Final Environmental Assessment
Airfield Storm Drainage System Repair
Joint Base Andrews–Naval Air Facility Washington, Maryland

Prepared for:

DEPARTMENT OF THE AIR FORCE

Joint Base Andrews, MD 20762

June 2015

FINDING OF NO SIGNIFICANT IMPACT (FONSI) AND FINDING OF NO PRACTICABLE ALTERNATIVE (FONPA)

Environmental Assessment (EA) Airfield Storm Drainage System Repair
Joint Base Andrews–Naval Air Facility Washington, Maryland

Purpose

Joint Base Andrews–Naval Air Facility Washington (JBA) is proposing to repair the airfield storm drainage system at multiple locations on the airfield. An assessment of JBA's airfield storm drainage system conducted in 2010 revealed numerous failing or inadequate system elements that cause ponding on runways and taxiways, resulting in unsafe conditions. The existing condition of the airfield storm drainage system impairs JBA's ability to successfully meet its National Pollutant Discharge Elimination System permit conditions and comply with state and federal water quality regulations.

The purpose of the Proposed Action is to provide an adequately sized and configured airfield storm drainage system that supports the flying mission at JBA by repairing and upgrading the airfield stormwater infrastructure. Implementing the Proposed Action would meet JBA's need to improve water quality and comply with various water quality regulations.

The U.S. Air Force, Air Force District Washington (AFDW), and JBA have prepared this EA in accordance with the National Environmental Policy Act (NEPA); the Council of Environmental Quality regulations implementing NEPA; and Title 32 CFR part 989, as amended, *The Environmental Impact Analysis Process (EIAP).*

Proposed Action

The Proposed Action includes repairing approximately 51,000 linear feet of storm sewer pipe and 122 manholes of the airfield stormwater drainage network.

Summary of Anticipated Environmental Effects Associated with the Proposed Action

Effects of implementing the Proposed Action were assessed. No impacts would be expected on geology, topography, groundwater, floodplains, hazardous materials, protected species, cultural resources, environmental justice, the protection of children, or recreation. Short-term beneficial effects on the local economy would occur through the generation of jobs. Short-term minor adverse effects on airfield operations, soils, surface water quality, wetlands, air quality, noise, and transportation may occur during the system repair operation. Temporary disruptions to airfield operations would be necessary when system repairs were being performed near runways or taxiways. Soil disturbance would be required and could result in some sedimentation in local streams. Approximately 0.84 acre of nontidal emergent wetland and 1.66 acres of wetland buffer would be temporarily affected by the Proposed Action. Permanent wetland impacts would be mitigated if necessary in accordance with regulatory requirements. Equipment use during project implementation would generate minor amounts of air pollutant emissions and noise, and project traffic would be generated on local roads.

Long-term minor beneficial effects on airfield operations, soils, surface waters, infrastructure, safety, and biological resources would be expected. After completion of repairs, fewer

measures have been taken to minimize impacts to wetlands and that proposed measures to minimize impacts are documented in the EA. Because there is no practicable alternative to impacting wetlands, compensatory mitigation for wetland losses might be required. Mitigation for wetland losses from the Proposed Action, however, is not anticipated to be required because the total amount of permanent wetland disturbance is less than 5,000 square feet, the regulatory minimum for which mitigation is required. Any required mitigation for wetland impacts is proposed to occur at an as yet undetermined site mutually agreeable to MDE and JBA. Pursuant to Executive Order 11990 and the authority delegated to me, and taking the above information into account, I find that there is no practicable alternative to this action and that the Proposed Action includes all practicable measures to minimize impacts to wetlands.

Finding of No Significant Impact

Based on my review of the facts and analysis contained in this EA, which is incorporated herein, I conclude the implementation of the preferred alternative will not have significant impacts on the environment, alone or when considered cumulatively with other proposed actions at the installation. Accordingly, an Environmental Impact Statement will not be required. The signing of this Finding of No Significant Impact and Finding of No Practicable Alternative completes the environmental impact analysis process, and an Environmental Impact Statement will not be prepared.

Darryl W. Burke

DARRYL W. BURKE
Major General, USAF
Commander, Air Force District of Washington

25 Aug 2015

Date

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Cover Sheet

Environmental Assessment for Airfield Storm Drainage System Repair at Joint Base Andrews–Naval Air Facility Washington, Maryland

Lead Agency:	Department of the Air Force
Proposed Action:	Repair of Airfield Storm Drainage System
Report Designation:	Final Environmental Assessment

Written comments and inquiries regarding this document should be directed to:

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Abstract: This environmental assessment (EA) has been prepared to evaluate the potential environmental effects of the United States Air Force's repair of the airfield stormwater drainage system at Joint Base Andrews–Naval Air Facility Washington, Maryland (JBA) in Prince George's County, Maryland. Assessments of JBA's stormwater collection and drainage system from 2004 to 2010 found that the system was degraded and that in numerous locations stormwater drainage pipes in the airfield were failing or inadequate. JBA needs to improve water quality on the base and comply with various water quality regulations. The Proposed Action includes repairing approximately 51,200 linear feet of storm sewer pipe and 122 manholes of the airfield stormwater drainage network. The system's manholes include storm drainage grate inlets, pedestal-top drop inlets, headwalls, and junction boxes. The purpose of the Proposed Action is to provide an adequately sized and configured airfield storm drainage system that supports the flying mission at JBA.

Under the No Action Alternative, JBA would not implement the proposed airfield stormwater system repair project. Routine maintenance of the stormwater system would continue, and JBA would operate with an inefficient, outdated, and damaged airfield stormwater system.

The potential effects on physical, biological, and socioeconomic environments were studied to determine how the Proposed Action and the No Action Alternative could affect those resources. The Proposed Action would have both adverse and beneficial effects on environmental resources. It is expected to result in less than significant effects on all resource areas. No effects would occur on topography, geology, groundwater, floodplains, hazardous materials, cultural resources, land use, environmental justice, the protection of children, or recreation.

The Proposed Action would have short-term adverse effects on the following resources:

- Airfield operations–because of temporary runway, taxiway, and parking ramp closures.
- Soils and surface waters–because of ground disturbance during system repair.
- Wetlands–because of necessary disturbance of wetlands at some repair locations.

- Air quality–from emissions during equipment use and truck traffic.
- Noise–because of noise generated by equipment during repairs.
- Transportation–from additional traffic generated by the project.

Short-term beneficial effects on the local economy would result because of the generation of construction jobs.

The Proposed Action would have long-term beneficial effects on the following resources:

- Airfield operations–because of reduced interruptions of airfield operations from standing water and bird and wildlife strikes.
- Soils and surface waters–because of reduced soil loss from infiltration and inflow into the storm drainage system.
- Infrastructure–because of an improved airfield storm drainage system.
- Safety and occupational health–because of improved safety in the airfield infield and for aircraft.
- Biological resources–from a reduced frequency of bird and wildlife collisions with aircraft.

The Proposed Action would result in long-term beneficial effects on the condition and effectiveness of JBA's airfield stormwater drainage system, helping JBA meet existing National Pollutant Discharge Elimination System (NPDES) permit conditions and Maryland Department of the Environment (MDE) water quality requirements.

The No Action Alternative would have long-term minor adverse effects on airfield operations, soils, surface waters, wetlands, stormwater management and storm drainage, safety and occupational health, and biological resources as the airfield stormwater system continues to degrade.

To implement the Proposed Action, various federal and state reviews and permits would be required. Potentially required permits, approvals, and environmental protection plans include, but are not limited to, the following:

- Nontidal Wetland Permit from MDE
- Section 404 Wetland Permit from the U.S. Army Corps of Engineers
- NPDES Permit for Stormwater Associated with Construction Activities from MDE
- Stormwater Management Plan and Erosion and Sediment Control Plan approval from MDE
- Approval of any new construction within Environmental Restoration Program sites by the Air Force Civil Engineer Center/Air Force Civil Engineer Center/Operations Division-East Region (AFCEC/CZOE)

These permits and approvals would be obtained prior to the start of construction.

Figures

Tables

Acronyms and Abbreviations

°F	degrees Fahrenheit
AADT	average annual daily traffic
ACM	Asbestos-containing material
AFCEC/CZOE	Air Force Civil Engineer Center/Operations Division-East Region
APE	Area of Potential Effects
AQCR	Air-Quality Control Region
AT/FP	Anti-terrorism/Force Protection
BASH	Bird/wildlife Aircraft Strike Hazard
BMP	best management practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CIPP	cured-in-place pipe
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
DNL	Day-night Sound Level
DoD	Department of Defense
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIFS	Economic Impact Forecast System
EO	Executive Order
EPA	United States Environmental Protection Agency
ERP	Environmental Restoration Program
ESQD	Explosive Safety-Quantity Distance
FAA	Federal Aviation Administration
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
GDP	General Discharge Permit
GHG	greenhouse gas
IC	institutional controls
JBA	Joint Base Andrews-Naval Air Facility Washington
L_{eq}	equivalent sound level
LOS	Level of Service
MDE	Maryland Department of the Environment
MDNR	Maryland Department of Natural Resources
MMRP	Military Munitions Response Program
MOA	Memorandum of Agreement
MS4	municipal separate storm sewer system
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
RTV	rational threshold value
SHPO	State Historic Preservation Office

SPCC	Spill Prevention, Control, and Countermeasure
SWPPP	Stormwater Pollution Prevention Plan
TCE	trichloroethylene
TMDL	Total Maximum Daily Load
U.S.C.	United States Code
UFC	Unified Facilities Criteria
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

CHAPTER ONE: PURPOSE AND NEED AND BACKGROUND INFORMATION

1.1 INTRODUCTION

Joint Base Andrews–Naval Air Facility Washington (JBA) is preparing an environmental assessment (EA) to evaluate the potential environmental effects of repairing the stormwater system on its airfield. JBA conducted a number of studies and assessments of its stormwater drainage system between 2004 and 2010. A study of the airfield drainage network revealed numerous failing or inadequate systems that cause ponding on runways and taxiways, resulting in unsafe conditions (Pond 2010).

This EA is being prepared in compliance with the National Environmental Policy Act (NEPA). NEPA is a federal law that requires the identification and analysis of potential environmental impacts resulting from proposed federal actions before those actions are taken.

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

The Proposed Action is to repair the JBA airfield storm drainage system. The purpose of the Proposed Action is to provide an adequately sized and configured airfield storm drainage system that supports the flying mission at JBA. A repaired storm drainage system would improve safety conditions on the airfield and ensure compliance with applicable regulations. The Proposed Action is needed to hasten the removal of stormwater from the airfield, reduce ponding on runways and taxiways after storms, improve safety for personnel who work in the airfield infield, and reduce the chance of collisions between aircraft and wildlife. The airfield storm drainage system on JBA is approaching complete failure. The system is inefficient and some parts of it are no longer functioning.

The repaired and upgraded airfield stormwater drainage system must be in compliance with various regulatory requirements. JBA is required to manage its stormwater discharges in accordance with the regulations and requirements contained in the Code of Maryland Regulation (COMAR), subsections of Chapter 26. Specific requirements for JBA are described in the Maryland Department of the Environment (MDE) 2010 *Maryland Stormwater Management Guidelines for State and Federal Projects*. The new General Permit for Stormwater Discharges Associated with Industrial Activity (Permit No. 12-SW) has been issued as final, with an effective date of January 1, 2014, replacing the previous Permit No. 02-SW. The new Industrial Permit requires that 20 percent of the untreated impervious area of the

facility needs to be restored by providing stormwater best management practices (BMPs) to provide water quality and environmental site design volumes.

Additionally, the Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5320-5C, *Surface Drainage Design* (including Change 1, dated 9/29/2006), requires that airfield storm drainage systems be designed to accommodate the stormwater runoff associated with the 2-year rainfall event with no encroachment of runoff on runways or taxiways, and that the center 50 percent of runways and taxiways be free from ponding associated with runoff from the 10-year rainfall event.

Finally, the Air Force is a signatory to the Memorandum of Agreement (MOA) with the FAA to address aircraft-wildlife strikes. In recognition of this agreement, stormwater management features are evaluated against the FAA AC 150/5200-33B, *Hazardous Wildlife Attractants on or near Airports*. Permanent stormwater features proposed for the project to meet stormwater permitting requirements must allow a maximum 48-hour detention period for the design storm. The Proposed Action is needed to meet these regulatory requirements.

