Final

ENVIRONMENTAL IMPACT STATEMENT

Addressing Campus Development at Fort George G. Meade, Maryland

SEPTEMBER 2010

FINAL

ENVIRONMENTAL IMPACT STATEMENT
ADDRESSING CAMPUS DEVELOPMENT
AT
FORT GEORGE G. MEADE, MARYLAND

PROPONENT:

16 Sept. 2010

CARROLL PARKER — DATE
Chief, Facilities Services
National Security Agency

RECOMMEND APPROVAL:

10 Sept. 2010

JAMES MALEY — DATE
Chief, Occupational Health, Environmental, and Safety Services
National Security Agency

RECOMMEND APPROVAL:

13 SEPT 2010

DANIEL L. THOMAS — DATE
Colonel, U.S. Army
Installation Commander
Fort George G. Meade

APPROVED:

13 Sept 2010

for KEITH B. ALEXANDER — DATE
General
Director, National Security Agency/Central Security Service

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ENVIRONMENTAL IMPACT STATEMENT
ADDRESSING CAMPUS DEVELOPMENT
AT
FORT GEORGE G. MEADE, MARYLAND

NATIONAL SECURITY AGENCY
FORT GEORGE G. MEADE, MARYLAND

SEPTEMBER 2010

COVER SHEET

FINAL ENVIRONMENTAL IMPACT STATEMENT
ADDRESSING CAMPUS DEVELOPMENT
AT FORT GEORGE G. MEADE, MARYLAND

Proponent: U.S. Department of Defense (DOD), National Security Agency (NSA).

Affected Location: Fort George G. Meade, Maryland.

Report Designation: Final Environmental Impact Statement (EIS).

Proposed Action: DOD proposes to develop a portion of Fort Meade (referred to as "Site M") as an operational complex and to construct and operate consolidated facilities for Intelligence Community use.

Abstract: DOD has considered development of Site M under three discrete phases identified for implementation over a horizon of approximately 20 years. Implementation of Phase I is being treated in this EIS as the Proposed Action. Phases II and III are being analyzed as alternative development options. Under Phase I, development would occur in the near term (approximately 2012 to 2015) on the eastern half of Site M-1, supporting 1.8 million square feet of facilities for a data center and associated administrative space. NSA would consolidate mission elements, which would enable services and support services across the campus based on function; serve the need for a more collaborative environment and optimal adjacencies, including associated infrastructure (e.g., electrical substation and generator plants providing 50 megawatts of electricity); and provide administrative functions for up to 6,500 personnel. Phase I would also include constructing a steam and chilled water plant, water storage tower, and electrical substations and generator facilities capable of supporting the entire operational complex on Site M.

Development of Site M takes into account several factors, including mission requirements, the condition of current facilities (both on and off NSA's Exclusive Use Area at Fort Meade), space planning, anti-terrorism/force protection, land availability, utility requirements, Base Realignment and Closure actions, traffic and parking changes, and environmental impacts. Use of multi-level parking facilities will be considered in lieu of surface parking. A key factor driving the site development concept planning is the co-location of mission functions to provide a more efficient and effective work environment for mission-critical functions of the Intelligence Community.

The analysis in this EIS considers various alternatives to the Proposed Action, including the No Action Alternative, electrical generation alternatives, pollution control alternatives, and location alternatives for the various proposed facilities.

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EXECUTIVE SUMMARY

Executive Summary

Introduction

This Final Environmental Impact Statement (EIS) has been prepared to address the proposal by the Department of Defense (DOD) for implementation of campus development initiatives and the construction of associated facilities for the National Security Agency (NSA) complex at Fort George G. Meade (Fort Meade), Maryland. The National Security Agency/Central Security Service (NSA/CSS) is a cryptologic intelligence agency administered as part of the DOD. It is responsible for the collection and analysis of foreign communications and foreign signals intelligence. For NSA/CSS to continue to lead the Intelligence Community into the next 50 years with state-of-the-art technologies and productivity, its mission elements will require new facilities and infrastructure.

This EIS has been prepared through coordination with Federal and state agencies and will support DOD decisionmaking. This EIS identifies and assesses the potential impacts associated with the Proposed Action and has been prepared to fulfill the requirements of the National Environmental Policy Act (NEPA) of 1969.

Purpose and Need

To meet the NSA's continually evolving requirements, the DOD proposes to develop a portion of Fort Meade (referred to as "Site M") as an operational complex and construct and operate consolidated facilities for Intelligence Community use. The purpose of the Proposed Action is to provide facilities that fully support the Intelligence Community's mission. The need for the action is to consolidate multiple agencies' efforts to ensure capabilities for current and future mission requirements as directed by Congress and the President.

Scope of the EIS

The scope of the analysis in this EIS consists of evaluation of the range of actions, alternatives, and impacts to be considered in accordance with NEPA. The purpose of the EIS is to inform decisionmakers and the public of the likely environmental consequences of the Proposed Action and alternatives. At Fort Meade, meeting NSA's requirements for facilities consists of developing a portion of the installation and constructing and operating new facilities for use by NSA. These actions are similar in timing and location and would fulfill a common need for providing essential infrastructure.

Interagency and Public Involvement

Agency and public participation in the NEPA process promotes open communication between the proponent (i.e., NSA) and regulatory agencies, the public, and potential stakeholders. All persons and organizations having a potential interest in the proposed project are encouraged to participate in the public involvement process.

DOD initiated the public scoping process for this EIS on July 2, 2009, with the publication of the Notice of Intent (NOI) to prepare an EIS (74 *Federal Register* [FR] 126). The purpose of conducting scoping is to provide members of the public and applicable regulatory agencies with the opportunity to submit formal comments regarding the development of the Proposed Action and possible alternatives and to assist in identifying issues relevant to the EIS. A letter was distributed on July 10, 2009, to 69 potentially interested Federal, state, and local agencies; Native American tribes; and other stakeholder groups or individuals. Announcements were also published in the *Baltimore Sun* and the *Washington Post* on July 12, 2009, notifying the public of the intent to prepare an EIS, identifying the public meeting date, and requesting scoping comments on the project. Subsequently, a scoping meeting was held on July 21, 2009, at the Meade Middle School on Fort Meade to provide a forum for the public and governmental and regulatory agencies to obtain information and provide scoping comments. Scoping comments were officially accepted through August 17, 2009. All scoping comments were considered during the preparation of the Draft EIS. Substantive concerns identified during scoping were (1) regional impacts on the regional transportation network systems, (2) regional impacts on fiscal and public revenue, (3) public utility capacity (e.g., water, sewer, and storm water systems) in terms of quality and quantity, (4) public safety and emergency services, and (5) potential historic resources on Site M.

A Notice of Availability (NOA) for the Draft EIS was published in the *Federal Register* on June 25 and July 2, 2010. The Draft EIS was distributed to 27 Federal, state, and local agencies having jurisdiction by law or special subject matter expertise and to any person, organization, stakeholder group, or agency that expressed interest in reviewing the Draft EIS during the scoping process. In addition, 19 individuals requested copies during the public review period for the Draft EIS. A public meeting was held on July 21, 2010, at the Meade Middle School on Fort Meade to offer a forum for providing information to the public and agencies and for receiving comments. The meeting was advertised in the *Baltimore Sun* and the *Washington Post*. The public meeting was attended by 14 individuals. One verbal comment and no written comments were provided during the public meeting. Comments on the Draft EIS were accepted through August 16, 2010. In total, seven sets of comments were received during the public review period for the Draft EIS.

Description of the Proposed Action

The DOD proposes to implement a plan to develop "Site M" at Fort Meade as an operational complex and to construct and operate consolidated facilities for Intelligence Community use. Site M consists of approximately 227 acres in the southwestern quadrant of Rockenbach Road and Cooper Avenue. The area presently serves as portions of Fort Meade's Applewood and Park golf courses. For development planning purposes, Site M is divided into two portions. The northern portion, fronting on Rockenbach Road and consisting of approximately 137 acres, is referred to as Site M-1. The southern portion, consisting of approximately 90 acres, is referred to as Site M-2.

Development of Site M takes into account several factors, including mission requirements, the condition of current facilities (both on and off NSA's Exclusive Use Area at Fort Meade), space planning, anti-terrorism/force protection, land availability, utility requirements, Base Realignment and Closure actions, traffic and parking changes, and environmental impacts. A key factor driving the site development concept planning is the co-location of mission functions to provide a more efficient and effective work environment for mission-critical functions of the Intelligence Community.

DOD has considered development of Site M under three discrete phases identified for implementation over a horizon of approximately 20 years. Implementation of Phase I is being treated in this EIS as the Proposed Action. Phases II and III are being analyzed as alternative development options and are discussed below.

Under Phase I, development would occur in the near term (approximately 2012 to 2014) on the eastern half of Site M-1, supporting 1.8 million square feet (ft^2) of facilities for a data center and associated administrative space. NSA would consolidate mission elements, which would enable services and support services across the campus based on function; serve the need for a more collaborative environment and optimal adjacencies, including associated infrastructure (e.g., electrical substation and generator plants providing 50 megawatts of electricity); and provide administrative functions for up to 6,500 personnel. This phase would also include a steam and chilled water plant, water storage tower, and electrical substations and generator facilities capable of supporting the entire operational complex on Site M.

Construction of the proposed facilities and the addition of personnel would require additional campus parking. The use of multi-level parking facilities will be considered in lieu of surface parking. The amount of replacement parking needed would depend on the facility alternatives selected.

Since the development of Site M is in the planning stages, no engineering or design work for replacement parking has been accomplished. Therefore, this EIS does not consider various design factors in detail, but makes general assumptions about the requirements that would be associated with surface parking and parking garages. The exact space requirements will become known as the detailed design process progresses.

Alternatives Analysis

In addition to the Proposed Action, two additional independent phases of development have been identified and are options that are addressed here as alternatives (see **Table ES-1**).

Table ES-1. Buildout Comparison for the Proposed Action and Alternatives

Alternative	Area of Building Footprints (ft^2)	Number of Personnel	Occupation Year	Estimated Cost
Proposed Action (Phase I)	1.8 million	6,500	2012–2014	$2.07 billion
Alternative 1 (Phases I and II)	3.0 million	8,000	2020	$3.18 billion
Alternative 2 (Phases I, II, and III)	5.8 million	11,000	2029	$5.23 billion

If all three phases were completed, approximately 11,000 personnel would be located at the proposed facilities at Site M. It is estimated that one-third of the personnel that would staff the new operational complex are already on Fort Meade. The remaining personnel would come from positions at other Intelligence Community locations throughout the Baltimore-Washington metropolitan area.

Alternative 1: Implement Phases I and II

Alternative 1 would include implementation of the Proposed Action (Phase I) along with Phase II. Under Phase II, development would occur in the mid-term on the eastern half of Site M-1, supporting the construction of an additional 1.2 million ft^2 of operational administrative facilities, and also would involve demolition activities. The analysis of Alternative 1 includes Phases I and II combined, for a total built space of 3.0 million ft^2 for 8,000 personnel.

Alternative 2: Implement Phases I, II, and III

Alternative 2 would include implementation of the Proposed Action (Phase I) along with Phases II and III. This alternative would include the demolition of the golf clubhouse buildings. Under Phase III, development would occur on Site M-2 in the long term, supporting the construction of an additional 2.8 million ft^2 of operational administrative facilities, bringing total built space to 5.8 million ft^2 for 11,000 personnel under all three phases[1].

[1] Approximately 11,000 personnel would be located at the proposed facilities at Site M, if all three phases were completed. It is estimated that one-third of the personnel (approximately 3,630 people) that would staff the new development are already on Fort Meade. The remaining personnel (approximately 7,370 people) would come from positions at other Intelligence Community locations throughout the Baltimore-Washington metropolitan area.

Alternatives to Electrical Generation and Pollution Control Systems

Electrical Generation Alternatives. DOD proposes to construct emergency generator facilities to ensure a redundant power supply. Alternatives to supply emergency power that were considered to be potentially viable included stationary internal combustion engines, natural gas-fired combustion turbines, and natural gas-fired microturbines. The DOD developed seven evaluation criteria to compare alternative ways of providing emergency power. These criteria are (1) proven and commercially available technology, (2) reliable equipment, (3) rapid start-up, (4) sufficient energy output, (5) meets Federal and state environmental regulations, (6) energy-efficient, and (7) cost-effective. For an emergency power system to be considered reasonable, at a minimum it must meet the first five criteria. Furthermore, any alternative that DOD selects would need to comply with Federal policy for energy efficiency and cost effectiveness in accordance with Executive Order (EO) 13221, *Energy Efficient Standby Power Devices*, and EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*. **Table ES-2** compares stationary internal combustion engines, natural gas-fired combustion turbines, and microturbines to the evaluation criteria outlined above. Based on the information shown in the table, only the stationary internal combustion engine generator sets and natural gas-fired combustion turbines alternatives are carried forward for further detailed analysis in this EIS.

Table ES-2. Comparison of Electrical Generation Alternatives

Emergency Power System	Proven and commercially available technology	Reliable equipment	Rapid start-up	Sufficient energy output	Meets environmental regulations	Meets evaluation criteria
Internal combustion engines	Yes	Yes	Yes	Yes	Yes	Yes
Natural gas-fired combustion turbines	Yes	Yes	Yes	Yes	Yes	Yes
Microturbines	Yes	Yes	No	Yes	Yes	No

Pollution Control System Alternatives. The proposed emergency generators could emit pollutants and have adverse contributions to already poor air quality in the Fort Meade area. These measures are being addressed proactively to avoid, by design, major impacts on air quality; and to identify the most direct way to comply with strict state and Federal air quality regulations in the region. DOD has identified and considered alternatives to limit air emissions during implementation of the Proposed Action. The DOD developed four evaluation criteria to compare alternative ways of reducing air pollutant emissions: (1) potential to significantly reduce air emissions, (2) proven and commercially available technology, (3) energy efficiency, and (4) cost effectiveness. **Table ES-3** compares each emissions-control alternative to all the evaluation criteria outlined above. As shown in the table, only the selective catalytic reduction and Operational Limits alternatives meet the evaluation criteria sufficiently and are carried forward for further detailed analysis.

Table ES-3. Comparison of Emissions-Control Alternatives

Control Method	Potential to Significantly Reduce Air Emissions	Proven and Commercially Available Technology	Energy Efficiency	Cost Effectiveness	Meets Evaluation Criteria
SCR	Yes	Yes	Yes	No	Yes [a]
SNCR	No	Yes	No	No	No
Operational Limits	Yes	N/A	N/A	N/A	Yes [b]

Notes:

a. Although not a cost-effective control method, SCR is carried forward for analysis in this EIS because it might be required to meet strict permitting requirements in the region.

b. Restrictions on operations through federally enforced limits might be required in addition to other control methods and is carried forward in that context.

Key:

SCR = selective catalytic reduction

SNCR = selective noncatalytic reduction

No Action Alternative

Since DOD has identified a need for action (i.e., consolidate multiple agencies' efforts to ensure capabilities for current and future mission accomplishment) that is required to sustain the mission on Fort Meade's NSA campus, it is understood that taking no action does not meet the project purpose and need. The No Action Alternative is analyzed to provide a baseline of the existing conditions against which potential environmental and socioeconomic impacts of the Proposed Action and alternatives can be compared. Under the No Action Alternative, NSA would not develop on Site M and would not construct and operate approximately 1.8 million ft^2 of administrative facilities. NSA/CSS operations and similar or related operations of other Intelligence Community agencies would continue at their present locations.

Summary of Environmental Impacts

The level of environmental impacts potentially resulting from the Proposed Action and alternatives would primarily be dependent on the alternative ultimately selected. **Table ES-4** summarizes the potential impacts from the Proposed Action and each alternative. Environmental impacts would generally be more adverse for Alternatives 1 and 2 than for the Proposed Action due to the increase in building footprint and the number of additional personnel associated with the alternatives. This summary of potential environmental impacts focuses on those impacts that are considered to be more adverse and limits discussions of minor, adverse impacts that would be expected from construction activities.

Generally, construction and demolition activities would be expected to result in some amount of ground disturbance. Short-term, adverse impacts on soil and water resources as a result of sedimentation, erosion, and storm water runoff are, to some extent, unavoidable. Construction and demolition activities also generate solid waste. These kinds of impacts would be expected regardless of the alternative chosen.

Best Management Practices and Mitigation Measures

The Proposed Action has the potential to result in adverse environmental impacts. The Proposed Action includes best management practices (BMPs), mitigation measures, and design concepts to avoid adverse impacts to the extent practicable (see **Table ES-5**). Unavoidable impacts would be minimized or compensated for to the extent practicable. In accordance with Council on Environmental Quality regulations, mitigation measures are considered for adverse environmental impacts. Once a particular impact associated with a proposed action is considered significant, then mitigation measures are developed where it is feasible to do so.

Table ES-4. Summary of Environmental Impacts from the Proposed Action and Alternatives

Resource Area	No Action Alternative	Proposed Action (Phase I)	Alternative 1 (Phases I and II)	Alternative 2 (Phases I, II, and III)
Land Use	No impacts on land use would be expected.	Short- to long-term, moderate, adverse impacts on land use would be expected from the reclassification and loss of viable open space. Short- to long-term, moderate, adverse impacts on recreation would be expected from the conversion of the golf course to administrative functions. Long-term, minor, beneficial impacts would be expected from consolidating NSA mission functions.	Impacts on land use and recreation would be similar in nature but slightly greater than the Proposed Action.	Impacts on land use and recreation would be similar in nature but slightly greater than Alternative 1.
Transportation	Long-term, major, adverse impacts would be expected due to failing levels of service (LOS) values.	Above already major adverse baseline levels, long-term, minor, adverse impacts would be expected due to an increase in failing LOS values.	Above already major adverse baseline levels, long-term, minor, adverse impacts would be expected due to an increase in failing LOS values.	Above already major adverse baseline levels, long-term, moderate, adverse impacts would be expected due to an increase in failing LOS values.
Noise	No impacts on the noise environment would be expected.	Short-term, negligible to minor, adverse impacts would be expected from construction activities. Long-term, negligible to minor, adverse impacts would be expected from facility operation. No impacts on sensitive receptors outside of Fort Meade would be expected.	Impacts on the noise environment would be similar in nature but slightly greater than the Proposed Action.	Impacts on the noise environment would be similar in nature but slightly greater than Alternative 1.
Air Quality	No impacts on air quality would be expected.	Short- and long-term, minor, adverse impacts on air quality would be expected from increased air emissions during construction activities and operation of the generators, respectively.	Impacts on air quality would be similar in nature but greater than the Proposed Action.	Impacts on air quality would be similar in nature but greater than Alternative 1.

Resource Area	No Action Alternative	Proposed Action (Phase I)	Alternative 1 (Phases I and II)	Alternative 2 (Phases I, II, and III)
Geological Resources	No impacts on geological resources would be expected.	Short- and long-term, minor to moderate, adverse impacts on geological resources would be expected from additional disturbance to soils and increased erosion and sedimentation from construction activities and placement of utilities.	Impacts on geological resources would be similar in nature but greater than the Proposed Action.	Impacts on geological resources would be similar in nature but greater than Alternative 1.
Water Resources	No impacts on water resources would be expected.	Short-term, minor, adverse impacts could occur from the potential transport of sediment or construction-related pollutants during large storm events. Long-term, negligible to minor, adverse impacts would be expected from the increase in impervious surfaces. Long-term, minor and major, adverse impacts would be expected from the generation of additional wastewater and the increase in potable water usage, respectively. Long-term, negligible to minor, adverse impacts could be expected from an increase in effluent to the Little Patuxent River as a result of discontinued use of treated wastewater used for irrigation after the removal of the golf course. Long-term, minor, beneficial impacts would be expected from a reduction in pesticide use as a result of the removal of the golf course.	Impacts on water resources would be similar in nature but greater than the Proposed Action.	Impacts on water resources would be similar in nature but greater than Alternative 1.

Resource Area	No Action Alternative	Proposed Action (Phase I)	Alternative 1 (Phases I and II)	Alternative 2 (Phases I, II, and III)
Biological Resources	No impacts on biological resources would be expected.	Long-term, minor, adverse impacts on vegetation would be expected from clearing and grading of the remnant forest surrounding the golf course. Long-term, minor, indirect adverse impacts on wetlands would be expected from a reduction in habitat diversity, shift in species composition, nutrient loading, and modifications to hydrologic regimes. Short-term, minor, adverse impacts on wildlife would be expected from temporary noise disturbances associated with construction activities. Long-term, moderate, adverse impacts on wildlife would occur from the potential mortality of terrestrial species during construction activities and the permanent loss of potential habitat. Long-term, minor, beneficial impacts would be expected from replanting native vegetation. No adverse impacts on coastal zone management, floodplains, or threatened and endangered species would be expected.	Impacts on biological resources would be similar in nature but greater than the Proposed Action.	Impacts on biological resources would be similar in nature but greater than Alternative 1.
Cultural Resources	No impacts on cultural resources would be expected.	No major impacts on any previously identified archaeological or architectural resources would be expected.	No major impacts on any previously identified archaeological or architectural resources would be expected.	Major impacts on potentially historic properties could occur if they were not treated as a design constraint and avoided.

Resource Area	No Action Alternative	Proposed Action (Phase I)	Alternative 1 (Phases I and II)	Alternative 2 (Phases I, II, and III)
Infrastructure and Sustainability	No impacts on infrastructure would be expected.	Long-term, major, adverse impacts on water supply would be expected from an increase in demand for potable water. Short- and long-term, minor, adverse impacts on sanitary sewer and wastewater systems, natural gas, and solid waste systems would be expected from an increase in demand for wastewater collection and treatment, an increase in demand for natural gas, and an increase in solid waste generated, respectively. Short- and long-term, negligible to minor, adverse impacts on storm water drainage systems would be expected from construction activities and increased impermeable surfaces, respectively. Short- and long-term, negligible to major, adverse impacts on the electrical system would be expected from increased energy use. Long-term, negligible, adverse impacts from the use of liquid fuel would be expected from increased site storage. No adverse impacts on communications systems would be expected. Long-term, beneficial impacts on heating and cooling capabilities would be expected from the use of modern, energy-efficient boiler and chiller plants.	Impacts on infrastructure systems would be similar in nature but slightly greater than the Proposed Action.	Impacts on infrastructure systems would be similar in nature but slightly greater than Alternative 1.

Resource Area	No Action Alternative	Proposed Action (Phase I)	Alternative 1 (Phases I and II)	Alternative 2 (Phases I, II, and III)
Hazardous Materials and Wastes	No impacts on hazardous materials and wastes would be expected.	Short- and long-term, negligible, adverse impacts would be expected from generation of hazardous materials and petroleum products and wastes during construction and operational activities. No impacts on asbestos-containing materials, radon, lead-based paint, pesticides, or polychlorinated biphenyls would be expected. Short-term, minor, adverse and long-term, minor, beneficial impacts would be expected from the remediation of the active Installation Restoration Program site and former mortar range training area within the project area.	Impacts on hazardous materials and wastes would be similar in nature to those described for Proposed Action.	Impacts on hazardous materials and wastes would be similar in nature but greater than those described for Alternative 1.
Socioeconomics and Environmental Justice	No impacts on socioeconomics or environmental justice would be expected.	Short- and long-term, major, beneficial impacts on the local economy and long-term, moderate, beneficial impacts on local demographics and housing characteristics would be expected from increased demand. Short-term, moderate, adverse impacts on the Class A Office Space market and long-term, minor, adverse impacts on the school systems and recreation would be expected from increased demand. Long-term, minor, adverse impacts on law enforcement and fire protection facilities would be expected from increased response times due to increased traffic levels. No impacts on minority or low-income populations would be expected.	Impacts on socioeconomics and environmental justice would be similar in nature but slightly greater than those described for the Proposed Action.	Impacts on socioeconomics and environmental justice would be similar in nature but slightly greater than those described for Alternative 1.

Table ES-5. Proposed BMPs, Mitigation, and Environmental Protection Measures

Resource Area	Proposed Measures
Land Use (see Section 4.1)	• No environmental protection measures have been identified for land use.
Transportation (see Section 4.2)	• Contribute to development of a regionwide traffic study to analyze the impacts of future growth in and around Fort Meade on the regional roadway network in Howard County and Anne Arundel County. • Potential on-installation road improvements already identified by U.S. Army: ○ Add left turn lanes to selected approaches to the following on-installation road intersections: Ernie Pyle Street and Mapes Road, Cooper Avenue and Mapes Road, Cooper Avenue and Rockenbach Road, and MD 175 and Rockenbach Road/Ridge Road. ○ Add right turn lanes to selected approaches to the following on-installation road intersection: O'Brien Road and Mapes Road. ○ Add through lanes to selected approaches to the following on-installation road intersections: Ernie Pyle Street and Mapes Road, MacArthur Road and Mapes Road, Taylor Avenue and Mapes Road, O'Brien Road and Mapes Road, O'Brien Road and Rockenbach Road, and Reece Road and MacArthur Road. ○ Add traffic signalization to the O'Brien Road and Rockenbach Road intersection. • Support for recommended road improvements to minimize impacts from the Proposed Action: ○ Add turn and/or through lanes to the following intersections: MD 175 and Rockenbach Road/Ridge Road, MD 175 and 26th Street/Disney Road, MD 175 and Reece Road (MD 174), MD 175 and Mapes Road/Charter Oaks Road, MD 175 and Llewellyn Avenue/Blue Water Boulevard, MD 174 (Reece Road) and Jacobs Road, Ernie Pyle Street and Mapes Road, MacArthur Road and Mapes Road, Cooper Avenue and Mapes Road, Taylor Avenue and Mapes Road, and O'Brien Road and Mapes Road. ○ Add traffic signalization to MD 174 (Reece Road) and Jacobs Road, and O'Brien Road and Samford Road. ○ Add loop ramp for traffic coming from westbound MD 32 to westbound MD 198. ○ Add additional lanes for northbound and southbound traffic on MD 295 and eastbound and westbound traffic on MD 32. • Contribute to development of mass transit proposals that have been identified by local and state agencies to address on-installation and regional circulation and connectivity issues.

Resource Area	Proposed Measures
Noise (see Section 4.3)	• Using the best available noise-control techniques (i.e., improved mufflers, equipment redesign, intake silencers, ducts, and engine enclosures and noise-attenuating shields or shrouds on all equipment and trucks) could mitigate noise impacts. • Pile-driving noise could be mitigated through the use of plywood noise barriers around the site, noise-control blankets, noise attenuation, and providing 30 days notice prior to pile-driving activities. • Specific construction times would be provided under the direction of the Fort Meade Garrison Command and could be restricted due to proximity of residential areas.
Air Quality (see Section 4.4)	• Implement energy-efficient electrical generation and pollution-control systems to reduce air emissions. • Construction would be accomplished in full compliance with current and pending State of Maryland regulatory requirements through the use of compliant practices or products. • Implement fugitive dust-control measures (e.g., wind breaks and barriers, control of vehicle access). • Construction and demolition equipment would be properly tuned and maintained prior to and during construction and demolition activities
Geological Resources (see Section 4.5)	• Develop an erosion-and-sediment-control plan for the Proposed Action. • Use BMPs as required by State of Maryland storm water regulations to minimize soil erosion, including fencing and sediment traps, applying water to disturbed soil, and revegetating disturbed areas as soon as possible after disturbance, as appropriate.
Water Resources (see Section 4.6)	• Implement nonstructural storm water management techniques per State of Maryland regulations, Leadership in Energy and Environmental Design (LEED) Silver requirements, NSA design standards, the NSA Real Property Master Plan, or as outlined in the Fort Meade *Green Building Manual*, as appropriate. • Maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property. • A forested 100-foot buffer would be established on the western side of Midway Branch within Site M. • If storm water management sizing criteria are not met through the implementation of Environmental Site Design to the maximum extent practicable, structural BMPs would be used and could include storm water retention ponds, storm water wetlands, infiltration basins or trenches, storm water filtering systems, and open channel systems.

Resource Area	Proposed Measures
Biological Resources (see Section 4.7)	• Use forestry practices to control erosion and sedimentation during clearing and construction activities. • Conduct selective phased clearing of vegetation to minimize fragmentation and maintain linkages between habitat. Preserve large or historic trees and plant additional trees around them to the extent possible. • Following construction activities, the project site would be landscaped using native plants where possible. • Wetland area management should follow a dual policy of floodplain and riparian area management and *in situ* wetland management emphasizing preservation and, where possible, enhancement and expansion of wetlands.
Cultural Resources (see Section 4.8)	• Treat undocumented cemetery locations as design constraint and fence off known cemetery boundaries. • In the event of an unexpected discovery of human remains during construction, an unanticipated discovery plan would be implemented.
Infrastructure and Sustainability (see Section 4.9)	• To promote sustainability, the following practices could be employed: construction of green roofs, retention of storm water for alternative uses, water use reduction measures, use of energy-efficient equipment, use and purchase of renewable energies, and purchase of locally produced materials. Sustainability features would be incorporated to meet Leadership in Energy and Environmental Design Silver requirements.
Hazardous Materials and Wastes (see Section 4.10)	• Preparation of a health and safety plan by the contractor prior to commencement of construction and demolition activities. • If contamination is encountered, the handling, storage, transportation, and disposal activities would be conducted in accordance with appropriate regulations. • All permanent storage tanks would be used with appropriate BMPs, such as secondary containment systems, leak detection systems, and alarm systems, and adhere to the NSA's Hazardous Materials Management Program to ensure that contamination from a spill would not occur. If a spill occurs, NSA's Spill Prevention Control and Countermeasures Plan outlines the appropriate measures for spill situations.
Socioeconomics and Environmental Justices (see Section 4.11)	• No environmental protection measures have been identified for socioeconomic resources and environmental justice.

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ACRONYMS AND ABBREVIATIONS

μg/m^3	micrograms per cubic meter
°F	Fahrenheit
AADT	annual average daily traffic
ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing material
ACP	access control point
AOI	Area of Interest
APE	Area of Potential Effect
AQCR	air quality control region
AR	Army Regulation
AST	aboveground storage tank
ATC	anticipated typical concentration
AT/FP	anti-terrorism/force protection
BACT	Best Available Control Technology
BGE	Baltimore Gas & Electric
BMP	best management practice
BNR	biological nutrient removal
BP	before present
BRAC	Base Realignment and Closure
BW	Baltimore-Washington
BWI	Baltimore-Washington International Airport
CAA	Clean Air Act
CEMP	Comprehensive Expansion Master Plan
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
COMAR	Code of Maryland Regulations
CPCN	Certificate of Public Convenience and Necessity
CRMP	Cultural Resources Management Plan
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Program
dB	decibel
dBA	A-weighted decibel
DCA	Departmental Consulting Archaeologist
DCON	discoverer's confirmation of notification
DERP	Defense Environmental Restoration Program
DINFOS	Defense Information School
DISA	Defense Information Systems Agency
DMA	Defense Media Activity
DNL	Day-Night Average A-weighted Noise Level
DNR	Department of Natural Resources
DOD	Department of Defense
DOE	Determination of Eligibility
DPW	Directorate of Public Works
EBS	Environmental Baseline Survey
EIFS	Economic Impact Forecast System
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ESCP	erosion-and-sediment-control plan
ESD	Environmental Site Design
EUL	Enhanced Use Lease
FCA	Forest Conservation Act
FEMA	Federal Emergency Management Agency
FGGM	Fort George G. Meade
FPPA	Farmland Protection Policy Act
FR	Federal Register
FSD	Forest Stand Delineation
ft^2	square feet
ft^3/hr	cubic feet per hour

FY	fiscal year
GHG	greenhouse gas
gpd	gallons per day
gpm	gallons per minute
GPR	ground penetrating radar
GRH	Guaranteed Ride Home
HAP	hazardous air pollutant
HAZWOPER	Hazardous Waste Operations and Emergency Response
HCS+	Highway Capacity Software
HFC	hydrofluorocarbon
HLPS	High Lift Pump Station
hp	horsepower
HUD	U.S. Department of Housing and Urban Development
HVAC	heating, ventilation, and air conditioning
Hz	Hertz
ICRMP	Integrated Cultural Resources Management Plan
IDG	Installation Design Guide
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
ITE	Institute of Transportation Engineers
ITR	injection timing retard
kg	kilograms
kW	kilowatt
LAER	lowest achievable emission rate
LBP	lead-based paint
lbs/yr	pounds per year
LEED	Leadership in Energy and Environmental Design
L_{eq}	equivalent noise level
LOS	level of service
LPZ	Lower Pressure Zone
MACT	Maximum Achievable Control Technology
MARC	Maryland Area Rail Commuter
MCZ	Meade Coordination Zone
MDA	Maryland Department of Agriculture
MDE	Maryland Department of the Environment
MDOT	Maryland Department of Transportation
MFH	military family housing
mgd	million gallons per day
mg/L	milligrams per liter
MHT	Maryland Historical Trust
mm	millimeter
MMBtu/hr	million British thermal units per hour
MMRP	Military Munitions Response Program
MOU	Memorandum of Understanding
MSAT	Mobile Source Air Toxic
msl	mean sea level
MTA	Maryland Transit Administration
MUTCD	Manual on Uniform Traffic Control Devices
MW	megawatt
MWR	morale, welfare, and recreation
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEC	Network Enterprise Center
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutant
NHPA	National Historic Preservation Act
NNSR	Nonattainment New Source Review
NOA	Notice of Availability
NOI	Notice of Intent
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places

NSA	National Security Agency
NSA/CSS	National Security Agency/Central Security Service
NSPS	New Source Performance Standards
NSR	New Source Review
ntu	nephelometric turbidity units
O_3	ozone
OSHA	Occupational Safety and Health Administration
OTR	ozone transport region
OWS	oil/water separator
PA/SI	Preliminary Assessment/Site Investigation
PCB	polychlorinated biphenyl
pCi/L	picoCuries per liter
percent g	percentage of the force of gravity
PFC	perfluorinated compound
$PM_{2.5}$	particulate matter less than or equal to 2.5 micrometers
PM_{10}	particulate matter less than or equal to 10 micrometers
POW	prisoner-of-war
ppm	parts per million
PSC	Public Service Commission
PSD	Prevention of Significant Deterioration
psig	pound-force per square inch gauge
PTE	potential to emit
R&E	research and engineering
RCN	Runoff Curve Number
RCRA	Resource Conservation and Recovery Act
RGMC	Regional Growth Management Committee
ROD	Record of Decision
ROI	Region of Influence
RONA	Record of Non-Applicability
ROTC	Reserve Officers’ Training Corps
SCR	selective catalytic reduction
SF_6	sulfur hexafluoride
SHA	State Highway Administration
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SNCR	selective noncatalytic reduction
SO_2	sulfur dioxide
SO_x	sulfur oxides
SPCC	Spill Prevention, Control, and Countermeasures
SPL	sound pressure level
SWMA	storm water management area
SWPPP	Storm Water Pollution Prevention Plan
TDM	Transportation Demand Management
TIP	Transportation Improvement Program
TMDL	Total Maximum Daily Load
TMP	Transportation Management Plan
TOD	Transit Oriented Development
tpy	tons per year
TSS	total suspended solids
UFC	Unified Facilities Criteria
UPZ	Upper Pressure Zone
USACE	U.S. Army Corps of Engineers
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 tanks
UXO	unexploded ordnance
VOC	volatile organic compound
WMATA	Washington Metropolitan Area Transit Authority
WSOC	Wideband Satellite Communications Operations Center
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

SECTION 1

PURPOSE OF AND NEED FOR THE ACTION

1. Purpose of and Need for the Action

1.1 Introduction

This Final Environmental Impact Statement (EIS) has been prepared to address the proposal by the Department of Defense (DOD) for implementation of campus development initiatives and the construction of associated facilities for the National Security Agency (NSA) complex at Fort George G. Meade (Fort Meade), Maryland. The location of Fort Meade is shown on **Figure 1.1-1**. The EIS has been prepared to comply with the requirements of the National Environmental Policy Act of 1969 (NEPA), as amended (42 United States Code [U.S.C.] Section 4321−4347); the Council on Environmental Quality's (CEQ) *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 Code of Federal Regulations [CFR] Parts 1500–1508); *Environmental Analysis of Army Actions* (32 CFR Part 651); DOD Instruction 4715.9 (*Environmental Planning and Analysis*); and, for guidance, NSA's draft *National Environmental Policy Act Procedures*.

The National Security Agency/Central Security Service (NSA/CSS) is a cryptologic intelligence agency administered as part of the DOD. It is responsible for the collection and analysis of foreign communications and foreign signals intelligence. For NSA/CSS to continue to lead the Intelligence Community into the next 50 years with state-of-the-art technologies and productivity, its mission elements will require new facilities and infrastructure.

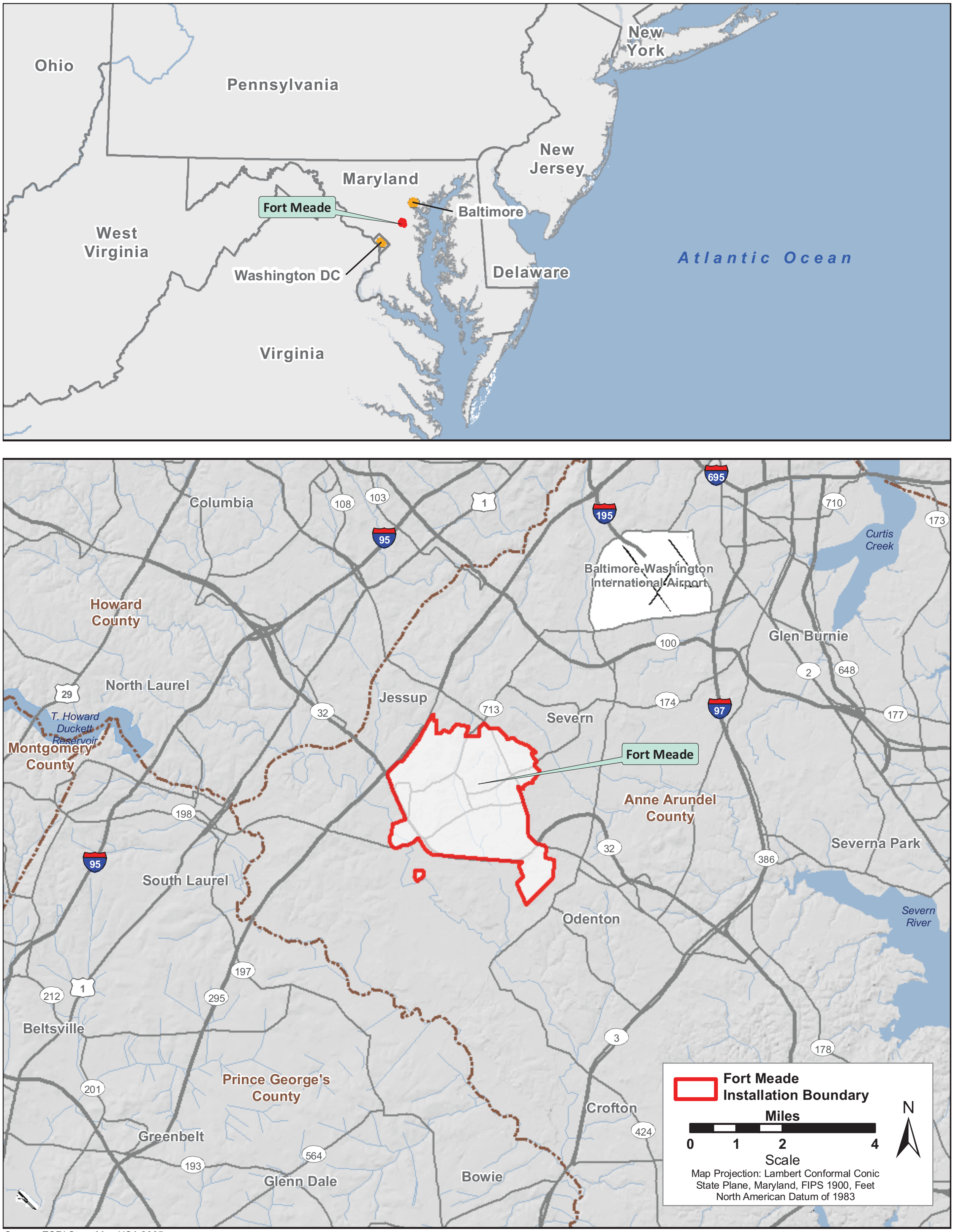
The EIS is organized into seven sections and appendices. **Section 1** states the purpose, need, scope, and public involvement efforts for the Proposed Action. **Section 2** contains a detailed description of the Proposed Action and the alternatives considered. **Section 3** describes the existing conditions of the potentially affected environment. **Section 4** identifies the environmental impacts of implementing all reasonable alternatives. **Section 5** identifies cumulative impacts associated with past, present, and reasonably foreseeable future actions when combined with the Proposed Action and alternatives. **Section 6** provides the names of those persons who prepared the EIS. **Section 7** lists the references used to support the analysis.

1.2 Purpose and Need

To meet the NSA's continually evolving requirements, the DOD proposes to develop a portion of Fort Meade (referred to as "Site M") as an operational complex and to construct and operate consolidated facilities for Intelligence Community use. The purpose of the Proposed Action is to provide facilities that fully support the Intelligence Community's mission. The need for the action is to consolidate multiple agencies' efforts to ensure capabilities for current and future mission requirements as directed by Congress and the President.

1.3 Scope of the EIS

The scope of the analysis in this EIS consists of evaluation of the range of actions, alternatives, and impacts to be considered in accordance with NEPA. The purpose of the EIS is to inform decisionmakers and the public of the likely environmental consequences of the Proposed Action and alternatives. At Fort Meade, meeting NSA's requirements for facilities consists of developing a portion of the installation and constructing and operating new facilities for use by NSA. These actions are similar in timing and location and would fulfill a common need for providing essential infrastructure.



Source: ESRI StreetMap USA 2005

Figure 1.1-1. Location of Fort Meade

The scope of the Proposed Action and the range of alternatives to be considered are presented in detail in **Section 2**. In accordance with CEQ regulations, the No Action Alternative is analyzed to provide the baseline against which the environmental impacts of implementing the range of alternatives addressed can be compared. This EIS identifies appropriate mitigation measures that are not already included in the Proposed Action or alternatives in order to avoid, minimize, reduce, or compensate for adverse environmental impacts.

1.3.1 Environmental Laws, Regulations, and Executive Orders

To comply with NEPA, the planning and decisionmaking process refers to other relevant environmental laws, regulations, and Executive Orders (EOs). The NEPA process does not replace procedural or substantive requirements of other environmental laws; it addresses them collectively in an analysis, which enables decisionmakers to have a comprehensive view of major environmental issues and requirements associated with the Proposed Action. According to CEQ regulations, the requirements of NEPA must be integrated "with other planning and environmental review procedures required by law or by agency practice so that all such procedures run concurrently rather than consecutively" (40 CFR 1500.2).

This EIS examines the environmental impacts of the Proposed Action and reasonable alternatives on the following resource areas: land use, transportation, noise, air quality, geological resources, water resources, biological resources, cultural resources, infrastructure, hazardous materials and wastes, and socioeconomics and environmental justice. **Appendix A** of this EIS contains summaries of the environmental laws, regulations, and EOs that might apply to this project. Where relevant, these laws are described in more detail in the appropriate resource areas presented in **Section 3**. The scope of the analyses of potential environmental consequences given in **Section 4** considers direct, indirect, and cumulative impacts.

As required in 40 CFR 1502.25, the EIS contains a list of all Federal permits, licenses, and coordination that might be necessary in implementing the Proposed Action or alternatives (see **Table 1.3-1**).

1.3.2 Other Relevant Laws, Regulations, and Executive Orders

The policies and goals of NEPA supplement an agency's existing authorizations (42 U.S.C. Section 4335). The DOD will adhere to mission requirements as identified in the National Security Act of 1947 (50 U.S.C. Section 401) and EO 12333, United States Intelligence Activities, as amended by EO 13355, *Strengthened Management of the Intelligence Community*. There could be aspects and details of the Proposed Action that are classified. However, the EIS presents the Proposed Action and alternatives in sufficient detail to adequately describe the types and magnitudes of environmental impacts potentially associated with the Proposed Action while also ensuring that sensitive information is safeguarded.

