Final

Environmental Assessment

Explosive Ordnance Disposal Training Facility, Munitions Storage Facility, and Munitions Maintenance and Inspection Facility

Westover Air Reserve Base, Massachusetts

August 2003

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14. ABSTRACT

This EA has been prepared in accordance with the National Environmental Policy Act, and assesses the potential environmental impacts of constructing and operating an Explosive Ordnance Disposal Training Facility and a Munitions Complex, consisting of a munitions storage facility and a munitions maintenance and inspection facility, at Westover Air Reserve Base (ARB), located in Hampden County, Massachusetts. In addition to the Proposed Action, two EOD site alternatives and the No Action Alternative were analyzed in the EA. Resource areas analyzed in the EA include air, geological, water biological, and cultural resources; noise; transportation; and environmental programs. The EA identified best management practices and preventive measures to reduce impacts to various resources. The EA also assessed the potential cumulative effects of the construction and training activities with other concurrent actions at Westover ARB and the surrounding area. The analysis found no significant impacts for any resource area, and no significant cumulative impacts. No mitigations are required.

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Abstract: This EA has been prepared in accordance with the *National Environmental Policy Act*, and assesses the potential environmental impacts of constructing and operating an Explosive Ordnance Disposal Training Facility and a Munitions Complex, consisting of a munitions storage facility and a munitions maintenance and inspection facility, at Westover Air Reserve Base (ARB), located in Hampden County, Massachusetts. In addition to the Proposed Action, two EOD site alternatives and the No Action Alternative were analyzed in the EA.

Resource areas analyzed in the EA include air, geological, water, biological, and cultural resources; noise; transportation; and environmental programs. The EA identified best management practices and preventive measures to reduce impacts to various resources. The EA also assessed the potential cumulative effects of the construction and training activities with other concurrent actions at Westover ARB and the surrounding area.

The analysis found no significant impacts for any resource area, and no significant cumulative impacts. No mitigations are required.

FINDING OF NO SIGNIFICANT IMPACT

FINDING OF NO SIGNIFICANT IMPACT

Explosive Ordnance Disposal Training Facility and Munitions Complex Westover Air Reserve Base, Massachusetts

This Finding of No Significant Impact (FONSI) was prepared in accordance with the *National Environmental Policy Act* of 1969, the Council on Environmental Quality regulations (40 *Code of Federal Regulations* (CFR) 1500-1508), and the *Air Force Environmental Impact Analysis Process* (32 CFR 989). The decisions included in this FONSI are based upon information contained in the Environmental Assessment (EA) for construction and operation of an Explosive Ordnance Disposal (EOD) Training Facility and a Munitions Complex at Westover Air Reserve Base (ARB), Massachusetts. The EA analyzed potential environmental consequences that could result from implementation of the Proposed Action, two EOD Site Alternatives, or the No Action Alternative.

BACKGROUND

The Air Force Reserve Command (AFRC) of the United States Air Force, at Westover ARB, proposes to construct and operate an Explosive Ordnance Disposal (EOD) Training Facility and a Munitions Complex at Westover Air Reserve Base (ARB), Massachusetts. The EOD facility will allow EOD personnel to meet their training requirements in accordance with Department of Defense and Air Force safety standards. The Munitions "Complex," consisting of a munitions storage facility (MSF) and a munitions maintenance and inspection facility (MMIF), will allow the base to provide adequate, safe, on-base facilities for the maintenance, inspection, and storage of munitions. Access is restricted along Taxiway D, and permission from the Air Traffic Control Tower is required to visit the site. EOD training operations and deliveries to the Munitions Complex will be coordinated with the Tower and with flightline activities as needed.

EOD Training Facility

The EOD Training Facility will be constructed on a site adjacent to Taxiway D, which aircraft no longer use. The site is relatively flat and is covered by grass, with a forested area to the south; minimal site preparation will be required. The proposed EOD site is adjacent to a grubbed and cleared area within the runway's Clear Zone. Stony Brook, a small creek, is located approximately 600 feet northwest on the other side of Taxiway D; a riverine wetland adjacent to Stony Brook is approximately 550 feet from the site. All construction activities will occur within the grassy area and no trees will need to be cut or removed for the project. Access to the site will be along the taxiway and across the flat, grassy area. No utilities will be constructed at the site.

The EOD Facility will be about 64 feet by 48 feet, with 2 foot-thick reinforced concrete walls at least 6 feet high, and two access corridors. A sloped earthen berm will support the concrete walls and extend out 12 feet from each outside wall surface; buried footings will also support the walls. A liner will be placed about two feet below the soil surface. A gravel road approximately 100 feet long and 20 feet wide, with a turnaround area near the structure, will be constructed from Taxiway D to the facility.

The EOD training activities will include the use of the explosive C-4 several times per year, with generally no more than 5 pounds of C-4 being used for any one exercise (although emergencies could necessitate the use of C-4 in larger amounts). Other types of explosives (e.g., impulse cartridges and blasting caps) will also be detonated during monthly exercises at the training facility. After completion of the munitions storage facility, all training materials will be stored at Westover ARB. Until the MSF is operational, C-4 and thermite grenades will be stored 20 miles away at the Barnes Air National Guard Station (ANGS) munitions storage facility and transported to Westover as needed for EOD training; all other training materials will be stored at Westover ARB. The facility will take approximately one to two months to construct, depending on the weather and other factors. Construction of the EOD Facility is not contingent upon approval of funding for the Munitions Complex, and the EOD and munitions facilities will probably not be constructed concurrently.

Munitions Complex

The Munitions Complex will be located on a site along Taxiway D, near the EOD Training Facility described above. The Complex has two components: a munitions storage facility (approximately 4,332 square feet), and a munitions maintenance and inspection facility (approximately 1,400 square feet), to be constructed more than 150 feet apart with a loading dock between the two facilities. Asphalt pavement will connect the two buildings and provide turn-around space for loading and unloading. Underground (concrete-encased) power and telephone lines, a water main, and a septic system will be installed to support the MMIF. The entire Munitions Complex will be fenced, have perimeter lighting, be protected by an intrusion detection system, and have high security locks/doors securing the buildings. The two munitions facilities will take approximately six months to construct, depending on weather and other factors.

The MSF will provide proper storage of munitions ranging from high explosives such as C-4 to grenades, flares, and small arms ammunition. Separate storage bays (cubes) will accommodate the storage incompatibility requirements for various types of munitions. Operations will include transportation of munitions to and from the facility, loading and unloading, and administrative activities. The MMIF operations will involve the munitions stored at the MSF. Activities will include movement of munitions between the MSF and the MMIF, munitions residue inspections, trailer maintenance, and work related to Time Compliance Technical Orders.

DECISION

Based on a review of the EA, I have decided to proceed with the construction and operation of the EOD Training Facility and the Munitions Complex. The following text summarizes impacts that will likely occur from proceeding with construction and operation of the facility.

The action will have short-term insignificant impacts on air quality during construction, primarily generated by heavy equipment, earth-moving activities, and worker vehicle traffic. Negligible air quality impacts will result from operation of the facilities.

Insignificant impacts to geological resources will result primarily from disturbance of the ground during construction activities, which will affect a shallow layer of the underlying

geology (including soils). Impacts to topography will also be insignificant. Each construction project will disturb less than one acre. Best management practices will reduce the potential for erosion during construction. The impacts to soils from EOD training operations will be insignificant, and preventive measures to avoid soil contamination from explosive residues will further reduce impacts. Impacts to soils from munitions operations will be negligible.

There will be insignificant impacts to surface water and groundwater. Short-term increases in sedimentation of nearby surface waters could result from ground disturbances during construction, but implementing best management practices will reduce the potential for erosion and sedimentation, and impacts will be insignificant. There will be no impacts to FEMA-delineated floodplains. The insignificant impacts from EOD training operations will be further reduced with the appropriate use of preventive measures to avoid water contamination from explosive residues. Impacts from operations at the munitions complex will be negligible.

The short-term insignificant impacts to biological resources will result primarily from construction activities, within an already disturbed area, that include minor digging, grading, stockpiling soil, and compaction from construction equipment. No critical habitat or threatened or endangered species will be affected. No wetlands will be filled as a result of the construction activities; no Section 404 permit will be required. Impacts to avian and other species from noise during EOD training activities will be insignificant. Impacts from munitions complex operations will be negligible.

No known cultural resources occur in the project area, and no buildings will be demolished. Construction impacts will be insignificant, and operations will not affect cultural resources.

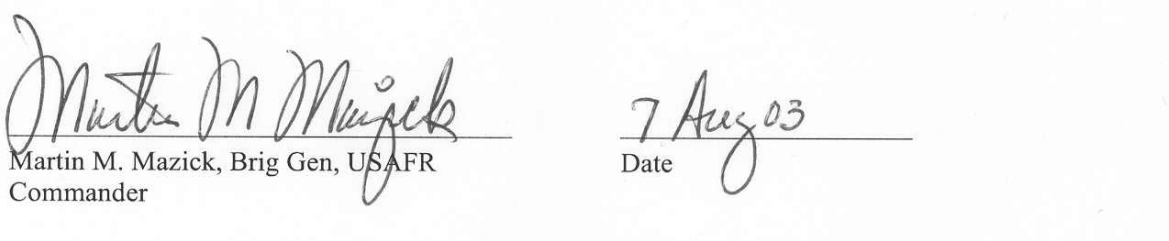
Construction, traffic, and training activities at the EOD facility will insignificantly affect the noise environment, because the noise generated will be intermittent, and will occur during daytime hours and within the context of fairly high noise levels. There are no sensitive receptors in the vicinity of the project area. EOD personnel (and observers at the EOD facility) will wear hearing protection during certain training exercises; hearing protection will not be needed by off-base residents or nearby receptors. To reduce noise impacts to the community, other best management practices include providing advance notice of exercises, limiting amounts of C-4 detonated at one time, and avoiding Sunday mornings and days with low cloud cover; these practices will be used to the extent possible while meeting mission requirements. Operations at the munitions complex will have negligible noise impacts.

Short-term insignificant impacts to the transportation network at Westover ARB during construction will result primarily from construction equipment and increased traffic. When construction is complete, the traffic levels in the project area will return to pre-construction levels. Operations will have only minimal transportation impacts. Aircraft operations at Westover ARB will not be affected.

The construction and operation of the EOD and munitions facilities will have insignificant impacts to environmental programs (human health and safety, hazardous materials and waste, the IRP, solid waste, or storm water).

CONCLUSION

In accordance with the Council on Environmental Quality regulations implementing the *National Environmental Policy Act* of 1969, as amended, and the *Air Force Environmental Impact Analysis Process*, 32 CFR 989, an assessment of the identified environmental effects has been prepared for construction and operation of an EOD Training Facility and a Munitions Complex at Westover ARB. I have determined that the action will have no significant impact on the quality of the human environment. Thus, an Environmental Impact Statement is not required.



Martin M. Mazick, Brig Gen, USAFR
Commander

7 Aug 03
Date

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This Executive Summary briefly discusses the purpose and need for the action; describes the Proposed Action, two EOD site alternatives, the No Action Alternative, and alternatives considered but eliminated; summarizes the environmental impacts by resource; and presents mitigations, best management practices, and preventive measures.

The United States Air Force Reserve Command (AFRC) proposes to construct and operate an Explosive Ordnance Disposal (EOD) training facility and a munitions complex at Westover Air Reserve Base (ARB), Massachusetts. The EOD facility would allow EOD personnel to meet their training requirements, while the munitions maintenance and inspection facility and munitions storage facility would allow the base to provide adequate, safe, on-base facilities for the maintenance, inspection, and storage of munitions.

The *National Environmental Policy Act* (NEPA) of 1969, as amended, requires federal agencies to consider environmental consequences in their decision-making process. The President's Council on Environmental Quality (CEQ) has issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental analysis. The Air Force environmental impact assessment process is accomplished through the adherence to the procedures set forth in CEQ regulations (40 *Code of Federal Regulations* (CFR) §1500-1508) and 32 CFR 989 (*Air Force Environmental Impact Analysis Process*). These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation, designed to ensure deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. This environmental assessment (EA) analyzes potential environmental consequences from implementing the Proposed Action or an EOD site alternative, or continuing with current practices (No Action Alternative).

The 439th Airlift Wing (439 AW), housed at Westover ARB, provides air transport capabilities for moving military equipment and personnel worldwide. As an aerial port of embarkation, the base is a staging area for contingency operations. The EOD Flight, as part of its mission, serves as first responder for civil and military incidents involving weapons of mass destruction and other explosive threats. The training of EOD personnel and the storage, maintenance, and inspection of munitions support the worldwide mission of the 439 AW.

The purpose of the action is two-fold. First, the action would provide a facility where EOD personnel can receive all required training to maintain proficiency with a variety of munitions; training would be conducted in accordance with Air Force safety and operational requirements and EOD standards. Second, the action would provide fully compliant facilities where munitions can be stored, maintained, and inspected, enhancing Westover's mission support and reducing the need to transport munitions that are used in on-base exercises.

The Proposed Action sites and EOD site alternatives are located in the northeast portion of Westover ARB (see Figure 1.3-2). Facility siting criteria eliminated many potential locations because of quantity-distance restrictions for explosives. In determining locations that would meet these distance restrictions and not affect flightline operations, only three sites were available for the EOD training facility, and only one for the munitions complex. All sites are near Taxiway Delta (D), which is not presently used for aircraft operations.

PROPOSED ACTION AND ALTERNATIVES

The EOD facilities, training, operations, and munitions would be essentially the same under the Proposed Action and both EOD site alternatives. The location, construction, and operation of the munitions complex is the same under the Proposed Action and both EOD site alternatives. Following this discussion is a description of the two EOD site alternatives, along with the No Action Alternative and alternatives eliminated from further analysis. Figure 1.3-2 shows the location of all proposed and alternative sites analyzed in this EA.

Construct and Operate EOD Training Facility

The proposed location for the EOD facility is 300 feet from Taxiway D, at the southwestern end of an access road south of and perpendicular to the taxiway (see Figure 2.1-1).

The facility would be about 64 feet by 48 feet, with 2 foot-thick reinforced concrete walls at least 6 feet high (see Figure 2.1-3). A sloped earthen berm would support the concrete walls and extend out 12 feet from each outside wall surface, and the walls would also be supported by buried footings. A liner would be placed on the asphalt two feet below the surface of the training facility, with sandy soil above the liner within the walled areas; the liner and sand would limit possible impacts to groundwater. The exact design details of the facility have not yet been determined. A fence may not be required due to the site's restricted access. The EOD Flight would coordinate with the Air Traffic Control Tower prior to all training events. The training facility is planned for scheduled training events and is not designed as an EOD range for destruction of unusable munitions or unexploded ordnance. However, emergency detonations could occur if needed, and would be accompanied by precautions to limit noise and other impacts and coordination with base operations and the surrounding public.

Some explosive materials used for training may leave a small amount of residue on the ground after firing (see Section 4.3.3 for a discussion of residue studies). In the interest of constructing a facility whose use will be sustainable over many years, certain facility design options and operational procedures are being considered to minimize potential contamination. In addition to the subsurface liner discussed above, other design and operational preventive measures could include the use of a retractable cover over the EOD facility between operations, the application of lime to the soil surface prior to the use of explosives that leave an RDX residue, and a partnership with the Strategic Environmental Research Development Program (SERDP) and the Environmental Security Technology Certification Program (ESTCP) as a demonstration project in their studies on reducing the environmental impacts from firing ranges. (These measures are described more fully in the Summary of Mitigations, Best Management Practices, and Preventive Measures at the end of this Executive Summary.) Before training occurs in the new facility, these and other measures would be evaluated to ensure the protection of soil and water resources.

The EOD facility would take one to two months to construct and is planned for Fiscal Year 2003. The estimated cost of construction is between $40,000 and $80,000. Construction of the EOD facility is not contingent upon approval of funding for the Munitions Complex, and the EOD facility and munitions complex would probably not be constructed at the same time.

Construct and Operate Munitions Complex

The proposed location for the munitions complex is along Taxiway D near the proposed and alternative locations for the EOD training facility; the location of the munitions complex is the same under the Proposed Action and both EOD site alternatives.

The complex would consist of two facilities—a munitions storage facility (MSF) and a munitions maintenance and inspection facility (MMIF). They would be constructed more than 300 feet apart with a loading dock between the two facilities (see Figure 2.1-4). Construction would include asphalt pavement, utility and water lines, a septic system, fencing, perimeter lighting, an intrusion detection system, and high security locks and doors.

The MSF would be a 4,332-square foot concrete structure consisting of eight 23-foot-square storage cubes and a 100-square foot mechanical room; it would include lightning protection, intrusion detection systems, and electrical and communications utilities. The exact size and design details of the facility would be established in accordance with standard DoD and Air Force guidelines. The MSF would provide proper storage of munitions ranging from high explosives such as C-4 to grenades, flares, and small arms ammunition. Access to the facility would be tightly controlled, and transportation and loading activities would be coordinated with EOD training operations and Base Operations.

The MMIF would be a standard steel/block structure totaling 1,400 square feet, and would include a munitions maintenance bay, mechanical room, restroom, and office space for three full-time personnel.

The munitions complex would take approximately six months to construct, depending on weather and other factors. Construction could occur in FY03 if funding becomes available, but may occur later, depending on mission requirements. The estimated total cost of construction for both munitions facilities is $3.6 million.

EOD Site Alternative 1, Taxiway D Access Road East ("East Alternative")

This alternative site is on a paved access road, approximately 300 feet from Taxiway D and east of the proposed EOD site. This site is near a ponded swale and has nearby monitoring wells associated with the Installation Restoration Program Site SS-21, Former Jet Engine Test Cell. Stony Brook is located approximately 1,000 feet north on the other side of Taxiway D. The Taxiway D Access Road East site is also located within 30 feet of riverine wetlands, and within 350 feet of palustrine wetlands in the adjacent forested area. Under this site alternative, approximately 1,200 square feet of asphalt pavement would need to be removed, with additional engineering design needed to minimize sedimentation and drainage impacts to downgradient wetlands.

EOD Site Alternative 2, Adjacent to Taxiway D ("Taxiway D Alternative")

This alternative site is located along Taxiway D, east of the access road leading to the proposed EOD site (see Figure 2.2-3). This grass-covered site is relatively flat and would require minimal site preparation. There is a forested area to the south. Stony Brook is located approximately 600 feet to the northwest across Taxiway D, with an adjacent riverine wetland approximately 550 feet from the site. All construction activities would occur within the grassy area and no trees would need to be cut. Access would be along the taxiway and across the flat, grassy area. A gravel road approximately 100 feet long and 20 feet wide, with a turnaround area near the structure, would be constructed from Taxiway D to the facility. Construction at this site would likely take less time than the proposed site or EOD Site Alternative 1 because no asphalt pavement removal would be needed. Additional engineering design would be needed to minimize impacts on sedimentation and drainage to downgradient wetlands.

No Action Alternative

Under the No Action Alternative, EOD training and munitions storage would continue under the current methods. EOD training at the Dog Patch area at Westover ARB is limited to the use of .50-caliber ammunition and shotgun shells, and other required training could not be conducted at Westover ARB. Without the new munitions storage facility, Hazardous Class 1.1 (C-4) and 1.2 (thermite grenades) items would continue to be stored at Barnes ANGS for use by Westover EOD personnel.

Alternatives Considered but Eliminated

The Air Force considered other alternatives in addition to the Proposed Action, the EOD Site Alternatives, and the No Action Alternative. The Implementation Alternative—Construction without Liner was eliminated due to the potential for groundwater contamination from an unlined facility. The Other On-Base Locations alternative was eliminated because no other sites met the distance requirements from occupied buildings or the flightline. The Construction of Off-Base Training Facility alternative was eliminated because of the cost and difficulty in obtaining additional lands for military operations. The Training at Off-Base Locations alternative was eliminated due to cost issues and the lack of suitable facilities.

ENVIRONMENTAL IMPACTS BY RESOURCE

The following resource areas were analyzed for potential environmental consequences associated with the Proposed Action and alternatives.

Air Quality. The Proposed Action and EOD site alternatives would have short-term insignificant impacts on air quality as a result of construction activities. There would be no significant air quality impacts from operation of the facilities. Impacts under the No Action Alternative would continue at the existing insignificant level.

Geological Resources. The Proposed Action and EOD site alternatives would have insignificant impacts to geological resources from disturbance of the ground during construction activities such as excavation and grading, and less than 1 acre would be disturbed for each construction project. Best management practices would reduce the potential for erosion during construction. The impacts to soils from EOD training operations would be insignificant, and would be further reduced with the use of preventive measures to avoid soil contamination from explosive residues. Impacts to soils from munitions operations would be negligible. Geological resources would not be impacted under the No Action Alternative.

Water Resources. The Proposed Action and EOD site alternatives would have insignificant impacts to surface water and groundwater. Short-term increased sedimentation of nearby surface waters could result from ground disturbances during construction, but implementing best management practices would reduce the potential for erosion and sedimentation, and impacts would be insignificant. There would be no impacts to FEMA-delineated floodplains. Operational impacts to water resources under all alternatives would be insignificant. Impacts from EOD training operations would be further reduced with the use of preventive measures to avoid water contamination from explosive residues; impacts from operations at the munitions complex would be negligible. Impacts under the No Action Alternative would continue at the existing insignificant level.

Biological Resources. The Proposed Action and EOD site alternatives would have only short-term and insignificant impacts to biological resources on Westover ARB; impacts would result primarily from construction and revegetation activities that would temporarily displace wildlife. No critical habitat, threatened or endangered species, or wetlands would be affected, and a Section 404 wetland permit would not be required. At the EOD East Alternative site, silt barriers would protect wetlands from adverse water runoff and erosion impacts during construction, with minimal indirect disturbance of wetlands. Operational impacts under all alternatives would be insignificant, as noise from training activities would not significantly affect avian or other wildlife species. Under the No Action Alternative, there would be no change to the biological environment on Westover ARB.

Cultural Resources. There are no known cultural resources near the project area, and no buildings would be demolished under the Proposed Action or either EOD site alternative; construction impacts would be insignificant. Operations would not affect cultural resources. There would be no impacts to cultural resources from the No Action Alternative.

Noise. The Proposed Action or EOD site alternatives would have insignificant impacts on the noise environment. Construction and traffic would insignificantly affect the noise environment, because the noise generated would be intermittent, and would occur during daytime hours and within the context of fairly high noise levels. Due to noise generated by the possible removal of asphalt, short-term impacts under the Proposed Action and the East Alternative could be slightly greater than the Taxiway D Alternative, but still insignificant. Training activities at the EOD facility under the Proposed Action or either alternative would increase noise levels in the long term, but impacts would be insignificant. There are no sensitive receptors in the vicinity of the project area. As a best management practice, EOD personnel (and observers at the EOD facility) would be required to wear hearing protection during certain training exercises; hearing protection would not be needed by off-base residents or nearby golfers. Using other suggested best management practices could reduce impacts to the community; these include (to the extent possible) providing advance notice of exercises, limiting amounts of C-4 detonated at one time, and avoiding Sunday mornings and days with low cloud cover. Noise impacts from EOD exercises to nearby receptors would be lowest under the Proposed Action (due to the greater distance from the base boundary) as compared to the site alternatives. Operations at the munitions complex would have negligible noise impacts. Under No Action Alternative, the current insignificant noise impacts would continue.

Transportation. The Proposed Action or EOD site alternatives would have insignificant short-term impacts to the transportation network at Westover ARB during construction as a result of increased traffic and the use of construction equipment. After construction is complete, traffic levels in the project area would essentially return to pre-construction levels, with no long-term impacts. Aircraft operations at Westover ARB would not be affected under any alternative. Operations would have only negligible impacts on transportation. The No Action Alternative would have no impact on the transportation infrastructure.

Environmental Programs. The Proposed Action and EOD site alternatives would have insignificant impacts to human health and safety, hazardous materials and waste, IRP, solid waste, or storm water. Remedial activities at the IRP sites near the proposed and alternative EOD sites would not affect EOD construction or operations. EOD operations, and construction and operations at the munitions complex site, would not affect or be affected by IRP activities. The No Action Alternative would result in a continuation of the current insignificant impacts.

Cumulative impacts are those changes to the physical, biological, and socioeconomic environments that would result from the Proposed Action (or Alternatives) in combination with past, present, and reasonably foreseeable future actions. There would be no significant cumulative impacts from the Proposed Action or either site alternative. The insignificant increases in air and noise emissions, and the insignificant impacts predicted for other resource areas, would also be insignificant when considered cumulatively with other activities at Westover ARB and the nearby off-base area.

MITIGATIONS, BEST MANAGEMENT PRACTICES, AND PREVENTIVE MEASURES

Significant adverse impacts can be mitigated through avoidance, minimization, remediation, reduction, or compensation; certain mitigations are required by law. Within each resource area, this EA presents any mitigations identified during the analysis, along with best management practices and preventive measures that are necessary or useful to minimize environmental impacts. ***Mitigations*** are required if significant impacts are identified. ***Best management practices*** are generally routine procedures used to reduce impacts to people or environmental resources. Mitigations and best management practices assist the project proponents in maintaining compliance with environmental regulations. ***Preventive measures*** are design features or operational practices that may be tested, evaluated, and/or used to further reduce environmental impacts.

Mitigations

No significant impacts were identified. Therefore, no mitigations are required.

Best Management Practices

Construction best management practices, to protect air quality and geological, water, biological, and cultural resources, include the following:

- Dampening disturbed soil as needed to prevent wind and water erosion
- Revegetating disturbed areas (exposed soil) as quickly as possible
- Using sediment barriers or traps and trench boxes
- Reviewing work plans and dig permits to identify and avoid potential impacts to cultural resources.

A noise best management practice to protect worker hearing, in compliance with OSHA regulations and AFOSH standards, is listed below:

- Using hearing protection (by EOD personnel and any other training participants or observers) during EOD training exercises when C-4 is detonated.

Noise best management practices to minimize annoyance to the on- and off-base community during EOD training exercises are listed below. This listing recognizes that all best management practices would be followed to the extent possible, given mission constraints, training requirements, and emergency situations that could preclude advance notice.

- Posting information in advance at the golf course when C-4 testing is scheduled.
- Providing advance notice to nearby residents and to the local news media when C-4 testing is scheduled.
- Restricting the use of C-4 to a maximum of 4 lbs, to the extent possible.
- Whenever possible, scheduling training activities using C-4 during daytime hours, avoiding nighttime (10:00 p.m. to 6:00 a.m.) and Sunday morning detonations.
- Consulting local weather forecasts and, to the extent possible, avoiding training activities using C-4 when skies are overcast.

Preventive Measures

The following are possible measures that could be used to reduce potential impacts to soils and groundwater from explosives residues. Ongoing research may provide additional preventive measures in the future. All preventive measures would be evaluated on a recurring basis to determine their effectiveness.

- Spreading a lime layer on the soil in the test area just prior to each test. The amount of lime would vary according to the amount of explosive used, and would serve to neutralize the somewhat acidic residual material. About 20 grams of lime would be applied for each gram of royal demolition explosive (RDX) used.
- Using a portable retractable cover over the test area between training activities. This will shed rainwater and avoid the need for leachate recovery in the sandy soil upon which EOD personnel detonate explosive materials.
- Developing a partnership between Westover ARB, SERDP, and ESTCP. The EOD facility would serve as a demonstration project in their studies on reducing the environmental impacts from firing ranges, and the findings would help identify effective strategies to minimize potential contamination from the EOD facility.

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TABLE OF CONTENTS

TABLE OF CONTENTS

EXECUTIVE SUMMARY **ES-1**

LIST OF FIGURES ..... **v**

LIST OF TABLES ..... **v**

ACRONYMS AND ABBREVIATIONS ..... **vii**

1. PURPOSE OF AND NEED FOR ACTION **1-1**

1.1 PURPOSE OF AND NEED FOR ACTION 1-1
1.1.1 EOD Training Facility 1-1
1.1.2 Munitions Complex 1-2
1.2 SELECTION CRITERIA FOR THE ACTION 1-2
1.3 DECISIONS TO BE MADE 1-3
1.4 LOCATION OF PROPOSED ACTION 1-4
1.5 ORGANIZATION OF THIS ENVIRONMENTAL ASSESSMENT 1-4
1.6 SCOPING AND CONSULTATION 1-4
1.7 LAWS AND REGULATIONS 1-7
1.7.1 Environmental Policy 1-7
1.7.2 Operations and Safety 1-7
1.7.3 Air Quality 1-8
1.7.4 Water Quality 1-8
1.7.5 Biological Resources 1-8
1.7.6 Wetlands and Floodplains 1-9
1.7.7 Cultural Resources 1-9
1.7.8 Noise 1-10
1.7.9 Transportation 1-10
1.7.10 Management of Hazardous Materials and Hazardous Waste 1-10
1.7.11 Environmental Justice 1-11
1.8 PERMITTING REQUIREMENTS 1-11

2. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES **2-1**

2.1. DESCRIPTION OF PROPOSED ACTION 2-1
2.1.1. Construct and Operate EOD Training Facility at Taxiway D Access Road West Site 2-1
2.1.2. Construct and Operate Munitions Complex 2-7
2.2. DESCRIPTION OF ALTERNATIVES 2-10
2.2.1. EOD Site Alternative 1 2-10
2.2.2. EOD Site Alternative 2 2-10
2.2.3. No Action Alternative 2-13
2.3. ALTERNATIVES CONSIDERED BUT ELIMINATED 2-15
2.4. REASONABLY FORESEEABLE CONCURRENT ACTIONS 2-15
2.5. SUMMARY OF POTENTIAL IMPACTS 2-15

3. AFFECTED ENVIRONMENT....3-1
3.1 AIR RESOURCES....3-2
3.1.1 Climate and Meteorology....3-2
3.1.2 Regional Air Quality....3-3
3.1.3 Air Pollutant Sources....3-5
3.1.4 Hazardous Air Pollutants....3-5
3.2 GEOLOGICAL RESOURCES....3-6
3.2.1 Geology and Topography....3-6
3.2.2 Soils....3-6
3.3 WATER RESOURCES....3-7
3.3.1 Groundwater....3-7
3.3.2 Surface Water....3-8
3.3.3 Floodplains....3-8
3.3.4 Water Quality....3-10
3.4 BIOLOGICAL RESOURCES....3-11
3.4.1 Vegetation....3-11
3.4.2 Wildlife....3-11
3.4.3 Threatened or Endangered Species....3-12
3.4.4 Wetlands....3-13
3.5 CULTURAL RESOURCES....3-16
3.6 NOISE....3-16
3.6.1 Noise Descriptors....3-16
3.6.2 Existing Noise Conditions....3-18
3.6.3 Noise Sensitive Receptors....3-19
3.7 TRANSPORTATION....3-19
3.7.1 Existing Conditions....3-20
3.8 ENVIRONMENTAL PROGRAMS....3-22
3.8.1 Health and Safety Issues....3-22
3.8.2 Hazardous Materials and Waste Management....3-22
3.8.3 Installation Restoration Program....3-24
3.8.4 Solid Waste....3-26
3.8.5 Storm Water....3-26

4. ENVIRONMENTAL CONSEQUENCES....4-1
4.1 AIR RESOURCES....4-2
4.1.1 Significance Criteria....4-2
4.1.2 Analysis Methods....4-3
4.1.3 Potential Impacts of the Proposed Action....4-3
4.1.4 Potential Impacts of EOD Site Alternative 1 (East Alternative)....4-5
4.1.5 Potential Impacts of EOD Site Alternative 2 (Taxiway D Alternative)....4-5
4.1.6 Potential Impacts of the No Action Alternative....4-6
4.1.7 Mitigations, Best Management Practices, and Preventive Measures....4-6
4.2 GEOLOGICAL RESOURCES....4-6
4.2.1 Significance Criteria....4-6
4.2.2 Analysis Methods....4-6
4.2.3 Potential Impacts of the Proposed Action....4-7
4.2.4 Potential Impacts of EOD Site Alternative 1 (East Alternative)....4-8
4.2.5 Potential Impacts of EOD Site Alternative 2 (Taxiway D Alternative)....4-8
4.2.6 Potential Impacts of the No Action Alternative....4-9
4.2.7 Mitigations, Best Management Practices, and Preventive Measures....4-9

4.3 WATER RESOURCES 4-9
4.3.1 Significance Criteria 4-9
4.3.2 Analysis Methods 4-10
4.3.3 Potential Impacts of the Proposed Action 4-10
4.3.3.1 EOD Training Facility 4-10
4.3.3.2 Munitions Complex 4-13
4.3.4 Potential Impacts of EOD Site Alternative 1 (East Alternative) 4-13
4.3.5 Potential Impacts of EOD Site Alternative 2 (Taxiway D Alternative) 4-14
4.3.6 Potential Impacts of the No Action Alternative 4-14
4.3.7 Mitigations, Best Management Practices, and Preventive Measures 4-14
4.4 BIOLOGICAL RESOURCES 4-14
4.4.1 Significance Criteria 4-15
4.4.2 Analysis Methods 4-15
4.4.3 Potential Impacts of the Proposed Action 4-15
4.4.3.1 Vegetation 4-16
4.4.3.2 Wildlife 4-16
4.4.3.3 Threatened or Endangered Species 4-17
4.4.3.4 Wetlands 4-17
4.4.4 Potential Impacts of EOD Site Alternative 1 (East Alternative) 4-17
4.4.5 Potential Impacts of EOD Site Alternative 2 (Taxiway D Alternative) 4-18
4.4.6 Potential Impacts of the No Action Alternative 4-18
4.4.7 Mitigations, Best Management Practices, and Preventive Measures 4-18
4.5 CULTURAL RESOURCES 4-18
4.5.1 Significance Criteria 4-18
4.5.2 Analysis Methods 4-19
4.5.3 Potential Impacts of the Proposed Action 4-19
4.5.4 Potential Impacts of EOD Site Alternative 1 (East Alternative) 4-20
4.5.5 Potential Impacts of EOD Site Alternative 2 (Taxiway D Alternative) 4-20
4.5.6 Potential Impacts of the No Action Alternative 4-20
4.5.7 Mitigations, Best Management Practices, and Preventive Measures 4-20
4.6 NOISE 4-21
4.6.1 Significance Criteria 4-21
4.6.2 Analysis Methods 4-21
4.6.3 Potential Impacts of the Proposed Action 4-22
4.6.3.1 EOD Training Facility 4-22
4.6.3.2 Munitions Complex 4-25
4.6.4 Potential Impacts of EOD Site Alternative 1 (East Alternative) 4-25
4.6.5 Potential Impacts of EOD Site Alternative 2 (Taxiway D Alternative) 4-25
4.6.6 Potential Impacts of the No Action Alternative 4-26
4.6.7 Mitigations, Best Management Practices, and Preventive Measures 4-26
4.7 TRANSPORTATION 4-26
4.7.1 Significance Criteria 4-27
4.7.2 Analysis Methods 4-27
4.7.3 Potential Impacts of the Proposed Action 4-27
4.7.4 Potential Impacts of EOD Site Alternative 1 (East Alternative) 4-28
4.7.5 Potential Impacts of EOD Site Alternative 2 (Taxiway D Alternative) 4-28
4.7.6 Potential Impacts of the No Action Alternative 4-29
4.7.7 Mitigations, Best Management Practices, and Preventive Measures 4-29

4.8 ENVIRONMENTAL PROGRAMS....4-29
4.8.1 Significance Criteria....4-29
4.8.2 Analysis Methods....4-29
4.8.3 Potential Impacts of the Proposed Action....4-30
4.8.3.1 Health and Safety....4-30
4.8.3.2 Hazardous Materials and Waste Management....4-30
4.8.3.3 Installation Restoration Program....4-31
4.8.3.4 Solid Waste....4-32
4.8.3.5 Storm Water....4-32
4.8.4 Potential Impacts of EOD Site Alternative 1 (East Alternative)....4-32
4.8.5 Potential Impacts of EOD Site Alternative 2 (Taxiway D Alternative)....4-33
4.8.6 Potential Impacts of the No Action Alternative....4-33
4.8.7 Mitigations, Best Management Practices, and Preventive Measures....4-33
4.9 COMPATIBILITY OF THE PROPOSED ACTION OR SITE ALTERNATIVES WITH OBJECTIVES OF FEDERAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS....4-33
4.10 RELATIONSHIPS BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY....4-33
4.11 CUMULATIVE IMPACTS....4-33
4.12 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES....4-34
4.13 FEDERAL ACTIONS TO ADDRESS ENVIRONMENTAL JUSTICE IN MINORITY POPULATIONS, LOW-INCOME POPULATIONS, AND CHILDREN....4-35

5. REFERENCES....5-1

6. LIST OF PREPARERS....6-1

APPENDICES:

APPENDIX A Climatological Data....A-1

APPENDIX B Air Quality Information....B-1

APPENDIX C Natural and Cultural Resources....C-1

LIST OF FIGURES

1.3-1 Regional Location and Vicinity of Westover ARB, Massachusetts 1-5
1.3-2 Westover ARB Showing Project Area 1-6

2.1-1 Aerial View of Project Area and Surroundings 2-2
2.1-2 Project Area Showing Proposed Action 2-3
2.1-3 Photograph of Proposed EOD Site, Facing West 2-4
2.1-4 Plan View of the Proposed EOD Facility 2-5
2.1-5 Proposed Design of Munitions Facilities 2-9
2.2-1 Project Area Showing EOD Site Alternative 1 2-11
2.2-2 Project Area Showing EOD Site Alternative 2 2-12
2.2-3 Photograph of EOD Site Alternative 2, Facing South 2-14

3.3-1 Surface Water Features on Westover ARB 3-9
3.4-1 Wetland Areas Near the Project Area 3-15
3.7-1 Proposed Route for Explosives Transport 3-21
3.8-1 Location of IRP Sites Near the Project Area 3-25

4.6-1 Noise Emissions from Equipment at 85 and 88 dBA 4-22

LIST OF TABLES

2.1-1 Approximate EOD Training Schedule 2-6
2.5-1 Summary of Impacts 2-16

3.1-1 National Ambient Air Quality Standards (NAAQS) 3-3
3.1-2 Air Pollutant Emissions at Westover ARB, Calendar Year 2000 3-5
3.6-1 Typical Decibel Levels Encountered in the Environment and Industry 3-17
3.6-2 Approximate Sound Levels (dBA) of Construction Equipment 3-18

4.1-1 Air Pollutant Generation from Construction Activities, Proposed Action 4-3
4.1-2 Air Pollutant Generation from Construction Activities, Site Alternative 1 (East Alternative) 4-5
4.1-3 Air Pollutant Generation from Construction Activities, Site Alternative 1 (Taxiway D Alternative) 4-5

Appendix Tables:

A-1 Westover ARB Meteorological Data, Low Ceiling / Low Visibility A-3

B-1 Air Emissions from the Construction of EOD and Munitions Facilities at Westover ARB, MA, Proposed Action B-3
B-2 Air Emissions from the Construction of EOD and Munitions Facilities at Westover ARB, MA, EOD Site Alternative 1 (East Alternative) B-5
B-3 Air Emissions from the Construction of EOD and Munitions Facilities at Westover ARB, MA, EOD Site Alternative 2 (Taxiway D Alternative) B-7

C-1 Federal and State Protected Species on or Near Westover ARB, MA C-3
C-2 Cultural Resources on Westover ARB C-4

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ACRONYMS AND ABBREVIATIONS

ACRONYMS/ABBREVIATIONS

Units of Measurement

° C	degrees Celsius
° F	degrees Fahrenheit
g	gram
kg	kilogram (1,000 grams; used for dry measurements)
L	liter (1,000 grams; used for liquid measurements)
mg	milligrams ($1/1{,}000^{th}$ or 0.001 gram)
µg	microgram ($1/1{,}000{,}000^{th}$ or 0.000001 gram)
ppb	parts per billion
ppm	parts per million
1 mg/kg	approximately equivalent to 1 ppm
1 mg/L	approximately equivalent to 1 ppm
1 µg/kg	approximately equivalent to 1 ppb
1 µg/L	approximately equivalent to 1 ppb

Acronyms and Abbreviations

AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
AFI	Air Force Instruction
AFMAN	Air Force Manual
AFOSH	Air Force Occupational Safety and Health
AFRC	Air Force Reserve Command
AICUZ	Air Installation Compatible Use Zone
ALC	Air Logistics Center
AMC	Air Mobility Command
ANGB	Air National Guard Base
ANGS	Air National Guard Station
AQCR	Air Quality Control Region
ARB	Air Reserve Base
ARPA	*Archaeological Resources Protection Act*
ATCT	Air Traffic Control Tower
ATSDR	Agency for Toxic Substances and Disease Registry
AW	Airlift Wing
BASH	Bird Aircraft Strike Hazard
Bldg	building
C-4	Composition 4
CAA	*Clean Air Act*
CCC	Chicopee Conservation Commission
CED	Explosive Ordnance Disposal Flight

CEQ	Council on Environmental Quality
CES	Civil Engineering Squadron
CERCLA	*Comprehensive Environmental Response, Compensation and Liability Act*
CFR	*Code of Federal Regulations*
CMR	*Code of Massachusetts Regulations*
CO	carbon monoxide
CWA	*Clean Water Act*
D	Delta
dB	decibel
dBA	"A-weighted" decibel
DDESB	DoD Explosives Safety Board
DEP	Department of Environmental Protection
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
ESTCP	Environmental Security Technology Certification Program
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPCRA	*Emergency Planning and Community Right-to-Know Act*
ERDC	Engineering Research and Development Center
ESA	*Endangered Species Act*
FEMA	Federal Emergency Management Agency
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
FR	*Federal Register*
FY	fiscal year
H_2S	hydrogen sulfide
HAP	hazardous air pollutant
HAZMAT	hazardous materials
HC	hydrocarbon
HQ	headquarters
IRP	Installation Restoration Program
LBP	lead-based paint
L_{dn}	day-night average sound level
L_{eq}	equivalent sound level
LT	long-term
MA	Massachusetts
MA DEP	Massachusetts Department of Environmental Protection
MAC	Military Airlift Command

MAW	Military Airlift Wing
MCL	maximum contaminant level
MCP	Massachusetts Contingency Plan
MEPA	*Massachusetts Environmental Policy Act*
MGL	Massachusetts General Law
MMIF	Munitions Maintenance and Inspection Facility
MNHESP	Massachusetts Natural Heritage and Endangered Species Program
MSF	Munitions Storage Facility
MSGP	multi-sector general permit
MSL	mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	*National Environmental Policy Act*
NEW	net explosive weight
NCP	National Oil and Hazardous Substances Contingency Plan
NFRAP	No Further Response Action Planned
NHPA	*National Historic Preservation Act*
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NOI	Notice of Intent
NPDES	National Pollution Discharge Elimination System
NPL	National Priority List
NRCS	Natural Resource Conservation Service (formerly SCS)
NRHP	National Register of Historic Places
NSWC	Naval Surface Warfare Center
O_3	ozone
OI	operating instruction
OSHA	Occupational Safety and Health Administration
Pb	lead
PCB	polychlorinated biphenyl
PM_{10}	particulate matter equal to or less than 10 microns in diameter
$PM_{2.5}$	particulate matter equal to or less than 2.5 microns in diameter
ppb	parts per billion
ppm	parts per million
PSD	Prevention of Significant Deterioration
QD	quantity-distance
RCRA	*Resource Conservation and Recovery Act*
RDX	royal demolition explosive
SAC	Strategic Air Command
SAF/MIQ	Deputy Assistant Secretary of the Air Force for Environment, Safety, and Occupational Health
SARA	*Superfund Amendments and Reauthorization Act*
SCS	Soil Conservation Service (now NRCS)

SERDP	Strategic Environmental Research Development Program
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_x	sulfur oxides
SR	state route
TAW	Tactical Airlift Wing
TCLP	toxicity characteristic leaching procedure
TDS	total dissolved solids
TNT	trinitrotoluene
TPSWD	tons per summer weekday
TSCA	*Toxic Substances Control Act*
TSD	transportation, storage, or disposal
TSP	total solid particulates
tpy	tons per year
Ub	Urban Land (soil classification)
Uk	Urban Land Hinkley-Windsor Association (soil classification)
USACE	United States Army Corps of Engineers
USAF	United States Air Force
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
VOC	volatile organic compound

CHAPTER 1

PURPOSE OF AND NEED FOR ACTION

1. PURPOSE OF AND NEED FOR ACTION

The United States Air Force Reserve Command (AFRC) proposes to construct and operate an Explosive Ordnance Disposal (EOD) training facility and a munitions complex at Westover Air Reserve Base (ARB), Massachusetts. The EOD facility would allow EOD personnel to meet their training requirements in accordance with Department of Defense and Air Force safety standards. The munitions "complex," consisting of a munitions maintenance and inspection facility (MMIF) and a munitions storage facility (MSF), would allow the base to provide adequate, safe, on-base facilities for the maintenance, inspection, and storage of munitions. The *National Environmental Policy Act* (NEPA) of 1969, as amended, requires federal agencies to consider environmental consequences in their decision-making process. The President's Council on Environmental Quality (CEQ) has issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental analysis. The Air Force environmental impact assessment process is accomplished through adherence to the procedures set forth in CEQ regulations (40 *Code of Federal Regulations* (CFR) §1500-1508) and 32 CFR 989 (*Air Force Environmental Impact Analysis Process*). These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation, designed to ensure deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. This environmental assessment (EA) analyzes potential environmental consequences from implementing the Proposed Action or an EOD site alternative, or continuing with current practices (No Action Alternative).

1.1 PURPOSE OF AND NEED FOR ACTION

The 439th Airlift Wing (439 AW), housed at Westover ARB, provides air transport capabilities for moving military equipment and personnel worldwide. As an aerial port of embarkation, the base is a staging area for contingency operations. The EOD Flight, as part of its mission, serves as first responder for civil and military incidents involving weapons of mass destruction and other explosive threats. The training of EOD personnel and the storage, maintenance, and inspection of munitions support the worldwide mission of the 439 AW.

1.1.1 EOD Training Facility

The mission of the 439 CES/CED ("EOD Team") is as follows:

> *To disarm and dispose of unexploded ordnance delivered or placed by enemy forces. In addition, EOD must be able to "render safe" U.S. ordnance made dangerous by incident, accident or other circumstance. EOD technicians are also obligated to use their special expertise to assist Federal and civil authorities when called upon in times such as dealing with terrorist or other criminal acts, accidents, and found explosives.*

The purpose of the action is to provide a facility where EOD personnel can receive training in all requirements to maintain proficiency with a variety of munitions. Training

is conducted in accordance with Air Force Manual (AFMAN) 91-201, *Explosive Safety Standards*, and the 439 CES Operating Instruction (OI) 91-1. Training must be performed monthly with some munitions and semi-annually with others. Currently, training is done on a limited basis. However, the new facility would allow fully compliant training with all required munitions. According to Air Force Instruction (AFI) 32-3001, *Explosive Ordnance Disposal Program*, Chapter 3 (Training), monthly qualification must involve training or operations using cartridge-actuated tools, demolition explosives, or pyrotechnic devices to perform render-safe procedures or general demolition. Semi-annual training requirements are met in conjunction with practical training and exercises involving hands-on training for formulating plans, selecting and using proper equipment, and resolving explosive ordnance incidents. The Air Mobility Command Standard Training Package (1 December 2000) provides guidance on the conduct of monthly and semi-annual training to meet requirements for AFRC personnel and active duty personnel. The EOD Career Field Education and Training Plan (AFSC 3E8X1, April 1997) includes additional details on activities to meet training requirements.

1.1.2 Munitions Complex

The 439 MSX/LGM mission includes oversight of the safe handling and storage of a variety of munitions, used both at Westover ARB and for operations at other locations worldwide. Several units at Westover ARB use munitions in their operations, and Airlift Defensive System modifications to the Westover-based C-5 aircraft and the transient C-5, C-130, C-141, and various fighter/attack aircraft require that the base have facilities for storage, maintenance, and inspection of munitions. AFI 21-201 requires that mission-dependent Class 1.1 munitions be inspected in a separate facility prior to issue and at other times. Air Force regulations require munitions technicians to perform additional work, such as munitions residue inspections, trailer maintenance, and other work required by Time Compliance Technical Orders. The purpose of the action is to provide adequate, safe, on-base facilities for these activities. The current munitions storage areas at Westover ARB total only 300 square feet, which is inadequate, and do not meet explosive safety standards. Further, the 439 AW does not have the capability to store Class 1.1 or 1.2 munitions on Westover ARB, and must store these munitions at Barnes Air National Guard Station (ANGS) and Fort Devens Army Base; access to these facilities by Westover personnel is limited.

1.2 SELECTION CRITERIA FOR THE ACTION

The following criteria were used to evaluate the Proposed Action and site alternatives. Safety issues were the primary factors involved in the consideration of sites for the two components (the EOD training facility and the munitions complex).

- The EOD training facility must be adequate to meet the projected needs for EOD training, based on the explosives that would be used.
- The munitions complex must have adequately sized and separated spaces for the storage of various compatibility classes of munitions.

- The EOD training facility and munitions complex should be within the base boundary to ensure security.
- The location for the EOD training facility and munitions complex should be accessible via existing the transportation structure to avoid road construction.
- For safety and security reasons, quantity-distance (QD) arcs (also known as safety zones) should not overlap populated areas, high-density public traffic routes (10,000 vehicles or more per day) or active runways, taxiways, or passenger terminals, and should not impact areas planned for development. Air Force Manual 91-201, *Explosive Safety Standards,* identifies hazards and states safety precautions and rules for working with explosives. Safety zones are based on protection requirements from potential explosive sites to exposed sites.
- The QD arcs for the new facilities must lie entirely within the base boundary, and must not overlap established mission-critical areas at Westover ARB, such as taxiway loading areas, drop zones, or the Dog Patch training area. Conversely, the munitions facility and EOD training facility must lie outside of the QD arcs for the taxiway loading areas. The munitions complex must lie outside of the QD arc for the EOD training facility. (The various safety zones are illustrated in Figures 2.1-1, 2.2-1, and 2.2-3.)
- The munitions complex must be accessible from the taxiway loading areas without crossing an active runway.
- There must be a source of water to support plumbing and fire suppression systems at the munitions complex.
- The Air Force should not have to acquire property. There is no funding allocated for purchasing off-base property near Westover ARB to support the proposed project. To obtain such funds, Westover ARB would need to modify their Program Objective Memorandum (a document that identifies total program requirements beyond the next fiscal year) or obtain funding through special legislation; either option would be a lengthy process.
- To the extent possible within mission constraints, construction and operational impacts to safety and to environmental resources should be minimized, and noise impacts to nearby receptors, both on- and off-base, should be limited.

1.3 DECISIONS TO BE MADE

The analysis in this EA evaluates the potential environmental consequences of constructing and operating the EOD training facility and the munitions complex. Based on this information, the Chairman of the Environmental Protection Committee at Westover ARB will determine whether to issue a Finding of No Significant Impact (FONSI) or to prepare an Environmental Impact Statement (EIS). As required by NEPA and its implementing regulations, preparation of an environmental document must precede final decisions regarding the proposed project, and be available to inform decision makers of the potential environmental impacts of selecting the Proposed Action, either of the EOD Site Alternatives, or No Action Alternative.

1.4 LOCATION OF PROPOSED ACTION

Westover ARB comprises approximately 2,500 acres of land within the communities of Chicopee and Ludlow in the northern portion of Hampden County. The base is near the Massachusetts cities of Springfield and Holyoke, and the Towns of West Springfield, Grandby, and South Hadley. Westover ARB is located in the Pioneer Valley Region, which encompasses 43 municipalities within Hampshire and Hampden Counties along the Connecticut River.

The base is approximately 2 miles east of the Connecticut River, and is intersected or bounded by Cooley, Stony, and Willimansett Brooks. Figure 1.3-1 shows the regional location of Westover ARB, while Figure 1.3-2 shows the project area in the northeastern portion of the base.

1.5 ORGANIZATION OF THIS ENVIRONMENTAL ASSESSMENT

This EA evaluates the Proposed Action, two EOD site alternatives, and the No Action Alternative. The Proposed Action and alternatives are discussed in Chapter 2. Chapter 3, Affected Environment, describes the environment on and around Westover ARB that could be affected by the Proposed Action or an alternative. Chapter 4, Environmental Consequences, addresses potential impacts (direct, indirect, and cumulative) of the Proposed Action and alternatives to this environment. Chapter 5 lists reference materials used to prepare the EA, and Chapter 6 is the list of preparers. Appendix A provides detailed climatological data, Appendix B contains spreadsheets used to analyze air quality impacts, and Appendix C lists protected natural resources and summarizes cultural resources on Westover ARB.

1.6 SCOPING AND CONSULTATION

For this EA, scoping consisted of discussing relevant issues pertaining to the planned action among representatives of the Headquarters Air Force Center for Environmental Excellence (HQ AFCEE), Westover ARB personnel (Civil Engineering Squadron and Environmental Flight; Wing Safety, and the Maintenance Group), Pioneer Valley Planning Commission, and the preparers of the document. Queries were made to potential offsite training facilities including: Springfield Arson/Bomb Squad, Massachusetts State Police Bomb Squad, Fort Devens Reserve Forces Training Area, and the 102 EOD Flight of Otis ANGS. Information for the EA was also obtained from the following organizations: Whiteman AFB, MO, and Scott AFB, IL (both installations have EOD training facilities); the United States Army Corps of Engineers (USACE) Engineer Research and Development Center (for residue data), and other USACE units; and the United States Army Center for Health Promotion and Preventative Medicine (for noise modeling). The input from these and other sources was considered in preparing this EA. As is typical for this level of environmental documentation, no formal public scoping meetings were conducted for this Proposed Action.

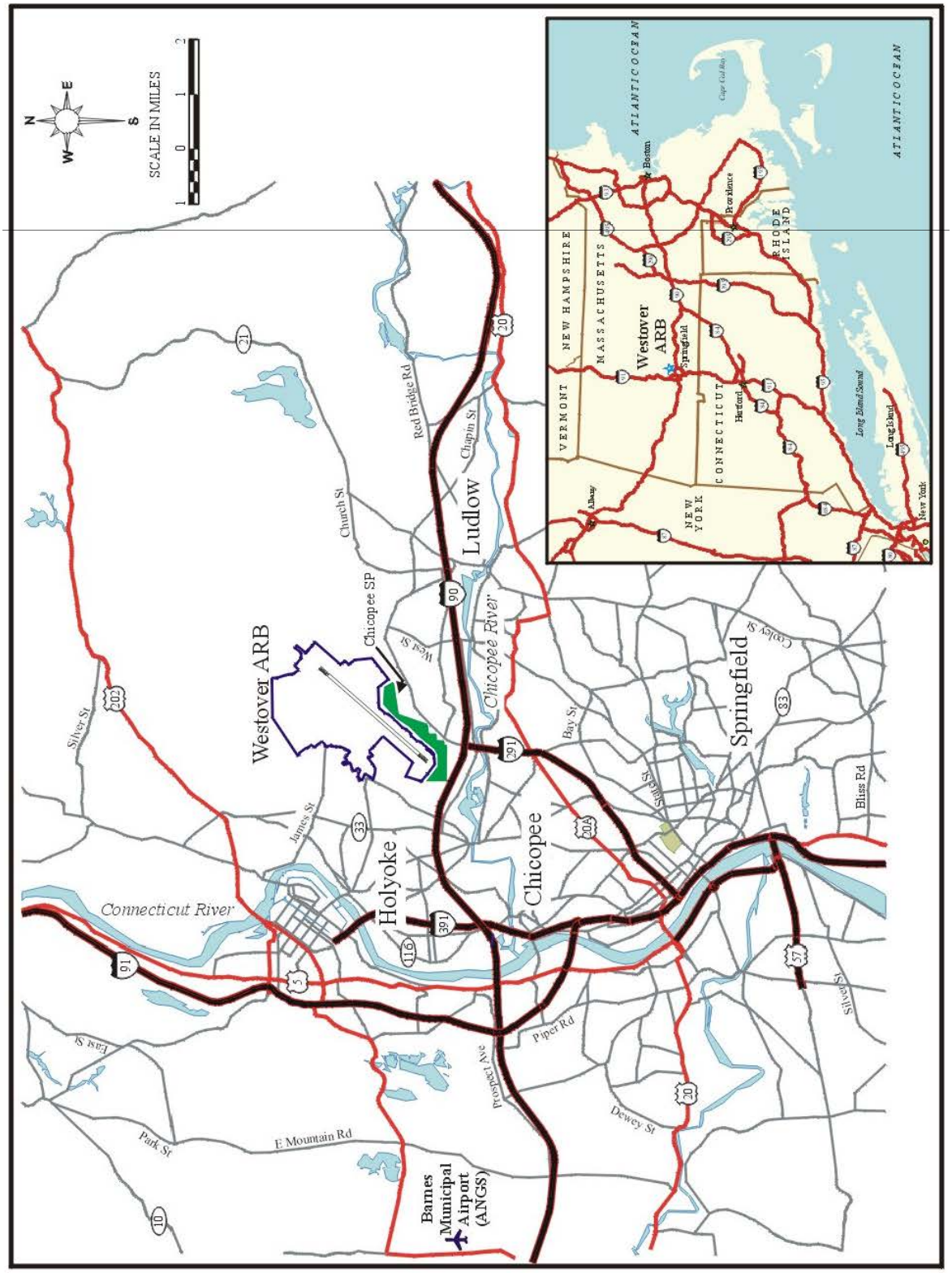

Figure 1.3-1. Regional Location and Vicinity of Westover ARB, MA

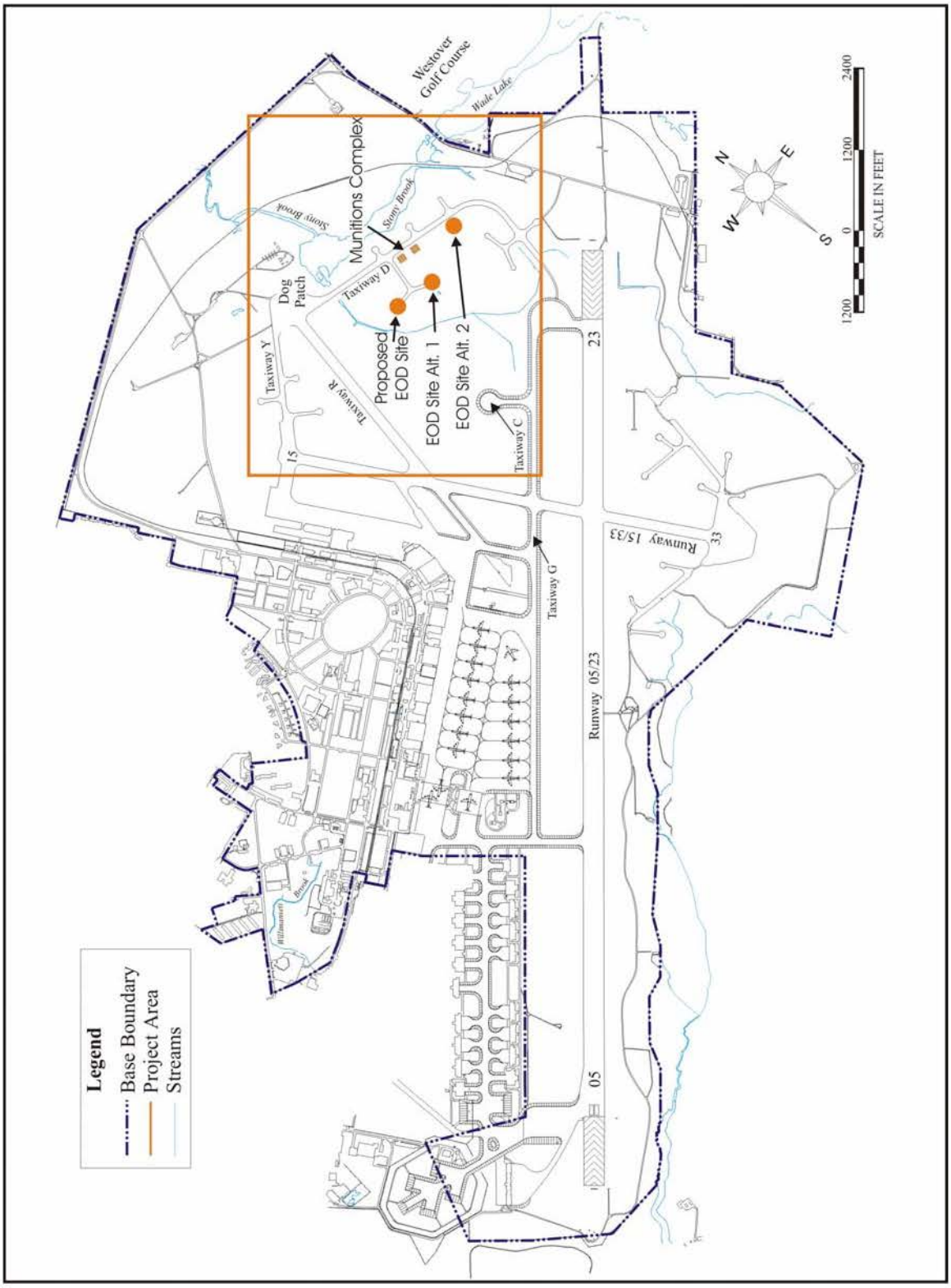

Figure 1.3-2. Westover ARB, Showing Project Area

The following environmental issues were identified during the scoping process for this Proposed Action: potential impacts to the natural environment (air, geology, water, biology, wetlands, noise, and cultural resources); the local community (land use and transportation); and relevant environmental programs (health and safety; hazardous materials and waste management; the Installation Restoration Program; solid waste, and storm water). Under the Proposed Action or an EOD site alternative, the EOD training facility project and munitions complex would be constructed on land that is near the current EOD training area, known as the Dog Patch (other training also occurs in the area), and would involve structures that are unobtrusive. For these reasons, impacts to aesthetics are not addressed in this EA.

The introduction to Chapter 3 discusses other environmental resource areas that are not relevant for evaluation in this EA. In addition, the EA examines the cumulative effects of the project when considered with other projects.

1.7 LAWS AND REGULATIONS

A brief summary of federal and state laws and regulations that may be applicable to the Proposed Action and alternatives is provided in the following paragraphs.

1.7.1 Environmental Policy

The *National Environmental Policy Act* of 1969 [42 United States Code (U.S.C.) §4321 *et seq*.] establishes national policy, sets goals, and provides the means to prevent or eliminate damage to the environment. These NEPA procedures ensure that information about environmental impacts is available to public officials and citizens before decisions are made on major federal actions that may significantly affect the environment. The President's CEQ regulations [40 *Code of Federal Regulations* (CFR) 1500-1508] implement the procedural provisions of NEPA.

Executive Order (EO) 11514, *Protection and Enhancement of Environmental Quality*, as amended by EO 11991, directs the Federal Government to act or provide guidance on how to implement particular requirements for protecting and enhancing the quality of the nation's environment.

EO 12372, *Intergovernmental Review of Federal Programs*, provides for opportunities for consultation by state and local governments on proposed federal developments.

The *Air Force Environmental Impact Analysis Process* (32 CFR 989) establishes the procedures to implement the CEQ regulations promulgated pursuant to NEPA.

1.7.2 Operations and Safety

Department of Defense Directive 6055.9, *DoD Explosives Safety Board (DDESB) and DoD Component Explosives and Safety Responsibilities*, provides DoD direction regarding the policies and responsibilities of the DDESB.

AFMAN 91-201, *Explosive Safety Standards*, provides detailed direction regarding the siting, operations, and safety practices of all types of military facilities that use or store munitions or explosives.

AFI 32-3001, *Explosive Ordnance Disposal Program*, provides Air Force guidance specifically for EOD programs.

1.7.3 Air Quality

The *Clean Air Act* (CAA) [42 U.S.C. §7401 *et seq.*, as amended] establishes as federal policy the protection and enhancement of the quality of the Nation's air resources to protect human health and the environment. The CAA sets national primary and secondary ambient air quality standards as a framework for air pollution control.

The *Massachusetts Air Quality Act* (as implemented in 310 CMR §6.00-8.00) sets forth requirements to achieve and maintain air quality levels that protect human health and safety, prevent injury to plant and animal life and property, and provide a coordinated statewide program of air pollution prevention, abatement, and control.

AFI 32-7040, *Air Quality Compliance*, instructs the Air Force on compliance with the CAA and federal, state, and local regulations.

1.7.4 Water Quality

The *Clean Water Act* (CWA) [33 U.S.C. §1251 *et seq.*, as amended], in order to restore and maintain the chemical, physical, and biological integrity of the water, establishes federal limits on the amounts of specific pollutants that can be discharged to surface waters, using the National Pollution Discharge Elimination System (NPDES). A new NPDES permit, or modification to an existing permit, would be required for changes from the present parameters in the quality or quantity of storm water runoff.

The *Massachusetts Clean Waters Act* (310 CMR 41.00 and 314 CMR 1.00-15.00*)* serves to protect the public health and enhance the quality and value of the water resources of the Commonwealth and is administered by the Department of Environmental Protection. Regulation 314 CMR 4.00 deals specifically with the water quality standards for surface waters, while 314 CMR 6.00 addresses groundwater quality standards.

AFI 32-7041*, Water Quality Compliance*, provides guidance on assessing, attaining, and sustaining compliance with the CWA and other federal, state, and local environmental regulations.

1.7.5 Biological Resources

The *Endangered Species Act* (ESA) [16 U.S.C. §1531-1543, *et seq.*] requires federal agencies that authorize, fund, or carry out actions to avoid jeopardizing the continued existence of threatened or endangered species and to avoid destroying or adversely modifying their critical habitat. Federal agencies must evaluate the effects of their actions on threatened or endangered species of fish, wildlife, and plants, and their critical habitats, and take steps to conserve and protect these species. All potentially adverse impacts to threatened and endangered species must be avoided or mitigated.

The *Massachusetts Endangered Species Act* (Massachusetts General Law (M.G.L.) c.131A and Regulations 321 CMR 10.00) defines endangered, threatened, and special

concern species. The Department of Fish and Wildlife evaluates the effects of actions on species native to the state.

AFI 32-7064*, Integrated Natural Resource Management*, provides Air Force guidance on compliance with the ESA and with federal, state, and local environmental regulations.

1.7.6 Wetlands and Floodplains

Section 404 of the CWA, administered by the U.S. Army Corps of Engineers, prohibits the discharge of dredged or fill materials into waters of the United States, including wetlands, without a permit issued by the USACE. The type of permit (nationwide or individual) required depends on the acreage of wetland filled, the type of construction project, the extent of wetland avoidance, the type and extent of wetland mitigation, and the presence or absence of threatened or endangered species.

EO 11990*, Protection of Wetlands*, requires federal agencies to take action to avoid, to the extent practicable, the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. The intent of EO 11990 is to avoid direct or indirect construction in wetlands if a feasible alternative is available. All federal and federally supported activities and projects must comply with EO 11990. If wetlands would be impacted, a Finding of No Practicable Alternative (FONPA) must be prepared and submitted to HQ USAF/CEV, in accordance with AFI 32-7061, for review and approval by the Deputy Assistant Secretary of the Air Force for Environment, Safety, and Occupational Health (SAF/MIQ) prior to implementing the activity.

EO 11988*, Floodplain Management*, requires federal agencies to evaluate the potential effects of actions on floodplains and avoid adverse floodplain impacts wherever possible.

The *Massachusetts Wetlands Protection Act* (310 CMR 10.00) establishes a public review and decision-making process to address flood control, prevention of pollution, protection of fisheries, and protection of wildlife habitat. This Act is administered by the Massachusetts Department of Environmental Protection and Municipal Conservation Commission.

AFI 32-7064, *Integrated Natural Resources Management*, provides the Air Force with guidance for no net loss of wetlands on Air Force installations.

1.7.7 Cultural Resources

The *National Historic Preservation Act* (NHPA) of 1966 [16 U.S.C. §470 *et seq.*, as amended] requires federal agencies to determine the effect of their actions on cultural resources and take certain steps to ensure these resources are located, identified, evaluated, and protected.

The *Archaeological Resources Protection Act* (ARPA) [16 U.S.C. §470a-11 *et seq.*, as amended] protects archeological resources on federal lands. If archaeological resources are discovered that could be disturbed during site activities, ARPA requires permits for excavating and removing the resource.

The *Native American Graves Protection and Repatriation Act* of 1990 [Public Law 101-601; 25 U.S.C. §3001-3013 *et seq.*] prohibits the intentional removal of Native American cultural items from federal or tribal lands except under an ARPA permit and in consultation with the appropriate Native American groups.

Massachusetts has instituted a permit system for the preservation of historical sites (950 CMR 70.00 and 71.00). The *Historical Preservation Act* is regulated by Massachusetts Historical Commissions.

AFI 32-7065*, Cultural Resource Management*, provides the Air Force with guidance on compliance with the NHPA, ARPA, and applicable federal, state, and local regulations.

1.7.8 Noise

The *Noise Control Act* of 1972 [42 U.S.C. §4901 *et seq.*] establishes a policy to promote an environment free from noise harmful to the health or welfare of people. Federal agencies must also comply with state and local requirements for the control and abatement of environmental noise.

The *Occupational Safety and Health Act* (OSHA) of 1970 [29 CFR §1910.95 *et seq*]. addresses occupational noise exposure.

The Air Force Occupational Safety and Health (AFOSH) Standard 161-20, *Hearing Conservation Program*, (soon to be superceded by AFI 48-20) implements the OSHA guidance for Air Force personnel.

1.7.9 Transportation

The *Hazardous Materials Transportation Act* of 1975 [49 U.S.C. §1761] provides for the protection of public health from the risks of transporting hazardous materials (explosives, flammable liquids and solids, combustible materials, corrosives, and compressed gases). The transportation of all hazardous materials must meet the requirements of this act.

1.7.10 Management of Hazardous Materials and Hazardous Waste

The *Resource Conservation and Recovery Act* (RCRA) of 1976 (42 U.S.C. §6901 *et seq.*), as amended, sets the requirements for reduction, control, management, and disposal of solid and hazardous waste.

The Massachusetts *Solid Waste Management Act* (310 CMR 19.00) is intended to protect public health, safety and the environment by comprehensively regulating the storage, transfer, processing, treatment, disposal, use, and reuse of solid waste in Massachusetts.

The Massachusetts *Hazardous Waste Management Act* (310 CMR 30.00) and Massachusetts *Contingency Plan* (310 CMR 40.00) are intended to protect public health, safety, and welfare, and the environment, by comprehensively regulating the generation, storage, collection, transport, treatment, disposal, use, reuse, and recycling of hazardous waste in Massachusetts.

AFI 32-7042*, Solid and Hazardous Waste Compliance*, provides Air Force guidance on compliance with RCRA and applicable federal, state, and local regulations.

The *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) of 1980, as amended by the *Superfund Amendments and Reauthorization Act* (SARA) [42 U.S.C. §9601 *et seq.*], provides for funding, enforcement, response, and liability for the release or threatened release of hazardous substances into the environment.

The Installation Restoration Program (IRP) is a Department of Defense (DoD) program designed to identify, confirm, quantify, and remediate suspected problems associated with past hazardous material disposal sites on DoD installations. The Defense Environmental Restoration Program (10 U.S.C. §2701 *et seq.*) is the legal mandate for the IRP.

AFI 32-7020*, Environmental Restoration Program*, provides Air Force guidance on compliance with CERCLA, and federal, state, and local regulations.

The *Emergency Planning and Community Right-to-Know Act* (EPCRA) of 1986 (42 U.S.C. §11001), sets forth requirements for emergency planning, including timely notification and response to a release of hazardous substances.

The *Toxic Substances Control Act* (TSCA) establishes requirements (40 CFR 761) for the manufacture, processing, distribution in commerce, use, cleanup, storage, and disposal of polychlorinated biphenyls (PCB).

The *Occupational Safety and Health Act* (OSHA) of 1970 [29 CFR §651 *et seq*]. provides regulations to protect the health and safety of employees in the workplace.

1.7.11 Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*, directs federal agencies to identify and address any disproportionately high and adverse human or environmental impacts of federal actions on minority or low-income populations.

Environmental Justice also takes into consideration EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, which was signed by the President on April 21, 1997. This EO requires that each federal agency identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on children, who are more at risk because of developing body systems, comparatively higher consumption-to-weight ratios, behaviors that may expose them to more risks and hazards than adults, and less ability than adults to protect themselves from harm.

1.8 PERMITTING REQUIREMENTS

The Phase II Final Rule (published in the *Federal Register* on December 8, 1999 and effective March 10, 2003) requires NPDES permit coverage for storm water discharges from construction activity disturbing greater than one acre of land. The construction activities are scheduled to extend beyond March 2003. Westover ARB plans to construct the EOD facility in FY 2003, while the munitions facilities would not be constructed until FY 2004 or FY 2005. The EOD facility would encompass less than one acre, so a

permit would not be required. At the current design stage, the munitions facilities would encompass approximately ¾ acre. If the final design exceeds one acre, Westover ARB will obtain the required permit.

Construction of the EOD training facility at the proposed site or at alternate site 2, along Taxiway D, would not occur in wetlands or within a wetland buffer zone. However, the Site Alternative 1 location, on the east end of the Taxiway D access road, lies outside of delineated wetland boundaries but within a State-delineated buffer zone.

Current plans do not involve filling any wetlands. However, if any wetland areas were to be filled, it would be necessary to obtain a permit from the USACE.

To construct in the area of a wetlands buffer, a notice of intent (NOI) and/or request for determination of applicability would need to be prepared and filed with the Chicopee Conservation Commission (CCC).

CHAPTER 2

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This section of the EA describes the Proposed Action, two EOD Site Alternatives, alternatives considered but eliminated from analysis, and the No Action Alternative. The Proposed Action includes activities related to the construction and operation of an EOD training facility and two munitions facilities at Westover ARB. Although the EOD and munitions facilities are assessed together in this EA to ensure that impacts are fully addressed, they would be funded separately, and it is unlikely that they would be constructed concurrently. The EOD Site Alternatives involve constructing the EOD facility at nearby locations but do not otherwise differ from the Proposed Action. Facility-siting and other criteria (see Section 1.2) eliminated all but the three assessed sites, which meet the QD criteria and would not affect flightline operations. They are along Taxiway D, currently not used for aircraft. Other alternatives considered but eliminated are discussed in Section 2.3. The chapter concludes with reasonably foreseeable cumulative actions and a summary of potential impacts, based on the resource-specific analyses in Chapter 4.

2.1. DESCRIPTION OF PROPOSED ACTION

The Proposed Action includes two components, discussed in the following subsections:

- Construction and operation of an EOD training facility.
- Construction and operation of a munitions "complex," which includes a storage facility and a munitions maintenance and inspection facility.

Figure 2.1-1 shows an aerial view of the project area and its surroundings, while Figure 2.1-2 illustrates the Proposed Action facility locations.

2.1.1. Construct and Operate EOD Training Facility at Taxiway D Access Road West Site

The EOD training facility would be constructed on a site approximately 300 feet from Taxiway D. The proposed site is located at the southwestern end of an access road south of and perpendicular to the taxiway (see Figure 2.1-1). The site is approximately 100 feet from a Palustrine wetland/upland complex. A photograph of the proposed EOD site is shown in Figure 2.1-3.

No new access road would be needed, and no utilities would be required at the EOD training facility, although telephone and electricity lines and other utilities would be installed to serve the nearby munitions complex. A 500-foot buried conduit (approximately 1 to 2 feet deep) for running the firing wire (two strand 18-gauge wire) would be installed.

The facility would be about 64 feet by 48 feet, with 2 foot-thick reinforced concrete walls at least 6 feet high, and two access corridors. Figure 2.1-4 shows plan and cross-section views of the proposed facility. A sloped earthen berm would support the concrete walls and extend out 12 feet (a 2:1 slope) from each outside wall surface. The walls would also be supported by buried footings two feet wide on each side of the wall. A liner would be placed at a depth of about two feet below the soil surface. The exact design details of the facility have not yet been determined.