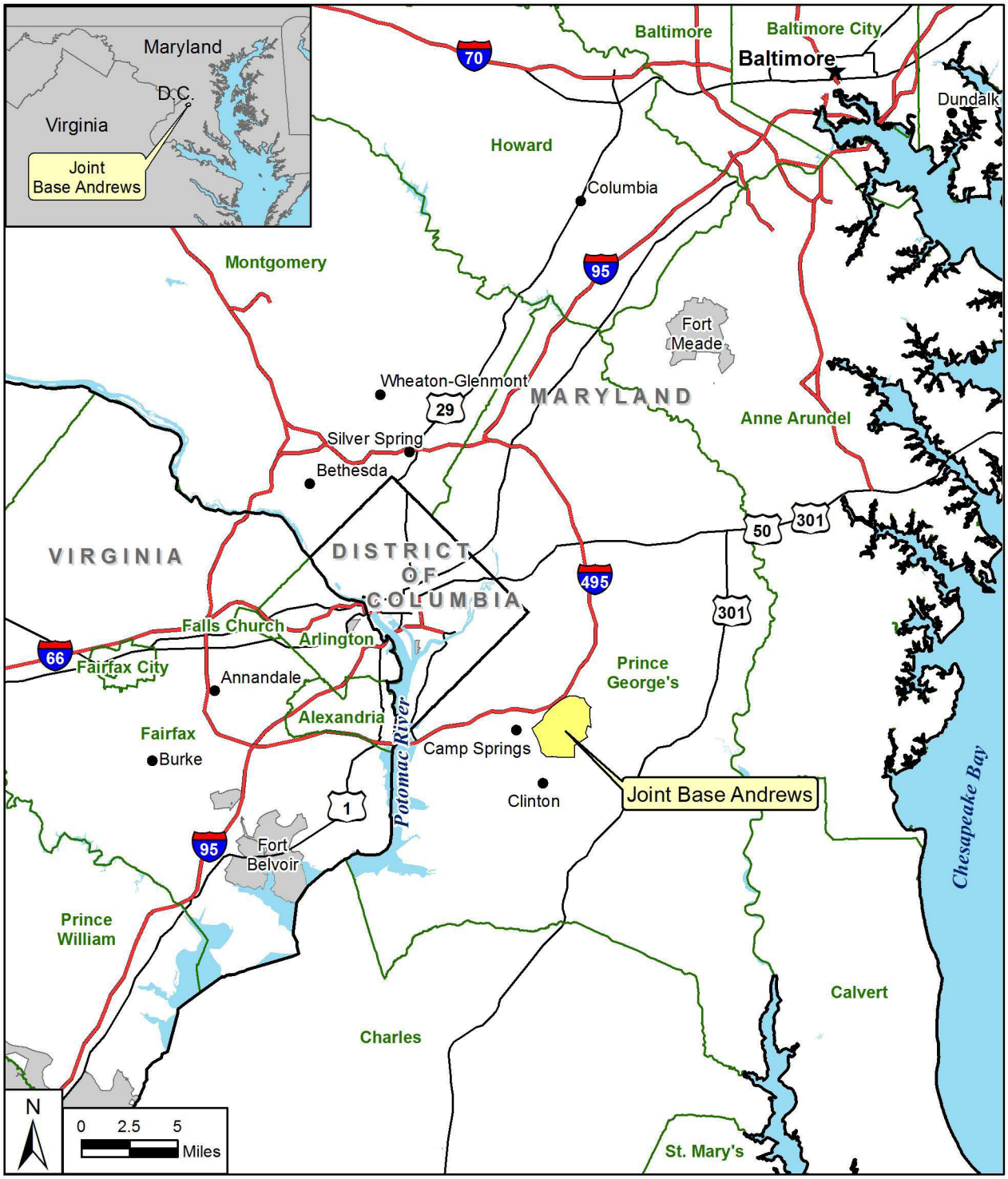
1.3 LOCATION OF THE PROPOSED ACTION

The Proposed Action would be implemented at JBA. JBA is in southern Prince George's County, Maryland, approximately 5 miles southeast of Washington, DC (Figure 1-1).

JBA's main base comprises 4,346 acres of land just outside (southeast) of the Capital Beltway (Interstate 495). The communities of Forestville, Greater Upper Marlboro, Clinton, and Camp Springs border JBA to the north, east, south, and west, respectively.

1.4 BACKGROUND

Stormwater runoff at JBA is managed to protect the quality of surface water on and downstream of the base. Stormwater on the airfield is conveyed through swales and ditches to eight networks of primarily underground culverts (Pond 2010). All surface runoff is eventually discharged into Henson Creek, Cabin Branch, and Piscataway Creek. Each of those streams ultimately flows into either the Potomac or Patuxent River, which both flow to the Chesapeake Bay. JBA must comply with various water quality and quantity requirements and regulations, including the Clean Water Act (CWA) National Pollutant Discharge Elimination System (NPDES) stormwater program, the *Maryland Stormwater Management Guidelines for State and Federal Projects*, the Energy Independence Security Act section 438 (*Storm water runoff requirements*



LEGEND

- Joint Base Andrews
- Interstate Highway
- U.S. Route
- County Boundary
- Surface Water

Location of Joint Base Andrews-Naval Air Facility Washington

Figure 1-1

for Federal development projects), Executive Order (EO) 13508 (Chesapeake Bay Protection and Restoration), and the Chesapeake Bay Total Maximum Daily Load (TMDL) requirements. The existing condition of the stormwater system impairs JBA's ability to successfully meet its NPDES permit conditions and comply with the specified state and federal regulations. In replacing or repairing the airfield stormwater system, JBA would be required to comply with Federal Aviation Administration (FAA) Advisory Circular 150/5320-5C, *Surface Drainage Design*, and Unified Facilities Criteria (UFC) 3-230-01, *Water Storage, Distribution, And Transmission*, in designing the subdrain system at the pavement repair locations. FAA Advisory Circular 150/5320-5C requires that airfield storm drainage systems be designed to accommodate the stormwater runoff associated with the 2-year rainfall event with no encroachment of runoff on runways or taxiways. UFC 3-230-1 provides requirements for typical storage, distribution and transmission systems for domestic water, fire protection, and nonpotable water for the Department of Defense (DoD).

1.5 DECISION TO BE MADE

This EA assesses the environmental, cultural, and socioeconomic resources and potential impacts on resources under the No Action Alternative and the Proposed Action. Based on the analysis in this EA, the USAF will make one of three decisions regarding the Proposed Action:

- Choose the alternative that best meets the purpose and need and sign a Finding of No Significant Impact (FONSI)/Finding of No Practicable Alternative (FONPA), allowing implementation of the selected alternative;
- Initiate preparation of an environmental impact statement (EIS) if it is determined that significant impacts would occur with implementation of the Proposed Action; or
- Select the No Action alternative, whereby the Proposed Action would not be implemented.

JBA would use this EA to guide it in implementing the Proposed Action in a manner consistent with the U.S. Air Force standards for environmental stewardship.

1.6 APPLICABLE REGULATORY REQUIREMENTS

This EA has been prepared in accordance with NEPA (42 *United States Code* [U.S.C.] 4321-4347), the Council on Environmental Quality (CEQ) *Regulations for Implementing the Procedural Provisions of NEPA* (Title 40 of the *Code of Federal Regulations* [CFR] §§ 1500-1508), and 32 CFR Part 989, et seq., *Environmental Impact Analysis Process* (EIAP [32 CFR

989], as amended (formerly known as Air Force Instruction 32-7061). CEQ regulations mandate that all federal agencies use a systematic interdisciplinary approach to environmental planning and the evaluation of actions that might affect the environment. This process evaluates potential environmental consequences associated with a proposed action and considers alternatives to the proposed action. The intent of NEPA is to protect, restore, or enhance the environment through well-informed federal decisions.

Air Force Policy Directive 32-70, *Environmental Quality*, states that the Air Force will comply with applicable federal, state, and local environmental laws and regulations, including NEPA. The Air Force's implementing regulation for NEPA is the EIAP.

Stormwater, water quality, and water quantity requirements and regulations with which JBA must comply include the CWA NPDES stormwater program, the *Maryland Stormwater Management Guidelines for State and Federal Projects*, the Energy Independence Security Act Section 438, EO 13508, and the Chesapeake Bay TMDL requirements.

This EA also serves as a means for ensuring compliance with other federal statutes, including the Endangered Species Act, CWA, Clean Air Act (CAA), National Historic Preservation Act (NHPA), various EOs, and other applicable state statutes and regulations. Where useful to provide better understanding, key provisions of the statutes and EOs are discussed in more detail in the text of the EA.

1.7 SCOPE OF THE ENVIRONMENTAL REVIEW

This EA includes an evaluation of the potential effects of the Proposed Action and No Action Alternative on the natural and manmade environments of JBA and surrounding areas. The analysis in this EA is based on known details of the Proposed Action, such as storm sewer locations, dimensions, and current conditions. Designs, specifications, and repair methods of individual portions of the airfield storm sewer system are subject to change as the project is implemented and new information is gathered. If any change in design or implementation would result in new or different environmental impacts than those evaluated in this EA, JBA would prepare a supplemental EA analyzing those impacts.

A notice of availability of the Draft EA and Finding of No Significant Impact (FONSI)/Finding of No Practicable Alternative (FONPA) was published in the Prince George's County Gazette and the Andrews Gazette newspapers, and copies of the Draft EA and FONSI were made available for review at the Upper Marlboro Branch of the Prince George's County Memorial Library

System at 14730 Main Street, Upper Marlboro, Maryland, and the JBA Library at 1642 Brookley Avenue, JBA. Additionally, the Draft EA and Draft FONSI were available on the JBA website, www.andrews.af.mil. Comments were received from State of Maryland departments and Prince George's County, Maryland. The state comments advised the Air Force that compliance with various regulations would be necessary when implementing the proposed action, but no objections to the analysis in the EA or the alternatives considered were raised. Prince George's County's comments indicated no objection to the proposed work. The comments are provided in Appendix A.

1.8 ORGANIZATION OF THIS DOCUMENT

This EA is organized into eight chapters. Chapter 1 contains the purpose and need for the document, as well as project location and other background information. Chapter 2 contains descriptions of the Proposed Action and alternatives. Chapter 3 contains general descriptions of biophysical resources and baseline conditions that could be affected by implementing the Proposed Action and the No Action Alternative. Chapter 4 contains an analysis of the potential environmental consequences of implementing the Proposed Action and No Action Alternative. Chapter 5 lists permits and approvals necessary for implementation of the Proposed Action. Chapter 6 list the preparers of the EA. Chapter 7 lists the persons and agencies consulted during preparation of the EA. Chapter 8 lists references used in preparation of the EA.

CHAPTER TWO: DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This chapter describes the alternatives that were considered in addressing the purpose and need for the Proposed Action stated in Chapter 1. This chapter presents information on the alternatives evaluated in this EA: the No Action Alternative and the Proposed Action.

2.2 SELECTION STANDARDS FOR ALTERNATIVES

A viable alternative for the repairing and upgrading the stormwater drainage system on the JBA airfield is one that results stormwater runoff control that is in compliance with Maryland stormwater regulations, Federal Aviation Administration (FAA) airfield stormwater management requirements, and the MOU between the Air Force and the FAA regarding aircraft-wildlife strikes. These requirements, which led to the selection of the proposed action of this EA, are the following:

- Code of Maryland Regulation (COMAR), subsections of Chapter 26. The primary requirement in the MDE *2010 Maryland Stormwater Management Guidelines for State and Federal Projects* is that runoff be managed to mimic runoff levels found in natural, forested conditions, requiring that from 1–2.6 inches of rainfall be captured and treated, depending on the design and site conditions.

- FAA AC 150/5320-5C, *Surface Drainage Design* (including Change 1, date 9/29/2006). Airfield storm drainage systems must be designed to accommodate the stormwater runoff associated with the 2-year rainfall event with no encroachment of runoff on runways or taxiways. Additionally, the center 50 percent of runways and taxiways must be free from ponding associated with runoff from the 10-year rainfall event.

- FAA Advisory Circular (AC) 150/5200-33B, *Hazardous Wildlife Attractants on or near Airports*. Permanent stormwater features proposed for the project must be designed to allow a maximum 48-hour detention period for the design storm to meet stormwater permitting requirements.