1.4 Interagency and Public Involvement

Agency and public participation in the NEPA process promotes open communication between the proponent and regulatory agencies, the public, and potential stakeholders. All persons and organizations having a potential interest in the proposed project are encouraged to participate in the public involvement process.

Table 1.3-1. List of Federal Permits, Licenses, and Other Entitlements for the Proposed Action

Agency	Permit/Approval/Coordination
U.S. Fish & Wildlife Service (USFWS)	– Endangered Species Act (ESA) Section 7 coordination – Migratory Bird Treaty Act coordination
U.S. Army Corps of Engineers (USACE)	– Clean Water Act (CWA) Section 404 Permit
Maryland Department of the Environment (MDE), Water Management Administration	– CWA Section 401 State Water Quality Certification CWA National Pollutant Discharge Elimination System (NPDES) permit
MDE, Air and Radiation Management Administration	– Clean Air Act (CAA) Minor New Source Review (NSR) construction permit – CAA Title V Minor permit modification – CAA Title V Significant permit modification
Maryland Department of Natural Resources Forest Service	– Forest Stand Delineation (FSD) and Forest Conservation Plan coordination
National Park Service (NPS)	– Consultation regarding potential impacts
Federally recognized Native American Tribes	– Consultation regarding potential impacts of cultural resources
Maryland Historical Trust (MHT)	– National Historic Preservation Act (NHPA) Section 106 consultation
Maryland Public Service Commission	– Waivers from Certificate of Public Convenience and Necessity (CPCN)

1.4.1 Scoping Process

The purpose of conducting scoping for an EIS is to provide members of the public and applicable regulatory agencies with the opportunity to submit formal comments regarding the development of the Proposed Action and alternatives and to assist in identifying issues relevant to the EIS. Scoping helps ensure that relevant issues are identified early in the NEPA process and are properly studied, that minor issues do not needlessly consume time and effort, and the Proposed Action and alternatives are thoroughly developed.

DOD initiated the public scoping process for this EIS on July 2, 2009, with the publication of the Notice of Intent (NOI) to prepare an EIS (74 *Federal Register* [FR] 126). A letter was distributed on July 10, 2009, to 69 potentially interested Federal, state, and local agencies; Native American tribes; and other stakeholder groups or individuals. Announcements were also published in the *Baltimore Sun* and the *Washington Post* on July 12, 2009, notifying the public of the intent to prepare an EIS, identifying the public meeting date, and requesting scoping comments on the project. Subsequently, a scoping meeting was held on July 21, 2009, at the Meade Middle School on Fort Meade to provide a forum for the public and governmental and regulatory agencies to obtain information and to provide scoping comments. Scoping comments were officially accepted through August 17, 2009. All scoping outreach tools, including the NOI, the text of the display advertisements, the interested party letter, interested party mailing list, and agency coordination, are included in **Appendix B**. All scoping comments were considered during the preparation of the Draft EIS. Substantive concerns identified during scoping were (1) impacts on the regional transportation network systems, (2) regional impacts on fiscal and public revenue, (3) public utility capacity (e.g., water, sewer, and storm water systems) in terms of quality and quantity, (4) public safety and emergency services, and (5) potential historic resources on Site M.

1.4.2 Review of the Draft EIS

DOD provided a 45-day public review period for the Draft EIS (40 CFR 1506.10). The public review period was initiated through publication of a Notice of Availability (NOA) in the *Federal Register* on June 25 and July 2, 2010. Methods similar to those used during the scoping period were used to notify the public and agencies of the public review period for the Draft EIS, including a mailing of the document to 101 potentially interested parties.

The Draft EIS was distributed to 27 Federal, state, and local agencies having jurisdiction by law or special subject matter expertise and to any person, organization, stakeholder group, or agency that had expressed interest in reviewing the Draft EIS during the scoping process. In addition, 19 individuals requested copies during the public review period for the Draft EIS (40 CFR 1502.19). A public meeting was held on July 21, 2010, at the Meade Middle School on Fort Meade to offer a forum for providing information to the public and agencies and for receiving comments. The meeting was advertised in the *Baltimore Sun* and the *Washington Post*. The public meeting was attended by 14 individuals. One verbal comment and no written comments were provided during the public meeting. Comments on the Draft EIS were accepted through August 16, 2010. In total, seven sets of comments were received during the public review period. All comments on the Draft EIS were considered during the preparation of the Final EIS. **Appendix C** of the EIS includes all materials, including the NOA and other public outreach tools, and all substantive comments on the Draft EIS that were received during the 45-day public review period for the Draft EIS.

1.4.3 Availability of the Final EIS

An NOA for the Final EIS will be published in the *Federal Register* announcing that the Final EIS is available for review. At a minimum, the Final EIS will be circulated to Federal and state agencies having jurisdiction by law or special subject matter expertise; any person, organization, or agency that has requested a copy of the Final EIS; and any person, organization, stakeholder group, or agency that has made a substantive comment on the Draft EIS (40 CFR 1502.19). During the 30-day waiting period associated with the release of the Final EIS, DOD will take no action nor make any decisions regarding whether or not to implement the Proposed Action. Comments that are received on the Final EIS during the waiting period will be considered in the decisionmaking process and documented as such in the Record of Decision (ROD).

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SECTION 2

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2. Description of the Proposed Action and Alternatives

2.1 Proposed Action (Phase I)

The DOD proposes to implement a plan to develop "Site M" at Fort Meade as an operational complex and to construct and operate consolidated facilities for Intelligence Community use. NSA's Real Property Master Plan identifies movement of its facilities to the interior of Fort Meade to meet new DOD physical security requirements. Implementation of the Phase I construction plan would meet the immediate need for the Proposed Action and provide up to 1.8 million ft^2 of facilities. Further details are provided in the following sections.

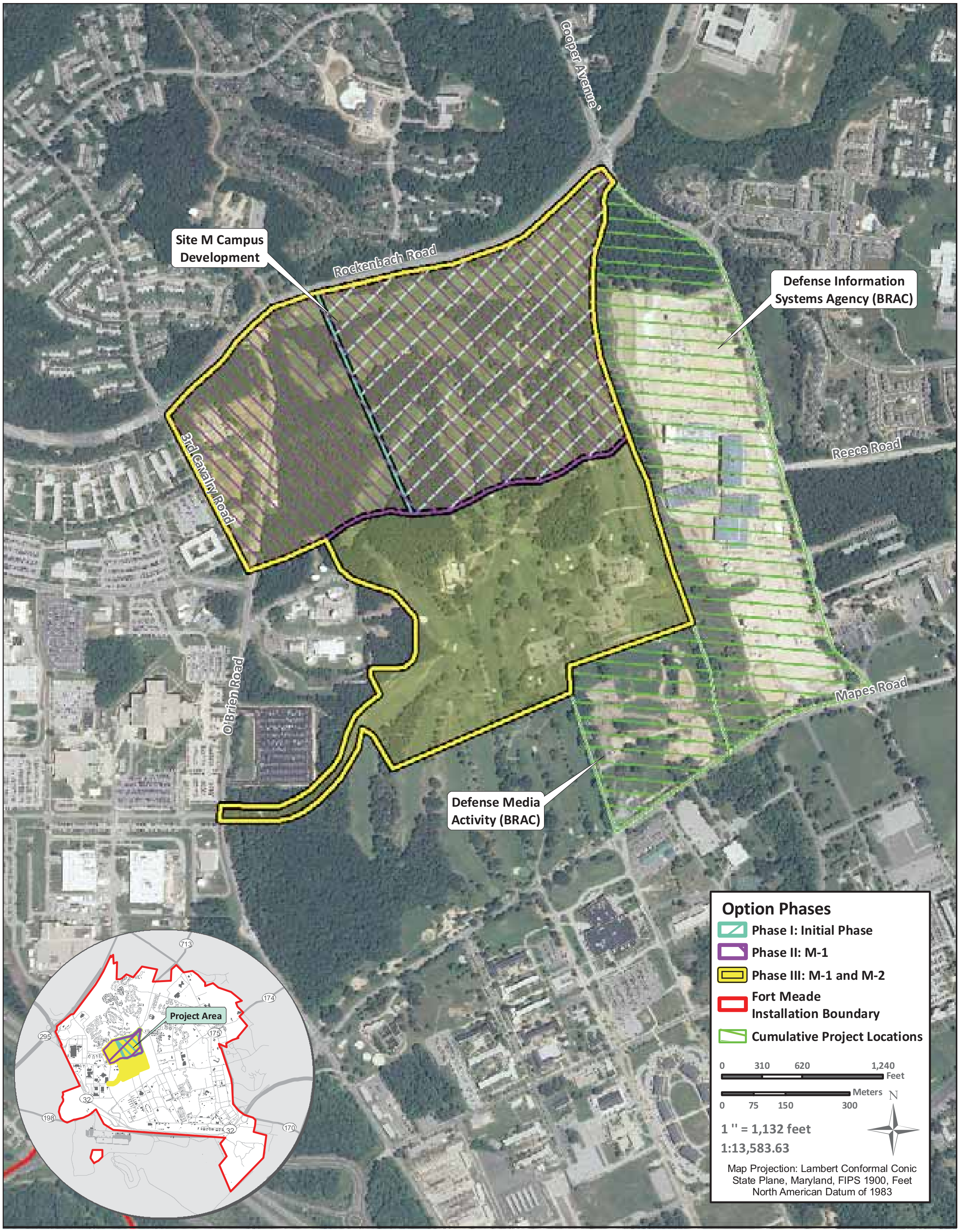
2.1.1 Land Use Planning

Site M consists of approximately 227 acres in the southwestern quadrant of Rockenbach Road and Cooper Avenue, as shown in **Figure 2.1-1**. The area presently serves as portions of Fort Meade's Applewood and Park golf courses (The Courses). For development planning purposes, Site M is divided into two portions. The northern portion, fronting on Rockenbach Road and consisting of approximately 137 acres, is referred to as Site M-1. The southern portion, consisting of approximately 90 acres, is referred to as Site M-2.

DOD has considered development of Site M under three discrete phases identified for implementation over a horizon of approximately 20 years. Implementation of Phase I is being treated in this EIS as the Proposed Action. Phases II and III are being analyzed as independent alternative development options and are discussed in **Section 2.2**. Under Phase I, development would occur in the near term (approximately 2012 to 2014) on the eastern half of Site M-1, supporting 1.8 million ft^2 of facilities for a data center and associated administrative space. NSA would consolidate mission elements, which would enable services and support services across the campus based on function; serve the need for a more collaborative environment and optimal adjacencies, including associated infrastructure (e.g., electrical substation and generator plants providing 50 megawatts [MW] of electricity); and provide administrative functions for up to 6,500 personnel. Phase I would also include a steam and chilled water plant, water storage tower, and electrical substations and generator facilities capable of supporting the entire operational complex on Site M.

Development of Site M takes into account several factors, including mission requirements, the condition of current facilities (both on and off NSA's Exclusive Use Area at Fort Meade), space planning, anti-terrorism/force protection (AT/FP), land availability, utility requirements, Base Realignment and Closure (BRAC) actions, traffic and parking changes, and environmental impacts. A key factor driving the site development concept planning is the co-location of mission functions to provide a more efficient and effective work environment for mission-critical functions of the Intelligence Community.

Construction of the proposed facilities and the addition of personnel would require additional campus parking. The existing NSA campus has limited developable land; therefore, the use of multi-level parking facilities will be considered in lieu of surface parking. Parking lots are fully used most days, including overflow parking, so the net loss of any parking would require replacement parking. However, the amount of replacement parking needed would depend on the facility alternatives selected, as described in **Section 2.2**.



Source of Potential Project Actions: HDR | e²M, Inc 2010; Source of Aerial Photography: USDA-APFO National Agricultural Inventory Project (NAIP) 2009.

Figure 2.1-1. Site M and Surrounding Areas

Since the development of Site M is in the planning stages, no engineering or design work for replacement parking has been accomplished. Therefore, this EIS does not consider various design factors in detail but makes general assumptions about the requirement that would be associated with surface parking and parking garages. The exact space requirements will become known as the detailed design process progresses.

As a result of BRAC actions, substantial personnel increases will occur at Fort Meade for the Defense Information Systems Agency (DISA) and the Defense Media Activity (DMA). These agencies will develop new facilities adjacent to Site M. DISA is currently developing a portion of the golf course east of Cooper Avenue, and DMA is developing an area south of Site M-2 (fronting on Mapes Road).

2.1.2 Operational Complex – Principal Facilities

DOD proposes to construct and operate a complex of facilities to house mission functions related to understanding the intentions and capabilities, and to limit the effectiveness, of our Nation's geopolitical adversaries. The operational complex would consist of the following principal facilities:

- *Office Modules and Operations Center* – Three office modules and one operations center (wholly contained in an office module as a discrete area) would provide approximately 1,728,000 ft^2 of space. The office modules would include a customized structural component, and supporting electrical, mechanical, fire protection/suppression, and security components. Initial operational capability would provide work space for approximately 6,500 personnel in an open environment conducive to both physical and virtual collaboration.
- *Module Interconnections* – Two two-floor module interconnections, totaling approximately 40,000 ft^2 of space, would provide access between the three office modules. The module interconnections would provide shared special purpose space including support and enabler areas (e.g., lobbies, main reception, security) for continuously secure operations.
- *Data Center* – A data center totaling 325,200 ft^2 of space would provide computational, data storage, and analytical support.

All facilities within the operational complex would comply with all Unified Facilities Criteria (UFC) 04-010-01, *DOD Minimum Antiterrorism Standards for Buildings*. Handicap accessibility design would comply with Federal and state requirements. The complex would include sustainability features that can be cost-effectively integrated to meet Leadership in Energy and Environmental Design (LEED) Green Building Rating System Silver requirements at a minimum. Facility and site design would place emphasis on maximizing operating efficiencies of building systems and minimizing the environmental footprint. The facilities would be energy-efficient and use "green" technology, including photovoltaic panels, solar collectors, heat recovery systems, wind turbines, green roofs, and habitat-oriented storm water management, where feasible.

2.1.3 Operational Complex – Supporting Facilities

Facilities supporting the data center would include an electrical substation and generator plants (providing 50 MW of service); chiller plants; boiler plants; ancillary parking; site improvements; water storage; water, gas, and communications services; paving, walks, curbs, and gutters; storm water management; and security systems.

Three alternatives for power generation equipment and three alternatives for generator pollution controls are available to the DOD and are discussed further in **Section 2.2.3**.

2.2 Alternatives Analysis

2.2.1 Development Alternatives to the Proposed Action

In addition to the Proposed Action, two independent phases of development have been identified and are options that are addressed here as alternatives. Alternatives 1 and 2 are larger build-out development options that can be compared with the Proposed Action. These alternatives are discussed below and presented along with the Proposed Action in **Table 2.2-1**. Because Alternatives 1 and 2 have long-term horizon years as shown in the table, should their components, Phases II and III, become feasible development options for expansion beyond the Proposed Action (Phase I) in the future, they may undergo separate detailed NEPA evaluation at that time to allow for use of better-known future baseline conditions and project specifications for those phases.

Table 2.2-1. Buildout Comparison for the Proposed Action and Alternatives

Alternative	Area of Building Footprints (ft^2)	Number of Personnel	Occupation Year	Estimated Cost
Proposed Action (Phase I)	1.8 million	6,500	2012–2014	$2.07 billion
Alternative 1 (Phases I and II)	3.0 million	8,000	2020	$3.18 billion
Alternative 2 (Phases I, II, and III)	5.8 million	11,000	2029	$5.23 billion

Approximately 11,000 personnel would be located at the proposed facilities at Site M, if all three phases were completed. It is estimated that one-third of the personnel that would staff the new operational complex are already on Fort Meade, in currently obligated NSA areas. The remaining personnel would come from positions at other Intelligence Community locations throughout the Baltimore-Washington metropolitan area.

2.2.1.1 Alternative 1: Implement Phases I and II

Under this alternative, the Proposed Action (Phase I) (1.8 million ft^2) would be implemented along with Phase II. Under Phase II, development would occur in the mid-term on the western half of Site M-1 (see **Figure 2.1-1**), supporting the construction of an additional 1.2 million ft^2 of operational administrative facilities, and also would include demolition activities. The analysis of Alternative 1 includes Phases I and II combined.

2.2.1.2 Alternative 2: Implement Phases I, II, and III

Under this alternative, the Proposed Action (Phase I) would be implemented along with Phase II and Phase III. This alternative would include the demolition of the golf clubhouse buildings. Under Phase III, development would occur on Site M-2 in the long term (see **Figure 2.1-1**), supporting the construction of an additional 2.8 million ft^2 of operational administrative facilities, bringing total built space to 5.8 million ft^2 for a total of 11,000 personnel under all three phases[2].

[2] Approximately 11,000 personnel would be located at the proposed facilities at Site M, if all three phases were completed. It is estimated that one-third of the personnel (approximately 3,630 people) that would staff the new development are already on Fort Meade. The remaining personnel (approximately 7,370 people) would come from positions at other Intelligence Community locations throughout the Baltimore-Washington metropolitan area.

2.2.2 Development Alternatives Eliminated from Further Detailed Analysis

2.2.2.1 Expansion of the NSA Campus

NSA has considered other areas of the Fort Meade campus for possible expansion in the future. NSA desires to expand into tracts contiguous to its campus to maintain secure adjacency within a single fenceline. In addition to Site M, given the constraints presented by the installation fenceline, the only area adjacent to the NSA campus where expansion could occur is the tract east of Canine Road and north of Emory Road, called the "9800 Area," extending to the Fort Meade Golf Course. In the future, this parcel of land could become a viable location for the construction of NSA assets or expansion under appropriate real estate agreements. However, the 9800 Area is currently occupied by barracks; and at present there are no plans for relocation. Therefore, the possibility of expansion into the 9800 Area will not be further evaluated in detail in the EIS.

2.2.2.2 Redevelopment of the NSA Campus

The NSA has considered redeveloping its existing campus on Fort Meade to accommodate a larger number of personnel and state-of-the-art technologies, and to meet recently increased security setback requirements from roads and its fenceline. Opportunities for redevelopment are limited given the developed nature of the campus. Space available for redevelopment includes existing buildings/operational spaces, and tracts currently occupied by parking lots. Converting or upgrading existing buildings is not feasible; all buildings are currently fully utilized with insufficient swing space to allow any building to be vacated and rebuilt. Construction of facilities on existing parking lots, and offsetting the loss of parking spaces by converting other parking lots into multi-level parking facilities, is another option. However, existing parking lots would have to be closed during construction of the multi-level parking facilities which would decrease the number of available parking spaces, so this alternative would not be feasible given the limited number of parking spaces currently available. Finally, all redevelopment options on the existing campus are limited by utility and roadway infrastructure issues. Existing utility systems are not expandable in terms of either operational capacity or accessibility and physical space for the scale of construction required. Therefore, this alternative will not be further evaluated in detail in the EIS.

2.2.2.3 Alternative Location to Fort Meade

The Proposed Action identified in **Section 2.1** would allow for the consolidation of multiple agencies' efforts to ensure Intelligence Community capabilities for current and future mission accomplishments as directed by Congress and the President. DOD has made significant investments at Fort Meade, and its desire is to consolidate and expand NSA's existing resources, including its personnel skill set, technical support, and infrastructure, on and adjacent to its existing campus rather than moving to a different location. Therefore, an alternative outside of Fort Meade will not be further evaluated in detail in the EIS.

2.2.3 Alternatives to Electrical Generation and Pollution Control Systems

2.2.3.1 Electrical Generation Alternatives

DOD proposes to construct emergency generator facilities to ensure a redundant power supply. This section describes the process used to identify emergency power alternatives to be carried forward, and the alternatives to be eliminated from further detailed environmental analysis in this document. Alternatives to supply emergency power that were considered potentially viable included stationary internal combustion engines, natural gas-fired combustion turbines, and natural gas-fired microturbines.

A comparative summary of the alternatives, and how they do or do not meet specific selection criteria, is also included. Details of the potential impacts from these alternatives are primarily evaluated in **Section 4.3** (Noise) and **Section 4.4** (Air Quality).

Stationary Internal Combustion Engines. Generators used to generate electricity can be driven by internal combustion engines that run on diesel fuel. They range in size from a few hundred to several thousand kilowatts (kW). Generators are commonly used for electricity and emergency power generation in central utility facilities and industrial applications. This alternative considers the use of 2.2- to 2.7-MW Tier 2 generators to provide emergency power.

Manufacturers' specifications for several generator types were reviewed. The 2.2- to 2.7-MW generator sets were selected for analysis because they are among the largest commercially available off-the-shelf units in terms of energy output that meet the Tier 2 air emissions standards. Tier 2 emissions controls are very effective for off-the-shelf generators of this size and type, and are ideal for the addition of other postcombustion control technologies. One 2.2- to 2.7-MW generator unit has a minimum space requirement that consists of an area approximately 22 feet long, 8.5 feet wide, and 10 feet high (Caterpillar 2008). Depending on the size of the individual units selected, between 22 and 24 generators would be needed to generate 50 MW of electrical energy output.

Although not required for emergency applications, it is possible that new Tier 4 generators could be available for nonemergency applications in the next few years. Generators ultimately selected might differ in specific features from the ones described in this EIS, but the emissions profiles would be consistent with or lower than the Tier 2 engines described herein. All generators meeting Tier 2 air emissions standards in the range of 2.2 to 2.7 MW would have comparable emissions profiles. Therefore, the 2.5-MW Tier 2 generators have been selected for the detailed analysis in this EIS.

Generator sets are the industry standard for emergency power generation and are a proven commercially available technology with rapid start-up capabilities. Banks of off-the-shelf generator sets can be configured to provide the emergency power requirements outlined and have the capacity for application of emissions-control technologies to meet the strict state and Federal air quality regulations within the Baltimore metropolitan region. The use of stationary internal combustion engine generator sets meets the critical evaluation criteria, and consequently, this alternative is carried forward for further detailed analysis in this EIS.

Natural Gas-Fired Combustion Turbines. Generators used to generate electricity that are driven by natural gas-fired combustion turbines are similar in many respects to those operated on diesel fuel. The principal difference between the two fuel types pertains to the potential air emissions, with natural gas-fired internal combustion producing fewer oxides of nitrogen emissions.

Like stationary internal combustion engines, natural gas-fired combustion turbines have the capacity for application of emissions-control technologies to meet the strict state and Federal air quality regulations within the Baltimore metropolitan region. The use of natural gas-fired combustion turbines meets the critical evaluation criteria, and consequently, this alternative is carried forward for further detailed analysis in this EIS.

Natural Gas-Fired Microturbines. Microturbines are small combustion turbines that produce between 25 kW and 1,000 kW of power. Microturbines were derived from turbocharger technologies found in large trucks or the turbines in aircraft auxiliary power units. Turbines of many sizes are commonly used for electricity generation in central utility generating stations and industrial applications. There are a number of manufacturers of turbine generator sets in a size appropriate to the Proposed Action. For the purposes of this analysis, this alternative considers the use of 1-MW microturbines for emergency power.

Manufacturers' specifications for several microturbines types were reviewed. The 1-MW microturbines were selected for analysis because they are among the largest commercially available units in terms of energy output. A single 1-MW microturbine unit has a minimum space requirement of approximately 28 feet long, 8 feet wide, and 10 feet high. All microturbines would be driven by internal combustion engines, though not all units would necessarily be made by the same manufacturer. Sixty 1-MW units would be needed to generate 50 MW of energy output. Other microturbines reviewed were smaller in size and power output, and had a higher cost per MW than other options evaluated. They would require a larger overall building footprint and cost and consequently were not considered realistic for the facilities being proposed.

Microturbines have limited air emissions, have a long record of commercial service in emergency and standby power applications, and are highly reliable. They come in a variety of sizes and can be operated together to meet the proposed project power requirements. However, they require more extensive start sequences and do not increase load quickly because of the need to equalize internal temperatures before applying additional load. Microturbines are not considered to be a viable alternative because of the time it takes for them to generate useful power. Additionally, microturbines have a substantially high capital cost and are more financially viable for uses requiring full-time operation. Therefore, microturbines have been eliminated from further detailed analysis in this EIS as an emergency power alternative.

Summary of Alternatives. The DOD developed seven evaluation criteria to compare alternative ways of providing emergency power. These criteria are (1) proven and commercially available technology, (2) reliable equipment, (3) rapid start-up, (4) sufficient energy output, (5) meets Federal and state environmental regulations, (6) energy-efficient, and (7) cost-effective. For an emergency power system to be considered reasonable, at a minimum it must meet the first five criteria. Furthermore, any alternative that DOD selects would need to comply with Federal policy for energy efficiency and cost effectiveness in accordance with EO 13221, *Energy Efficient Standby Power Devices*, and EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*. **Table 2.2-2** compares stationary internal combustion engines, natural gas-fired combustion turbines, and microturbines to the evaluation criteria outlined above. Based on the information shown in the table, only the stationary internal combustion engine generator sets and natural gas-fired combustion turbines alternatives are carried forward for further detailed analysis in this EIS.

Table 2.2-2. Comparison of Electrical Generation Alternatives

Emergency Power System	Proven and commercially available technology	Reliable equipment	Rapid start-up	Sufficient energy output	Meets environmental regulations	Meets evaluation criteria
Internal combustion engines	Yes	Yes	Yes	Yes	Yes	Yes
Natural gas-fired combustion turbines	Yes	Yes	Yes	Yes	Yes	Yes
Microturbines	Yes	Yes	No	Yes	Yes	No

2.2.3.2 Pollution Control System Alternatives

The proposed emergency generators could emit pollutants and have adverse contributions to already poor air quality in the Fort Meade area. DOD has identified and considered alternatives to limit air emissions during implementation of the Proposed Action. These measures are being addressed proactively to avoid, by design, major impacts on air quality; and to identify the most direct way to comply with strict state and Federal air quality regulations in the region. Fort Meade is in a nonattainment area for ozone (O_3) and fine particulate matter ($PM_{2.5}$) (i.e., particulate matter less than or equal to 2.5 micrometers). DOD seeks to minimize, by design, the effects of the Proposed Action on regional air quality by limiting emissions of nitrogen oxides (NO_x), volatile organic compounds (VOCs), $PM_{2.5}$, and sulfur oxides (SO_x), which are the precursors of O_3 and $PM_{2.5}$. Air quality conditions and regulations pertinent to the Proposed Action and alternatives and associated impacts are discussed in **Sections 3.4** and **4.4**.

Generators have the potential to emit (PTE) NO_x at rates much greater than VOC, $PM_{2.5}$, and SO_x. Emissions of NO_x, in particular, are a concern in O_3 and $PM_{2.5}$ nonattainment areas. Due to the scope of the Proposed Action and the equipment requirements, NO_x emissions could be considerable, and controls likely would be mandatory under Federal and state air permitting requirements. Although emissions controls for VOC, $PM_{2.5}$, and SO_x have all been carried forward for detailed analysis, NO_x emissions are the focus of the control systems and strategies outlined herein.

NO_x controls can be classified into two types: combustion- and postcombustion-control methods. Combustion-control methods prevent the formation of NO_x during the combustion process, while post-combustion methods reduce NO_x emissions after they are created by the combustion process. Combustion-control methods reduce the amount of NO_x emissions by lowering combustion temperatures. They are more economical than post-combustion methods and are often incorporated directly into the design of generators to maximize efficiency and to meet regulatory requirements. Combustion-control methods include injection timing retard (ITR) for generators. Post-combustion-control methods "treat" flue gases to remove NO_x after its formation. Post-combustion control methods include selective catalytic reduction (SCR) and selective noncatalytic reduction (SNCR).

An example of a combustion-control technology for generators is ITR. Injection of fuel into the cylinder of an internal combustion engine initiates the combustion process. Retarding the timing of the diesel fuel injection causes the combustion process to occur later in the power stroke when the piston is in the downward motion and combustion chamber volume is increasing. By increasing the volume, the combustion temperature and pressure are lowered, thereby lowering NO_x formation. Preignition chamber combustion, adjusting the air-to-fuel ratio, and derating are other combustion-control technologies used in generators. These technologies are often used in concert to meet the Federal Tier 1 and Tier 2 emissions standards for generators, and are naturally incorporated into the standard designs. Therefore, combustion-control technologies for generators are not distinctly and separately addressed in this EIS. Generators that meet the Tier 2 standards have been carried forward for detailed analysis in this EIS, and it is assumed that they incorporate reasonable combustion-control technologies to meet these standards.

Selective Catalytic Reduction. SCR is a very effective postcombustion-control method of reducing NO_x emissions in generators. It involves the injection of ammonia in the exhaust gases in the presence of a catalyst. The catalyst allows the ammonia to reduce NO_x levels at lower exhaust temperatures than SNCR (discussed below). SCR can result in NO_x reductions up to 90 percent. Due to the limited effectiveness of other emissions-control technologies incorporated into off-the-shelf generator units, SCR is the most effective NO_x control for generators despite its high cost. SCR also meets the Lowest Achievable Emissions Rate requirement for generators, which is, by definition, independent of cost. It is likely that the use of SCR would be required to meet both Federal and state air permitting requirements. SCR for generators has been carried forward for detailed analysis.

Emergency diesel generators greater than 2.237 MW (3,000 horsepower [hp]) must meet the Tier 4 New Source Performance Standards (NSPS) in 2011 only if add-on controls such as SCR are not required to do so (71 FR 39157). Since it is technologically unlikely the Tier 4 standards are achievable without add-on controls, the effective NSPS for 2.2- to 2.7-MW emergency diesel generators is Tier 2. Notably, there are currently no commercially obtainable Tier 4 generators of suitable size; therefore, nominal emissions factors are not available. Although not required for emergency generator applications, it is possible that Tier 4 generators could be available for nonemergency application within the next few years. For the purposes of this EIS, it is assumed that off-the-shelf Tier 4 generators available after 2011 will be similar in design or have emissions similar to the existing off-the-shelf Tier 2 units with SCR. Generators ultimately selected might differ in specific features from the ones described in this EIS, but the emissions profiles would be consistent with or lower than the Tier 2 engines described herein. Therefore, the Tier 2 generators have been carried forward to facilitate a detailed analysis in this EIS because they are the most suitable off-the-shelf generators at this time.

Selective Noncatalytic Reduction. SNCR is a moderately effective postcombustion-control method of reducing NO_x emissions from generators. It involves the injection of a NO_x-reducing agent, such as ammonia or urea, in the exhaust gases. The ammonia or urea breaks down the NO_x in the exhaust gases into water and atmospheric nitrogen. SNCR reduces NO_x up to 50 percent. However, the technology is extremely difficult to apply to emergency generators that do not operate under steady conditions because the location where the ammonia (or urea) must be injected is constantly changing. Unlike SCR, SNCR does not meet the Lowest Achievable Emissions Rate requirements for generators. It is unlikely that it would be sufficient to meet Federal and state permitting requirements. Therefore, SNCR was eliminated from detailed analyses as an emissions-control alternative for generators.

Operational Limits. Limiting emergency generator operation is the most direct and cost-effective emissions-control method. It is accomplished by incorporating federally enforceable limits in the construction and operating permit(s) of new units. The obvious drawback to this approach is that if the limitations are not carefully chosen, the equipment might not meet the needs of the Proposed Action. Due to the operational requirements of the Proposed Action, limiting the operation would not be a suitable stand-alone approach to reducing emissions. However, when used in conjunction with other control methods, such as SCR, it might be a very effective approach to reduce the potential for emissions and to subsequently comply with Federal and state permitting requirements. Therefore, although not distinctly and separately addressed in this EIS, restricting operation through federally enforceable limits might be required in addition to other control methods, and has been addressed throughout this EIS in that context.

Summary of Alternatives. The DOD developed four evaluation criteria to compare alternative ways of reducing air pollutant emissions: (1) potential to significantly reduce air emissions, (2) proven and commercially available technology, (3) energy efficiency, and (4) cost effectiveness. **Table 2.2-3** compares each emissions-control alternative to all the evaluation criteria outlined above. As shown in the table and for the reasons stated above, only the SCR and Operational Limits alternatives meet the evaluation criteria sufficiently and are carried forward for further detailed analysis.

2.3 No Action Alternative

CEQ regulations specify the inclusion of the No Action Alternative in the alternatives analysis (40 CFR 1502.14). Since DOD has identified a need for action (i.e., consolidate multiple agencies' efforts to ensure capabilities for current and future mission requirement) that will be necessary to sustain the mission on Fort Meade's NSA campus, it is understood that taking no action does not meet the project purpose and need. The No Action Alternative is analyzed to provide a baseline of the existing conditions against which potential environmental and socioeconomic impacts of the Proposed Action and alternative

Table 2.2-3. Comparison of Emissions-Control Alternatives

Control Method	Potential to Significantly Reduce Air Emissions	Proven and Commercially Available Technology	Energy Efficiency	Cost Effectiveness	Meets Evaluation Criteria
SCR	Yes	Yes	Yes	No	Yes[a]
SNCR	No	Yes	No	No	No
Operational Limits	Yes	N/A	N/A	N/A	Yes[b]

Notes:

a. Although not a cost-effective control method, SCR is carried forward for analysis in this EIS because it might be required to meet strict permitting requirements in the region.

b. Restrictions on operations through federally enforced limits might be required in addition to other control methods and is carried forward in that context.

Key:

SCR = selective catalytic reduction

SNCR = selective noncatalytic reduction

actions can be compared. Under the No Action Alternative, NSA would not develop on Site M and would not construct and operate approximately 1.8 million ft^2 of administrative facilities. NSA/CSS operations and similar or related operations of other Intelligence Community agencies would continue at their present locations.

2.4 Identification of the Preferred Alternative

CEQ's implementing regulations instruct EIS preparers to "identify the agency's preferred alternative, if one or more exists in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference" (40 CFR 1502.14(c)). The DOD's preferred alternative is to implement the Proposed Action (Phase I) as described in **Section 2.1**.

2.5 Identification of Cumulative Actions

CEQ defines cumulative impacts as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." Informed decisionmaking is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

The following discussion presents those actions or projects that are temporally or geographically related to the Proposed Action and, as such, have the potential to result in cumulative impacts. The cumulative impacts analysis is presented by resource area in **Section 5** of the EIS.

2.5.1 Actions on Fort Meade

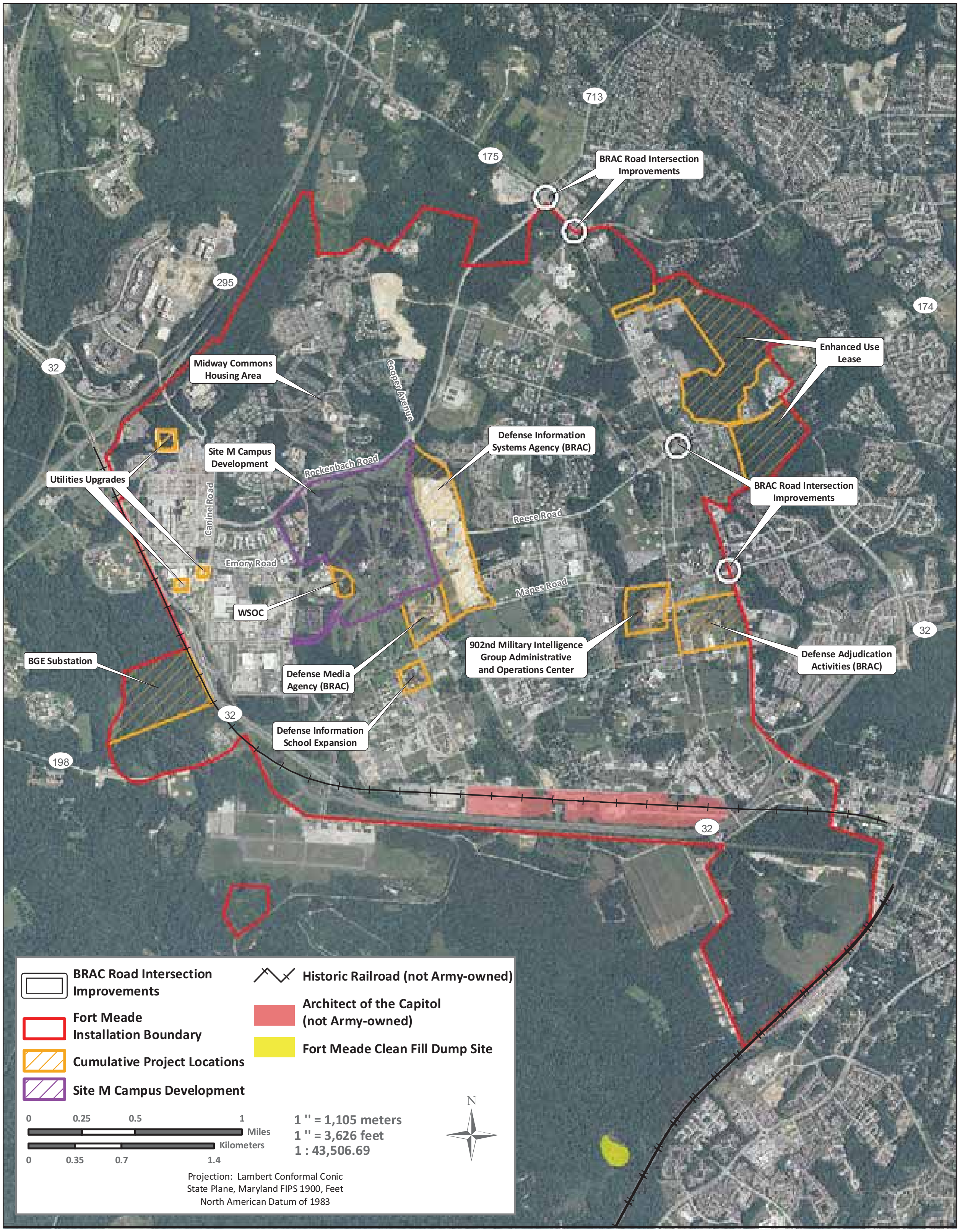
Past Actions. Prior to its establishment as a military reservation in 1917, Site M was used as farmland (DOD 2001). The area currently occupied by Site M was originally developed as the northern half of what was known as the Fort Meade cantonment area during World War I. Between World Wars I and II, the buildings were demolished and Site M was used as a firing range and training area, before being developed as a golf course in 1938. Development of the NSA campus to the west of Site M began in the mid-1950s when NSA became a tenant of Fort Meade (USACE Baltimore District 2004a). Past actions and development of the campus that could result in cumulative impacts would be encompassed in the description of the existing conditions given in this EIS (see **Section 3**). Therefore, no specific past actions have been identified for cumulative impacts analysis.

Utilities Upgrades. DOD prepared an EIS for the replacement and modernization of utilities infrastructure on the NSA campus (DOD 2009a). The *Environmental Impact Statement for the Proposed Utilities Upgrade Project at Fort George G. Meade* analyzed the construction and operation of a utility plant, generator facility, and central boiler plant. Components of the utility plant include new transmission and distribution lines on the NSA campus, an electrical substation and associated switchgear, and an emergency generator facility and associated fuel storage. The proposed generator facility and associated fuel storage would upgrade emergency electrical power to an existing substation. The proposed Central Boiler Plant would replace an existing central boiler plant that is outdated and inefficient. No major impacts were identified; however, this project will be considered in the cumulative impacts analysis because of its proximity to the Proposed Action.

Base Realignment and Closure Actions. The U.S. Army prepared a ROD in November 2007 based on the *Final Environmental Impact Statement for Implementation of Base Realignment and Closure 2005 and Enhanced Use Lease Actions at Fort George G. Meade, Maryland* (the "BRAC/EUL EIS") (USACE Mobile District 2007). The DOD is consolidating and relocating DISA, DMA, and Department of Adjudication Activities to Fort Meade and these facilities are scheduled to open by September 2011. A Post Exchange, gym, and unaccompanied personnel housing would also be constructed on Fort Meade to provide facilities associated with accommodating additional incoming personnel. The locations of the major projects are shown in **Figure 2.5-1**. Combined, these projects would require approximately 3 million ft^2 (69 acres) of new facility and vehicle space. Major adverse impacts on traffic and transportation, vegetation and wildlife, and utilities were identified as a result of the associated increased personnel (approximately 5,700 people) and removal of forest (approximately 25 acres) (USACE Mobile District 2007). As a result of traffic impacts, intersection improvements are planned (but not yet funded for construction) for four intersections along MD 175 (see **Figure 2.5-1**). Construction activities for BRAC projects are underway and estimated to be completed in 2011 (Fort Meade RGMC 2009a). BRAC actions are considered in the cumulative impacts analysis.

Enhanced Use Lease (EUL) Actions. The November 2007 ROD based on the BRAC/EUL EIS also identified excess land owned by Fort Meade to be leased to a private developer for the construction of office buildings (173 acres) and two 18-hole golf courses (367 acres) (see **Figure 2.5-1**). It is anticipated that approximately 2.0 million ft^2 would be developed for office space and parking. Major adverse impacts on traffic and transportation, vegetation and wildlife, and utilities were identified as a result of the associated increased personnel (approximately 10,000 people) and removal of forest (approximately 205 acres) (USACE Mobile District 2007). No construction plans or timelines have been determined at this time. However, EUL actions are considered in the cumulative impacts analysis.

Military Family Housing. In 2002, the U.S. Army transferred military family housing (MFH) responsibilities on Fort Meade to Picerne Military Housing through leasing agreements. The neighborhood closest to Site M is Midway Common. Midway Common is the largest MFH neighborhood at Fort Meade and includes more than 800 homes. It serves all ranks of soldiers and is home to single-family, one-level ranch homes with basements, duplexes, and townhomes. Major renovations to Midway Common are underway through 2009 (Picerne Military Housing 2009). Ongoing actions at the Midway Common neighborhood are considered in the cumulative impacts analysis because it is adjacent to Site M.



Source of Potential Project Actions: HDR | e²M, Inc 2010; Source: of Boundary Data: Fort Meade GIS 2010; Source of Aerial Photography: USDA-APFO NAIP 2009.

Figure 2.5-1. Locations of Other Actions under Consideration for Cumulative Impacts

902nd Military Intelligence Group Administrative and Operations Center. The U.S. Army Intelligence and Security Command identified a requirement to construct a new 902nd Military Intelligence Group administrative and operations center. The proposed facility would occupy approximately 420,000 ft^2 on the western portion of Fort Meade (see **Figure 2.5-1**). The EA and FONSI for this project identified short-term impacts on transportation systems because of the influx of construction vehicles and construction workers traveling to and from Fort Meade (INSCOM 2007). Given the limited extent of potentially adverse impacts and the distance between the proposed 902nd Military Intelligence Group building and the Proposed Action, this project is not considered further in this EIS for potential cumulative impacts.

Defense Information School Expansion. The Defense Information School (DINFOS) identified a requirement to expand its existing facility (Building 6500) to add on approximately 60,273 ft^2 of administrative and teaching space (Brundage 2009a). The proposed facility would be added on to the south side of Building 6500 on Cain Street, south of Mapes Road and Site M (see **Figure 2.5-1**). Additionally, approximately 50,630 ft^2 of existing teaching space in Building 6500 would be renovated. To facilitate renovation and construction, DINFOS would use clusters of modular units at the intersection of Taylor Avenue and Simonds Street. Once these modular units are no longer needed, DINFOS would construct an 8,000-ft^2 training space for Field Training Exercises at the location previously occupied by the modular units. This project includes construction, landscaping, site improvements, and infrastructure additions and improvements. Given the proximity of this project to Site M, this project is considered in the cumulative impacts analysis.

Wideband Satellite Communications Operations Center. The Department of the Army has plans to construct a Wideband Satellite Communications Operations Center (WSOC) at Fort Meade to the east of the 8900 Area and west of Site M. This facility would provide 24-hour satellite communication and transmission control of the wideband satellite constellation. The WSOC would be a 27,244-ft^2 facility. Primary and supporting facilities include 1,000-kW generators, United Postal Service system, anti-terrorism measures, electric service, water service, sewer, gas service, pavements, storm drainage, and information systems (USACE Baltimore District 2008). Given the proximity of this project to Site M, this project is considered in the cumulative impacts analysis.