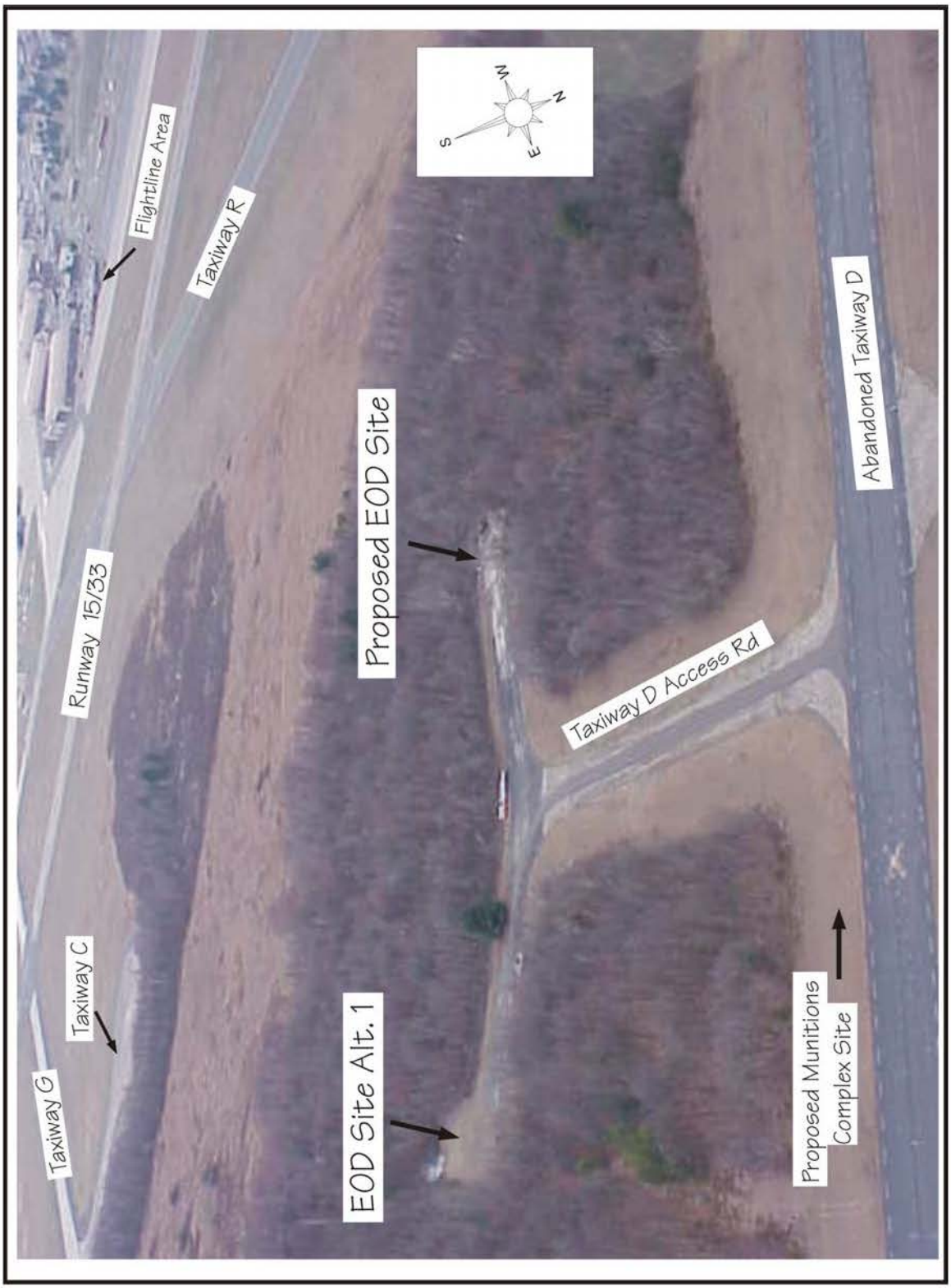

Figure 2.1-1. Aerial View of Project Area and Surroundings, Facing South

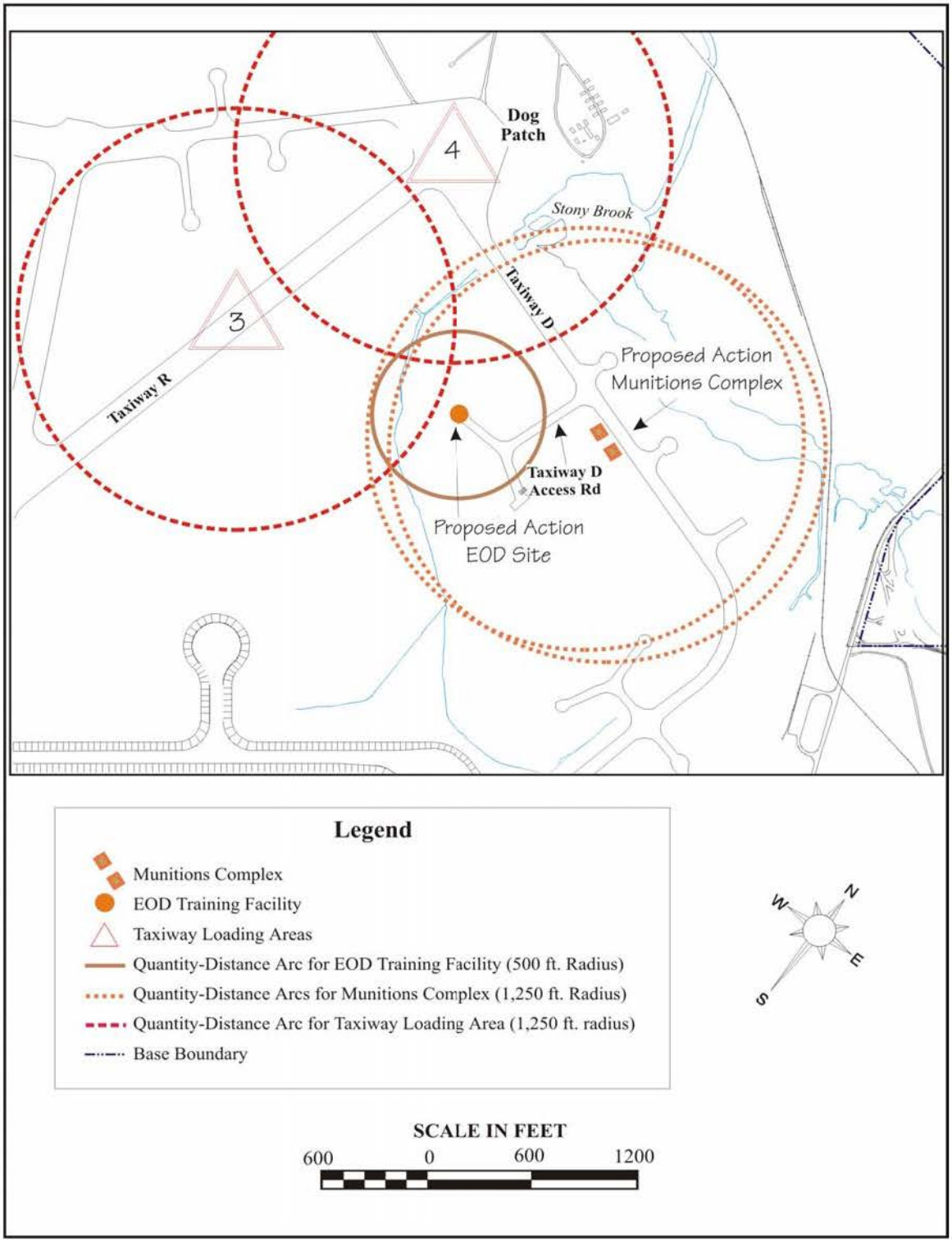

Figure 2.1-2. Project Area Showing Proposed Action

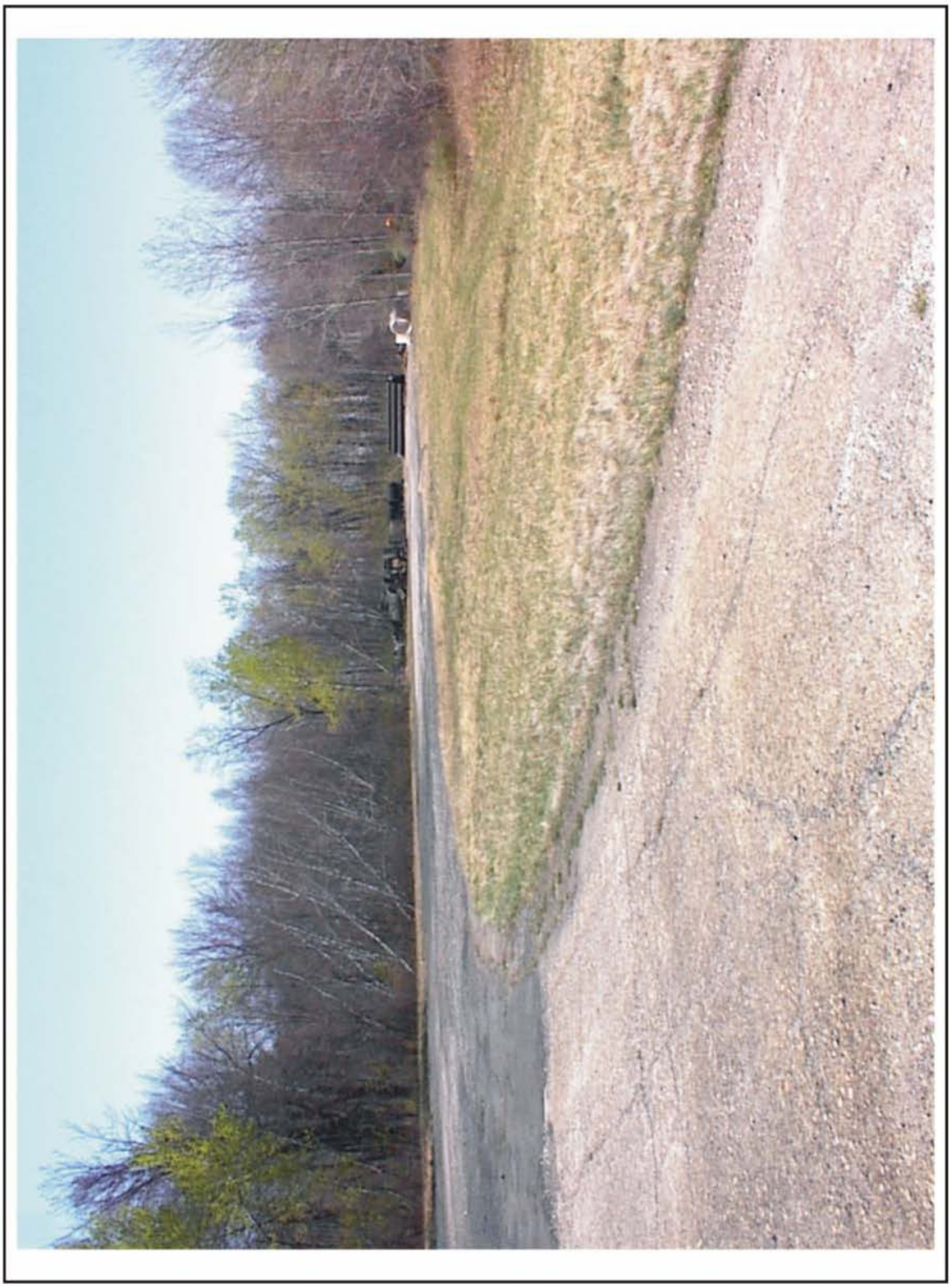

Figure 2.1-3. Proposed EOD Site, Facing West

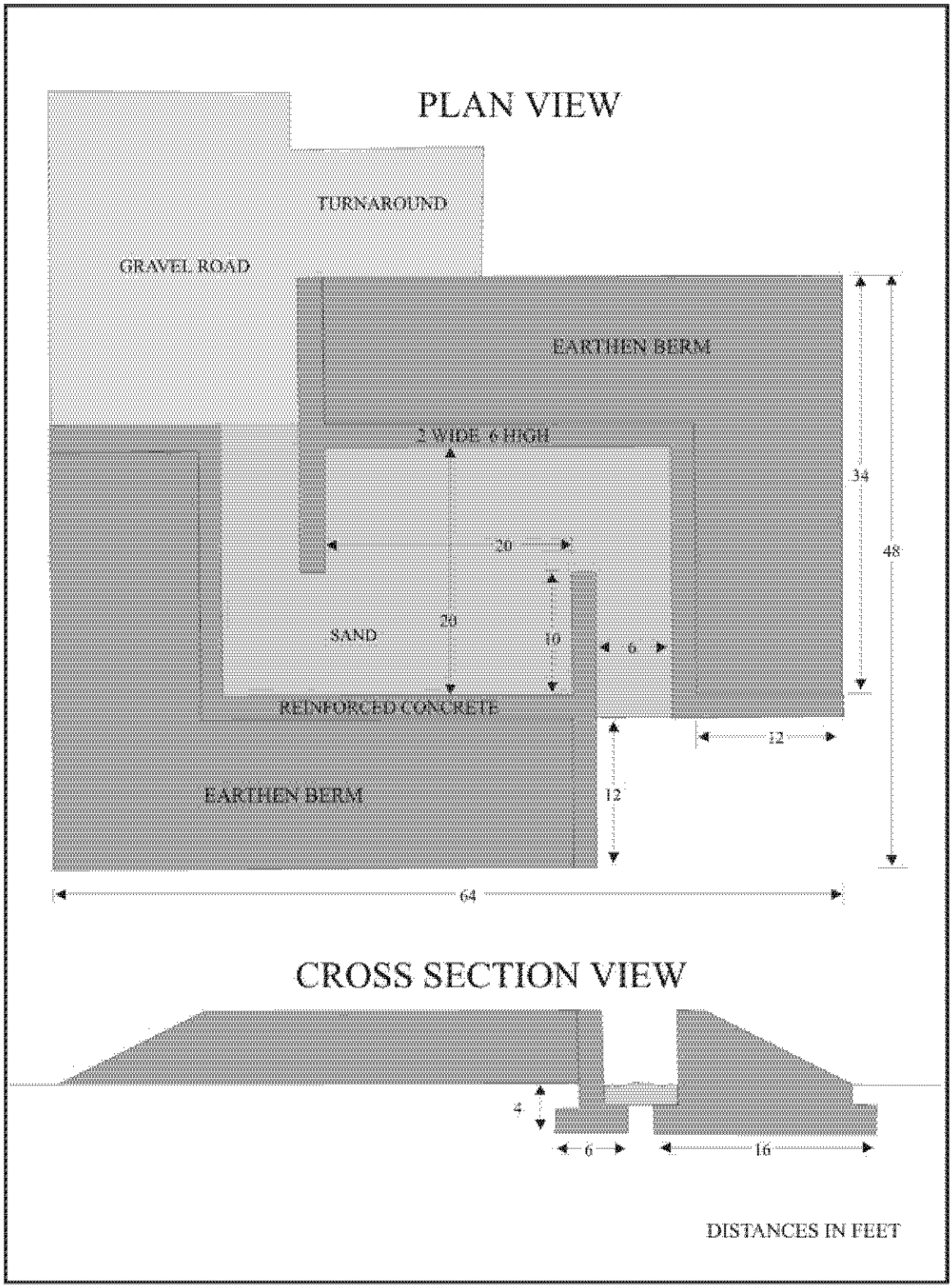

Figure 2.1-4. Plan View of the Proposed EOD Facility

Access is restricted along the taxiway, and permission from Base Operations is required to enter the area. Because the area has restricted access, a fence would probably not be required. The restricted site access would facilitate training operations. Since only one road goes from Taxiway D to the proposed site, one person at the taxiway and road intersection could limit entry. The EOD Flight would coordinate with the Air Traffic Control Tower (ATCT or Tower) prior to a training event, and a red flag visible from the taxiway would be flown during training exercises.

The facility is planned for scheduled training events and is not intended as an EOD range for destruction of unusable munitions. The height of the walls and dimensions of the facility are based on requirements for approved training munitions, not unexploded ordnance such as aircraft munitions (which are sent off-site for subsequent disposition). However, in the event of an emergency where ordnance cannot be safely transported off base, the training facility could be used to detonate the ordnance. In this rare situation, precautions to limit noise and other impacts would be implemented, and there would be additional coordination with base operations, the MA DEP, and the surrounding public.

Training would be conducted in accordance with AFMAN 91-201 (*Explosive Safety Standards*), AFI 32-3001 (*Explosive Ordnance Disposal Program*), and 439 CES OI 91-1, and would occur at least monthly (the minimum requirement) for all qualified personnel assigned to EOD. The EOD Team currently consists of 12 Reservists, with the addition of 6 full-time active duty EOD personnel planned for the near future. Training plans indicating the type of operation and approximate net explosive weight (NEW) have been developed (Frye, 2003), and are summarized in Table 2.1-1. Training would generally occur monthly, but could occur more frequently if necessary to maintain members' proficiency with explosive operations. The existing OI for munitions training would be updated when the new facility is constructed.

Table 2.1-1
Approximate EOD Training Schedule[1]

Month	*Activity*	*Net Explosive Weight (NEW) in pounds*
January	Explosive Devices	1.25
February	Ordnance Disposal	5.00
March	General Demolition Procedures	< 2.50
April	Ordnance Clearance Procedures & General Demolition	< 1.00
May	General Demolition Procedures	5.00
June	Ordnance Disposal	< 1.00
July	EOD Tools	< 2.50
August	General Demolition Procedures	< 1.00
September	General Demolition Procedures & Aircraft Exercises	< 2.50
October	Ordnance Clearance Procedures	< 1.00
November	Ordnance Disposal	5.00
December	Ordnance Disposal	< 1.00

[1] Activities scheduled may change due to unforeseen circumstances or mission requirements.

Source: 439 CES/CED, 2003.

The EOD training activities would include the use of C-4 several times per year, with generally no more than 5 pounds of C-4 being used for any one exercise (although emergencies could necessitate the use of C-4 in larger amounts). The EOD personnel could use smaller quantities at a time to allow different trainees to set up each shot. Other types of explosives (e.g., impulse cartridges; blasting caps; detcords) would also be detonated during monthly exercises at the training facility.

Some explosive materials used for training may leave a small amount of residue on the ground after firing (see Section 4.3.3 for a discussion of residue studies). In the interest of constructing a facility whose use will be sustainable for many years, several facility design options and operational procedures are being considered to minimize potential contamination. As noted above, a liner would be placed two feet below the surface of the training facility, with blast-absorbing medium (sand) above the liner within the walled areas (Moriarty, 2002). The liner and sand would limit possible impacts to groundwater.

Additional preventive measures would be considered to further minimize the potential for residual chemicals leaching into soil and water. One possible measure would involve spreading a lime layer on the soil in the test area just prior to each test. The amount of lime would vary according to the amount of explosive used, and would serve to neutralize the somewhat acidic residual material. About 20 grams of lime would be applied for each gram of royal demolition explosive (RDX) used (Davis, 2002). A second preventive measure could be to use a portable retractable cover over the test area between training activities to shed rainwater and avoid the need for leachate recovery. Another preventive measure could involve Westover's partnership with the Strategic Environmental Research Development Program (SERDP) and the Environmental Security Technology Certification Program (ESTCP) as a demonstration project in their studies on reducing the environmental impacts from firing ranges. The findings would help identify effective strategies to minimize potential contamination from the EOD facility. Before training occurs in the new facility, these and other measures would be evaluated to ensure the protection of soil and water resources.

After completion of the munitions storage facility, all training materials would be stored at Westover ARB. Until the MSF is operational, C-4 and thermite grenades would be stored 20 miles away at Barnes ANGS munitions storage facility and transported to Westover as needed for EOD training. C-4 is categorized as Hazard/Class Division 1.1, while thermite grenades are Hazard/Class Division 1.2.

The EOD facility would take one to two months to construct, depending on weather and other factors. If funding becomes available, construction would likely occur in Fiscal Year 2003 (FY03). The estimated cost of construction is between $40,000 and $80,000, depending on contracting and construction methods (Moriarty, 2002). Construction of the EOD facility is not contingent upon approval of funding for the Munitions Complex, and the EOD and munitions facilities would likely not be constructed at the same time.

2.1.2. Construct and Operate Munitions Complex

The munitions complex would be located on a site along Taxiway D (see Figure 2.1-1). The site is near the proposed location for the EOD training facility described above, with access to the site similarly restricted (see Section 2.1.1). The complex would consist of

two facilities—a munitions storage facility and a munitions maintenance and inspection facility. They would be constructed more than 150 feet apart with a loading dock between the two facilities. Figure 2.1-5 shows the proposed design for the complex.

Asphalt pavement would be laid to connect the two buildings and provide turn-around space for loading and unloading. Approximately 3,000 ft of underground, concrete-encased, power and telephone lines would be installed, along with a water main to connect to the main base water system. A properly-sized septic system would be installed to support the MMIF. The entire munitions complex would be surrounded by a fence, have perimeter lighting, be protected by an intrusion detection system, and have high security locks/doors securing the buildings (Robison, 2002).

The two munitions facilities would take approximately six months to construct, depending on weather and other factors. Construction could occur in FY03 if funding becomes available, but may occur later, depending on mission requirements. The estimated total cost of construction for both munitions facilities is $3.6 million.

2.1.2.1. Munitions Storage Facility

The MSF would be a structure with external and internal concrete walls. It would consist of eight storage cubes, each 23 feet square, and a 100-sq. foot mechanical room, for a total of 4,332 sq. feet. Multiple bays would each be accessible by forklift. Lightning protection and intrusion detection systems would be included, along with electrical and communications utilities. The walls would be supported by buried footings that would extend to a depth of 48 inches to accommodate frost-heave conditions. This facility would not be inhabited except during stocking operations (Robison, 2002). The exact size and design details of the facility will be established in accordance with standard DoD and Air Force guidelines.

The MSF would provide proper storage of munitions ranging from high explosives such as C-4 to grenades, flares, and small arms ammunition. Separate storage bays (cubes) would accommodate the storage incompatibility requirements for various types of munitions. Operations would include transportation of munitions to and from the facility, loading and unloading, and administrative activities associated with storing and tracking the facility contents. Access to the facility would be tightly controlled. Transportation to and from the facility, as well as loading and unloading activities, would be coordinated with EOD training operations and flightline activities.

2.1.2.2. Munitions Maintenance and Inspection Facility

The MMIF would be a standard steel/block structure totaling 1,400 sq. feet, and would include a munitions maintenance bay, one mechanical room, one unisex restroom, and office space for three full-time personnel.

The MMIF would have fire alarm and fire suppression systems, lightning protection, an intrusion detection system, and heating and air conditioning. The walls would be supported by buried footings, which would extend to a depth of 48 inches to accommodate frost-heave conditions. The exact design details of the facility would be in accordance with standard DoD and Air Force guidelines. Access to the facility would be tightly controlled.

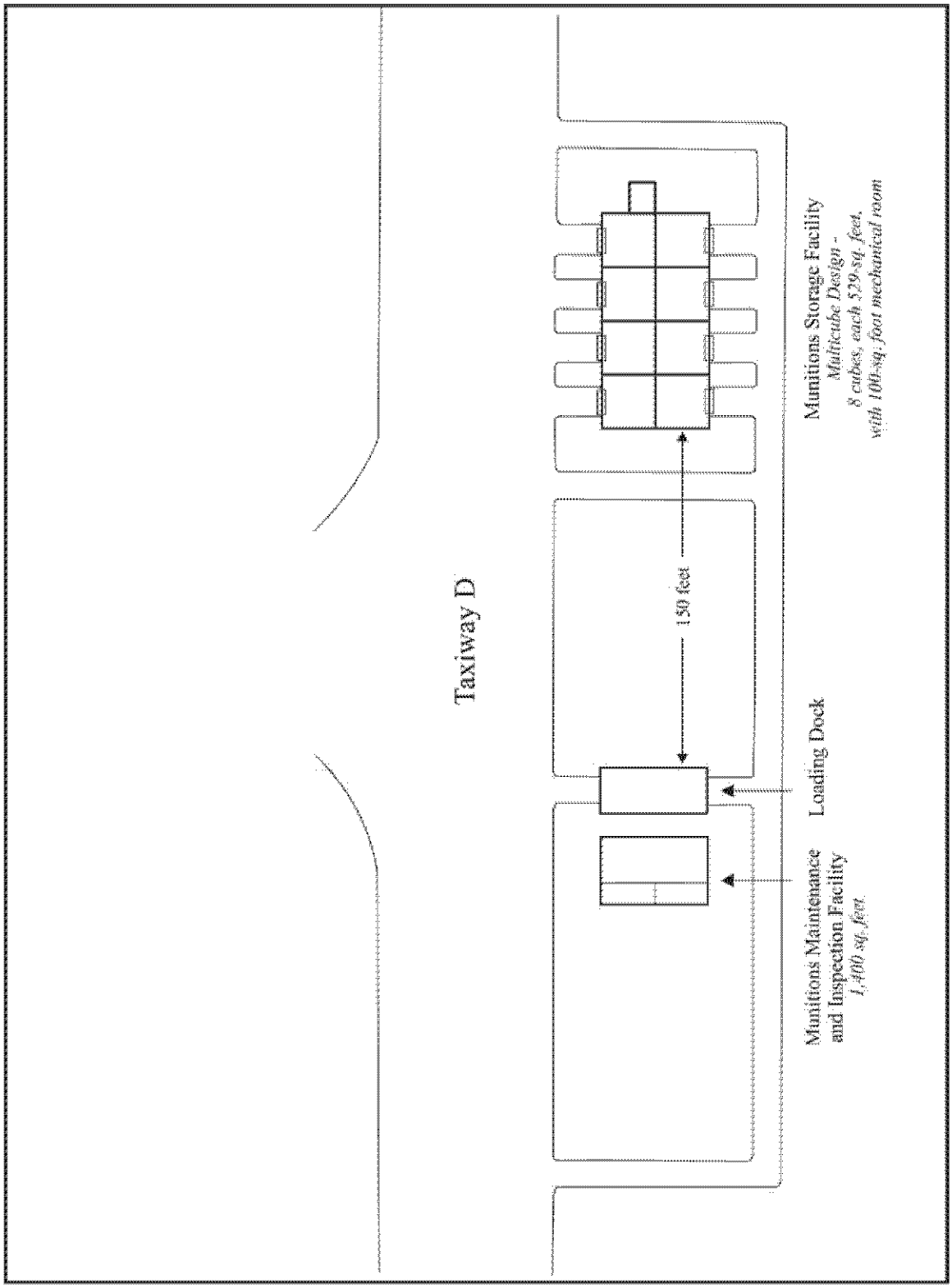

Figure 2.1-5. Proposed Design of Munitions Facilities

The MMIF operations would involve the munitions stored at the MSF. Activities would include movement of munitions between the MSF and the MMIF, munitions residue inspections, trailer maintenance, and work related to Time Compliance Technical Orders.

2.2. DESCRIPTION OF ALTERNATIVES

In addition to the Proposed Action, this EA assesses two EOD site alternatives and the No Action Alternative. The two EOD site alternatives involve different locations for the EOD training facility, but the location for the munitions complex is the same under the Proposed Action and both EOD site alternatives. The site alternatives are discussed below, along with alternatives that were considered but eliminated from further analysis.

2.2.1. EOD Site Alternative 1

The location of EOD Site Alternative 1 is illustrated in Figures 2.1-1 and 2.2-1.

2.2.1.1. Construct and Operate EOD Training Facility at Taxiway D Access Road East ("East Alternative")

This alternative site for the EOD Training Facility is on a paved access road, approximately 300 feet from Taxiway D (see Figure 2.2-1), at the location of a former engine test cell.

The site is near a ponded swale and has nearby monitoring wells associated with IRP Site SS-21, Former Jet Engine Test Cell, which is under long-term monitoring. The site is also located within 30 feet of riverine wetlands, and within 350 feet of Palustrine wetlands in the adjacent forested area. Stony Brook is approximately 1,000 feet to the north, on the other side of Taxiway D.

The EOD facilities, training exercises, and munitions would be the same as under the Proposed Action. Access to this site would also be along the taxiway, and would be controlled as described under the Proposed Action.

Construction at EOD Site Alternative 1 would likely take approximately the same length of time as the proposed site because asphalt pavement (approximately 1,200 square feet) may be removed from both sites. Additional engineering design would be needed to minimize impacts on sedimentation and drainage to downgradient wetlands. Construction would also be completed in approximately one to two months during FY03, depending on funding. Costs for this site would be similar to those for the proposed site.

2.2.1.2. Construct and Operate Munitions Complex, EOD Site Alternative 1

The location, construction, and operations of the Munitions Complex would be the same as described under the Proposed Action.

2.2.2. EOD Site Alternative 2

This alternative is illustrated in Figure 2.2-2.

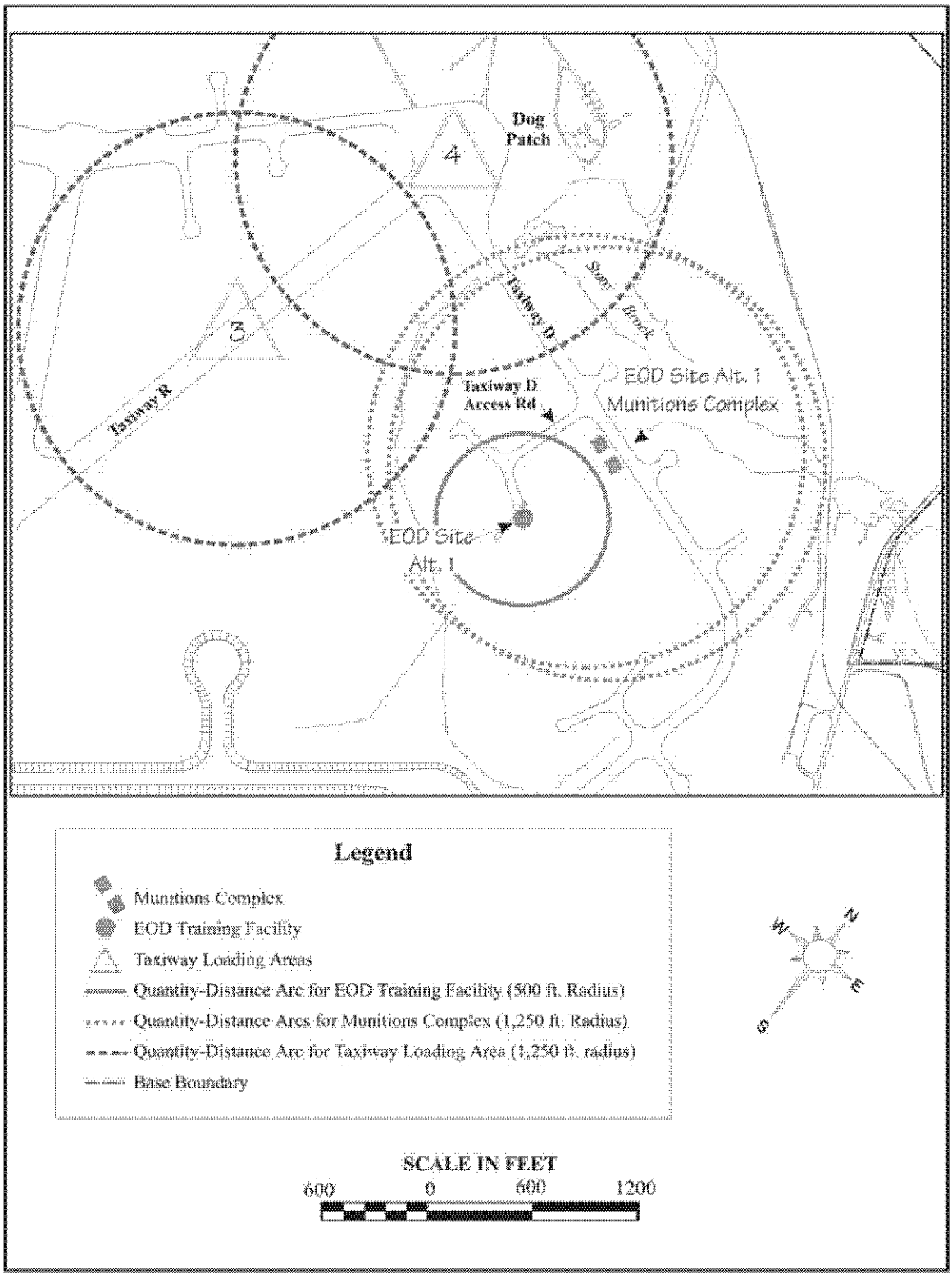

Figure 2.2-1. Project Area Showing EOD Site Alternative 1

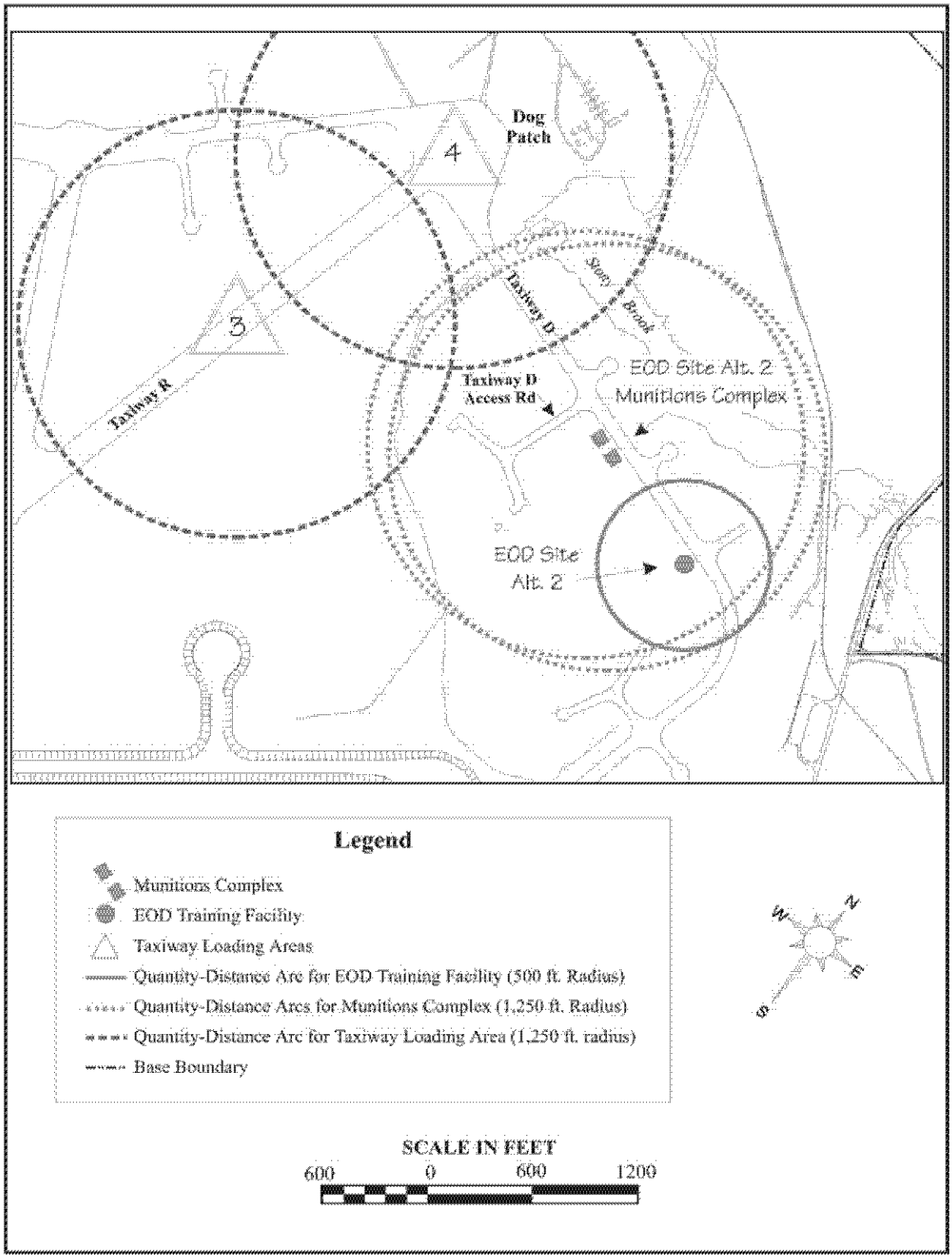

Figure 2.2-2. Project Area Showing EOD Site Alternative 2

2.2.2.1. Construct and Operate EOD Training Facility Adjacent to Taxiway D ("Taxiway D Alternative")

EOD Site Alternative 2 is located along Taxiway D (see Figure 2.2-2). Figure 2.2-3 shows a photograph of this site facing south. (This site is not included in the aerial photograph in Figure 2.1-1.)

This site is relatively flat and covered by grass, with a forested area to the south, and minimal site preparation would be required. Stony Brook is approximately 600 feet to the northwest across Taxiway D, with a riverine wetland adjacent to Stony Brook approximately 550 feet from the site. All construction activities would occur within the grassy area and no trees would need to be cut. Access would be along the taxiway and across the grassy area. A gravel road approximately 100 feet long and 20 feet wide, with a turnaround area near the structure, would be constructed from Taxiway D to the facility.

The facilities, training exercises, and munitions would be the same as under the Proposed Action. During training, two personnel at either side of the site would restrict access, and a red flag would be flown on the eastern edge of the site along Taxiway D.

Construction at EOD Site Alternative 2 would likely take less time than the proposed site or EOD Site Alternative 1 because no pavement removal would be needed. Additional engineering design would be needed to minimize impacts on sedimentation and drainage to downgradient wetlands. Construction would also be completed in approximately one to two months and would likely occur during FY03, depending on the availability of funding. Costs for this site would be similar to those for the other sites.

2.2.2.2. Construct and Operate Munitions Complex, EOD Site Alternative 2

The location, construction, and operations of the Munitions Complex would be the same as under the Proposed Action.

2.2.3. No Action Alternative

Under the No Action Alternative, EOD training would continue under the current methods. Training at the Dog Patch area at Westover ARB is limited to the use of impulse cartridges and shotgun shells, and other required training could not be conducted at Westover ARB. EOD Team members would be required to acquire live explosive training elsewhere. The current munitions storage inadequacies would continue. Hazard/Class Division 1.1 and 1.2 munitions used in EOD training would continue to be stored at Barnes ANGS and transported from there as needed for training operations. Without an MSF that meets explosive safety and quantity requirements, Westover would have no place to store munitions from a disabled aircraft while it was being repaired. This situation would create severe explosive safety problems.