These criteria govern the options to be considered for repairing and upgrading the airfield stormwater drainage system. Alternatives that did not comply with these regulatory requirements were not considered viable.

2.3 DETAILED DESCRIPTION OF THE PROPOSED ACTION

JBA proposes to repair approximately 51,200 linear feet of storm sewer pipe and 122 manholes of the airfield stormwater drainage network (Figure 2-1). The system's manholes include storm drainage grate inlets, pedestal-top drop inlets, headwalls, and junction boxes.

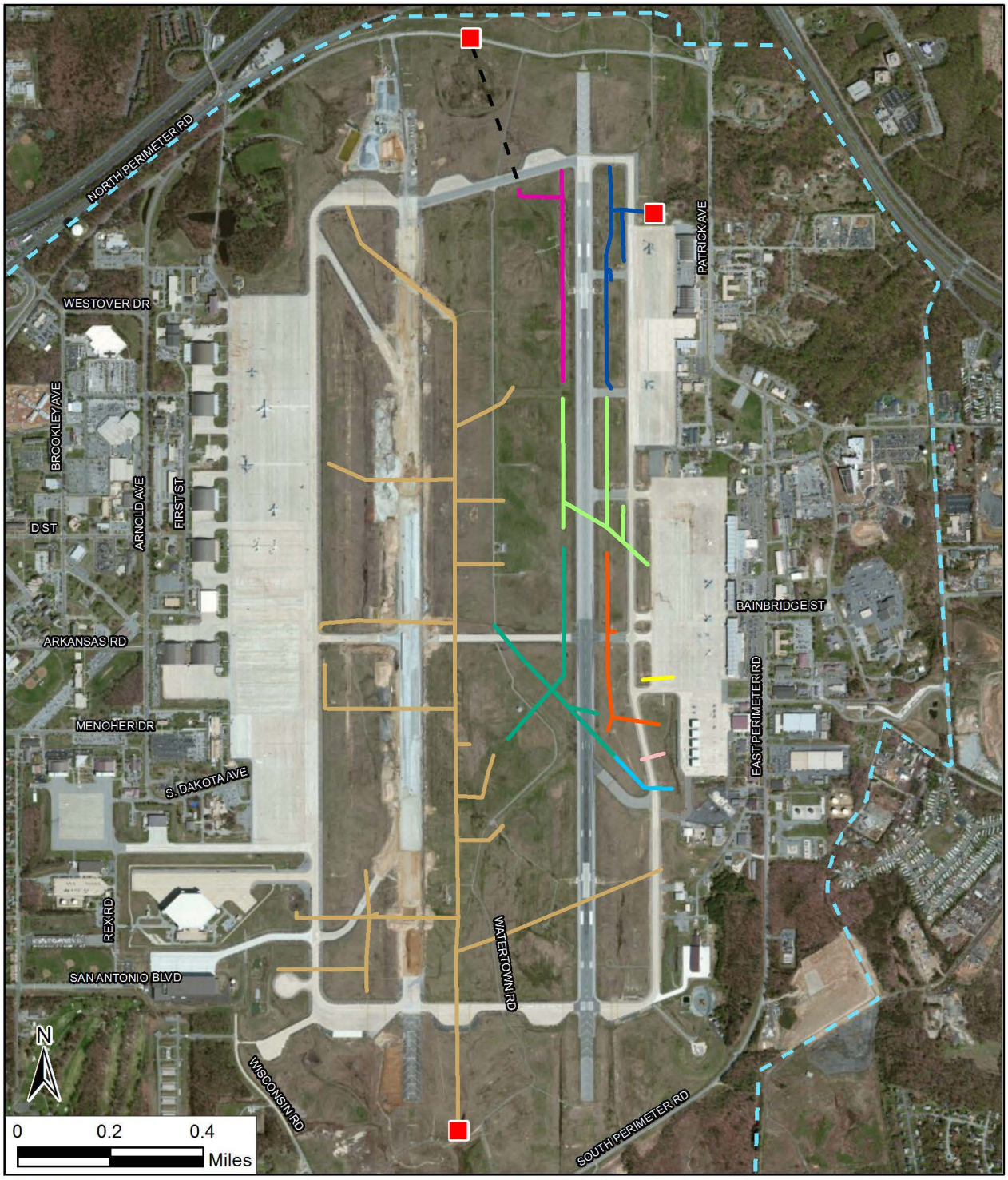
In general, the stormwater pipes on the airfield are in a condition suitable for lining. Therefore, wherever practicable, existing drainage pipes would remain in place and would be lined using cured-in-place pipe (CIPP), which is suitable for pipe diameters between 6 inches and 96 inches, or centrifugally cast mortar pipe (CCMP), which is generally used to line pipes larger than 96 inches in diameter. Storm drain pipes at JBA range in size from 12 inches to 90 inches in diameter. Approximately 85 percent (43,520 linear feet) of pipe is proposed to be lined.

FAA Advisory Circular 150/5320-5C (including Change 1, dated 9/29/2006) requires that airfield storm drainage systems be designed to accommodate the stormwater runoff associated with the 2-year rainfall event with no encroachment of runoff on runways or taxiways. Additionally, the regulations specify that the center 50 percent of runways and taxiways must be free from ponding associated with runoff from the 10-year rainfall event. JBA would comply with the requirements by upsizing some pipe segments to accommodate additional flow. Where pipes are upsized, they would be replaced with new reinforced concrete pipe. Approximately 15 percent (7,680 linear feet) of pipe is proposed to be replaced.

The upsized pipes would increase flow to the system, and overall peak flow to the system outfall south of the airfield (to Piscataway Creek) would be increased. Two weir and orifice structures would be installed at the southern end of the airfield to prevent any increase in peak flow from the system to Piscataway Creek. The weir and orifice structures would restrict peak flows to Piscataway Creek to less than or equal to the existing condition peak flows for each of the design storms (2-year and 10-year). Piscataway Creek is listed by the state of Maryland as a water body that is impaired bacterially and biologically.

At two locations where pipes were previously abandoned, the abandonments would be completed by filling to provide solid pipes beneath pavements and flow would be redirected into new pipes installed at these locations to reduce the risk of a pipe collapse in the future, reduce maintenance, and accommodate system improvements.

No increase in the amount of impervious pavement area on the airfield would result from the Proposed Action. The existing pavement geometry, elevations, centerline alignments, full-



LEGEND

- JBA Boundary
- Outfall

Storm Drainage Network

- A
- B
- C
- D
- E
- F
- G
- H
- J

Airfield Storm Drainage Network

Source: ESRI 2011.

Figure 2-1

strength pavement widths, and shoulder widths for areas impacted by storm drain improvements would remain in their current configurations.

Areas within the airfield where there is groundwater contamination are subject to institutional controls (ICs). Ground disturbance within the IC areas would require an IC waiver from the JBA Environmental Restoration Program by the Air Force Civil Engineer Center/Operations Division-East Region (AFCEC/CZOE). The stormwater system repair contractor could be required to prepare a health and safety plan directing the use of appropriate personal protective equipment and airspace monitoring to ensure worker protection when excavating within the IC areas. The IC waiver requires coordination with AFCEC/CZOE for any digging within 10 feet of any JBA Environmental Restoration Program (ERP) groundwater monitoring well in the vicinity of the proposed work area. The IC waiver also addresses actions required if contaminated groundwater or soil is discovered during the course of digging activities.

2.3.1 Construction Schedule

The Proposed Action would be implemented in five construction phases, with each phase addressing storm drainage on a discreet area of the airfield. The conceived phasing scheme is sequential, meaning Phase 3 would not be constructed until phases 1 and 2 were constructed. Storm pipes that would be impacted by future construction related to the 2020 Conceptual Plan would be repaired in phases 4 and 5 to minimize disruption of airfield operations. If funding were available, phases 1, 2, and 3 could be awarded and constructed concurrently. Phases 4 and 5 would be coordinated with future runway and taxiway improvements on the east side of the airfield.

- Phase 1–September 2015 to October 2016: Replace or rehabilitate storm drain pipes between the West Runway and Taxiway Whiskey.
- Phase 2–September 2016 to October 2017: Line or replace the main trunk line from the upland section south of Taxiway November to the outfall south of Taxiway Sierra.
- Phase 3–September 2017 to September 2018: Line or replace storm drain pipes that connect into the main trunk line.
- Phase 4–September 2018 to December 2019: Line or replace storm drain pipes near the East Runway.
- Phase 5–September 2019 to December 2020: Line or replace storm drain pipes near Taxiway Echo.

The project would be conducted to minimize interference with airfield operations. Two transitional taxiways and at least one runway would remain open at all times so that the airfield would remain fully operational.

The need for an on-site concrete batch plant is not anticipated. Relatively small quantities of cast-in-place concrete would be needed.

Contractors would access JBA through the Pearl Harbor Gate on the east side of the base. The laydown area would be located at the site used by the West Runway Project and Taxiway Sierra Project contractors, a 5-acre site off Nevada Avenue in the northeast portion of the base. During construction, access routes from the laydown site to the work site would follow the perimeter roads and existing maintenance roads that access the airfield.

Any required relocation of water lines, new connections, and line abandonment during implementation of the Proposed Action would be completed by Terrapin Utilities, which owns the water and sewer lines at JBA.

Any contaminated soil encountered during implementation of the Proposed Action would be handled in full accordance with applicable regulations.

Several areas of existing wetlands would be temporarily disturbed in the course of repairing the storm drainage network. Temporary impacts to wetlands would be restored on-site. Less than 5,000 square feet of wetland area would be permanently impacted, so no mitigation for wetland impacts is anticipated. If MDE or the U.S. Army Corps of Engineers (USACE) was to determine that permanent impacts to wetlands should be mitigated, those impacts would be mitigated off-site. Acceptable mitigation options would be determined by MDE and USACE.

2.4 DESCRIPTION OF THE NO ACTION ALTERNATIVE

Under the No Action Alternative, JBA would not implement the proposed stormwater system repair project. Routine maintenance of the stormwater systems would continue, and JBA would operate with an inefficient, outdated, and damaged airfield stormwater system. The deficiencies would impair JBA's future ability to successfully meet NPDES permit conditions, and the *Maryland Stormwater Management Guidelines for State and Federal Projects*; Energy Independence Security Act section 438; EO 13508; and the Chesapeake Bay TMDL requirements, and, therefore, the base would not be in compliance with state and federal water quality regulations. Inadequate conveyance of stormwater from the airfield would continue to

cause unsafe airfield operations during larger precipitation events. Standing water deteriorates pavement, inhibits visibility of airfield markings, can cause hydroplaning, and attracts birds, increasing the bird/wildlife-aircraft strike hazard (BASH). Collapsing drainage infrastructure would continue to pose a hazard to personnel working in the airfield infield.

The No Action Alternative is used as a baseline against which the impacts of the Proposed Action can be evaluated.

2.5 ALTERNATIVES CONSIDERED AND ELIMINATED FROM FURTHER CONSIDERATION

Through the course of developing the Proposed Action as described above, JBA considered various design options for repairing the airfield stormwater drainage system. Replacing existing pipes in-kind was considered and, based on video inspection of the pipes, the alternative of lining the pipes was selected as the preferred method of repair. JBA considered repairing storm structures, but inspections of them revealed that they should be replaced rather than repaired. Hydrological and hydraulic modeling revealed that the proposed storm drainage project would result in an increase in peak flows to the Piscataway Creek and, to satisfy MDE permitting requirements, JBA would have to either perform stream restoration along Piscataway Creek for a distance of approximately 2 miles, or provide on-site stormwater detention to ensure that peak flows to Piscataway Creek would not exceed the peak flows for the existing conditions. JBA selected to provide on-site stormwater detention. Several studies have been conducted at JBA to assess the effectiveness and condition of the stormwater drainage system. One of the studies specifically addressed the repair of collapsed storm drains on the airfield and provided recommendations to upgrade the stormwater systems (Pond 2010). The Proposed Action in its current formulation is based largely on the findings and recommendations of that study and the inspections and modeling conducted through the course of designing the Proposed Action.

JBA considered no alternatives other than repairing the airfield stormwater drainage system (the Proposed Action) and the No Action Alternative. The existing airfield stormwater drainage system does not meet regulatory requirements for stormwater runoff on airfields and in its current condition poses a danger to airfield operations at JBA. If JBA were to select the No Action Alternative, the airfield would be noncompliant with Maryland's Stormwater Management requirements and would not meet FAA design requirements for airfields. Repairing the airfield stormwater drainage system is the only feasible alternative to achieve the purpose of and need for the Proposed Action.