BGE Substation. Baltimore Gas & Electric (BGE) has plans to construct a substation southwest of MD 32 and southeast of the Baltimore-Washington (BW) Parkway. This substation would supply power from the electrical grid to Fort Meade, the NSA, and other users in the surrounding area. Currently, this BGE substation is proposed for southeast of the Canine Road gate, and transmission lines would cross MD 32 and enter the NSA campus. This project is in the planning stages, but it is associated with the electrical needs of the Proposed Action and is in the vicinity of Fort Meade (DOD 2009a). Therefore, this project is considered in the cumulative impacts analysis.

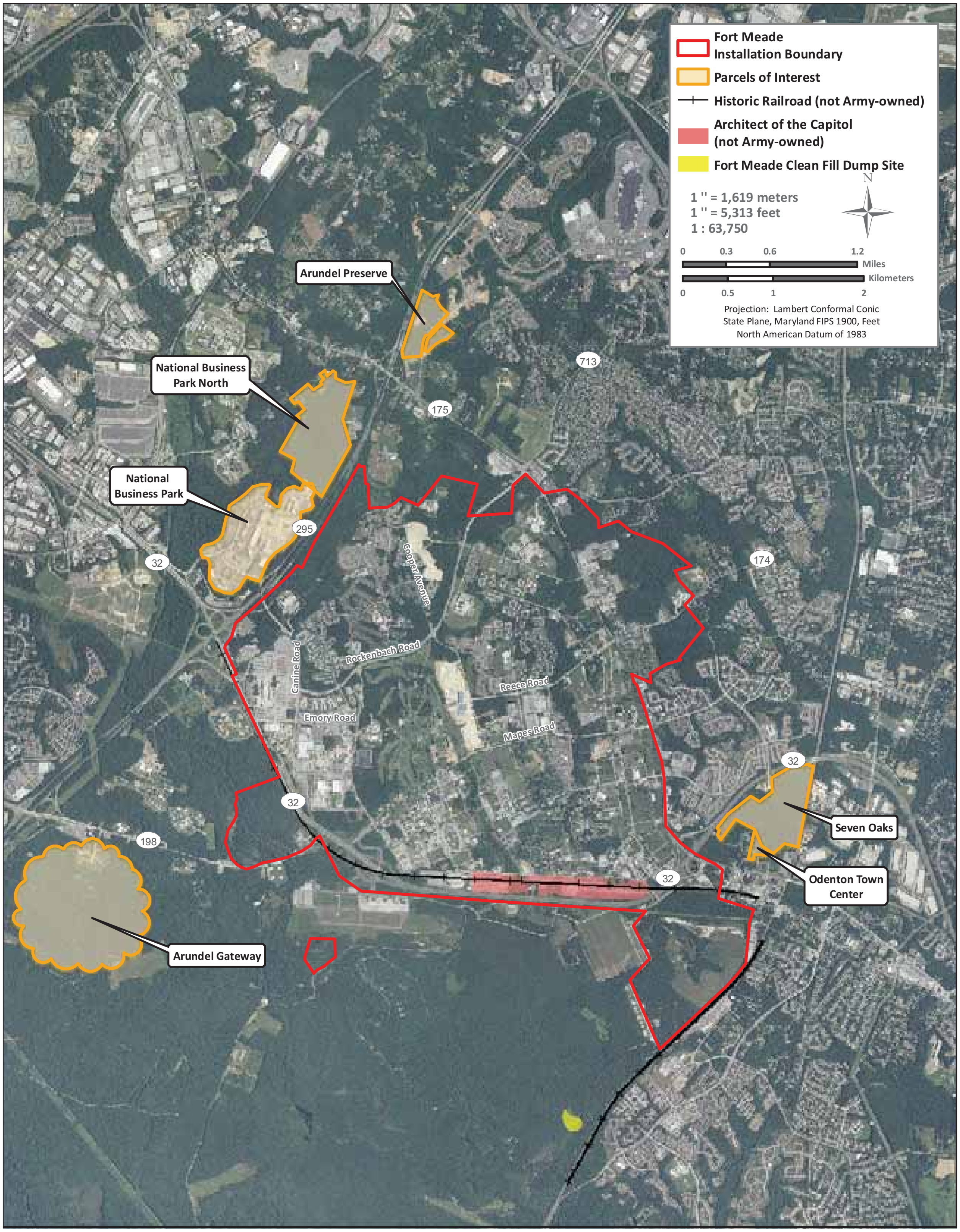
2.5.2 Other Actions Outside of NSA and Fort Meade

Mixed-Use Commercial and Residential Development. The following major approved or anticipated projects outside Fort Meade are considered in the cumulative impacts analysis and are shown in **Figure 2.5-2**:

- *National Business Park* – National Business Park is a 285-acre office park to the west of Site M and Fort Meade, on the west side of the BW Parkway. Tenants of National Business Park include primarily defense contractors such as Booz Allen Hamilton, Lockheed Martin, Northrup Grumman, Computer Sciences Corporation, and Mitre Corporation (Bell 2005, McIlroy 2006, Sernovitz 2009a). National Business Park has approximately 20 buildings totaling more than 2 million ft^2 of office space and additional land that can support approximately 500,000 ft^2

(McIlroy 2006). Construction of a 161,000-ft^2 building began in July 2009. It is anticipated that government contractors associated with BRAC actions at Fort Meade will lease this office space (Sernovitz 2009b).

- *National Business Park North* – National Business Park North is a new development that will be an extension of the adjacent National Business Park to the south. The office park consists of 110 acres. Construction of the first building, approximately 125,000 ft^2, is scheduled for completion in 2011. The National Business Park North parcel is anticipated to have an estimated seven or eight buildings at full build-out (McIlroy 2006, Sernovitz 2009a, Anne Arundel County 2010a).
- *Seven Oaks* – Seven Oaks is a 725-acre, mixed-use residential neighborhood to the east of Fort Meade. Development of Seven Oaks has been ongoing since 1987, and the majority of construction activities are complete. Seven Oaks consists primarily of 2,700 residential units with some commercial office space available. It is anticipated that many BRAC newcomers would seek a residence in Seven Oaks (Siegel 2008).
- *Odenton Town Center* – The Odenton Town Center is planned to be a 128-acre area consisting of more than 5.5 million ft^2 of high-tech office and retail space to the east of Fort Meade. This area is being designed to accommodate several types of Federal government security requirements (AAEDC undated). The Odenton Town Center is a subarea of the Odenton Growth Management Area, which comprises approximately 1,600 acres of real estate that is planned to be developed or redeveloped to provide shopping, entertainment, and access to transportation (e.g., Maryland Area Rail Commuter [MARC] rail line) (Anne Arundel County 2008a).
- *Arundel Gateway* – Arundel Gateway is a proposed mixed-use development located in western Anne Arundel County southeast of Fort Meade. The 300-acre site is slated for a 2011 opening to meet BRAC expansion needs (Ribera Development LLC 2010). Currently zoned for industrial use, rezoning the land for mixed use would bring 1,600 homes and a mix of shops and offices to the area (Stewart 2009).
- *Arundel Preserve* – Arundel Preserve is a 268-acre, mixed-use community located northeast of Fort Meade at the I-295/MD 175 interchange. Proposed to be completed in June 2011, the Arundel Preserve Town Center would include a 150-room hotel, six-story office building, and 242-unit apartment building (Arundel Preserve 2010, Sernovitz 2010). The project would also include an additional 100 mixed residential units (Anne Arundel County 2010a).



Source of Parcels of Interest: HDR | e²M, Inc 2010; Source: of Boundary Data: Fort Meade GIS 2010; Source of Aerial Photography: USDA-APFO NAIP 2009.

Figure 2.5-2. Locations of Other Actions Outside of NSA and Fort Meade

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SECTION 3

AFFECTED ENVIRONMENT

3. Affected Environment

3.1 Land Use

3.1.1 Definition of Resource

The term "land use" refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in local zoning laws. There is, however, no nationally recognized convention or uniform terminology for describing land use categories. As a result, the meanings of various land use descriptions, "labels," and definitions vary among jurisdictions.

Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. Compatibility among land uses fosters the societal interest of obtaining the highest and best uses of real property. Tools supporting land use planning include master plans/management plans and zoning regulations. In appropriate cases, the locations and extent of proposed actions need to be evaluated for their potential effects on project site and adjacent land uses.

The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include existing land use at the project site, surrounding land use, and the duration of a proposed activity and its "permanence."

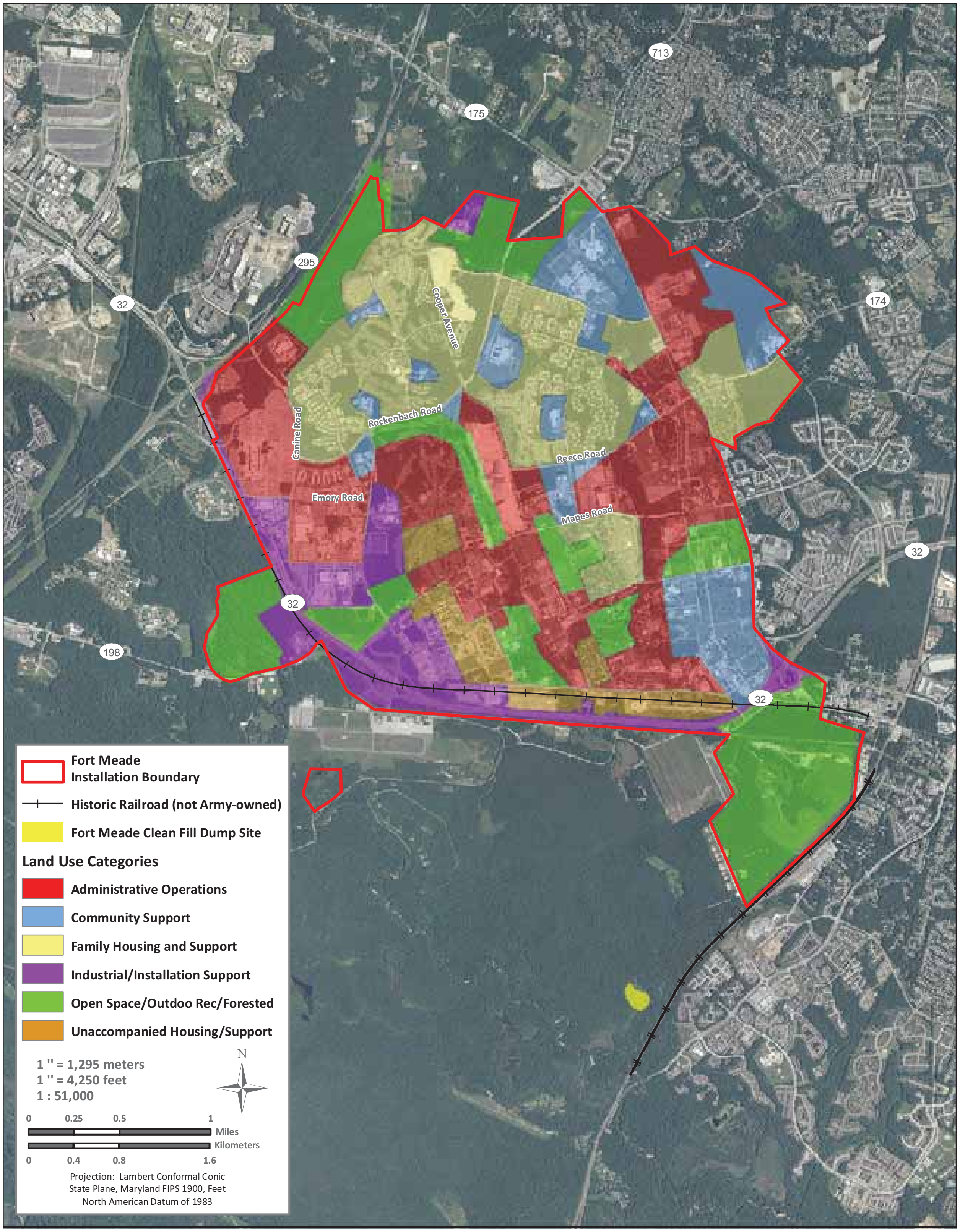
Visual resources are defined as the natural and man-made features that give a particular setting or area its aesthetic qualities. These features define the landscape character of an area and form the overall impression that an observer receives of that area. Evaluating the aesthetic qualities of an area is a subjective process because the value that an observer places on a specific feature varies depending on his/her perspective.

3.1.2 Existing Conditions

Fort Meade encompasses 5,067 acres in the northwestern corner of Anne Arundel County, Maryland. The installation is 17 miles southwest of Baltimore, Maryland, and 24 miles northeast of Washington, D.C. (see **Figure 3.1-1**). The installation is primarily composed of administration, intelligence operations, instructional institutions, family housing, and support facilities. Fort Meade is bounded by the BW Parkway (MD 295) to the northwest, Annapolis Road (MD 175) to the northeast, and Patuxent Freeway (MD 32) to the south and west. Other significant nearby transportation arteries include U.S. Route 1 and Interstate 95, which run parallel to and just to the west of the BW Parkway. Interstate 97, which connects Baltimore and Annapolis, is several miles east of Fort Meade (Fort Meade 2005b, USACE Mobile District 2007).

Fort Meade is part of the Baltimore Metropolitan Region, which includes Baltimore City and the five surrounding counties of Anne Arundel, Baltimore, Carroll, Harford, and Howard. Land use at Fort Meade is made up of general categories including Operations, Tenant Agency, Housing, Community, School (county), and Open Space (see **Table 3.1-1**). Fort Meade itself is zoned R1 Residential by Anne Arundel County but the county does not have jurisdiction over Federal land.

On-installation. The northern half of Fort Meade is predominantly military family housing with schools. The southern half consists primarily of administrative, unaccompanied housing, and instructional operations. The Applewood and Park golf courses and retail center are between the northern and southern



Source of Land Use: Fort Meade 2005b; Source: of Boundary Data: Fort Meade GIS 2010; Source of Aerial Photography: USDA-APFO NAIP 2009.

Figure 3.1-1. Existing Land Uses on Fort Meade

Table 3.1-1. Land Use at Fort Meade

Land Use	Approximate Acres	Percentage
Administrative Operations	1,422	28%
Community Support	593	12%
Family Housing and Support	1,140	22%
Industrial/Installation Support	571	11%
Open Space/Outdoor Recreation/Forested	1,093	22%
Unaccompanied Housing/Support	248	5%
Total	**5,067**	**100%**

Source: Fort Meade 2005b

portions of the installation. The NSA campus is on the western edge of Fort Meade and is approximately 630 acres. The NSA campus is a mix of administrative and industrial functions that includes administrative and operations buildings, utilities, parking, and open space land uses (Fort Meade 2005b). Areas on Fort Meade surrounding the NSA campus include the Midway Common MFH neighborhood to the northeast, administrative facilities and barracks to the east, and open space to the southeast (DOD 2009a).

Site M makes up approximately 227 acres of Open Space and Tenant Agency land use and is bounded by O'Brien and 3rd Cavalry Road to the west, Rockenbach Road to the north, Cooper Avenue to the east, and Mapes Road to the south (Fort Meade 2005b). Zimborski and Taylor Avenues run north to south through Site M. Currently land use on Site M includes portions of the Applewood and Park golf courses and is zoned for Government Use and Recreation. Three buildings are currently associated with the golf course area: the maintenance facility, clubhouse, and driving range service building. Site M was acquired by the DOD in 1919/1920 and was used for housing, training, and recreational purposes. The site has functioned as a golf course since the late 1930s (USACE Baltimore District 2004a).

The northwest portion of Site M includes two baseball fields and wooded areas that are within the Tenant Agency land use category (USACE Baltimore District 2004a). Existing land uses surrounding Site M include MFH to the north, the NSA campus to the west, and administration/operations to the east. Currently, DMA and DISA facilities are under construction east and south of Site M as reviewed in the 2007 BRAC EIS (see **Figure 2.5-1**). Future land use adjacent to Site M also potentially includes the Post Exchange, gym, and unaccompanied personnel housing, all south of Site M.

The U.S. Army supports morale, welfare, and recreation (MWR) programs at Fort Meade for military families and personnel. These programs and related facilities at Fort Meade include, but are not limited to, an arts and crafts center; fitness center; automotive skills center; outdoor recreation; and the Post library; child, youth, and school services; and the golf courses. MWR programs remain an important part of Fort Meade and the U.S. Army in providing recreational opportunities for military families and personnel. The clubhouse area associated with the golf course hosts events through MWR programs on the installation. BRAC development for administrative use on the eastern portion of the golf courses has reduced the golf course from 36 to 27 holes. Currently the golf course supports numerous golf tournaments and recreational events for DOD personnel, family, and civilians. Fort Meade has two areas available for public access besides the golf courses, the Post Exchange, which are currently in the central portion of the installation.

Fort Meade has developed a Comprehensive Expansion Master Plan (CEMP) to establish goals for future development conducive to high technology, intelligence, administrative, and training missions by current and future tenants over the next 30 years (Fort Meade 2005b). The CEMP envisions Fort Meade as a Federal campus, built for long-term sustainability for the mission and the environment (DOD 2009a). NSA completed a Real Property Master Plan in January 2009 to ensure the adequacy of the physical environment to support mission requirements and the introduction of new technology necessary to effectively implement the Intelligence Enterprise at the NSA campus (URS/LAD 2009). The land use vision of the NSA Real Property Master Plan includes supporting the co-location of appropriate organizations, promoting collaboration, and increasing efficiencies related to land use. The Fort Meade CEMP also envisions future public access and community support function land uses on the southeastern perimeter of the installation (Fort Meade 2005b). See **Section 2.5** and **Section 5** of this EIS for a discussion of cumulative actions related to Fort Meade.

Off-installation. Land use surrounding Fort Meade consists primarily of developed property that supports a growing population. Towns near Fort Meade include Odenton to the east, Jessup to the north, and Laurel to the west. The populations of Laurel, Jessup, and Odenton around Fort Meade have increased by approximately 3, 20, and 60 percent respectively between 1990 and 2000 (U.S. Census Bureau 2000). Areas to the north and east of Fort Meade are zoned for a range of residential uses with higher density residential units to the east. Areas to the northwest are zoned for residential with some industrial zoning areas as well. Zoning regulations to the west of Fort Meade establish a wide variety of residential, commercial, and industrial uses with large amounts of open space along the Little Patuxent River. Land use in these commercial and industrial areas is mostly government in nature. Areas to the south of Fort Meade are zoned for recreation and parks, including the 12,750-acre Patuxent Research Refuge (URS/LAD 2009, DOD 2009a).

Anne Arundel County has a General Development Plan that is a comprehensive land use plan prepared in compliance with state requirements and guidelines. It is a policy document that is formally adopted by the County Council. The General Development Plan establishes policies and recommendations to guide land use decisions over a 10- to 20-year planning period (Anne Arundel County 2009a).

Anne Arundel County has three designated “Town Centers,” Glen Burnie, Parole, and Odenton, which are areas with a mix of general commercial and multifamily residential uses. The Odenton Town Center Master Plan was adopted in 2003 and establishes development and zoning regulations and guidelines to promote an attractive, viable, and pedestrian-friendly Transit Oriented Development center near the Odenton MARC rail station, southeast of Fort Meade (Anne Arundel County 2008b). The Odenton Growth Management Area is a 1,600-acre area encompassing major commercial and industrial zoned portions of Odenton that was established in 1990. Approximately 55 percent of the land in the Odenton Growth Management Area is developed. The remaining 45 percent is available for development and is one of the county’s priority target areas for new growth given its public transit opportunities and its proximity to Fort Meade (Fort Meade 2005b, Anne Arundel County 2008b). The Odenton Town Plan is the guide for the future development of the Odenton Growth Management Area, and identifies where new roads and community facilities should be located, as well as the type and intensity of future development in the different subareas (Anne Arundel County 2008b).

Maryland counties adopted Smart Growth initiatives in 1997 as guidelines for future development. Smart Growth initiatives call for mixed-use land development, walkable communities, preservation of open space, a variety of transportation options, and compact building design.

Visual Resources. Fort Meade has six visual zones based on the architectural character and land use patterns. These zones are different from land use categories shown in **Table 3.1-1**. In addition, there are three overlaying visual themes: the Georgian Revival, community life, and industrial. The six visual zones are as follows:

- *Administrative Zones* – Four predominantly administrative areas compose the southern, western, central, and eastern zones. The southern administrative zone is one of the most prominent and visible areas of Fort Meade. It houses important buildings such as the Pershing and Hodges Halls and the McGlachlin Parade field. While a mix of uses and varying building scales exist in this zone, continuity is maintained through frequent use of red brick on building facades and uniform building setbacks. The predominant architectural styles in the older sections are Georgian Revival and Colonial Revival. Mature tree-lined avenues and formal landscaping and road planning give this area a historical look. The western administrative zone is along the Patuxent Freeway (MD 32), and is characterized by large modern buildings. Overall site planning mirrors a modern industrial park-type character. The eastern administrative zone is along Annapolis Road (MD 175), and is characterized by relatively new buildings scattered amongst older World War II buildings. New buildings follow Georgian and Colonial Revival styles of architecture.
- *Unaccompanied Personnel Housing Zones* – Two areas, one near Site M and another in the 6th Cavalry area compose the unaccompanied personnel zone. This zone is characterized by several uses such as housing, administration, recreation, shops, dining halls, and chapels. With functions dedicated to the mission support of active military personnel, this zone is characterized with similar building layouts, uses, and purpose; however, the architectural style is not Georgian or Colonial Revival. Buildings have painted masonry facades and lack adequate landscaping and outdoor site planning.
- *Residential Zone* – Three distinct areas, an area in the north of the installation, an area in the central administrative zone area, and an area to the east of Annapolis Road (MD 175), compose the Residential Zone. While the dominant use in this zone is family housing, other support uses like schools, the chapel complex, convenience stores, and day care are also in this zone. This zone has a very definite image directly related to its function. Architectural styles promoted for new construction are Craftsman, Urban, Seaside, and Colonial.
- *Recreational Zones* – These zones are scattered throughout the installation and include the centrally located golf course and its associated buildings, and the Burba Park in the south. These zones are characterized by jogging trails, wooded picnic areas, thick tree cover, and green fields.
- *Community Support Zones* – Currently, in the central portion of the installation, this zone encompasses the Post Exchange mall, the Commissary, and Club Meade. With considerable new construction planned in the future, improved site planning, landscaping, and Colonial Revival architectural style can be incorporated.
- *Industrial Zones* – Industrial areas are scattered throughout the installation; however, Rock Avenue composes the main industrial corridor. Adequate landscaping and comprehensive use of shaded trees along streets is missing in this area. Most buildings are old wooden warehouse structures with the exception of a few new buildings with red brick facades and green standing seam metal roofs (USACE Mobile District 2007).

The Site M visual character is in the Western Administrative Zone and is bound by Rockenbach Road in the north; Mapes Road in the south; and the Midway Branch, a tributary of the Little Patuxent River, in the east. O'Brien Road cuts through the western part of the site dividing it into two separate parcels. There are no significant structures on the golf course parcels. The majority of the Proposed Action site has gently rolling contours with trees lining the existing golf course holes. Site M has open views to the east and south. Mature trees line Rockenbach Road in the north and buffer the MFH community from the site (USACE Mobile District 2007).

3.2 Transportation

3.2.1 Definition of Resource

This section documents existing transportation systems, conditions, and travel patterns in the vicinity of Fort Meade. The transportation systems consist of the road network and transit system (comprising rail and bus services). Available capacity and performance of the transportation system indicate the conditions that commuters and travelers encounter. The traffic network, vehicular traffic, travel patterns, circulation, and parking are described for the modeled area. Traffic operations during the peak hour are evaluated, with emphasis on an intersection's level of service (LOS). The transportation system is addressed from a regional and a local perspective.

3.2.2 Existing Conditions

3.2.2.1 Study Area

Fort Meade is located along the northern side of Patuxent Freeway (MD 32), east of BW Parkway (MD 295), on the western edge of Anne Arundel County, Maryland. It is favorably situated in proximity to Baltimore-Washington International Airport (BWI) and regional arterial and freeway facilities. A vicinity map is presented in **Figure 1.1-1**.

The proposed campus development site at Site M would be located in the southwestern quadrant of Rockenbach Road and Cooper Avenue, inside the Fort Meade installation. The area presently serves as a portion of the Fort Meade Golf Course. The northeastern portion of Site M, fronting Rockenbach Road, is referred to as the Proposed Action (Phase I). The portion of the site between the Phase I parcel and 3rd Cavalry Road is referred to as Phase II. The remaining portion of the site, south of Phase I and Phase II, is referred to as Phase III. Implementation of Proposed Action (Phase I) would be completed by Year 2015. Phases II and III are alternative development actions and would be built-out by Year 2020 and Year 2029, respectively. The location of the proposed site and associated phases are shown in **Figure 2.1-1**.

3.2.2.2 Transportation System Network

This section describes the internal and external roadway network surrounding Fort Meade and the description of access control points (ACPs) for Fort Meade.

Internal Roadway Network (On-Installation)

Fort Meade is well connected internally through arterial and collector roadways. The following describes major roadways inside Fort Meade:

- *Rockenbach Road (Route 713)* – It is a four-lane undivided roadway connecting Annapolis Road (MD 175) to the east and Canine Road to the west. Posted speed limit is 45 mph.
- *Reece Road (Route 174)* – It is a two-lane undivided roadway connecting Annapolis Road (MD 175) to the east and Cooper Avenue to the west. It also provides access to the military housing to the eastern side of MD 175. Posted speed limit is 25 mph.
- *Mapes Road* – It is a two-lane undivided roadway connecting Annapolis Road (MD 175) to the east and MD 32 to the west. Posted speed limit is 30 mph.

- *Cooper Avenue* – It is a two-lane undivided roadway connecting Llewellyn Avenue to the south and Rockenbach Road to the north. Cooper Avenue further traverses north of Rockenbach Road and provides access to the military housing. Posted speed limit is 25 mph.
- Other major roadways inside Fort Meade boundary include Llewellyn Avenue, O'Brien Road, Samford Road, and Ernie Pyle Street.

External Roadway Network (Off-Installation)

Major highways serving Fort Meade include MD 295, MD 32, MD 175, and Fort Meade Road (MD 198). The following describes each of these highways:

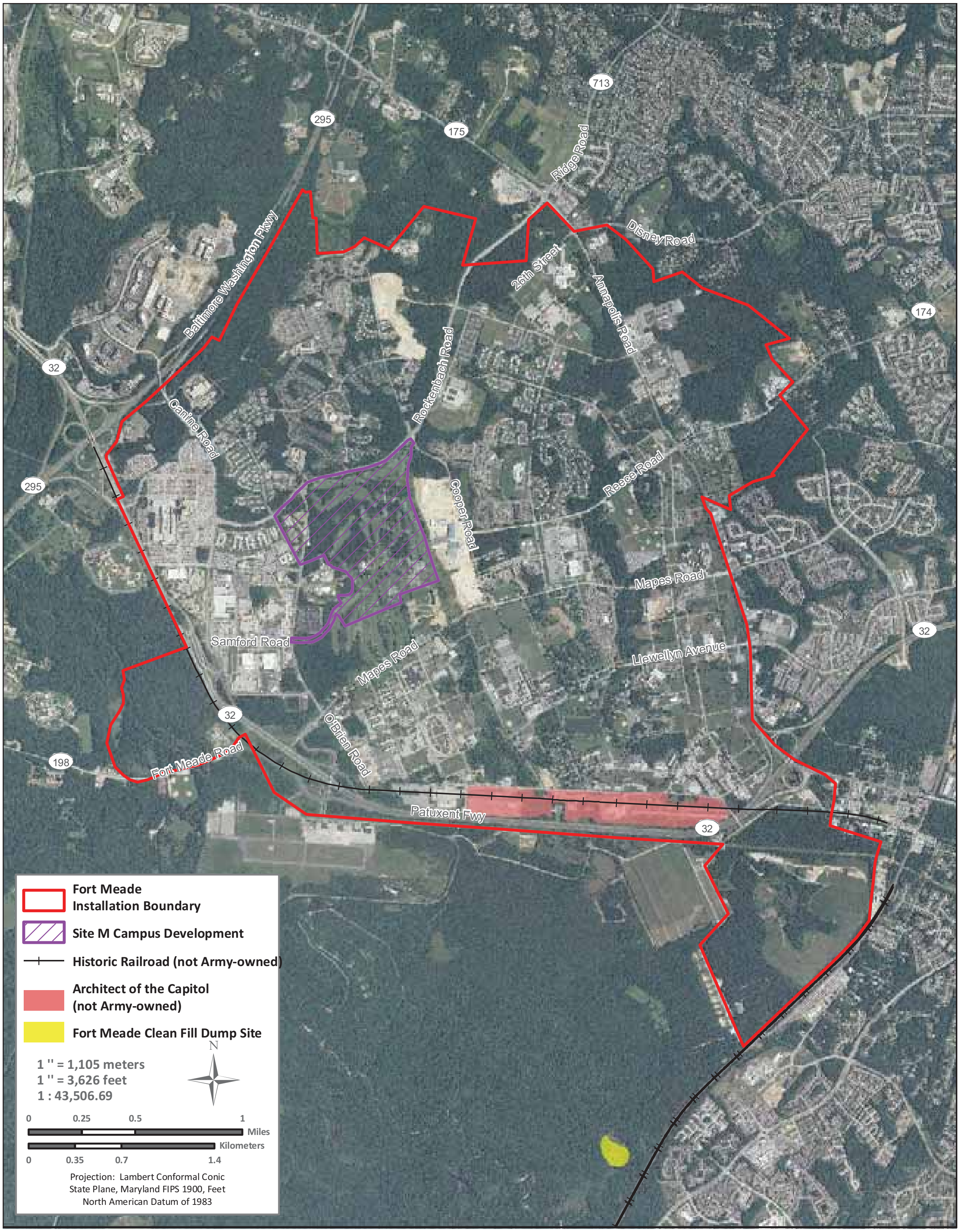
- *Baltimore-Washington Parkway (MD 295)* – The BW Parkway is a freeway located along the west side of Fort Meade. It traverses in a north-south direction connecting Baltimore to the north and Washington, DC, to the south. It carries two lanes of traffic in each direction.
- *Patuxent Freeway (MD 32)* – MD 32 forms the southern boundary of Fort Meade. It is a limited access freeway that connects I-70 to the northwest and beyond and I-97 to the southeast. It carries two lanes of traffic in each direction.
- *Annapolis Road (MD 175)* – MD 175 forms the northeastern boundary of Fort Meade connecting Columbia Pike (U.S. Route 29) to the north and MD 3 to the south. It is a two-lane to four-lane road in the vicinity of Fort Meade with auxiliary lanes at intersections.
- *Fort Meade Road (MD 198)* – MD 198 is a two-lane undivided roadway on the east side of MD 295. It widens to a four-lane divided roadway to the west side of MD 295. It connects the Fort Meade ACP at Mapes Road to the east and U.S. Route 29 to the west.

Figure 3.2-1 is provided to illustrate the roadway network in the vicinity of Fort Meade.

Access Control Points

Access to Fort Meade, not including NSA, is provided via five ACPs. All ACPs are gated entry. Inspection is conducted for all inbound vehicles at each access point. Four ACPs are located on Rockenbach Road, Reece Road, Mapes Road, and Llewellyn Avenue, respectively, west of MD 175. The Llewellyn Avenue gate is closed at this time; however, it is opened for special events and to lessen traffic demand at the MD 175/Mapes Road ACP. An ACP is also located on Mapes Road east of MD 32.

Five current access points to NSA are located on Canine Road via MD 295 interchange, Canine Road via MD 32 interchange, O'Brien Road (north of Mapes Road), Rockenbach Road (east of Canine Road), and Samford Road via MD 32. **Table 3.2-1** summarizes the ACP locations.



Source of Potential Project Actions: HDR | e²M, Inc 2010; Source of Boundary Data: Fort Meade GIS 2010; Source of Aerial Photography: USDA-APFO NAIP 2009.

Figure 3.2-1. Roadway Network Surrounding Fort Meade

Table 3.2-1. Access Control Points

Gate Location	Type of Entry
Rockenbach Road @ MD 175	Fort Meade Employees
Reece Road @ MD 175	Fort Meade Employees, Visitors
Mapes Road @ MD 175	Fort Meade Employees
Llewellyn Avenue Road @ MD 175	Closed (open as needed for special events and to alleviate heavy traffic on at the MD 175/Mapes Road ACP)
Mapes Road @ MD 32	Fort Meade Employees, Truck Entry
Rockenbach Road @ Canine Road	Restricted – for NSA Employees only
O'Brien Road @ Mapes Road	Restricted – for NSA Employees only
Samford Road @ MD 32	Restricted – for NSA Employees only
Canine Road @ MD 32	Restricted – for NSA Employees only
Canine Road @ MD 295	Restricted – for NSA Employees only

Intermodal Transportation

Fort Meade, including current NSA areas, is accessible via several public transportation modes. Transit services serving Fort Meade are as follows (KFH Group 2009):

Train Service

- MARC, operated by Maryland Transit Administration (MTA), provides rail services from Washington, DC, and Baltimore to Odenton Station and Savage Station in the Fort Meade area. The Odenton Station in Anne Arundel County and Savage Station in Howard County are along the Penn line and Camden line, respectively. Both of the train stations are within a 4-mile radius of Fort Meade. In the morning, there are 14 trips departing from Baltimore and 8 trips departing from Washington, DC (Union Station) to Fort Meade area stations. In the afternoon, there are 14 trips departing from Baltimore and 9 trips departing from Washington, DC. Additional limited service north of Baltimore includes stops at Martin Airport, Edgewood, Aberdeen, and Perryville.
- The closest Washington Metropolitan Area Transit Authority (WMATA) train station to Fort Meade is Greenbelt Metro Station. It is located in Prince George's County on the Green Line. However, there is no connecting bus service from the Metro Station to Fort Meade.

Bus Service

- K Route, operated by Central Maryland Regional Transit, provides peak hour service to Fort Meade. It operates from Arundel Mills to the Odenton MARC Rail Station. This route operates with 60-minute headway and provides two morning and two evening trips to Reece Road Gate at Fort Meade.
- F Route, also operated by Central Maryland Regional Transit, provides service from Laurel to the NSA complex at Fort Meade. This route also operates with two morning and two evening trips.
- Route 17, operated by MTA, provides service from the Patapsco Light Rail Station to BWI airport, and it reaches within a 4-mile radius of Fort Meade.

Air Service

- BWI airport is within 10 miles of Fort Meade. The airport provides services to national and international locations. Connections to BWI are provided via other regional bus and train stations; however, a direct connection from Fort Meade does not exist.

Government Operated Shuttle Service

- NSA provides shuttle service between the MARC Rail Station at Odenton and the NSA campus and Fort Meade to employees and civilians with proper identification. The shuttle operates seven morning trips from the Odenton MARC Rail Station to the NSA campus and the installation, and seven return trips in the evening from the NSA campus to the Odenton MARC Rail Station.
- The Link shuttle is operated by the BWI Business Partnership, a public policy organization. The shuttle circulates in and around the BWI Hotel District. The shuttle provides services between the BWI MARC Rail Station and the NSA Visitor Center Gate, including intermediate stops at the BWI Business Park Light Rail Station and the Friendship Annex 3 Building. It operates Monday through Friday from 5 a.m. to 5 p.m.

Parking Facilities

There are approximately 112 acres of surface parking spaces and one small two-level parking structure on the NSA campus. Parking is provided throughout the NSA campus on surface lots adjacent to most buildings. Existing parking lots, including overflow parking, are at nearly 100 percent capacity on most weekdays during normal business hours. Currently, preferential parking spaces are assigned to NSA employees who carpool/vanpool (two or more people riding together). The NSA also participates in the Guaranteed Ride Home Program, administered by the BWI Business Partnership, for employees who carpool, vanpool, use public transportation, or ride a bike to work at least 3 days per week (URS/LAD 2009).

3.2.2.3 Existing Traffic Operations

The study area is composed of the intersections along MD 175, MD 32, and MD 174 that would be affected by the proposed campus development as well as BRAC and EUL actions. Additionally, the interchange of MD 295/MD 32 is considered in the analysis per the request of Fort Meade Regional Growth Management Committee (RGMC). **Table 3.2-2** summarizes the study area intersections list and the intersections are shown in **Figure 3.2-2**.

Table 3.2-2. Study Area Intersection List

No.	Location	Intersection
1	Off-installation (Boundary)	MD 175 and Rockenbach Road/Ridge Road
2		MD 175 and Disney Road/26th Street
3		MD 175 and MD 174 (Reece Road)
4		MD 175 and Mapes Road
5		MD 175 and Llewellyn Avenue
6	Off-installation	Jacobs Road and MD 174 (Reece Road)
7	Off-installation (Boundary)	Mapes Road and MD 32 Eastbound Ramps
8		Mapes Road and MD 32 Westbound Ramps
9	On-installation (Internal)	Llewellyn Avenue and Ernie Pyle Street
10		Mapes Road and Ernie Pyle Street
11		Mapes Road and MacArthur Road
12		Mapes Road and Cooper Avenue
13		Mapes Road and Taylor Avenue
14		Mapes Road and O'Brien Road
15		O'Brien Road and Samford Road
16		O'Brien Road and Rockenbach Road
17		Cooper Avenue and Rockenbach Road
18		Reece Road and MacArthur Road
19	Off-installation	MD 295 and MD 32 Interchange
20		
21		
22		
23		

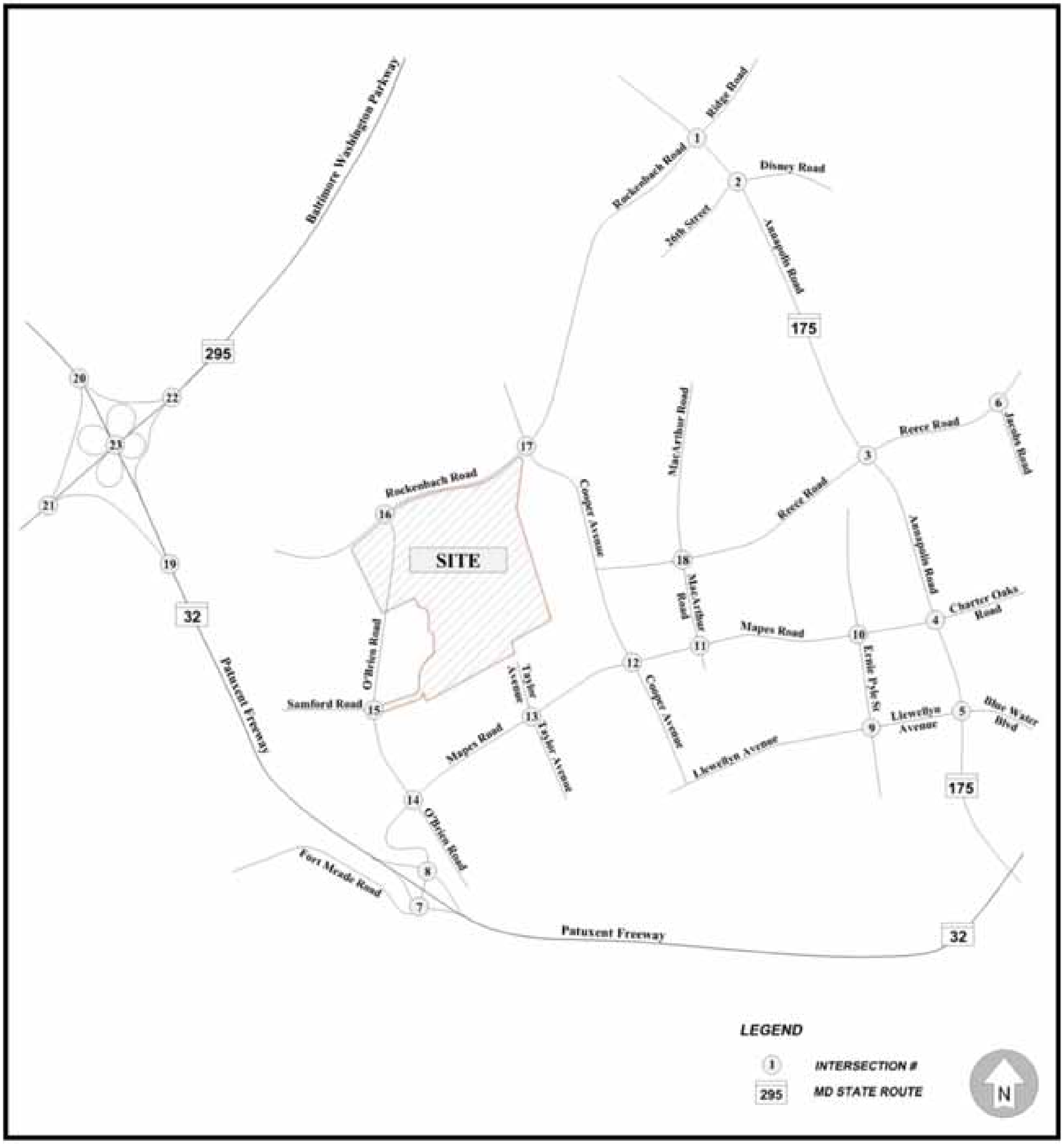


Figure 3.2-2. Study Area Intersections

Existing Conditions: Traffic Volumes

Turning movement traffic counts for the intersection of O'Brien Road/Samford were performed during regular weekday mornings (6 to 8 a.m.) and evenings (4 to 6 p.m.) peak hours for this study. Traffic counts for all other study area intersections were obtained from a report titled *Fort Meade Installation-Wide Traffic and Safety Engineering Study* (DOD 2008b). Additional information on existing conditions was obtained from reports titled *Fort Meade BRAC Near Term Highway Corridor Studies* (Anne Arundel County 2009b) and *Site M Transportation Management Plan, Fort George G. Meade, Maryland* (WR&A 2010). Weekday peak hour traffic counts on the roadway/ramp links of MD 295/MD 32 interchange were obtained from the highway traffic monitoring team of Maryland State Highway Administration (SHA). The intersection traffic counts obtained from the Traffic and Safety Engineering Study and the interchange traffic counts obtained from the SHA team were conducted in 2007. In order to reflect the current (2009) traffic volumes, an annual compounded growth rate of 4 percent per year was applied to the old counts through 2009 based upon the *Anne Arundel County Design Manual: Guidelines for Traffic Impact Studies*. Note that 4 percent growth is a realistic rate considering the recent economic climate.

Figure 3.2-3 illustrates the AM/PM peak hour traffic volumes at each of the study area intersections and interchange links.

Existing Conditions: Capacity Analysis and Levels of Service

Traffic analyses were performed for the study area's signalized and unsignalized intersections using the latest version of traffic modeling and analysis software – Synchro version 7. Synchro/SimTraffic is the software application used in modeling traffic flow and optimizing traffic signal timing. AM/PM peak hour traffic volumes and lane configurations were programmed in Synchro to determine the intersection LOS. Due to continual growth in the area, the existing signal timings at the signalized intersections are in need of constant adjustments. Therefore, in an effort to show the best-case conditions, existing traffic signal timings were optimized.

Highway Capacity Software (HCS+) was used to analyze the weaving and merging/diverging conditions at the MD 295/MD 32 interchange.

The LOS describes the operational conditions of an intersection. It ranges from a LOS of A (least congested) through LOS F (most congested). Per Anne Arundel County and State of Maryland standards, levels at D or better for an intersection would be a satisfactory LOS. The intersections operating with LOS E or F are considered failed conditions.

Table 3.2-3 shows the general definition of each LOS category for a signalized intersection.