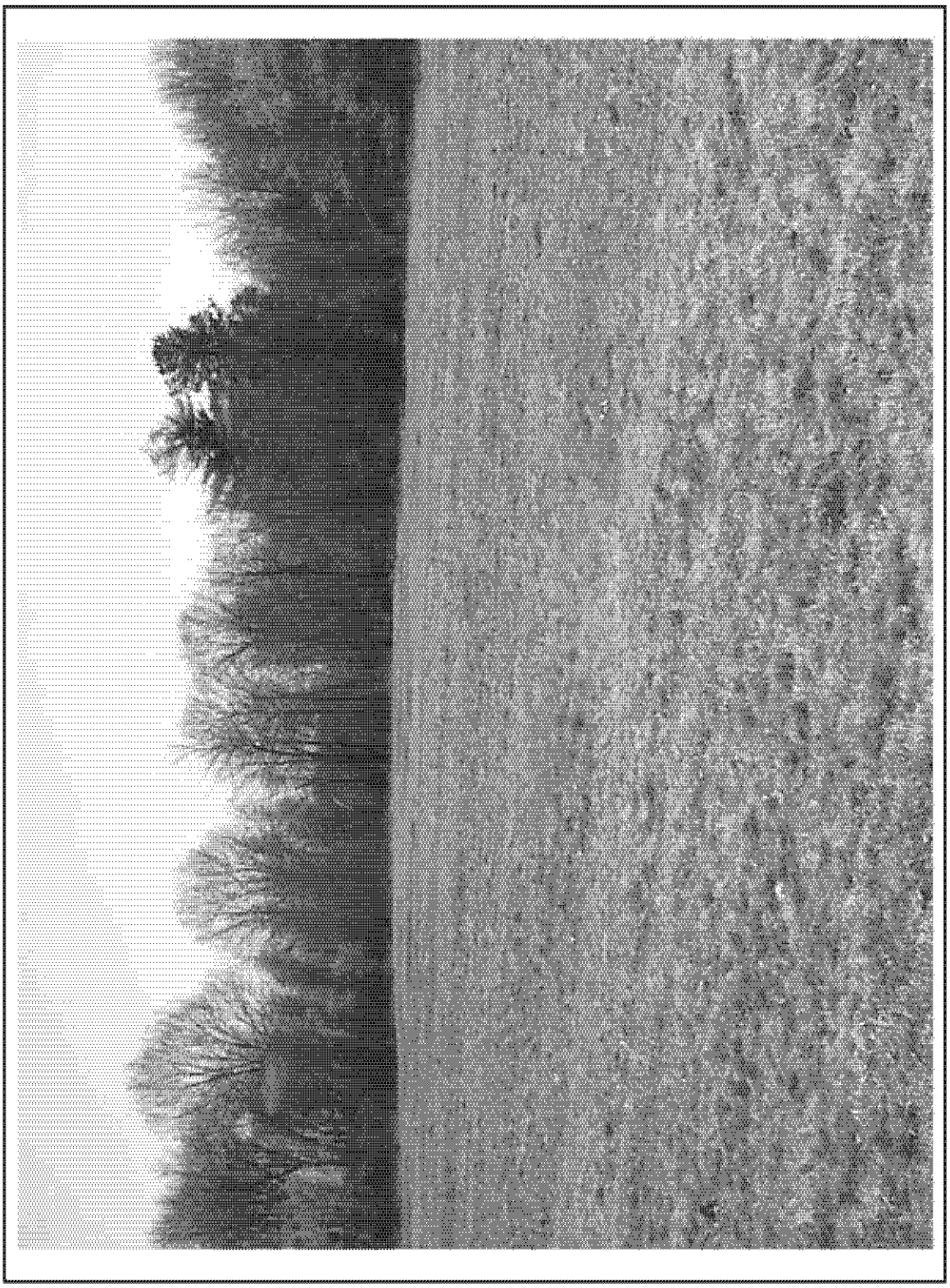

Figure 2.2-3. Photograph of EOD Site Alternative 2, Facing South

2.3. ALTERNATIVES CONSIDERED BUT ELIMINATED

The Air Force considered the following alternatives in addition to the Proposed Action, the two Site Alternatives, and the No Action Alternative.

Implementation Alternative—EOD Facility Construction Without Liner. Constructing the EOD training facility without a liner was considered but eliminated due to the potential for groundwater contamination.

Other On-Base Locations. Personnel from the Westover ARB Safety Office, Civil Engineering, the Safety Office, the Maintenance Squadron, and the Environmental Office plotted QD arcs throughout the installation and determined that the project area contained the only suitable on-base locations for the EOD training facility and the munitions complex. Based on the criteria discussed in Section 1.1, this area did not affect occupied buildings, flightline operations, or existing mission-critical areas such as taxiway loading areas, drop zones, or the Dog Patch training area. Therefore, other sites for the EOD training facility and munitions complex were eliminated from further consideration.

Construction of Off-Base Facilities. Constructing an EOD training facility or munitions complex off-base was discussed but not seriously considered because of the safety and security issues and the cost and difficulty in obtaining additional lands for military operations.

Conducting EOD Training at Off-Base Locations. This option was considered for several locations. A representative from the 439 CES/CED contacted Springfield Arson and Bomb Squad, the Massachusetts Bomb Squad, and Otis ANG Station to determine if they could be used for training Westover ARB personnel, but these organizations did not have the same requirements or suitable facilities to support the Westover ARB training mission. Fort Devens, which has a training range, was also contacted, but there were problems with site access, training schedule, cost, and munitions storage that precluded the reasonable use of the facility (Santoro, 2001). This option was therefore eliminated.

2.4. REASONABLY FORESEEABLE CONCURRENT ACTIONS

The Proposed Action or an alternative would be concurrent with other actions at Westover ARB. Facilities currently being constructed in the main base area include a new military entrance processing center, which is expected to be complete in Summer 2003. Just beginning construction are a new Marine Reserve center and an EOD administration building near Civil Engineering. Other projects programmed for construction during the relevant time period include renovating two dormitories, resurfacing Runway 1 (15/33), and upgrading airfield lighting. Projects for upgrading the airfield lighting are unfunded but could occur in FY 03 if funding becomes available.

2.5. SUMMARY OF POTENTIAL IMPACTS

Based on discussions with Air Force personnel and comparisons with similar military activities, areas of potential concern for the Proposed Action and the alternatives have been identified. The potential impacts were evaluated and are described in Chapter 4.

Impacts can be adverse (negative) or beneficial. The intensity of an adverse impact can be significant or insignificant. *No impact* is specified in cases in which a resource would not be affected because certain resource elements (e.g., floodplains, sensitive noise receptors, or low-income or minority populations) are not present in the area of the Proposed Action or a Site Alternative. *No impact* could also occur under the No Action Alternative if there were no changes to the existing environment. Mitigations are implemented to reduce a significant impact to one of insignificance, while best management practices are used to reduce the severity or duration of an adverse impact. Beneficial effects can result if the action measurably improves a condition. Beneficial impacts are not characterized as to their level of significance. Each resource section presents significance criteria, assesses the significance of a potential impact, and identifies any needed or recommended mitigations for that resource.

Where applicable, impacts are also defined as short-term or long-term. Generally, short-term impacts are associated with construction, and long-term impacts, with operations. For this project, short-term impacts are defined as those lasting about six months (the duration for constructing the EOD and munitions storage facilities) or less, while long-term (LT) impacts last more than six months. Table 2.5-1 summarizes the impacts for each resource area under the Proposed Action, the EOD Site Alternatives, and the No Action Alternative.

Table 2.5-1
Summary of Impacts

Resource Area	*Proposed Action*	*EOD Site Alt. 1 (East Alternative)*	*EOD Site Alt. 2 (Taxiway D Alternative)*	*No Action Alternative*
Air Resources				
Air Quality	Insignificant increase in air emissions during construction and operations			No change in current level of air emissions
Geological Resources				
Geology	Insignificant ST impacts from excavation; no impacts from operations			No impacts to geology
Soils	Insignificant ST disturbance of soils during construction; insignificant LT impacts to soils during operations			Continued minor impacts to soils; no significant impacts
Water Resources				
Groundwater	Insignificant impacts to groundwater and aquifers from excavation and operations			No impact to ground-water or aquifers
Surface Water	Insignificant ST impacts from sedimentation or erosion during construction; insignificant LT impacts from operations			No change from current impacts
Floodplains	No impact to floodplains			No impact to floodplains
Water Quality	Insignificant impact to water quality from construction or operations			No impact to water quality

Table 2.5-1
Summary of Impacts

Resource Area	*Proposed Action*	*EOD Site Alt. 1 (East Alternative)*	*EOD Site Alt. 2 (Taxiway D Alternative)*	*No Action Alternative*
Biological Resources				
Vegetation	Insignificant impact from disturbance of vegetation during construction; no impacts from operations			Minor temporary disturbances from continued operations in Dog Patch
Wildlife	Insignificant impact to wildlife during construction or operations			Minor temporary disturbances from continued operations
T&E Species	Insignificant impact to T&E or state-protected species from construction or operations			No impact to protected species
Wetlands	No significant impact to wetlands from construction or operations	Construction would occur in State 100-foot buffer zone; no significant impact to wetlands from construction or operations	No significant impact to wetlands from construction or operations	No impact to wetlands
Cultural Resources				
Cultural Resources	No impacts to cultural resources from construction or operations			
Noise				
Noise	Insignificant ST noise increase associated with construction activities; insignificant LT increase in noise from operations	Insignificant ST noise increase from construction; insig-nificant LT impact (slightly more than the Proposed Action)	Insignificant ST noise increase from construction; insig-nificant LT impact (slightly more than to Proposed Action or Site 1 Alternative)	Noise levels would be unchanged
Transportation				
Traffic and Road Network	Short-term insignificant impact from additional vehicle traffic during construction activities; insignificant LT impacts from operations and munitions deliveries; negligible changes to road network			No change in vehicle traffic
Environmental Programs				
Health & Safety	Insignificant impact to health & safety from construction and operation of facilities			Insignificant impact from continued operations
Hazardous Materials & Hazardous Waste	Insignificant impact from handling and use of materials; insignificant amount of hazardous waste generation during operations			Insignificant impact from continued use
Installation Restoration Program	Insignificant impacts from construction or operation of facilities	Insignificant impacts from construction or operation of facilities; coordination required with IRP activities at SS-21	Insignificant impacts from construction or operation of facilities	No impact to IRP
Solid Waste	Insignificant ST increase in solid waste from construction activities; no significant LT impacts			No change in solid waste generation
Storm Water	Insignificant impact to storm water during construction or operations			No change in storm water flow

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CHAPTER 3
AFFECTED ENVIRONMENT

3. AFFECTED ENVIRONMENT

This chapter describes the relevant environment at Westover ARB, providing baseline information to allow the evaluation of potential environmental impacts that could result from the Proposed Action, the two EOD Alternatives, or the No Action Alternative. As stated in 40 CFR §1508.14, the human environment includes natural and physical resources and the relationship of people to those resources. The environmental baseline resource areas described in this chapter were selected after identifying the potential issues and concerns related to the Proposed Action and alternatives. Only relevant resource areas are described here and evaluated in Chapter 4. These include **Air, Geological, Water, Biological, and Cultural Resources; Noise; Transportation**; and selected environmental programs (**Health And Safety; Hazardous Materials And Waste Management; Installation Restoration Program; Solid Waste**; and **Storm Water**).

In accordance with 40 CFR 1502.15, the resource areas that would *not* be impacted are not described in this chapter, nor evaluated in Chapter 4. These are listed below, with a brief explanation for their omission from the analysis.

- **Land Use** and **Visual Resources.** The action would occur on land that is already used for similar purposes and would involve structures that are similar to those in place. Therefore, no impacts to land use or visual resources would occur.
- **Socioeconomic Resources.** The cost of the action is minimal (both construction and operation) and there would be no change in personnel authorizations. Therefore, there would be no socioeconomic impacts.
- **Environmental Justice.** The action would occur entirely on base. Any off-base noise or transportation impacts would not disproportionately affect any low-income or minority populations, or children, and there would be no environmental justice impacts (as noted in Section 4.13).
- **Other Environmental Programs.** There are no underground storage tanks (UST) involved in the action, no utilities would be constructed, and there would be no change in wastewater generation. No existing buildings would be modified, so there would be no disturbance of contaminants such as lead-based paint (LBP), polychlorinated biphenyls (PCB), or asbestos. Therefore, these environmental programs would not be affected.

This chapter begins with a brief description of the history and mission of Westover ARB. The order of resource description is based on introducing the physical environment (air, geology, and water), the natural environment (biology), and the human environment (cultural resources, noise, and transportation). The chapter concludes with the environmental programs that manage these resources, controlled materials, and waste.

History and Mission of Westover ARB

Construction and activation of Westover began in April 1940. During World War II, Westover Air Force Base (AFB) served as a bomber training base and as a port for departures and arrivals. Following World War II, the headquarters of the Military Airlift Command (MAC) was located at Westover AFB. In 1955, Westover AFB was transferred to the Strategic Air Command (SAC) and became the largest SAC base in the eastern United States, with both bomber and tanker aircraft assigned. In April 1974, the

SAC 99th Bombardment Wing was deactivated and the installation was transferred to the Air Force Reserve in May 1974. Between 1974 and 1987, the base had a tactical airlift mission, with the 439th Tactical Airlift Wing (439 TAW) operating C-123 and C-130 aircraft. In 1987, the base assumed a strategic airlift training mission as it converted to 16 C-5A Galaxy aircraft. The 439 TAW was redesignated as the 439th Military Airlift Wing (439 MAW). In conjunction with the 1992 reorganization of the Air Force command structure, the 439 MAW was redesignated the 439th Airlift Wing (439 AW), and Westover AFB was redesignated as Westover ARB.

When mobilized, most units assigned to the 439 AW are gained by the Air Mobility Command and are subject to deployment throughout the world. The Air Force Reserve Command continues to manage the base during mobilization periods using members of the 439th Support Group.

There are approximately 2,500 reservists assigned to the 439 AW at Westover ARB. Reservists attend training one weekend per month and perform an annual 15-day active duty tour. The base has a daily work force of about 1,100 civilians, including 450 Air Reserve Technicians. Tenant organizations include the Marine Corps Reserve, Army Reserve, Navy Reserve, Army National Guard, and Army Reserve School.

3.1 AIR RESOURCES

3.1.1 Climate and Meteorology

Westover ARB is located within the Connecticut River Lowlands of Western Massachusetts. This region is bounded by the Berkshires Mountains to the west and the Worcester Plateau to the east. The lowland areas of the Connecticut River Valley in Massachusetts are typically characterized by cold winters and moderately warm summers with occasional hot spells. The average annual temperature at Westover ARB is 9° C (49° F). The average maximum temperature is 28 °C (83° F), with the hottest temperatures typically recorded in July. The average minimum temperature is -4 °C (24° F), with the coldest month being January.

Precipitation in the Westover ARB region is relatively stable throughout the year. Mean precipitation averages approximately 42 inches per year. Average snowfall in the area is 50 inches per year, with twelve days annually exceeding 1.5 inches of snow. Prevailing winds are from the south in the summer, at an average of about five knots, and during the remainder of the year, from the northwest at approximately six knots (USMC, 2001).

Low cloud ceilings (greater than or equal to 50 percent sky coverage) and limited visibility occur at Westover AFB throughout the year but are more prevalent during the winter months, according to data collected by the base weather station. The frequency of ceilings less than 1,500 feet and/or visibility less than 3 miles ranges from 13 percent of the time in August to 17 percent in January, with an annual average of 14 percent. The frequency of ceilings less than 1,000 feet and/or visibility less than 2 miles ranges from 7 percent of the time in May and July to 12 percent in January, with an annual average of 9 percent. The frequency of ceilings less than 500 feet and/or visibility less than 1 mile ranges from 1 percent of the time during warmer months to 3 percent in January, with an annual average of 1 percent (USAF, 1998f). These frequencies reflect daily averages;

detailed tables showing frequencies by month and time of day (3-hour intervals) are found in Appendix A, Climatological Data.

3.1.2 Regional Air Quality

The National Ambient Air Quality Standards (NAAQS), established by the United States Environmental Protection Agency (USEPA), define the maximum allowable concentrations of pollutants that may be reached but not exceeded within a given time period. Massachusetts has adopted the USEPA's NAAQS, which are shown in Table 3.1-1. These standards were selected to protect human health with a reasonable margin of safety. Exceeding the concentration levels within a given time period is a violation, and constitutes a nonattainment of the pollutant standard.

Table 3.1-1
National Ambient Air Quality Standards (NAAQS)

Pollutant	Averaging Time	NAAQS µg/m^3 (ppm)[a]	
		Primary[b]	Secondary[c]
O_3	1 hr	235 (0.12) [d]	same
	8 hr	157 (0.08)	same
CO	1 hr	40,000 (35)	none
	8 hr	10,000 (9)	none
NO_2	AAM[e]	100 (0.053)	same
SO_2	3 hr	None	1,300 (0.5)
	24 hr	365 (0.14)	none
	AAM	80 (0.03)	none
PM_{10}	AAM	50	same
	24 hr	150	same
$PM_{2.5}$	AAM	65	same
	24 hr	15	same
Pb	¼ year	1.5	same

[a] µg/m^3 — micrograms per cubic meter; ppm — parts per million

[b] National Primary Standards establish the level of air quality necessary to protect the public health from any known or anticipated adverse effects of a pollutant, allowing a margin of safety to protect sensitive members of the population.

[c] National Secondary Standards establish the level of air quality necessary to protect the public welfare by preventing injury to agricultural crops and livestock, deterioration of materials and property, and adverse impacts on the environment.

[d] On June 5, 1998 EPA issued the final rule identifying areas where the 1-hour NAAQS for ozone is no longer applicable because there has been no current measured violation of the 1-hour standard in such area's time.

[e] AAM —Annual Arithmetic Mean.

PM_{10} is particulate matter equal to or less than 10 microns in diameter.

$PM_{2.5}$ is particulate matter equal to or less than 2.5 microns in diameter.

Source: USEPA, 2001

Six "criteria" pollutants are regulated by the NAAQS. The criteria pollutants are ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and particulate matter, which has been further defined by size. There are standards for particulate matter smaller than 10 microns in diameter (PM_{10}) and smaller than 2.5

microns in diameter ($PM_{2.5}$). Compliance with the $PM_{2.5}$ standard will be phased in during future years. Particulate matter (PM_{10} and $PM_{2.5}$) is generated during ground-disturbing activities and combustion. The principal source of CO and SO_2 is combustion. Volatile organic compounds (VOC) and NO_2, which are the precursors of O_3, are also primarily emitted from combustion.

Westover ARB is located in the Hartford-New Haven-Springfield Interstate Air Quality Control Region (AQCR), which is USEPA's AQCR No. 42. This region is currently classified as being in serious non-attainment for ozone (O_3) and in attainment for nitrogen oxides (NO_x) and sulfur oxides (SO_x) (USEPA, 2002).

Ozone is created by the complex photochemical reactions of NO_x and VOCs that are derived from hydrocarbon (HC) emissions from motor vehicles and aircraft. Ozone is the only pollutant that exceeded applicable air quality standards in 1993 and 1994. The number of exceedance events of the ozone standard typically varies between one and three at each air quality monitoring location in Massachusetts.

In 2000, Chicopee, which is in the vicinity of Westover ARB, had one 8-hour exceedance of the ozone standard occur on July 9th. Massachusetts uses the federal one-hour and eight-hour standards to assess ozone concentrations. Exceedances occur if ozone concentrations equal or exceed either 0.125 ppm averaged over one hour or 0.085 ppm averaged over eight hours (MA DEP, 2001).

Prevention of Significant Deterioration (PSD) area classification requirements (40 CFR 52.21 and 310 CMR 7.02(4)(c)(4) regulate the construction of new major stationary sources of criteria pollutants or significant modifications to existing major sources in order to protect local and regional visibility. The following criteria determine the significance of a modification:

- Carbon monoxide: 100 tons per year (tpy)
- Nitrogen oxides: 40 tpy
- Sulfur dioxide: 40 tpy
- Particulate matter: 25 tpy of PM emissions and 15 tpy of PM_{10} emissions
- Ozone: 40 tpy of VOCs
- Lead: 0.6 tpy
- Fluorides: 3 tpy
- Sulfuric acid mist: 7 tpy
- Total reduced sulfur (including hydrogen sulfide (H_2S)): 10 tpy

Significance is also determined by increases in ambient air quality, according to the classification of the area. Class I areas allow the smallest incremental growth and accommodate only a small degree of air quality deterioration. Class II areas can accommodate normal, well-managed industrial growth. Class III areas allow the largest increments of growth and provide for a larger amount of development than either Class I or Class II areas. PSD requirements include an exemption for concentrations of particulate matter attributable to the increase in emissions from construction or other temporary emission-related activities of new or modified sources.

Congress has identified several mandatory Class I areas and allows state and tribal authorities to designate other Class I areas. In Massachusetts, the Appalachian National Scenic Trail crosses through the Berkshires approximately 40 miles west of Westover

ARB. This is the only designated Class I sensitive area within 62 miles (100 kilometers) of the base, the distance within which PSD Class I requirements apply.

3.1.3 Air Pollutant Sources

Westover ARB generates air emissions from mobile sources (primarily aircraft) and stationary sources (e.g., boilers, emergency generators, and aircraft refueling operations). The aircraft operations consist of a mixture of C-5 and civil aircraft; these contribute 70 percent of the total mobile air emissions. The remainder of mobile emissions on the base comes from motor vehicles. Even though Westover ARB actual emissions are below the Major Source Threshold, it is considered a major source for emissions due to the base's potential to emit. The base has demonstrated stationary emissions below planning thresholds for NO_x, SO_x, and VOCs since 1989 and has a restricted emissions status. The base is not subject to Reasonably Available Control Technology requirements under 310 CMR 7.19. Emissions are shown in Table 3.1-2.

Table 3.1-2
Air Pollutant Emissions at Westover ARB, Calendar Year 2000
(values in tons per year)

Emissions	TSP/PM_{10}	NO_x	SO_x	CO	VOC
Mobile Sources	43	773	17	304	63
Stationary Sources	1.7	13	18	5.1	2.9
Sources: USAF, 2001a					

The *Clean Air Act* (CAA) Amendments of 1990 mandate that the State Implementation Plan (SIP) for O_3 analyze a typical summer weekday for VOCs and NO_x, the O_3 precursors. In 1994, the Hampden County total in Tons Per Summer Weekday (TPSWD) for VOCs was approximately 137.52 for VOCs and 61.68 for NO_x. The total amount of any primary air pollutant emitted from all Westover ARB sources represents less than 1% of the total Hampden County emissions. The results of a 1995 emissions inventory comparing Hampden County, Hampshire County, and Westover ARB provided the Westover's TPSWD for VOCs (0.33), NO_x (0.34) and CO (0.72). Westover ARB only produced approximately 0.14% of VOC emissions for the region's TPSWD, less than 0.07% of the NO_x emissions, and 0.07% of CO emissions (USAF, 1997). Westover ARB is not considered a major contributor to air pollution in the region (USMC, 2001).

3.1.4 Hazardous Air Pollutants

Hazardous air pollutants (HAP) include a wide range of materials or chemicals that are toxic or potentially harmful to human health. Emissions of a wide range of metals, organic and inorganic chemicals, and radionuclides are regulated under 40 CFR 61. There are about 188 HAPs found in numerous products and used in many processes, but only 9 of those are generated during internal combustion processes or earth-moving activities, and then only in small amounts. Westover ARB emitted approximately 0.71 tpy of HAPs in 2000. Miscellaneous chemical usage comprised nearly half of the emissions, and fuel transfer/dispensing, storage tanks, and external combustion sources made up most of the remainder (USAF, 2001a).

3.2 GEOLOGICAL RESOURCES

Geological resources discussed in this EA include physical features of the earth such as geology (surface and subsurface features), topography, and soils within the vicinity of the Proposed Action and EOD Site Alternatives (hereafter referred to as the project area).

3.2.1 Geology and Topography

Surface geology controls both the topography and the drainage patterns of the northeastern portion of the base, where the project area is located. Westover ARB is generally located on the surface of a Pleistocene outwash delta that was built by glacial meltwaters associated with the glacial Chicopee Delta. These fan-shaped deposits of sand developed in the now vanished Glacial Lake Hitchcock, whose deposits of silt and clay underlie the sandy outwash.

Underlying the deltaic deposits are lacustrine deposits of gray varied clays with fine sand and silt laminate. The thickness of this unit ranges from 10 to more than 250 feet in the Westover ARB area. A glacial till layer of poorly sorted gravel, sand, silt, and clay is sometimes present below the lacustrine deposits with a thickness of up to 20 feet or more. These are unconformably underlain by Triassic sedimentary bedrock (USAF, 1998a).

Westover ARB is not located near any major activity faults (USAF, 1997). According to seismic zones identified in Air Force Manual 88-3, *Seismic Design for Buildings*, Westover ARB is located in Seismic Zone 2 (U.S. Air Force, 1992). Earthquakes within this seismic zone are typically categorized as VII to VIII on the Modified Mercalli index, and 5.0 to 5.5 on the Richter Scale. Due to the flat terrain in the area, there is minimal risk of landslides.

The topography of the project area can be characterized as a reasonably flat sand plain with gentle undulations, exhibiting a slight tilt to the east and northeast. The proposed munitions complex site is nearly flat. The proposed EOD site and the Taxiway D Alternative EOD site are also nearly flat, while the East Alternative EOD site has a gentle downward slope to the east, south, and north. Elevations range from about 240 to 245 feet above mean sea level (MSL).

3.2.2 Soils

The soils of the area reflect the geologic history. For the most part, except for the Stony Brook system and small shallow isolated depressions, the project area contains well- and excessively-drained sandy loams of glaciofluvial origin. The United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) (the former Soil Conservation Service) mapped and classified Westover ARB soils in 1975. The major soil unit present on base is the Urban Land Hinkley-Windsor association (Uk); areas disturbed or destroyed by urban development are classified as Ub. The sand dune ridges generally contain well-drained fine to medium sands and silty sands, while the Stony Brook system contains true hydric and organically enriched swamp (paludal) deposits associated with poorly- and very poorly-drained environments (USAF, 1995c).

Hydric soils are saturated, flooded, or ponded long enough during the growing season to develop anaerobic (living without free oxygen) conditions in the upper part of the soil. These soils are sufficiently wet to support the growth and regeneration of hydrophytic vegetation (plants adapted for life in saturated soil conditions). The presence of hydric

soils and hydrophytic vegetation are two of the three criteria for determining the presence of a wetland (USACE, 1987).

The proposed EOD and munitions complex sites and the East Alternative EOD site are within the Urban Land Hinkley-Windsor association. The Taxiway D Alternative EOD site is located in the Windsor loamy sand with 0-3 percent slopes. Although this is a relatively highly-erodible soil, the flat terrain minimizes the erodibility in this area.

The Windsor soils have a layer of loamy sand to a depth of seven inches, with a layer of loamy sand, loamy fine sand, and sand to a depth of 23 inches. Sand and fine sand extend to a depth of 60 inches. Permeability is rapid and water transmissivity in the soil is high. These soils are not prone to flooding, and the depth to a seasonally high water table is greater than six feet. This soil has a low shrink-swell potential and is generally suitable for construction. Due to the sandy nature of this soil, excavations require support to prevent caving in. The hazard of both water and wind erosion is slight (USDA, 1978).

The Urban Land-Hinkley-Windsor soil has been modified by construction, and has good potential for further construction development. In general, properties are similar to the Windsor loamy sand. The potential for wind and water erosion is slight (USDA, 1978).

3.3 WATER RESOURCES

Water resources include the quantity and quality of surface and groundwater sources. The hydrologic cycle results in the transport of water into the air, the ground surface, and subsurface. Natural and human-induced factors determine the quality of water resources. Water resources discussed in this document include groundwater, surface water, floodplains, and water quality.

3.3.1 Groundwater

Groundwater in the project area is primarily contained in the shallow delta outwash plain aquifer that underlies Westover ARB. This unconfined aquifer lies above glacio-lacustrine fine-grained sediments (i.e., silts and clays). Within Westover ARB, the shallow aquifer thickness is 25 to 85 feet, and is thinner (approximately 25-40 feet) near the project area (USAF, 1995c). The lacustrine deposits vary in thickness from 10 to 250 feet and are sometimes underlain by glacial till (0 to 20 feet thick) unconformably overlying Triassic bedrock. The Triassic bedrock comprises the uppermost confined aquifer (USAF, 1998a). Groundwater within the Triassic bedrock aquifer occurs mainly in joints and fractures.

The water table within the unconfined shallow aquifer ranges from 5 to 20 feet in depth and is significantly influenced by topography. Near the project area, shallow groundwater flows are directed northerly and easterly towards Stony Brook, where discharge as bank seepage contributes to the base flow of Stony Brook and to the maintenance of hydric conditions in adjoining wetlands.

Very minor use is made of groundwater supplies at Westover ARB. The sediments could yield approximately 100 to 300 gallons per minute under normal pumping conditions (USMC, 2001). However, groundwater beneath the project area is not used for Westover ARB's drinking water, as this shallow aquifer is classified as a non-potential drinking water source area (GW-3 as defined in 310 CMR 40.0006). A deeper confined aquifer, about 150 feet below the surface, is used by nearby residences as a source of drinking

water. The closest groundwater wells (in the deeper aquifer) to the project area are located off-base, approximately 3,900 feet from the proposed site, 3,600 feet from the Taxiway D alternative site, and 4,000 feet from the East Alternative site (USAF, 1998a). This aquifer is separated from the shallow aquifer by a 60-foot aquitard of low-permeability clays.

3.3.2 Surface Water

Westover ARB has nine outfalls where storm water exits the base. USEPA (Region 1) issued NPDES Permit No. MA0005444 to discharge storm water at Outfalls 001 and 002. Outfalls 003 through 009 were permitted by USEPA for coverage under the multi-sector general permit (MSGP) published in the September 29, 1995 *Federal Register* (60 FR 50803). The MSGP was reissued in October 2000 and included Outfalls 001 and 002. The proposed and alternative sites drain to Outfall 5 and the Stony Brook system (USAF, 2001b); consequently, the description of surface water focuses on this area. Figure 3.3-1 shows surface water features in the project area.

Base flow to the Stony Brook system, a tributary to the Connecticut River in South Hadley, is from a variety of sources, including storm water runoff via Outfall 005 (USAF, 1997); overland flow; or sheet flow from wooded and filled areas. Base flow is contributed by infiltration of surface waters on gentle land slopes underlain by pervious soils derived principally from glacial outwash. The total drainage area of Outfall 005 is 327.7 acres, of which 41.5 acres (approximately 13 percent) are covered with pavement or other structures (USAF, 2001b). Surface waters are not used for any industrial, domestic, or municipal purposes.

The proposed EOD site drains westward through Palustrine Forested Shrub/Scrub Emergent wetlands to an intermittent drainage ditch that flows north beneath Taxiway D and into Stony Brook. The proposed munitions complex site and the Taxiway D Alternative EOD site drain into Stony Brook, the only perennial stream in the area. Stony Brook flows north and then westward through the town of South Hadley, eventually discharging into the Connecticut River (USAF, 1995c).

The East Alternative site drains into an adjacent pond (which has nearby monitoring wells associated with IRP Site SS-21), or into the Palustrine Forested Shrub/Scrub Emergent wetlands within 30 feet of the site. Excess water in the wetlands flows southwest, then to the north beneath Taxiway D and into Stony Brook.

3.3.3 Floodplains

The Federal Emergency Management Agency (FEMA) defines types of floodplains. The two relevant zone types at Westover ARB are "A" (areas subject to inundation by a 100-year flood, but no detailed hydraulic calculations have been performed by FEMA), and "AE" (areas subject to inundation by a 100-year flood as determined by detailed methods). The X500 zone boundary is subject to inundation by a 100- to 500-year flood.

Flood zones on Westover ARB have not been determined because the area is not within the jurisdiction of either Chicopee or Ludlow. Therefore, Flood Insurance Rate Maps for the communities of Chicopee and Ludlow depict the area of Westover ARB as an "area not included in mapping" (ANI) zone. FEMA maps that illustrate Stony Brook show off-base floodplains associated with the brook as it enters and exits the base (USMC, 2001).

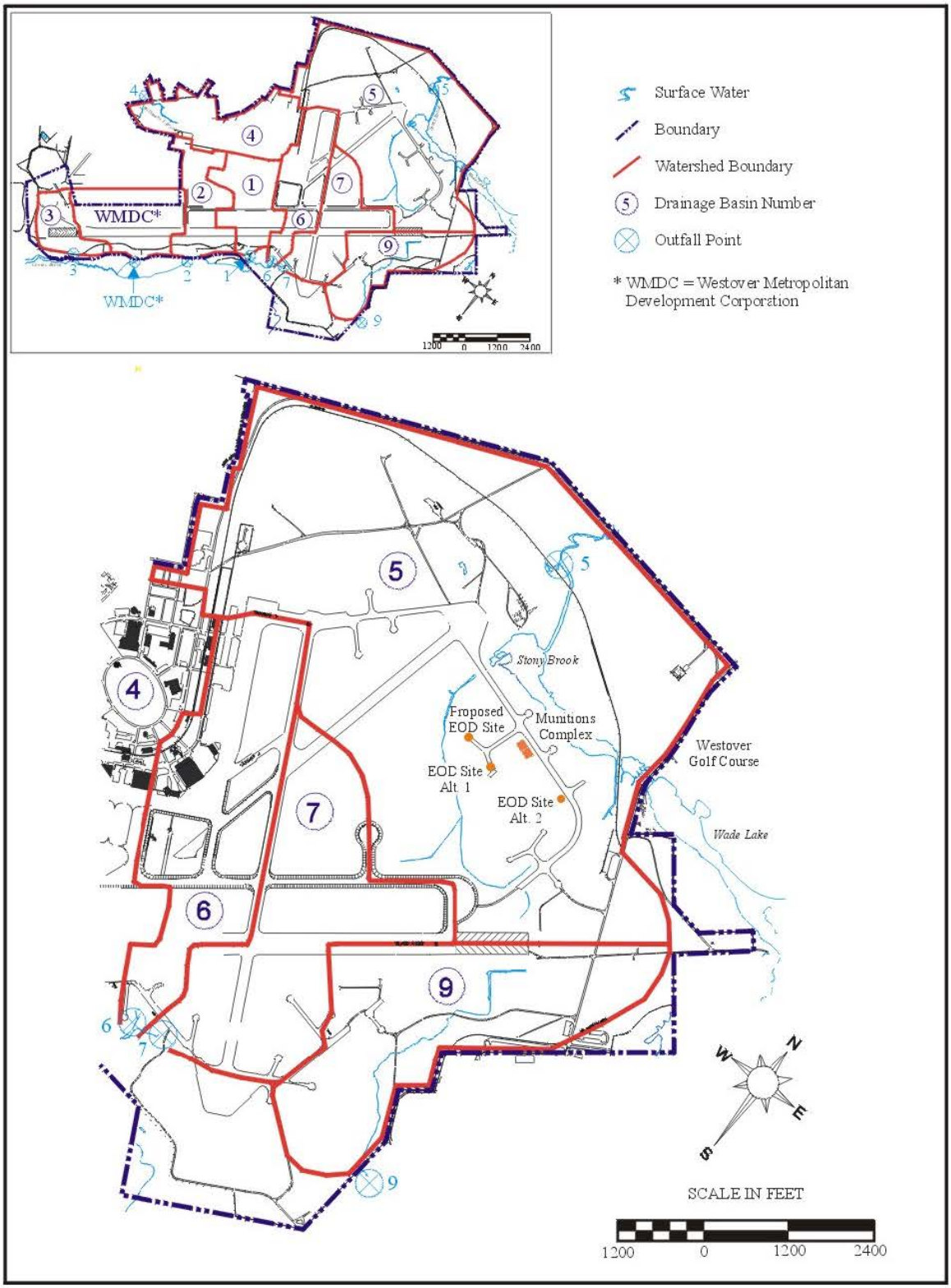

Figure 3.3-1. Surface Water Features on Westover ARB

The FEMA boundary for the AE flood zone is located approximately 3,500 feet northwest from the project area, where Stony Brook exits the base. The A flood zone boundary is located approximately 1,800 feet northeast of the proposed munitions complex, 2,500 feet northeast of the proposed EOD site, 1,300 feet northeast of the Taxiway D Alternative site, and 2,200 feet northeast of the East Alternative site, where Stony Brook enters the base. FEMA zone X500 is approximately 3,000 feet north of the project area.

3.3.4 Water Quality

Historical surface water quality data for Westover ARB has been collected at storm water outlets. As noted in Section 3.3.2, Outfalls 001 and 002 were sampled as part of NPDES permit requirements. In 1992, a storm water report for Westover ARB (USAF, 1997) indicated that storm water outlet 005 in the Study Area held only storm discharges (i.e., was not transporting groundwater). However, later evaluations have found that groundwater is in fact a contributor to Outfall 005. During dry weather sampling, significant groundwater flow was noted in the storm drainage system for Outfall 005 (USAF, 1997). The 1992 storm water study delineated those pollutants whose concentrations were likely to be in excess of 10 parts per billion (ppb) and should, therefore, be subject to quantitative sampling and analysis as required by 40 CFR 122.21 (g)(7)(iii)(B). These measurements included eight basic parameters for demand substances, nutrients, petroleum hydrocarbons, and pH, as well as a diagnostic list of inorganic cations and anions, and several organic chemical groups typically associated with storm water. Included in this listing is the determination of total lead, which is related to vehicular and aerosol fallout and to military activities involving small arms fire. Lead, which has been found in storm water from Stony Brook, has a high affinity for organic sediments. Therefore, it is likely that under existing environmental conditions, some degree of lead-related stress has occurred in the wetlands and watercourses of Stony Brook. Recent sampling from Landfill A found no lead at levels of concern (Moriarty, 2003).

Protection of surface water quality from runoff at Westover ARB is implemented in part through the base's *Storm Water Pollution Prevention Plan* (SWPPP) and the *Erosion and Sedimentation Control Manual* (USAF, 1998d). These documents identify best management practices to minimize sedimentation impacts (such as runoff from a construction site) as well as chemical contamination of surface water.

Shallow groundwater samples obtained from installed wells and IRP site evaluations are considered representative of the groundwater flowing onto Westover ARB. There is no evidence of explosive residue contaminants of concern in any of the wells. The water is characterized by very low total dissolved solids (TDS) and low specific conductance. Due to the dilution effects of infiltration, wells completed near the water table generally contain lower concentrations of major cations and anions than wells completed in the lower part of the aquifer. Iron and manganese are present in the groundwater entering the base in concentrations exceeding the maximum contaminant levels (MCL) for drinking water. However, this is likely a natural occurrence, since these elements are common in New England groundwaters derived from unconsolidated sand and gravel aquifers (USAF, 1995c).

Surface water sampling of Stony Brook in conjunction with investigations of IRP sites LF-02 and LF-12 discovered no evidence of contamination (USAF, 1995c). Only manganese exceeded the secondary drinking water maximum contaminant level (MCL), and as noted above, this is likely due to natural factors.

3.4 BIOLOGICAL RESOURCES

Biological resources include the native and introduced plants and animals that make up natural communities. Natural communities are closely linked to the climate and topography of the area. Biological resources discussed below include vegetation, wildlife, threatened or endangered species, and wetlands.

3.4.1 Vegetation

Westover ARB lies within the Eastern Broadleaf Forest (Oceanic) Province, characterized by temperate deciduous forests with tall, broadleaf trees that provide a continuous and dense canopy in summer, but shed their leaves completely in winter. A 1994 survey of the base's botanical resources reported major native-plant communities of deciduous woodlands, native grasslands, and open wetlands, along with approximately 60 acres of pine plantations. The survey identified a total of 463 species, with total flora estimated to be 450-500 species (USAF, 1998b). Numerous lichen and moss species were also found, with the wetland areas on base containing the greatest diversity of these species (USAF, 1998b).

The deciduous woods, primarily located in the northern and eastern portions of the base, are dominated by mixtures of red maple (*Acer rubrum*), white oak (*Quercus alba*), red oak (*Quercus rubra*), black oak (*Quercus velutina*), and scarlet oak (*Quercus coccinea*). Red maple, considered to be one of the most important forest trees at Westover ARB, dominates the canopies of the mesic and wet woodlands, and is co-dominant with oak or gray birch *(Betula populifolia)* in the drier, younger plots. Oaks are important at all dry and mesic sites, and are the major canopy dominants at the driest sites (USAF, 1998b).

