of any known maternity roost trees or hibernaculum for the species (reference: https://www.mass.gov/service-details/the-northern-long-eared-bat).

2. This determination is not applicable to geographically separated areas of Hanscom AFB that include FAMCAMP (which has not been surveyed) or Sagamore Hill (which has documented the presence of the NLEB).

3. If further information is needed, please contact me at (781) 225-6144, scott.sheehan.1@us.af.mil.

SCOTT E. SHEEHAN, GS-12, DAF
Hanscom AFB Natural Resources Manager

APPENDIX C5

Massachusetts Natural Heritage and Endangered Species Program – Map of Northern Long-eared Bat Locations

The closest known hibernaculum and/or maternity roost tree for the NLEB is 9.3 miles away, east of Reading, MA near Bear Meadow Brook.
(Source: https://mass-eoeea.maps.arcgis.com/apps/Viewer/index.html?appid=de59364ebbb348a9b0de55f6febdfd52)