2.6 COMPARISON MATRIX OF ENVIRONMENTAL EFFECTS OF ALL ALTERNATIVES

Table 2-1 summarizes the impacts of the No Action Alternative and the Proposed Action, which are described in more detail in Chapter 4.

Table 2-1. Comparison of Effects between No Action Alternative and Proposed Action

Resource	Proposed Action	No Action	Cumulative
AIRCRAFT OPERATIONS	• Short-term minor adverse effect: Repair of the airfield stormwater system would require some disruption in airfield operations. • Long-term beneficial effect: Adequate and timely drainage of stormwater from the runways would improve airfield operations after storms.	• Long-term minor adverse effect: Ponding on the airfield runways, ramps, and taxiways caused by inadequate conveyance of stormwater would continue to result in delays to aircraft operations.	• Short-term minor adverse cumulative effect: Other airfield projects would also create interruptions in airfield operations. All interruptions would be temporary and none would be permitted during emergency conditions.
EARTH RESOURCES	• Short-term minor adverse effect on soils: Soil disturbance would occur during repair of the storm drainage system. • Long-term minor beneficial effect on soils: The quantity of soil lost to infiltration and inflow into the storm drainage system would be reduced. • Geology: No effect. • Topography: No effect.	• Long-term minor adverse effect on soils: Erosion would continue at stormwater drainage system inflow and outfall locations. • Geology: No effect. • Topography: No effect.	• Short-term minor adverse cumulative effect: Soil disturbance is site-specific. Other projects would also disturb soils, but in different areas. Most JBA soils have been previously disturbed.
WATER RESOURCES	• Short-term minor adverse effect on surface waters: Sediment carried in stormwater runoff during construction would reach surface waters. • Long-term minor beneficial effect on surface waters: The quantity of sediment and contaminants that enter the stormwater drainage network through infiltration and inflow would be reduced. • Groundwater: No effect. • Short-term adverse effect on wetlands: Stormwater drainage system work requires that some wetlands be disturbed.	• Long-term minor adverse effect on water resources and wetlands: Sediment and contaminants in soils on JBA would continue to enter the damaged stormwater drainage system through infiltration and inflow and drain to local streams, degrading water quality. Ponding on the airfield after precipitation events could create new wetlands or expand existing wetlands, which would require removal to safely carry out the Air Force mission.	• Short-term minor adverse cumulative effect on surface waters: All projects have the potential to cause soil erosion and accidental releases, which can affect surface waters via stormwater runoff. • Long-term minor adverse cumulative effect on wetlands: Other projects could affect wetlands, resulting in a minor cumulative effect.

Table 2-1. Comparison of Effects between No Action Alternative and Proposed Action

Resource	Proposed Action	No Action	Cumulative
AIR QUALITY	• Short-term minor adverse effect: Airborne dust and other pollutants would be generated during construction.	• No effect.	• Short-term minor adverse cumulative effect: Construction projects each contribute minor quantities of air pollutants.
NOISE	• Short-term minor adverse effect: Noise would increase intermittently during construction activities.	• No effect.	• Short-term minor adverse cumulative effect: Construction projects each contribute to the overall noise environment, but effects are temporary.
INFRASTRUCTURE	• Long-term beneficial effect: The airfield stormwater drainage system would be repaired, more efficient, and sized to minimize airfield ponding. • No effect on other elements of infrastructure.	• Long-term minor adverse effect on the airfield stormwater drainage system: The system would continue to deteriorate over time.	• No cumulative effect.
TRANSPORTATION	• Short-term minor adverse effects: Additional vehicles and day-labor traffic would be generated during construction.	• No effect.	• Short-term minor adverse cumulative effect: Individual construction projects each contribute minor amounts of traffic. • No long-term effect.
HAZARDOUS MATERIALS AND HAZARDOUS WASTE MANAGEMENT	• No effect.	• No effect.	• No cumulative effect.
SAFETY & OCCUPATIONAL HEALTH	• Long-term minor beneficial effect: Reducing or eliminating ponding on the airfield and minimizing or eliminating standing water on ramps, taxiways, and runways would result in better pavement conditions, allow full visibility of airfield markings, reduce the risk of hydroplaning, and reduce BASH.	• Long-term minor adverse effect: Ponding on the airfield and runways would continue to pose a safety risk; further erosion and collapsing of drainage gates on the airfield would increase the safety risk to aircraft, vehicles, and personnel working in the aircraft infield.	• No cumulative effect.

Table 2-1. Comparison of Effects between No Action Alternative and Proposed Action

Resource	Proposed Action	No Action	Cumulative
BIOLOGICAL RESOURCES	• Long-term minor beneficial effect: The number of collisions between birds and other wildlife and aircraft would be expected to decrease. • Listed species: No effect.	• Long-term minor adverse effect: The probability of wildlife deaths through aircraft-wildlife strikes would increase as the storm drainage network failed further and ponding increased.	• No cumulative effect.
CULTURAL RESOURCES	• No effect.	• No effect.	• No cumulative effect.
LAND USE	• No effect.	• No effect.	• No cumulative effect.
SOCIAL AND ECONOMIC ENVIRONMENT	• Short-term minor beneficial effect on the regional economy: Expenditures and employment associated with the Proposed Action would increase regional employment, income, and sales volume. • Environmental justice: No effect. • Protection of children: No effect. • Recreation: No effect.	• Long-term minor adverse effect: Interruptions in airfield operations due to insufficient stormwater removal from the airfield would adversely affect operational costs. • Environmental justice: No effect. • Protection of children: No effect. • Recreation: No effect.	• No cumulative effect.

CHAPTER THREE: AFFECTED ENVIRONMENT

3.1 FACILITY HISTORY AND CURRENT MISSION

JBA was initially established as Camp Springs Army Air Field in 1943 with a mission to train fighter pilots for overseas combat duty. The base's name was changed to Andrews Air Force Base In 1947 when the Air Force became a separate service. Along with Naval Air Facility Washington, it became a joint base known as Joint Base Andrews–Naval Air Facility Washington, Maryland (or JBA) in 2009 as part of the Defense Base Realignment and Closure process. The 11th Wing was redesignated as the host wing at JBA in October 2010 when the 316th Wing was inactivated.

JBA is home to the Presidential Airlift Group, which is responsible for the operation of the VC-25A aircraft popularly known as Air Force One. Due to its proximity to the capital and governmental facilities, JBA is frequently used by the President and Vice President of the United States, congressional delegations, foreign heads of state, and other high-ranking government and diplomatic officials. JBA supports multiple missions, and units are equipped with a wide range of aircraft such as fighters, aerial refueling tankers, transport aircraft, and helicopters. JBA also provides aviation support to varied military and civilian aircraft.

3.2 AIRCRAFT OPERATIONS

JBA supports approximately 141,000 annual aviation operations, including takeoffs, landings, and closed patterns. A "closed pattern" consists of an aircraft approaching a runway to land but then accelerating to take off again without touching down. Each takeoff or landing constitutes one operation, and a closed pattern constitutes two operations. The airfield has two runways, East Runway and West Runway.

3.3 EARTH RESOURCES

3.3.1 Geology

JBA sits on the coastal plain of southern Maryland, which is composed of unconsolidated sand, gravel, silt, clay, and organic materials 10 to 20 feet deep overlaying bedrock. Surface formations at JBA have largely been previously disturbed by grading and facility construction activities.

3.3.2 Topography

JBA is on the western side of the middle Atlantic Coastal Plain Physiographic Province, an area of generally level to gently sloping terrain with local relief of less than 100 feet, except along steep stream banks. JBA sits on a plateau between the Anacostia River and the Patuxent River. Surface elevations at JBA range from about 215 to 280 feet above mean sea level. Most of JBA is relatively flat, but along its eastern edge the topography drops off steeply into stream valleys that drain to the Patuxent River.

3.3.3 Soils

The two dominant, naturally occurring soil associations at JBA are the Sassafras-Croom and the Beltsville-Leonardtown-Chillum associations. The Sassafras-Croom association is adjacent to drainages on JBA's west side (Payne's Branch and Meetinghouse Branch) and southern boundary (Piscataway Creek). The Beltsville-Leonardtown-Chillum association occupies most of the northern portion of JBA and is comprised mostly of gently-to-moderately sloping soils, but also includes level-to-fairly steep areas.

There has been a considerable amount of development over the years at JBA and most of the naturally occurring soils are no longer present or identifiable. Approximately 50 percent of the soils have little to no horizon development, which is characteristic of land that is altered by disturbance to the extent that the original soil series cannot be identified. Some areas, particularly in and around the runways and taxiways, have 20 or more feet of fill material. About 10 percent of soils on JBA are considered to be undisturbed, and these are primarily along the perimeter and areas of the golf course.

Soils within the airfield mainly consist of loamy Udorthents, which are classified as Hydrologic Soil Group B and typically have moderate to good infiltration capacities and are generally well drained. There are pockets of Beltsville Silt Loam, which is classified as Hydrologic Soil Group C and has limited infiltration capacity.

3.4 WATER RESOURCES

3.4.1 Surface Waters

The upland topography of JBA creates a watershed divide, with the western and southern portions of the base generally draining to the Potomac River (which is slightly more than 6 miles west of JBA) via Tinkers, Henson, and Piscataway creeks, and the northeastern portion

generally draining to the Patuxent River, which is approximately 7 miles east of JBA (Figure 3-1). Most of JBA is in the Potomac River watershed.

Several streams that are fed by a shallow, unconfined surface aquifer originate on or near JBA (Figure 3-1). Piscataway Creek, a tributary of the Potomac River, originates in the southern portion of JBA. Tinkers Creek, a tributary of Piscataway Creek, originates in the eastern portion of JBA as Meetinghouse Branch and Paynes Branch. Henson Creek, another tributary of the Potomac River, originates just north of JBA. Cabin Creek and Charles Branch originate in the northeastern portion of JBA and drain east to Western Branch, a tributary of the Patuxent River. Surface water features at JBA also include the 16.9-acre base lake (Freedom Lake) in the southwest corner of the base, three ponds in the northwest portion of the base, and two small impoundments on the south golf course.