The coniferous woods, primarily located in the north and northeastern portions of the base, are commercial pine plantations composed mainly of red pine *(Pinus resinosa)*, scotch pine *(Pinus sylvestris)*, and white pine (*Pinus strobus*). Many of the red and scotch pines were planted during World War II by German prisoners of war, but disease and insect problems have greatly reduced the health and value of these tree stands, and some areas have been re-planted with white pine.

Westover ARB has the largest contiguous grasslands in the Connecticut River Watershed. These open grasslands, located throughout southern, central, and northern portions of the base, are mowed with varying frequency, and differ greatly in composition; some are dominated by native species of grasses and herbs, while others are dominated almost entirely by European pasture grasses (USAF, 1998b).

The Taxiway D Alternative EOD site is relatively flat and covered by grass, with a forested area to the south. The proposed and East Alternative EOD sites are at the end of a paved access road with an adjacent forested area.

3.4.2 Wildlife

The environmental setting at Westover ARB, with its open grasslands, wooded and riparian areas, and wetlands, make it an attractive habitat to many animal species.

Common mammalian species within the local area and observed on Westover ARB include white-tailed deer, red fox, coyote, raccoon, woodchuck, gray squirrel, southern flying squirrel, eastern chipmunk, eastern cottontail, northern short-tailed shrew, and white-footed mouse. Black bear have also been documented on the base (USAF, 1998b).

Bird surveys have reported that more than 70 different bird species can be found on Westover ARB. The most abundant native birds in the area include mourning dove, eastern king bird, blue jay, American crow, American robin, killdeer, red-winged blackbird, black-capped chickadee, bobolink, and eastern phoebe. Common seasonal granivores (i.e., seed-eaters) include eastern meadowlark, horned-lark, field sparrow, and Savannah sparrow. Starling, house sparrow, rock dove, house finch, turkey vulture, and miscellaneous blackbirds are also common. Raptors frequently observed on base, especially during spring and fall migrations, include red-tailed, broad-winged, red-shouldered, and rough-legged hawk, and American kestrel. Wading birds include great blue heron, greater yellowlegs, and white-rumped sandpiper. Waterfowl species include mallard, Canada goose, and black duck. Herring gull, ring-billed gull, and greater black-backed gull are also present (USAF, 1998b).

Previous surveys have identified 18 herptile species (11 amphibian and 7 reptile) on the base, although the total number of herptile species may be higher because of the habitat potential of the base and the limitations of the survey. Common amphibians identified on Westover ARB include wood frog, bullfrog, gray tree frog, spring peeper, green frog, American toad, Fowler's toad, redback salamander, and eastern spotted newt. Common reptiles include the eastern garter snake, northern ringneck snake, black racer, northern water snake, common snapping turtle, and spotted turtle (USAF, 1998b).

3.4.3 Threatened or Endangered Species

A listed species, provided protection under the ESA, is so designated because of danger of its extinction as a consequence of economic growth or development without adequate concern and conservation. An endangered species is any species of fish, plant life, or wildlife that is in danger of extinction throughout all or a significant part of its range, other than a species of *Insecta* determined by the United States Department of the Interior to constitute a pest whose protection under this part would present an overwhelming and overriding risk to humans. A threatened species is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. A sensitive species is any species where there is a concern for population viability range-wide or in the region.

No federally-listed threatened or endangered species have been found on Westover ARB (USAF, 1998b). However, several state-listed species occur on the base. Table C-1 shows the protected species that occur on the base or may occur nearby.

There are several rare or scarce plant species that have been documented on Westover ARB. The climbing fern or Hartford fern *(Lygodium palmatum)*, a Massachusetts species of special concern, has been documented in several areas on the base. The Massachusetts Natural Heritage and Endangered Species Program (MNHESP) has ranked the Hartford fern as an "S3 species" and considers it scarce, but not extremely rare. The plant itself is afforded legal protection in Massachusetts; however, its habitat is not (USAF, 1998b). The Hartford fern is an evergreen, ivy-like plant that sprawls over the ground or climbs

up shrubs or coarse herbs. The Hartford fern grows in moist pine-oak-maple woods with an open understory, moist thickets, and stream margins (USAF, 1998b).

The wild lupine *(Lupinus perennis)*, a MNHESP "S3 species," has been documented within the open grassland areas in the northeastern portion of the base (Jenkins 1995). The wild lupine is locally common on Westover ARB; however, it does not have legal protection in Massachusetts. This species prefers maturing pitch pine stands on sandy soil but has been documented within the open grassland areas in the northeastern portion of the base (USAF, 1998b).

Two colonies of the large whorled pogonia *(Isotria verticillata)* have been documented in two locations within the wooded areas on Westover ARB. This species is uncommon in Massachusetts and has been ranked by MNHESP as an "S4 species," but has no legal protection in Massachusetts. The larger colony, located in the northern portion of the base, consists of approximately 40 plants, and was coincidental with tree clubmoss *(Lycopodium obscurum)* and sheep laurel *(Kalmia angustifolia)*. The smaller colony, located in the woodlands near the East Alternative EOD site, consisted of only a few plants (USAF, 1998b).

Westover ARB supports the largest populations of two State-listed bird species in the six-state New England region: the upland sandpiper *(Bartramia longicanda)*, State-listed as endangered, and the grasshopper sparrow *(Ammodramus savannarum)*, State-listed as threatened. The upland sandpiper and the grasshopper sparrow have been documented in grassy areas near the runway (Moriarty, 2001).

In addition, several other State-listed species have been documented on the base, including: the loggerhead shrike *(Lanius ludovicianus)* (State-listed as endangered); the northern harrier *(Circus cyaneus)* and vesper sparrow *(Pooecetes gramineus)* (both State-listed as threatened); and the sharp-shined hawk *(Accipiter striatus)*, Cooper's hawk *(Accipiter cooperii)*, and blackpoll warbler *(Dandroica striata)* (State-listed special concern species) (USAF, 1998b).

The peregrine falcon *(Falco peregrinus)*, formerly federally- and State-listed as endangered but recently delisted at the federal level subject to further monitoring, has also been documented on the base as a transient species (USAF, 1998b).

Several State-listed special concern herptile species were also identified, including the blue-spotted salamander *(Ambystoma laterole)*, four-toed salamander *(Hemidactylium scutatum)*, and spotted turtle *(Clemmys guttata)*. In addition, suitable habitat was identified on Westover ARB for several other State-listed or rare herptile species, including the eastern spadefoot toad *(Scaphiopus holbrooki)* (State-listed as threatened); the wood turtle *(Clemmys muhlenbergii)* (State-listed special concern species); and the eastern box turtle *(Terrapene carolina)* and eastern hognose snake *(Heterodon platirhinos)* (both considered rare in Massachusetts) (USAF, 1998b).

The pine barrens zanclognatha *(Zanclognatha marta)* (State-listed as threatened moth species) has also been identified on the base (USAF, 1998b).

3.4.4 Wetlands

Wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in

saturated soil conditions (USACE, 1987). Wetlands are diverse ecosystems that provide natural flood control by storing spring runoff and heavy summer rains, replenish groundwater supplies, remove water pollutants, filter and use nutrients, provide a source of water for livestock and, in dry years, are valuable for crop and forage production. They also provide habitat for many plant and animal species, including economically valuable waterfowl and 45 percent of the nation's endangered species.

Wetlands are protected by Section 404 of the *Clean Water Act*. In Massachusetts, the U.S. Army Corps of Engineers shares jurisdictional authority with the State to regulate wetlands. Wetlands are also protected in Massachusetts by the *Massachusetts Wetlands Protection Act* (referred to as Wetlands Act). The Wetlands Act regulates activities of any size that may remove, dredge, or alter any bank, freshwater or coastal wetland, beach, dune, flat, marsh, meadow, or swamp bordering on any resource area as defined in the Wetlands Act. Areas protected under the Wetlands Act include 100-year floodplains, 100-foot wetland buffer zones, and riverfront areas.

At a local level, the Chicopee or Ludlow Conservation Commission has jurisdiction over activities at the base. The Chicopee Wetlands Ordinance was created to oversee activities that occur within resource areas not covered under the *Massachusetts Wetlands Protection Act* (regulations have not yet been created to enact this ordinance). The Chicopee Conservation Commission performs final resource-area determinations on a project-specific basis. The Chicopee Wetlands Ordinance requires that no person shall remove, fill, dredge, alter or build upon or within 100 feet of the wetland resource areas.

A base-wide survey in June-July 1997 identified 33 wetlands, totaling approximately 144 acres, on Westover ARB (USAF, 1998c). The wetlands are located in a variety of landscapes, ranging from forested areas to open grasslands (USAF, 1998b). Figure 3.4-1 shows Westover ARB wetlands near the project area.

The largest amount of wetland acreage on base is associated with the Stony Brook wetland complex. Most of the wetlands in the northeast portion of the base, with the exception of the wetlands located near the former antennae farm, are hydrologically-connected to the Stony Brook wetland complex. The open portion of the wetland has many downed and standing dead trees as a result of this flooding. The open area is mostly dominated by cattails *(Typha sp.)*, sedges, and cutgrass *(Leersia oryzoides)*. The edges of the wetland are shrubby and are dominated by a mixture of alder, buttonbush, elderberry, skunk cabbage, dogwoods, and a variety of sedges (USAF, 1998b).

The proposed EOD site is adjacent to a 100-foot wetland buffer zone boundary of a forested wetland/upland complex that is approximately 60 percent wetland. This delineated wetland is classified as a Palustrine Forested Shrub/Scrub Emergent Wetland with depressional topography, and drains into a man-made drainage ditch that feeds Stony Brook. Soil morphology indicated the area has been drained somewhat but appears to maintain saturation for several days during the growing season. The adjacent uplands are dominated by an overstory of northern red oak, white oak, and eastern white pine with an understory composed of predominantly cinnamon fern (*Osmunda cinnamomea*), mountain laurel (*Kalmia latifolia*), and Christmas fern (Polystichum acrostichoides). The uplands contain disturbed upland soils.

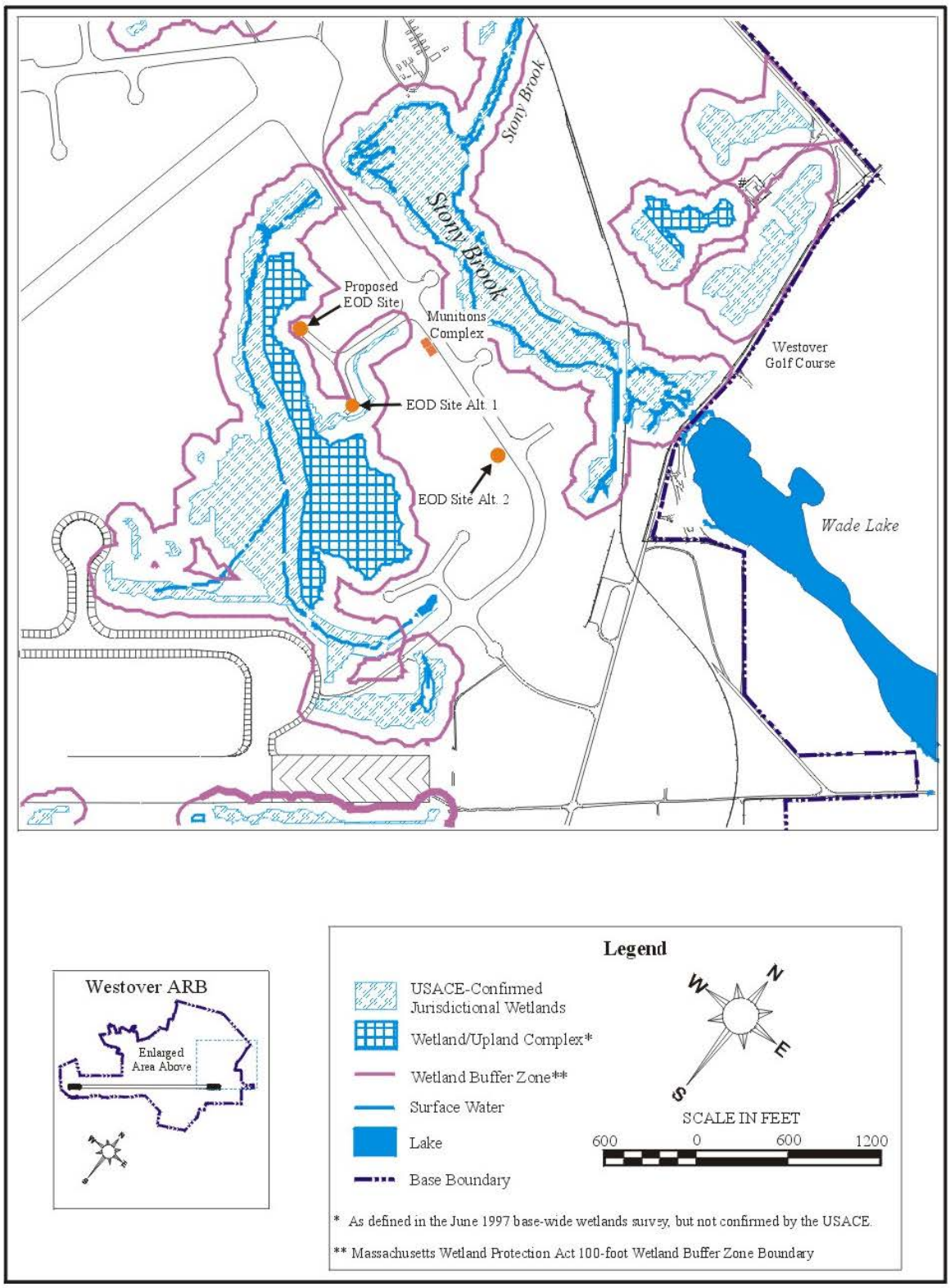

Figure 3.4-1. Wetlands Near Project Area, Westover ARB

The East Alternative site is located within the 100-foot wetland buffer zone boundary of the forested wetland/upland complex adjacent to the proposed site. The munitions complex and Taxiway D Alternative EOD sites are not within any wetland buffer zones.

3.5 CULTURAL RESOURCES

Cultural resources are archaeological, historical, and Native American items, places, or events considered important to a culture, community, tradition, religion, or science. Archaeological and historic resources are locations where human activity measurably altered the earth or left deposits of physical or biological remains. Prehistoric examples include arrowheads, rock scatterings, and village remains, whereas historic resources generally include campsites, roads, fences, homesteads, trails, and battlegrounds. Architectural examples of historic resources include bridges, buildings, canals, and other structures of historic or aesthetic value.

Native American resources can include tribal burial grounds, habitations, religious ceremonial areas or instruments, or anything considered essential for the persistence of their traditional culture.

In 1994, an archaeological and architectural reconnaissance survey of Westover ARB identified seven broad areas of archaeological sensitivity, defined as having known or potential archaeological remains (USAF, 1995a). In general, these areas are distributed along the perimeter of the base where military construction and other activities have been less extensive. The project area is not within any of these seven areas.

The northern end of the base, including the northern portion of the main runway and the surrounding taxiways, has been extensively altered during construction and landscaping. Much of this land (wetlands bordering the southern edge of Stony Brook) was low and wet prior to the construction of the base, and probably had low potential for archaeological remains. When the runways were constructed during the 1950s, these wetlands were filled to create level land for the runway facilities, and it is unlikely that intact archaeological deposits are present. There are no known archaeological resources within the project area (USAF, 1995b). Appendix C contains a summary description of the prehistoric, historic, and Cold War sites on Westover ARB.

3.6 NOISE

This section provides a description of noise, existing ambient noise levels and primary noise generators, and sensitive receptors.

3.6.1 Noise Descriptors

Noise is defined as any unwanted sound that interferes with normal activities or in some way reduces the quality of the environment. Sounds that disrupt normal activities or otherwise diminish the quality of the environment are designated as noise. Ambient noise levels vary greatly in magnitude and character from one location to another, depending on the normal activities conducted in the area. In general, noise levels around Air Force installations result primarily from aircraft operations. Noise can be stationary or transient, intermittent or continuous. The human response to noise is generally divided into three categories: physiological (primarily hearing loss); behavioral (which includes speech and sleep interference); and subjective (predominantly annoyance).

Community response to noise is not based on a single event, but on a series of events over the day. Factors that have been found to affect the subjective assessment of the daily noise environment include the noise levels of individual events, the number of events per day, and the time of day at which the events occur. Most environmental descriptors of noise are based on these three factors, although they may differ considerably in the manner in which the factors are taken into account.

A decibel (dB) is the physical unit commonly used to describe sound levels. Sound measurement is further refined by using an "A-weighted" decibel (dBA) scale that emphasizes the audio frequency response curve audible to the human ear. Thus, the dBA measurement more closely describes how a person perceives sound. Table 3.6-1 shows noise levels for various human activities, while Table 3.6-2 provides approximate sound levels for various types of construction equipment.

Table 3.6-1
Typical Decibel Levels Encountered in the Environment and Industry

Sound Level (dBA)	Maximum Exposure Limits	Source of Noise	Subjective Impression
10			Threshold of hearing
20		Still recording studio; Rustling leaves	
35		Soft whisper at 5 feet; Typical library	
40		Quiet urban setting (nighttime); Normal level in home	Threshold of quiet
50		Private business office; Light traffic at 100 ft; Quiet urban setting (daytime)	
55		Window air conditioner; Men's clothing department in store	Desirable limit for outdoor residential area use (EPA)
60		Conversational speech; Data processing center	
65		Busy restaurant; Automobile at 100 ft	Acceptable level for residential land use
70		Vacuum cleaner in home; Freight train at 100 ft	Threshold of moderately loud
75		Freeway at 10 ft	
80		Ringing alarm clock at 2 ft; Kitchen garbage disposal; Loud orchestral music in large room	Most residents annoyed
85		Printing press; Boiler room; Heavy truck at 50 ft	Threshold of hearing damage for prolonged exposure
95	4 hr	Freight train at 50 ft; Home lawn mower	
100	2 hr	Pile driver at 50 ft; Heavy diesel equipment at 25 ft	Threshold of very loud
105	1 hr	Banging on steel plate; Air hammer	
110	0.5 hr	Rock music concert; Turbine condenser	
115	0.25 hr	Jet plane overhead at 500 ft	
120	< 0.25 hr	Jet plane taking off at 200 ft	Threshold of pain
135	< 0.25 hr	Civil defense siren at 100 ft	Threshold of extremely loud

Source: U.S. Army, 1978

Table 3.6-2
Approximate Sound Levels (dBA) of Construction Equipment

Averaging Time	Sound Levels (dBA) at Various Distances (ft)					
	50	100	200	400	800	1,600
8 hours	88.5	82.5	76.5	70.5	64.5	58.5
24 hours	82.0	76.0	70.0	64.0	58.0	52.0

L_{eq} for 8 and 24 hours, using an average source of 90 dB at 50 feet from a typical mix of construction equipment, generating a maximum noise level 70 percent of an eight hour period. The 24 hour average is averaged over one year, assuming 250 workdays.

Noise attenuation of 6 dBA for each doubling of distance assumes flat terrain with no trees or buildings. Trees and buildings would increase the attenuation, reducing noise levels at various distances.

Assumes a background noise level of 55 dBA for a typical urban area (USEPA, 1974)

Sources: Thumann, 1976; U.S. Army, 1978

Construction noise is normally measured over an 8-hour time period, using the equivalent sound level (L_{eq}). The L_{eq} is obtained by averaging dBA sound levels over a selected time period.

Another descriptor of the noise environment over extended periods of hours or days is the day-night average sound level (L_{dn}). To compute an L_{dn}, single noise events are measured using an A-weighted scale with corrections added for the number of events and the time of day.

A 10-dB penalty is added for noise that occurs between the hours of 10 p.m. and 7 a.m. because nighttime noise events are considered more annoying than noise occurring during daytime. The L_{dn} descriptor is accepted by federal agencies, including the Air Force, as a standard for estimating noise impact and establishing guidelines for compatible land uses. Noise generated near the ground generally attenuates 6 dB for each doubling of distance from a noise source; trees and terrain would further increase attenuation. Noise generated further above ground (above 50 ft) generally attenuates about 2 dB for every doubling of distance.

The *Noise Control Act* of 1972 (42 U.S.C. § 4901-4918) provides a basis for state and local governments to establish exterior noise standards for various land uses. The Act also directs federal agencies to carry out their programs in such a manner as to minimize noise impacts on public health and welfare. The U.S. Department of Housing and Urban Development sets an L_{dn} of 65 dBA as an acceptable exposure for all sources of noise except loud, impulsive sounds such as sonic booms or quarry blasting. The USEPA has identified 55 dBA as a desirable noise level for outdoor and residential use. The Air Force sets an L_{dn} of 65 to 70 dBA as an acceptable level for most on-base administrative and residential land-use areas.

3.6.2 Existing Noise Conditions

Most noise generated at Westover ARB is from aircraft operations, training activities, traffic, and construction activity. Noise produced by aircraft during takeoff and landing operations produces more noise impacts than ground traffic. These noises fall into a broad range of "transient" noises, which come and go in a finite period of time. Dependent primarily on the type of aircraft, type of operations, and distance from the

observer to the aircraft, the maximum flyover noise levels will vary widely in magnitude, ranging from levels undetectable in the presence of other background noise, to levels sufficiently high to create feelings of annoyance, or to levels that interfere with speech or sleep. The duration of the noise will also vary depending on the aircraft's proximity, speed, and orientation with respect to the observer. Most aircraft operations take place between the hours of 7:00 a.m. and 10:00 p.m.

Current aircraft activity at Westover ARB includes operations by C-5A aircraft assigned to the 439 AW, and UH-1, AH-1, and OH-6 helicopters assigned to the Massachusetts Army National Guard. Operations also include transient military and military support aircraft, and civil aircraft using the Westover Metropolitan Airport.

The number of aircraft operations affects the level of noise in the vicinity of an Air Force base. The Air Force examined the effects of aircraft noise and accidents on communities near Air Force installations and developed the Air Installation Compatible Use Zone (AICUZ) Program, which is governed by AFI 32-7063, *Air Installation Compatible Use Zone Program*. The AICUZ program has two objectives: to assist local, regional, state, and federal officials in protecting and promoting the public health, safety, and welfare by encouraging compatible development within the AICUZ area of influence; and to protect Air Force operational capability from the effects of land use that are incompatible with aircraft operations. Westover's current AICUZ study was approved by the Federal Aviation Administration in January 1996 (USAF, 1996). The base works closely with surrounding communities regarding development proposals that could affect the base.

Other sources of noise at Westover ARB include vehicular traffic, construction, training activities, and equipment operation. Except for aircraft operations that can cause noise levels in excess of 80 dBA, noise levels on Westover ARB are generally less than 65 dBA, typical of an urban area. The project area is located in the northeastern portion of the base, with an average day-night sound level greater than 75 dBA. The sites are not located within the Westover airfield's clear zones or accident potential zones. The main source of noise in the project area is from aircraft traffic, with additional noise generated by training activities at the Small Arms Range and in the Dog Patch area.

3.6.3 Noise Sensitive Receptors

A noise sensitive receptor is defined as the occupants of a facility where a state of quiet is a basis for use, such as a residence, hospital, child care center, or church. The project area is on the northeast side of the runway, away from the main base facilities and not within 3,000 feet of the nearest residence. The base golf course is located approximately 2,200 feet from the proposed munitions complex, 3,000 feet from the proposed EOD site, 2,000 feet from the Taxiway D Alternative EOD site, and 2,700 feet from the East Alternative EOD site. The closest residence is approximately 3,000 feet from the proposed munitions complex, 3,800 feet from the proposed EOD site, 3,200 feet from the Taxiway D Alternative EOD site, and 3,700 feet from the East Alternative EOD site.

3.7 TRANSPORTATION

Transportation systems facilitate the movement of people, goods, and materials on the ground, on water, or through the air. For transportation systems to be adequate, users must be able to reach their destination within reasonable limits of time, cost, and

convenience. The proposed and alternative EOD and munitions complex sites are located near Taxiway D, which is no longer used by aircraft. The sites are also outside the Westover airfield's clear zone and accident potential zones. The transportation system discussed in this EA includes a network of roads and the three gates providing access to the base.

3.7.1 Existing Conditions

State Route (SR) 33 is located less than one mile west of Westover ARB and is the main thoroughfare providing access to the base. Approximately two miles southwest of the base, SR 33 intersects with Interstate 90 (the Massachusetts Turnpike), an east-west route between Boston and New York State. Interstate 91 runs north-south approximately five miles west of the base.

Westover's main gate is located off SR 33 on Industrial Road and is open 24 hours a day, 7 days a week. The main gate handles most traffic. The gate on the east side of the installation off New Ludlow Road is open about 2 hours in the morning and 2 hours in the evening, and another gate located north of the main gate off of SR 33 and Central Avenue is open during normal daytime hours. Approximately 1,450 vehicles enter and exit the base Monday through Friday (USAF, 1995c). Approximately 625 reservists enter the base every weekend for training. There are no major traffic congestion problems on base, and traffic flow on base is good during the workweek and on training weekends. Vehicle traffic is minimal in the area of the proposed and alternate sites. Ground access to the sites must be coordinated with Operations Group personnel. Construction workers and equipment would enter the base through the Main Gate and follow Industrial Road to Patriot Avenue, Patriot Avenue to Perimeter Road, Perimeter Road to an unnamed gravel road and then onto the hot cargo pad and Taxiway D.

Until the munitions complex is completed, ordnance stored on base for EOD and other military training would be located in Bldgs 7011, 7012, and 7072, off of Hangar Avenue. Transport of ordnance from these buildings to the proposed or an alternative EOD site would follow Hangar Avenue to Patriot Avenue, Patriot Avenue to Perimeter Road, Perimeter Road to an unnamed gravel road, and then onto the hot cargo pad and Taxiway D. The C-4 ordnance and thermite grenades (Hazardous Class 1.1 and 1.2, respectively) used in training would be stored at Barnes ANGS and transported to Westover ARB. Barnes Municipal Airport and ANGS is located three miles north of Westfield, MA, off US Hwy 202, approximately 20 miles to the south and west of Westover ARB (see Figure 3.7-1). When the munitions complex is operational, all munitions used for EOD training would be stored on base within the MSF.

While munitions are stored at Barnes ANGS, the primary explosive route from Barnes ANGS to Westover would follow US Hwy 202 to SR 33, SR 33 to the Main Gate at Industrial Road, Industrial Road to Patriot Avenue, Patriot Avenue to Perimeter Road, Perimeter Road to an unnamed gravel road, the unnamed gravel road to the hot cargo pad, and then to Taxiway D and the site selected for the EOD facility.

If a training event did not use all the C-4 and thermite grenades acquired earlier in the day, the materials would be returned to Barnes ANGS. The primary explosive route from Westover ARB to Barnes ANGS would follow SR 33 to US Hwy 202 (Santoro, 2001).

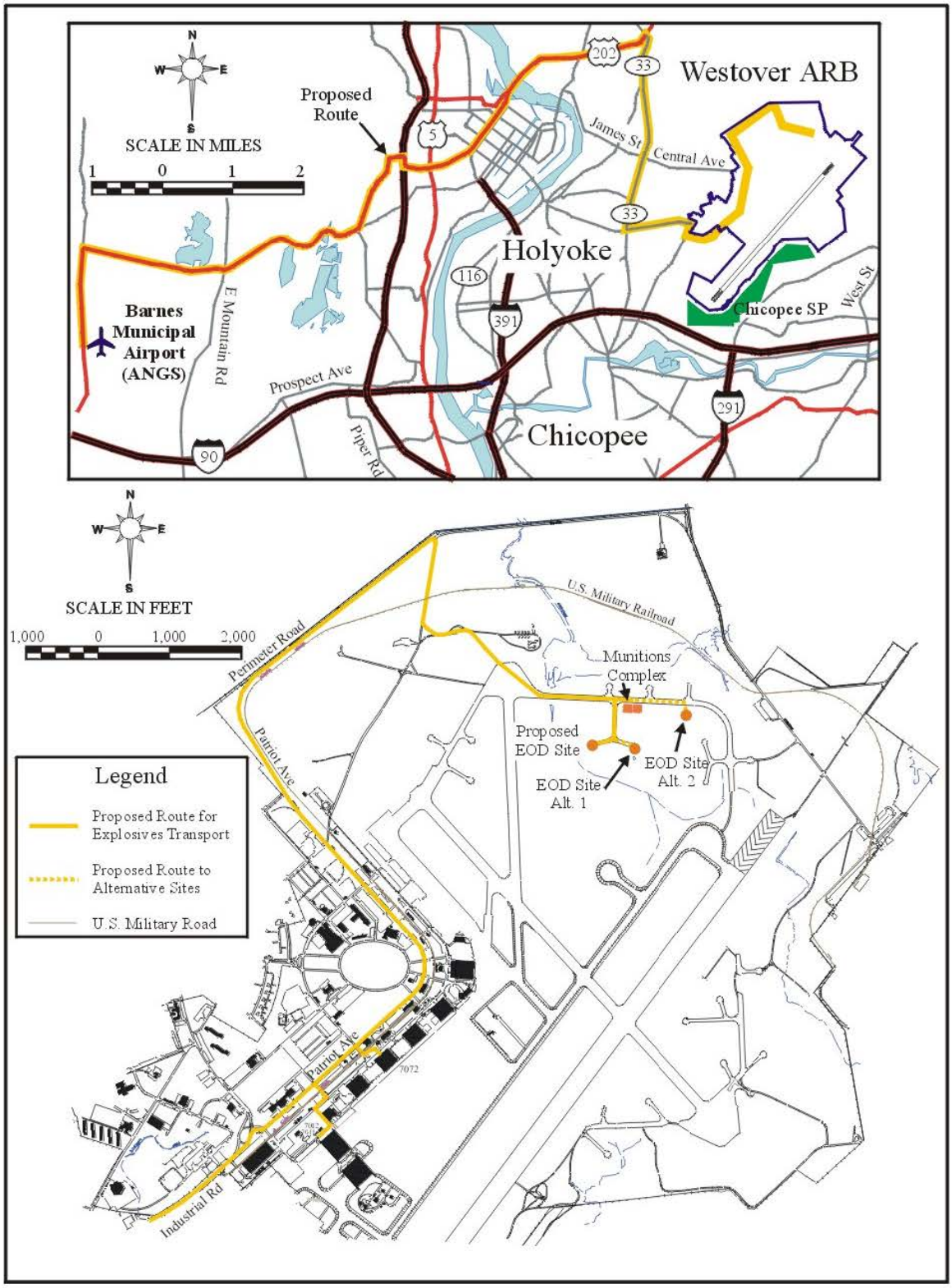

Figure 3.7-1. Proposed Route for Explosives Transport

A currently unused U.S. military railroad line is located near the project area. The line is approximately 1,000 feet from the proposed munitions complex, 2,000 feet from the proposed EOD site, 750 feet from the Taxiway D Alternative EOD site, and 1,800 feet from the East Alternative EOD site.

3.8 ENVIRONMENTAL PROGRAMS

The environmental programs at Westover ARB include: asbestos; LBP; hazardous material and hazardous waste management; PCBs; the Installation Restoration Program (IRP); solid waste; USTs; wastewater; and storm water. The Environmental Flight is responsible for managing most components of these programs. Human health and safety are addressed through requirements in the environmental programs and through the Safety Office and Bioenvironmental Engineering. All programs are managed in accordance with applicable federal, state, local, and DoD, and Air Force Instructions, standards, laws, and regulations that apply to the installation.

As noted at the beginning of Chapter 3, only relevant environmental programs are described in detail in this section and analyzed in Chapter 4. These include health and safety, hazardous materials and hazardous wastes, IRP, solid waste, and storm water

3.8.1 Health and Safety Issues

Human health and safety involves Air Force personnel and the general public. Safety addresses injuries or deaths that are usually the result of one-time accidents. Injuries include direct impacts to humans, resulting, for example, from exposures to toxic chemicals, radiant heat, or overpressures from explosions. Other health issues arise when people are affected over a long period of time (in cases such as cancer or asbestosis).

Both the Westover ARB Safety Office and Bioenvironmental Engineering Office review safety issues. The Air Force has formal safety programs addressing construction operations that provide detailed safety requirements. Contractors are responsible for all aspects of the safety and health of their employees. They must submit a safety plan that conforms to 29 CFR Part 1910 (Occupational Safety and Health Standards) and Part 1926 (Safety and Health Regulations for Construction), and must also comply with Air Force Occupational Safety and Health (AFOSH) Standards.

Project construction activities would be relatively minimal because no large buildings would be constructed, and the only demolition would be excavation of pavement at the alternate EOD site. Electric and water utilities would be installed, but these operations would be routine and would not include unique operations or hazards that could affect workers or the public.

Quantity-distance zones have been established for explosive safety (regulated under AFMAN 91-201, *Explosive Safety Standards*) and would apply to the proposed or alternative sites. Only mission-required inhabited buildings are allowed within these zones; at the proposed and alternative sites, the QD zones do not impinge on any structures, including inhabited buildings. Personnel from the 439 CES/CED and the 439 MXS/LGM are trained in the safe handling of explosive-class materiel.

3.8.2 Hazardous Materials and Waste Management

Hazardous materials are substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present a substantial danger to

public health or the environment if released. These typically include reactive materials such as explosives, ignitables, toxics (such as pesticides), and corrosives (such as battery acid). When improperly stored, transported, or otherwise managed, hazardous materials can significantly affect human health and safety and the environment.

Hazardous materials at Westover ARB are managed in accordance with the Department of Defense (DoD) Directive 4210.15 *(Hazardous Materials Pollution Prevention),* AFI 32-7086 *(Hazardous Materials Management),* and AFI 32-7080 *(Pollution Prevention Program),* all of which incorporate all requirements of federal regulations, DoD Directives, and AFIs for the reduction of hazardous material uses and purchases. EO 12088, *Federal Compliance with Pollution Control Standards*, requires that necessary actions are taken for the prevention, management, and abatement of environmental pollution from hazardous materials due to federal facility activities.

The Hazardous Materials (HAZMAT) Pharmacy (Bldg 1301) functions as a centralized clearinghouse for receipt, storage, and distribution of hazardous materials for use on base. The EOD Shop receives hazardous materials (primarily WD-40 or equivalent mild cleaner) from the HAZMAT Pharmacy for cleaning equipment; approximately 2 quarts are used in aerosol form per year (Santoro, 2001). Explosive materiel used by the EOD Shop is stored according to explosive class. Class 1.3 and 1.4 items are currently stored in Bldgs 7011 and 7012, and Class 1.4 items are also stored in Bldg 7072.

A hazardous waste is generated when a hazardous material is spilled, spent, or contaminated to the extent that it cannot be used for its original purpose, or cannot be converted to a usable product. Both the *Resource Conservation and Recovery Act* (RCRA) (42 USC 6961) and the Massachusetts *Hazardous Waste Management Act* (310 CMR 30.00) impose designs and operating standards to ensure that hazardous wastes are managed properly to prevent future uncontrolled situations. At Westover ARB, hazardous wastes are managed by the Environmental Flight.

Hazardous wastes are generated at Westover ARB during routine operations and maintenance activities. Westover ARB currently operates as a generator of hazardous waste and is not permitted as a Transportation, Storage, or Disposal (TSD) facility or for the on-site disposal of hazardous waste. Hazardous wastes are transported by approved carriers to licensed treatment or disposal facilities in accordance with regulatory requirements. The base has 16 satellite points (where small quantities of waste may be stored until the containers are full) and 2 accumulation points (an above ground waste oil tank in Hangar 5 and an accumulation point for other wastes in Bldg 1301) where wastes may be stored for up to 90 days before being transported off base for proper disposal through the Defense Reuse and Marketing Organization (DRMO) or other facility (Walker, 2001).

The EOD Shop at Westover ARB generates no hazardous wastes (Walker, 2001). Rags used for cleaning are collected and cleaned under a base contract. Munitions used for EOD training are not a RCRA waste. Expired service/shelf life items are inspected by qualified munitions inspection personnel to determine serviceability. Expired service life items are inspected and usually retained in a serviceable condition code to be issued and used "For Training Use Only." If major defects are found and items are rejected, they are reported to Ogden Air Logistics Center (ALC), Hill AFB, Utah, on an automated AF

Form 191, *Ammunition Disposition Request*, for disposition direction. Expired shelf life (major defect) items are inspected and disposition is coordinated through Ogden ALC.

3.8.3 Installation Restoration Program

The DoD's *Defense Environmental Restoration Program*, governed by AFI 32-7020, addresses past hazardous material disposal sites. CERCLA, as amended by the *Superfund Amendments and Reauthorization Act* (42 USC 9601 *et seq.*) provides federal agencies with the authority to inventory, investigate, and clean up uncontrolled or abandoned hazardous waste sites. Areas that may be contaminated by hazardous materials or wastes through spills or leaks are investigated and cleaned up through the IRP, which is the Air Force's CERCLA-based environmental restoration program. At Westover ARB, restoration activities conducted by the IRP are regulated by the USEPA and MA DEP in accordance with CERCLA and SARA guidance and policy, the National Oil and Hazardous Substances Contingency Plan (NCP), the Massachusetts Contingency Plan (MCP). In June 1993, USEPA Region 1 notified Westover ARB that the installation would not be listed on the National Priority List (NPL).

There are 21 locations on base that have been designated as IRP sites (USAF, 1998a). Sites are in various stages of restoration, ranging from investigation and characterization, to remediation, closure, or long-term monitoring. Only two IRP sites are located near the project area, as shown in Figure 3.8-1.

IRP Site LF-12 is a construction rubble landfill that is now longer active. It is located across Taxiway D, approximately 2,000 feet from the proposed EOD site, 600 feet from the Taxiway D Alternative EOD site, and 1,400 feet from the East Alternative EOD site. A No Further Response Action Planned (NFRAP) document was submitted to MA DEP, who approved closure of the site on November 3, 1999.

IRP Site SS-21 (former jet engine test cell) is approximately 700 feet from the proposed munitions complex, 500 feet from the proposed EOD site, and 1,000 feet from the Taxiway D Alternative EOD site, and its boundaries include the East Alternative EOD site. The Preliminary Assessment / Site Investigation conducted at SS-21 during 1994 and 1995 indicated the presence of VOCs and petroleum hydrocarbons in soil and groundwater. A Phase II Remedial Investigation was conducted in 1997 to characterize the subsurface conditions. Based on the sampling results, petroleum-contaminated soil was removed and disposed (USAF, 1998e). Non-aqueous phase liquid contaminants were removed from a monitoring well at the site prior to the soil removal action. The removal action achieved a level of "No Significant Risk" to human health risk and eliminated all uncontrolled sources, as defined in 310 CMR 40.1003(5). An ecological risk assessment was conducted to determine the need for additional action (Kwiatkowski, 2001). The site closure was approved by the MA DEP after their acceptance of the risk assessment, which found that no further action was required (Moriarty, 2003).