Table 3.2-3. LOS Definitions

Levels of Service	Operating Conditions	Delay (seconds per vehicle)
A	Free-flow condition	< 10
B	Little congestion	10–20
C	Moderate congestion	20–35
D	Approachable unstable flow with increasing congestion	35–55
E	Unstable flow, congested condition	55–80
F	Heavy congestion, stop and go	> 80

Source: TRB 2000

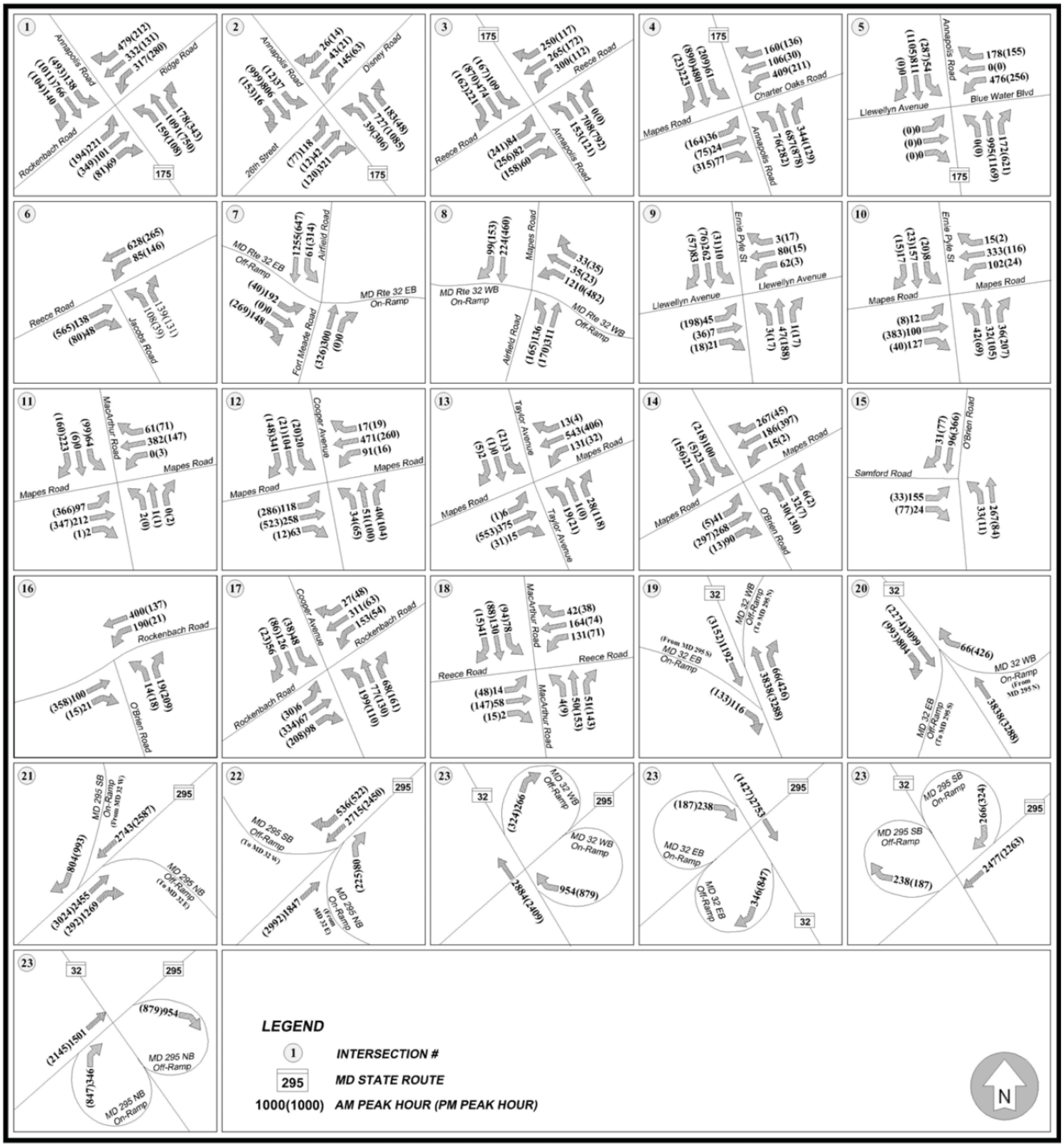


Figure 3.2-3. Existing Peak Hour Traffic Volumes (Year 2009)

Figure 3.2-4 presents the existing AM/PM peak hour LOS results at all the study area intersections and interchange. The results are discussed after the figure.

As shown in **Figure 3.2-4**, the signalized intersection of MD 175 and Rockenbach Road would operate with LOS E during existing conditions, which is considered a failed intersection. All other signalized and unsignalized study area intersections would maintain LOS D or better, which is an acceptable LOS per the county and state standard.

Per the HCS+ analysis results for the MD 295 and MD 32 interchange, the weaving segment along MD 32 in the westbound direction between on-ramp and off-ramp would fail in AM and PM peak hour conditions. The weaving segment along MD 295 in northbound direction between on-ramp and off-ramp would also fail in PM peak hour conditions. The weaving segments along the MD 32 eastbound and the MD 295 southbound directions would maintain satisfactory LOS D or better. All the merging/diverging segments would also operate with desired LOS.

3.3 Noise

3.3.1 Definition of Resource

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise can be intermittent or continuous, steady or impulsive, and can involve any number of sources and frequencies. It can be readily identifiable or generally nondescript. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day. Affected receptors can be specific (i.e., schools, churches, or hospitals) or broad areas (e.g., nature preserves or designated districts) in which occasional or persistent sensitivity to noise above ambient levels exists.

Noise Metrics. Sound varies by both intensity and frequency. Sound Pressure Levels (SPLs), described in decibels (dB) are used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of an SPL to a standard reference level. The cycles from high to low pressure each second, also called Hertz (Hz), are used to quantify sound frequency. The human ear responds differently to different frequencies. A-weighted decibels (dBA) are used to characterize sound levels that can be sensed by the human ear. "A-weighted" denotes the adjustment of the frequency content of a sound-producing event to represent the way in which the average human ear responds to the audible event. All sound levels discussed in this EIS are A-weighted.

The SPL noise metric describes instantaneous noise levels; there is no time domain associated with an SPL. The equivalent noise level (L_{eq}) is often used to describe an average noise level occurring over a stated period of time, usually an hour. Being an average, it is the total energy of the noise, so it is easier to measure and a better indicator of the likelihood that a noise would generate complaints. Many noise standards and noise ordinances are based on L_{eq}. The Day-Night Average A-weighted Noise Level (DNL) is a form of 24-hour average noise level. DNL is the energy-averaged sound level measured over a 24-hour period, with a 10-dBA penalty assigned to nighttime noise events (10:00 p.m. to 7:00 a.m.) to account for increased annoyance. DNL is a useful descriptor for noise because it averages ongoing, yet intermittent, noise, and it measures total sound energy over a 24-hour period.

Federal Regulations. The Federal government has established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social effects associated with noise. According to U.S. Army,

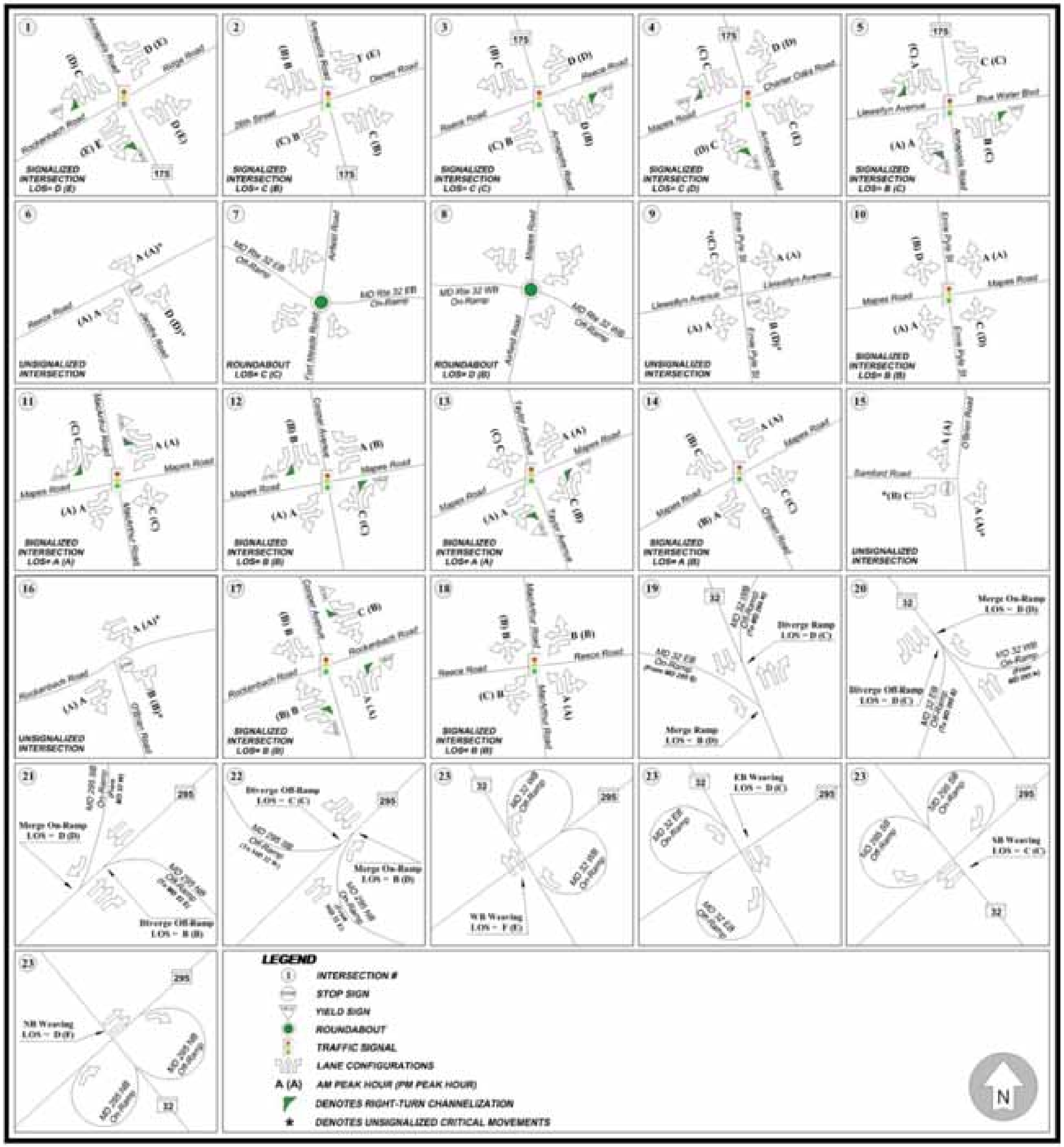


Figure 3.2-4. Existing Lane Geometry and Level of Service (Year 2009)

Federal Aviation Administration, and the U.S. Department of Housing and Urban Development (HUD) criteria, residential units and other noise-sensitive land uses are "clearly unacceptable" in areas where the DNL noise exposure exceeds 75 dBA, "normally unacceptable" in regions exposed to noise between 65 and 75 dBA, and "normally acceptable" in areas exposed to noise of 65 dBA or less. The Federal Interagency Committee on Noise developed land use compatibility guidelines for noise in terms of DNL (FICON 1992). For outdoor activities, the U.S. Environmental Protection Agency (USEPA) recommends a DNL of 55 dBA as the sound level below which there is no reason to suspect that the general population would be at risk from any of the effects of noise (USEPA 1974).

EO 12088, *Federal Compliance with Pollution Control Standards*, identified the head of each executive agency as being responsible for ensuring that all necessary actions are taken for the prevention, control, and abatement of environmental pollution with respect to Federal facilities and activities under the control of the agency. The head of each executive agency is responsible for compliance with applicable pollution control standards, which includes the Noise Control Act of 1972 (Public Law 92-574). "Applicable pollution control standards" means the same substantive, procedural, and other requirements would apply to a private person under the Act. The executive agency is responsible for submitting an annual plan for the control of environmental pollution, which shall provide for any necessary improvement in the design, construction, management, operation, and maintenance of Federal facilities and activities. The head of each executive agency also ensures that sufficient funds for compliance with applicable pollution control standards are requested in the agency budget.

Under the Noise Control Act of 1972, the Occupational Safety and Health Administration (OSHA) established workplace standards for noise. The minimum requirement states that constant noise exposure must not exceed 90 dBA over an 8-hour period. The highest allowable sound level to which workers can be constantly exposed to is 115 dBA, and exposure to this level must not exceed 15 minutes within an 8-hour period. The OSHA limit for instantaneous noise exposure, such as impact noise, is 140 dBA. An employer must administer a continuing, effective hearing conservation program as provided in 29 CFR Part 1910.95(c) if employee noise exposure equals or exceeds an 8-hour average sound level of 85 dBA. One component of the program is that employers are required to provide hearing protection equipment that will reduce sound levels to acceptable limits (29 CFR Part 1910.95).

State Regulations. The State of Maryland's Environmental Noise Act of 1974 limits noise to the level that will protect health, general welfare, and property. The State of Maryland limits both the overall noise environment (see **Table 3.3-1**) and the maximum allowable noise level for residential, industrial, and commercial areas (see **Table 3.3-2**). Construction and demolition activities are exempt from the limits shown in **Tables 3.3-1** and **3.3-2** during the daytime hours (i.e., between 7:00 a.m. and 10:00 p.m.). For construction and demolition activities, a person may not cause or permit noise levels that exceed 90 dBA during daytime hours or the noise levels specified in **Table 3.3-2** during nighttime hours (i.e., between 10:00 p.m. and 7:00 a.m.). Blasting operations for construction and demolition activities are exempt from the limits shown in **Tables 3.3-1** and **3.3-2** during the daytime hours. In addition, noise from pile-driving activities is exempt from the limits shown in **Tables 3.3-1** and **3.3.2** during the daytime hours of 8 a.m. to 5 p.m. Emergency operations are completely exempt from the regulation (Code of Maryland Regulations [COMAR] 26.02.03).

Per COMAR 26.02.03, an exception to the regulation could be requested if an individual feels that meeting the requirements is not practical in a particular case. The request must be submitted in writing to the Maryland Department of the Environment (MDE) and must provide evidence as to why compliance is not practical.

Table 3.3-1. State of Maryland Overall Environmental Noise Standards

Zoning District	Sound Level (dBA)	Measure
Industrial	70	L_{eq} (24-hour)
Commercial	64	DNL
Residential	55	DNL

Source: COMAR 26.02.03

Table 3.3-2. Maximum Allowable Noise Levels for Receiving Land Use Categories

Day/Night	Maximum Allowable Noise Levels (dBA)		
	Industrial	Commercial	Residential
Day (7 a.m. to 10 p.m.)	75	67	65
Night (10 p.m. to 7 a.m.)	75	62	55

Source: COMAR 26.02.03

Ambient Sound Levels. Noise levels vary depending on the housing density and proximity to parks and open space, major traffic areas, or airports. As shown on **Table 3.3-3**, the noise level in a normal suburban area is a DNL of about 55 dBA, which increases to 60 dBA for an urban residential area, and to 80 dBA in the downtown section of a city (USEPA 1974). Most people are exposed to sound levels of 50 to 55 dBA or higher on a daily basis.

Table 3.3-3. Typical Outdoor Noise Levels

DNL (dBA)	Location
50	Residential area in a small town or quiet suburban area
55	Suburban residential area
60	Urban residential area
65	Noisy urban residential area
70	Very noisy urban residential area
80	City noise (downtown of major metropolitan area)
88	3rd floor apartment in a major city next to a freeway

Source: USEPA 1974

Construction Sound Levels. Clearing and grading activities, and building construction, can cause an increase in sound that is well above the ambient level. A variety of sounds come from graders, pavers, trucks, welders, and other work processes. **Table 3.3-4** lists sound levels associated with common types of construction equipment that could be used under the Proposed Action and alternatives. Construction equipment usually exceeds the ambient sound levels by 20 to 25 dBA in an urban environment and up to 30 to 35 dBA in a quiet suburban area.

Table 3.3-4. Predicted Noise Levels for Construction Equipment

Construction Category and Equipment	Predicted Noise Level at 50 feet (dBA)
Clearing and Grading	
Bulldozer	80
Grader	80–93
Truck	83–94
Roller	73–75
Excavation	
Backhoe	72–93
Jackhammer	81–98
Building Construction	
Concrete mixer	74–88
Welding generator	71–82
Pile driver	91–105
Crane	75–87
Paver	86–88

Source: USEPA 1971

3.3.2 Existing Conditions

Fort Meade, including current NSA areas, is relatively quiet with no significant sources of noise. The existing NSA campus does not have an airfield, heavy industrial operations, or heavy weapons ranges. The main source of noise on Fort Meade and the NSA campus is vehicular traffic. Other sources of noise on Fort Meade and the NSA campus include the normal operation of heating, ventilation, and air conditioning (HVAC) systems; military unit physical training; lawn maintenance; snow removal; and construction activities. None of these operations or activities produces excessive levels of noise.

Vehicular traffic is the major contributor to the ambient noise levels at Fort Meade (USACE Mobile District 2007). Two major highways in the region are adjacent to Fort Meade: MD 295 (BW Parkway) to the north and MD 32 (Patuxent Freeway) to the west. MD 295 and MD 32 provide direct access to the NSA campus area of the installation via ramps onto Canine Road, and MD 32 provides access to Fort Meade via ramps onto Mapes Road. In addition, the roadways in the immediate vicinity of Site M (Canine Road to the west, O'Brien Road on the western side of Site M-1, Rockenbach Road to the north, and Mapes Road to the south) are designated as primary roads within the installation and are, therefore, heavily used by Fort Meade and NSA personnel. Cooper Avenue east of Site M is designated as a secondary road (Fort Meade 2005b).

Another potential noise source is Tipton Airport, a public airport approximately 1.7 miles southwest of Site M-1 just south of the Fort Meade installation boundary (URS/LAD 2009). Approximately 135 aircraft operations per day are conducted at the airfield, primarily by transient general aviation aircraft (AirNav 2009). Aircraft noise in the Fort Meade area is low, however, due to the fact that approach paths to the Tipton runway are oriented in an east-west direction, and commercial planes are not permitted to fly over the NSA campus. Occasional helicopter arrivals and departures from Fort Meade that are required for Naval Support Activity Washington's mission can increase the local ambient sound levels, but these events are generally of short duration (URS/LAD 2009).

The 2009 *Environmental Impact Statement for the Proposed Utilities Upgrade Project at Fort George G. Meade* estimated existing ambient noise levels at several locations within Fort Meade and the NSA campus. Noise levels were estimated to be between a DNL of 55 to 65 dBA, depending on the noise-sensitive receptor's proximity to major roadways (DOD 2009a). Therefore, existing ambient noise levels at Fort Meade and the NSA campus fall into the "normally acceptable" range as defined by U.S. Army, Federal Aviation Administration, and HUD criteria.

The Patuxent Research Refuge, administered by the USFWS, abuts the installation to the southwest. The northern tract of the refuge is directly across MD 32 from the installation; activities within the north tract include hunting, fishing, wildlife observation, trails, and many interpretive programs (USFWS 2009). An outdoor small arms firing range is within the northeastern corner of the refuge, approximately 5,000 feet east of Tipton Airport. The range is actively used by local law enforcement personnel and Federal and government personnel, for handgun and rifle proficiency training. Ambient noise levels in recreational areas vary from approximately 35 dBA in wilderness areas up to approximately 60 dBA in heavily used areas (USEPA 1974). Due to the multiple noise-generating activities adjacent to the northern portion of the Patuxent Research Refuge (i.e., Tipton Airport, the small arms range, and MD 32) the ambient noise level in this area would be expected to approach a suburban residential area, as shown in **Table 3.3-3**.

3.4 Air Quality

3.4.1 Definition of Resource

Air pollution is the presence in the outdoor atmosphere of one or more contaminants (e.g., dust, fumes, gas, mist, odor, smoke, or vapor) in quantities and of characteristics and duration such as to be injurious to human, plant, or animal life or to property, or to interfere unreasonably with the comfortable enjoyment of life and property. Air quality as a resource incorporates several components that describe the levels of overall air pollution within a region, sources of air emissions, and regulations governing air emissions. Below is a discussion of the regional climate, the National Ambient Air Quality Standards (NAAQS), local ambient air quality, and the State Implementation Plan (SIP) for the CAA for the Baltimore region.

3.4.2 Existing Conditions

Regional Climate. The climate of the project area is affected by its proximity to the Chesapeake Bay, Delaware Bay, and Atlantic Ocean. The daily average high temperatures range from 40 degrees Fahrenheit (°F) during January to 87 °F during July. Daily average low temperatures range from 23 °F during January to 67 °F during July. The record minimum and maximum temperatures are -7 °F and 105 °F, respectively. The annual average precipitation amounts to 41 inches and is uniformly distributed throughout the year. The annual average snowfall amounts to 20 inches. At least a trace of precipitation occurs on approximately one-third of the days during the year. Prevailing winds are from the west-northwest. Southwesterly winds are more frequent during the summer months and northwesterly winds are more frequent during the winter months. The region is frequently under the influence of the Bermuda High Pressure System during the summer months. Air quality problems in the region are typically associated with this summer phenomenon (USACE Mobile District 2007).

National Ambient Air Quality Standards and Attainment Status. USEPA Region 3 and MDE regulate air quality in Maryland. The CAA (42 U.S.C. 7401–7671q), as amended, gives USEPA the responsibility to establish the primary and secondary NAAQS (40 CFR Part 50) that set acceptable concentration levels for seven criteria pollutants: particulate matter less than 10 microns (PM_{10}), $PM_{2.5}$, sulfur dioxide (SO_2), carbon monoxide (CO), NO_x, O_3, and lead. Short-term standards (i.e., 1-, 8-, and 24-hour periods) have been established for pollutants contributing to acute health effects, while long-term standards (i.e., annual averages) have been established for pollutants contributing to chronic health effects. Each state has the authority to adopt standards stricter than those established under the Federal program; however, the State of Maryland accepts the Federal standards.

Federal regulations designate air quality control regions (AQCRs) that have concentrations of one or more of the criteria pollutants that exceed the NAAQS as *nonattainment* areas. Federal regulations designate AQCRs with levels below the NAAQS as *attainment* areas. *Maintenance* areas are AQCRs that have previously been designated nonattainment and have been redesignated to attainment for a probationary period through implementation of maintenance plans. According to the severity of the pollution problem, nonattainment areas can be categorized as marginal, moderate, serious, severe, or extreme. Anne Arundel County (and therefore Fort Meade and NSA) is within the Baltimore Intrastate AQCR, or AQCR 115 (40 CFR 81.12). AQCR 115 is within the ozone transport region (OTR) that includes 11 states and Washington, DC. USEPA has designated Anne Arundel County as the following (40 CFR 81.321):

- Moderate nonattainment for the 8-hour O_3 NAAQS
- Attainment for all other criteria pollutants.

Local Ambient Air Quality. Existing ambient air quality conditions in the region can be estimated from measurements conducted at air quality monitoring stations close to the NSA campus. The most recent available data from MDE for nearby monitoring stations describe the existing ambient air quality conditions at Fort Meade, including current NSA areas (see **Table 3.4-1**). With the exception of the 8-hour O_3 NAAQS, most recent air quality measurements are below the NAAQS (USEPA 2008a). The reported measurement of 0.113 ppm for the 8-hour level exceeds the NAAQS of 0.08 ppm. This exceedance is expected because the region has been designated an O_3 nonattainment area.

State Implementation Plan. The CAA, as amended in 1990, mandates that state agencies adopt SIPs that target the elimination or reduction of the severity and number of violations of the NAAQS. SIPs set forth policies to expeditiously achieve and maintain attainment of the NAAQS.

Because the Baltimore Metropolitan Area is a moderate nonattainment area for the 8-hour O_3 NAAQS, the State of Maryland was required to develop SIPs that outline the actions that would be taken to achieve the 8-hour O_3 NAAQS. The current USEPA-approved regional air quality plans are the *Baltimore Nonattainment Area 8-Hour Ozone State Implementation Plan and Base Year Inventory* (MDE 2007). Within this plan, MDE compiles a regional emissions inventory and sets regional emissions budgets. The current USEPA-approved SIP revisions for the region estimates of NO_x and VOC are outlined below (see **Table 3.4-2**).

Since 1990, Maryland has developed a core of air quality regulations that have been approved by the USEPA. These approvals signified the development of the general requirements of the Maryland SIP. The Maryland program for regulation of air emissions affects industrial sources, commercial facilities, and residential development activities. Regulation occurs primarily through a process of reviewing engineering documents and other technical information, applying emissions standards and regulations in the issuance of permits, performing field inspections, and assisting industries in determining their compliance status with applicable requirements.

The CAA defines mandatory Class I Federal areas as certain national parks, wilderness areas, national memorial parks, and international parks that were in existence as of August 1977. There are no Class I areas in the State of Maryland. Class I Areas closest to the Site M include Shenandoah National Park and James River Face in Virginia, and Otter Creek and the Dolly Sods Wilderness Area in West Virginia (USEPA 2008b).

Table 3.4-1. 2007 Local Ambient Air Quality Monitoring Results

Pollutant	Primary NAAQS [a]	Secondary NAAQS [a]	Monitored Data [b]
CO			
8-Hour Maximum [c] (parts per million [ppm])	9	None	3.1
1-Hour Maximum [c] (ppm)	35	None	19
NO_2			
Annual Arithmetic Mean (ppm)	0.053	0.053	0.019
O_3			
8-Hour Maximum [d] (ppm)	0.08	0.12	0.113
$PM_{2.5}$			
Annual Arithmetic Mean [e] (micrograms per cubic meter [$\mu g/m^3$])	15	15	14.1
24-Hour Maximum [f] ($\mu g/m^3$)	65	65	46
PM_{10}			
Annual Arithmetic Mean [g] ($\mu g/m^3$)	50	50	29
24-Hour Maximum [c] ($\mu g/m^3$)	150	150	64
SO_2			
Annual Arithmetic Mean (ppm)	0.03	None	0.004
24-Hour Maximum [c] (ppm)	0.14	None	0.021

Notes:

a. Source: 40 CFR 50.1–50.12.
b. Source: USEPA 2008a.
c. Not to be exceeded more than once per year.
d. The 3-year average of the fourth highest daily maximum 8-hour average O_3 concentrations over each year must not exceed 0.08 ppm.
e. The 3-year average of the weighted annual mean $PM_{2.5}$ concentrations at each monitor within an area must not exceed 15.0 $\mu g/m^3$.
f. The 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor must not exceed 65 $\mu g/m^3$.
g. The 3-year average of the weighted annual mean PM_{10} concentration at each monitor within an area must not exceed 50 $\mu g/m^3$.

Table 3.4-2. 2009 Projected Annual Emissions Inventory for the Baltimore Nonattainment Area

Emission Source	Criteria Pollutant or Precursor Emissions (tons per year [tpy])			
	NO_x	VOC	$PM_{2.5}$	SO_x
Point	23,644	3,903	3,291	113,942
Quasi-Point	3,401	500	408	2,189
Area	7,862	37,537	9,196	5,396
Non-Road	11,696	12,566	1,403	413
On-Road	36,502	13,460	686	320
Biogenics	635	33,527	0	0
Total	**83,742**	**101,496**	**14,987**	**122,261**

Source: MDE 2007

Clean Air Act Conformity. The 1990 amendments to the CAA require Federal agencies to ensure that their actions conform to the SIP in a nonattainment area. USEPA has developed two distinctive sets of conformity regulations: one for transportation projects and one for nontransportation projects. Nontransportation projects are governed by general conformity regulations (40 CFR Parts 6, 51, and 93), described in the final rule *Determining Conformity of General Federal Actions to State or Federal Implementation Plans*, published in the *Federal Register* on November 30, 1993. The General Conformity Rule requirements became effective January 31, 1994. Under Section 176(c) of CAA, the General Conformity Rule became applicable 1 year after the O_3 nonattainment designations became effective. Maryland has adopted the Federal conformity regulations by reference (COMAR 26.11.26.03). The Proposed Action is a nontransportation project within a nonattainment area. Therefore, a general conformity analysis is required with respect to the 8-hour O_3 NAAQS.

The General Conformity Rule specifies threshold emissions levels by pollutant to determine the applicability of conformity requirements for a project (see **Table 3.4-3**). For an area in moderate nonattainment for the 8-hour O_3 NAAQS within the OTR, the applicability criterion is 100 tons per year (tpy) for NO_x and 50 tpy for VOCs (40 CFR 93.153).

Table 3.4-3. Applicability Thresholds for Nonattainment Areas

Criteria pollutants	Applicability threshold (tpy)
O_3 (NO_x or VOCs)	
Serious Nonattainment Areas	50
Severe Nonattainment Areas	25
Extreme Nonattainment Areas	10
Other O_3 Nonattainment Areas outside an O_3 Transport Region	100
Marginal and Moderate Nonattainment Areas Inside an O_3 Transport Region	
VOC	**50**
NO_x	**100**
CO	100
All Nonattainment Areas	100
SO_2 or NO_x	
All Nonattainment Areas	100
PM_{10}	
Moderate Nonattainment Areas	100
Serious Nonattainment Areas	70
$PM_{2.5}$ ($PM_{2.5}$, NO_x)	
All Nonattainment Areas	100
Lead	
All Nonattainment Areas	25

Sources: 40 CFR 93.153 and 71 FR 40420

Mobile Sources. Mobile sources of concern include primarily automobiles and vehicular traffic. The primary air pollutants from mobile sources are CO, NO_x, and VOCs. Lead emissions from mobile sources have declined in recent years through the increased use of unleaded gasoline and are extremely small. Potential SO_2 and particulate emissions from mobile sources are small compared to emissions from point sources, such as power plants and industrial facilities. Air quality impacts from traffic are generally evaluated on two scales.

- *Mesoscale* – Mesoscale analysis is performed for the entire AQCR by the MDE. Potential emissions increases from additional vehicle miles traveled resulting from an action could affect regional O_3 levels. However, because these are problems of regional concern and subject to air transport phenomena under different weather conditions, regional impacts are generally evaluated using regional airshed models. Mesoscale analysis is not sensitive enough to detect changes due to a single project and generally not conducted on a project-specific basis. Additional information on a cumulative analysis for the region, regional modeling, and transportation conformity can be found in **Section 5.1**.
- *Microscale* – Microscale analysis is performed to identify localized hot spots of criteria pollutants. CO is a site-specific pollutant with higher concentrations found adjacent to roadways and signalized intersections. Microscale analysis is often conducted on a project-specific basis in regions where CO is of particular concern. Anne Arundel County, and therefore NSA and Fort Meade, is neither a nonattainment nor a maintenance area for CO; therefore, microscale analysis is not necessary for this EIS.

The project does not involve new intermodal freight or bus terminals, major highway projects, or significant diesel traffic. The intersections affected are primarily secondary arterial roads, at which it is not expected for levels of $PM_{2.5}$ to exceed the NAAQS (USEPA 2008c). A detailed qualitative $PM_{2.5}$ analysis has not been conducted because the Proposed Action does not meet any of the following criteria:

- A new or expanded highway project that serves a significant volume of or will result in a significant increase in diesel vehicles, such as facilities with greater than 125,000 annual average daily traffic (AADT) and 8 percent or more of such AADT is diesel truck traffic
- A project that creates a new, or expands or improves accessibility to, an existing bus or rail terminal or transfer point that will have a significant number of diesel vehicles congregating at that location, or that is defined as regionally significant
- A project that affects intersections that are at LOS D, E, or F with a significant number of diesel vehicles, or that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project
- A project otherwise considered a project of "air quality concern" as outlined in 40 CFR 93.123 (b)(1)(i),(ii),(iii) or (iv).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the CAA. The MSATs are compounds emitted from highway vehicles and nonroad equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. In the design year it is expected that MSAT levels could be higher in some locations than others, but current tools and science are not adequate to quantify them. However, on a regional basis, USEPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause regionwide MSAT levels to be significantly lower than today (USDOT 2006).

Existing Emissions. Title V of the CAA requires states to establish an air operating permit program. The requirements of Title V are outlined in the Federal regulations in 40 CFR Part 70 and in the MDE's regulations at COMAR 26.11.03. The permits required by these regulations are often referred to as Title V or Part 70 permits. Based on its PTE, NSA is a major source of air emissions for NO_x. Stationary sources of air emissions at NSA include boilers, generators, and classified material reclamation furnaces. An NSA campuswide Title V permit (No. 24-003-00317) was issued on April 1, 2005 (NSA 2005). As part of the Title V permit requirements, NSA must submit a comprehensive emissions statement annually. **Table 3.4-4** summarizes the 2008 NSA campus emissions from significant stationary sources. Fort Meade (not including NSA) holds a Synthetic Minor permit and has accepted federally enforceable limitations to ensure its emissions remain below the major source thresholds for all criteria pollutants. Because the activities described in this EIS would ultimately be located entirely on the NSA campus and would be under the direct control of NSA, all new stationary sources of emissions would be processed as an addition to the NSA campuswide Title V permit, and not Fort Meade's permit.

Table 3.4-4. 2008 Emissions from Significant Stationary Sources at NSA (tpy)

SO_x	CO	PM_{10}	$PM_{2.5}$	NO_x	VOC	Total HAP
9.38	3.13	0.85	0.01	39.77	2.61	0.31

Source: Vice 2009

Permitting Requirements. MDE oversees programs for permitting the construction and operation of new or modified stationary source air emissions in Maryland. Maryland air permitting is required for many industries and facilities that emit regulated pollutants. Based on the size of the emissions units and type of pollutants emitted (criteria pollutants or hazardous air pollutants [HAPs]), MDE sets permit rules and standards for emissions sources.

The air quality permitting process begins with the application for a construction permit. The generator facility, the boiler plant, and other stationary sources of air emissions would require permits to construct in one form or another. There are three types of construction permits available through the MDE for the construction and temporary operation of new emissions sources: Major New or Modified Source Construction Permits in Nonattainment Areas (Nonattainment New Source Review [NNSR]); Prevention of Significant Deterioration (PSD) permits in Attainment Areas; and Minor New Source Construction Permits (Minor New Source Review [NSR]).

NNSR and PSD permits are both part of the MDE Major NSR program. Thresholds that determine the type of construction permit that might be required depend on both the quantity and type of emissions. Thresholds requiring either an NNSR or a PSD permit for a modification to an existing source in Anne Arundel County are outlined in **Table 3.4-5**. PSD review and permitting is required for sources emitting 100 tpy of any regulated pollutant for any of 26 named PSD source categories. One of the named source categories is fossil fuel boilers that singly or in combination at a single facility total more than 250 million British thermal units per hour (MMBtu/hr) heat input (COMAR 26.11.01.01B[37]). For all other sources not in the 26 named source categories, PSD review is required if the source emits 250 tpy or more of any regulated pollutant.

Nonattainment New Source Review. Major New or Modified Source Construction Permits in Nonattainment Areas (NNSR Permit) are required for any major new sources or major modifications to existing sources intended to be constructed in an area designated as nonattainment. Currently, when undergoing a physical or operational change, a source determines major NSR applicability through a

Table 3.4-5. Major Modification Thresholds of Criteria Pollutants within Anne Arundel County

Pollutant	New major source (tpy)		Major modification to an existing source [a] (tpy)	
	PSD [b]	NNSR	PSD	NNSR
CO	250 (100)	N/A	100	N/A
NO_x	N/A	25	N/A	25
SO_2	250 (100)	N/A	40	N/A
PM	250 (100)	N/A	25	N/A
PM_{10}	250 (100)	N/A	15	N/A
$PM_{2.5}$	250 (100)	N/A	10	N/A
VOCs	N/A	25	N/A	25

Source: COMAR 26.11.17.01, 40 CFR Part 52

Notes:

a. Represents the project emissions increase considered "significant."

b. PSD review and permitting is required for sources emitting 100 tpy of any regulated pollutant for fossil fuel boilers (or combination of them) totaling more than 250 MMBtu/hr heat input (COMAR 26.11.01.01B (37)).

Key: N/A = Not applicable

two-step analysis. First, determine if the increased emissions from a particular proposed project alone are above the thresholds. If the emissions increased were below the threshold, a NNSR permit would not be required. Second, if the emissions increased were above the threshold, a procedure called "netting" is applied to determine if the project's net emissions plus all contemporaneous increases and decreases in the previous 5 years at the source are above the thresholds (COMAR 26.11.17.01 B (16) and COMAR 26.11.17.02 F (1)). If this determination results in an increase that is lower than the threshold, an NNSR permit would not be required.

NNSR permits are legal documents that specify what construction is allowed; what emissions limits must not be exceeded; reporting, recordkeeping, and monitoring requirements; and often how the source can be operated. The NNSR permitting process typically takes 18 to 24 months. Specifically, typical requirements for a NNSR permit can include the following:

- Best Available Control Technology (BACT) review for qualifying attainment criteria pollutants
- Lowest achievable emission rate (LAER) review for qualifying nonattainment pollutants (i.e., VOC and NO_x)
- Maximum Achievable Control Technology (MACT) review for HAPs
- Air quality analysis (predictive air dispersion modeling)
- Acquiring emissions offsets at a 1 to 1.3 or greater ratio for all contemporaneous emissions increases that have occurred or are expected to occur
- A public involvement process.

Prevention of Significant Deterioration. The PSD program protects the air quality in attainment areas. PSD regulations impose limits on the amount of pollutants that major sources can emit. The PSD process would apply to all pollutants for which the region is in attainment (all but O_3). The PSD permitting process typically takes 18 to 24 months to complete. Sources subject to PSD are typically required to complete the following:

- BACT review for criteria pollutants
- Predictive modeling of emissions from proposed and existing sources
- Public involvement.

Minor New Source Review. A Minor New, Modified, and certain Major Source Construction Permit (or Minor NSR permit) would be required to construct minor new sources, minor modifications of existing sources, and major sources not subject to NNSR or PSD permit requirements. The Minor NSR permitting process typically takes 4 to 5 months to complete. Sources subject to Minor NSR could be required to complete the following:

- BACT review for each criteria pollutant
- MACT review for regulated HAPs and designated categories
- Air quality analysis (predictive air dispersion modeling), upon request by MDE
- Establish procedures for measuring and recording emissions and process rates.

Maryland Public Service Commission (PSC). In Maryland, agencies constructing an electric generating station, including emergency back-up power, must apply for and obtain either (1) Certificate of Public Convenience and Necessity (CPCN) for larger power generation projects, or (2) or a CPCN waiver for smaller power generation projects that meet certain applicability thresholds established by the PSC. Waivers are available for generating stations designed to provide onsite-generated electricity where the capacity of the generating station does not exceed 70 megawatts.

Operation Permits. Under MDE's Title V Facility Permit regulations (COMAR 26.11.02 and 26.11.03), a Title V Significant Permit Modification is required for facilities whose emissions increases exceed the emissions thresholds outlined in **Table 3.4-5**. In addition, a Significant Permit Modification would be required if it became necessary to establish federally enforceable limitations to reduce potential emissions below the thresholds. A minor permit modification would be required if emissions were below the thresholds and a federally enforceable limit was not necessary. Submission of an application for these permit modifications would be required within 1 year of the first operation of a new emissions source.

Because this EIS has several separate project components that are being evaluated, it is important to assess how they can be combined or aggregated for permitting. Project emissions are aggregated from projects that are technically or economically dependent. A technically dependent project is incapable of being performed as planned in the absence of the other project. Economically dependent projects require each other for their economic viability. The generator plant and boiler plant are all both technically and economically independent of each other. Therefore, their emissions would not be aggregated for permitting purposes. Other stationary sources of air emissions would have to be reviewed on a case-by-case basis during the permitting process to make this determination.

In addition to the permitting requirements to construct and operate new or modified emissions sources, NSPS and National Emission Standards for Hazardous Air Pollutants (NESHAPs) set emissions-control standards for categories of new stationary emissions sources of both criteria pollutants and HAPs.

The NSPS process requires USEPA to list categories of stationary sources that cause or contribute to air pollution that might reasonably be anticipated to endanger public health or welfare. The NSPS program sets uniform emissions limitations for many industrial sources. As of July 11, 2005, stationary diesel engines (such as back-up generators) are subject to NSPS. Applicability of the NSPS is based on engine size and date of purchase and construction. Limitations on emissions come into effect using a tiered approach over time, Tier 1 being the least restrictive and Tier 4 being the most. In addition, boilers and gas combustion turbines with a maximum heat input of 10 MMBtu/hr or greater would be required to comply with NSPS.

The CAA Amendments of 1990, under revisions to Section 112, required USEPA to list and promulgate NESHAPs to reduce the emissions of HAPs, such as formaldehyde, benzene, xylene, and toluene from categories of major and area sources (40 CFR Part 63). New stationary sources whose PTE HAPs exceed either 10 tpy of a single HAP, or 25 tpy of all regulated HAPs, would be subject to MACT requirements.

Greenhouse Gases and Global Warming. Greenhouse gases (GHGs) are components of the atmosphere that trap heat relatively near the surface of the earth, and therefore, contribute to the greenhouse effect and global warming. Most GHGs occur naturally in the atmosphere, but increases in their concentration result from human activities such as the burning of fossil fuels. Global temperatures are expected to continue to rise as human activities continue to add carbon dioxide, methane, nitrous oxide, and other greenhouse (or heat-trapping) gases to the atmosphere. Most of the United States is expected to experience an increase in average temperature. Precipitation changes, which are also very important to consider when assessing climate change effects, are more difficult to predict. Whether or not rainfall will increase or decrease remains difficult to project for specific regions (USEPA 2010a, IPCC 2007).

The extent of climate change effects, and whether these effects prove harmful or beneficial, will vary by region, over time, and with the ability of different societal and environmental systems to adapt to or cope with the change. Human health, agriculture, natural ecosystems, coastal areas, and heating and cooling requirements are examples of climate-sensitive systems. Rising average temperatures are already affecting the environment. Some observed changes include shrinking of glaciers, thawing of permafrost, later freezing and earlier break-up of ice on rivers and lakes, lengthening of growing seasons, shifts in plant and animal ranges, and earlier flowering of trees (USEPA 2010a, IPCC 2007).

Federal agencies, states, and local communities address global warming by preparing GHG inventories and adopting policies that will result in a decrease of GHG emissions. EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance* (October 5, 2009), outlines policies intended to ensure that Federal agencies evaluate climate change risks and vulnerabilities, and to manage the short- and long-term effects of climate change on their operations and mission. The EO specifically requires Federal agencies to measure, report, and reduce their GHG emissions from both their direct and indirect activities. NSA is a part of the DOD-wide program to reduce GHG emissions and has begun the process of inventorying their direct and indirect emissions of GHG, and determining their role in the overall process. This is both in response to, and consistent with, the guidelines put forth in EO 13514. Direct activities generating potential GHG emissions include sources the agencies own and control, and from the generation of electricity, heat, or steam they purchased. Indirect activities include their vendor supply chains, delivery services, and employee travel and commuting. For the purposes of simplicity in this EIS, Scope 1 and 2 GHG emissions outlined in EO 15314 were deemed *direct*, and Scope 3 GHG emissions were considered *indirect*. NSA is in the process of setting reduction goals for the Year 2020 as outlined in the EO. NSA is not considered a major GHG emissions source under the recent USEPA Mandatory Reporting of Greenhouse Gases Rule requiring the reporting of GHG emissions from large sources in the United States (USEPA 2010b).

3.5 Geological Resources

3.5.1 Definition of Resource

Geological resources consist of the Earth's surface and subsurface materials. Within a given physiographic province, these resources typically are described in terms of geology, topography and physiography, soils, and, where applicable, geologic hazards and paleontology.

Geology is the study of the Earth's composition and provides information on the structure and configuration of surface and subsurface features. Such information derives from field analysis based on observations of the surface and borings to identify subsurface composition.

Topography and physiography pertain to the general shape and arrangement of a land surface, including its height and the position of its natural and human-made features.

Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses. In appropriate cases, soil properties must be examined for their compatibility with particular construction activities or types of land use.

Prime farmland is protected under the Farmland Protection Policy Act (FPPA) of 1981. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The soil qualities, growing season, and moisture supply are needed for a well-managed soil to produce a sustained high yield of crops in an economic manner. The land could be cropland, pasture, rangeland, or other land, but not urban built-up land or water. The intent of the FPPA is to minimize the extent that Federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses. The Act also ensures that Federal programs are administered in a manner that, to the extent practicable, will be compatible with private, state, and local government programs and policies to protect farmland.

The implementing procedures of the FPPA and Natural Resources Conservation Service (NRCS) require Federal agencies to evaluate the adverse effects (direct and indirect) of their activities on prime and unique farmland, as well as farmland of statewide and local importance, and to consider alternative actions that could avoid adverse effects. Determination of whether an area is considered prime or unique farmland and potential impacts associated with a proposed action are based on preparation of the farmland conversion impact rating form AD-1006 for areas where prime farmland soils occur and by applying criteria established at Section 658.5 of the FPPA (7 CFR 658). The NRCS is responsible for overseeing compliance with the FPPA and has developed the rules and regulations for implementation of the Act (see 7 CFR Part 658, 5 July 1984).