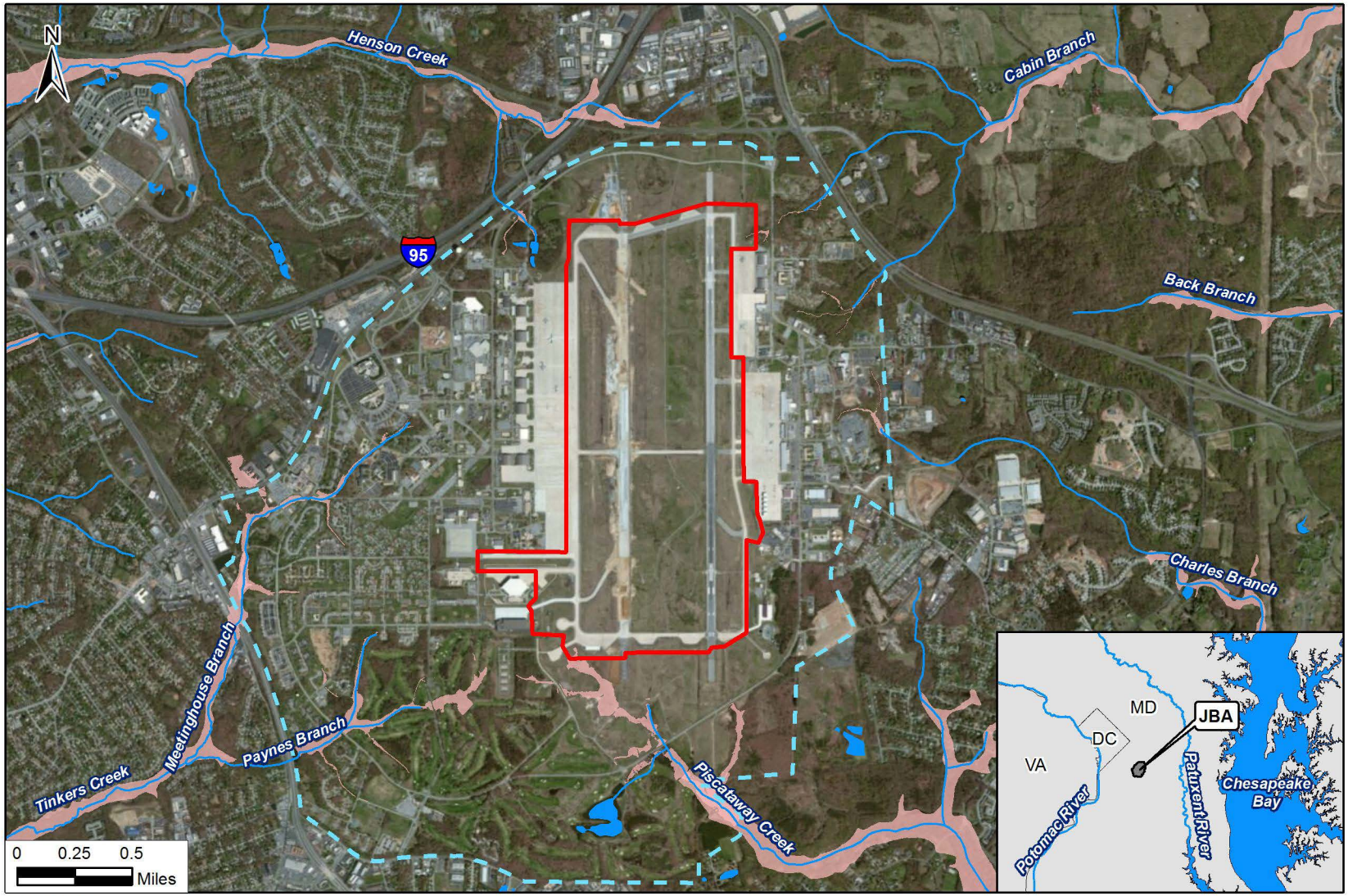
Numerous regulatory mechanisms govern surface water quality at JBA. MDE has authority to regulate stormwater discharges under the NPDES program in Maryland. JBA maintains coverage under MDE's General Discharge Permit (GDP) for industrial activities (GDP No. 12-SW) and under MDE's GDP for discharges by operators of a municipal separate storm sewer system (MS4) (No. 05-SF-5501). JBA is also required to comply with applicable requirements of the U.S. Environmental Protection Agency's (EPA's) Chesapeake Bay TMDL, EO 13508, and section 438 of the Energy Independence and Security Act.

3.4.2 Groundwater

JBA is in a portion of the Maryland Coastal Plain that includes several important regional water supply aquifers. The aquifers are several hundred feet below the ground surface and include the Aquia, Magothy, Patapsco, and Patuxent formations. The Aquia formation at a depth of 150 feet is the primary source of groundwater for much of Prince George's, Anne Arundel, Charles, and St. Mary's counties. It is recharged by infiltration in an area northwest of JBA. The Magothy, Patapsco, and Patuxent formations also provide groundwater for Prince George's, Anne Arundel, and Charles counties. Groundwater in the soils at JBA occurs at depths of less than 20 feet and is likely unconfined and is recharged primarily through infiltration.

3.4.3 Floodplains

The Federal Emergency Management Agency typically does not map floodplains on federal property; therefore, flood insurance rate maps are not available for JBA. In 2005, JBA completed a study of the 100-year floodplains on the base. The floodplains are generally limited



LEGEND

- JBA Boundary
- Airfield Boundary
- Surface Water
- 100-Year Floodplain

Surface Water

Figure 3-1

Source: ESRI 2011; JBA GIS 2014; NHD 2015.

to small streams and the area immediately adjacent to these streams. The floodplain of Piscataway Creek at the southern end of the airfield extends to just south of Taxiway Whiskey and is the only floodplain area within the boundaries of the Proposed Action (Figure 3-2).

EO 11988, *Floodplain Management*, requires that development on federal lands avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains.

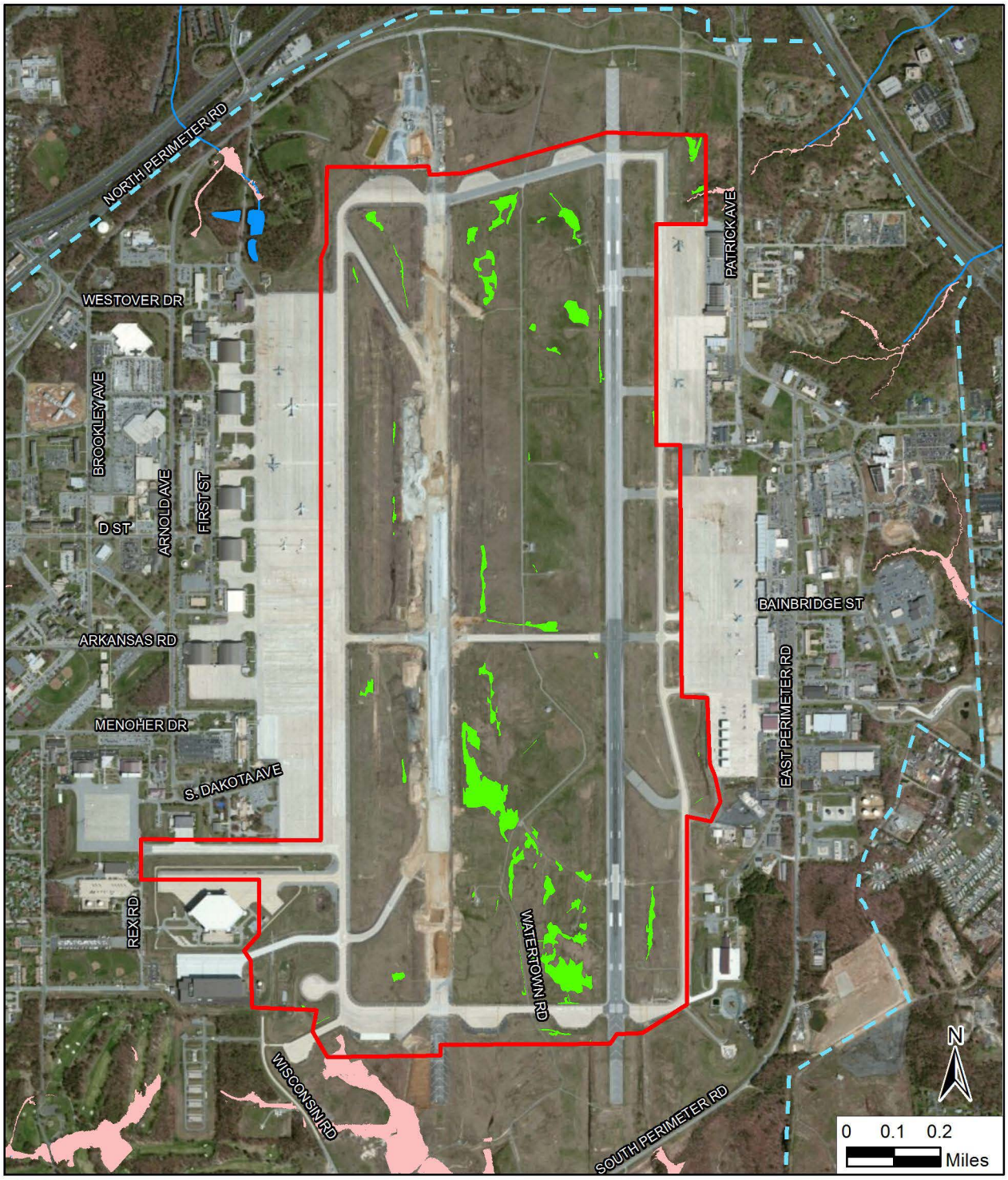
3.4.4 Wetlands

Wetlands on JBA are mostly palustrine (freshwater) forested and riverine types associated with the streams, lake, ponds, and impoundments around the edges of JBA. Emergent wetlands are on the golf course near Freedom Lake and at the southern end of the airfield. Scrub-shrub wetlands are at various locations around Freedom Lake, and forested wetlands are scattered throughout JBA in its undeveloped areas.

The wetlands on the airfield infield are probably associated with springs and pockets of the Hydrologic Soil Group C soils of the Beltsville Silt Loam soil association, which have limited infiltration capacity. Wetlands on the JBA airfield were delineated in 2012 and the delineation was confirmed by USACE on 11 March 2014. The delineation indicates the presence of 28.5 acres of wetlands in the airfield infield (Figure 3-2). Because the Proposed Action would occur in isolated spots on the airfield to access specific parts of the stormwater drainage system, a total of only 2.5 acres of wetlands (i.e., 0.84 acre of nontidal emergent wetlands and 1.66 acres of wetland buffer) are within the footprint of the Proposed Action (HDR 2014).

JBA manages wetlands to provide wetland protection, enhancement, and restoration where necessary for support of fish, wildlife, or plants. Additionally, JBA implements the ecosystem management projects to maintain or restore the hydrological processes in streams, floodplains, and wetlands when feasible, as outlined in DoD Issuance 4715.3, Environmental Conservation Program. As outlined in the JBA Integrated Natural Resources Management Plan (USACE Baltimore District 2007), however, managing JBA's wetlands also includes preventing wetlands from forming on the airfield through proper drainage and stormwater management practices to maintain airfield safety; standing water on the airfield attracts wildlife, including birds, which in turn can increase the potential for a BASH.

EO 11990 (*Protection of Wetlands*) directs federal agencies to minimize the destruction, loss, and degradation of wetlands, and to preserve and enhance the natural and beneficial values of



LEGEND

- JBA Boundary
- Airfield Boundary
- Wetland
- 100-Year Floodplain

Airfield Wetlands and Floodplains

Source: ESRI 2011; JBA GIS 2014.

Figure 3-2

wetland communities. In accordance with CWA, projects at JBA that involve dredging or filling wetlands require section 404 permits from USACE and a nontidal wetland permit from MDE.

3.4.5 Coastal Zone

JBA is within the designated Maryland coastal zone. When a federal agency conducts an activity or development project, or has an activity performed by a contractor for the benefit of the federal agency, the agency must determine whether its activities are reasonably likely to affect any coastal use or resource and to conduct the activities in a manner that is consistent to the maximum extent practicable with the enforceable policies of the applicable state coastal program. The federal agency must provide a consistency determination and supporting materials to the state Coastal Zone Management Program agency at least 90 days before starting the proposed activity (unless a different arrangement has previously been made between the federal agency and the authorized state agency). An assessment of the consistency of the proposed activities with the enforceable policies of the Maryland Coastal Program is in Appendix B.

3.5 AIR QUALITY

EPA Region 3 and MDE regulate air quality in Maryland. The CAA (42 U.S.C. § 7401-7671q), as amended, assigns EPA responsibility to establish the primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR part 50) that specify acceptable concentration levels of six criteria pollutants: particulate matter (measured as both particulate matter less than 10 microns in diameter [PM_{10}] and particulate matter less than 2.5 microns in diameter [$PM_{2.5}$]), sulfur dioxide, carbon monoxide, oxides of nitrogen, ozone, and lead. Short-term NAAQS (i.e., 1-, 8-, and 24-hour periods) have been established for pollutants contributing to acute health effects, while long-term NAAQS (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; the state of Maryland has adopted the federal standards.

Federal regulations designate air quality control regions (AQCRs) in violation of the NAAQS as *nonattainment* areas. Federal regulations designate AQCRs with levels below the NAAQS as *attainment ar*eas. According to the severity of the pollution problem, nonattainment areas can be categorized as marginal, moderate, serious, severe, or extreme.

Prince George's County (and, therefore, all areas associated with the action) is within the National Capital Interstate AQCR (AQCR 47) (40 CFR 81.12). EPA has designated Prince George's County as a marginal nonattainment area for the 8-hour ozone NAAQS, and as a nonattainment area for the $PM_{2.5}$ NAAQS (USEPA 2014a). In addition, the county is in the Ozone Transport Region, which includes 12 states and the District of Columbia. EPA monitors levels of criteria pollutants at representative sites in each region throughout Maryland. For reference purposes, Table 3-1 shows the monitored concentrations of criteria pollutants at the monitoring location closest to JBA. The reported measurement of 0.08 parts per million (ppm) for the 8-hour level exceeds the NAAQS of 0.075 ppm. This exceedance is expected because the region has been designated an ozone nonattainment area.