A recently discovered site near the proposed project area was found to contain contaminated soil from a parked helicopter that had leaked oil. The contamination was localized and no floating hydrocarbon product was found in groundwater. This and other localized petroleum contamination "spots" are being remediated in accordance with Massachusetts Contingency Plan requirements (310 CMR 40).

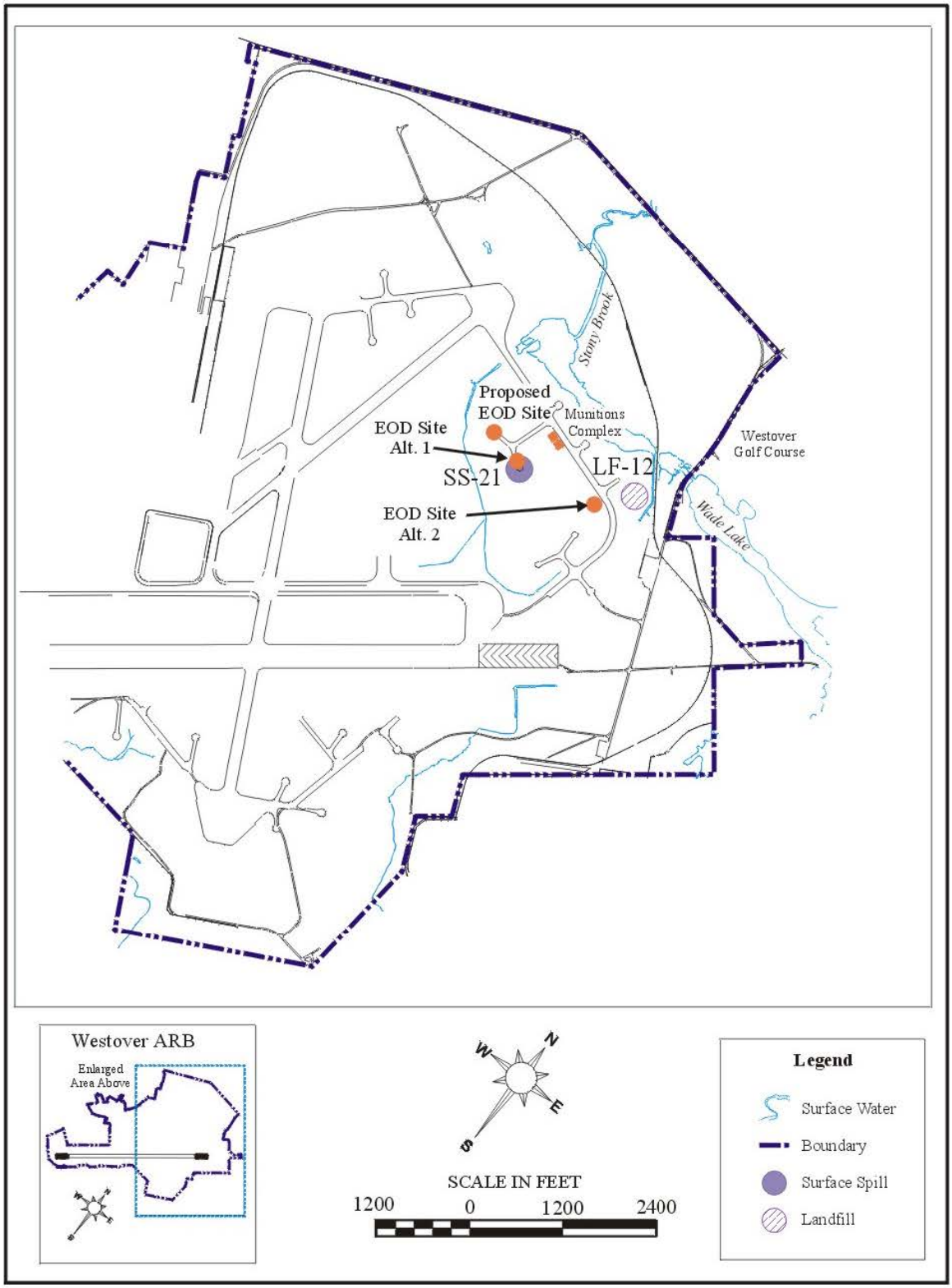

Figure 3.8-1. Location of IRP Sites Near the Project Area

3.8.4 Solid Waste

The solid waste management program at Westover ARB includes all waste materials that are neither hazardous nor toxic, and which are normally disposed of by landfilling or incineration, or are recycled or recovered. These wastes include non-hazardous trash, garbage, bulky wastes, liquids or sludges, slurries, other types of construction debris, and recoverable or recyclable trash or materials. Solid wastes currently generated at the base are disposed of by a private waste collection and hauling company. Solid wastes are managed in compliance with RCRA, Subtitle D, and the *Massachusetts Solid Waste Management Act* (310 CMR 19.00).

There are three closed landfills and no open landfills on Westover ARB. The closest landfill to the proposed and alternative EOD sites is IRP Site LF-12, a former construction rubble site discussed in Section 3.8.3 above. Former sanitary landfills A and B (IRP sites LF-02 and LF-01, respectively) are located approximately one-half mile or further west-northwest of the proposed and alternative sites.

The EOD Shop annually generates on the order of tens of pounds of scrap metal (e.g., impulse cartridge cases) and other solid waste. As noted in Section 3.8.2, rags used for cleaning munitions and equipment are recycled through a base contract.

3.8.5 Storm Water

The installation's storm water program is managed by the Environmental Flight, with sampling and analysis support by the Bioenvironmental Engineering Flight. Section 3.3.2 discusses the historical and current status of Westover ARB storm water permits. The installation's SWPPP (USAF, 2001b) was prepared to comply with specific requirements in AFI 32-7041, *Water Quality Compliance*. In lieu of numerical discharge permits, the MSGP requires the development of a SWPPP for controlling pollutant contributions to storm water. The MSGP includes all outfalls, and Westover ARB has developed a storm water monitoring plan that continues chemical analysis of Outfalls 001 and 002. As noted in Section 3.3.2, the proposed and alternate EOD sites and munitions complex site all drain to Outfall 005.

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

4. ENVIRONMENTAL CONSEQUENCES

This chapter discusses the potential for significant impacts to the human environment as a result of implementing the Proposed Action, EOD Site Alternatives, or No Action Alternative. As defined in 40 CFR §1508.14, the human environment is interpreted to include natural and physical resources, and the relationship of people with those resources. Accordingly, this analysis has focused on identifying types of impacts and estimating their potential significance. This chapter discusses the effects that the Proposed Action or an alternative could generate in the environmental resource areas described in Chapter 3.

The concept of "significance" used in this assessment includes consideration of both the context and the intensity or severity of the impact, as defined by 40 CFR §1508.27. Severity of an impact could be based on the magnitude of change, the likelihood of change, the potential for violation of laws or regulations, the context of the impact (both spatial and temporal), degrees of adverse effect to specific concerns such as public health or endangered species, and the resilience of the resource. The criteria used to characterize impacts are introduced at the beginning of each resource section. According to these criteria, adverse impacts of a proposed activity are identified as significant or insignificant. *Significant* impacts are the most substantial and should receive the greatest attention in decision making. Impacts that are *insignificant* result in little or no effect to the existing environment and cannot be easily detected. *No impact* is specified in cases in which a resource would not be affected because certain resource elements (e.g., floodplains, or low-income or minority populations) are not present in the area of the Proposed Action or a site alternative. *No impact* could also occur under the No Action Alternative if there were no changes to the existing environment. If a resource would be measurably improved by a proposed activity, a *beneficial* impact was noted.

Impacts can be short-term or long-term. Short-term impacts occur during construction or immediately afterwards. Although short in duration, such impacts may be obvious and disruptive. For this project, short-term impacts are defined as those lasting about six months (the duration for constructing the EOD and munitions facilities) or less. Long-term impacts are generally associated with the operations phase, and in this case would last more than six months, extending beyond the construction period.

Significant adverse impacts can be mitigated through avoidance, minimization, remediation, reduction, or compensation; certain mitigations are required by law. Within each resource area, this document presents any mitigations identified during the analysis, along with best management practices and preventive measures that are necessary or useful to minimize environmental impacts. Mitigations and best management practices assist the project proponents in maintaining compliance with environmental regulations. Preventive measures are design features or operational practices that may be tested, evaluated, and/or used to further reduce environmental impacts.

This chapter is organized by resource in the same order as Chapter 3. Each resource section begins with a description of the resource-specific significance criteria. This is followed by a discussion of the analysis methods and the potential impacts of the Proposed Action, EOD Site Alternatives, and No Action Alternative, including suggested best management practices, if applicable. For water resources and noise, the analysis of

the Proposed Action is further subdivided between the EOD facility and the munitions complex to ensure a comprehensive discussion of potential impacts. Discussion of the alternatives involves only the EOD training facility; the site, construction, and operations of the munitions complex would be the same under the Proposed Action or either EOD site alternative. Each resource area concludes with a discussion of applicable mitigations, best management practices, and preventive measures.

In accordance with 40 CFR §1502.16, this chapter concludes with a discussion of the compatibility of the Proposed Action with objectives of federal, state, and local land use plans, policies, and controls; an evaluation of the relationships between short-term uses of the environment and long-term productivity; cumulative impacts: irreversible and irretrievable commitments of resources; and environmental justice.

Mission of Westover ARB

The mission of the 439 AW is to provide air transport capabilities for moving military equipment and personnel worldwide and to serve as a staging area for contingency operations. A well-trained EOD function and the safe and efficient storage, maintenance, and inspection of munitions is an essential component of the worldwide mission of the 439 AW and Westover ARB.

Neither the Proposed Action nor any site alternative would have an adverse impact on the base's flying mission. Aircraft operations would not be affected for several reasons. The proposed or alternative sites are on or near a taxiway that is no longer used by aircraft. EOD training operations would be coordinated with Base Operations to ensure that activities such as practice drops from aircraft would not occur during the demolition exercises. (A practice cargo drop area is located to the southwest about 1,000 feet from the proposed EOD site and the Taxiway D Alternative EOD site, and 2,000 feet from the East Alternative EOD site.) EOD personnel would continue their current practice of notifying Base Operations at least three days in advance (when practicable) of training exercises (Pirrone, 2001). EOD personnel would develop a policy to maintain constant radio communication with the Tower and would coordinate with Tower prior to making any detonation; controllers would ensure that appropriate lateral and vertical separation exists for aircraft in the local area. Munitions personnel would also coordinate with the Tower as needed when munitions deliveries or other operations were scheduled.

4.1 AIR RESOURCES

The Proposed Action would have short-term insignificant adverse impacts on air quality generated by heavy equipment and earth-moving activities during construction. Air quality impacts from operation of the EOD and munitions facilities would be insignificant under the Proposed Action or either EOD site alternative. Impacts from construction at the EOD alternative sites would also be insignificant, and would differ only negligibly from impacts generated from the Proposed Action. Under the No Action Alternative, emissions from operational activity would continue at the same minimal level as current operations.

4.1.1 Significance Criteria

Air quality impact significance is based on federal, state, or local pollution regulations or standards. A significant impact would be a violation of standards, or an exposure of

sensitive receptors to excessive quantities of fugitive dust. Increases in emissions below criteria levels would not be significant. A beneficial impact to air quality would be a reduction in baseline emissions.

4.1.2 Analysis Methods

The analysis was based on a review of existing air quality in the region, information on Westover ARB air emission sources, projections of emissions from the proposed activities, a review of state permit requirements for construction estimates, and an estimate of construction-related air emissions, using USEPA emission factors. The types of equipment likely to be used include bulldozers, dump trucks, backhoes, cranes, water trucks, concrete trucks, and flatbed trucks. The backhoe would be used with a percussion chisel as well as a lift bucket. Estimates were also calculated of emissions from worker vehicles during both construction and operations. Impacts were evaluated based on the predicted emissions and comparison to air quality standards.

4.1.3 Potential Impacts of the Proposed Action

There would be increased emissions from heavy equipment and worker vehicles used during construction of the munitions complex and EOD training facility, but there would be only insignificant impacts to air quality because no federal, state, or local pollution standard or regulation would be violated. Construction is estimated to continue for 1 to 2 months for the EOD facility, and up to 6 months for the munitions complex; the two construction periods would probably not overlap. Heavy construction equipment would generate the most emissions, with CO, NO_x, and VOCs as the main constituents of exhaust, and earth-moving operations would generate fugitive dust (measured as PM_{10}). Although construction-related emissions are generally exempt from federal regulatory review, USEPA still requires that such activities not exceed the NAAQS. The estimated emissions are shown in Table 4.1-1. Appendix B includes calculations for the emissions.

The project area is in a region that is in serious non-attainment for ozone. Emissions above the *de minimus* concentration of 45 metric tons per year (50 tons per year) for the ozone precursors NO_x and VOCs would require a general conformity study. Estimated emissions from the Proposed Action are below these thresholds, and would negligibly increase the emissions as compared to the maintenance budget for the SIP. Therefore, this project is exempt from further conformity analysis pursuant to 40 CFR 93.153.

Table 4.1-1
Air Pollutant Generation from Construction Activities:
Proposed Action
(tons per year)

Emissions	**VOC**	**PM_{10}**	**CO**	**SO_x**	**NO_x**
Construction Emissions	0.13	0.137	0.93	0.15	1.49

Source: Calculated with emission factors from AP-42 (USEPA, 2000b; USEPA, 1985; SCAQMD, 1992)

For the EOD facility, the depth of construction would be approximately four feet, and there would be two-foot wide footings extending either side of a two-foot wall that is eight feet high (with two feet buried). Grading would disturb only about 8,000 square

feet (0.15 acre) for the facility. No road construction for the proposed EOD site would be necessary due to its location on an access road. The project (including site preparation, facility construction, and landscaping) would be completed in less than two months. Forms for the concrete were assumed to be constructed on-site.

The munitions complex involves construction of a 4,332-square foot concrete storage MSF and a 1,400-square foot MMIF; laying asphalt pavement to connect the two buildings; and installing approximately 3,000 feet of underground, concrete-encased, utility lines, a water main, a septic system, and fencing. The two facilities would take approximately six months to construct. Grading would disturb only about 21,750 square feet (0.5 acre) for the facilities and associated pavement.

Because of the small quantity of potential emissions, construction activities at these facilities would not exceed or contribute to an exceedance of air quality standards, and the impacts would not be significant. No other air pollutants of note would be generated during the construction of the facility.

The construction activities would have an unavoidable short-term impact on air quality. Construction equipment and personal vehicles would produce exhaust emissions, and excavation would generate fugitive dust. These emissions would not be significant, given the short duration of time for construction, the limited types and quantities of equipment to be used, and the limited area to be disturbed. The contractor would be required to use best management practices to reduce fugitive dust emissions, such as dampening soil, and replacing ground cover in disturbed areas as quickly as possible, as required under the Westover ARB *Storm Water Pollution Prevention Plan*, Section 4.3 (USAF, 2001b).

Operation of the EOD training facility would minimally affect air quality. The facility would only be used one to a few days per month, with several training demolitions occurring during each day of training exercises. The emissions from explosive detonation are determined primarily by the oxygen balance of the explosive. A deficiency of oxygen promotes the formation of CO and unburned organic compounds, and produces little, if any, NO_x. An excess of oxygen causes more NO_x and less CO and other unburned organics. Particulates produced from a detonation are more attributable to incorporation of dirt particles by the explosive than from the explosive charge. Explosions also produce unburned hydrocarbons, with methane being the predominant type reported (USEPA, 2000b). Each pound of RDX detonated would generate about 0.1 pounds of CO. Each pound of trinitrotoluene (TNT) would generate about 0.4 pounds of CO and 0.007 pounds of VOC (methane) (USEPA, 2002).

Operation of the munitions complex would also have negligible impacts on air quality, with impacts limited to small increases in vehicular traffic from the three personnel staffing the MMIF, personnel storing or retrieving munitions from the MSF, and trucks delivering munitions to the storage facility.

These levels would not be significant compared to PSD criteria for Massachusetts. No air permit would be required for operation of the EOD facility. Hazardous materials (used in cleaning and maintenance activities) that are considered as HAPs could be generated in negligible minimal amounts. However, based on the cleaning materials currently used by the 439 CES/CED, no HAPs would be generated by maintenance operations. Negligible amounts of HAPs could be generated from explosive demolition.

The primary emission components, as noted above, would be particulate matter, CO, and NO_x. No significant impacts would occur.

4.1.4 Potential Impacts of EOD Site Alternative 1 (East Alternative)

Construction of the EOD training facility at this alternate location would also not require road construction because the site is at the end of an access road. Emissions generated from construction activities are projected to be slightly greater than at the proposed site; more fill would be needed because of the slope of the area is slightly greater than the proposed site. Table 4.1-2 provides the estimated construction emissions. The same best management practices would be followed during construction Operational emissions would be negligible and the same as under the Proposed Action. Consequently, overall emissions would essentially be the same as compared to the Proposed Action, and would be insignificant. Construction and operation of the munitions complex would be the same as under the Proposed Action.

Table 4.1-2
Air Pollutant Generation from Construction Activities:
EOD Site Alternative 1 (East Alternative)
(tons per year)

Emissions	VOC	PM_{10}	CO	SO_x	NO_x
Construction Emissions	0.13	0.39	0.96	0.16	1.56

Source: Calculated with emission factors from AP-42 (USEPA, 2000b; USEPA, 1985; SCAQMD, 1992)

4.1.5 Potential Impacts of EOD Site Alternative 2 (Taxiway D Alternative)

Under this option, the EOD training facility would be constructed at EOD Site Alternative 2, adjacent to Taxiway D. Grading would disturb approximately 8,000 square feet (0.2 acre) for the facility and a gravel access road. With the exception of higher amounts of PM_{10} from a greater amount of grading, the construction emissions are predicted to be slightly lower than at the other construction sites (see Table 4.1-3). No asphalt would need to be removed at this site and no extra fill would be required. The same best management practices would be followed during construction. The negligible operational emissions would be the same as under the Proposed Action. Consequently, emissions would essentially be the same as compared to the Proposed Action, and would be insignificant. Construction and operation of the munitions complex would be the same as under the Proposed Action.

Table 4.1-3
Air Pollutant Generation from Construction Activities:
EOD Site Alternative 2 (Taxiway D Alternative)
(tons per year)

Emissions	VOC	PM_{10}	CO	SO_x	NO_x
Construction Emissions	0.13	0.38	0.94	0.15	1.53

Source: Calculated with emission factors from AP-42 (USEPA, 2000b; USEPA, 1985; SCAQMD, 1992)

4.1.6 Potential Impacts of the No Action Alternative

Under the No Action Alternative, emissions from detonating .50-caliber ammunition would continue. Emissions from EOD training and current munitions operations constitute a negligible input to the overall emissions generated at Westover ARB. Air quality would not be noticeably affected, and no significant impacts would occur.

4.1.7 Mitigations, Best Management Practices, and Preventive Measures

No significant impacts would result from implementing the Proposed Action or an alternative. No mitigations would be required or are recommended.

Construction best management practices include dampening disturbed soil as needed to prevent wind and water erosion, and revegetating disturbed areas as quickly as possible.

4.2 GEOLOGICAL RESOURCES

Geological resources are limited, non-renewable earth resources whose characteristics can easily be degraded by physical disturbances. Impacts to geological resources would result primarily from disturbance of the ground during construction activities such as excavation and grading. These activities would affect a shallow layer of the underlying geology (including soils). The topography would be slightly affected by the construction of earthen berms adjacent to the outside walls of the EOD facility. The Proposed Action would result in less than 1 acre being disturbed for each construction project, and impacts to soils and geology would be insignificant. The insignificant construction impacts at the EOD site alternatives would be similar to those of the Proposed Action. Training activities at the EOD facilities would have insignificant impacts on soils; potential impacts could be reduced by the use of preventive measures. Geological resources would not be affected by operations at the munitions facilities or under the No Action Alternative.

4.2.1 Significance Criteria

An action's impact on geological resources would be significant if it depletes the regional or local resource, activates a fault, initiates slumping events, or causes an event with irreparable damage or injuries. Impacts to soil are significant if an action accelerates the rate of erosion, or substantially degrades soil characteristics. Insignificant impacts occur when a resource is only slightly affected. Reduction of a hazard or erosion potential is a beneficial impact.

4.2.2 Analysis Methods

The geological resources within the proposed project area were studied to determine the potential impacts from implementing the Proposed Action, EOD site alternatives, or No Action Alternative. Geological studies, previous EAs, U.S. Geological Survey (USGS) topographical maps, and a USDA Soil Survey were reviewed to characterize the existing environment. Construction activities that could influence geological resources were evaluated to predict the type and magnitude of potential impacts. The predicted post-construction environment was compared to the existing environment and the change was evaluated to determine if significant changes in any existing conditions would occur.

4.2.3 Potential Impacts of the Proposed Action

Excavation for the Proposed Action would impact the underlying geological layers to a depth of 4 feet or less. The EOD facility involves an approximately 8,000 square foot area (including 2,000 square feet for the firing wire and utility conduit), while the munitions complex involves approximately 21,750 square feet of disturbance. As discussed in Section 3.2, the material underlying soils is mainly well-sorted, outwash deltaic material. As discussed in Section 3.3, the depth to groundwater in the location of the proposed sites of the EOD and munitions facilities ranges from about 5 to 20 feet. Due to the limited amount of area disturbed and the depth of excavation, impacts to the geologic layers and their hydrogeologic properties would not be significant.

The earthquake risk in the area is low and relief in the proposed site area is nearly flat. No significant impacts from seismicity would be anticipated. Construction or operation of the EOD or munitions facilities would not activate a fault or cause slumping events.

Soils in the project area would be impacted by excavation, grading, and construction of the facilities. As areas are excavated, soil would be temporarily stockpiled nearby. Windsor sandy loam, or other suitable soil, could be used as fill material to construct the earthen berms for the EOD facility; approximately 160 cubic yards of fill (16 standard dump truck loads) would be required. Approximately 60 cubic yards of soil would be used within the walls of the EOD facility to help drain the site. The soil would be tamped (compacted). The needed fill materials are common resources in the region, and the use of soil from an established borrow area would not result in any significant impacts.

Most soils underlying the proposed sites have a low shrink-swell potential, with fair to good compaction, and good potential for construction. The potential for erosion by water or wind is slight at the proposed sites. Best management practices, such as daily watering and revegetating exposed soil as soon as possible, would be implemented. Impacts to soils from construction of the facilities would not be significant.

A contaminant of concern from EOD operations is RDX, a by-product of C-4 detonation. RDX, also known as cyclonite or hexogen, is a white crystalline powder used as an ingredient in explosives and is a potential contaminant of concern. RDX is listed as a toxic substance by the Agency for Toxic Substances and Disease Registry (ATSDR) and the *Toxic Substances Control Act* (TSCA). RDX does not bind easily to soil and can be transported into groundwater. It is nearly insoluble in water (Vermont SIRI, 2002), dissolving very slowly (ATSDR, 2002).

Detonation of certain explosives during EOD training exercises would result in deposition of RDX residues on the soil. As discussed in Section 2.1, specific EOD operational measures could be enacted to avoid possible contamination of soil and water. One potential prevention measure could be the application of lime to the soil surface prior to each test. The lime would interact with any residues of RDX, converting the RDX to organic matter in the soil (Davis, 2002). Another preventive measure could involve a partnership with SERDP and ESTCP as a demonstration project in their studies on reducing the environmental impacts from firing ranges; the findings would identify effective strategies to minimize potential contamination from Westover's EOD facility. Issues related to RDX are discussed more fully in Section 4.3.3.1 below.

Soil samples from the project area were taken in late 2002 and found to be free of RDX residues. The proposed EOD facility would be monitored within the bermed area. Westover ARB would also continue to conduct soil testing outside of the site to monitor potential RDX residues. If contamination were detected, the soil would be excavated, its waste disposal requirements would be characterized, and it would be disposed of in accordance with the MCP (Moriarty, 2002). Potential residues are anticipated to be well below the soil standards in the MCP for oil and hazardous materials in 310 CMR 40.0975 (see Section 3.2.2). Another preventive measure could be to use a retractable cover over the soil surface between EOD training operations. The cover would shed rainwater and limit the need for leachate recovery. Impacts to soils would be insignificant.

Operations at the munitions facilities would not impact geologic resources.

4.2.4 Potential Impacts of EOD Site Alternative 1 (East Alternative)

Impacts would be similar to those under the Proposed Action. The area disturbed would be nearly identical. This alternative EOD site is near an area of wetlands, and the soils have a slightly higher proportion of clay than EOD Site Alternative 2 adjacent to Taxiway D. The area was previously disturbed during construction of the engine test cell. The soil is well suited to construction, and the potential for wind and water erosion is slight.

To construct in the area of a wetlands buffer, an NOI and/or request for determination of applicability would need to be prepared and filed with the CCC. To approve the project, it is likely that the CCC would issue an Order of Conditions to be met; this process was implemented when work was needed for the nearby IRP Site SS-21. Preventing sedimentation of the adjacent wetlands would likely be a requirement of the CCC. Westover ARB currently implements requirements of the installation's SWPPP and *Erosion and Sedimentation Control Manual*, and the construction permit and contracting documents would also address sediment and erosion control measures. Consequently, given the existing protections and following any additional CCC requirements, geological impacts would not be significant.

EOD operational impacts would be essentially the same as under the Proposed Action, and the same best management practices and preventive measures would be used.

Impacts related to the munitions facilities would be the same as under the Proposed Action.

4.2.5 Potential Impacts of EOD Site Alternative 2 (Taxiway D Alternative)

More area would be disturbed under this alternative than under the Proposed Action or EOD Site Alternative 1. This site is not within or near a wetland, and the soil type provides good drainage. The depth of construction for the facility would be similar to that described for the Proposed Action, with the addition of a gravel road from Taxiway D to the site. Soils and geological resources would not be significantly impacted.

EOD operational impacts would be essentially the same as under the Proposed Action, and the same best management practices and preventive measures would be used.

Impacts related to the munitions facilities would be the same as under the Proposed Action.

4.2.6 Potential Impacts of the No Action Alternative

Geological resources would not be significantly impacted under the No Action Alternative. Current activities do not result in disturbances to the geology or soils in the project area.

4.2.7 Mitigations, Best Management Practices, and Preventive Measures

No significant impacts would result from implementing the Proposed Action or Alternatives, and no mitigations are required.

Best management practices during construction would include daily watering and revegetating exposed soil as soon as possible to avoid erosion.

Design and operational preventive measures could include the use of a retractable cover over the EOD facility between operations, to shed rainfall and limit the need for leachate recovery. Another measure would be the application of lime to the soil surface prior to the use of explosives that leave an RDX residue; the lime would interact with any residues of RDX, converting the RDX to organic matter in the soil. Yet another possible measure is a partnership with SERDP and ESTCP as a demonstration project in their studies on reducing the environmental impacts from firing ranges.

4.3 WATER RESOURCES

Direct impacts to water resources would result primarily from disturbing the ground during construction activities and from altering surface hydrology, but impacts to groundwater from excavation would be insignificant. No adverse impact to the underlying confined bedrock aquifers would occur because of their extensive depth below the surficial aquifer. The shallow alluvial aquifer would not be significantly impacted. Short-term disturbances from construction activities during the Proposed Action could cause wind or water soil erosion, which could lead to increased sedimentation of nearby surface waters. Implementing best management practices would reduce the potential for erosion and sedimentation, and impacts would be insignificant. The quality of groundwater and surface water would not be significantly affected. There would be no impacts to FEMA-delineated floodplains.

Training operations at the EOD facility could deposit small amounts of explosive residues, but impacts to water from operation of the EOD facility would be insignificant. Impacts from munitions complex operations would be negligible.

Under the EOD site alternatives, the insignificant impacts from construction would be similar to those under the Proposed Action. If the No Action Alternative were selected, there would be no change in the existing insignificant impacts to water.

4.3.1 Significance Criteria

A significant impact would occur if surface or groundwater quality were degraded to a point where it did not meet the state and federal standards set for its designated uses, or if available water supplies were inadequate for projected needs. A significant impact could also occur if the groundwater recharge area, or yield, were to substantially decrease as a result of an action. Insignificant impacts would result if the affected water resource had limited potential for future use, or the impacts are not measurable. Beneficial impacts

would occur if groundwater recharge, surface water storage, or water quality were improved.

4.3.2 Analysis Methods

To determine the potential impacts of the Proposed Action, EOD site alternatives, and No Action Alternative, documents on the hydrology and hydrogeology of the area (e.g., Westover's *Storm Water Pollution Prevention Plan* and *Erosion Sediment Control Plan*), construction methods, and configuration of the EOD and munitions facilities were reviewed. Maps showing topography, watersheds, and base drainage were examined. The review focused on hydrogeology in the project area, water quality in the local area, and the proximity of the construction site to surface waters, and evaluated the effects of the actions with regard to those factors.

4.3.3 Potential Impacts of the Proposed Action

4.3.3.1 EOD Training Facility

Excavation to about 4 feet in depth would be required to pour the footings of the concrete walls; this would be the maximum depth of construction as no utilities would be installed. Approximately 0.15 acre would be disturbed. The construction would occur above the water table in the unconfined aquifer. The excavations would have no impact on the groundwater in the confined aquifers, which are 100 feet or more below the surface. As discussed in Section 3.3.1, the deep aquifers are confined beneath low permeability layers and are protected from physical disturbance or chemical contamination beneath the proposed facility. The only impacts to groundwater would be to the shallow, unconfined groundwater, which is not used for drinking water. The area and depth of disturbance are minimal, so impacts on future recharge would not be significant.

As noted in Section 4.2.3, RDX does not bind easily to soil and can be transported into groundwater, but is nearly insoluble in water, dissolving very slowly. Although a maximum contaminant level has not been established for RDX in the Federal Drinking Water Standards, there is a Health Advisory level of 0.002 milligrams per liter (mg/L) (also known as 2 micrograms per liter (µg/L) or 2 parts per billion (ppb)). This level pertains to the amount of contaminant delivered to the user.

The Engineer Research and Development Center (ERDC) of the U.S. Army Corps of Engineers has been conducting detailed studies of residues at military training ranges. Even at ranges where extensive testing involves large quantities of explosives, minimal soil contamination was detected (Walsh et al, 2001; Jenkins et al, 2001). To better determine residue patterns from individual detonations, ERDC has been conducting detonations on snow at munitions ranges (Jenkins et al, 2000a; Jenkins et al, 2000b). At Fort Lewis, Washington, sampling was performed at the hand grenade range, 105-mm howitzer firing point, and a portion of the artillery impact area. Also at Fort Lewis, some groundwater seeps and monitoring wells detected RDX at very low (<1.0 µg/L) concentrations (Walsh et al, 2001).

A hand grenade range was sampled at Fort Richardson, Alaska. In general, concentrations of explosives residues in and around detonation craters were barely detectable (slightly above 1 µg/L), indicating that only minor amounts of explosives residue are deposited during high-order (normal detonation) of munitions (Jenkins et al,

2001). Similar results were determined at Fort Greely, Alaska (Walsh, et al, 2001). A low-order detonation crater resulted from a partial detonation of the high-explosive filler, leaving solid explosive composition in contact with surface soil. This crater was heavily contaminated with TNT and its degradation byproducts. The study authors recommended that the resultant debris be removed from low-order detonations to minimize the potential for leaching into the groundwater (Jenkins et al, 2001). Further testing at other locations has confirmed that nearly all explosive residues are consumed during high-order detonations (Moriarty, 2003).

At Camp Ethan Allen, Vermont, three 81-mm mortar rounds were detonated by EOD personnel using 1.25 lbs. of C-4 (approximately 90 percent RDX) and a blasting cap for each detonation (Jenkins et al, 2000a). Estimates of initial explosive that was deposited as residues ranged from 0.0007 to 0.011 percent for RDX, and from 0.0000001 to 0.00023 percent for TNT (the TNT was derived from the mortar). The estimated soil concentrations of RDX ranged from 0.58 to 181 µg/kg and of TNT ranging from 0.004 to 1.3 µg/kg (Jenkins et al, 2000a). During a separate study at Camp Ethan Allen, a land mine was detonated with a blasting cap, and residue patterns were assessed on the snow-covered range. Although the main residue was TNT, this compound quickly degrades (half-life of approximately 2 days) without a continuing source (Jenkins et al, 2000b).

The ERDC was contacted regarding the EOD training program proposed at Westover ARB. The quantity of explosives used in the program is negligible compared to usage on the artillery and grenade ranges that are being tested by the ERDC. With high-order detonations, there are negligible residues detected even in areas with continuous detonations. Consequently, it is unlikely that residues would accumulate at Westover ARB in quantities that could adversely affect groundwater (Jenkins, 2001).

Lime interacts with RDX to convert it to organic matter in the soil (Davis, 2002). As discussed in Sections 2.1 and 4.2.3, lime application is therefore a possible measure to avoid soil and water contamination. Due to negligible amounts of RDX residues after a high-order detonation and the interaction of any traces of RDX with lime (if used), no significant impacts to the shallow groundwater would occur. Levels of residues in the soil and groundwater are anticipated to be well below the health advisory level for RDX in 310 CMR 40.0974 (see Section 3.3.1). Periodic monitoring of the groundwater (and overlying soil) would be conducted to ensure that contamination is not occurring. As stated in Section 4.2.3, if soil contamination is detected, the soil would be removed and disposed of after coordination with the MA DEP.

Two other possible preventive measures were noted in Section 4.2.3. One is the use of a retractable cover to shed rainwater between training operations, further reducing the potential for migration of contaminants into groundwater. Water quality would continue to meet state and federal standards set for its use. The detonation events leave minimal residues, and waste materials will be collected and placed in containers after a demolition event is concluded and before EOD personnel leave the area. A second measure could involve a partnership with SERDP and ESTCP as a demonstration project in their studies on reducing the environmental impacts from firing ranges; the findings would identify effective strategies to minimize potential contamination at Westover.

Soil sampling was conducted before and after explosives were detonated at IRP Site LF-01 (Landfill B), and no contamination was detected (AMRO, 1999). Site LF-01 is

more than 4,000 feet to the west-northwest from the proposed EOD site; it was last used in the mid-1970s and capped in 1998. Recent sampling of groundwater from a shallow monitoring well near Landfill B found explosive residues in the range of 0.1 to 0.6 µg/L (Moriarty, 2001), well below MCL goals. These residues probably accumulated from historic levels of ordnance; they are highly localized near Landfill B and do not affect the proposed EOD site. When munitions used at the EOD training range do not explode completely (i.e., low-order detonation), standard practice at the EOD training range has been to perform high-order detonations on the remnants of the partially exploded munitions to explode them completely. The complete (high-order) detonation reduces the amount of residue and results in less potential for contamination of soil and groundwater. The closest existing groundwater well to the project area is located off-base, approximately 3,600 feet from the nearest of the proposed and alternative EOD facility sites. The off-base drinking water wells for private residences are typically deep wells into the bedrock (100 to 300 feet deep). There are no contamination issues attributed to the base associated with wells in this area (Kwiatkowski, 2001), and no contamination is anticipated from the Proposed Action.

Because only about 0.15 acre would be disturbed for the EOD facility, no NPDES permit for discharge from construction would be required. Drainage for the proposed site would eventually enter Stony Brook. The contractor would be responsible for erosion and sediment control. Best management practices (using sediment barriers/traps and trench boxes; watering stockpiled soil) would reduce the potential for impacting surface waters. Runoff and potential siltation would not be significant with use of the best management practices described above. The Proposed Action would not cause a significant amount of total suspended solids to discharge into Stony Brook. Revegetating areas of exposed soil with natural vegetation or grasses after construction would further minimize soil erosion.

Removing approximately 1,000 square feet of asphalt and installing approximately 350 square feet of concrete would slightly decrease the current amount of runoff from the site. The negligible difference in the amount of runoff would not result in a noticeable benefit to surrounding wetland areas, but would likely result in slightly improved water quality of runoff entering the wetland area.

After construction, the impervious area would decrease by less than 0.05 acre, a reduction of less than 0.1 percent in the impervious area within Outfall 005's drainage basin. The construction of earthen berms and the use of sand within the facility would also slightly increase infiltration, but impacts on recharge would be negligible. The decrease in runoff would not be significant; the Proposed Action would not generate long-term contributions to off-base erosion. Surface waters would not incur long-term significant impacts from operating the facility as planned under the Proposed Action. Preventive measures to further reduce impacts are described in Section 4.2.3.

There are no delineated FEMA floodplains on base. The Proposed Action would not adversely affect the floodplain of Stony Brook.

The Proposed Action could result in the use of water (supplied via water truck) for periodic wetting of the disturbed area during construction. Water would be used at the concrete plant to mix the concrete for the facility's walls. The water supply in the communities surrounding Westover ARB is adequate relative to the small amount of water required for construction activities. Impacts from increased water usage during

EOD facility construction would be insignificant, and the overall increase in water use during EOD operations would be negligible.

4.3.3.2 Munitions Complex

Like the EOD facility, construction of the two munitions facilities would involve excavation up to about 4 feet in depth to place footings for concrete walls, and would disturb approximately 21,750 square feet (0.5 acre) for the two facilities, loading dock, and associated paved areas. This would occur above the water table and would have no impact on groundwater in the deep aquifers 100 feet or more below the surface; the only potential groundwater impacts from excavation would be to the shallow, unconfined groundwater. Although the area of ground disturbance is larger than for the EOD facility, the total amount is relatively minimal within the context of the project area. Impacts on surface runoff and groundwater recharge would be insignificant.

Because only about 0.5 acre would be disturbed for the munitions complex, no NPDES permit for discharge from construction would be required. Drainage for the proposed site would eventually enter Stony Brook. The construction contractor would be responsible for erosion and sediment control. Best management practices (using sediment barriers/traps and trench boxes; watering stockpiled soil) would reduce the potential for impacting surface waters. Runoff and potential siltation would not be significant with use of the best management practices described above.

Small amounts of water would be used during construction for wetting disturbed areas and for mixing concrete, but these impacts would be insignificant. The overall increase in water use during operations at the munitions facilities would be negligible.

4.3.4 Potential Impacts of EOD Site Alternative 1 (East Alternative)

Construction of the EOD facility at the East Alternative site would disturb slightly more land (approximately 0.2 acre) than the Proposed Action, since 1,200 square feet of asphalt may be removed. The depth of the water table in the unconfined aquifer is approximately 6 feet at this site (USAF, 1998e). No NPDES permit for discharge from construction would be required. The contractor would be responsible for erosion and sediment control. The potential for soil erosion during construction would be slightly higher than the Proposed Action (due to slightly greater slopes), but insignificant. Removal of approximately 1,000 square feet of asphalt and installing approximately 350 square feet of concrete would slightly decrease the amount of runoff that currently occurs from the site. The negligible difference in runoff would not result in a noticeable long-term benefit to surrounding wetland areas. However, removal of the asphalt would likely result in slightly improved water quality of the water entering the wetland area.