3.5.2 Existing Conditions

Physiography and Topography. The region around Fort Meade is in the Atlantic Coastal Plain physiographic province, characterized by relatively flat topography that gently slopes toward the east. The lowest elevation on the installation is less than 100 feet above mean sea level (msl) in the southwestern corner along Little Patuxent River. The highest elevation is recorded at 300 feet above msl in the northwestern corner of the installation. Minor variation in microtopography occurs throughout Fort Meade and is attributable to disturbance caused by development (USACE 2005b). Slopes at Fort Meade are generally less than 10 percent grade (USACE Mobile District 2007).

Geology. The geologic history of the eastern United States is characterized by mountain-building processes and the cyclical opening and closing of a proto-Atlantic Ocean (USGS 2000). During the Alleghenian mountain-building event, shallow water marine sediments were uplifted, forming the Blue Ridge-South Mountain anticlinorium. During the Cenozoic Era (1.65 million years before present [BP] to Recent), the Blue Ridge-South Mountain anticlinorium began to erode, and Atlantic Coastal Plain sediments were deposited in lower elevations. Unconsolidated sand, clay, and silt compose the Atlantic Coastal Plain physiographic province. These sediments thicken towards the southeast, forming a wedge. Precambrian to early Cambrian igneous and metamorphic crystalline rocks underlie the sediments, and are exposed along the boundary between the Coastal Plain and Piedmont provinces several miles to the west of the installation.

Sediments underlying the Fort Meade region include interbedded, poorly sorted sand and gravel deposits up to 90 feet thick from the Pleistocene Epoch (100,000 to 1.65 million years BP); and the Patapsco Formation (0 to 400 feet thick), the Arundel Clay (0 to 100 feet thick), and the Patuxent Formation (0 to 250 feet thick) of the Potomac Group, which were deposited during the Cretaceous period (138 to 63 million years BP) (USACE 2005a, MGS 2008). Metamorphic Precambrian bedrock underlies the Patuxent Formation (USACE 2005b). The Arundel Clay acts as a confining layer between the Lower Patapsco Aquifer and the Patuxent Aquifer, in the Patapsco and Patuxent Formations, respectively. This clay is composed of red, gray, and brown grains with some ironstone nodules and plant fragments. The Midway Branch stream borders Site M in its eastern boundary. Streams are underlain by alluvium such as interbedded sand, silt, and clay with minor gravel inclusions. See **Section 3.6.2** for a discussion on hydrology.

Soils. Thirty-nine distinct soil series are mapped at Fort Meade, but the primary soil series is the Evesboro complex. The Evesboro complex composes 42 percent of the installation and is a deep, well- to excessively-drained sandy loam, which has only been slightly modified from the geologic parent material (U.S. Army 2007). Soils classified as Urban Land or Udorthents have also been mapped at Fort Meade. These classifications describe soils that have been modified and disturbed by earth-moving equipment or are composed of refuse, respectively.

Nine soil units have been mapped at Site M, including the Evesboro and Galestown soils, Patapsco-Evesboro-Fort Mott Complex, Downer-Hammonton Complex, Downer-Hammonton Urban Land Complex, Patapsco-Fort Mott Urban Land Complex, Sassafras and Croom soils, Zekiah and Issue silt loam, Udorthents, and Urban Land. All of these soils have been previously disturbed. Approximately 72 percent of soils mapped at Site M are classified as Evesboro and Galestown soils and Patapsco-Evesboro-Fort Mott Complex. The Evesboro and Galestown soils are classified as loamy sand with slopes ranging from 0 to 5 percent, and are somewhat excessively to excessively drained. The Patapsco-Evesboro-Fort Mott Complex is an excessively-drained, loamy sand with 0 to 5 percent slopes. All other soil units compose less than 10 percent of the soils mapped at Site M. **Table 3.5-1** lists the soil properties of soils mapped in order of descending extent at Site M (NRCS 2009).

Soils mapped at Site M are portrayed in **Figure 3.5-1**. At the site of the Proposed Action, four of the six soils mapped are rated as very limited for building construction. The Patapsco-Fort Mott Urban Land Complex, Evesboro and Galestown soils, and Udorthents are rated as very limited due to slope. The Zekiah and Issues silt loam flanks the Midway Branch stream and therefore is rated as very limited due to its flooding potential. Soils classified as very limited for roads at the Site of the Proposed Action would be the Zekiah and Issue silt loam (due to flood potential) and Udorthents (due to slope and shrink-swell potential). The Patapsco-Fort Mott Urban Land Complex and the Evesboro and Galestown soils are rated as somewhat limited for road construction because of slope (NRCS 2009). The Patapsco-Evesboro-Fort Mott Complex and Downer-Hammonton Complex (2 to 5 percent slopes) are rated as having no limitation for building or road construction.

At Site M-1 (Phase II), the only soil rated as having any limitations to building or road construction is the Evesboro-Galestown soil. This soil is rated as very limited due to slope for buildings, and somewhat limited due to slope for roads. The Downer-Hammonton complex (2 to 5 percent slopes) and the Patapsco-Evesboro-Fort Mott complex are rated as having no limitations to building or road construction (NRCS 2009).

Table 3.5-1. Soil Properties of Soils Mapped at Site M

Map Unit Name and Texture	Slope (percent)	Farmland Classification	Drainage	Road Limitations	Building Limitations
Evesboro and Galestown sandy loam	0 to 5	N	Excessively drained	S	V
Patapsco-Evesboro-Fort Mott sandy loam	0 to 5	St	Excessively drained	None	None
Downer-Hammonton complex loamy sand	2 to 5	P	Well-drained	None	None
Sassafras and Croom loam	15 to 25	N	Well-drained	V	V
Downer-Hammonton-Urban land complex	0 to 5	N	Moderately well drained	Not rated	Not rated
Patapsco-Fort Mott-Urban land complex	5 to 15	N	Somewhat excessively drained	S	V
Zekiah and Issue silt loam	0 to 2	N	Somewhat poorly drained	V	V
Downer-Hammonton complex loamy sand	5 to 10	St	Well-drained	S	V
Udorthents, refuse substratum	0 to 50	N	Well-drained	V	V
Urban Land	--	N	--	Not rated	Not rated

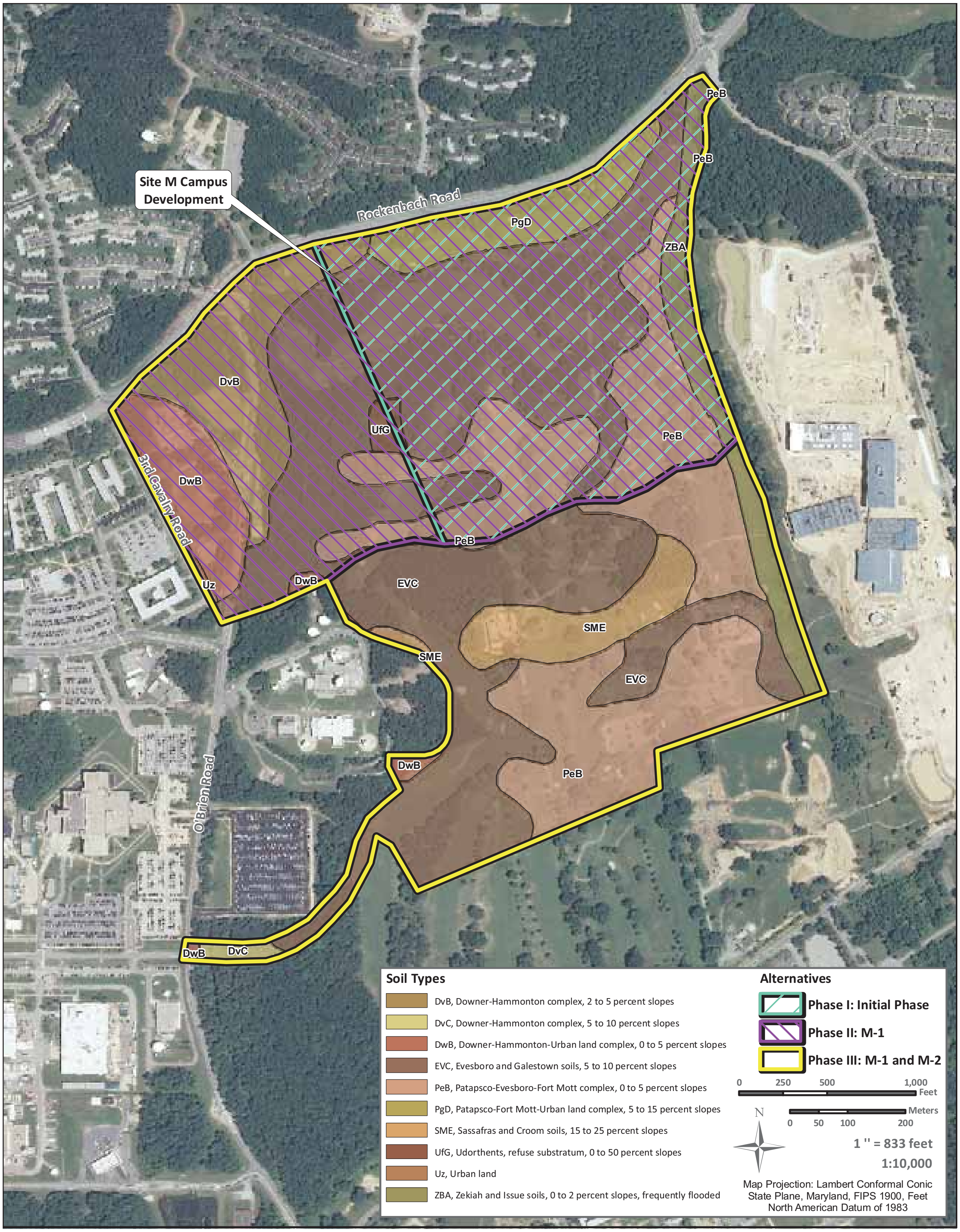
Source: NRCS 2009

Key:

P = prime farmland; St = farmland of statewide importance; N = not prime farmland; S = somewhat limited; V = very limited

In addition to the soils mapped for Phase I and Phase II, soils mapped for Phase III include Sassafras and Croom soils and the Downer-Hammonton Complex (5 to 10 percent slopes). These soils are rated as very limited for both building and road construction primarily due to slope. The Sassafras and Croom soils also have shrink-swell potential as a building constraint; the Downer-Hammonton Complex (5 to 10 percent slopes) is limited for building construction due to the depth to saturation. The Patapsco-Evesboro-Fort Mott Complex and Downer-Hammonton-Urban Land Complex are rated as having no construction limitations for roads or buildings within all of Site M (NRCS 2009).

Hydric Soils. The Zekiah component of the Zekiah and Issue silt loam mapping unit is designated as a hydric soil. Hydric soils are soils that are saturated, flooded, or ponded for long enough during the growing season to develop anaerobic (oxygen-deficient) conditions in their upper part. Anaerobic soil conditions are conducive to the establishment of vegetation that is adapted for growth under oxygen-deficient conditions and is typically found in wetlands (hydrophytic vegetation). The presence of hydric soil is one of the three criteria (hydric soils, hydrophytic vegetation, and wetland hydrology) used to determine that an area is a wetland based on the USACE *Wetlands Delineation Manual*, Technical Report Y-87-1 (USACE 1987). See **Section 3.7.1** for a discussion of wetlands on Site M.



Sources: Potential Project Actions: HDR | e²M, Inc 2010; Soils: USDA, 2006; Aerial Photography: USDA-APFO NAIP 2009.

Figure 3.5-1. Soil Types on Site M

Prime Farmland. Of the nine soil units mapped within Site M, one soil is considered a prime farmland soil, and two are considered to be farmland of statewide importance soils (NRCS 2009). However, these soils have all been previously disturbed and modified, and no agricultural use of these lands occurs or is planned to occur. Therefore the areas where these soils occur are not available for use in agriculture and would not be considered prime farmland or farmland of statewide importance.

Geologic Hazards. Geologic hazards are defined as a natural geologic event that can endanger human lives and threaten property. Examples of geologic hazards include earthquakes, landslides, sinkholes, and tsunamis. The U.S. Geological Survey (USGS) has produced seismic hazards maps based on current information about the rate at which earthquakes occur in different areas and on how far strong shaking extends from the quake source. The hazard maps show the levels of horizontal shaking that have a 2 in 100 chance of being exceeded in a 50-year period. Shaking is expressed as a percentage of the force of gravity (percent g) and is proportional to the hazard faced by a particular type of building. In general, little or no damage is expected at values less than 10 percent g, moderate damage could occur at 10 to 20 percent g, and major damage could occur at values greater than 20 percent g. The 2008 United States National Seismic Hazards Map shows that the region of Fort Meade has a very low seismic hazard rating of approximately 6 percent g (USGS 2009). No other potential geologic hazards are identified for the project areas.

3.6 Water Resources

3.6.1 Definition of the Resource

Water resources include groundwater, surface water, and floodplains. Evaluation of water resources examines the quantity and quality of the resource and its demand for various purposes. Groundwater consists of subsurface hydrologic resources. It is an essential resource that functions to recharge surface water and is often used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater typically can be described in terms of its depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate.

Surface water resources generally consist of wetlands, lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale. The Clean Water Act (CWA) (33 U.S.C. 1251 et seq., as amended) establishes Federal limits, through the National Pollutant Discharge Elimination System (NPDES), on the amounts of specific pollutants that are discharged to surface waters in order to restore and maintain the chemical, physical, and biological integrity of the water. The NPDES program regulates the discharge of point (end of pipe) and nonpoint sources (storm water) of water pollution. Section 404 of the CWA regulates the discharge of fill material into waters of the United States, which includes wetlands. Waters of the United States are defined within the CWA, as amended, and jurisdiction is addressed by the USEPA and the U.S. Army Corps of Engineers (USACE). These agencies assert jurisdiction over (1) traditional navigable waters, (2) wetlands adjacent to navigable waters, (3) nonnavigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months), and (4) wetlands that directly abut such tributaries. A water body can be deemed impaired if water quality analyses conclude that exceedances of water quality standards, established by the CWA, occur. The CWA requires that Maryland establish a Section 303(d) list to identify impaired waters and establish Total Maximum Daily Loads (TMDLs) for the sources causing the impairment. A TMDL is the maximum amount of a substance that can be assimilated by a water body without causing impairment.

The USEPA issued a Final Rule for the CWA concerning technology-based Effluent Limitations Guidelines and New Source Performance Standards for the Construction and Development point source category. All NPDES storm water permits issued by the USEPA or states must incorporate requirements established in the Final Rule. This Rule is effective February 1, 2010, and will be phased in over 4 years. All new construction sites are required to meet the non-numeric effluent limitations and to design, install, and maintain effective erosion and sedimentation controls, including the following:

- Control storm water volume and velocity to minimize erosion
- Minimize the amount of soil exposed during construction activities
- Minimize the disturbance of steep slopes
- Minimize sediment discharges from the site
- Provide and maintain natural buffers around surface waters
- Minimize soil compaction and preserve topsoil where feasible.

In addition, construction site owners and operators that disturb one or more acres of land are required to use best management practices (BMPs) to ensure that soil disturbed during construction activities does not pollute nearby water bodies. Effective August 1, 2011, construction activities disturbing 20 or more acres must comply with the numeric effluent limitation for turbidity in addition to the non-numeric effluent limitations. The maximum daily turbidity limitation is 280 nephelometric turbidity units (ntu). On February 2, 2014, construction site owners and operators that disturb 10 or more acres of land are required to monitor discharges to ensure compliance with effluent limitations as specified by the permitting authority. The USEPA's limitations are based on its assessment of what specific technologies can reliably achieve. Permittees can select management practices or technologies that are best suited for site-specific conditions.

Storm water is an important component of surface water systems because of its potential to introduce sediments and other contaminants that could degrade lakes, rivers, and streams. Proper management of storm water flows, which can be intensified by high proportions of impervious surfaces associated with buildings, roads, and parking lots, is important to the management of surface water quality and natural flow characteristics. Prolonged increases in storm water volume and velocity associated with development and increased impervious surfaces has the potential to impact adjacent streams as a result of stream bank erosion and channel widening or down cutting associated with the adjustment of the stream to the change in flow characteristics. Storm water management systems are typically designed to contain runoff onsite during construction and to maintain predevelopment storm water flow characteristics following development, through either the application of infiltration or retention practices. Maintaining storm water flows onsite during construction reduces potential for the transport of sediments or construction-related pollutants into adjacent water bodies during or as the result of storm events. Properly designed permanent storm water management practices following site development maintain or reduce predevelopment storm water flow volumes and velocity. Failure to size storm water systems appropriately to hold or delay conveyance of the largest predicted precipitation event often leads to downstream flooding and the environmental and economic damages associated with flooding.

Construction activities, such as clearing, grading, trenching, and excavating, disturb soils and sediment. If not managed properly, disturbed soils and sediments can easily be washed into nearby water bodies during storm events, where water quality is reduced. Section 438 of the Energy Independence and Security Act (EISA) (42 U.S.C. Section 17094) establishes into law new storm water design requirements for Federal construction projects that disturb a footprint greater than 5,000 ft^2 of land. The project footprint consists of all horizontal hard surfaces and disturbed areas associated with the project development, including both building area and pavements such as roads, parking lots, and sidewalks. Note that these requirements do not apply to resurfacing of existing pavements. Under these requirements, predevelopment site hydrology must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Predevelopment hydrology would be modeled or calculated using recognized tools and must include site-specific factors such as soil type, ground cover, and ground slope. Site design would incorporate storm water retention and reuse technologies such as bioretention areas, permeable pavements, cisterns/recycling, and green roofs to the maximum extent technically feasible. Post-construction analyses would be conducted to evaluate the effectiveness of the as-built storm water reduction features. As stated in a DOD memorandum dated January 19, 2010, these regulations will be incorporated into applicable DOD UFC within 6 months (DOD 2010). Additional guidance is provided in the USEPA's *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*.

Maryland's Stormwater Management Act of 2007 requires establishing a comprehensive process for storm water management approval and that Environmental Site Design (ESD), through the use of nonstructural BMPs and other better site design techniques, be implemented to the maximum extent practicable. ESD is defined as "…using small-scale storm water management practices, nonstructural techniques, and better site planning to mimic natural hydrologic runoff characteristics and minimize the impact of land development on water resources." Under this definition, ESD includes optimizing conservation of natural features (e.g., drainage patterns, soil, vegetation), minimizing impervious surfaces (e.g., pavement, concrete channels, roofs), and slowing runoff to maintain discharge timing and to increase infiltration and evapotranspiration. "Maximum extent practicable" is defined as designing storm water management systems so that all reasonable opportunities for using ESD planning techniques and treatment practices are exhausted before a structural BMP is implemented. The Stormwater Management Act emphasizes that structural storm water control practices be used only where absolutely necessary (MDE 2009c). MDE developed and published guidance on the technical procedures and calculations necessary for implementing ESD. The guidance document, *Environmental Site Design Process and Computations*, was published in July 2010 (MDE 2010b).

Designers must now ensure that storm water management plans are designed with the following criteria:

- Prevent soil erosion from development projects
- Prevent increases in nonpoint pollution
- Minimize pollutants in storm water runoff from both new development and redevelopment
- Restore, enhance, and maintain chemical, physical, and biological integrity of receiving waters to protect public health and enhance domestic, municipal, recreational, industrial, and other uses of water as determined by MDE
- Maintain 100 percent of the average annual predevelopment groundwater recharge volume
- Capture and treat storm water runoff to remove pollutants
- Implement a channel protection strategy to protect receiving streams
- Prevent increases in the frequency and magnitude of out-of-bank flooding from large, less frequent storms
- Protect public safety through the proper design and operation of storm water management facilities (MDE 2009c).

3.6.2 Existing Conditions

Groundwater. Three aquifers underlie Fort Meade: Upper Patapsco, Lower Patapsco, and the Patuxent. Flow from all three aquifers is generally toward the southeast. The aquifers are composed of unconsolidated silt, sand, and gravel. The Upper Patapsco Aquifer is unconfined and considered to be the water table aquifer. The Middle Patapsco Clay unit is the confining layer between the Upper and Lower

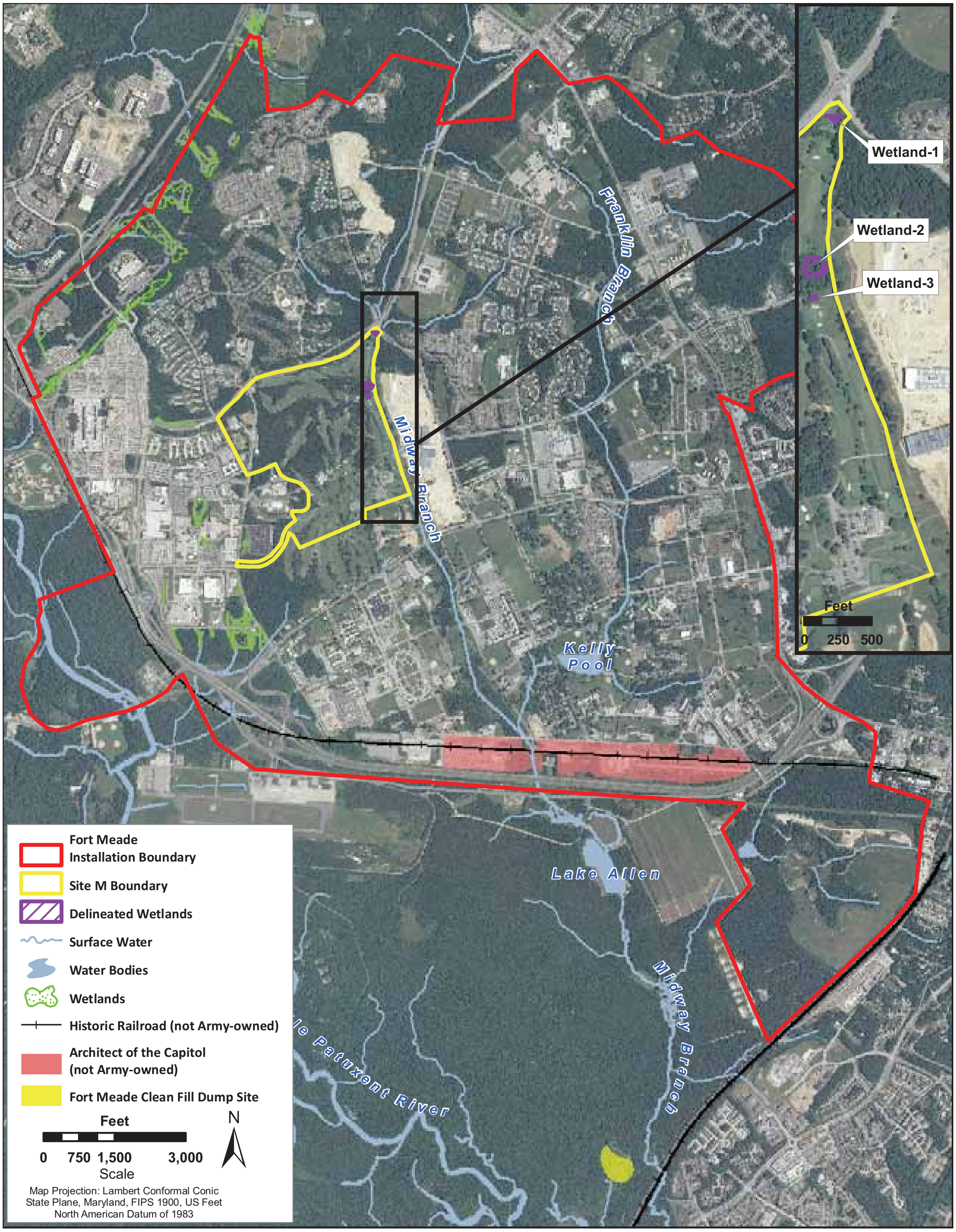
Patapsco aquifers. The Arundel Clay is the confining layer between the Lower Patapsco Aquifer and the Patuxent Aquifer. The Patuxent Aquifer is confined above by the Arundel Clay and below by crystalline bedrock of the Baltimore Mafic Complex (U.S. Army 2007). The Upper Patapsco Aquifer's average thickness is 250 feet. The aquifer is under confined conditions and is one of the best waterbearing formations in Anne Arundel County. The Lower Patapsco Aquifer is capable of yielding 0.5 to 2 million gallons per day (mgd) of water from individual wells in most localities and is a source of water for several large wells within the region. The Patuxent Aquifer is capable of yielding large quantities of water. The aquifer is at or near the surface near the fall line (the boundary between the Coastal Plain and Piedmont Physiographic Provinces) and dips below the surface as it moves eastward. The aquifer is between 200 and 400 feet thick beneath Fort Meade. Fort Meade withdraws potable water from the Patuxent Aquifer (Fort Meade 2005c).

Drinking water for the installation is provided by six groundwater wells installed in the Patuxent Aquifer in the southern portion of Fort Meade. Well yield is dependent upon the thickness and permeability of sediments. Where strata are thick and permeable, well fields can produce up to 1 mgd of water (U.S. Army 2007). Average depth to groundwater in the six wells ranges from 80 to 120 feet below ground surface (INSCOM 2007). Fort Meade averages about 3.3 mgd withdrawn from wells. Various VOCs, pesticides, and explosive compounds have been detected in Fort Meade's groundwater from the Upper and Lower Patapsco aquifers (U.S. Army 2007). Additional information regarding Fort Meade's potable water supply is described in **Section 3.9.2**. Fort Meade complies with standards in the Safe Drinking Water Act and COMAR. Drinking water is tested according to permit requirements.

Surface Water. Fort Meade is primarily within the Little Patuxent River Watershed of the Patuxent River Basin, which drains 65,947 acres. The northeastern portion of the installation is within the Severn Run Watershed. The Little Patuxent River originates north of I-70 in Howard County, Maryland, converges with the Middle Patuxent River in the Town of Savage, and eventually empties into the Chesapeake Bay. The Little Patuxent River flows through the southwestern corner of Fort Meade (U.S. Army 2007). The velocity of the Little Patuxent River slows at Fort Meade, allowing formation of riffles and pools. The Chesapeake Bay, the largest estuary in the United States, lies approximately 12 miles east of the installation.

There are three primary tributaries and associated subwatersheds on Fort Meade, all of which drain to the Little Patuxent River. Midway Branch originates off-installation to the north and flows southward through the western half of the installation, draining approximately 1,461 acres on-installation. Midway Branch runs north to south along the eastern border of Site M. The stream is routed through several culverts throughout the golf course, one of which is approximately 500 feet long (URS/LAD 2009, USACE Baltimore District 1997). Franklin Branch originates as an intermittent stream near Meade Senior High School and flows to the south draining 1,176 acres of the eastern half of the installation. Franklin Branch merges with Midway Branch at Fort Meade's southern boundary, forming the Rogue Harbor Branch that flows off-installation into Lake Allen (formerly Soldier's Lake), south of MD 32. The third and southernmost tributary is composed of two small, unnamed branches that join on-installation before emptying into the Little Patuxent River to the south (U.S. Army 2007). With the exception of several storm water management ponds, Burba Lake, an 8-acre man-made surface water reservoir used for fishing and outdoor recreation, is the only enclosed water body on Fort Meade. Burba Lake is on Franklin Branch near its confluence with Midway Branch (USACE Mobile District 2007). Numerous swales, ditches, streams, and brooks also traverse Fort Meade. **Figure 3.6-1** shows the surface water bodies in the vicinity of Site M. Wetlands on Fort Meade are discussed in **Section 3.7.1**.

Storm water runoff on Fort Meade is conveyed to its three primary drainages, with the majority carried by the Midway and Franklin branches. All natural drainages discharge into the Little Patuxent River. Runoff from developed areas on Fort Meade is conveyed through an extensive network of drainpipes and



Source of Aerial Photography: USDA-APFO NAIP 2009; Source of Boundary Data: Fort Meade GIS 2010; Surface Water and floodplains: Fort Meade 2009

Figure 3.6-1. Surface Water Bodies and Wetlands on Fort Meade

associated drainage structures, supplemented by swales, ditches, other drains, and retention ponds. In recent years, Fort Meade has constructed new retention ponds to reduce concentrated flows to the main branch channels and prevent bank overflows and flooding (U.S. Army 2007). An erosion-and-sediment-control plan (ESCP) has been produced for the Midway and Franklin Branch drainages. This plan proposes BMPs to be implemented to minimize the amount of erosion and transportation of sediment in the two main drainages on Fort Meade (DOD 2007).

The majority of storm water on Site M flows east-southeast to Midway Branch, which flows south into Lake Allen and eventually into the Little Patuxent River. Storm water in the westernmost portion of Site M flows west to a drainage path that runs north to south along O'Brien Road and empties into an unnamed tributary and storm water management wetland area, eventually draining into the Little Patuxent River (URS/LAD 2009). Storm water drainage across the golf course on Site M is of concern because of the lack of riparian buffers and associated pollutants from the use of various herbicides, pesticides, and fertilizers for golf course maintenance (USACE Baltimore District 2004b). A study was conducted by the USACE in March 2008 to further refine floodplain boundaries along Midway Branch in the vicinity of Site M. See **Section 3.7.2** for more information on floodplains in the vicinity of Site M.

Midway Branch is classified as a Use I-P stream by MDE. This designation includes the use of the water body for public water supply; swimming and other whole-body water contact sports; play and leisure time activities where individuals can come in direct contact with the surface water; fishing, the growth and propagation of fish (other than trout), other aquatic life, and wildlife; agricultural water supply; and industrial water supply (USACE Mobile District 2007). Midway Branch (a subbasin of the Little Patuxent River basin) was listed on Maryland's 2002, 2004, and 2006 303(d) lists as a Category 5 impaired water body due to excess sediment. The USACE performed a *Midway Branch Watershed Assessment* in May 2002. The Midway Branch Stream station, a water quality station bordering Site M, tested "poor" during the assessment (U.S. Army 2007). The USACE study recommended restoration opportunities for Midway Branch that included restoring riparian buffer vegetation and planting vegetation to stabilize stream banks (URS/LAD 2009). The Maryland Department of Natural Resources (DNR) developed a *Stream Corridor Assessment Report* for Fort Meade in October 2005. More than 18 miles of streams on Fort Meade were surveyed and a total of 107 potential environmental problems were identified, including bank erosion sites, fish blockages, exposed pipe sites, inadequately vegetated stream buffers, channelization, pipe outfalls, and other unusual conditions. A large portion of these degraded sites occurs within the segment of Midway Branch along Site M (U.S. Army 2007).

The Little Patuxent River watershed is in nonattainment for its designated use of supporting aquatic life because of biological impairments. First through fourth order streams in the Little Patuxent River basin, including the three main tributaries on Fort Meade, are impaired for Aquatic Life and Wildlife Designated Use based on the results of a combination of fish and benthic bioassessments (MDE 2008a). As an indicator of designated use attainment, MDE uses Benthic and Fish Indices of Biotic Integrity developed by the Maryland DNR, Maryland Biological Stream Survey (MDE 2009a). A TMDL is required for the basin with low priority (MDE 2008a).

Data suggest that the Little Patuxent River watershed's biological communities are strongly influenced by urban land use. The probable causes and sources of the biological impairments of the Little Patuxent River watershed include altered hydrology and increased runoff resulting in channel erosion, elevated suspended sediment transport (total suspended solids), and increased inorganic pollutant loads and conductivity. Although there is presently a Category 5 listing for phosphorus in Maryland's 1996 Integrated Report, a Biological Stressor Identification Analysis performed in 2009 did not identify any nutrient stressors (e.g., total nitrogen, total phosphorus, dissolved oxygen) showing a significant association with degraded biological conditions (MDE 2009a). Currently, the waters of the Little Patuxent River watershed do not display signs of eutrophication. The State of Maryland reserves the right to require future controls if evidence suggests that nutrients from the basin are contributing to downstream water quality problems. Reductions could be required by the forthcoming Chesapeake Bay TMDL, currently under development and scheduled to be completed by the USEPA at the end of 2010 (MDE 2009b).

Fifty-three percent of the Little Patuxent River watershed is composed of urban land uses. Increased impervious surface cover in urban landscapes alters stream hydrology by forcing runoff to occur more readily and quickly during rainfall events, thereby causing urban streams to have more “flashy” hydrology. When storm water flows through stream channels faster, more often, and with more force, stream channel widening, erosion, and streambed scouring occur. The scouring associated with these increased flows leads to accelerated channel erosion, thereby increasing sediment deposition throughout the streambed either through the formation of bars or settling of sediment in the stream substrate (MDE 2009a). Generally, stream quality and watershed health diminish when impervious cover exceeds 10 percent and become severely degraded beyond 25 percent. Results from the Maryland Biological Stream Survey indicated that in surveyed streams, health was never good when watershed imperviousness exceeded 15 percent. These studies establish a fundamental connection between impervious cover and watershed impairment (MDE 2009c).

The State of Maryland Water Resources Administration has categorized Little Patuxent River above its confluence with the Patuxent River as “stressed” (but not impaired) with respect to bacteria. Nitrogen loading, nutrient loading, and suspended sediment concentrations in Little Patuxent River have also been characterized as high. These conditions are the result of a combination of storm water surface runoff and sewage treatment plant discharges, with the latter accounting for much of the nitrogen and nutrient loading under normal circumstances (URS/LAD 2009)

The Fort Meade Wastewater Treatment Plant (WWTP) discharges treated wastewater into the Little Patuxent River under NPDES permit number MD0021717. The permit requires the installation to operate a biological nitrogen removal process year-round. The NPDES permit established an annual maximum loading rate for nitrogen and phosphorus at 54,820 and 4,112 pounds per year (lbs/yr), respectively, based on flow equal to or less than 3.0 mgd. The NPDES permit also includes maximum loading rates based on flow greater than 3.0 mgd and up to 4.5 mgd. The loading rates were established to prevent the nitrogen and phosphorus loads on the Chesapeake Bay from increasing as the flow to the WWTP increases (MDE 2008b). When a TMDL for the Patuxent River (of which the Little Patuxent River is a tributary to) is completed, the nutrient limitations could be revised accordingly to incorporate any TMDL requirements. Effluent from Fort Meade’s WWTP must be tested monthly for loading rates (MDE 2008b). An additional NPDES permit (number 95-DP-2634) regulates the use of wastewater treatment effluent for irrigation purposes at the golf course on Site M (DOD 2007).

The State of Maryland requires special protections for waters of very high quality, designated as Tier II waters. The policies and procedures that govern these special waters are commonly called “anti-degradation policies.” Per COMAR 26.08.02.04, which outlines Maryland’s antidegradation policy, an applicant for discharge permits for discharge to Tier II waters that will result in a new, or an increased, permitted annual discharge of pollutants and a potential impact on water quality, shall evaluate alternatives to eliminate or reduce discharges or impacts. If impacts are unavoidable, an applicant shall prepare and document a social and economic justification. MDE shall determine, through a public process, whether these discharges can be justified. A segment of the Patuxent River (Patuxent River 1) south of Fort Meade is categorized as a Tier II water. This segment is approximately a half mile in length and occurs upstream of its confluence with Little Patuxent River (MDE 2010a).

3.7 Biological Resources

3.7.1 Definition of Resource

Biological resources include native or naturalized plants and animals and the habitats (e.g., wetlands, forests, and grasslands) in which they exist. Protected and sensitive biological resources include federally listed (endangered or threatened), proposed, and candidate species, and designated or proposed critical habitat; species of concern managed under Conservation Agreements or Management Plans; and state-listed species.

The Maryland Forest Conservation Act (FCA) (Natural Resources Article Section 5-1601 through 5-1613) is in effect for Fort Meade and the NSA campus. The FCA is not applicable to Fort Meade property as Federal land; however, Fort Meade and NSA, as a tenant, have agreed to voluntarily participate, as long as not prohibited by critical national security mission obligations. The main purpose of the FCA is to minimize the loss of Maryland's forest resources during land development by making the identification and protection of forests and other sensitive areas an integral part of the site planning process. Of primary interest are areas adjacent to streams or wetlands, those on steep or erodible soils or those within or adjacent to large contiguous blocks of forest or wildlife corridors. Although the Maryland DNR, Forest Service administers the FCA, it is implemented on a local level. Gaining approval of the required Forest Conservation Plan (development of more than 1 acre) can necessitate long-term protection of included priority areas or planting/replanting a sensitive area offsite. Any activity requiring an application for a subdivision, grading permit, or sediment control permit on areas that are 40,000 ft^2 or greater is subject to the FCA and requires a Forest Conservation Plan and a Forest Stand Delineation (FSD) prepared by a licensed forester, licensed landscape architect, or other qualified professional (Maryland DNR undated).

Wetlands are important natural systems and habitats that can support a diverse number of species. Wetlands perform a number of important biological functions, some of which include water quality improvement, groundwater recharge, nutrient cycling, wildlife habitat provision, and erosion protection. Wetlands are protected as a subset of "the waters of the United States" under Section 404 of the CWA. The term "waters of the United States" has a broad meaning under the CWA and incorporates deepwater aquatic habitats and special aquatic habitats, including some wetlands. USACE defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Part 328). The USACE has jurisdiction over wetlands that are determined to be jurisdictional under Section 404 of the CWA. Section 404 of the CWA authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill materials into the waters of the United States, including jurisdictional wetlands. In addition, Section 404 of the CWA also grants states with sufficient resources the right to assume these responsibilities. The USACE also makes jurisdictional determinations under Section 10 of the Rivers and Harbors Act of 1899.

Section 401 of the CWA gives states and regional boards the authority to regulate through water quality certification any proposed federally permitted activity that could result in a discharge to water bodies, including wetlands. The state may issue certification with or without conditions, or deny certification for activities that might result in a discharge to water bodies.

EO 11990, *Protection of Wetlands*, requires that Federal agencies provide leadership and take actions to minimize or avoid the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland.

MDE is the state agency largely responsible for administering Maryland's environmental laws, regulations, and environmental permits related to wetlands, water withdrawal, discharges, storm water, and water and sewage treatment. The mission of the MDE is to protect the state's air, land, and water from pollution and to provide for the health and safety of its citizens through a cleaner environment.

Freshwater wetlands in Maryland are protected by the Nontidal Wetlands Protection Program, which sets a state goal of no overall net-loss of nontidal wetlands acreage and functions. Activities in nontidal wetlands require a nontidal wetland permit or a letter of exemption, unless the activity is exempt by regulation. Any activity that involves excavating, filling, changing drainage patterns, disturbing the water level or water table, or grading and removing vegetation in a nontidal wetland or within a 25-foot buffer requires a permit from the MDE's Water Management Administration (MDE undated).

Under the Endangered Species Act (ESA) (16 U.S.C. § 1536), an "endangered species" is defined as any species in danger of extinction throughout all or a significant portion of its range. A "threatened species" is defined as any species likely to become an endangered species in the foreseeable future. Although candidate species receive no statutory protection under the ESA, the USFWS advises government agencies, industry, and the public that these species are at risk and might warrant protection under the ESA in the future.

3.7.2 Existing Conditions

Vegetation. The State of Maryland requires that institutions preparing large-scale land development plans coordinate with the Maryland DNR to protect and preserve existing forest stand conditions. The FCA strives to conserve forest cover on development sites by establishing rules that minimize the loss of existing forests and, in some cases, replenish forest that has been lost to development activities in the past. The Maryland DNR reviews development plans for compliance with the FCA and monitors forest protection during construction. Institutional land redevelopment plan reviews by Maryland DNR consider reforestation elements of campus master plans as best practices in the mitigation of potential environmental impacts associated with large-scale land development.

FCA requirements that Fort Meade would adhere to are described in the Fort Meade Policy, (Fort Meade 2006b) and are as follows:

- Proposed projects 40,000 ft^2 or larger would comply with the FCA and submit their proposal through Fort Meade to the Maryland DNR for review and approval. The long-term agreement cannot be developed with Maryland DNR, but rather would be incorporated in the installation's Integrated Natural Resources Management Plan (INRMP) to ensure compliance with the FCA plan.
- In lieu of submitting an FCA application to Maryland DNR, smaller development and short-term construction projects, as determined by Fort Meade, can be directly approved by the installation. Approval requires FCA mitigation at 20 percent of the project area.
- FCA specifications and standards would be followed. To the fullest extent, all mitigation shall occur within the project area; otherwise on other Fort Meade designated land, such as Forest Conservation Areas (Fort Meade 2006a).
- The FSD plan would include existing forest, and locations of all 100-year old indigenous dominant trees (considered historic/specimen trees on Fort Meade). The Forest Conservation

Plan would be a component of the project development plans, with full retention priority given to the preservation of the older developing forest areas and individual historic/specimen trees.

- Should existing designated forest conservation mitigation areas require disturbance or development, the project proponent would mitigate the impact as provided for in the FCA standards, but not less than an equal mitigation area.
- Landscape tree planting areas can be credited as FCA mitigation areas, but these areas must be a minimum of 35 feet wide (with 3 trees abreast) and cover a minimum 0.25 acres (measured from the tree trunks).
- All forestation/reforestation plants shall be indigenous dominant native trees, such as oaks, American beech, yellow poplar, and pitch pine, and have a one-year replacement warranty. Planting density would be proportional to 120 caliper tree inches per acre (e.g., 96–1.25″, 160–0.75″, 240–0.5″ caliper trees).

An FSD was conducted for Site M in September 2009. Based on data collected during the FSD, the forested component of the 104-acre forest area is characterized by a mid-climax hardwood forest dominated by chestnut oak with Virginia pine occurring as a codominant. Other canopy species include persimmon, sassafras, and southern red oak. The understory coverage is variable sparse and characterized primarily by *Smilax* with some *Vitis* and saplings of codominants present. Other understory species include American beech saplings, sassafras saplings, blueberry, red oak, and hickory. Twenty plots within the site were evaluated based on stand composition, structure, and condition; all plots within the 104-acre FSD site have a Low Priority Retention rating (HDR|e²M 2009a).

The Fort Meade Directorate of Public Works (DPW) Environmental Division has also developed a *Tree Management Policy* that formalizes tree management and replacement on installation for activities that could cause the death, or destruction of or lead to removal of existing trees. The policy states that any person or activity that adversely impacts desirably located trees would be responsible for replacing trees at their own cost. Preservation of dominant trees and woodland areas can be credited towards the total FCA requirement. Forestation that cannot feasibly be performed within the project area shall be performed on other designated land areas within Fort Meade. The planting plan and specifications shall be a component of the projects planning documents. All forestation planting shall be with indigenous and dominant plants species. Funding requirement for forestation planting shall be the equivalent of planting 5-gallon-size trees at 20-foot spacing; presently valued at $5,000 per acre. For in-house restoration projects such as shoreline stabilization projects and riparian buffer planting, smaller planting stock can be used (U.S. Army 2007).

Landscaped areas on Fort Meade are primarily managed through implementation of the 2005 *Installation Design Guide* (IDG). The purpose of the IDG is to provide design guidance for standardizing and improving the quality of the total environment of the installation. This includes not only the visual impact of features on the installation, but also the impact of projects on the total built and natural environment. The improvement of the quality of visual design and development and use of sustainable design and development practices have a direct and future impact on the quality of life for those who live, work, or visit the installation. The IDG includes standards and general guidelines for the design issues of site planning, architectural, vehicular and pedestrian circulation, and landscape elements (Fort Meade 2005a). The IDG contains landscape design standards for the selection, placement, and maintenance of vegetation with an overall goal of improving the physical and psychological well being of the people who live and work on the installation (U.S. Army 2007).

Invasive plant species are an increasing concern and priority on Fort Meade. Fort Meade, through periodic volunteer efforts, performs active management to control or eradicate invasive plant species in a variety of habitats. Efforts for invasive species management are concentrated in wetland areas, at Burba

Park, in designated habitat protection areas, and at the front entrance of Fort Meade; all other areas on post are monitored closely. Fort Meade tracks eradication location information in the post GIS database. Between 2005 and 2007, Fort Meade partnered with the USFWS Patuxent Wildlife Research Center under the "Pulling Together Initiative" to control invasive plants (U.S. Army 2007). Based on the FSD conducted in September 2009, coverage by invasive species in Site M is dominated by mile-a-minute, *Smilax*, and *Microstegium*.