Table 3-1.
Air Quality Standards and Monitored Data

Pollutant	Air quality standards	Monitored data
Carbon Monoxide		
1-hour[a] (ppm)	35	0.7
8-hour[a] (ppm)	9	0.3
Nitrogen Dioxide		
1-hour (ppb)	100	36.0
Ozone		
8-hour[b] (ppm)	0.075	0.08
Sulfur Dioxide		
1-hour[a] (ppb)	75	7.0
3-hour[a] (ppm)	0.5	No Data
Particulate Matter ($PM_{2.5}$)		
24-hour[c] ($\mu g/m^3$)	35	19
Annual arithmetic mean[d] ($\mu g/m^3$)	12	5.7
Particulate Matter (PM_{10})		
24-hour[a] ($\mu g/m^3$)	150	44

Sources: 40 CFR 50.1-50.12, USEPA 2014b.

Notes:
ppm = parts per million, ppb = parts per billion, $\mu g/m^3$ = micrograms per cubic meter.
[a] Not to be exceeded more than once per year.
[b] The 3-year average of the fourth highest daily maximum 8-hour average ozone concentrations over each year must not exceed 0.075 ppm.
[c] The 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor must not exceed 35 $\mu g/m^3$.
[d] The 3-year average of the weighted annual mean $PM_{2.5}$ concentrations must not exceed 12.0 $\mu g/m^3$.

JBA is considered a synthetic minor facility for the purposes of air permitting and holds a synthetic minor operating permit (#033-00655) that expires 30 January 2017. The permit requirements include annual periodic inventory of all significant stationary sources of air

emissions for each of the criteria pollutants of concern, as well as monitoring and recordkeeping. Primary stationary sources of air emissions include boilers, generators, and paint booth(s). Table 3-2 lists JBA's 2013 facility-wide air emissions from all significant stationary sources.

Table 3-2.
Annual Emissions for Significant Stationary Sources at JBA

Pollutant	Emissions (tons/year)
Carbon monoxide	5.5
Nitrogen oxides	8.8
Volatile organic compounds	2.5
Fine particulate matter	0.2
Fine particulate matter ($PM_{2.5}$)	0.2
Sulfur dioxide	0.1

Source: JBA 2014.

Greenhouse Gases (GHGs) and Climate Change. The average high temperature in Prince George's County is 87° Fahrenheit (°F) in the hottest month of July, and the average low temperature in the county is 22°F in the coldest month of January. Prince George's County has average annual precipitation of 43.7 inches per year. The wettest month of the year is May with an average rainfall of 4.3 inches (Idcide 2014).

GHGs are components of the atmosphere that trap heat relatively near the surface of the earth and contribute to the greenhouse (or heat-trapping) effect and climate change. Most GHGs occur naturally in the atmosphere, but their concentrations are increased from human activities such as the burning of fossil fuels. Global temperatures are expected to continue to rise as human activities add carbon dioxide, methane, nitrous oxide, and other greenhouse gases to the atmosphere. Whether rainfall will increase or decrease remains difficult to project for specific regions (USEPA 2012c and IPCC 2007).

EO 13514 (*Federal Leadership in Environmental, Energy, and Economic Performance*) outlines policies intended to ensure that federal agencies evaluate climate-change risks and vulnerabilities and manage the short- and long-term effects of climate change on their operations and mission. The EO specifically requires agencies within DoD to measure, report, and reduce their GHG emissions from both their direct and indirect activities. DoD has committed to reduce GHG emissions from noncombat activities 34 percent by 2020 (DOD 2010). In addition, the CEQ recently released draft guidance on when and how federal agencies

should consider GHG emissions and climate change in NEPA analyses. The draft guidance includes a presumptive effects threshold of 25,000 metric tons per year (i.e., 27,563 tons per year) of carbon dioxide equivalent emissions from a federal action (CEQ 2010).

3.6 NOISE

Human response to noise varies depending on the type and characteristics of the noise, distance between the noise source and the receptor, receptor sensitivity, and time of day. Noise is often generated by activities essential to a community's quality of life, such as construction or vehicular traffic.

Sound varies by both intensity and frequency. Sound pressure level, described in decibels (dB), is used to quantify sound intensity. The decibel is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Hertz is a unit used to quantify sound frequency. The human ear responds differently to different frequencies. "A-weighing", measured in A-weighted decibels (dBA), approximates a frequency response expressing the perception of sound by humans. Sounds encountered in daily life and their A-weighted decibel levels are provided in Table 3-3.

Table 3-3.
Common Sounds and Their Levels

Outdoor	Sound level (dBA)	Indoor
Motorcycle	100	Subway train
Tractor	90	Garbage disposal
Noisy restaurant	85	Blender
Downtown (large city)	80	Ringing telephone
Freeway traffic	70	TV audio
Normal conversation	60	Sewing machine
Rainfall	50	Refrigerator
Quiet residential area	40	Library

Source: Harris 1998.

The A-weighted decibel noise metric describes steady noise levels, although very few noises are, in fact, constant. Therefore, A-weighted Day-night Sound Level has been developed. "Day-night Sound Level" (DNL) is defined as the average sound energy in a 24-hour period with a 10-dB penalty added to the nighttime levels (10 p.m. to 7 a.m.). DNL is a useful descriptor for noise because it (1) averages ongoing yet intermittent noise, and (2) measures total sound energy

over a 24-hour period. In addition, Equivalent Sound Level (L_{eq}) is often used to describe the overall noise environment. L_{eq} is the average sound level in decibels.

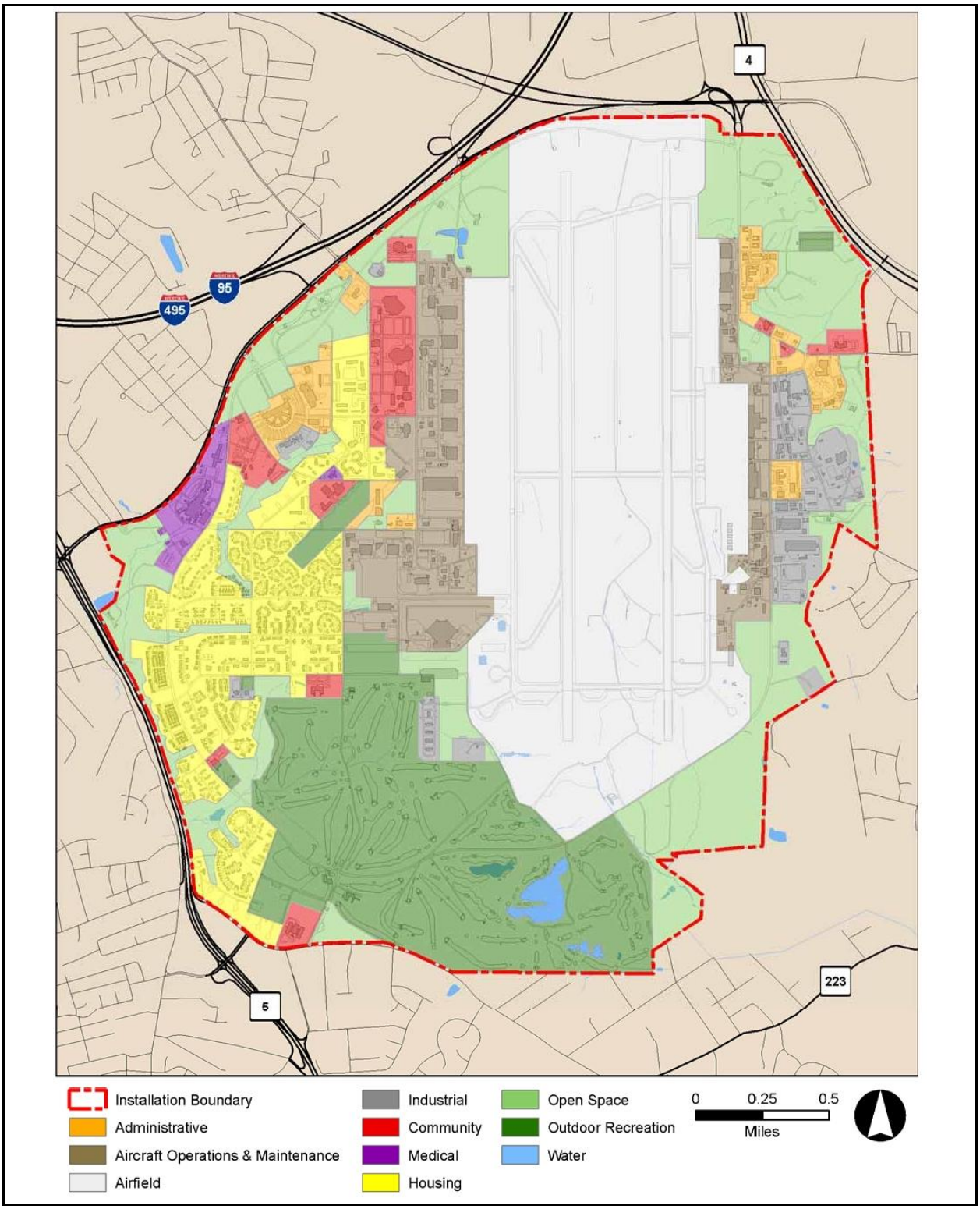
The Noise Control Act of 1972 (PL 92-574) directs federal agencies to comply with applicable federal, state, and local noise control regulations. In 1974, EPA provided information suggesting continuous and long-term noise levels in excess of DNL 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals. The state of Maryland's Environmental Noise Act of 1974 limits noise to that level, which will protect the health, general welfare, and property of the people of the state. Maryland limits both the overall noise environment and the maximum allowable noise level for residential, industrial, and commercial areas (COMAR 26.02.03). Maximum levels cannot exceed 65 dBA in the daytime and 55 dBA at night in residential areas. The DNL also cannot exceed 55 dBA in residential areas and 64 dBA in commercial areas. For construction activities, noise levels may not exceed 90 dBA during daytime hours (i.e., 7 a.m. to 10 p.m.) (COMAR 26.02.03). Prince George's County maintains a nuisance noise ordinance that does not set strict not-to-exceed noise levels.

Individuals both on and off the base may be subjected to multiple sources of noise during the day including traffic, aircraft overflights, construction activities, operation of heating-ventilating-cooling systems, lawn maintenance, and general maintenance of streets and sidewalks. Existing noise levels (L_{eq} and DNL) were estimated for the surrounding areas. Table 3-4 lists the land-use category and the estimated background noise levels for noise-sensitive areas near the airfield (ANSI 2013, USAF 2007) (Figure 3-3). There are no noise-sensitive areas within 800 feet of the airfield infield; the closest noise-sensitive receptor is approximately one-half mile away. Noise-sensitive areas near the airfield are within or adjacent to the 65 dBA DNL noise contour where the noise environment is dominated by aircraft noise.

Table 3-4.
Estimated Background Noise Levels at Nearby Noise Sensitive Areas

Closest noise sensitive area			Estimated existing sound levels (dBA)			
					L_{eq}	
Distance to Noise Sensitive Area	Direction	Type	Land-use category	DNL	daytime	nighttime
2,558 feet	West	School	Noisy urban residential	65+	61	54
4,777 feet	Southeast	Residential				
2,450 feet	North	Church				

Sources: ANSI 2013, USAF 2007.



Land Use

Figure 3-3

3.7 INFRASTRUCTURE

3.7.1 Airfield Stormwater Drainage System

Stormwater on the airfield is conveyed through swales and ditches to eight networks of primarily underground culverts (Figure 2-1) (Pond 2010). Network A is the major network of the storm drainage system on the airfield and drains the western half of the airfield. Smaller networks D–H, which drain the central and south portions of the eastern half of the airfield, connect to Network A. Networks A–H drain a combined area of 1,210 acres and discharge from a storm drain outfall south of the airfield into Piscataway Creek. Network B drains 42 acres of the northeastern portion of the airfield on the western edge of the East Runway and discharges into Henson Creek north of the airfield. Henson and Piscataway creeks (and, therefore, networks A, B, and D–H) drain to the Potomac River. Network C drains 33 acres of the northeastern portion of the airfield on the east side of the East Runway. It drains to a tributary of Cabin Branch, which is a tributary of the Patuxent River. Both the Potomac River and Patuxent River flow to the Chesapeake Bay.

JBA maintains coverage under MDE's GDP for industrial activities (GDP No. 12-SW) and under MDE's GDP for discharges by small MS4 operators (No. 05-SF-5501). JBA complies with the requirements of the permits through implementing a stormwater pollution prevention plan (SWPPP) that minimizes the potential for contaminants to reach nearby surface waters.