As discussed in Section 3.3.1, the deep aquifers are confined beneath low permeability layers and are protected from physical disturbance or chemical contamination beneath the alternate site. Only negligible impacts to groundwater would occur to shallow, unconfined groundwater (similar to those described under the Proposed Action). Floodplains would not be impacted. EOD water usage requirements would be the same as for the Proposed Action, as would operational practices and their insignificant impacts.

As noted under Section 4.2.4, the base would need to issue an NOI and/or request for determination of applicability and coordinate with the CCC prior to construction within

the 100-foot wetland buffer zone at this site. Implementation of protective measures of the installation's SWPPP, *Erosion and Sediment Control Manual*, and CCC Order of Conditions would protect the wetlands from adverse runoff. Overall, the insignificant impacts to water resources from this Alternative would be similar to those of the Proposed Action.

Impacts from the construction and operation of the munitions facilities would be the same as under the Proposed Action.

4.3.5 Potential Impacts of EOD Site Alternative 2 (Taxiway D Alternative)

Construction of the EOD facility at the Taxiway D Alternative site would disturb slightly more land (approximately 0.2 acre) than the Proposed Action, since a gravel access road (2,000 square feet) would be constructed between Taxiway D and the EOD facility. The depth of the water table in the unconfined aquifer is approximately 6 feet at this site (USAF, 1998e). No NPDES permit for discharge from construction would be required. The contractor would be responsible for erosion and sediment control. Soils at this site are predominantly sandy loam with a slight to moderate potential for wind erosion and a slight potential for water erosion, due to soil type and slope. Slightly more soil would be disturbed, with a greater chance for erosion, than at the proposed site; however, the Taxiway D alternative site is flatter, with less chance of water runoff. The potential insignificant impacts to underlying aquifers and water usage would be the same as those discussed for the Proposed Action. Operational practices would be the same as under the Proposed Action, and impacts would be insignificant.

Impacts from the construction and operation of the munitions facilities would be the same as under the Proposed Action.

4.3.6 Potential Impacts of the No Action Alternative

Under the No Action Alternative, limited EOD training would continue in the Dog Patch area. The current situation (no adverse impacts to groundwater, surface water, or floodplains) would continue. Munitions operations would be unchanged.

4.3.7 Mitigations, Best Management Practices, and Preventive Measures

No significant impacts would result from implementing the Proposed Action or either EOD site alternative, and no mitigations are required.

Best management practices during construction would include using sediment barriers or traps and trench boxes, and watering stockpiled soil, and revegetating excavated areas as soon as possible.

The design and operational preventive measures described in Section 4.2.7 would also reduce impacts to water resources.

4.4 BIOLOGICAL RESOURCES

Impacts to biological resources on Westover ARB would be short-term and insignificant, resulting primarily from construction and revegetation activities that would temporarily displace wildlife. These activities would occur within an area that has already been disturbed by construction activity, and would include digging, grading, stockpiling soil, and compaction from construction equipment. Construction activities would affect

vegetation and wildlife on Westover ARB only minimally. No critical habitat or threatened or endangered species would be affected by the Proposed Action, and no significant impacts are projected. No wetlands would be filled as a result of the construction activities, and a Section 404 permit would not be required. Training exercises at the EOD facility would generate noise a few times per month but would not significantly affect avian and other species. Other operational noise from the EOD and munitions facilities would have negligible effects on wildlife.

The EOD site alternatives would result in impacts to biological resources similar to those described under the Proposed Action. Silt barriers would protect wetlands from adverse water runoff and erosion impacts during construction at the East Alternative site, with minimal indirect disturbance of wetlands caused by runoff. Under the No Action Alternative, there would be no change to the biological environment on Westover ARB.

4.4.1 Significance Criteria

Impacts to vegetation or wildlife could be significant if the viability of a protected plant or animal species was jeopardized, with little likelihood of re-establishment after completion of the action. The significance of an impact is also dependent upon the importance of the resource, and the proportion of the resource that could be affected relative to its occurrence in the vicinity. An impact would be adverse but insignificant if the disturbed population of a species could be re-established to its original state and condition, or the population is sufficiently large or resilient to respond without measurable change. An increase in the population of a protected species in response to an enhanced habitat, or the increased viability of a species, would be a beneficial impact.

Significant impacts to wetlands could occur if construction activities resulted in altered hydrologic flow, drainage of sediment or contaminants into surface waters or wetland areas, or actual filling or destruction of a wetland area. Minor, short-term changes in the amounts of uncontaminated runoff to a wetland area would be an insignificant impact. Improved viability of a wetland would be a beneficial impact.

4.4.2 Analysis Methods

The assessment of potential impacts to biological resources focused on the proposed location on Westover ARB for the EOD training facility and the munitions complex. The existing habitat was evaluated in areas with planned project activities. The *Integrated Natural Resource Management Plan* (USAF, 1998b) and the *Wetlands Identification and Delineation Report* (USAF, 1998c) were reviewed along with other environmental documents to provide data on existing biological resources on the base. The predicted impacts were then reviewed for significance.

4.4.3 Potential Impacts of the Proposed Action

The loss of vegetation and temporary displacement of wildlife during construction activities would be an unavoidable impact, but would not be significant. There would be no operational impacts to vegetation, and operational impacts to wildlife and protected species would be insignificant. The following subsections address impacts to vegetation, wildlife, threatened or endangered species, and wetlands.

4.4.3.1 Vegetation

Excavation of soils and vegetative cover during construction of the EOD and munitions facilities would not require the disruption of important habitat or previously undisturbed land. No trees would need to be removed for site preparation and development. After construction of the facilities, disturbed soil would be reseeded with grasses and watered to restore the disturbed areas to their pre-construction condition. Impacts to vegetative resources on Westover ARB would not be significant because the existing vegetation would be restored. EOD training activities would occur only one to a few days per month, so impacts to vegetation from training activities at the facility would not be significant. Operations at the munitions complex would not affect vegetation.

Exposed bare soil can lead to invasion by different plant communities, such as non-native plants, grasses, and noxious weeds. As a best management practice, the Air Force would require the contractor to revegetate the areas as soon as possible after construction is complete to prevent the invasion of undesirable weed species. The Air Force would continue to spray for noxious weeds as needed. The earthen berm surrounding the EOD facility would be seeded with grasses and mowed occasionally to maintain a suitable ground cover.

Best management practices and control measures would be implemented to ensure that impacts to biological resources are avoided to the extent possible. The amount of vegetation disturbed during construction activities would be kept to the minimum amount required. Construction for the EOD facility would disturb less than 0.15 acre, and for the munitions complex, about 0.5 acre. The project area is relatively flat, and wind and water erosion would be minimal. Additional construction practices proposed to minimize adverse effects could include using straw bales, silt fences, silt traps, or diversion structures and covering stockpiles during grading activities to contain waterborne erosion.

4.4.3.2 Wildlife

Wildlife such as white-tailed deer, red fox, coyote, raccoon, woodchuck, gray squirrels, and others would be displaced during the construction portion of this action. Impacts to these species are not considered significant due to their abundance and their ability to seek similar habitat in the surrounding area. After the construction was completed, the contractor would be required to revegetate the disturbed area. The wildlife species previously displaced would likely return to the area and establish population levels similar to pre-construction levels.

Training activities at the proposed EOD facility would generate noise (See Section 4.6.3). The proposed site falls within the 75 dBA AICUZ noise contour and is in the vicinity of the Dog Patch area, where noise levels are also high from training conducted with impulse cartridge ammunition. The small arms range is also located in the northern portion of the base. Because wildlife in the area are currently exposed to noise levels higher than 75 dBA (which includes sound levels above 100 dB for short periods of time), any increase in noise levels from operating the EOD facility are not expected to cause a significant impact to these species. Operations at the munitions complex would cause only negligible impacts to wildlife.

4.4.3.3 Threatened or Endangered Species

Construction activities associated with the Proposed Action would occur on previously disturbed land within the base. As noted in Section 3.4.3, no federally listed species are known to occur on Westover ARB. There are three species of plants on Westover ARB considered to be of special concern, scarce, or on the watch list (see Table 3.4-1). A biological survey has not been conducted specifically for the project area; however, since the site consists of maintained grasses and asphalt, is unlikely that protected species use the project area. Protected birds that may migrate through the area, such as the American peregrine falcon, may be temporarily startled by explosive noise during EOD training activities, but no significant impacts would be expected as a result of the noise. No impacts from activities at the munitions facilities would affect protected species. As noted in Section 4.4.2.2, fairly high noise levels from aircraft and other activities in the area already exist. Section 4.6.3 addresses noise levels in more detail. Impacts to threatened and endangered species would not be significant.

4.4.3.4 Wetlands

No wetlands would be filled as a result of the Proposed Action, and a Section 404 permit would not be required. Ground disturbance during construction activities in the project area could increase soil erosion from wind, having a short-term adverse impact on aquatic resources at sites where open waters are nearby. The closest wetlands are associated with drainage to Stony Brook. The EOD facility site is adjacent to a 100-foot buffer zone that extends from the upland complex of a wetland/upland area. The munitions complex is approximately 150 feet east of a buffer zone along the access road, and approximately 200 feet from the buffer zone that lies along Stony Brook, across Taxiway D. Sedimentation and drainage from the facility sites would encounter upland areas before reaching the wetland, so sedimentation impacts to wetlands would be negligible at this distance. No coordination under the Wetlands Act or with the CCC would be required. The potential for soil erosion is lowered by using best management practices such as ground watering during construction. The EOD facility's earthen berm would be seeded with grasses and mowed to maintain a ground cover, thus reducing the potential for soil erosion from the berm's sloped surface. Drainage in the project area would not change substantially as a result of the Proposed Action.

Taking into account the application of best management practices during construction and EOD training activities (e.g., ground-wetting to decrease dust), and the preventive measures described in Section 4.2.3, impacts to wetlands would be insignificant. Munitions operations would not affect wetlands. The hydrologic flow into wetlands would not be altered.

4.4.4 Potential Impacts of EOD Site Alternative 1 (East Alternative)

For the EOD East Alternative site, impacts would be similar to those described under the Proposed Action. This site has been disturbed and altered by pre-existing asphalt pavement, and the area surrounding the site has also been disturbed during IRP activities. A portion of the existing asphalt at this site may need to be removed. The site lies within the 100-foot wetland buffer zone. To construct the EOD training facility in the area of a wetlands buffer, the Air Force must prepare an NOI and/or request for determination of applicability and file it with the CCC. The earthen berm would increase sheet flow to the

wetlands during intense precipitation events. During mild gradual rainfall, runoff to the wetlands would decrease. Implementation of protective measures of the installation's SWPPP, Erosion and Sediment Control Manual, and CCC Order of Conditions, as discussed in Section 4.2.4, would protect the wetlands from adverse runoff and minimize wetland impacts.

No critical habitat or threatened or endangered species would be affected by construction or operations under this site alternative, and no wetlands would be filled. There would be no significant impact to biological resources.

4.4.5 Potential Impacts of EOD Site Alternative 2 (Taxiway D Alternative)

The project sites are both located in grassy areas that were disturbed during construction of Taxiway D; this area is not considered critical habitat. A biological survey has not been conducted specifically for the project area; however, since the site consists of maintained grasses and does not contain the habitat of the protected animal species discussed in Section 3.4.3, it is unlikely that they exist at the project sites. The closest wetlands are associated with Stony Brook and are approximately 650 feet from the EOD alternate site; sedimentation impacts would be negligible at this distance. The same facility planned for the proposed site would be constructed here if this site was selected, and disturbed areas would be revegetated. Construction and operational impacts to biological resources would be insignificant.

4.4.6 Potential Impacts of the No Action Alternative

For the No Action Alternative there would be no changes to existing activity in the area, and impacts to biological resources would be unchanged.

4.4.7 Mitigations, Best Management Practices, and Preventive Measures

No significant impacts would result from implementing the Proposed Action or an alternative. No mitigation would be required or is recommended.

The best management practices and prevention measures described for geological and water resources (Sections 4.2.7 and 4.3.7) would also protect wetlands and other biological resources.

4.5 CULTURAL RESOURCES

Cultural resources are limited, nonrenewable resources whose values may easily be diminished by physical disturbances. There are no known cultural resources within or near the areas of the Proposed Action or EOD site alternatives. No buildings would be demolished as part of this action. No significant impacts to cultural resources are projected under the Proposed Action or either EOD site alternative. There would be no impacts to cultural resources from the No Action Alternative.

4.5.1 Significance Criteria

The criteria used to determine the significance of impacts on cultural resources include the effects of National Register of Historic Places (NRHP) eligibility, future research potential, or suitability for religious or traditional uses. An impact could be significant if it resulted in the physical alteration, destruction, or loss of a resource listed or eligible for

inclusion in the NRHP. Depending upon the nature of the resource, an adverse impact would not be significant if only slight portions of the resource were affected or if the value of the resource was not very important. The impact of an action could be beneficial if it protected or reconstructed the resource.

4.5.2 Analysis Methods

To determine potential impacts, the analysis focused on the types of activities that would occur and their location, and the *significance of the resources in that location. An Archaeological* Reconnaissance Survey (Brown University, 1981), *Results of a Cultural Resources Reconnaissance Survey* (USAF, 1995a), *Westover ARB Cultural Resource Management Plan* (USAF, 1995b), and previous NEPA documents were reviewed to provide data on existing cultural resources on the base.

4.5.3 Potential Impacts of the Proposed Action

No known cultural resources have been identified in the area proposed for construction of the EOD training facility or munitions complex. The project area contains no prehistoric or historic resources, or Cold War resources potentially eligible for listing on the NRHP (see Section 3.5 and Appendix C). This area has been previously disturbed due to past construction; therefore, digging in these locations is not anticipated to unearth resources of any importance. No buildings would be demolished as part of this action. The project area is located in a high sensitivity area according to the 1981 survey (Brown University, 1981), but is not within any of the seven areas identified as having the potential for significant historical archaeological remains in a 1994 survey (USAF, 1995a).

In accordance with the *Cultural Resources Management Plan*, all areas of archaeological sensitivity have the potential for ancillary activities to disturb subsurface archaeological deposits (USAF, 1995b). Removing and grubbing vegetation for landscaping purposes could disrupt subsurface deposits. The movement of heavy trucks or machinery within sensitive areas could also cause disturbance to archaeological deposits. Such equipment, because of its weight, may compact near-surface archaeological deposits or create deep wheel ruts that extend down into archaeological deposits, particularly if the machinery is moved through such areas when the ground is wet and soft.

Two best management practices are suggested to ensure that site locations and areas of archaeologically sensitivity are not inadvertently compromised by construction or other activities. First, all proposed work plans would be reviewed by base cultural and natural resource managers to ascertain whether any such areas may be affected (the areas of cultural and natural resource sensitivity overlap considerably on Westover ARB) (USAF, 1995b). Second, Civil Engineering should review dig permits to determine if proposed activities could affect archaeological sites or areas of sensitivity, allowing pre-construction decisions on avoidance of archaeological sites or the need for additional investigations. The use of these best management practices would prevent significant impacts to cultural resources from activities associated with the Proposed Action. Should unknown archaeological resources be uncovered during construction activities, the Air Force would follow procedures described in AFI 32-7065, *Cultural Resource Management*, for coordination with the Massachusetts Historical Commission and Advisory Council on Historic Preservation.

There would be no impacts to cultural resources from EOD training activities or munitions operations.

4.5.4 Potential Impacts of EOD Site Alternative 1 (East Alternative)

Impacts at the East Alternative site would be similar to those under the Proposed Action. This site has been previously disturbed, as the area is covered in pavement and was the site of an engine test cell. Due to previous construction activities in this area, it is unlikely that intact archaeological resources would be discovered. The project area is not located in one of the seven areas identified as having the potential for significant historical archaeological remains (USAF, 1995a). No buildings would be demolished as part of this alternative. There are no known prehistoric or historic resources located in the project area. The same best management practices discussed under the Proposed Action (Section 4.5.3) would be followed for this alternative. With the implementation of these practices, significant impacts to cultural resources are not projected to occur. In the event of an unexpected discovery during construction, the Air Force would follow procedures described in AFI 32-7065.

There would be no impacts to cultural resources from EOD training activities or munitions operations.

4.5.5 Potential Impacts of EOD Site Alternative 2 (Taxiway D Alternative)

Impacts at the Taxiway D Alternative site would be similar to those under the Proposed Action. The area was previously disturbed during construction of the taxiway, and therefore it is unlikely that intact archaeological resources would be discovered. The project area is not within any of the seven areas identified as having the potential for significant historical archaeological remains (USAF, 1995a). No buildings would be demolished as part of this alternative. There are no known prehistoric or historic resources located in the project area. The same best management practice described under the Proposed Action (Section 4.5.3) would be followed for this alternative. With the implementation of these practices, significant impacts to cultural resources are not projected to occur. In the event of an unexpected discovery during construction, the Air Force would follow procedures described in AFI 32-7065.

There would be no impacts to cultural resources from EOD training activities or munitions operations.

4.5.6 Potential Impacts of the No Action Alternative

For the No Action Alternative, current conditions would not change and no impacts to cultural resources would occur.

4.5.7 Mitigations, Best Management Practices, and Preventive Measures

No impacts to cultural resources have been identified, and no mitigation measures are necessary.

Best management practices include the review of work plans and dig permits by cultural resource managers to identify and avoid potential impacts to cultural resources.

4.6 NOISE

Activities associated with the Proposed Action or EOD site alternatives would have insignificant impacts on the noise environment. Construction and traffic would insignificantly affect the noise environment, because the noise generated would be intermittent, and would occur during daytime hours and within the context of fairly high noise levels. Due to noise generated from the possible removal of asphalt, short-term impacts under the Proposed Action and the East Alternative could be slightly greater than the Taxiway D Alternative, but still insignificant. Training activities at the EOD facility under the Proposed Action or either alternative would increase noise levels in the long term, but impacts would be insignificant. There are no sensitive receptors in the vicinity of the project area. As a best management practice, EOD personnel (and observers at the EOD facility) would be required to wear hearing protection during certain training exercises; hearing protection would not be needed by off-base residents or nearby golfers. Using other suggested best management practices could reduce impacts to the community. Noise impacts from EOD exercises to nearby receptors would be lowest under the Proposed Action (due to the greater distance from the base boundary) as compared to the site alternatives. Under No Action Alternative, the current insignificant noise impacts would continue.

4.6.1 Significance Criteria

Impacts to the noise environment are related to the magnitude of noise levels generated by construction and training activities and the proximity of noise-sensitive receptors to the noise source. For construction or traffic noise, increasing the L_{eq} (averaged over 24 hours) to 73 dB or above at a sensitive noise receptor for one year or more could be a significant impact, as this could potentially cause hearing loss in a portion of the general public. If noise levels increased, but affected noise-sensitive receptors at a level below 73 L_{eq}, the impact would not be significant. A decrease in noise levels would be a beneficial impact.

The significance of noise impacts from explosives testing would be based on community reactions to test events. Given a threshold value of approximately 140 dB for physiological damage to unprotected human ears, and approximately 150 dB to break a poorly mounted window, any peak dB level above this would be considered a significant impact. Homeowners become concerned about structural rattling and possible damage when the level exceeds 120 dB.

4.6.2 Analysis Methods

The analysis of noise impacts was based on the assessment of the estimated noise levels generated from the Proposed Action and a comparison with ambient noise levels. The analysis was also based on identifying any sensitive receptors within the vicinity of the proposed project area. Documents reviewed included the AICUZ Study (USAF, 1996b) and NEPA documents. Maps of Westover ARB were used to determine the locations of sensitive receptors, nearby residences, and nearby areas susceptible to annoyance (such as the golf course). Noise evaluation and modeling data for C-4 demolition and other explosives were used to assess potential noise levels for the EOD facility operation.

4.6.3 Potential Impacts of the Proposed Action

Normal background noise levels average around 65 to over 75 dBA on Westover ARB. The project area is near the flightline, where arrivals and departures of C-5 and other aircraft, along with aircraft maintenance activities, create a fairly noisy background. The project area is within the noise contour above 75 dBA (see Section 3.6.2). EOD facility and munitions complex noise impacts under the Proposed Action are described below.

4.6.3.1 EOD Training Facility

Construction activity for the EOD facility would occur over a one- to two-month period, and construction noise would be a short-term and intermittent impact. In general, construction activity would be limited to daytime weekday hours. During construction, additional vehicle trips would be generated in and around the northeast side of Westover ARB by vehicles transporting workers, material, and equipment to and from the project area. This traffic would likely enter via the Main Gate and continue to Patriot Avenue, Perimeter Road, an unnamed gravel road, and then to the project site. The effects of additional construction-related traffic on base roads and in the project area would not create any significant noise impacts. Given the types of equipment likely to be used in constructing the EOD facility (bulldozers, dump trucks, etc.), and the noise levels of the equipment (see Table 3.6-2), typical noise emissions at 50 feet from multiple pieces of construction equipment would be approximately 90 dBA or, averaged over eight hours, about 88.5 dBA (U.S. Army, 1978). Without considering additional attenuation from trees, this level would reduce to about 82 dBA at 100 feet, 76 dBA at 200 feet, and 64 dBA at 800 feet (see Figure 4.6-1). These are the outdoor noise levels; within a building the noise levels would be attenuated by 20 to 25 dBA, and would be insignificant.

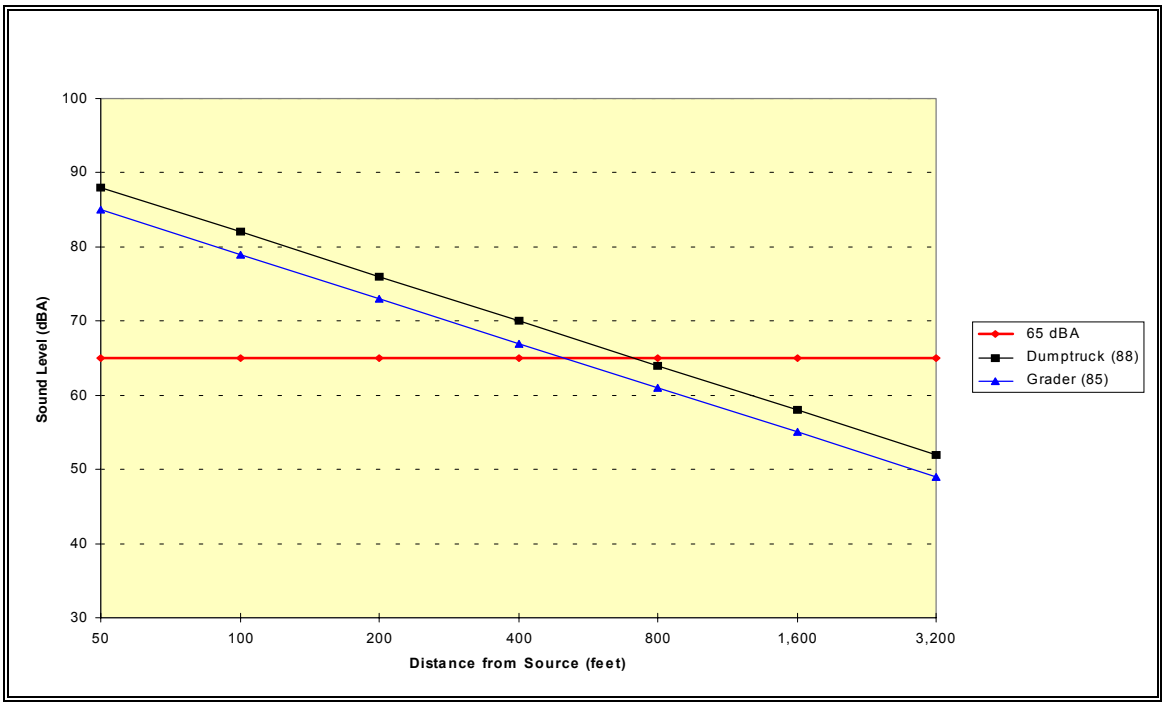

Figure 4.6-1. Noise Emissions from Equipment at 85 and 88 dBA

There are no sensitive receptors within the vicinity of the project area. The proposed EOD site is approximately 3,000 feet from the Westover golf course and 3,800 feet from the closest residence. Construction noise heard at these locations would be at approximately 52 dBA, which would be a negligible impact. After construction is complete, the number of vehicles entering and leaving the project area (and consequent traffic noise) would be comparable to pre-construction levels.

As described in Section 2.1, Westover's EOD training would be conducted approximately once a month. For several of these training sessions through the year, personnel would use C-4 for one to two days per session. During the remaining training sessions, other explosives would be used (see Table 2.1-1). Long-term noise levels associated with training activities at the EOD facility would increase intermittently, but this would occur within the surrounding environment of aircraft operations and other activities that result in an overall noise level greater than 75 dBA in the project area.

Westover's Bioenvironmental Engineering Flight has evaluated noise levels for two types of munitions used in EOD training, but have not conducted noise surveys for C-4 (the explosive with the highest potential for noise impacts). However, Dobbins ARB, GA, recently began operating a training facility similar to the one planned for Westover ARB and conducted noise monitoring with C-4 demolitions. A single blasting cap with 2.5 lbs of C-4 was detonated, and the resulting noise levels for an 8-hour average were 80 dBA (below the level of 85 dBA for inclusion into the hearing conservation program). A peak level of 144.6 dBA was recorded. The monitoring device was about 300 feet from the detonation area. Two weeks later, 2.5 lbs of C-4 was detonated with a blasting cap; a sound level meter recorded a peak of 123 dBA (Lynch, 2001).

Modeling of C-4 noise levels using PEAKEST (a noise modeling software program) was conducted at Aberdeen Proving Ground, MD. The model predicts peak noise levels at defined distances from the detonation, either on the surface or buried. Criteria developed by the Naval Surface Warfare Center (NSWC) in Dahlgren, VA, established that a peak level of 115 dB would have a low risk of noise complaints, while a level of 130 dB would have a high risk of noise complaints.

The NSWC guidelines were based on more than 10 years of experience using meteorological forecasts, and were based on high-use weapons ranges. To minimize noise levels, the best time for detonations is mid-day on a sunny day. The NSWC recommends suspending testing on overcast days or days with a low cloud cover, especially in winter (Pater, 2001). Section 3.1.1 summarizes cloud cover data for Westover ARB; Table A-1 contains low-ceiling and visibility data by month at three-hour intervals. At Westover, a best management practice to avoid undue noise impacts would be for the EOD Flight to obtain low-ceiling forecasts from the Westover ARB weather station before finalizing plans for using C-4 explosive and, to the extent possible within mission constraints, avoid using C-4 on days with broken to overcast clouds.

Linear peak noise levels of detonating 5 pounds of C-4 are predicted to range from 145 to 152 dB at 500 feet, 137 to 146 dB at 1,000 feet, 123 to 141 dB at 3,000 feet, and 120 to 138 dB at 4,000 feet. The modeling data accounted for a variation in temperature and wind velocity with altitude. The modeling assumed that the C-4 charge was on the ground surface, unburied, and without any walls blocking the sound. Burial of the charge by two feet could reduce the noise levels by approximately 10 dB. Sound rays bent

upwards can dissipate noise levels; the walls of the facility would reflect the sound waves to some extent. Also, the surrounding trees would help attenuate the noise levels. Decreasing the charge strength by half would reduce the levels by approximately 3 dB (Russell, 2001). Other potential noise dampening options include constructing a raised wall on the north side of the facility (towards the golf course and the closest residents), using sound absorbent material on the walls of the facility, or placing a mat on top of the C-4 prior to detonation.

The typical amount of C-4 used in training exercises is 2.5 pounds, although amounts can vary between 1.25 pounds up to nearly 5 pounds. When using 2.5 pounds of C-4, the predicted mean noise levels at the golf course would be 126 dB before accounting for any attenuation from the facility walls or from trees between the golf course and EOD facility. Without attenuation, the noise level outside of the closest residence would be 124 dB (about 100 dB or less within the residence). These levels would be below the previously mentioned human hearing and structural damage criteria. There could be some noise complaints occurring at these sound levels, if not attenuated. However, considering the likelihood of attenuation and the existing noise environment, the number of complaints and their severity would be insignificant. Using a maximum of 4 pounds of C-4 per event would ensure that instantaneous levels stay below these criteria, and this is suggested as a best management practice.

The Westover ARB Bioenvironmental Engineering Flight also conducted a noise survey during an EOD training operation in which two M6 electrical blasting caps were detonated (USAF, 2000). A reading taken 300 feet away from the blasting caps was recorded at 96 dBA. Another noise survey was conducted on a Percussion Actuated Non-electrical Disrupter, which fires a shell similar to a 12-gauge shotgun shell. A reading taken at 50 feet from the equipment was recorded at 122 dBA, while a reading at 100 feet was 106 dBA (USAF, 2001c). Studies conducted at Dobbins AFB have confirmed these findings (Lindbergh, 2003). There have been no noise complaints from current EOD training activities or firing range activities.

The nearby residences and golf course are near the 65 dBA noise contour defined by the installation's AICUZ Study. These areas experience aircraft noise at levels of approximately 110 to 120 dB for nearly half a minute per takeoff or landing event. The peak noise from detonating C-4 would be at about the same level as the extended noise of aircraft operations, although the explosive noise is very quick and localized, rather than extended over nearly a minute and over a larger area like the aircraft noise. Noise from detonations would also be dampened by the barrier walls and other construction features of the EOD training facility; other noise minimization strategies such as those described above could also be employed. Consequently, the nearby residents and golfers would not be significantly impacted by the occasional noise from EOD training exercises.

Although noise impacts to the surrounding community would be insignificant when considered within the overall noise environment at and around Westover ARB, several best management practices are suggested to minimize community annoyance during C-4 detonations. (Other munitions scheduled for use during EOD training activities generate much lower sound levels and would not be a concern for significant noise impacts.) The noise modeling and evaluations described above, however, suggest that without ear protection, EOD personnel at the training facility during C-4 detonations could

experience hearing loss. As a best management practice, they (and any observers) would wear hearing protection during C-4 detonations, as specified by OSHA and Air Force requirements (see Section 1.7.8). This best management practice, along with others to minimize community annoyance, are discussed in Section 4.6.7.

4.6.3.2 Munitions Complex

Construction of the munitions facilities would take approximately six months, and would probably not be concurrent with construction of the EOD facility. Construction noise would be an insignificant short-term and intermittent impact. Construction activity would be generally be limited to daytime weekday hours. During construction, additional vehicle trips would be generated in and around the northeast side of Westover ARB by vehicles transporting workers, material, and equipment to and from the project area.

Construction traffic would follow the same route as described for the EOD facility. The same types of equipment would be used, and the insignificant noise impacts would be similar but would occur over a six-month period.

There are no sensitive receptors within the vicinity of the project area. The proposed munitions complex site is approximately 2,100 feet from the golf course and 2,900 feet from the closest residence. Construction noise at these locations would be at approximately 55 dBA, providing an insignificant noise impact to these areas. After construction is complete, the number of vehicles entering and leaving the project area (and consequent traffic noise) would be comparable to pre-construction levels.

Noise impacts from munitions operations would be negligible, consisting of traffic noise from a few worker vehicles and from delivery trucks once or twice per week.

4.6.4 Potential Impacts of EOD Site Alternative 1 (East Alternative)

Under the East Alternative, impacts from noise generated during EOD facility construction and training operations would be essentially the same as under the Proposed Action, and the same best management practices and C-4 constraints would apply. No significant short-term noise impacts are anticipated, and construction noise would not impact sensitive receptors. This site is slightly closer to the golf course and nearby residences, so the noise impacts from demolition of C-4 at the EOD training facility would be slightly greater (by 1 to 2 dB) than under the Proposed Action. The amount of C-4 used per training event should be limited to 4 pounds, as discussed above. No significant long-term impacts from operation of the EOD facility would occur.

Impacts from the construction and operation of the munitions complex would be the same as under the Proposed Action.

4.6.5 Potential Impacts of EOD Site Alternative 2 (Taxiway D Alternative)

Under the Taxiway D Alternative, noise generated from construction and training activities would be essentially the same as under the Proposed Action, and the same best management practices and C-4 constraints would apply. However, demolition events would cause slightly higher noise levels (approximately 2-3 dBA more) from this site compared to the East Alternative site, because this site along Taxiway D is closer to the golf course and residences and does not have trees between the site and Taxiway D. Long-term noise impacts would still be insignificant.

Impacts from the construction and operation of the munitions complex would be the same as under the Proposed Action.

4.6.6 Potential Impacts of the No Action Alternative

Under the No Action Alternative; noise levels would remain at current levels.

4.6.7 Mitigations, Best Management Practices, and Preventive Measures

No significant impacts were identified, and no mitigations are therefore required.

Only insignificant noise impacts would be associated with construction of the EOD facility at any site, or with construction and operation of the munitions complex, and no best management practices related to noise are identified for these activities.

Although no significant noise impacts would be associated with the EOD training operations, the following best management practice would be used to protect worker hearing, in compliance with OSHA regulations and AFOSH standards:

- Personnel (and any observers) at the facility would wear hearing protection during EOD training exercises when C-4 is detonated, as required by OSHA and AFOSH requirements, to avoid permanent physiological damage.

Other suggested practices would reduce noise impacts from C-4 activities, minimizing annoyance to the on- and off-base community. This listing recognizes that the practices listed below would be followed to the extent possible, given mission constraints, training requirements, and emergency situations that could preclude advance notice:

- The base would post information in advance at the golf course when C-4 testing is scheduled.
- The base would provide advance notice to nearby residents and to the local news media when C-4 testing is scheduled.
- EOD personnel would restrict the use of C-4 to a maximum of 4 lbs, to the extent possible.
- EOD personnel would, whenever possible, schedule training activities using C-4 to occur during daytime hours, avoiding nighttime (10:00 p.m. to 6:00 a.m.) and Sunday morning detonations.
- EOD personnel would consult local weather forecasts and, to the extent possible, avoid conducting training activities using C-4 when skies are overcast.

4.7 TRANSPORTATION

Impacts to the transportation network at Westover ARB during construction and operations at the EOD and munitions facilities would be insignificant. Short-term insignificant impacts would result primarily from temporary disturbances caused by construction equipment and increased traffic from construction worker vehicles and dump trucks. After construction is complete, the traffic levels in the area of the proposed or alternative site would return to approximately pre-construction levels, with insignificant increases in vehicle traffic from workers and munitions delivery. Impacts from the EOD site alternatives would be similar to those under the Proposed Action. Aircraft flights at Westover ARB would not be affected under the Proposed Action or the

EOD site alternatives. The No Action Alternative would have no impact on the transportation infrastructure.

4.7.1 Significance Criteria

Impacts to the transportation system would be significant if road capacity was exceeded, substantial traffic delays occurred as the result of rerouting traffic, or major repairs to roads would be necessary. Impacts would not be significant if traffic rerouting or delays caused only minor inconveniences, or if construction vehicle use caused only minor road damage. No impact would occur if there were no noticeable change in the traffic levels, or if there were no required road repairs. Beneficial impacts would include an improvement in traffic flow or road conditions.

4.7.2 Analysis Methods

The analysis focused on whether modifications in traffic volumes, traffic flows, or traffic patterns would result from implementing the Proposed Action or a site alternative. Information on existing traffic routes, volumes, and flow was examined to predict the types and extent of impacts that would likely occur. Sources of information used in the analysis include previous EAs prepared for Westover ARB, maps of the base and surrounding area, and a Supplemental EIS for Military and Civil Aircraft Operations at Westover ARB.

4.7.3 Potential Impacts of the Proposed Action

The proposed EOD facility construction would occur over a one- to two-month period, while the proposed munitions complex construction would take about six months. It is unlikely that the two construction projects would be done concurrently.

The EOD facility construction is small in scope, which limits the number of days required and the volume of construction vehicles and construction worker vehicles accessing the base and site. Although the munitions facilities are somewhat larger and will therefore take longer, the type of construction is similar. Some construction equipment and vehicles would be brought on site and left until they have performed their needed function. Other vehicles, such as dump trucks, may access the site multiple times during a day to load or unload material. An estimated 20 contractor and construction vehicles would enter and exit the base on a daily basis Monday through Friday during the construction periods. They would enter through the Main Gate and follow Industrial Road to Patriot Avenue to Perimeter Road to an unnamed gravel road, and across the hot cargo apron and Taxiway D to the project area. Compared to the 1,450 vehicles that currently enter the base on a daily basis, an additional 20 vehicles would be less than a 1.4-percent increase in the total traffic. There is currently no traffic congestion at the Main Gate and the small amount of additional worker vehicles would not lead to traffic congestion. Impacts from additional contractor vehicle traffic would not be considered significant. No roads would be closed as part of the Proposed Action.

When the EOD facility is complete, ammunition would be delivered there for use in EOD training, which would be scheduled to meet monthly training requirements. The advent of adverse weather or inability of a trainee to attend an event might require training to occur more than once in some months.

Until completion of the munitions storage facility, several vehicle trips per year would be made from Westover ARB to Barnes ANGS to retrieve C-4 ordnance and thermite grenades for EOD training. These trips and on-base trips up to a few times a month to the EOD facility from Bldgs 7011, 7012, and 7072 would have insignificant impacts. Any unused materials would be transported back to Bldgs 7011, 7012, or 7072 for storage. Transporting of munitions would be done in a properly placarded Air Force vehicle following U.S. Department of Transportation and Air Force requirements for hazardous materials and explosives. The transport vehicle has two fire extinguishers on board. The explosives would be transported in a trailer (they cannot be in the same compartment as personnel) and one individual performing the explosive transport would be armed to protect the cargo (Santoro, 2001).

After completion of the MSF, all materials (including C-4) needed for EOD training would be stored at the MSF, which is in the immediate area of the EOD training facility. It would no longer be necessary to travel to Barnes ANGS or to other buildings on Westover to retrieve munitions for EOD training.

The Proposed Action would not adversely impact aircraft operations at Westover ARB. EOD personnel would coordinate with Base Operations prior to the demolition of explosives to ensure no aircraft are performing cargo drops in the area or flying near the site. The unused railway located approximately 2,000 feet from the proposed site is outside the 500-foot QD radius and would not be affected. No significant impacts are projected to the transportation network as a result of the training exercises.

When the munitions complex is completed, it would receive deliveries of various types of munitions. Deliveries would be by truck and would follow the same route as described above for construction vehicles, and delivery vehicles would follow all U.S. Department of Transportation and Air Force safety requirements. Impacts to the transportation network would be insignificant.