Wetlands. Fort Meade, including current NSA areas, has 159.7 acres of jurisdictional wetlands, most of which occur along the Little Patuxent River floodplain in the southwestern portion of the installation (see **Figure 3.7-1**). During the September 2009 FSD site visit, additional wetlands were identified within Site M.

Wetland field investigations were conducted in October 2009 to determine the presence and extent of jurisdictional wetlands and other waters of the United States on and in close proximity to Site M. Four wetlands or other waters of the United States were delineated within the assessment area (see **Table 3.7-1**). Wetland-1 is a 0.05-acre Palustrine emergent herbaceous habitat in the northeastern corner of Site M adjacent to the west bank of Midway Branch. Wetland-2 is a 0.39-acre Palustrine forested habitat located adjacent to the west bank of Midway Branch in the north-central section of Site M. Wetland-3 is a 0.02-acre Palustrine emergent and open water habitat associated with a golf course pond. Midway Branch is considered a waters of the United States that drains to the south for approximately 3,330 linear feet along the eastern boundary of Site M (HDR|e²M 2009b).

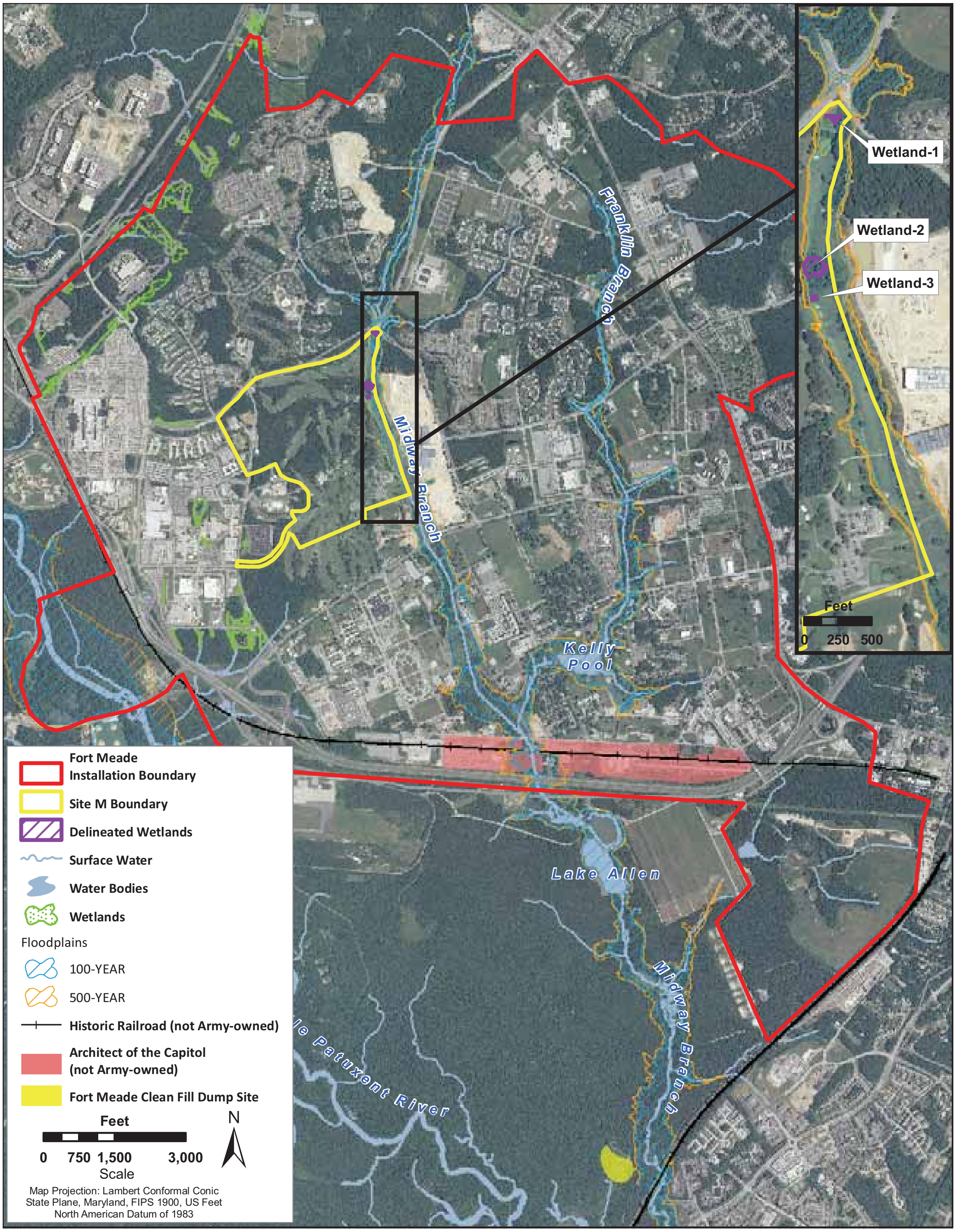
Table 3.7-1. Wetlands and Other Waters of the United States within and Adjacent to Site M

Site Name	Type	Size
Wetland 1	Palustrine emergent	0.05 acres
Wetland 2	Palustrine forested	0.39 acres
Wetland 3	Palustrine forested/open water	0.02 acres
Midway Branch	Perennial stream	3,330 linear feet

Source: HDR|e²M 2009b

Coastal Zone Management. According to the Maryland DNR, all of Fort Meade and surrounding Anne Arundel County fall within Maryland's Coastal Zone Management Program (CZMP) area. MDE regulates activities proposed within Maryland's Coastal Management Zone through Federal consistency requirements. For activities impacting coastal and marine resources such as wetlands, a Coastal Zone Consistency Determination is issued as part of Maryland's environmental permitting process. Since tributaries running through Fort Meade eventually empty into the Chesapeake Bay, they are applicable for protection under CZMP.

In May 2002, the USACE completed a watershed assessment of Midway Branch that concluded the habitat condition for Midway Branch was fair, using the USEPA Rapid Bioassessment Protocols. The study also recommended restoration opportunities that included restoring riparian buffer vegetation and planting general vegetative protection to stabilize stream banks. Any development on Site M would require storm water retention and treatment before the release of storm water into Midway Branch, a tributary of the Chesapeake Bay (see **Section 3.6** for a discussion of storm water management). A 100-foot buffer must be established, preserved, and maintained between development and the streams to comply with the Coastal Zone Management Act (CZMA). The buffer acts as a water quality filter for the removal or the reduction of sediment, nutrients, and toxic substances found in surface runoff (URS/LAD 2009).



Source of Aerial Photography: USDA-APFO NAIP 2009; Source of Boundary Data: Fort Meade GIS 2010; Surface Water and floodplains: Fort Meade 2009

Figure 3.7-1. Wetlands and Floodplains on Fort Meade

Floodplains. Floodplains are areas of low-level ground present along rivers, stream channels, or coastal waters that are subject to periodic or infrequent inundation due to rain or melting snow. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, nutrient cycling, water quality maintenance, and habitat for a diversity of plants and animals. Flood potential is evaluated by the Federal Emergency Management Agency (FEMA), which defines the 100-year floodplain as an area within which there is a 1 percent chance of inundation by a flood event in a given year. Risk of flooding is influenced by local topography, the frequency of precipitation events, the size of the watershed above the floodplain, and upstream development. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety. EO 11988, *Floodplain Management*, directs Federal agencies to avoid siting within floodplains unless the agency determines that there is no practicable alternative. Where the only practicable alternative is to site in a floodplain, a specific eight-step process must be followed to comply with EO 11988. The process is outlined in the FEMA document *Further Advice on EO 11988 Floodplain Management*. A study was conducted by the USACE in March 2008 to further refine floodplain boundaries along Midway Branch in the vicinity of Site M. See **Figure 3.7-1** for the locations of the 100-year and 500-year floodplains in the vicinity of Site M.

Wildlife. Wildlife species found on Fort Meade are typical of those found in urban-suburban areas. Mammalian species found on Fort Meade include white-tail deer (*Odocoileus virginianus*) and groundhogs (*Marmota monax*), particularly near the Little Patuxent River. Other mammals include gray squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), eastern chipmunk (*Tamias striatus*), mouse (*Peromyscus* sp.), vole (*Microtu*s sp.), eastern mole (*Scalopus aquaticus*), and red fox (*Vulpes vulpes*) (DOD 2009a, U.S. Army 2007).

Avian species common to Fort Meade include species that have adapted to an urban-suburban habitat, such as American robin (*Turdus migratorius*), catbird (*Dumetella carolinensis*), mockingbird (*Mimus polyglyottos*), Carolina chickadee (*Poecile carolinensis*), Carolina wren (*Thryothorus ludovicianus*), house wren (*Troglodytes aedon*), downy woodpecker (*Picoides pubescens*), common flicker (*Colaptes auratus*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), rock dove (*Columba livia*), mourning dove (*Zenaida macroura*), and song sparrow (*Melospiza melodia*) (DOD 2009a, U.S. Army 2007). Species observed on Site M on August 25, 2009, and September 4, 2009, are included in **Table 3.7-2**.

Threatened and Endangered Species. Except for occasional transient individuals, no federally listed or proposed endangered or threatened species are known to occur on any of the sites. No legally state-protected species are known to occur on any of the sites.

A species survey of the 70-acre northwestern extension of the NSA exclusive use area and the 580-acre NSA secure area was conducted in 2002. The only species of concern noted during this survey was the state rare mud salamander (*Pseudotriton montanus*) found along the west-central boundary of the 70-acre northwestern extension (DOD 2009a, U.S. Army 2007).

Fort Meade contains the following five Maryland species of concern (DOD 2009a, U.S. Army 2007):

- Glassy darter (*Etheostoma vitreum*) – Maryland Threatened
- Downy bushclover (*Lespedeza stuevei*) – Maryland Watchlist
- Pubescent sedge (*Carex hirtifolia*) – Maryland Watchlist
- Purple chokeberry (*Aronia prunifloia*) – Maryland Watchlist
- Roughish panicgrass (*Panicum leucothrix*) – Maryland status uncertain.

Table 3.7-2. Species Observed on Site M

Common Name	Scientific Name
Amphibians	
American bullfrog	*Rana catesbeiana*
Pickerel frog	*Rana palustris*
Birds	
American goldfinch	*Carduelis tristis*
American robin	*Turdus migratorius*
Blue jay	*Cyanocitta cristata*
Carolina chickadee	*Poecile carolinensis*
Carolina wren	*Thryothorus ludovicianus*
Cedar waxwing	*Bombycilla cedrorum*
Eastern towhee	*Pipilo erythrophthalmus*
Eastern wood pewee	*Contopus virens*
Gray catbird	*Dumetella carolinensis*
Killdeer	*Charadrius vociferus*
Northern flicker	*Colaptes auratus*
Pileated woodpecker	*Dryocopus pileatus*
White-breasted nuthatch	*Sitta carolinensis*
Willow flycatcher	*Empidonax traillii*
Mammals	
American beaver	*Castor canadensis*
Eastern gray squirrel	*Sciurus carolinensis*
Groundhog (woodchuck)	*Marmota monax*
White-tailed deer	*Odocoileus virginianus*

3.8 Cultural Resources

3.8.1 Definition of the Resource

"Cultural resources" is an umbrella term for many heritage-related resources defined in several Federal laws and EOs. These include the National Historic Preservation Act (NHPA) (1966), the Archeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (NAGPRA) (1990).

The NHPA focuses on cultural resources such as prehistoric and historic sites, buildings and structures, districts, or other physical evidence of human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or other reason. Such resources might provide insight into the cultural practices of previous civilizations or they might retain cultural and religious significance to modern groups. Resources judged to be important under criteria established in the NHPA are considered eligible for listing in the National Register of Historic Places (NRHP). These are termed "historic properties" and are protected under the NHPA. NAGPRA requires consultation with culturally affiliated Native American tribes for the disposition of Native American human remains, burial goods, and cultural items recovered from federally owned or controlled lands.

Typically, cultural resources are subdivided into archaeological sites (prehistoric or historic sites containing physical evidence of human activity but no structures remain standing); architectural sites (buildings or other structures or groups of structures, or designed landscapes that are of historic or aesthetic significance); and sites of traditional, religious, or cultural significance to Native American tribes.

Archaeological resources comprise areas where human activity has measurably altered the earth or deposits of physical remains are found (e.g., projectile points and bottles). *Architectural resources* include standing buildings, bridges, dams, and other structures of historic or aesthetic significance. Generally, architectural resources must be more than 50 years old to warrant consideration for the NRHP. More recent structures, such as Cold War-era resources, might warrant protection if they are of exceptional importance or if they have the potential to gain significance in the future. *Resources of traditional, religious, or cultural significance to Native American tribes* can include archaeological resources, sacred sites, structures, neighborhoods, prominent topographic features, habitat, plants, animals, and minerals that Native Americans consider essential for the preservation of traditional culture.

This EIS describes in detail the nature and extent of environmental impacts resulting from the Proposed Action and each alternative and discusses appropriate mitigation measures for adverse impacts on cultural resources. In addition, under Section 106 of the NHPA, Federal agencies must take into account the effect of their undertakings on historic properties and allow the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. Under this process, the Federal agency evaluates the NRHP eligibility of resources within the proposed undertaking's Area of Potential Effect (APE) and assesses the possible effects of the proposed undertaking on historic resources in consultation with the State Historic Preservation Office (SHPO) and other parties. The APE is defined as the geographic area(s) "within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." Under Section 110 of the NHPA, Federal agencies are required to establish programs to inventory and nominate cultural resources under their purview to the NRHP.

3.8.2 Existing Conditions

The prehistoric era in Maryland is generally divided into three periods: Paleoindian (12,000 to 9500 BC), Archaic (9500 to 1000 BC), and Woodland (1000 BC to AD 1600). These periods cover the time from the region's earliest definitive occupation by humans until contact with people from Europe and Africa in the middle of the 16th century. Although evidence of human occupation before 12,000 BC is slowly emerging from archaeological sites such as Cactus Hill in Virginia, Topper in South Carolina, and Meadowcroft Rockshelter in Pennsylvania, no archaeological sites predating the Paleoindian Period have been identified in Maryland. In general, prehistoric occupations along the Patuxent River drainage are poorly represented prior to the major climate change that occurred at the end of the Late Pleistocene. As the climate shifted from glacial to temperate, prehistoric populations appear to have increased significantly. This rapid increase in population is reflected in the archaeological record by an exponential increase in prehistoric sites until contact with Europeans in the 16th century.

The English colony of Maryland was established in 1634 by Lord Baltimore and by the mid-17th century the area around the Chesapeake Bay and the Patuxent River and its tributaries were occupied by European settlers. The Fort Meade area in Anne Arundel County was initially settled by Quakers. Early on, the region prospered as Maryland became an important tobacco-producing and slave-importing colony.

Agriculture based on the plantation system remained the economic mainstay in the county throughout the 18th century, although other crops were incorporated and small-scale industry developed to offset the declining yields from tobacco production.

Maryland did not secede from the Union during the Civil War; however, it was a border state with mixed allegiances. Although no military engagements took place in the project area, many troops passed through the county on their way to the District of Columbia, Virginia, or farther south. Significant socio-cultural changes occurred during the war. Many slaves fled to the District of Columbia, which abolished slavery in 1862, or to Alexandria, Virginia, where the occupying Union Army forces offered jobs along the docks as stevedores. On January 1, 1865, the State of Maryland voted to emancipate its slaves, effectively ending the Anne Arundel County plantation system. Overall, throughout much of the 19th century and early 20th century, the state underwent a gradual transformation from agrarian to an industrial-urban base.

The onset of World War I prompted Congress to approve the establishment of 32 new military installations, including Fort Meade in 1917. The site chosen for Fort Meade was an area adjacent to Odenton, Maryland. By October 1918, the essential components of the installation were completed including barracks, a hospital complex, headquarters, warehouses, and a remount depot. Before war's end, approximately 100,000 soldiers received training at Fort Meade. During the inter-war years, Fort Meade played a significant role in implementing military reorganization under the National Defense Act of 1920. These new roles included training for the National Guard, Officers Reserve Corps, the Reserve Officers' Training Corps (ROTC), the Citizens' Military Training Camp, and the newly established tank school. To implement these new functions, a new phase of construction was ushered in to replace many of the World War I-era temporary buildings that were in poor condition. Among the newly constructed permanent buildings were family housing units, troop support buildings, and general administrative buildings.

Construction continued during the inter-war period and dramatically increased during World War II with the construction of a temporary cantonment to accommodate increased troop mobilization. New construction included the addition of 251 permanent brick buildings and 218 temporary wooden buildings. This period would also result in the acquisition of 6,137 acres and further construction programs to support the changing mission of the installation. In addition to an expanded role in infantry, artillery, and tank training, Fort Meade would also serve as a Troop Replacement Depot for the European Theater of Operations, a prisoner-of-war camp, a Cooks and Bakers school, and a demobilization center.

During the post-war years, Fort Meade underwent a series of administrative changes and command reorganization and, by 1947, became the headquarters of The United States Second Army Command. Various crises prompted Fort Meade to revert to wartime operations and resume its role as a primary processing center for new soldiers. Development continued at Fort Meade throughout the latter half of the 20th century including the construction of two major family housing units at Meade Heights in 1952 and Argonne Hills in 1959. It should be noted that post-war construction was guided not by a master plan but by functional needs. This is evident in the cinder block construction and minimal stylistic detail that characterizes much of the buildings on the installation.

During the Cold War Era, Fort Meade became the first military installation to employ the Nike-Ajax air defense unit. The air defense unit became operational under the 36th Antiaircraft Artillery Missile Battalion, which, as part of the 35th Antiaircraft Brigade, was responsible for the defense of Washington, DC. In 1954, Fort Meade became the headquarters of the NSA, which was established by the National Security Act of 1947 and EO 10421 in 1952. Additionally, several government and military tenants have a presence at Fort Meade including the Defense Information School, the headquarters of the Defense Courier Service, the United States Army Field Band, and the USEPA.

Archaeological Resources

Numerous cultural resources investigations have been conducted at Fort Meade; however, prior to the development and implementations of the installation's Cultural Resources Management Plan (CRMP) in 1994, cultural resources investigations were conducted on an as-needed basis. A critical component of the CRMP was the development of an archaeological sensitivity model that designated areas of high and low potential for containing archaeological sites. Areas of previous disturbance were also delineated. The CRMP recommended 2,710.6 acres for survey whereas no additional effort was recommended for 1,852.9 acres. Subsequent testing of the model on 407 acres identified six archaeological sites (USACE Baltimore District 2006). In 1995, an additional 2,210 acres were surveyed, which resulted in the documentation of 29 archaeological sites (USACE Mobile District 2007). Since the completion of these baseline surveys, three additional cemeteries have been identified and Phase II site evaluations have been conducted at 20 archaeological sites (USACE Baltimore District 2006).

To date, 40 archaeological sites have been documented at Fort Meade (see **Table 3.8-1**). Of these, 19 contain prehistoric cultural components, 11 contain historic cultural components, 3 contain both historic and prehistoric components, and 7 are historic cemeteries. NRHP eligibility status for all 40 sites has been determined through consultation with the Maryland Historical Trust (MHT), which serves as Maryland's SHPO. One site (18AN1240) has been determined eligible for the NRHP under Criterion D. The site consists of a Late Archaic subperiod base camp containing stratified cultural deposits. The remaining 39 sites did not meet the criteria for eligibility and have been determined not eligible for the NRHP.

The APE under consideration in this EIS consists of approximately 227 acres proposed for campus development at Fort Meade (see **Figure 3.8-1**). The area presently serves as a portion of Fort Meade's Applewood and Parks golf courses. The northern portion, fronting on Rockenbach Road and composing approximately 137 acres, is referred to as Site M-1. The southern portion, encompassing approximately 90 acres, is referred to as Site M-2. The APE for archaeological resources consists of the eastern half of Site M-1.

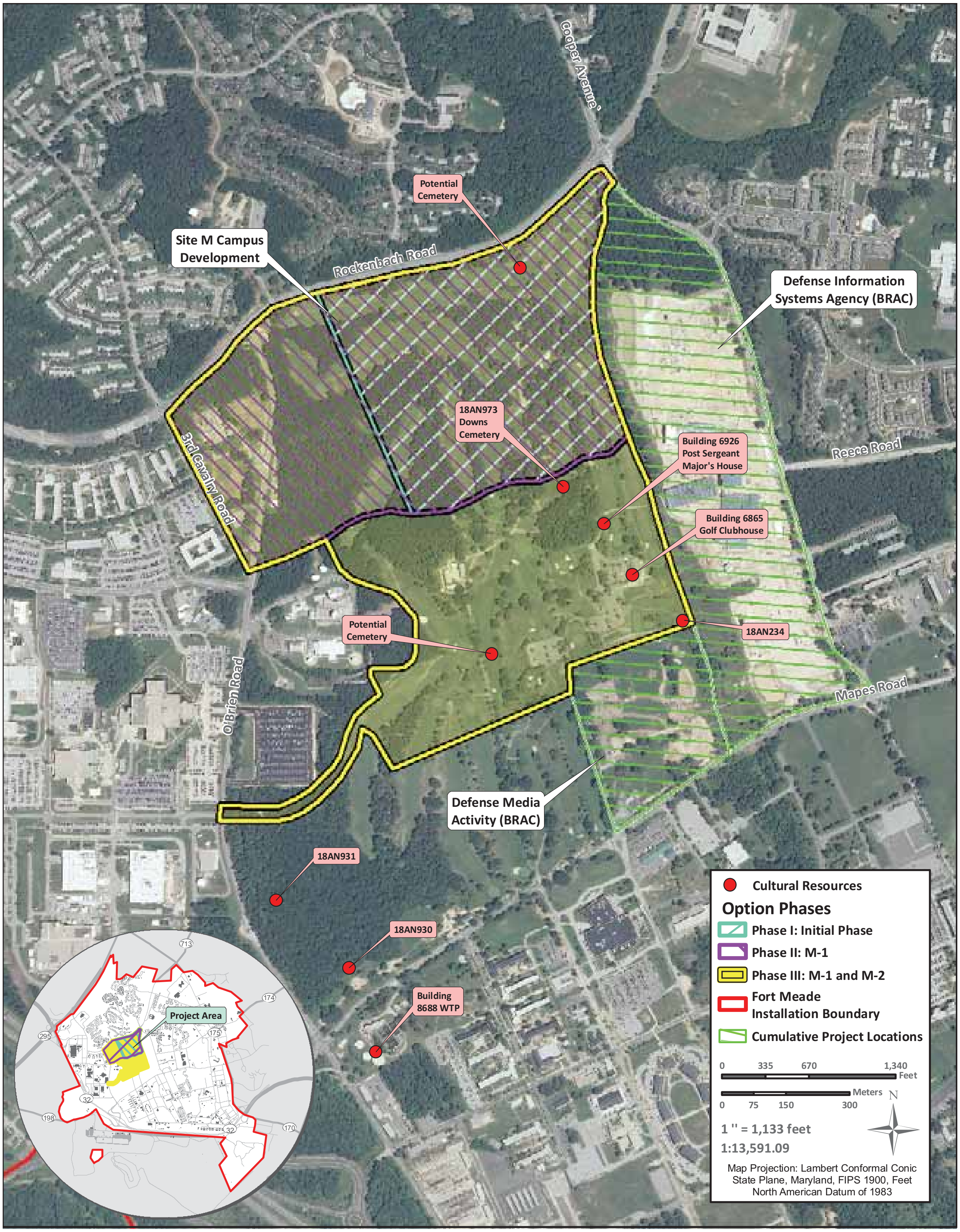
Two previously recorded archaeological sites (18AN234 and 18AN973) lie within the APE. Site 18AN234 consists of a small Late Archaic/Early Woodland artifact scatter and appears to occur along the boundary of the southeastern corner of Site M-2 (see **Figure 3.8-1**). The site was subjected to further Phase II site evaluation in 2003 and was found to contain disturbed cultural deposits. In light of these findings, the site was recommended eligible but later determined not eligible for the NRHP by MHT. Site 18AN973 is the Downs Cemetery and Farmstead. Downs Cemetery is a small historic cemetery dating to the late 19th century based on the presence of two grave markers dating from 1875 and 1883. The cemetery is on a wooded knoll and is demarcated by a chain-link fence. The site has been recommended as not eligible for the NRHP as it does not contain the graves of any persons of transcendent importance, is not associated with historic events, does not possess distinctive design features, and is not of significant age (USACE Baltimore District 2006). The associated farmstead component, however, has not been evaluated and remains potentially eligible for the NRHP. As stated in a letter received during the EIS public scoping period (see **Appendix B**), MHT has recommended Phase II testing to fully evaluate the NRHP eligibility of site 18AN973, should the site be considered for development.

In addition to the Downs Cemetery at Site 18AN973, historical map data suggest a strong potential for the existence of two undocumented cemeteries in the APE (see **Figure 3.8-1**). The first occurs approximately 360 meters east of the present Golf Course Clubhouse, encompassing approximately 0.11 acres in the southern portion of Site M-2. The second area lies south of the intersection of Rockenbach Road and Cooper Avenue in the northeastern quadrant of Site M-1 and encompasses approximately 0.09 acres. The map shows that the two cemeteries were situated on the present-day fairways on the 5th hole of the

Table 3.8-1. Previously Recorded Archaeological Sites on Fort Meade

Site No.	Survey Level	Type of Site	Recommendation
18AN51	Phase II	Prehistoric	Not Eligible
18AN234	Phase II	Prehistoric	Not Eligible
18AN398	Phase II	Prehistoric/Historic	Not Eligible
18AN399	Phase II	Prehistoric	Not Eligible
18AN762	Phase II	Prehistoric	Not Eligible
18AN929	Phase II	Prehistoric	Not Eligible
18AN930	Phase II	Prehistoric	Not Eligible
18AN931	Phase II	Prehistoric	Not Eligible
18AN932	Phase II	Historic	Not Eligible
18AN970	Phase I	Watts Cemetery	Not Eligible
18AN971	Phase I	Sulphur Spring Cemetery	Not Eligible
18AN972	Phase I	Friedhofer Cemetery	Not Eligible
18AN973	Phase I	Downs Cemetery	Not Eligible
18AN974	Phase II	Prehistoric	Not Eligible
18AN975	Phase II	Prehistoric	Not Eligible
18AN976	Phase I	Prehistoric/Historic	Not Eligible
18AN977	Phase I	Historic	Not Eligible
18AN978	Phase II	Prehistoric	Not Eligible
18AN979	Phase I	Historic	Not Eligible
18AN980	Phase I	Historic	Not Eligible
18AN981	Phase I	Historic	Not Eligible
18AN982	Phase II	Historic	Not Eligible
18AN983	Phase II	Historic	Not Eligible
18AN984	Phase I	Historic	Not Eligible
18AN985	Phase I	Prehistoric	Not Eligible
18AN986	Phase II	Prehistoric	Not Eligible
18AN987	Phase II	Historic	Not Eligible
18AN988	Phase II	Historic	Not Eligible
18AN989	Phase II	Prehistoric	Not Eligible
18AN990	Phase II	Historic	Not Eligible
18AN991	Phase I	Prehistoric/Historic	Not Eligible
18AN992	Phase I	Prehistoric	Not Eligible
18AN993	Phase I	Prehistoric	Not Eligible
18AN994	Phase I	Prehistoric	Not Eligible
18AN995	Phase I	Prehistoric	Not Eligible
18AN996	Phase I	Prehistoric	Not Eligible
18AN1240	Phase II	Prehistoric	**Eligible**
[To be Assigned]	Phase I	Meeks Cemetery	Not Eligible
[To be Assigned]	Phase I	Phelps Cemetery	Not Eligible
[To be Assigned]	Phase I	Warfield/Clark Cemetery	Not Eligible

Source: USACE Baltimore District 2006



Sources: Potential Project Actions: HDR | e²M, Inc 2010; Cultural Resources: Fort Meade 1977 and Fort Meade GIS 2009; Aerial Photography: USDA-APFO NAIP 2009.

Figure 3.8-1. Project Location Map Showing Cultural Resources

Applewood course and the 3rd hole of the Parks course. The 1977 topographic map designates 5th and 3rd holes as 13A and 4B, respectively (see **Figure 3.8-2**). At present, information pertaining to these cemeteries is limited and purported attempts to identify their locations have been unsuccessful. This might be the case for any number of reasons (USACE 2005a). Often, groundbreaking disturbances, disturbances to vegetation, and secondary vegetation growth can obscure or destroy cemetery boundaries, original landscape features, and grave markers. However, if such disturbances were above ground or surficial, the potential exists for the preservation of subsurface human remains.

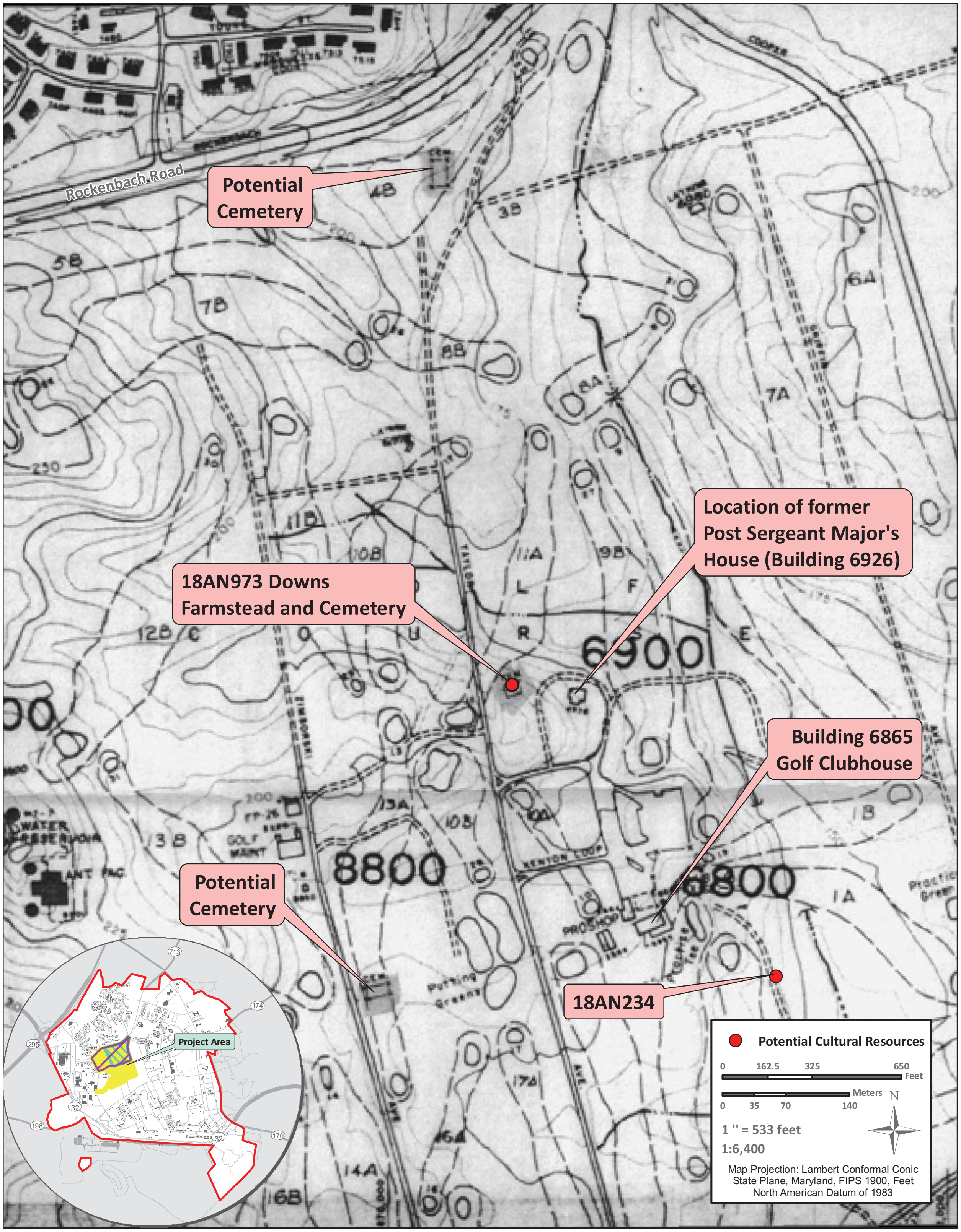
Architectural Resources

The systematic inventory and assessment of architectural resources at Fort Meade began in 1994 with the development and implementation of the CRMP (USACE Baltimore District 2006). In preparation of the CRMP, an architectural survey was undertaken and all structures and buildings constructed prior to 1954 were evaluated for NRHP eligibility. This survey documented 501 buildings. Among these, 23 World War I-era and 62 World War II-era buildings were recommended for additional investigation to determine NRHP eligibility. A Phase II architectural survey of these buildings was conducted by R. Christopher Goodwin & Associates in 1996. The remaining 416 buildings identified during the baseline 1994 study were determined ineligible for the NRHP. In preparation of the 2001 Integrated Cultural Resources Management Plan (ICRMP), the USACE evaluated all pre-1960 Cold War-era buildings. The results from the 1994, 1996, and 2001 architectural surveys were submitted to MHT for review and concurrence (USACE Baltimore District 2006, USACE Mobile District 2007).

Currently, no buildings and structures at Fort Meade are listed on the NRHP; although the Fort Meade Historic District and a Water Treatment Plant (WTP) (Building 8688) have been determined eligible through consultation with MHT (see **Table 3.8-2**) (USACE Baltimore District 2006, USACE Mobile District 2007). The Fort Meade Historic District contains 13 contributing Georgian Revival brick buildings constructed between 1928 and 1940 within the planned portion of the original post. Buildings within the Fort Meade Historic District are significant under the National Register Areas of Significance for architecture and military history. These Areas of Significance are associated with the development of Fort Meade as a permanent Army installation in the 1920s through 1940s. The district originally consisted of 132 buildings and structures; however, with the privatization of several military housing units, many of the contributing elements of the original district are no longer under Army jurisdiction. The WTP (Building 8688) was built in 1941 in the Art Moderne style. The building is constructed of concrete and brick and retains most of its original architectural features. The building is significant under National Register Criterion C as an outstanding example of Art Moderne design.

In conjunction with preparation of the 2006 ICRMP, five water towers and three bridges were evaluated for NRHP eligibility. The water towers (WT001, WT002, WT003, WT004, and WT008) were constructed between 1928 and 1955 and were associated with various periods in the historical development of Fort Meade. All five water towers were considered for eligibility under National Register Criteria A and C. The evaluations found that the water towers were not associated with events that have made a significant contribution in American history, that the water towers do not represent the work of a master, and lack distinctive characteristics. Accordingly, all five water towers were recommended not eligible for the NRHP.

Additionally, three stone bridges (Llewellyn Avenue Bridge, Redwood Avenue Bridge, and Leonard Wood Avenue Bridge) built on the installation by German prisoners-of-war (POWs) between 1944 and 1946 were evaluated for NRHP eligibility under Criterion A. During World War II, many POWs were detained in Maryland and, due to labor shortages, put to work in agriculture and industry. At Fort Meade, approximately 1,632 Italian and 2,000 German POWs were housed for the remainder of the war in temporary structures and tents. During their detainment at Fort Meade, German POWs operated the post



Sources: Cultural Resources: Fort Meade 1977 and Fort Meade GIS 2009

Figure 3.8-2. 1977 Topographic Map, Fort Meade (Not to Scale)

Table 3.8-2. NRHP-Eligible Buildings on Fort Meade

Building Number	Building Name	Construction Date	Original Use	Current Use	Quartermaster Plan
4215	Meade Hall	1928	Barracks	Administrative	621-540
4216	Pulaski Hall	1928	Barracks	Administrative	621-530
4217	Post Headquarters	1928	Barracks	Administrative	621-550
4230	Fire Station	1934	Fire Station	Vehicle Storage	634-125
4411	Old Post Hospital	1930	Hospital	Administrative	6118-700
4413	Garage	1931	Ambulance Garage	Vehicle Storage	6118-676
4415	Kuhn Hall	1931	Nurse's Quarters	Military Officer Housing	6118-745
4419	Chapel	1934	Chapel	Chapel	6118-820
4431	Theater	1933	Theater	Theater	608-200
4551	Hodges Hall	1934	Administrative	Administrative	6118-761-774
4552	Van Deman Hall	1940	Barracks	Administrative	621-1900
4553	Benjamin Tallmadge Hall	1929	Barracks	Administrative	Unknown
4554	Nathan Hale Hall	1929	Barracks	Administrative	621-640 (5008)
8688	WTP	1941	WTP	WTP	6118-1076

Source: USACE Baltimore District 2006

laundry and were used as laborers in the construction of three bridges. The evaluation found that the stone bridges are historically significant for their association with German POWs in Maryland during World War II. As such, Llewellyn Avenue Bridge, Redwood Avenue Bridge, and Leonard Wood Avenue Bridge were recommended eligible for the NRHP under Criterion A (USACE Baltimore District 2006).

In its public scoping letter (see **Appendix B**), MHT identified four additional cultural resources within the footprint of the proposed Fort Meade Campus Development. These include Building 6926/Post Sergeant Major's House and Building 6865/Golf Course Clubhouse, two possibly eligible architectural resources. The Post Sergeant Major's House was built ca. 1910 and the Golf Course Clubhouse was built in 1940. The Post Sergeant Major's House, which was previously used as a tenant farm, was the oldest standing structure at Fort Meade. Buildings 6926 and 6865 were inventoried to the Maryland Inventory of Historic Places in December 1991. MHT has requested that they be formally evaluated for NRHP eligibility and that appropriate Determination of Eligibility (DOE) forms be submitted to assist in reaching a consensus on eligibility determinations for these resources. However, the Post Sergeant Major's House and the Golf Course Clubhouse were demolished in the mid-1990s. A replacement clubhouse (Building 6800) was constructed adjacent to the site of Building 6865. Demolition of these buildings precludes further study of these former architectural resources. A parking lot is present in the location of the former Golf Course Clubhouse, while the general area of the former Post Sergeant Major's

House has grown over with vegetation. Given these current site conditions, the potential for archaeological deposits associated with use of the Post Sergeant Major's House is high. However, disturbances associated with parking lot construction might have already had an adverse impact on archaeological deposits associated with the Golf Course Clubhouse, such that site integrity and research potential is low.

Additionally, a large portion of the project area lies within Fort Meade's Applewood and Parks golf courses. The Applewood course was built in 1950 and the Parks course was built in 1956. Neither golf course has been previously identified as a cultural resource; however, both could be eligible for the NRHP as historic landscape(s). MHT requested that the Applewood and Parks golf courses be inventoried and evaluated for NRHP eligibility. A subsequent evaluation of the golf courses conducted by DOD concluded that they did not meet the criteria for NRHP eligibility and recommended them as ineligible for listing on the NRHP (HDR|e²M 2010b).

Lastly, in order to assess potential visual impacts on nearby or adjacent historic buildings, a visual APE was established and all architectural resources within an approximate 0.25-mile radius of Site M were identified. No architectural resources occur within the visual APE. The closest architectural resource is the WTP (Building 8688) 0.41 miles south of Site M. As previously described, the WTP was built in 1941 and has been determined eligible for the NRHP.

Resources of Traditional, Religious, or Cultural Significance to Native American Tribes

At present, no known traditional cultural properties or American Indian sacred sites occur within or near the Proposed Action. Additionally, no traditional cultural properties or American Indian sacred sites have been recorded at Fort Meade. While there are no federally recognized Indian tribes present in Maryland, seven federally recognized tribes elsewhere in the United States are believed to have a historical affiliation. Accordingly, the Cultural Affairs Manager for Fort Meade has initiated consultation in accordance with American Indian Religious Freedom Act and NAGPRA to ascertain their interest in Fort Meade matters (USACE Baltimore District 2006).

3.9 Infrastructure and Sustainability

3.9.1 Definition of the Resource

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function and includes utility. Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as "urban" or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to the economic growth of an area. The infrastructure components discussed in this section include water supply, sanitary sewer and wastewater system, storm water drainage, power supply, natural gas supply, solid waste management (i.e., nonhazardous waste), communications, security systems, liquid fuel supply, heating and cooling system, and pavements. This section has been prepared to protect sensitive information pertaining to infrastructure systems and only discusses those points considered directly relative to the Proposed Action.

3.9.2 Existing Conditions

Water Supply

Potable Water. Fort Meade maintains a Water Appropriation and Use Permit (Permit No. AA1969G021 [5]) that allows an average withdrawal of approximately 3.3 mgd from six groundwater wells on the south side of the installation. During peak demand, the permit allows a withdrawal of approximately 4.3 mgd from the wells (Fort Meade 2009b). Fort Meade currently withdraws approximately 3.3 mgd from the wells (DOD 2009a).

Water Treatment Plant and Distribution System. Potable water is pumped from wells to the Fort Meade WTP. The WTP is in the southwestern quadrant of the cantonment area, near the intersection of Mapes Road and O'Brien Road, adjacent to the Little Patuxent River. It was constructed in 1919 and has undergone upgrades in 1942, 1956, 1968, 1984, and 1986. The WTP is a multi-media filtration plant that contains three aboveground clearwell storage tanks that have a combined capacity of 2.3 million gallons and seven active water storage tanks that have capacities ranging from 200,000 to 600,000 gallons (USACE Mobile District 2007). The present day WTP design capacity is 7.2 mgd. For the past 10 years, the WTP produced an average of 3.4 mgd (URS/LAD 2009). Water is treated for turbidity, iron, and manganese, and fluoride is added to the water before it is distributed by pump stations and storage tanks to the entire installation. NSA receives approximately 1.2 mgd from the WTP. Additionally, there are two water supply wells adjacent to the NSA campus that serve the National Cryptologic Museum and are permitted for withdrawal of an annual average of 0.018 mgd (DOD 2009a, URS/LAD 2009). The water system, including the WTP and associated piping infrastructure, at Fort Meade is currently being privatized.

High Lift Pump Stations. Treated water is pumped from the clearwell storage tanks into the potable water distribution system through two High Lift Pump Stations (HLPSs). The HLPSs have a combined pumping capacity of approximately 17.1 mgd. The distribution system contains approximately 90 miles of 4- to 20-inch-diameter water mains, 10 pumps, 556 main valves, 634 fire hydrants, and approximately 1,200 building connections (USACE Mobile District 2007).

HLPS No. 1 (Building 8698) contains six pumps. Pump No. 1 is a backwash pump used solely to backwash the rapid-flow sand filters in the WTP. Pump No. 1 is the only pump capable of providing backwash water. Pumps No. 2 through No. 6 serve as the potable water distribution system. Pumps No. 2 and No. 5 each have a capacity of 1.44 mgd and Pumps No. 3 and No. 4 each have a capacity of 1.0 mgd. Pump No. 6 is a diesel-powered pump with a capacity of 3.0 mgd. Pump No. 6 is currently nonoperational and is reserved for power outages to supply water to the potable water distribution system. The combined capacity of HLPS No. 1, when Pump No. 6 is operational, is approximately 7.92 mgd.

HLPS No. 2 (Building 8699) contains four pumps. Pumps No. 1 and No. 2 each have a capacity of 1.73 mgd. One of these pumps can operate either electrically or by diesel fuel. Pump No. 3 has a capacity of 2.16 mgd and Pump No. 4 has a capacity of 3.60 mgd. The combined pump capacity of HLPS No. 2 is 9.2 mgd.

The potable water distribution system is divided into four sections: two high-level systems (above 57.9 meters [190 feet]) and two low-level systems (below 51.8 meters [170 feet]). The existing primary distribution system consists of 16-, 12-, 10-, 8-, 6-, and 4-inch mains looped and cross connected throughout the installation. Water mains are constructed of cast iron, transite, and ductile iron (USACE Mobile District 2007).

Site M is in the Upper Pressure Zone (UPZ) and the remainder of the NSA campus is in the Lower Pressure Zone (LPZ). HLPS No. 1 provides water to the Annapolis Hill booster station (Building 1957) and storage tank. The Annapolis Hill booster station and storage tank provide water to the Hunt Hill storage tank. The Hunt Hill storage tank provides water to the UPZ. HLPS No. 2 and the Chaffee Hill storage tanks provide water to the LPZ by way of four interconnected water mains. The Chaffee Hill storage tanks also provide water to the UPZ by way of a booster station (Building 8900) (URS/LAD 2009).