Aviation fuel and oil spills and unpermitted connections to the storm sewer system at JBA can contaminate stormwater runoff and streams. JBA reduces the risk and impact of spills by implementing a spill response program. A stop discharges plan is in place to identify and correct illicit connections to the storm sewer system.

3.7.2 Other Airfield Infrastructure

At many locations, the storm drainage pipes that would be replaced intersect existing electrical, communications, water, and fuel line infrastructure (HDR 2014). Electrical infrastructure in the airfield comprises individual electrical conduits, electrical duct banks, and communications duct banks. A 10-inch diameter water line was installed under the West Apron and along the east side of Taxiway Whiskey in a 2003 project, and relocation of the water line is part of the Taxiway Whiskey Project. There are also active water lines near Taxiway Echo and the East Apron, and active fuel lines at two stormwater drainage inlet replacement locations.

3.8 TRANSPORTATION

Transportation near JBA is achieved mainly via road and street networks and pedestrian walkways. Regional access is provided by Interstate 95 and Interstate 495. State routes that provide access to the area include Pennsylvania Avenue, Branch Avenue, Allentown Road, Woodyard Road, and Dower House Road, while Perimeter Road and Watertown Road provide direct access to the site.

The average annual daily traffic (AADT) is the average number of vehicles traveling along a roadway each day. The level of service (LOS) is a measure of the operational conditions on a roadway or at an intersection. LOS ranges from A to F, with "A" representing the best operating conditions (e.g., free flow, little delay) and "F" the worst (e.g., congestion, long delays). LOS A, B, and C are typically considered good operating conditions. Table 3-5 outlines the routes near the proposed sites and in the area, their AADT, and their estimated existing LOS. Notably, some of the nearby roadways are already congested during peak traffic periods (i.e., they operate at LOS D, E, or F).

Table 3-5.
Existing AADT and LOS on Nearby Roadways

Roadway	AADT (vpd)	One-way peak-hour volume (vph)	Volume to capacity ratio	Estimated LOS
Allentown Road	31,465	1,699	1.00	E
Pennsylvania Avenue	61,620	1,133	0.67	E
Branch Avenue	48,410	2,218	1.30	F
Capital Beltway	211,750	1,307	0.77	E

Sources: MDOT 2014, ITE 2003.
Notes: vpd = vehicles per day, vph = vehicles per hour.

Air, Rail, and Public Transportation. The closest international airport with commercial service is Ronald Reagan Washington National Airport, which is 15 miles from JBA and has 842 operations per day (AirNav 2014). Other nearby airports include Baltimore–Washington International Thurgood Marshall Airport and Washington Dulles International Airport. The closest Amtrak station is 56 miles from JBA at Union Station, Washington, DC. Three public agencies provide transit service to the area surrounding JBA: Washington Metropolitan Area Transit Authority, the Maryland Transit Administration, and "TheBus" of Prince George's County. Commuters must walk to/from any public transit stops and through the JBA entry control facilities to their base destination or to a JBA shuttle stop. The Branch Avenue Metro Station

provides regional rail service and transfers to buses. Two bus routes have at least two stops within a quarter mile of the intersection of Suitland Road and Allentown Road outside of the Main Gate.

3.9 HAZARDOUS MATERIALS AND HAZARDOUS WASTE

Hazardous materials and wastes include substances that may present substantial danger to public health or the environment if released into the air, water, or soil. Petroleum products include petroleum-based fuels, oils, and their wastes, and are considered hazardous materials. Issues associated with hazardous materials and wastes typically center on waste streams; underground storage tanks; above-ground storage tanks; and the storage, transport, use, and disposal of pesticides, fuels, lubricants, and other industrial substances.

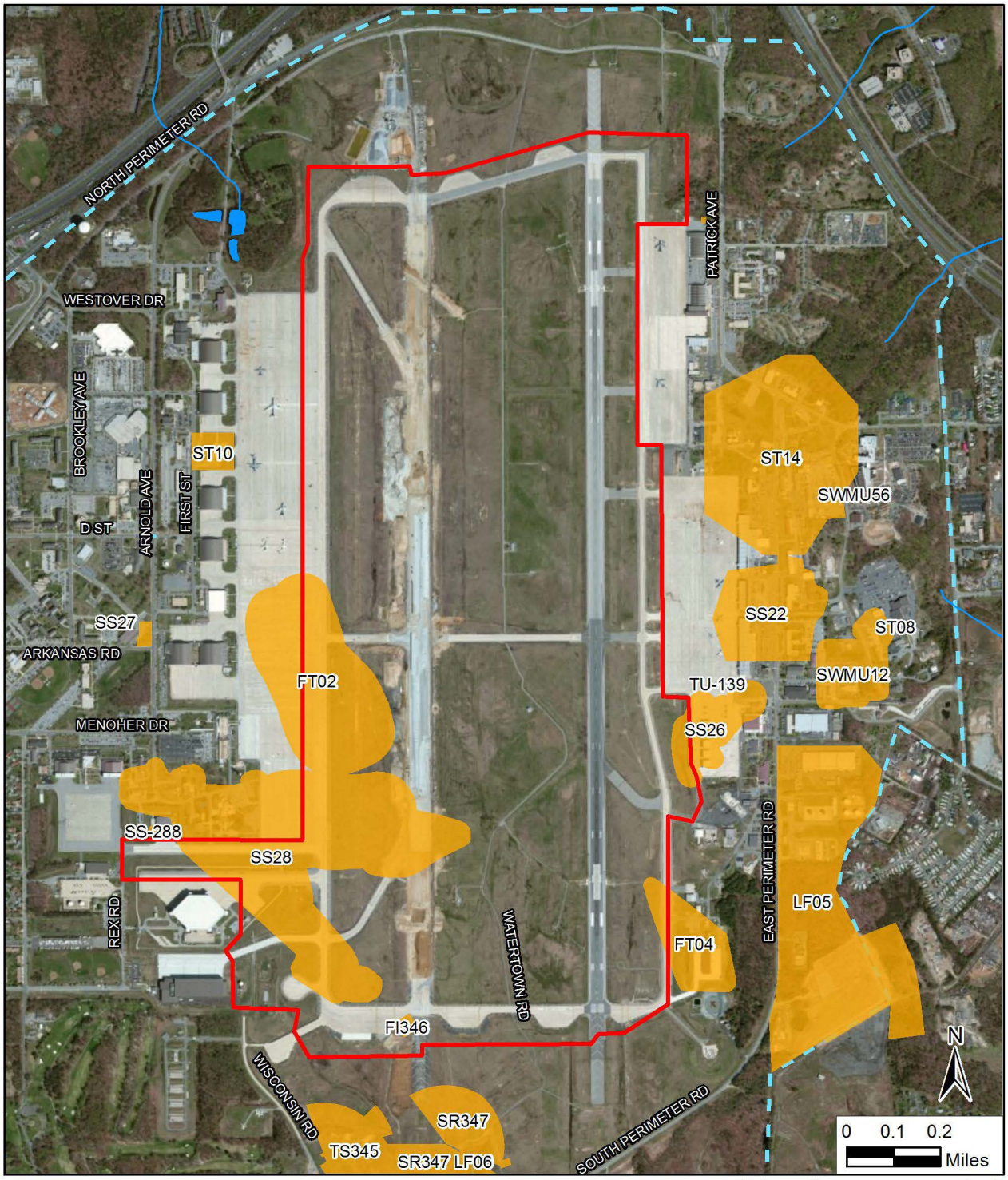
3.9.1 Hazardous Materials and Waste Management

Aircraft operations conducted at JBA require the use and storage of hazardous materials, including flammable and combustible liquids, acids, aerosols, batteries, and petroleum products. Most spills of hazardous materials and petroleum products at JBA result from leaking vehicles, aircraft, and storage tanks. The spill prevention, control, and countermeasure (SPCC) plan for JBA provides procedures for spill reporting, containment, cleanup, and disposal of hazardous materials and petroleum products. The JBA fire department is responsible for acting as the first responding unit for all spill incidents.

JBA is regulated as a large-quantity generator of hazardous wastes by EPA under identification number MD0570024000. Primary types of hazardous wastes that are generated include batteries, used fuel and oil, solvents, fluorescent bulbs, rags, fuel filters, and solvent-contaminated solids. Most hazardous waste generated at JBA is associated with aircraft operations.

3.9.2 Environmental Restoration Program

The ERP is an Air Force effort to identify, characterize, and remediate environmental contamination from past activities at Air Force bases. Small areas on the airfield that would be affected by the Proposed Action are covered under the base's ERP (Figure 3-4). One area at the southern end of the West Apron is known to have trichloroethylene (TCE) in the groundwater. A lead contamination area is located at the southern end of the West Runway, but no work associated with the Proposed Action is anticipated within the area. Asbestos-containing material (ACM) was encountered on the airfield during removal of storm drains and pavement



LEGEND

- JBA Boundary
- Airfield Boundary
- Environmental Site

Environmental Restoration/MMRP Sites

Source: ESRI 2011; JBA GIS 2014.

Figure 3-4

under drain pipes during replacement of the West Runway. Electrical conduit also may contain ACM, and abandoned transite water lines containing ACM exist in the airfield, in particular near Taxiway Whiskey.

Historic fuel supply activities, landfills, and other support and training operations have affected groundwater and surface waters at JBA with metals, volatile organic compounds, semi-volatile organic compounds, polyaromatic hydrocarbons, polychlorinated biphenyls, and pesticides. JBA is responsible for 60 ERP sites on the base. It is also responsible for one Military Munitions Response Program (MMRP) site and six potential MMRP sites that are under investigation.

3.10 SAFETY AND OCCUPATIONAL HEALTH

Potential safety issues at JBA include flight and airfield operations and maintenance, antiterrorism/force protection (AT/FP) activities, explosives use, and construction activities. Development on JBA is restricted in some areas because of safety-related constraints, including operational constraints associated with the airfield.

Clearance and permission are required to enter or work in an area that extends 3,000 feet from the end of the runway, 1,500 feet on either side of the runway centerline, and 5,000 feet from the end of the clear zone. Explosives safety quantity distance (ESQD) arcs are maintained between explosive storage areas and other types of facilities. JBA has three primary ESQD arcs located on and in close proximity to the airfield. Development and construction are prohibited within ESQD arcs to maintain personnel safety and minimize damage potential to other facilities.

The JBA 2010 General Plan Update specifically describes safety and security requirements that have been implemented for various areas of the base. General security and safety requirements are incorporated into all projects. Day-to-day operation and maintenance activities conducted at JBA are performed in accordance with applicable Air Force safety regulations, published Air Force technical orders, and standards prescribed by Air Force occupational safety and health requirements.

All contractors working on construction projects on JBA are responsible for complying with Air Force safety and Occupational Safety and Health Administration (OSHA) regulations. They are required to conduct construction activities in a manner that does not pose any undue risk to workers or personnel. Industrial hygiene programs address exposure to hazardous materials, use of personal protective equipment, and use and availability of Material Safety Data Sheets.

The failing JBA airfield storm water drainage infrastructure results in improper water drainage from the airfield, creating areas of standing water. Standing water and the collapsing storm water drainage system are safety hazards to personnel working at the airfield. The standing water also creates a BASH concern.

3.11 BIOLOGICAL RESOURCES

3.11.1 Vegetation

Most of the land on JBA is developed or intensely managed. The most abundant type of vegetation on the base is associated with managed or improved sections of developed areas, such as lawns, gardens, the golf course, and the airfield. Dominant turf species are fescue (*Festuca elatior*) and perennial ryegrass (*Lolium perenne*).

Patches of original vegetation are found in unimproved areas and consist of shallow emergent marshland and forestland. JBA is in the Atlantic Slope Section of the Oak-Pine Forest Region. A substantial portion of Prince George's County has been deforested for urban and suburban development, and only small patches of the original forest remain. JBA has approximately 720 acres of forest land scattered around the perimeter and southern portion of JBA. No patches of original vegetation remain on the airfield.

3.11.2 Wildlife

Eighty-four bird species have been identified at JBA. Birds associated with the airfield include the Canada Goose (*Branta canadensis*), Green Heron (*Butorides virescens*), Great Blue Heron (*Ardea herodias*), American Crow (*Corvus brachyrhynchos*), and various common perching and song birds. Raptors that have been observed on the base include the Great Horned Owl (*Bubo virginianus*), Eastern Screech Owl (*Otus asio)*, American Kestrel (*Falco sparverius*), Red-shouldered Hawk (*Buteo lineatus*), and Red-tailed Hawk (*B. jamaicensis*) (USACE Baltimore District 2007).