4.7.4 Potential Impacts of EOD Site Alternative 1 (East Alternative)

The insignificant impacts under the East Alternative would be similar to those under the Proposed Action. The same roads would be affected in the project area. No road would be constructed under this alternative. Transporting ordnance would involve the same safety precautions as the Proposed Action. Short-term impacts from construction vehicles would not be significant, and long-term operation of the training facility would not cause significant impacts to roads or traffic patterns.

Impacts related to the construction and operation of the munitions complex would be the same as under the Proposed Action.

4.7.5 Potential Impacts of EOD Site Alternative 2 (Taxiway D Alternative)

Impacts to transportation would also be insignificant under the Taxiway D Alternative. A gravel access road (100 feet by 20 feet) would be constructed off Taxiway D leading to the EOD facility; the road would be used by vehicles to deliver ammunition to the EOD facility. The same roads would be affected as under the Proposed Action and East Alternative, except that the access road for unloading explosives would be gravel instead of asphalt.

Impacts related to the construction and operation of the munitions complex would be the same as under the Proposed Action.

4.7.6 Potential Impacts of the No Action Alternative

Under this alternative, the EOD Training Facility and access road would not be constructed. There would be no changes to existing traffic flow or road conditions.

4.7.7 Mitigations, Best Management Practices, and Preventive Measures

No significant impacts from implementing the Proposed Action or site alternatives were identified. No mitigation measures are required.

No best management practices were identified for transportation activities.

4.8 ENVIRONMENTAL PROGRAMS

The Proposed Action would have insignificant impacts to human health and safety, hazardous materials and waste, IRP, solid waste, or storm water. The EOD site alternatives would result in insignificant impacts similar to those under the Proposed Action. Remedial activities at the IRP sites near the proposed and alternative EOD sites would not affect EOD construction or operations. The munitions complex site would not affect or be affected by IRP activities. The No Action Alternative would result in a continuation of the current insignificant impacts.

4.8.1 Significance Criteria

An impact to environmental programs would be considered significant if workers or the general public were exposed to hazardous substances above health criteria levels, or suffered a permanent disability or loss of life, or if the restoration of an IRP site were delayed or extended. Significant impacts would also occur if the generation of wastes exceeded handling or disposal capacity, or if a spill or leak of a hazardous substance occurred that could not be remediated as part of the action. An insignificant impact would result if there were minor changes in operational procedures to protect workers and the public. Impacts would also be insignificant if there were small increases in the use of hazardous materials, or the generation of hazardous waste, solid waste, or storm water, and those increases were within the capacity of existing management systems. A beneficial impact would occur if worker or public safety improved, if the generation of wastes were reduced or eliminated, or if exposure to hazardous substances were reduced.

4.8.2 Analysis Methods

To assess potential impacts, the analysis focused on issues relating to health and safety, hazardous materials use, hazardous and solid waste generation, the IRP, and storm water. The analysis identified the existing environmental programs and the extent to which the construction and operation of an EOD training facility and a munitions complex could affect a given program. Key elements included the extent of construction, the potential for generating additional wastes, and the potential for disturbing IRP sites. Sources of information included site inspections and interviews of base personnel, hazardous and solid waste data, the SWPPP, IRP documents (including the Management Action Plan), state and federal laws and regulations, and similar materials.

4.8.3 Potential Impacts of the Proposed Action

4.8.3.1 Health and Safety

Health and safety issues addressed in this document primarily apply to construction and ordnance detonation activities, for both of which the Air Force has formal safety programs that provide detailed safety requirements. Contractors must comply with all AFOSH Standards and OSHA regulations, and would be required to submit a safety plan for construction of the facility. Safety plans may be written to address specific tasks for particular types of activities. The health or safety risk would be a function of the type of work. Health and safety are also specifically safeguarded for special activities, such as detonating munitions. The construction activities of the Proposed Action would not include unusual or unique hazards, and the risks would not be significant.

The munitions facilities and EOD training facility would operate under strict standards governing the number of explosive types that can be stored and used, and how the materials would be handled.

Until the munitions complex at Westover ARB becomes operational, explosive materiel would continue be stored according to explosive class on Westover ARB at the designated facilities referenced in Section 3.8.2, with the exception of the C-4 (Hazardous Class 1.1) and thermite grenades (Hazardous Class 1.2) currently stored at Barnes ANGS. The explosives would remain in secure storage until brought to the EOD facility for training purposes. All procedures and applicable regulations for transporting munitions would be followed when moving them between facilities. (For example, explosives brought from Barnes ANGS would be secured during transport and guarded.) There would be no changes in the methods that personnel use to handle munitions. The potential impacts would not differ substantially from those that occur from transporting munitions on base, except that public roads would be used to transport materiel from Barnes ANGS to Westover ARB. Impacts to the health and safety of Air Force personnel and the public would not be significant.

After the munitions complex is operational, the safety and handling procedures described above would still apply, except that it would no longer be necessary to store Hazardous Classes 1.1 and 1.2 munitions at Barnes ARNG. Acquiring munitions for EOD training exercises would be simplified due to the proximity of the EOD training facility to the munitions complex, although personnel would continue to follow all prescribed safety procedures. Impacts to the health and safety of Air Force personnel and the public would not be significant. Safety conditions and efficiency would improve when it becomes unnecessary to travel to Barnes ANGS to obtain C-4 and thermite grenades.

The QD zones from the proposed sites (see Figure 2.1-1) would be within the base boundaries, and there would be no impact to the surrounding off-base population or land use. No explosive impacts to the public would occur from the safe detonation of explosives at the training facility. The zone would extend across Taxiway D, but this taxiway is no longer used by aircraft. Consequently, use of explosives at the training facility would not affect safe operation of aircraft at Westover ARB.

4.8.3.2 Hazardous Materials and Waste Management

Hazardous materials may be used by the construction contractor during the construction activities, but would be controlled under standard safety and handling procedures. Site

safety and health plans would address potential spills and exposure to hazardous materials, and are designed to protect worker and public health and prevent environmental damage.

Although the facility construction could temporarily increase the use of hazardous materials and generation of hazardous waste on base, no new types of hazardous materials or wastes would be used or generated. Typical construction contracts require the contractor to store and transport the hazardous materials, and arrange for the proper disposal of any excess materials or waste; disposal of contractor-derived waste is not included in base reporting to regulatory agencies. Standard safety procedures would be required (e.g., no smoking while handling flammable materials). These wastes would be similar to wastes generated by previous projects, and could be safely managed through the construction contract. Overall, construction activities would minimally change the short-term generation of wastes and any impacts would not be significant.

Hazardous materials used during operations of the EOD and munitions facilities would primarily be limited to explosive class materials. Cleaning of equipment may be done with minute quantities of WD-40 in the field, but this activity would more likely occur at equipment storage facilities. Paint could be used for marking equipment boxes. Paint would be a new hazardous material for the EOD Flight and the request would be coordinated with the following base organizations: Bioenvironmental Engineering, Base HAZMAT Pharmacy, Safety, and Environmental (Santoro, 2001).

The EOD demolition exercises would leave minimal residue (see Sections 4.2.3 and 4.8.3.3). Based on past exercises, this material has not been characterized as warranting disposal as a hazardous waste (Moriarty, 2001), and material remaining after training exercises has been disposed of as solid waste or recycled. Prior to disposal of a new material that had not been tested and could potentially have remaining hazardous characteristics, the material would be analyzed to determine whether it is a hazardous waste. If found to be hazardous waste, it would be disposed of in coordination with the MA DEP and according to the MA MCP.

The storage, inspection, and handling of hazardous materials (including explosive class materiel) at both facilities, and disposing of residual material at the EOD training facility, would have insignificant impacts to the management of hazardous materials and waste.

4.8.3.3 Installation Restoration Program

There are two IRP sites in the vicinity of the proposed EOD site. As indicated in Section 3.8.3, LF-12 has been closed by the MA DEP, and SS-21 has been remediated and is considered to pose no human health risk. An ecological risk assessment was conducted to determine the need for additional action (Kwiatkowski, 2001). The MA DEP approved the site closure after their acceptance of the risk assessment, which found that no further action was required (Moriarty, 2003).

Activities at IRP Site LF-01 (Landfill B) resulted in the discovery of buried explosives. These were carefully handled and detonated at the site after the base had notified MA DEP and other agencies. Prior to the detonation, soil samples were taken and tested for various nitroaromatic and nitramine compounds, but none was detected (AMRO, 1999). Metals tested before and after the event were all below toxicity characteristic leaching

procedure (TCLP) criteria. The minor contamination at Landfill B was highly localized, and no contamination is expected at the proposed EOD site.

Construction and operation of the EOD training facility and the munitions complex at the proposed locations would not affect any IRP sites, including the two in the vicinity of the proposed EOD site, nor would IRP operations affect operations at these facilities.

A recently discovered spill site near the proposed project area, with localized oil contamination from a leaking helicopter but no floating hydrocarbon product in groundwater, is being remediated. This site and another localized petroleum contamination spill site are being remediated in accordance with the MCP (310 CMR 40) and the Massachusetts *Hazardous Waste Management Act* (310 CMR 30).

4.8.3.4 Solid Waste

The construction materials and old aircraft components stored on the proposed EOD site would be removed during the initial stages of construction. Asphalt may be removed from the area where the EOD facility would be placed. Any removed asphalt would be recycled and reused during future road construction at Westover ARB. The Proposed Action would generate a temporary increase in construction debris; all garbage would be removed from the EOD and munitions facility construction sites and disposed of by the construction contractor. The amounts are limited and would not adversely affect the capacity of a construction and debris landfill. Solid waste amounts generated from operational activities after construction is completed would not significantly impact waste management. Most munitions used in the EOD training exercises would be expended, leaving a minimal amount of solid waste for disposal. The amount generated would be on the order of tens of pounds per year. Very little solid waste would be generated during operations of the munitions complex.

4.8.3.5 Storm Water

Impacts to storm water would not be significant given the minimal relief of the project area and the installation's implementation of the SWPPP and *Erosion and Sedimentation Control Manual*. Protection of storm water is also discussed under Section 4.3.3. Operational activities at either facility would not significantly impact storm water.

4.8.4 Potential Impacts of EOD Site Alternative 1 (East Alternative)

Under the East Alternative, the EOD facility construction and pavement removal activities would not include unusual or unique hazards, and the risks would not be significant. Asphalt may be removed from the EOD site and, if so, would be recycled. Because the EOD site is within the boundaries of SS-21, approval must be coordinated with MA DEP to demonstrate that IRP site SS-21 would not be adversely affected and could be closed with no further remedial action. Construction activities would need to be planned to ensure that the ongoing evaluation of ecological risk would not be adversely affected.

Other EOD facility construction impacts would be similar to those under the Proposed Action, and operational impacts would be the same. Construction and operation of the munitions complex would be the same as under the Proposed Action. No significant impacts to Environmental Programs are projected.

4.8.5 Potential Impacts of EOD Site Alternative 2 (Taxiway D Alternative)

Under the Taxiway D Alternative, impacts to Environmental Programs would be similar to those under the Proposed Action. Activities occurring at the Taxiway D Alternative site would not affect any IRP activities. Other EOD facility construction and operational impacts would be similar to those under the Proposed Action. Construction and operation of the munitions complex would be the same as under the Proposed Action. No significant impacts to Environmental Programs are projected.

4.8.6 Potential Impacts of the No Action Alternative

The No Action Alternative would continue the current insignificant impacts to environmental programs from limited training with explosives in the Dog Patch area. Training munitions and cleaning materials would continue to be handled in accordance with applicable regulations and guidance, and minimal amounts of solid waste would continue to be generated.

4.8.7 Mitigations, Best Management Practices, and Preventive Measures

There would be no significant impacts to Environmental Programs, and no mitigations are required.

No best management practices specifically addressing environmental programs have been identified. The practices and preventive measures suggested for the protection of air, geological, and water resources (Sections 4.1.7, 4.2.7, and 4.3.7, respectively) would reduce environmental impacts and the subsequent need to manage remediation measures.

4.9 COMPATIBILITY OF THE PROPOSED ACTION OR SITE ALTERNATIVES WITH OBJECTIVES OF FEDERAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS

The Proposed Action or EOD Site Alternatives do not conflict with existing federal, state, and local land use plans, policies, and controls. The action would occur on base and in an area of similar land use. The QD arcs for the explosives used at the EOD training facility and munitions complex are within the base boundary. Because the sites are adjacent to a taxiway not used by aircraft, they would not affect use of the airfield.

4.10 RELATIONSHIPS BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

The Proposed Action and EOD site alternatives would involve the use of previously developed areas. No croplands, pastureland, wooded areas, or wetlands would be modified or affected as a result of implementing the Proposed Action or an alternative. Consequently, productivity of the area would not be degraded.

4.11 CUMULATIVE IMPACTS

Cumulative impacts are those changes to the physical, biological, and socioeconomic environments that would result from the Proposed Action or EOD site alternatives in combination with past, present, or reasonably foreseeable actions. Significant cumulative impacts could result from impacts that are not significant individually, but when considered together, are collectively significant.

The use of construction-related vehicles and their short-term impacts on air quality, noise, and traffic is unavoidable. The short-term increases in air emissions and noise during construction and the impacts predicted for other resource areas would not be significant when considered cumulatively with other ongoing and planned activities at Westover ARB and nearby off-base areas. The construction and operation activities would affect dispersed locations, not necessarily concurrently, and would not cause significant cumulative impacts.

The action would result in short-term traffic impacts in the vicinity of Westover ARB. It is unlikely that the two projects would be constructed concurrently. Although construction of the EOD training facility and munitions complex would temporarily (and adversely) affect traffic flow, there would be no long-term adverse impacts. Consequently, there would be no significant cumulative traffic impacts from the Proposed Action or an alternative.

The cumulative impact of the action with other ongoing construction in the area would produce an increase in solid waste generation; however, the increase would be small and limited to the timeframe of each construction project. Regional landfills used for construction and demolition debris do not have capacity concerns and could readily handle the solid waste generated by the various projects.

Long-term increases in air emissions and noise would occur under the Proposed Action or EOD site alternatives. Because these impacts would be in a remote area of the base removed from other activities, no significant cumulative impacts are anticipated to occur. The noise during construction and operation of the facilities would be masked in part by aircraft operations occurring above the Taxiway D area.

Other ongoing and potential base projects could involve impacts concurrent with construction or operation of the EOD training facility and munitions complex, depending on funding availability for the projects. However, the projects are in different areas of the installation and cumulative impacts would be insignificant.

The Proposed Action or EOD site alternatives would be concurrent with other actions (e.g., construction projects and additions and alterations to facilities) that are planned or ongoing at Westover ARB. Any such future federal actions that may have potentially significant cumulative impacts to the environment would be assessed in separate NEPA documents upon their proposal.

4.12 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The Proposed Action or EOD site alternatives would require the use of fill and other construction materials (such as concrete). These materials would be irretrievably committed. The loss of vegetation from clearing land for the EOD training facility and munitions complex would be an irretrievable commitment of resources. However, the land that would be occupied by the facilities ultimately could be revegetated if either or both of the facilities were removed in the future. Therefore, the commitment of land is not necessarily irreversible.

The Proposed Action or EOD site alternatives would also irretrievably consume economic resources and various types of fuel from construction and demolition activities.

4.13 FEDERAL ACTIONS TO ADDRESS ENVIRONMENTAL JUSTICE IN MINORITY POPULATIONS, LOW-INCOME POPULATIONS, AND CHILDREN

Environmental justice is the pursuit of equal justice and equal protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, and/or socioeconomic status. No significant impacts to human health or the environment are anticipated from implementation of the Proposed Action or an EOD site alternative. The project would include the construction and operation of an EOD training facility and munitions complex on base. The construction activity related to the action would occur within the boundaries of Westover ARB, except for construction traffic entering and leaving the installation. Operation of the facility would involve the transportation of munitions through the base and along corridors within the surrounding communities.

No low-income or minority neighborhoods or populations are located near the proposed and alternative EOD training facility sites the munitions complex site, or along the explosive transportation route, so there is no possibility of disproportionate impact to these populations. Air and noise emissions from construction and operation of the facility would be temporary and would minimally affect off-base receptors. There would be no disproportionate adverse impacts to any low-income or minority populations near Westover ARB, nor would there be any disproportionate impacts to children in the vicinity.

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CHAPTER 5
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5. REFERENCES

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CHAPTER 6

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6. LIST OF PREPARERS

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Appendix A
CLIMATOLOGICAL DATA

APPENDIX A.
Westover ARB Climatological Data

This appendix provides detailed climatological data on low ceilings (cloud cover) and visibility at Westover ARB, Massachusetts.

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Table A-1. Westover ARB Meteorological Data, Low Ceiling / Low Visibility													
Percentage Frequency of Occurrence: Ceiling Less Than 3,000 Feet, Visibility Less Than 3 Mi.[1]													
Time Interval[2]	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Annual*
00-02	28	21	25	23	20	26	20	21	24	22	22	24	23
03-05	27	21	27	24	25	34	30	34	32	28	22	25	27
06-08	28	23	27	26	27	30	29	36	38	30	28	27	29
09-11	25	21	26	24	21	21	18	22	25	22	26	24	23
12-14	21	20	23	21	16	15	12	15	18	16	21	23	18
15-17	20	18	20	18	13	12	9	11	14	15	20	22	16
18-20	21	18	19	19	14	12	10	13	14	16	21	22	17
21-23	23	19	21	20	16	16	12	15	17	18	22	24	19
All Hours	24	20	23	22	19	21	17	21	23	21	23	24	21
Percentage Frequency of Occurrence: Ceiling Less Than 1,500 Feet, Visibility Less Than 3 Mi.													
Time Interval[2]	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Annual*
00-02	19	15	19	16	14	19	17	16	16	14	16	16	16
03-05	20	15	20	18	18	28	25	30	24	21	17	17	21
06-08	19	18	19	18	21	25	24	30	30	23	19	18	22
09-11	17	16	17	14	13	12	11	13	16	14	16	16	15
12-14	14	13	13	10	8	7	6	7	8	9	12	15	10
15-17	13	12	13	10	7	5	4	6	7	9	11	15	9
18-20	13	12	13	11	8	7	6	7	7	9	11	14	10
21-23	16	13	15	13	9	10	7	10	11	12	12	14	12
All Hours	17	14	16	14	12	14	13	15	15	14	14	16	14
Percentage Frequency of Occurrence: Ceiling Less Than 1,000 Feet, Visibility Less Than 2 Mi.													
Time Interval[2]	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Annual*
00-02	14	11	13	12	8	11	9	10	10	8	12	11	11
03-05	14	11	15	13	12	19	18	19	16	14	11	11	14
06-08	13	13	13	11	13	17	16	20	22	17	13	13	15
09-11	12	11	11	7	7	6	5	7	9	8	10	12	9
12-14	10	9	8	5	4	3	2	3	4	6	7	11	6
15-17	10	9	8	5	3	2	1	2	3	5	7	10	5
18-20	10	8	9	5	4	3	2	3	3	5	6	9	6
21-23	11	9	10	7	5	5	2	4	6	7	8	10	7
All Hours	12	10	11	8	7	8	7	9	9	9	9	11	9
Percentage Frequency of Occurrence: Ceiling Less Than 200 Feet, Visibility Less Than 0.5 Mi.													
Time Interval[2]	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	*Annual*
00-02	4	2	4	2	1	1	1	1	#	2	2	3	2
03-05	4	3	3	2	3	3	3	5	3	4	2	2	3
06-08	3	2	3	2	2	2	2	4	7	6	3	3	3
09-11	2	2	1	#	0	0	0	0	#	1	1	2	1
12-14	2	2	#	0	0	0	0	0	0	#	#	1	#
15-17	2	1	#	#	#	0	0	#	#	#	1	1	1
18-20	2	1	1	#	#	#	#	0	0	#	#	1	1
21-23	2	1	2	1	#	#	#	#	#	0	1	2	1
All Hours	3	2	2	1	1	1	1	1	1	2	1	2	1

[1] All mileages are in Statute Miles.

[2] Time Intervals are in Local Standard Time (Greenwich Mean Time less 5 hours)

= Less than 0.5 percent

Source: Westover ARB Operational Climatic Data Summary, December 1998

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Appendix B

AIR QUALITY INFORMATION

APPENDIX B.
Air Quality Information

This appendix contains spreadsheets showing the calculation of potential air quality impacts related to the Proposed Action and the EOD Site Alternatives.

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Table B-1. Air Emissions from the Construction of EOD and Munitions Facilities at Westover ARB, MA								
Proposed Action								
Six months to construct (120 work days)								
	Summary (emissions in tons per year)							
	CO	**VOC**	**NOx**	**SOx**	**PM-10**			
Total Const.	**0.93**	**0.13**	**1.49**	**0.15**	**0.37**			
	Summary (emissions in tons per day)							
	CO	**VOC**	**NOx**	**SOx**	**PM-10**			
	0.01	**0.00**	**0.01**	**0.00**	**0.00**			
Grading		**PM-10**						
PM_{10}								
PM_{10} emissions from bulldozing		58.095		160	hours			
		44.313		157.3	lbs PM_{10}			
$PM_{10} = \frac{1.0*s^{1.5}}{M^{1.4}}$		1.311		**0.08**	**tons PM_{10}**			
		0.98	lbs/hr					
where s = silt (%), M = moisture (%)								
Construction								
Equipment	**Days**	**Hours/ day**	**Pieces**	**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Bulldozer	20	8	1	*1.03*	*0.21*	*2.16*	*0.21*	*0.21*
Emissions (lbs)				164.64	32.93	345.74	32.93	32.93
Dump Trucks	20	6	2	*1.80*	*0.19*	*4.17*	*0.45*	*0.26*
Emissions (lbs)				432.00	45.60	1000.80	108.00	62.40
Backhoe/loader	10	8	1	*1.16*	*0.23*	*1.69*	*0.15*	*0.15*
Emissions (lbs)				92.40	18.48	135.52	12.32	12.32
Crane	20	8	1	*1.75*	*0.58*	*4.46*	*0.39*	*0.58*
Emissions (lbs)				279.36	93.12	713.92	62.08	93.12
Water Truck	20	1	1	*1.80*	*0.19*	*4.17*	*0.45*	*0.26*
Emissions (lbs)				36.00	3.80	83.40	9.00	5.20
Concrete Truck	5	8	2	*1.80*	*0.19*	*4.17*	*0.45*	*0.26*
Emissions (lbs)				144.00	15.20	333.60	36.00	20.80
Flatbed Truck	10	8	1	*1.80*	*0.19*	*4.17*	*0.45*	*0.26*
Emissions (lbs)				144.00	15.20	333.60	36.00	20.80
Total Emissions	lbs			1292.40	224.33	2946.58	296.33	247.57
	tons			**0.65**	**0.11**	**1.47**	**0.15**	**0.12**
Worker Vehicle Trips								
Exhaust				**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Number of workers	15		EF (g/mi)	9.387	0.598	0.655	0	0
Commute (miles)	15		lbs/mi	0.02068	0.00131718	0.001442731	0	0
Days	120		Amt (lbs)	558.26	35.56	38.95	0.00	0.000
Total Miles	27,000		**Amt (tons)**	**0.28**	**0.02**	**0.02**	**0.00**	**0.000**
EF = Emission Factor for calendar year 2000 (USEPA,2000) in grams per mile								

Table B-1. Air Emissions from the Construction of EOD and Munitions Facilities at Westover ARB, MA								
Proposed Action								
PM-10 Trucks Driving on Paved Roads								
Miles/round trip	1.5							
Trucks/hour	2							
Hours of activity	4							
Days	20		EF (lbs/mile)	0.4	with street cleaning			
VMT	240		TOTAL (lbs)	96	**Total (tons)**	**0.05**		
PM-10 Trucks Driving on Unpaved Roads								
Miles/round trip	0.5							
Trucks/hour	2							
Hours of activity	0.5							
Days	20		EF (lbs/mile)	23				
VMT	10		TOTAL (lbs)	230	**Total (tons)**	**0.12**		
SUMMARY	Amounts in tons per year							
	CO	**VOC**	**NOx**	**SOx**	**PM-10**			
Grading (fugitive dust)					0.08			
Trucks - paved roads					0.05			
Trucks - unpaved roads					0.12			
Construction Equipment	0.65	0.11	1.47	0.15	0.12			
Worker Vehicles	0.28	0.02	0.02	0.00	0.00			
TOTAL Construction	**0.93**	**0.13**	**1.49**	**0.15**	**0.37**			
Pounds	1851	260	2986	296	731			
Pounds / day avg	**15**	**2**	**25**	**2**	**6**			
Tons/day avg	**0.01**	**0.00**	**0.01**	**0.00**	**0.00**			
Sources:								
US EPA AP42, 2001								
CEQA SCAQMD, 1992								
US EPA Non-Road Engine and Vehicle Study, 1991								

Table B-2. Air Emissions from the Construction of EOD and Munitions Facilities at Westover ARB, MA								
EOD Site Alternative 1, Taxiway D Access Road East ("East Alternative")								
Six months to construct (120 work days)								
	Summary (emissions in tons per year)							
	CO	**VOC**	**NOx**	**SOx**	**PM-10**			
Total Const.	**0.96**	**0.13**	**1.56**	**0.16**	**0.39**			
	Summary (emissions in tons per day)							
	CO	**VOC**	**NOx**	**SOx**	**PM-10**			
	0.01	**0.00**	**0.01**	**0.00**	**0.00**			
Grading		**PM-10**						
PM_{10}								
PM_{10} emissions from bulldozing		58.095		176	hours			
		44.313		173.1	lbs PM_{10}			
$PM_{10} = \frac{1.0*s^{1.5}}{M^{1.4}}$		1.311		**0.09**	**tons PM_{10}**			
		0.98	lbs/hr					
where s = silt (%), M = moisture (%)								
Construction								
Equipment	**Days**	**Hours/ day**	**Pieces**	**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Bulldozer	22	8	1	*1.03*	*0.21*	*2.16*	*0.21*	*0.21*
Emissions (lbs)				181.10	36.22	380.32	36.22	36.22
Dump Trucks	22	6	2	*1.80*	*0.19*	*4.17*	*0.45*	*0.26*
Emissions (lbs)				475.20	50.16	1100.88	118.80	68.64
Backhoe/loader	10	8	1	*1.16*	*0.23*	*1.69*	*0.15*	*0.15*
Emissions (lbs)				92.40	18.48	135.52	12.32	12.32
Crane	20	8	1	*1.75*	*0.58*	*4.46*	*0.39*	*0.58*
Emissions (lbs)				279.36	93.12	713.92	62.08	93.12
Water Truck	22	1	1	*1.80*	*0.19*	*4.17*	*0.45*	*0.26*
Emissions (lbs)				39.60	4.18	91.74	9.90	5.72
Concrete Truck	5	8	2	*1.80*	*0.19*	*4.17*	*0.45*	*0.26*
Emissions (lbs)				144.00	15.20	333.60	36.00	20.80
Flatbed Truck	10	8	1	*1.80*	*0.19*	*4.17*	*0.45*	*0.26*
Emissions (lbs)				144.00	15.20	333.60	36.00	20.80
Total Emissions	lbs			1355.66	232.56	3089.58	311.32	257.62
	tons			**0.68**	**0.12**	**1.54**	**0.16**	**0.13**
Worker Vehicle Trips								
Exhaust				**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Number of workers	15		EF (g/mi)	9.387	0.598	0.655	0	0
Commute (miles)	15		lbs/mi	0.02068	0.00131718	0.001442731	0	0
Days	120		Amt (lbs)	558.26	35.56	38.95	0.00	0.000
Total Miles	27,000		**Amt (tons)**	**0.28**	**0.02**	**0.02**	**0.00**	**0.000**
EF = Emission Factor for calendar year 2000 (USEPA,2000) in grams per mile								

Table B-2. Air Emissions from the Construction of EOD and Munitions Facilities at Westover ARB, MA								
EOD Site Alternative 1, Taxiway D Access Road East ("East Alternative")								
PM-10 Trucks Driving on Paved Roads								
Miles/round trip	1.5							
Trucks/hour	2							
Hours of activity	4							
Days	22		EF (lbs/mile)	0.4	with street cleaning			
VMT	264		TOTAL (lbs)	105.6	**Total (tons)**	**0.05**		
PM-10 Trucks Driving on Unpaved Roads								
Miles/round trip	0.5							
Trucks/hour	2							
Hours of activity	0.5							
Days	22		EF (lbs/mile)	23				
VMT	11		TOTAL (lbs)	253	**Total (tons)**	**0.13**		
SUMMARY	Amounts in tons per year							
	CO	**VOC**	**NOx**	**SOx**	**PM-10**			
Grading (fugitive dust)					0.09			
Trucks - paved roads					0.05			
Trucks - unpaved roads					0.13			
Construction Equipment	0.68	0.12	1.54	0.16	0.13			
Worker Vehicles	0.28	0.02	0.02	0.00	0.00			
TOTAL Construction	**0.96**	**0.13**	**1.56**	**0.16**	**0.39**			
Pounds	1914	268	3129	311	789			
Pounds / day avg	**16**	**2**	**26**	**3**	**7**			
Tons/day avg	**0.01**	**0.00**	**0.01**	**0.00**	**0.00**			
Sources:								
US EPA AP42, 2001								
CEQA SCAQMD, 1992								
US EPA Non-Road Engine and Vehicle Study, 1991								

Table B-3. Air Emissions from the Construction of EOD and Munitions Facilities at Westover ARB, MA								
EOD Site Alternative 2, Adjacent to Taxiway D ("Taxiway D Alternative")								
Six months to construct (120 work days)								
	Summary (emissions in tons per year)							
	CO	**VOC**	**NOx**	**SOx**	**PM-10**			
Total Const.	**0.94**	**0.13**	**1.53**	**0.15**	**0.38**			
	Summary (emissions in tons per day)							
	CO	**VOC**	**NOx**	**SOx**	**PM-10**			
	0.01	**0.00**	**0.01**	**0.00**	**0.00**			
Grading		**PM-10**						
PM_{10}								
PM_{10} emissions from bulldozing		58.095		160	hours			
		44.313		157.3	lbs PM_{10}			
$PM_{10} = \frac{1.0*s^{1.5}}{M^{1.4}}$		1.311		**0.08**	**tons PM_{10}**			
		0.98	lbs/hr					
where s = silt (%), M = moisture (%)								
Construction								
Equipment	**Days**	**Hours/ day**	**Pieces**	**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Bulldozer	21	8	1	*1.03*	*0.21*	*2.16*	*0.21*	*0.21*
Emissions (lbs)				172.87	34.57	363.03	34.57	34.57
Dump Trucks	21	6	2	*1.80*	*0.19*	*4.17*	*0.45*	*0.26*
Emissions (lbs)				453.60	47.88	1050.84	113.40	65.52
Backhoe/loader	10	8	1	*1.16*	*0.23*	*1.69*	*0.15*	*0.15*
Emissions (lbs)				92.40	18.48	135.52	12.32	12.32
Crane	20	8	1	*1.75*	*0.58*	*4.46*	*0.39*	*0.58*
Emissions (lbs)				279.36	93.12	713.92	62.08	93.12
Water Truck	21	1	1	*1.80*	*0.19*	*4.17*	*0.45*	*0.26*
Emissions (lbs)				37.80	3.99	87.57	9.45	5.46
Concrete Truck	5	8	2	*1.80*	*0.19*	*4.17*	*0.45*	*0.26*
Emissions (lbs)				144.00	15.20	333.60	36.00	20.80
Flatbed Truck	10	8	1	*1.80*	*0.19*	*4.17*	*0.45*	*0.26*
Emissions (lbs)				144.00	15.20	333.60	36.00	20.80
Total Emissions	lbs			1324.03	228.44	3018.08	303.82	252.59
	tons			**0.66**	**0.11**	**1.51**	**0.15**	**0.13**
Worker Vehicle Trips								
Exhaust				**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Number of workers	15		EF (g/mi)	9.387	0.598	0.655	0	0
Commute (miles)	15		lbs/mi	0.02068	0.00131718	0.001442731	0	0
Days	120		Amt (lbs)	558.26	35.56	38.95	0.00	0.000
Total Miles	27,000		**Amt (tons)**	**0.28**	**0.02**	**0.02**	**0.00**	**0.000**
EF = Emission Factor for calendar year 2000 (USEPA,2000) in grams per mile								

Table B-3. Air Emissions from the Construction of EOD and Munitions Facilities at Westover ARB, MA								
EOD Site Alternative 2, Adjacent to Taxiway D ("Taxiway D Alternative")								
PM-10 Trucks Driving on Paved Roads								
Miles/round trip	1.5							
Trucks/hour	2							
Hours of activity	4							
Days	21		EF (lbs/mile)	0.4	with street cleaning			
VMT	252		TOTAL (lbs)	100.8	**Total (tons)**	**0.05**		
PM-10 Trucks Driving on Unpaved Roads								
Miles/round trip	0.5							
Trucks/hour	2							
Hours of activity	0.5							
Days	21		EF (lbs/mile)	23				
VMT	10.5		TOTAL (lbs)	241.5	**Total (tons)**	**0.12**		
SUMMARY	Amounts in tons per year							
	CO	**VOC**	**NOx**	**SOx**	**PM-10**			
Grading (fugitive dust)					0.08			
Trucks - paved roads					0.05			
Trucks - unpaved roads					0.12			
Construction Equipment	0.66	0.11	1.51	0.15	0.13			
Worker Vehicles	0.28	0.02	0.02	0.00	0.00			
TOTAL Construction	**0.94**	**0.13**	**1.53**	**0.15**	**0.38**			
Pounds	1882	264	3057	304	752			
Pounds / day avg	**16**	**2**	**25**	**3**	**6**			
Tons/day avg	**0.01**	**0.00**	**0.01**	**0.00**	**0.00**			
Sources:								
US EPA AP42, 2001								
CEQA SCAQMD, 1992								
US EPA Non-Road Engine and Vehicle Study, 1991								

Appendix C

NATURAL AND CULTURAL RESOURCES

APPENDIX C.
Natural and Cultural Resources

This appendix contains a table detailing protected wildlife and plant species found on Westover ARB, and a list summarizing cultural resources on Westover ARB (USAF, 1995a).

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Table C-1 Federal and State Protected Species on or near Westover ARB, MA[1]

Common Name	*Scientific Name*	*Status*[2]		*Presence on Westover ARB*[3]
		Federal	*State*	
BIRDS				
Upland sandpiper	*Bartramia longicauda*	NL	E	occurs
Grasshopper sparrow	*Ammodramus savannarum*	NL	T	occurs
Vesper sparrow	*Pooecetes gramineus*	NL	T	occurs
Loggerhead shrike	*Lanius ludovicianus*	NL	E	migrates through
Northern harrier	*Circus cyaneus*	NL	T	migrates through
American peregrine falcon	*Falco peregrinus anatum*	NL[4]	E	migrates through
Blackpoll warbler	*Dendroica striata*	NL	SC	migrates through
Cooper's hawk	*Accipiter cooperii*	NL	SC	migrates through
Sharp-shinned hawk	*Accipiter striatus*	NL	SC	migrates through
MAMMALS				
Northern water shrew	*Sorex palustris*	NL	SC	historic range
Southern bog lemming	*Synaptomys cooperi*	NL	SC	historic range
AMPHIBIANS				
Blue-spotted salamander	*Ambystoma laterale*	NL	SC	occurs
Four-toed salamander	*Hemidactylium scutatum*	NL	SC	occurs
Eastern spadefoot toad	*Scaphiopus holbrookii*	NL	T	historic range
REPTILES				
Spotted turtle	*Clemmys guttata*	NL	SC	occurs
Wood turtle	*Clemmys muhlenbergii*	NL	SC	historic range
Eastern box turtle	*Terrapene carolina*	NL	R	historic range
Eastern hognose snake	*Heterodon platirhinos*	NL	R	historic range
INSECTS				
Pine Barrens zanclognatha moth	*Zanclognatha martha*	NL	T	occurs
PLANTS				
Hartford fern (or climbing fern)	*Lygodium palmatum*	NL	SC	occurs
Wild lupine	*Lupinus perennis*	NL	S	occurs
Large whorled pogonia	*Isotria verticillata*	NL	WL	occurs

[1] These species have been documented on, or may occur in the vicinity of, Westover ARB.

NOTES:

[2]
T - Threatened
E - Endangered
NL - Not Listed
SC - Special Concern
R – Rare
S – Scarce
WL - Watch List

[3] Occurs - refers to a species documented as inhabiting or occurring on Westover ARB on a continual basis.

Migrates through - refers to a species inhabiting Westover ARB on an indiscriminate basis.

Historic range - refers to a species with potential habitat on Westover ARB, and where historical information indicates that the species previously inhabited or migrated through the area.

[4] The American peregrine falcon, *Falco peregrinus anatum*, was recently removed from the federal list of endangered and threatened wildlife.

Sources: USAF, 1998b

Table C-2. Cultural Resources On Westover ARB
Prehistoric Sites:
• Westover Air Force Base/Small Arms Range Parcel site (not potentially significant)
• Drop Zone site (location and significance unknown)
• Westover-Stony Brook site (potentially significant)
• Two unnamed sites located at the Granby/Arms Range (not potentially significant).
None of these sites is located within the proposed or alternative site areas. The closest site is the Westover-Stony Brook site, which is located approximately 3,300 feet north of the proposed site, 3,500 feet from the Taxiway D alternative site, and 3,700 feet from the East Alternative site.
Historic Sites:
• Cooley Brook site (potentially significant)
• Tower structure (potentially significant)
• Tilly structure (potentially significant)
• Unnamed structure on Robinson Road (not potentially significant)
• Robinson structure on Robinson Road (not potentially significant)
• Concrete foundations on Granby Road (not potentially significant)
None of these sites is within the proposed or alternative site areas. The nearest site is the Tilly Structure Historical Site, which is located approximately 4,700 feet east of the proposed site, 3,000 feet from the Taxiway D alternative site, and 4,000 feet from the East Alternative site.
Cold War Sites:
To identify Cold War resources important to the base's history, the Air Force conducted an inventory of Cold War period facilities on Westover ARB in 1994 (USAF, 1995b). The following facilities were inventoried.
• Facility 1875 (Target Intelligence Training Building)
• Facility 1900 (a photographic laboratory that produced and distributed maps and reconnaissance photographs taken by spy planes and satellites over various potential target areas)
• Facility 7400 (Alert Hangar)
• Facility 7450 (Readiness Crew Facility or "Molehole")
• Facility 1100/T-240 (used as Strategic Air Command Headquarters), which was constructed during World War II but used during the Cold War period.
These facilities may be potentially eligible for listing on the National Register of Historic Places. However, none is located near the proposed or alternative sites. Facilities 1100, 1875, and 1900 are located in the main built up portion of the installation and Facilities 7400 and 7450 are located at the south end of the runway.

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