Sanitary Sewer and Wastewater System

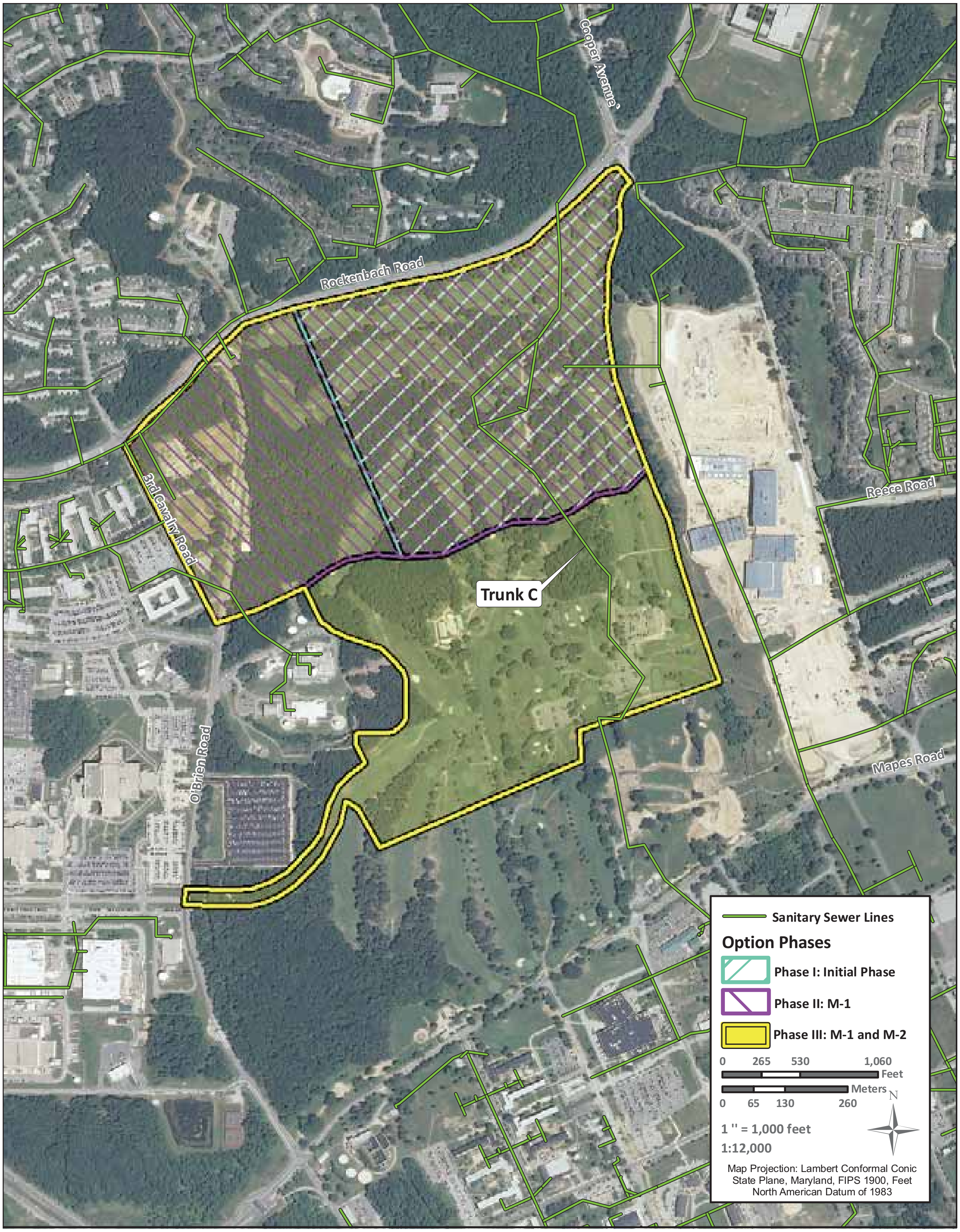
Wastewater Treatment Plant. The Fort Meade WWTP is adjacent to the Little Patuxent River, near the intersection of MD 198 and MD 32. It is a modified, activated sludge WWTP that has been operating for approximately 16 years (USACE Baltimore District 2004a, USACE Mobile District 2007). The WWTP was originally designed with an average flow of 4.6 mgd; however, the operation and configuration of the WWTP has significantly changed since its original design (URS/LAD 2009). Currently, the flow to the WWTP is 2.5 mgd, which is approximately 55 percent of the original design capacity (Anne Arundel County 2010b). Similarly, the maximum observed flow was 4.18 mgd, compared to the maximum design flow of 12.3 mgd. The WWTP capacity is limited due to the existing treatment process necessary for compliance with the current NPDES permit (Permit No. 07-DP-2533) (URS/LAD 2009). The permit requires the installation to operate a biological nitrogen removal process year-round. The NPDES permit established an annual maximum loading rate for nitrogen and phosphorus at 54,820 and 4,112 lbs/yr, respectively, based on flow equal to or less than 3.0 mgd. The NPDES permit also includes maximum loading rates based on flow greater than 3.0 mgd and up to 4.5 mgd. The loading rates were established to prevent the nitrogen and phosphorus loads on the Chesapeake Bay from increasing as the flow to the WWTP increases (MDE 2008b).

The WWTP is composed of a headworks, chemical flocculation, primary clarification, activated sludge process with nitrification/denitrification, tertiary filtration, chlorination/dechlorination, reaeration tanks, sludge storage, and surge basins. The WWTP differs from a traditional activated sludge process in the following ways:

- Lime, coagulant, and polymer are added upstream of the clarifiers to increase efficiency in removing biological oxygen demand and total suspended solids (TSS)
- The modification of the second stage aeration basins to mix, but not aerate, allows for the denitrification of the oxidized nitrogen compounds
- Filtering the effluent in the tertiary filtration process results in a lower TSS concentration compared to most conventional plants (USACE Mobile District 2007).

Wastewater Collection and Pumping System. The sanitary sewer collection and pumping system at Fort Meade is composed of 58 miles of piping on and around the NSA campus, 55 miles of gravity sewers, 3 miles of force mains, and 9 pumping stations. **Figure 3.9-1** shows the locations of the sanitary sewer lines in the vicinity of Site M. The pipe diameter of the gravity sewers, installed between 1941 and 1987, range from 4 to 30 inches. The force mains have pipe diameters that range from 3 to 24 inches. Wastewater from the gravity sewers and force mains flow to two major pump stations, the Leonard Wood and the East Side pump stations (USACE Mobile District 2007). There are also seven other pump stations found throughout Fort Meade (Fort Meade 2006c). **Table 3.9-1** presents the capacities of all nine pump stations at Fort Meade.

There are no sewage treatment activities or equipment at Site M; however, treated effluent has been used to irrigate the golf courses on Site M since 1984. Fort Meade maintains an NPDES permit (Permit No. 95-DP-2634) that regulates the use of wastewater treatment effluent for irrigation purposes at the golf course (DOD 2007). Buildings at Site M are tied into the WWTP. Site M is in the Midway Branch West Trunk Area sewage collection system. An 18-inch gravity main (line ‘C’ shown on **Figure 3.9-1**) runs north to south through the site and golf courses. A 12-inch gravity main east of Site M runs north to south for the DISA campus (URS/LAD 2009).



Sources: Potential Project Actions: HDR | e²M, Inc 2010; Sanitary Sewer Lines: Fort Meade GIS 2009; Aerial Photography: USDA-APFO NAIP 2009.

Figure 3.9-1. Sanitary Sewer Lines in the Vicinity of the NSA Campus

Table 3.9-1. Summary of Capacities of Pump Stations at Fort Meade

Pump Station	Capacity*
No. 1	30 gallons per minute (gpm)
No. 2	60 gpm
No. 3	60 gpm
No. 4 (East Side)	1,500 gpm
No. 5	150 gpm
No. 6	120 gpm
No. 7	3 hp
No. 8	120 gpm
No. 9 (Leonard Wood)	3,450 gpm

Source: Fort Meade 2006c
Note: * Pump station capacities presented are based on the latest available data provided by Fort Meade staff.

Wastewater System Evaluation. The Chesapeake Bay has experienced a decline in water quality from excessive nutrient enrichment (i.e., phosphorus and nitrogen). The Chesapeake Bay Agreement of 1983, signed by Maryland, Virginia, Pennsylvania, and the District of Columbia, specified a nutrient reduction goal of 40 percent by the Year 2000. The MDE developed a strategy for achieving the desired reduction by the upgrade of 66 major WWTPs in the watershed to remove nitrogen through a process known as biological nutrient removal (BNR). Regulatory agencies expect that by using the BNR process, more than 90 percent of pollutants are removed, while achieving a total nitrogen concentration below 8 milligrams per liter (mg/L) (USACE Mobile District 2007).

The Chesapeake Bay 2000 Agreement requires further reduction of nitrogen and phosphorus entering the bay by approximately 20 million pounds and 1 million lbs/yr, respectively. In the future, MDE might require the use of enhanced nutrient removal technologies. WWTPs using these technologies are expected to reduce nitrogen and phosphorus in the wastewater down to 3.0 mg/L total nitrogen and 0.3 mg/L total phosphorus (USACE Mobile District 2007).

A Wastewater Systems Report for Fort Meade completed in June 2007 identified the following actions that should take place to increase the capacity of the WWTP and wastewater collection system (URS/LAD 2009):

- Retrofit the WWTP treatment process and replace filters to meet the NPDES biological nitrogen removal and the Chesapeake Bay initiative
- Upgrade site safety and security at the WWTP
- Upgrade instrumentation and controls at the WWTP
- Upgrade wastewater collection Pump Stations
- Inflow/infiltration control.

The wastewater system, including the WWTP and associated piping infrastructure, at Fort Meade is currently being privatized.

Storm Water Drainage System

The storm water drainage system at Fort Meade is composed of two major defined watersheds and one minor undefined watershed. These three watersheds are supplemented with an extensive network of storm drain pipes and attendant drainage structures that are supplemented by swales, ditches, other drains, and retention ponds. These drainage areas are generally north-south oriented, emanate in the northern portion of the installation, and ultimately discharge into the Little Patuxent River (USACE Mobile District 2007). **Figure 3.9-2** shows the locations of the storm water drainages in the vicinity of Site M.

The eastern portion of Fort Meade is drained by the Franklin Branch, the central portion is drained by Midway Branch, and the western portion is drained by several unnamed tributaries. Construction of retention ponds at Fort Meade has been ongoing for the past several years. These retention ponds reduce the concentrated flow into the main branch channels, thereby preventing back overflow and flooding (USACE Mobile District 2007).

The NSA campus is topographically divided into three natural drainage sub-basins that cover the northern, eastern, and western areas of the NSA campus. Site M can be divided into two major drainage basins. The northern half of Site M flows into the 9800 Area, and then flows south through the South Campus to the storm water management area (SWMA). The eastern three-quarters of Site M drains east and southeast directly into Midway Branch, a tributary of the Patuxent River. A ridge line bisects the northeastern corner of the drainage area, creating two separate outlet points to Midway Branch. The southern half of Site M flows through the existing research and engineering (R&E) overflow parking area and joins flows from the northern area, in the South Campus. The western one-quarter of Site M drains west and southwest across existing developed land to a SWMA near Perimeter Road and MD 32 (URS/LAD 2009).

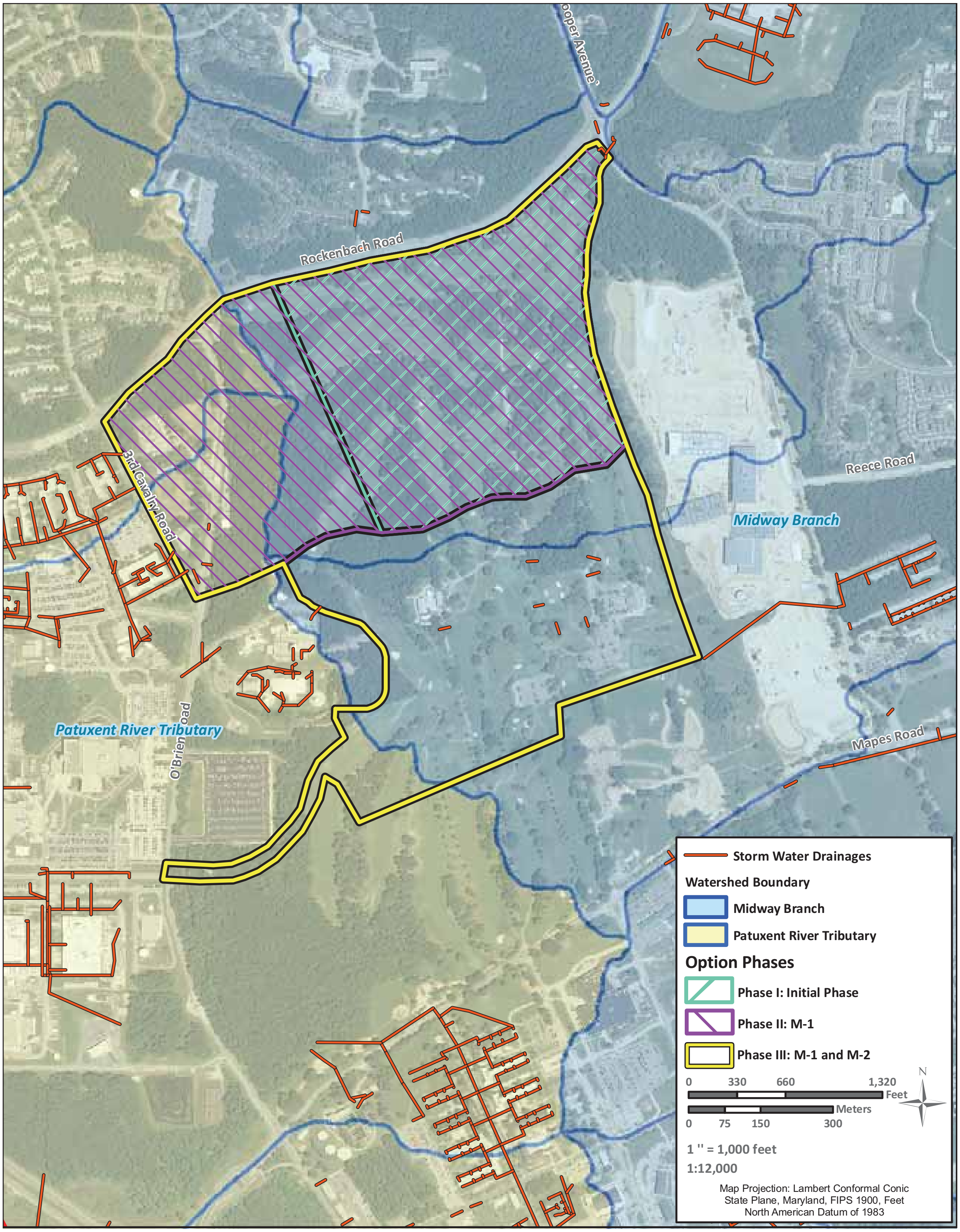
Based on the provisions of COMAR 26.17.01 and 26.17.02, all jurisdictions within Maryland must implement a storm water management program to control the quality and quantity of storm water runoff resulting from any new development. Under the regulations, the release rate from newly developed areas cannot exceed the rate generated by the site under undeveloped conditions (USACE Mobile District 2007).

Electrical System

Electrical power is supplied to Fort Meade by BGE via four distribution substations; three of which serve the NSA campus and one of which serves Fort Meade (URS/LAD 2009).

Currently BGE uses several energy sources to generate electricity. The sources used are detailed in **Table 3.9-2**. BGE also offers a mix of power purchase options to commercial users. The options allow users to specify different mixes of generating sources if more renewable power than is offered by the baseline generation mix is desired.

The three substations at the NSA campus are near full capacity. In various locations beyond the three substations, the ductbank infrastructure and building distributions pose limits on how the power can be used. The NSA campus substations are within the 300-foot AT/FP standoff and need to be relocated. In addition, the substations are outdated and unreliable. The electrical power infrastructure is aging, in need of maintenance, and has experienced outages (both internal to the system and weather-induced). The constantly changing mission of the facility load centers, which distributes power inside the buildings, requires a more flexible power system distribution to meet the demand. The power distribution system needs to be able to redirect power to the buildings in response to evolving mission requirements or



Sources: Potential Project Actions: HDR | e²M, Inc 2010; Storm Water Drainages: Fort Meade GIS 2009; Aerial Photography: USDA-APFO NAIP 2009.

Figure 3.9-2. Storm Water Drainages and Watershed Boundaries in the Vicinity of the NSA Campus

Table 3.9-2. Fuel Sources Used to Produce Electricity by BGE

Fuel Source	Percent
Coal	51.2
Oil	0.3
Natural Gas	6.4
Nuclear	33.2
System Mix*	4.3
Renewable Sources	4.7
Captured Methane Gas	*0.3*
Geothermal	*0.0*
Hydroelectric	*2.8*
Solar	*0.0*
Solid Waste	*0.1*
Wind	*0.0*
Wood or Biomass	*1.5*
Total	**100.1**

Source: BGE 2009

Note: * BGE Supply Mix represents the Maryland Renewable Portfolio Standard requirement of 4.5% (2.0% Tier I, 2.5% Tier II), and the balance of 95.5% is simply the PJM "Residual Mix."

unexpected system failure conditions. There are several secondary sources of electrical power composed of 18 engine-driven emergency standby generators at 15 locations at Fort Meade (USACE Mobile District 2007). The existing backup generators are diesel powered. In May 2009, NSA approved a plan to upgrade and modernize aging utilities infrastructure on the original campus through the construction and operation of a North Utility Plant, a South Generator Facility, a Central Boiler Plant, and associated infrastructure to upgrade and modernize aging utilities infrastructure (DOD 2009a).

There is no electrical power generated at Site M. There are seven transformers on Site M; three are south of the maintenance area, along Zimborski Avenue on a utility pole; three are pole-mounted transformers south of the golf course, at the entrance along Mapes Road; and one is a pole-mounted transformer east of the baseball field on Mapes Road (USACE Mobile District 2007).

Natural Gas System

Natural gas is supplied by BGE to the Defense Energy Support Center, a DOD agency, which in turn provides it to Fort Meade and NSA. Natural gas is supplied to Fort Meade via high-pressure (100 pound-force per square inch gauge [psig]) mains (USACE Mobile District 2007). Natural gas is supplied to the NSA campus by a 4-inch gas main. An extensive natural gas distribution system loops the entire campus and provides natural gas to a majority of the facilities. The gas delivery pressure is 88 psig per the existing pressure gauges in the gas meter building. The current natural gas capacity is 445,000 cubic feet per hour (ft^3/hr), which is supplied by seven BGE meters. Current demand is approximately 139,060 ft^3/hr (33 percent of the capacity). Studies confirm that the system capacity can be exceeded by 25 percent (URS/LAD 2009).

Currently, there are no natural gas sources at Site M. Three natural gas lines run adjacent to Site M; one 8-inch gas line is along Rockenbach Road to the north, one 6-inch gas line is along Mapes Road to the south, and one 8-inch gas line is along O'Brien Road to the west (URS/LAD 2009).

Solid Waste

In 2009, Fort Meade generated approximately 3,763 tons of household, commercial, and industrial waste. In 2009, NSA generated approximately 3,689 tons of municipal solid waste. Solid waste is ultimately transported by the Directorate of Public Works staff to local landfills and transfer stations. Fort Meade does not currently operate a landfill. There are numerous other rubblefills and landfills in the greater Baltimore area (DOD 2009a).

Recyclable materials at Fort Meade are collected by a licensed contractor and processed at the Fort Meade Recycle Center (Building 2250) under a Qualified Recycling Program. Recyclables include cardboard, white paper, newspaper, paper pulp, aluminum cans, and scrap metal. In 2009, Fort Meade recycled 5,085 tons of recyclable materials. NSA operates its own recycling program, and in 2009 NSA recycled 10,763 tons of recyclable materials, with a waste diversion rate of 74 percent (DOD 2009a, USACE Mobile District 2007). The Automatic Waste Collection System on the NSA campus receives classified waste through a system of chutes, pipes, and valves. Classified waste is declassified at the Paper Destruct Building, where it is converted into paper pulp and recycled (URS/LAD 2009).

Communication System

The Network Enterprise Center (NEC) has oversight for the communication system at Fort Meade. Fiber-optic cable is used exclusively on-installation and all new buildings have Category 5 telephone cable installed. There are 24 authorized Integrated Services Digital Network users. Each Directorate has their own Local Area Network. The NSA has its own communications and signal support (Fort Meade 2005b).

A nontactical radio trunking system that uses hand-held Motorola radios is managed by the NEC. Cellular service is available; however, it is strictly controlled, and very limited authorized government users are on-installation. Fort Meade and NSA have different controls for cellular service on-installation. There is also a High Frequency Military Affiliated Radio System station that is maintained on-installation by the NEC. Telephone service is provided by Verizon (USACE Mobile District 2007).

Security Systems

Currently, there are no discrete security systems (i.e., ACPs, gates, or fence lines) at Site M. Security for the NSA campus is based on Director of Central Intelligence Directives; UFC 4-010-01, *DOD Minimum Anti-terrorism Standards for Buildings*; and UFC 4-022-01, *DOD Security Engineering: Entry Control Facilities/Access Control Points*. In addition, the following strategies, derived from Fort Meade's IDG, are considered for the orientation of facilities:

- Deny aggressors a clear "line of sight" to the facility from on or off the site where possible. Protect the facility against surveillance by locating the protected facility outside of the range or out of the view of vantage points.
- Protect against attack by selecting perimeter barriers to block sightlines such as obstruction screens, trees, or shrubs. Noncritical structures or other natural or man-made features can be used to block sightlines.
- Create "defensible space" by positioning facilities to permit building occupants and police to clearly monitor adjacent areas.

- If roads are nearby, orient a building so the sides of the building are not parallel to vehicle approach routes.
- Design vehicular flow to minimize vehicle bomb threats; avoid high-speed approach into any critical or vulnerable area.
- Avoid siting the facility adjacent to high surrounding terrain, which provides easy viewing of the facility from nearby nonmilitary facilities (URS/LAD 2009).

MD 175 and MD 32 are important perimeter highways that provide access to the Fort Meade entry/exit gates. The installation, including the current NSA areas, uses ten ACPs; eight of which are actively in-use to connect with the surrounding road network. Three of the externally controlled-access points are dedicated to the NSA campus: ACP No. 1 (MD 32 and Canine Road), ACP No. 6 (MD 32 and Samford Road), and ACP No. 2 (the exit from MD 295 South) (URS/LAD 2009).

Liquid Fuel Supply

The NSA operations involving liquid fuel are limited to the use of No. 2 fuel oil for heating and diesel fuel for running emergency generators. The NSA also operates truck-mounted fuel tanks (50 gallons each) for refueling forklifts and other mobile equipment. The Central Boiler Plant uses two 200,000-gallon aboveground storage tanks (ASTs), which contain No. 2 fuel oil used for steam generation. The Central Boiler Plant also uses a 10,000-gallon diesel day tank for an emergency diesel generator (DOD 2009a). Information on the Central Boiler Plant on the NSA campus is provided in the *Heating and Cooling System* section below. NSA has 13 underground storage tanks (USTs) and 42 ASTs that have a combined total capacity of 964,000 gallons.

Building 8880 on Site M is divided into a maintenance area and an equipment storage area. There is a 1,000-gallon gasoline/diesel AST and a 550-gallon fuel oil UST at Building 8880 that were installed in the 1990s. There are two 1,000-gallon fuel oil ASTs at Site M; one at Building 8870 and one at Building 8890. In addition, there is a 525-gallon gasoline AST at the clubhouse on Site M, which is used for refueling the golf carts (USACE Baltimore District 2004a).

Heating and Cooling System

The Central Boiler Plant (Building 9807) on the NSA campus provides high-pressure steam for heating, domestic water generation, and humidification for the majority of the NSA campus (URS/LAD 2009). The Central Boiler Plant is composed of four dual-fuel natural gas/fuel oil-fired boilers, pumps, piping, and two 200,000-gallon ASTs that store backup fuel (No. 2 fuel oil) for the boilers. The plant also contains a small pump station in a closed pit that houses return lines and fuel lines. The plant operates continuously; however, the number of boilers in operation depends on the demand and time of year. The boilers primarily operate on natural gas but use No. 2 fuel oil for backup. Contractors service the boiler plant, but employees monitor the feed and perform the daily chemical analysis (DOD 2009a). The steam and condensate distribution system is a direct burial system that is accessed by manholes. Most of the steam piping is along Samford, Canine, and Emory roads. Sections of the steam pipe and buildings can be isolated through valves in the manholes. A steam piping replacement project was performed from 1993 through 2001 (URS/LAD 2009). There are some individual chillers associated with buildings on the NSA campus, but currently there is no central chilled water distribution system to provide air conditioning (DOD 2009a).

Pavements

Parking Facilities. There are approximately 112 acres of surface parking space and one small two-level parking structure on the NSA campus. Parking is provided throughout the NSA campus on surface lots adjacent to most buildings. Parking spaces fall into one of four groups: (1) "General" spaces, available for use by NSA employees or visitors; (2) "Reserved" spaces, restricted on a 24/7 basis to individual senior staff; (3) "Handicap" spaces, restricted to NSA employees or visitors whose vehicles display a valid disabled license plate or rearview mirror tag; and (4) "NSA Fleet," areas used by government or private trucks, buses, and other maintenance vehicles that are not available for use by NSA employees or visitors. The parking lots are mostly devoid of green areas and shade trees to articulate the parking areas and provide shade to moderate the thermal heat gain produced by large expanses of paving. Existing parking lots, including overflow parking, are at nearly 100 percent capacity on most weekdays during normal business hours. Ample parking capacity is available during off hours, weekends, and holidays (DOD 2009a, URS/LAD 2009).

Sidewalks. There are sidewalks between parking lots and adjacent to most facilities on Fort Meade and the NSA campus; however, the sidewalks adjacent to most facilities are limited and not interconnected throughout Fort Meade and the NSA campus in a manner to facilitate walking or biking as alternatives to driving around the installation. In addition to the limited number of sidewalks between major facilities, pedestrian flow is severely restricted by security checks that occur at internal NSA fence lines around many of the buildings (URS/LAD 2009).

3.10 Hazardous Materials and Wastes

3.10.1 Definition of Resource

Hazardous materials are defined by 49 CFR 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions" in 49 CFR 173. Transportation of hazardous materials is regulated by the U.S. Department of Transportation regulations within Title 49 CFR.

Hazardous substances are defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) at 42 U.S.C. 9601(14), as amended by the Superfund Amendments and Reauthorization Act. The definition of hazardous substances includes (A) any substance designated pursuant to 33 U.S.C. 1321(b)(2)(A); (B) any element, compound, mixture, solution, or substance designated pursuant to 42 U.S.C. 9602; (C) any hazardous waste having the characteristics identified under or listed pursuant to Section 3001 of the Resource Conservation and Recovery Act (RCRA) of 1976, as amended, (42 U.S.C. 6921); (D) any toxic pollutant listed under 33 U.S.C. 1317(a); (E) any hazardous air pollutant listed under Section 112 of the CAA (42 U.S.C. 7412); and (F) any imminently hazardous chemical substance or mixture with respect to which the Administrator of the USEPA has taken action pursuant to 15 U.S.C. 2606. The term hazardous substance does not include petroleum products and natural gas.

Hazardous wastes are defined by the RCRA at 42 U.S.C. 6903(5), as amended by the Hazardous and Solid Waste Amendments, as "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR 273. Four types of waste are currently covered under the universal waste regulations: hazardous waste batteries, hazardous waste pesticides that are either recalled or collected in waste pesticide collection programs, hazardous waste thermostats, and hazardous waste lamps.

Toxic substances are regulated under the Toxic Substances Control Act (15 U.S.C. 2601 et seq.), which gives the USEPA the ability to track industrial chemicals produced or imported into the United States. USEPA reviews manufacturer specifications for these chemicals and can require reporting or testing of those that might pose an environmental or human-health hazard. USEPA can ban the manufacture and import of those chemicals that pose an unreasonable risk. Asbestos-containing materials (ACMs), polychlorinated biphenyls (PCBs), and lead-based paint (LBP) are among the chemicals regulated by the Toxic Substances Control Act.

ACMs at U.S. Army facilities are regulated by Army Regulation (AR) 200-1 and AR 420-70, *Buildings and Structures*. AR 200-1 contains the environmental policy for the Army's Asbestos Management Program, and it requires the development and execution of an Asbestos Management Plan. AR 420-70 contains the facilities engineering policy for the U.S. Army's Asbestos Management Program. It consists of requirements for facility surveys, monitoring, training, and facility disposition. AR 420-70 excludes ACMs from all procurements and uses where asbestos-free substitute materials exist. Fort Meade maintains an Asbestos Management Program (DOD 2008a). Facilities most likely to contain ACMs are those built or remodeled prior to 1978, at a time before friable (crushable) ACMs were banned from use by the USEPA (SBCAPCD 2009); however, facilities constructed in or after 1978 might contain nonfriable asbestos.

In general, hazardous materials, hazardous substances, hazardous wastes, and toxic substances include elements, compounds, mixtures, solutions, and substances which, when released into the environment or otherwise improperly managed, could present substantial danger to the public health, welfare, or the environment.

Evaluation of hazardous materials and wastes focuses on ASTs; USTs; and the storage, transport, handling, and use of pesticides, fuels, solvents, oils, lubricants, ACMs, PCBs, and LBP. A storage tank is a vessel and its associated piping that contains a product. From a regulatory perspective, if less than 10 percent of the volume of the storage tank and piping is underground, it is an AST. If at least 10 percent of the volume of the storage tank and piping is underground, it is a UST.

Evaluation might also extend to generation, storage, transportation, and disposal of hazardous wastes when such activity occurs at or near the project site of a proposed action. In addition to being a threat to humans, the improper release of hazardous materials and wastes can threaten the health and well-being of wildlife species, botanical habitats, soil systems, and water resources. In the event of a release of hazardous materials or wastes, the extent of contamination varies based on the type of soil, topography, and water resources.

3.10.2 Existing Conditions

Hazardous Materials and Petroleum Products. AR 200-1, *Environmental Protection and Enhancement* identifies the requirements for managing hazardous materials on U.S. Army facilities, including guidance for the proper use, generation, transportation, storage, and handling of hazardous materials and petroleum products.

Fort Meade uses, handles, and stores hazardous materials and petroleum products, which include pesticides, oils, lubricants, cleaners, hydraulic fluids, and fuels (gasoline and diesel). Common usages of hazardous materials and petroleum products within the areas of the Proposed Action and proposed alternatives include pesticide applications, fuel for heating buildings, and lubricants and fuels for landscaping equipment, golf cart cleaning, and maintenance processes.

No buildings that contain hazardous materials or petroleum products have been documented within Site M-1; however, several buildings that contain hazardous materials and petroleum products have been documented within Site M-2. **Table 3.10-1** identifies the buildings within Site M-2 and includes a brief description of the hazardous materials and petroleum products at each. **Figure 3.10-1** shows the locations of these buildings relative to the areas of the Proposed Action and both proposed alternatives. Several structures have been demolished within Site M-2 that once contained hazardous materials and petroleum products. These structures include a former clubhouse building and two associated structures (approximately 200 feet southwest of the current clubhouse building) that were demolished in the mid-1990s and several former maintenance buildings that were razed between the 1960s and present (USACE Baltimore District 2004a). No evidence of hazardous material or petroleum product spills has been documented at these former buildings.

Hazardous and Petroleum Wastes. Fort Meade maintains an Installation Hazardous Waste Management Plan, as directed by AR 200-1. This plan describes the roles and responsibilities of all members of Fort Meade with respect to the waste stream inventory, waste analysis planning, hazardous waste management procedures, training, emergency response, and pollution prevention. The plan establishes the procedures to comply with applicable Federal, state, and local standards for hazardous and petroleum waste management (DOD 2004).

Fort Meade is a RCRA Large Quantity Generator and operates a 90-day storage facility. Fort Meade's USEPA identification number is MD9210020567 (USACE Baltimore District 2004a). Large-quantity generators generate more than 1,000 kilograms (kg) of hazardous waste, or more than 1 kg of acutely hazardous waste, per month.

Various activities and operations at Fort Meade generate hazardous and petroleum wastes, which include oils, lubricants, antifreeze, brake fluids, hydraulic fluids, paint and paint thinners, cleaners, degreasers, solvents, and batteries. No buildings that contain hazardous or petroleum wastes have been documented within Site M-1; however, several buildings that contain hazardous and petroleum wastes have been documented within Site M-2. **Table 3.10-1** identifies the current buildings within Site M-2 and includes a brief description of the hazardous and petroleum wastes at each. **Figure 3.10-1** shows the locations of these buildings. Several former structures within Site M-2, including the former clubhouse buildings and former maintenance buildings, have been documented as once containing hazardous and petroleum wastes. No spills or releases of hazardous or petroleum wastes have been documented at any of these former buildings (USACE Baltimore District 2004a).

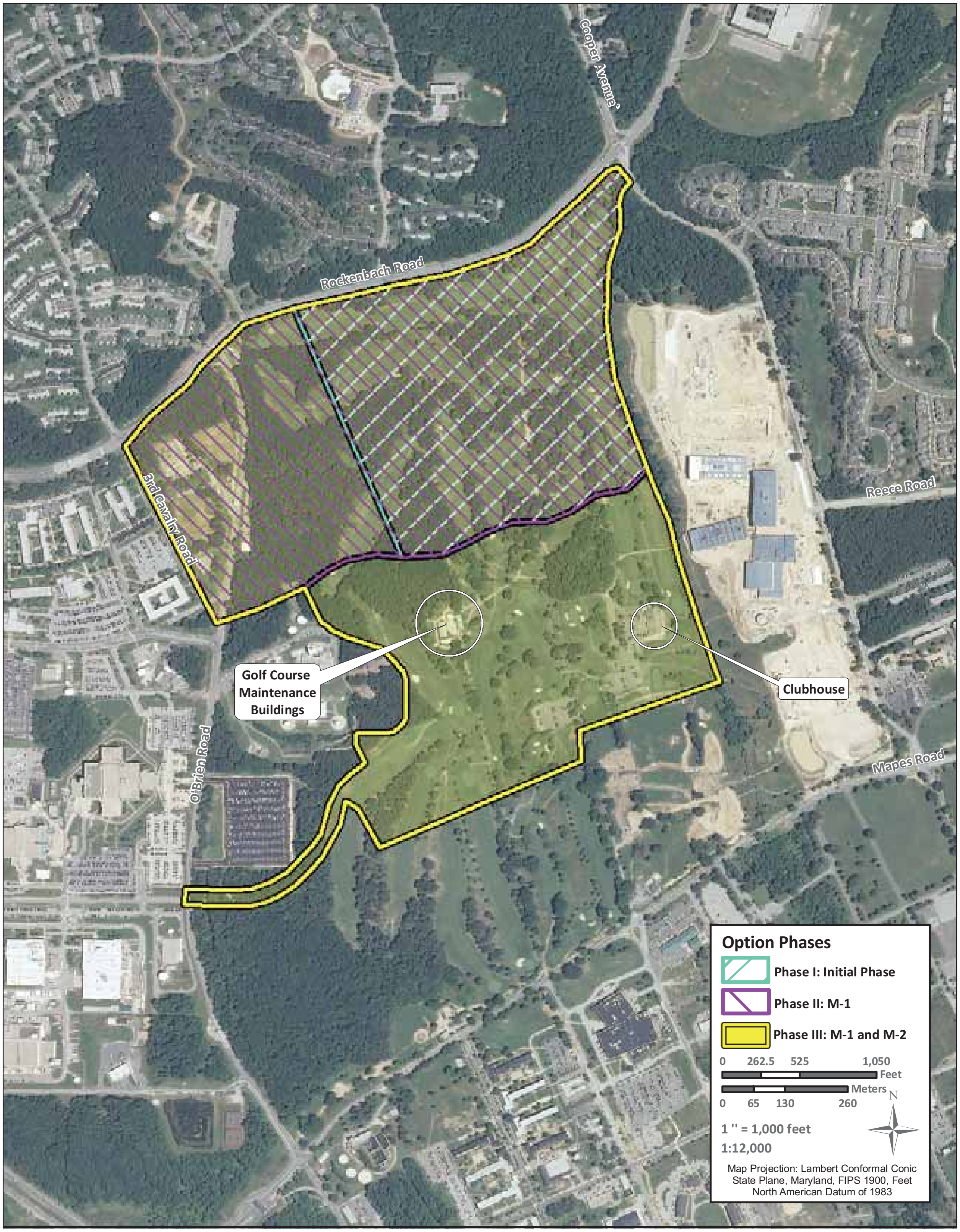
Storage Tanks and Oil/Water Separators. There are approximately 100 ASTs and 10 USTs currently at Fort Meade outside of NSA (DOD 2009b, 2009c). There are no ASTs and no USTs within Site M-1. There are, however, 5 ASTs and 1 UST within Site M-2. All of these storage tanks were installed in the mid-1990s, and are described as follows:

- One 525-gallon, gasoline AST with secondary containment near the current clubhouse building
- One 1,000-gallon, double-walled, fuel oil AST (Building 8870)
- One 1,000-gallon, double-walled, gasoline/diesel AST (Building 8880)
- One 1,000-gallon, double-walled, fuel oil AST (Building 8890)
- One 800-gallon, double-walled, waste oil AST (Building 8890)
- One 550-gallon, fuel oil UST (Building 8880) (USACE Baltimore District 2004a).

Table 3.10-1. Current Facilities within Site M that Contain Hazardous and Petroleum Products and Wastes

Building Name, Year Constructed, and Size	Building Construction	Current Building Use	Types of Hazardous Materials and Petroleum Products Present	Types of Hazardous and Petroleum Wastes Present
Clubhouse, 1995, square footage not available	Concrete block and wood frame with concrete slab below basement	Recreation, dining, lounge, and golf cart storage and maintenance	Gasoline, solvents, and cleaners	Used oil (in 55-gallon drums) and spent golf cart batteries
Golf Course Maintenance Area				
21 – Hazardous Waste Storage Locker, 1993, 25 ft^2	Steel building with built-in secondary containment	Hazardous wastes storage	None	Hazardous wastes including spent antifreeze, cleaners, and solvents
8860 – Pumphouse Building, 1949, 225 ft^2	Concrete block frame with wooden roof; concrete slab under portion of building, soil under remainder of building	Pumphouse for water sprinkler system	Oil, grease, lubricants, asphalt roof coating, and wood preservatives	55-gallon drums and cans of used oil; possible former storage location of hazardous waste prior to Building 21
8870 – Maintenance Building, 1989, 4,800 ft^2	Steel frame with metal siding on concrete slab	Maintenance and landscaping storage	Fertilizers, insecticides, herbicides, rock salt, degreasers, and paints	None
8880 – Maintenance Building, 1964, 4,000 ft^2	Steel frame with metal siding on concrete slab	Maintenance and equipment storage	Gasoline cans, grease, paint, hydraulic oil, and herbicides	None
8890 – Maintenance Building, 1989, 4,000 ft^2	Steel frame with metal siding on concrete slab	Office space with lockers, break room, workshop, and maintenance and landscaping storage	Oil and solvents; several flammable material storage cabinets containing solvents, paints, and paint thinners	Used oil in an 800-gallon AST
8890A – Hazardous Materials Storage Building, 1989, 144 ft^2	Concrete block frame on concrete slab with built-in secondary containment	Hazardous materials storage	Fertilizers and herbicides	None

Source: USACE Baltimore District 2004a



Source of Potential Project Actions: HDR | e²M, Inc 2010; Source of Aerial Photography: USDA-APFO NAIP 2009.

Figure 3.10-1. Locations of Current Buildings that Contain Hazardous and Petroleum Products and Wastes within Site M

Approximately 12 USTs were formerly within Site M-1, including at the former clubhouse, in the area of the current maintenance buildings, and at a former farmhouse (approximately 200 feet north of the current clubhouse). These former USTs were removed at various dates between 1990 and 2000. Of the 12 former USTs, 2 (a 550-gallon diesel UST and a 2,000-gallon gasoline UST) were removed from the maintenance area (within Site M-2) due to leaks in 1990 and 1992, respectively. Contaminated soil was excavated from both sites during the UST removal process, and groundwater monitoring was conducted until 1996 when sampling results indicated that groundwater complied with MDE cleanup standards. There are currently no ongoing or planned remediation projects within the areas of the Proposed Action and proposed alternatives resulting from AST or UST leaks (USACE Baltimore District 2004a).

Two oil/water separators (OWSs) are within Site M-2. One of the OWSs was installed in 2003 at an equipment washing station at the golf courses' maintenance area. The second OWS is near the clubhouse building and is used for the washing of golf carts. Both OWSs are reportedly in good condition and serviced on a regular basis. No other OWSs are within Site M-2, and no OWSs are within Site M-1 (USACE Baltimore District 2004a).

Asbestos-Containing Materials. With exception to Buildings 8860 and 8880, all buildings in the areas of the Proposed Action and proposed alternatives were constructed after 1978; therefore, friable ACMs are not expected within these buildings. Because Buildings 8860 and 8880 were constructed in 1949 and 1964, respectively, ACMs might be present in these buildings (USACE Baltimore District 2004a).

Radon. Radon is a naturally occurring colorless, odorless, radioactive gas formed by the natural breakdown or decay of uranium in rock, soil, and water. It has the tendency to accumulate in enclosed spaces that are below ground and poorly ventilated, such as basements. Radon has been determined to increase the risk of developing lung cancer. In general, the risk increases as the level of radon and the length of exposure increase. USEPA has established a guidance radon level of 4 picoCuries per liter (pCi/L) in indoor air for residences; however, there have been no standards established for commercial structures. Radon gas accumulations greater than 4 pCi/L are considered to represent a health risk to occupants.

The USEPA-designated radon potential in Anne Arundel County, Maryland, is Radon Zone 2, which has an average indoor radon level between 2 and 4 pCi/L (USEPA 2009c). The U.S. Army conducted radon monitoring at Fort Meade in 1990. All indoor radon concentrations were below 4.0 pCi/L (USACE Baltimore District 2004a).

Lead-Based Paint. In 1978, the United States Consumer Products Safety Commission banned the use of LBP for residential use. Under the LBP Poisoning Prevention Act (42 U.S.C. 4822), as amended, LBP hazards equal to or greater than 1 microgram per cubic centimeter must be abated.

LBP at Fort Meade is managed according to their Lead Hazard Management Plan. The purpose of the plan is to implement a management program for the identification and risk assessment of lead and LBP hazards (DOD 2006).

Within Site M, only Buildings 8860 and 8880 were constructed prior to 1978 (USACE Baltimore District 2004a). As such, these buildings are assumed to contain LBP.

Pesticides. AR 200-5, *Pest Management*, promulgates policies, responsibilities, and procedures to implement the Army Pest Management Program. Fort Meade's pest management practices are covered in its Integrated Pest Management Plan, which notes pesticide application procedures, storage management, and safety concerns (DOD 2005).

Numerous pesticides are used at Fort Meade. These products include herbicides (such as dithiopyr and oxadiazon), fungicides (such as chlorothalonia and mancozeb), and insecticides (such as lambda-cyhalothrin and carbaryl). Many of these products are used in the maintenance of the two golf courses in Site M. As noted in **Table 3.10-1**, pesticides are stored in Buildings 8870, 8880, and 8890A (all within Site M-2). All pesticide storage facilities are subject to periodic inspection by the Maryland Department of Agriculture (MDA). Prior MDA inspections found that pesticides are being used and stored properly at Site M. Current applications of pesticides within Site M are conducted within the guidelines established by the manufacturer and as specified in the Integrated Pest Management Plan (USACE Baltimore District 2004a). There is no documentation to indicate any misuse or spills of pesticide products within Site M.

Soil sampling investigations were conducted at 5 of the 36 golf course holes as part of a 2004 Environmental Baseline Survey (EBS) of Site M to determine if environmental contamination from pesticide use at the golf courses was present. Places where pesticides are commonly applied, such as golf course greens, fairways, and tee boxes, and places where pesticides are stored and mixed, such as maintenance buildings, were the most likely to be contaminated. Sampling results determined that pesticides, including heptachlor epoxide, alpha chlordane, and dieldrin, were in excess of MDE residential soil clean-up standards at several sampling locations within Site M; however, the level of contamination, coupled with the proposed future use of Site M as a administrative complex connected to public water and sewer, was not significant enough to require remedial action. The sampling investigation did not test for arsenic and lead, which were commonly used as pesticides in the past, and it did not include groundwater sampling (USACE Baltimore District 2004a).

Prior to use as a military reservation, portions of Site M were used for farming until at least 1917. Although there is no indication of such, there is the potential for pesticide contamination within Site M from improper former pesticide use to support farming operations. There are currently no ongoing or planned pesticide remediation projects within Site M. The EBS noted that the level of contamination was not significant enough to impact the future use of Site M and would not require remedial action (USACE Baltimore District 2004a).

Polychlorinated Biphenyls. PCBs are mixtures of synthetic organic chemicals that range from oily liquids to waxy solids. PCBs were primarily used in dielectric fluids for industrial electrical equipment, but were also used in hydraulic fluids, fluorescent lamp ballasts, paints, inks, cutting oils, plasticizers, fire retardants, and heat exchange fluids. The USEPA banned most production and use of PCBs in 1979. 40 CFR 761 regulates the manufacture, processing, distribution in commerce, use, disposal, storage, and marking of PCBs and PCB items.

AR 200-1 states that U.S. Army policy is to manage PCBs in place unless operational, economic, or regulatory considerations justify removal. The use, management, disposal, and cleanup of PCBs at Army installations must comply with 40 CFR 761.

Seven electrical transformers were previously observed during the EBS site visit; however, all were labeled as not containing PCBs (USACE Baltimore District 2004a). Other possible sources of PCBs within Site M include electrical light ballasts, capacitors, and electrical surge protectors within buildings. No PCB contamination has been documented within Site M; however, an area of PCB-contaminated groundwater (Site M, Parcel 6 [formerly known as Area of Interest (AOI) 13]) has been documented approximately 250 feet southeast of the area of the Proposed Action and proposed alternatives (USACE Baltimore District 2004a).

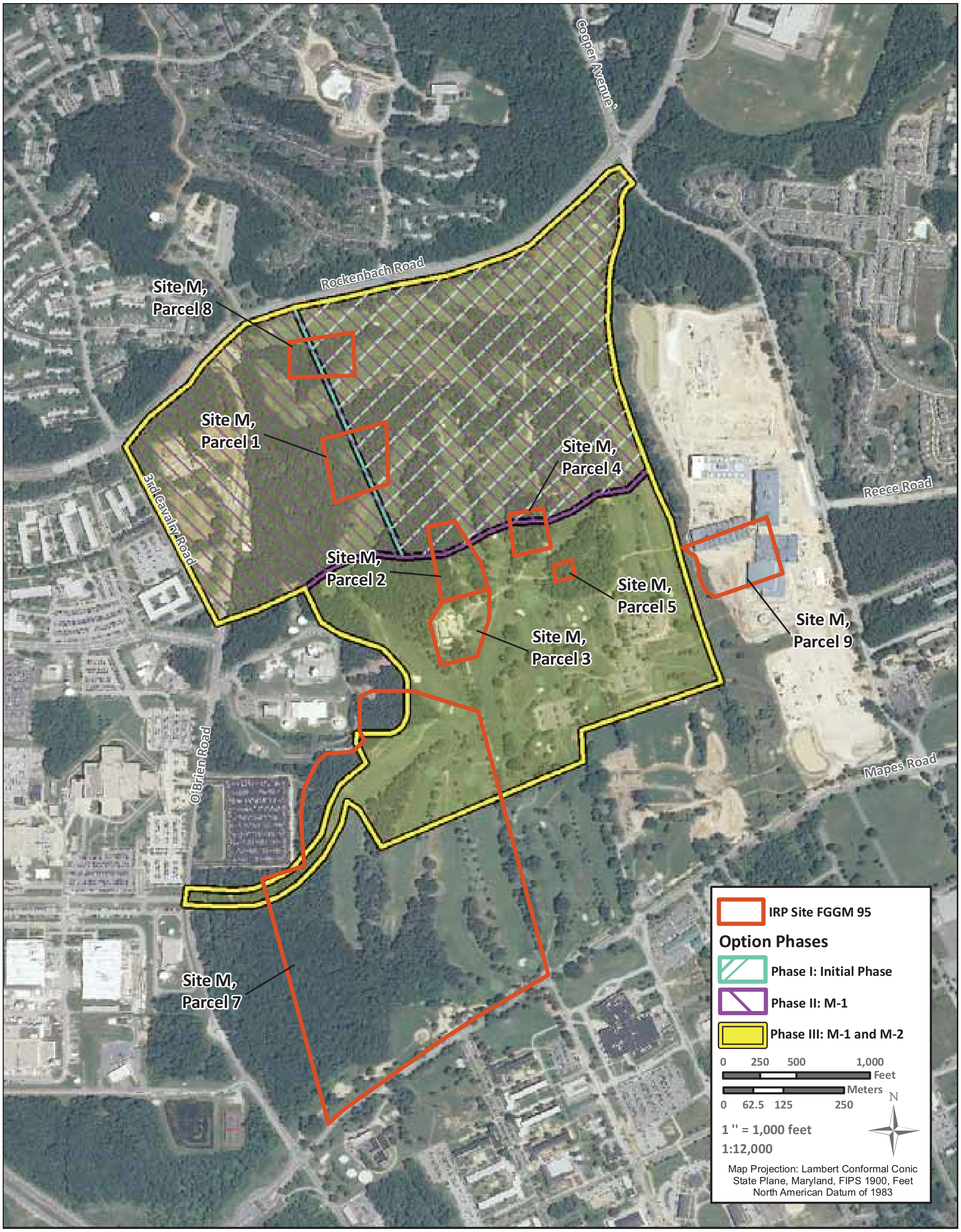
Environmental Restoration Program. The Defense Environmental Restoration Program (DERP) was formally established by Congress in 1986 to provide for the cleanup of DOD property at active installations, BRAC installations, and formerly used defense sites throughout the United States and its territories. The three restoration programs under the DERP are the Installation Restoration Program (IRP), Military Munitions Response Program (MMRP), and Building Demolition/Debris Removal. The IRP requires each installation to identify, investigate, and clean up contaminated sites. The MMRP addresses nonoperational military ranges and other sites that are suspected or known to contain unexploded ordnance (UXO), discarded military munitions, or munitions constituents. Building Demolition/Debris Removal involves the demolition and removal of unsafe buildings and structures. Eligible DERP sites include those contaminated by past defense activities that require cleanup under CERCLA and certain corrective actions required by RCRA. Non-DERP sites are remediated under the Compliance-Related Cleanup Program.

Fort Meade was placed on the USEPA's National Priority List of contaminated sites in July 1998, based on the evaluation of four locations, which have been identified as past storage or disposal sites for hazardous materials or hazardous wastes and where environmental contamination likely occurred. These four sites include the Defense Reutilization and Marketing Office, the Closed Sanitary Landfill, the Clean Fill Dump (closed), and the Post Laundry Facility (INSCOM 2007). All four sites are outside of Site M.

There are 33 active IRP sites and 2 response complete (no further action required) IRP sites at Fort Meade (Fluck 2010a). Of these sites, one active IRP site (FGGM 95) and one response complete site (FGGM 101), now part of FGGM 95, are within the area of the Proposed Action and the proposed alternatives (see **Figure 3.10-2**).

Active IRP Site FGGM 95 is a compilation of 23 nearby landfills. Of the 23 landfills, 8 (Site M, Parcels 1 through 5 and 7 through 9) are within Site M and are shown in **Figure 3.10-2**. The 8 former landfills sites are discussed as follows:

- *Site M, Parcel 1* (formerly known as AOI 1) is within Site M-1, approximately 700 feet southeast of the intersection of Rockenbach and O'Brien Roads. Historical aerial photographs indicate that Site M, Parcel 1 appears to have been a possible dumpsite in 1938 (URS 2009). Several deteriorated 55-gallon drums, tires, and unidentifiable metal remains were observed at Site M, Parcel 1 during the 2004 EBS of Site M (USACE Baltimore District 2004a). A 2004 geophysical study revealed the presence of buried metallic objects, possibly including scrap metal, automobile frames, axles, pipes, and household appliances. Soil sampling conducted during a 2007 Preliminary Assessment/Site Investigation (PA/SI) of Fort Meade detected arsenic, lead, and mercury in the soil above respective action levels. Aluminum, iron, and manganese were detected in groundwater above respective action levels (URS 2009). Risk analysis was performed on the site in 2009 and it was determined that there was no soil risk and a minimal hazard to groundwater. Future groundwater monitoring is to be conducted at Site M, Parcel 1 to determine appropriate remedial actions (URS 2010a).
- *Site M, Parcel 2* (formerly known as AOIs 2 and 3) is within Sites M-1 and M-2, approximately 50 feet north of the maintenance area for the golf courses. Historical aerial photographs show a solid waste landfill in operation at this area in 1943 (URS 2009). Metal scraps and 55-gallon drums were observed at Site M, Parcel 2 during the EBS site visit (USACE Baltimore District 2004a). The 2004 geophysical survey found evidence of a landfill with disturbed soil to 8 feet below the ground surface. Soil sampling conducted during the 2007 PA/SI detected concentrations of arsenic and benzaldehyde in excess of MDE clean-up standards. Aluminum, iron, lead, and manganese were detected in groundwater samples at concentrations that exceed MDE clean-up standards (URS 2009). Future soil and groundwater monitoring efforts are proposed at Site M, Parcel 2 to determine appropriate remedial actions (URS 2010a).



Sources: Site M Parcels: URS 2009; Aerial Photography: USDA-APFO NAIP 2009.

Figure 3.10-2. Location of IRP Site FGGM 95

- *Site M, Parcel 3* (formerly known as AOI 5) is at the maintenance area for the golf courses. This site was identified when soil samples collected in 1999 and 2004 exhibited concentrations of pesticides above MDE clean-up standards. Additionally, during the EBS site visit, a ground-surface soil stain on the dirt floor of the western portion of Building 8860 at the golf courses' maintenance area was noted. The age, source, size, and depth of this soil stain are not known. Soil samples collected from the area of the soil stain during the EBS site visit indicated that arsenic, mercury, and diesel range organics exceeded MDE soil clean-up standards and anticipated typical concentrations (ATCs) for the region (USACE Baltimore District 2004a). Additional groundwater and soil sampling has occurred and determined that there is no apparent hazard/risk at Site M, Parcel 3. Pending approval from the USEPA, the site is to be classified as no further action required (URS 2009, URS 2010b).

- *Site M, Parcel 4* (formerly known as AOI 7) is in the south-central portion of Site M-1 and the north-central part of Site M-2. Site M, Parcel 4 is a former training area. Groundwater sampling, conducted as part of the EBS, detected aluminum, iron, and manganese at concentrations in excess of MDE clean-up standards (USACE Baltimore District 2004a). Subsequent sampling has determined that there is no apparent hazard/risk at Site M, Parcel 4. Pending approval from the USEPA, the site is to be classified as no further action required (URS 2009, URS 2010b).

- *Site M, Parcel 5* (formerly known as AOI 11) is within Site M-2, approximately 500 feet northwest of the current golf course clubhouse building. Concrete debris was observed at Site M, Parcel 5 during the EBS site visit. Soil sampling, taken as part of the EBS, determined that concentrations of aluminum, arsenic, chromium, and iron exceed MDE clean-up standards and ATC for the region. Groundwater contamination at Site M, Parcel 5 was not reported. A geophysical survey and review of historical aerial photographs did not indicate former solid waste disposal concerns at Site M, Parcel 5 (USACE Baltimore District 2004a). Because no evidence of release has been documented at Site M, Parcel 5, the site is to be classified as no further action required, pending USEPA approval (URS 2010b).

- *Site M, Parcel 7* (formerly known as AOIs 6 and 8) is in the western portion of the area of Alternative 2. The site includes a former training area, portions of a former mortar range, and a possible former landfill. (The mortar range portion of Site M, Parcel 7 is discussed in the *Ordnance* subsection.) Metal cans, piping, and a fire hydrant were observed at the suspected former landfill portion of Site M, Parcel 7 during the EBS site visit. Historical aerial photographs show scarred ground at Site M, Parcel 7 from 1938 to 1957. Sampling conducted at Site M, Parcel 7 during the EBS indicated that aluminum, iron, manganese, and cobalt were detected in groundwater, and arsenic was found in soil (USACE Baltimore District 2004a). Future groundwater monitoring efforts are proposed at Site M, Parcel 7 to determine appropriate remedial actions (URS 2010a).

- *Site M, Parcel 8* (formerly known as AOI 16) is in the northwestern corner of the golf course area within Site M-1 and is a suspected former landfill and former training area. Historical aerial photographs show disturbed ground at Site M, Parcel 8 from 1938 to 1957. No surface solid waste was observed at Site M, Parcel 8 during the EBS site visit; however, a geophysical study identified magnetic anomalies, suggesting the presence of buried metallic wastes (USACE Baltimore District 2004a). Sampling conducted as part of the 2007 PA/SI detected concentrations of antimony, arsenic, iron, and lead in soil samples above MDE clean-up standards, and aluminum, iron, and manganese in groundwater samples above MDE clean-up standards (URS 2009). Future soil and groundwater monitoring efforts are proposed at Site M, Parcel 8 to determine appropriate remedial actions (URS 2010a). This site was formerly referred to as IRP Site FGGM 101; however, Site FGGM 101 was closed and integrated into FGGM 95 (Fort Meade 2009c).

- *Site M, Parcel 9* (formerly AOI 14) is within Site M-2, approximately 200 feet east-northeast of the current clubhouse building. Historical aerial photographs show scarred ground at Site M, Parcel 9 from 1938 to 1943. Soil sampling taken during the EBS determined that concentrations of arsenic exceed MDE clean-up standards and ATC for the region. Groundwater sampling detected concentrations of iron and manganese that exceed MDE clean-up standards but not ATC. No surface solid waste was observed at Site M, Parcel 9 during the EBS site visit; however, a geophysical study identified an 8-foot-by-8-foot, unknown, physical anomaly (USACE Baltimore District 2004a). The physical anomaly was excavated in 2007 and determined to be a naturally occurring combination of natural features. No solid waste was discovered. Subsequent sampling has determined that there is no apparent hazard/risk at Site M, Parcel 9. Pending approval from the USEPA, the site is to be classified as no further action required (URS 2009, URS 2010b)

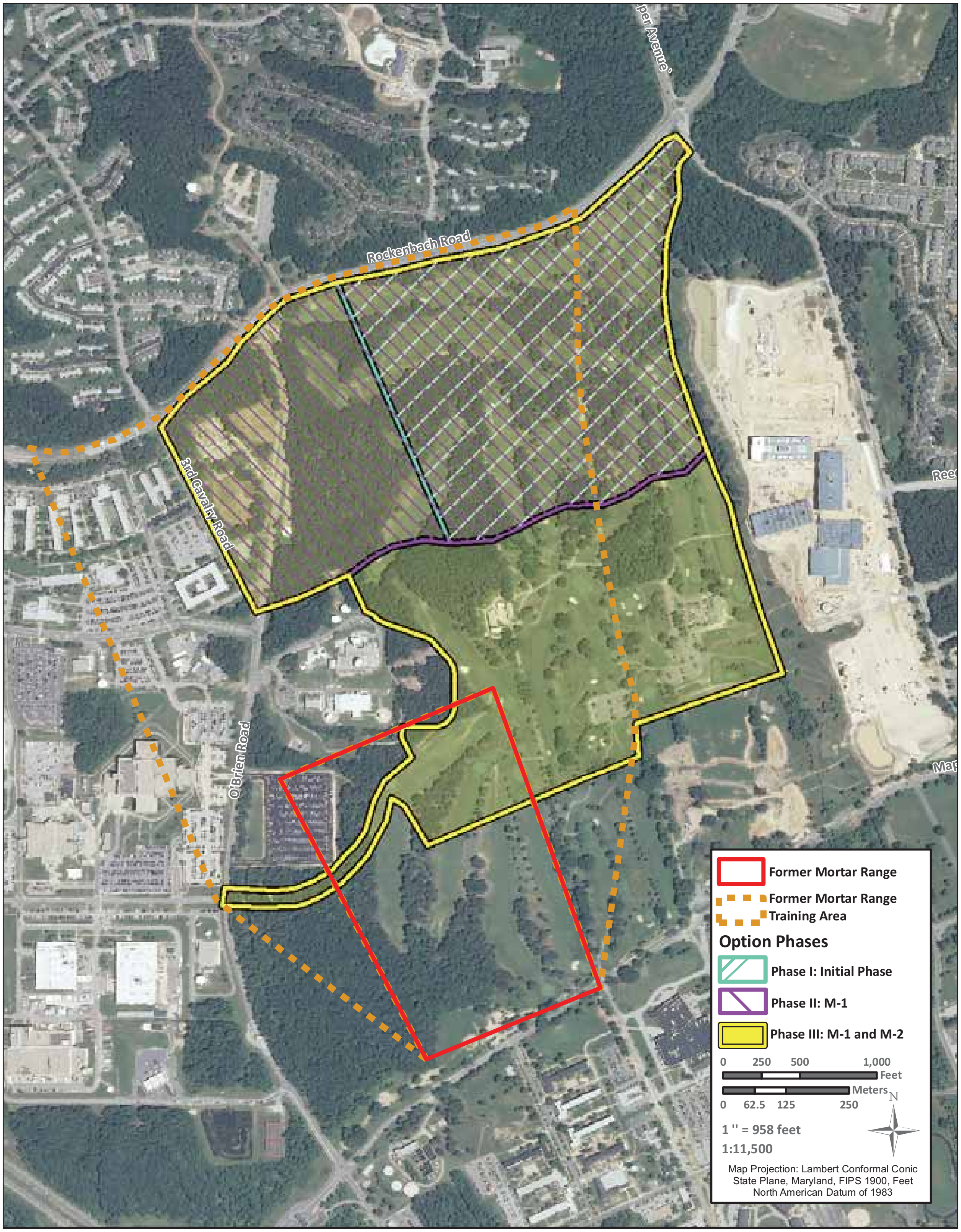
Ordnance. Historically, portions of Fort Meade, including much of Site M, were used for military training purposes from World War I through World War II. The Fort Meade MMRP, which is a part of the Fort Meade IAP, identifies two active MMRP sites and three response complete (no further action required) MMRP sites at Fort Meade. Of these sites, one active MMRP site (FGGM-003-R-01), which is also identified as "Mortar Range," is within Sites M-1 and M-2 (see **Figure 3.10-3**). FGGM-003-R-01 is divided into two components: the former mortar range and the adjoining mortar range training area (Fort Meade 2009c).

The U.S. Army currently is conducting a remedial investigation for UXO, munitions debris, munitions constituents, and munitions and explosives of concern at FGGM-003-R-01. The primary purpose of this investigation is to characterize surface and subsurface conditions for explosive safety hazards including munitions, explosives of concern, and munitions constituents (USACE Baltimore District 2009). To date, more than 6,000 anomalies have been detected at the former mortar range and former mortar range training area, and more than 1,300 of them have been investigated. Most of the material investigated has been determined to be non-munitions-related scrap metal; however, some munitions debris, including 60-millimeter (mm) rounds, 81-mm rounds, a practice landmine, 3-inch Stokes practice mortars rounds, flares (expended), practice grenades, a dummy grenade, and discarded small arms ammunitions and casings have been detected. With the exception of the discarded small arms ammunition found south of the Proposed Action and alternatives, all munitions debris has been determined to be practice (Fluck 2010b). No explosives and no propellants have been detected in soil samples collected from the former mortar range (Tegtmeyer 2010). All munitions debris and small arms ammunition discovered during the MMRP investigation thus far have been disposed of in accordance with Federal and U.S. Army regulations (Brundage 2009b). Based on the available data to date, the Army intends to move the remedial investigation of the former mortar range into the feasibility study phase to address any ordnance constituents discovered during the remedial investigation (Fluck 2010b).

3.11 Socioeconomics and Environmental Justice

3.11.1 Definition of Resource

Socioeconomics. Socioeconomics is the relationship between economies and social elements such as population levels and economic activity. Factors that describe the socioeconomic environment represent a composite of several interrelated and nonrelated attributes. There are several factors that can be used as indicators of economic conditions for a geographic area, such as demographics, median household income, unemployment rates, percentage of families living below the poverty level, employment, and housing data. Data on employment identify gross numbers of employees, employment by industry or trade, and unemployment trends. Data on personal income in a region are used to compare the before and after effects of any jobs created or lost as a result of a proposed action. Data on industrial, commercial, and other sectors of the economy provide baseline information about the economic health of a region.



Sources: Mortar Range Boundaries: USACE Baltimore District 2009; Aerial Photography: USDA-APFO NAIP 2009.

Figure 3.10-3. Former Mortar Range (Site FGGM-003-R-01) Boundaries

The Proposed Action addressed in this EIS has the potential to affect the construction and real estate industries the most; therefore, this section focuses primarily on the construction and real estate industries to provide a baseline level of data to evaluate potential impacts.

Environmental Justice. EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, pertains to environmental justice issues and relates to various socioeconomic groups and the disproportionate effects that could be imposed on them. This EO requires that Federal agencies' actions substantially affecting human health or the environment do not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. The EO was enacted to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Consideration of environmental justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity of a proposed action.

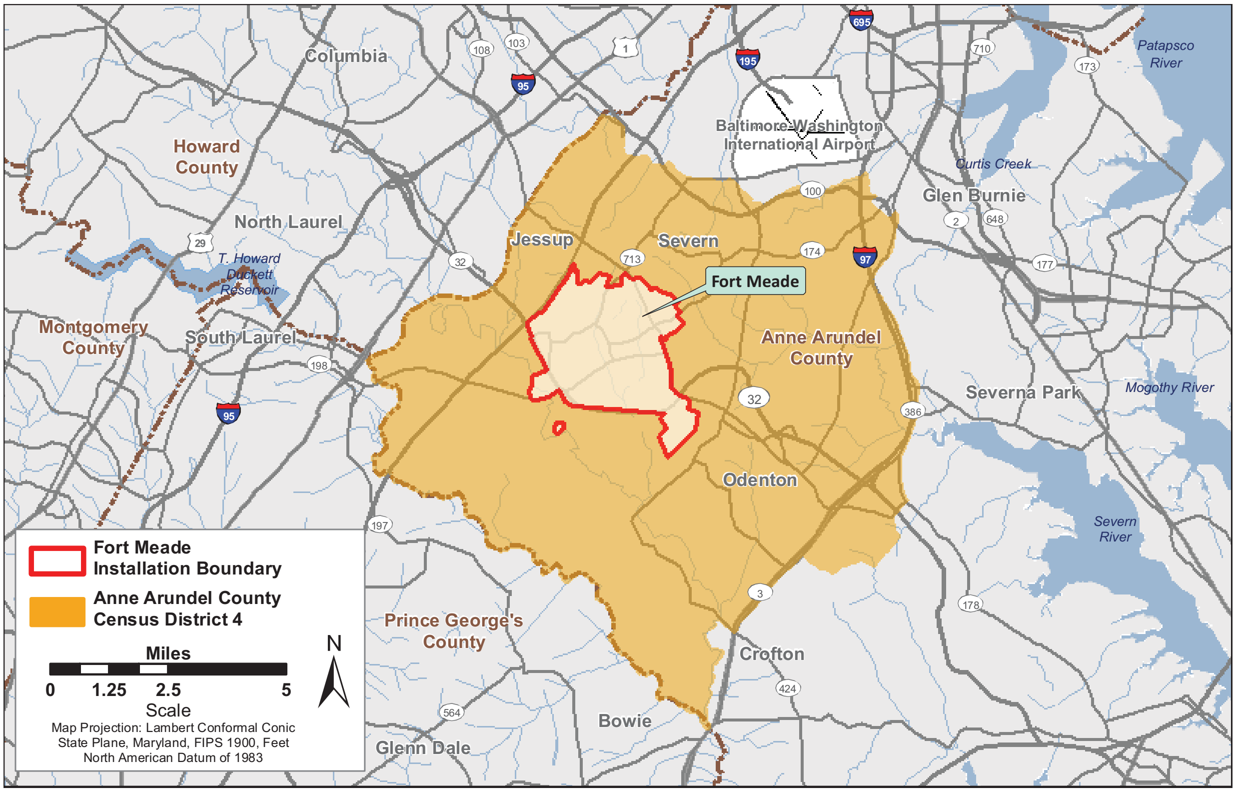
3.11.2 Existing Conditions

Fort Meade's work force currently consists of approximately 40,000 employees, composed of military, civilian, and contractor personnel. The installation has the fourth largest workforce and one of the largest joint service centers of all installations in the continental United States (U.S. Army IMCOM 2008). Fort Meade's close proximity to the Baltimore metropolitan area and the Washington, DC. metropolitan area allows workers to commute from a large number of communities with varying socioeconomic characteristics. For purpose of this analysis, three spatial levels are used: (1) Anne Arundel County Census District 4, (2) a Region of Influence (ROI), and (3) the State of Maryland. Anne Arundel County Census District 4 includes Fort Meade and three neighboring communities, Jessup, Severn, and Odenton, providing an overview of the installation and adjacent communities (see **Figure 3.11-1**). For this socioeconomic analysis, the distribution of Fort Meade employee's place of residence was used to determine the ROI (see **Table 3.11-1**) (Friedberg 2009). Included in the ROI are Anne Arundel County, Carroll County, Baltimore City, Baltimore County, Howard County, and Prince George's County. This ROI represents baseline levels for where the majority of the economic impacts would occur. The State of Maryland is included to compare the previous two spatial levels to a larger scale. Additional counties from the area around Fort Meade (e.g., Calvert, Montgomery, Talbot) were not included as part of the ROI because a relatively small portion of Fort Meade employees live in these counties (Friedberg 2009).

Table 3.11-1. Distribution of Fort Meade Workforce by County/City

County in Maryland	Percentage of Workforce
Anne Arundel County	39%
Howard County	22%
Baltimore County/City	14%
Carroll County	7%
Prince George's County	5%
Other	13%

Source: Friedberg 2009



Source: ESRI StreetMap USA 2005

Figure 3.11-1. Location of Anne Arundel County Census District 4

Demographic and Housing Characteristics. **Table 3.11-2** includes the populations for Anne Arundel County District 4, the ROI, and the State of Maryland for 1990, 2000, and 2008 (U.S. Census Bureau 1990, U.S. Census Bureau 2000, U.S. Census Bureau 2008). The State of Maryland experienced an 11 percent increase in population from 1990 to 2000 and a 6 percent increase in population from 2000 to 2008. The ROI grew slower than Maryland over the two time periods, but Baltimore City skews the results downward. Looking at the individual counties that make up the ROI, Howard County grew the fastest from 1900 to 2000 and Carroll County grew the fastest from 2000 to 2008 as the suburban reaches of Baltimore, Maryland, and Washington, DC, expanded. Baltimore City experienced negative growth from 1990 to 2008. The area around Fort Meade, identified as Anne Arundel County Census District 4, grew by 30 percent from 1990 to 2000. Data for Anne Arundel County Census District 4 are not available for 2008 as the U.S. Census Bureau's smallest geographic level for population estimates between decennial censuses is county-level data.

The number of vacant housing units in the ROI increased by approximately 28,000 units during a 7-year time period ending in 2007, with similar increases occurring in the State of Maryland. Data for Anne Arundel County Census District 4 were not available in 2007 as the U.S. Census Bureau's smallest geographic level for estimates between decennial censuses is county level data. **Table 3.11-3** contains Vacant Housing data for Anne Arundel Census District 4, the ROI, and the State of Maryland.

Employment Characteristics. **Table 3.11-4** contains employment data for the three areas of analysis and includes the percentage of the workforce employed within each industry. Anne Arundel County Census District 4 has a higher percentage of the workforce employed in the Armed Forces; 7 percent versus approximately 1 percent for the ROI and State of Maryland. Fort Meade is located within

Table 3.11-2. Population Summary, 1990 to 2008

Location	1990	2000	2008	Percentage Change	
				1990 to 2000	2000 to 2008
Anne Arundel County District 4	76,611	99,265	N/A	29.6	N/A
ROI*	2,895,355	3,095,356	3,200,527	6.9	3.4
Anne Arundel County	427,239	489,656	512,790	14.6	4.7
Baltimore City	736,014	651,154	636,919	-11.5	-2.2
Baltimore County	692,134	754,292	785,618	9.0	4.2
Carroll County	123,372	150,897	169,353	22.3	12.2
Howard County	187,328	247,842	274,995	32.3	11.0
Prince George's County	729,268	801,515	820,852	9.9	2.4
State of Maryland	4,781,468	5,296,486	5,633,597	10.8	6.4

Source: U.S. Census Bureau 1990, U.S. Census Bureau 2000, U.S. Census Bureau 2008
Note: * ROI calculated by adding Anne Arundel, Baltimore, Carroll, Howard, and Prince George's counties; and Baltimore City.

Table 3.11-3. Vacant Housing Units, 2000 and 2007

Location	2000			2007		
	Total Units	Vacant Units	Percent Vacant	Total Units	Vacant Units	Percent Vacant
Anne Arundel County District 4	33,949	1,463	4.3	N/A	N/A	N/A
ROI*	1,250,604	84,905	6.8	1,302,924	112,395	8.6
Anne Arundel County	186,937	8,267	4.4	201,205	11,377	5.7
Baltimore City	300,477	42,481	14.1	294,631	58,897	20.0
Baltimore County	313,734	13,857	4.4	326,104	16,296	5.0
Carroll County	54,260	1,757	3.2	60,966	2,171	3.6
Howard County	92,818	2,775	3.0	102,745	4,652	4.5
Prince George's County	302,378	15,768	5.2	317,273	19,002	6.0
State of Maryland	2,145,283	164,424	7.7	2,296,973	214,400	9.3

Source: U.S. Census Bureau 2000, U.S. Census Bureau 2007
Note: * ROI calculated by adding Anne Arundel, Baltimore, Carroll, Howard, and Prince George's counties; and Baltimore City. Percentages rounded to nearest tenth.

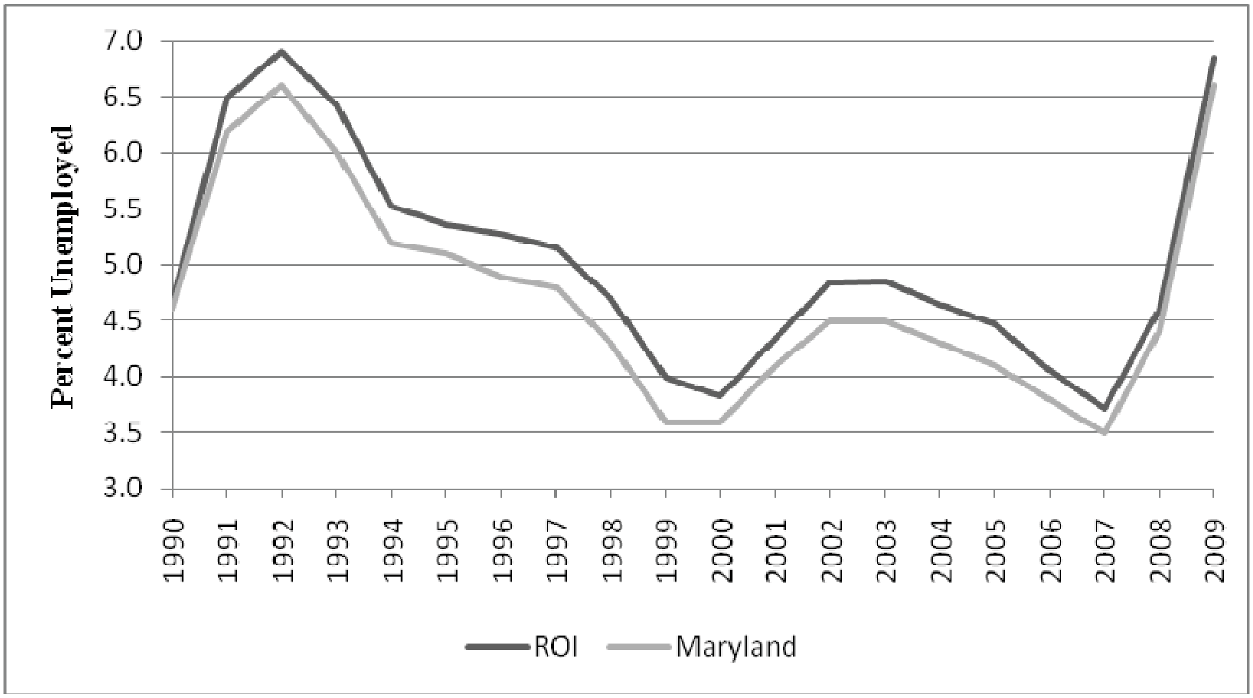
Census District 4 and which accounts for the higher percentage of employment within the Armed Forces. For all areas identified, the educational, health, and social services industries employ the greatest number of people. The construction industry accounts for approximately 6 percent of the workforce in Anne Arundel County Census District 4, ROI, and State of Maryland. General employment characteristics across the three areas of analysis are similar, with no one industry having a stronger presence in any of the three areas.

Unemployment in the ROI and the State of Maryland trend together as is seen in **Figure 3.11-2**. The ROI has a slightly lower unemployment level from 1990 to 2009 compared to the State of Maryland. As mentioned, the workforce composition between ROI and Census District 4 are similar in nature. Consequently unemployment levels in Census District 4 would be similar to the ROI's unemployment levels.

Table 3.11-4. Overview of Employment by Industry for Census Year 2000

	Anne Arundel County Census District 4	ROI							State of Maryland
		Sum of 5 counties and Baltimore City	Anne Arundel County	Baltimore City	Baltimore County	Carroll County	Howard County	Prince George's County	
Percentage of Employed Persons in Armed Forces	6.9	0.9	3.0	0.1	0.1	0.1	0.6	1.1	0.8
Agriculture, forestry, fishing and hunting, and mining	0.2	0.3	0.2	0.1	0.2	1.4	0.3	0.2	0.6
Construction	6.6	6.3	8.1	5.1	5.9	10.4	5.1	5.9	6.9
Manufacturing	7.3	6.9	7.3	7.8	9.0	9.9	6.9	3.4	7.3
Wholesale trade	3.6	3.0	3.8	2.7	3.4	3.7	3.4	2.0	2.8
Retail trade	12.5	10.3	11.7	8.9	11.3	11.3	9.6	9.4	10.5
Transportation and warehousing, and utilities	5.3	5.5	5.7	5.6	4.9	4.4	3.6	6.7	4.9
Information	3.8	3.9	3.6	3.2	3.2	3.9	4.7	5.1	4.0
Finance, insurance, real estate, and rental and leasing	6.1	7.3	6.4	6.8	9.5	7.2	7.5	6.0	7.1
Professional, scientific, management, administrative, and waste management services	12.6	11.8	12.1	10.2	10.5	9.4	16.2	12.6	12.4
Educational, health, and social services	16.7	21.5	17.1	26.8	22.9	19.3	21.7	20.0	20.6
Arts, entertainment, recreation, accommodation, and food services	5.6	6.7	6.6	8.3	6.5	5.7	5.6	6.5	6.8
Other services (except public administration)	4.8	5.4	5.6	5.3	4.9	5.6	4.7	6.3	5.6
Public administration	14.9	11.1	11.9	9.3	7.6	7.9	10.6	15.9	10.5

Source: U.S. Census Bureau 2000



Source: BLS 2009

Figure 3.11-2. ROI and Maryland Unemployment from 1990 to 2009

Commercial Real Estate Market. The commercial real estate market within Anne Arundel County contains approximately 875 office buildings of which 105 buildings are Class A Office Space. Class A Office Space is generally characterized as large buildings (i.e., more than 100,000 ft^2) close to public transportation and transportation corridors, and with high quality interiors and exteriors. The ROI contains approximately 5,750 office buildings of which 530 buildings are Class A Office Space. Class B and Class C office spaces include smaller one or two story buildings that would not be able to accommodate employees and equipment needed for the Proposed Action. Therefore, Class B and Class C office spaces were excluded from analysis to determine the maximum impact of relocation of NSA employees. Office space is classified in this section as existing, under construction, or future properties (in planning phases). The offices spaces are furthered classified as being either vacant or occupied. About one-third of the NSA staff that would relocate are currently occupying leased properties within Anne Arundel County and the ROI.

Currently, 80 percent of existing Class A Office Space in Anne Arundel County is occupied (6.6 million ft^2 of the total 8.3 million ft^2 is vacant) and 82 percent in the ROI (46.4 million ft^2 of the total 56.3 million ft^2 is vacant). The amount of Class A Office Space under construction within Anne Arundel County and the ROI represent a small portion of the total Class A Office Space market, while the future Class A Office Space in Anne Arundel County and the ROI represent a much larger portion. If all the future properties were constructed, there would be a 102 and 64 percent increase of Class A Office Space in Anne Arundel County and the ROI, respectively (Goodall 2009).

School Characteristics. Within the ROI there are 809 elementary, middle, and high schools. During the 2006–2007 school year, more than 472,000 students in the ROI were enrolled in the school systems. **Table 3.11-5** contains the school data for each county within the ROI (NCES 2007).

Table 3.11-5. School Districts and Enrollment Levels within the ROI, 2006–2007

School District	School Type (number of schools)	Enrollment	Total District Enrollment
Anne Arundel County	Elementary (77)	32,404	73,048
	Middle (22)	16,746	
	High (12)	23,343	
	Other(5)	555	
Baltimore City	Elementary (127)	48,147	85,106
	Middle (29)	12,554	
	High (35)	22,139	
	Other (9)	2,266	
Baltimore County	Elementary (106)	47,727	105,248
	Middle (28)	23,198	
	High (26)	33,823	
	Other (5)	500	
Carroll County	Elementary (23)	11,878	28,013
	Middle (8)	6,224	
	High (9)	9,786	
	Other (4)	125	
Howard County	Elementary (39)	21,671	49,651
	Middle (19)	12,008	
	High (11)	14,880	
	Other (3)	1,092	
Prince George's County	Elementary (146)	66,637	131,014
	Middle (28)	21,982	
	High (30)	40,195	
	Other (7)	2,200	

Source: NCES 2007

In 2008, Anne Arundel County public elementary schools (grades K to 5) were at 94 percent of maximum capacity. Space for approximately 2,224 additional students is available in elementary schools before 100 percent capacity is reached. Middle schools (grades 6 to 8) were at 74 percent of maximum capacity, and space for about an approximately 5,783 additional students is available before maximum capacity is reached in middle schools. Anne Arundel County high schools (grades 9 to 12) were at 92 percent of capacity, and space for about an approximately 2,019 additional students is available before maximum capacity is reached. In total, Anne Arundel County public schools were at 88 percent of maximum capacity in 2008, and space for an approximately 10,026 additional students is available before maximum capacity is reached (AACPS 2009).

Law Enforcement and Fire Protection. The Department of the Army and the U.S. Army Military Police provide emergency and law enforcement services for Fort Meade. Anne Arundel County Police Department also shares duties along Maryland State Highways MD 32 and MD 175 (USACE Mobile

District 2007). Outside of Fort Meade facilities, police services exist in all counties within the ROI. For example, the Anne Arundel County police department employs more than 1,000 sworn and civilian members; the Baltimore City Police Department employs approximately 4,000 sworn and civilian members in nine separate precincts; and Prince George's County employs 1,420 officers and 260 civilians (City of Baltimore 2009, AACPD 2008, PGCPD 2009).

The Fort Meade Fire Department is located on the installation and consists of two engine companies, a truck company, and a HAZMAT team (USACE Mobile District 2007). The Odenton Station and the Jessup/Maryland City Station in Anne Arundel County are in close proximity to Fort Meade and provide mutual aid to one another. Challenges currently facing Jessup/Maryland City include longer response times and a decrease in volunteer participation; whereas Odenton experiences robust volunteer participation, and the potential for decreases in response time exist with a proposed relocation of the station (AACFD 2008b).

Within the ROI there are approximately 210 fire and rescue departments. The number of career and volunteer facilities varies from county to county. For example, in Carroll County many of the fire fighters are volunteer, but in Baltimore City nearly all of the fire fighters are career fire fighters (CCFD 2009, BCFD 2009). The number of stations also varies between counties; the number of stations in each county is listed in **Table 3.11-6.**

Table 3.11-6. Number of Fire and Rescue Stations in the ROI

County	Number of Stations
Anne Arundel County	30
Baltimore City	41
Baltimore County	58
Carroll County	14
Howard County	11
Prince George's County	56

Source: AACFD 2008a, BCFD 2009, CCFD 2009, HCFD 2007, PGCFD 2009

Recreation. A portion of The Courses at Fort Meade, a 27-hole golf facility, is located within Site M. The golf course is open to active-duty military personnel, retired military personnel, and civilian employees. Yearly membership to The Courses is available to active-duty military personnel, retired military personnel, and civilian employees. Persons who do not fall into the aforementioned categories could play on a daily fee basis if an authorized patron accompanies them. In addition to the 9- and 18-hole golf courses, The Courses includes a clubhouse, a dining room, a pro-shop, and a driving range, all available to the patrons. Originally containing 36 holes, The Courses was recently reduced to 27 holes as a result of adjacent BRAC construction. The golf course was profitable from Fiscal Years (FYs) 1998 to 2007, with the exception of FY 2003. During this 10-year span, profits from the golf course ranged from approximately $100,000 to $500,000 per year. In FY 2008, a deficit of $159,000 was reported, and for FY 2009 a deficit of $367,000 is projected. Much of the decline in revenue is due to degradation of services as a result of BRAC construction. Measures are in process to reduce operating costs (e.g., fewer snack bar hours) and provide more targeted marketing to increase revenues (Fort Meade RGMC 2009a). There is also a walking/running trail that passes through Site M. This trail provides those living and working on Fort Meade an on-installation option for exercise.

Environmental Justice. Minority and low-income populations were characterized within Anne Arundel County Census District 4, the ROI, and the State of Maryland. The immediate area around Fort Meade (Anne Arundel County Census District 4) was evaluated for low-income or minority populations in comparison to the ROI and the State of Maryland to determine if impacts would disproportionally affect minority or low-income populations. Census District 4 has an African-American population composing 28 percent of the total population, which is more than Anne Arundel County (14 percent) and less than the ROI (38 percent) and equal to the State of Maryland (28 percent). **Table 3.11-7** contains a detailed breakdown of the racial/ethnic make-up of the census district, the ROI, and the State of Maryland. The percent of families in Census District 4 living below the poverty level is 4 percent, which is lower than both the ROI and the state levels and similar to Anne Arundel County. The Census District reported the highest median household income ($61,903), followed by the State of Maryland ($52,868), and the ROI ($49,658) and very similar to Anne Arundel County ($61,768).

Table 3.11-7. Race, Ethnicity, and Poverty Characteristics, 2000

	Anne Arundel County Census District 4	ROI							State of Maryland
		Sum of 5 counties and Baltimore City	Anne Arundel County	Baltimore City	Baltimore County	Carroll County	Howard County	Prince George's County	
Total Population	99,265	3,095,356	489,656	651,154	754,292	150,897	247,842	801,515	5,296,486
Percent White	63.3	55.2	81.2	31.6	74.4	95.7	74.3	27.0	64.0
Percent Black or African American	28.1	38.1	13.6	64.3	20.1	2.3	14.4	62.7	27.9
Percent American Indian and Alaska Native	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3
Percent Asian	3.8	2.4	2.3	1.5	3.2	0.8	7.7	3.9	4
Percent Native Hawaiian and Other Pacific Islander	0.1	0.0	0.1	0.0	0.0	0.0	0	0.1	0.0
Percent Other Race	1.4	1.4	0.9	0.7	0.6	0.3	1.1	3.4	1.8
Percent Two or More Races	2.8	1.8	1.7	1.5	1.4	0.7	2.2	2.6	2.0
Percent Hispanic or Latino	3.9	3.3	2.6	1.7	1.8	1.0	3	7.1	4.3
Percent Families below poverty	4.1	7.0	3.6	18.8	4.5	2.7	2.5	5.3	6.1
Median Household Income	$61,903	$49,658 *	$61,768	$30,078	$50,667	$60,021	$74,167	$55,256	$52,868

Source: U.S. Census Bureau 2000

Note: * Calculated by averaging each county's weighted Median Household Income

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