Mammals encountered on the airfield include the white-tailed deer (*Odocoileus virginianus*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), and eastern cottontail (*Sylvilagus floridanus*). Reptiles occasionally found on the airfield include the eastern garter snake (*Thamnophis sirtalis*), black rat snake (*Elaphe obsolete*), fence lizard (*Sceloporus undulatus*), and eastern box turtle (*Terrapene carolina*).

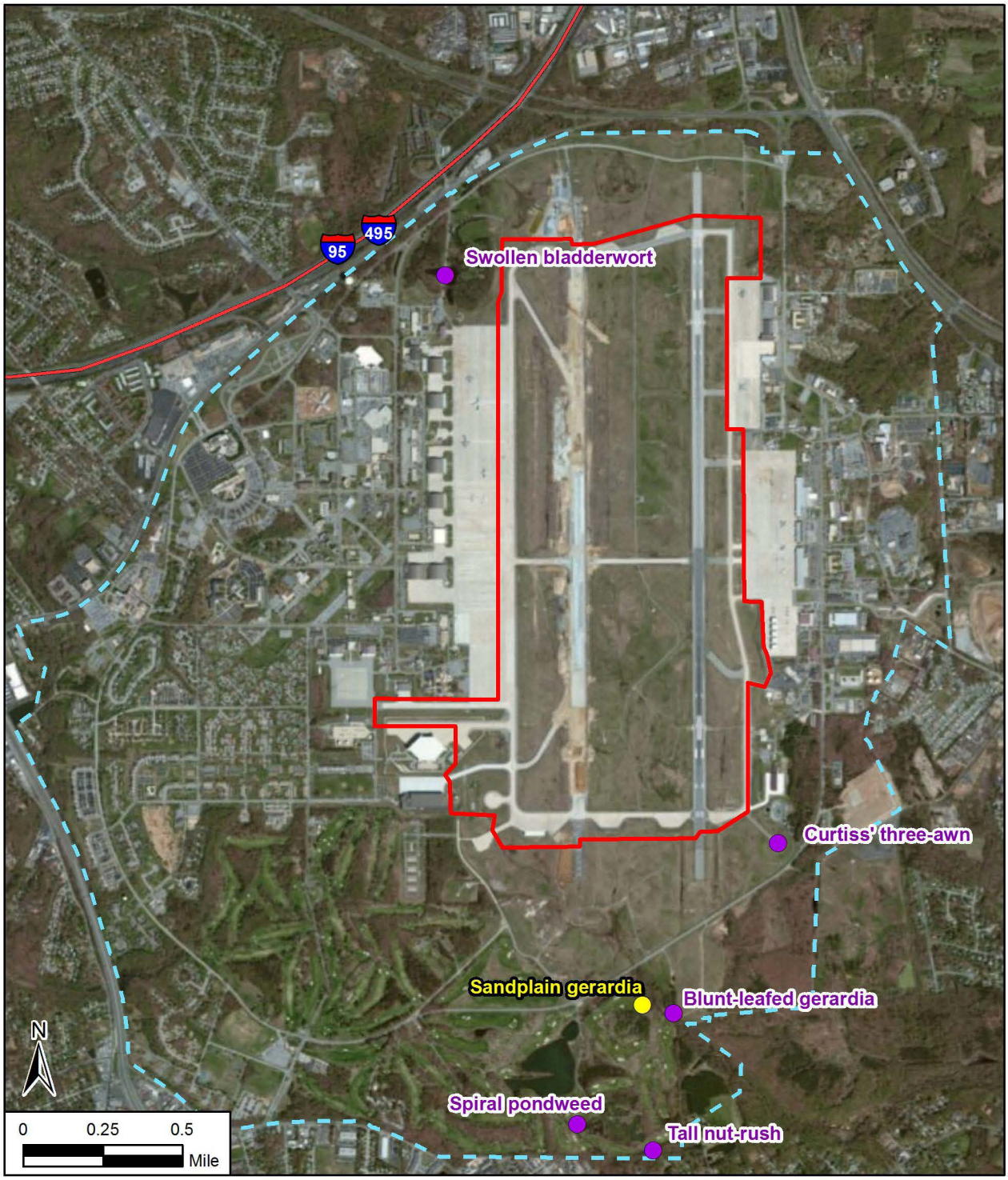
JBA is in the Atlantic flyway near several wildlife refuges, so it is an area of high BASH potential. The Air Force Bird/Wildlife Aircraft Strike Hazard Program provides guidance to minimize wildlife-aircraft strikes. BASH management practices are aimed at discouraging the presence of wildlife on the airfield and include the use of sound (an air cannon and predator calls) and a trained dog and handler to disrupt flocks of birds on the ground. The Air Force is a signatory to the memorandum of agreement (MOA) with the FAA and other federal agencies to address aircraft-wildlife strikes. Through the MOA, the agencies establish procedures necessary to coordinate their missions to address conditions contributing to aircraft-wildlife strikes. Signatories to the MOA agree to coordinate projects on or near airports with the FAA as they relate to BASH.

3.11.3 Threatened and Endangered Species

Sensitive and protected biological resources include plant and animal species that are federally or state-listed for protection. Surveys at JBA have identified 21 rare, threatened, or endangered plant species on JBA property, only six of which were recorded on the main base (Figure 3-5). Two state-listed species have been found near the airfield, but neither of them was found during the most recent survey in 2006 (USACE Baltimore District 2007). The species are the swollen bladderwort (*Utricularia inflata*) along the edges of the Bell Chance Pond near the northwest corner of the airfield, and the Curtiss' three-awn (*Aristida curtissii*) at the southeast corner of the airfield near South Perimeter Road. The only federally listed species known to occur on JBA is the sandplain gerardia (*Agalinis acuta*), but it grows only south of the flightline near the 13th tee of the golf course, well off the airfield.

3.12 CULTURAL RESOURCES

The NHPA of 1966, as amended, outlines federal policy to protect historic properties and promote historic preservation in cooperation with states, tribal governments, local governments, and other consulting parties. The NHPA established the National Register of Historic Places (NRHP) and designated the State Historic Preservation Office (SHPO) as the entity responsible for administering state-level programs. Section 106 of the NHPA and its implementing regulations outline the procedures for federal agencies to follow to take into account the effect of their actions on historic properties. Under section 106, federal agencies are responsible for identifying historic properties within the area of potential effects (APE) for an undertaking, assessing the potential impact of the action on the properties, if any, and considering ways to



LEGEND

- JBA Boundary
- Airfield Boundary
- Federally Endangered
- State-Listed Rare, Threatened or Endangered

Threatened and Endangered Species

Source: ESRI 2011; JBA GIS 2014.

Figure 3-5

avoid, minimize, and mitigate any adverse effects. For both aboveground and archaeological resources, the APE for the airfield stormwater drainage system repair project is the airfield.

3.12.1 Historical Properties

One NRHP-eligible, aboveground historic property has been identified on JBA: Belle Chance (PG:77-14). The Belle Chance property includes a 1912 dwelling, two auxiliary buildings, a cemetery, and one historic archaeological site (18PR447). It is near the northwest corner of the airfield, but is outside the area that would be affected by the Proposed Action.

3.12.2 Archaeological Resources

Archaeological site 18PR447 has been determined eligible for listing on the NRHP and is part of the NRHP-eligible Belle Chance property. The site is also outside the area that would be affected by the Proposed Action.

3.12.3 Native American Tribes

There are no federally recognized Native American tribes in Maryland. Two tribes, the Piscataway Indian Nation and the Piscataway Conoy Tribe, are recognized by the state of Maryland as having ancestral ties to Maryland.

3.13 LAND USE

In 2010, JBA updated its General Plan, including its land-use and capital improvement recommendations. In doing so, the base inventoried existing land uses and noted linkages between land-use classifications as well as potentially conflicting land uses. Land on the main base is categorized in 10 land-use classifications (Figure 3-3). The Airfield land use occupies 1,525 acres, or about 35 percent of JBA's main base, and the Aircraft Operations and Maintenance land use occupies about 365 acres, or about 8 percent of the base adjacent to the east and west flight lines (Infinity Technology and PBS&J 2010). The airfield separates the base into eastern and western halves. Open Space and Outdoor Recreation land uses border the northern and southern ends of the airfield.

3.14 SOCIAL AND ECONOMIC ENVIRONMENT

This section describes the economic and sociological environment of the region of influence surrounding JBA. A "region of influence" is a geographic area selected as a basis on which social and economic impacts of project alternatives are analyzed. The region of influence for the

JBA alternatives is defined as Prince George's County, Maryland. For comparative purposes, socioeconomic data also is presented for the state of Maryland and the United States.

JBA is in a relatively robust economic region, east of the nation's capital in the Washington, DC-Baltimore corridor. Economic indicators for population, employment, and income for Prince George's County are very similar to those of the state and the nation, as noted in the following paragraphs.

3.14.1 Population

The population of Prince George's County was about 890,000 in 2013, an increase of 11 percent since 2000. During the same time period (2000–2013), the Maryland and United States populations each grew by 12 percent (U.S. Census Bureau 2000, 2014a).

3.14.2 Employment

The Prince George's County labor force increased 10 percent between 2000 and 2013, just below Maryland's labor force growth of 11 percent and just above the United States labor force growth of 9 percent. The county's 2013 annual unemployment rate was 7 percent, the same as the Maryland state unemployment rate and the national unemployment rate (BLS 2014).

The leading Prince George's County industries (on the basis of earnings by industry) are government and government enterprises; professional, scientific, and technical services; and construction. Together these three industry sectors account for about 60 percent of the county's total industry earnings. The government and government enterprises sector (which includes JBA) is the largest sector, accounting for 38 percent of the county's industry earnings (BEA 2014). JBA is a major contributor to the regional economy, employing about 14,000 people and having an annual economic impact of about $1.2 billion (JBA 2014b).

3.14.3 Income

Prince George's County income levels were lower than the state's but higher than the nation's. The county's per capita personal income was $31,806. This figure was 88 percent of the Maryland state per capita personal income of $36,177, but 113 percent of the national per capita personal income of $28,184. The county's median household income of $72,052 was 99 percent of the Maryland median household income of $72,483 and 138 percent of the national median household income of $52,250 (U.S. Census Bureau 2014b).

3.14.4 Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*, was issued by President Clinton on February 11, 1994. The EO requires federal agencies to take into consideration disproportionately high and adverse environmental effects of governmental decisions, policies, projects, and programs on minority and low-income populations.

Per CEQ guidance, minority populations should be identified when either the minority population of the affected area exceeds 50 percent or the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997). The U.S. Census Bureau identifies minority populations as Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and other Pacific Islander, persons of two or more races, and persons of Hispanic or Latino origin. Minority population data is presented in Table 3-6. As of 2013, 86 percent of the Prince George's County population was of a minority race or ethnicity. Prince George's County had a much higher percentage of minority populations than Maryland or the United States, which had minority populations with 47 percent and 37 percent, respectively. The county's minority population is predominantly Black or African American (65 percent), followed by Hispanic or Latino (16 percent), and Asian (4 percent) (U.S. Census Bureau 2014a).

Table 3-6.
Minority and Low-Income Populations

Jurisdiction	Minority population, 2013[a]	Persons below poverty level, 2013[b]
Prince George's County	86%	10%
Maryland	47%	10%
United States	37%	16%

Notes:
[a] U.S. Census Bureau 2014a.
[b] U.S. Census Bureau 2014b

Per CEQ guidance, poverty thresholds established by the U.S. Census Bureau are used to identify low-income populations (CEQ 1997). Poverty status is reported as the number of persons or families with income below a defined threshold level. As of 2013, the U.S. Census Bureau defined the poverty threshold level as $11,892 or less of annual income for an individual and $23,836 or less of annual income for a family of four (U.S. Census Bureau 2014c). Poverty data is presented in Table 3-6, with 10 percent of Prince George's County residents classified

as living in poverty, the same as the Maryland poverty rate but lower than the national poverty rate of 16 percent.

3.14.5 Protection of Children

On April 21, 1997, President Clinton issued EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. The EO seeks to protect children from disproportionately occurring environmental health or safety risks. The EO recognizes that a growing body of scientific knowledge demonstrates that children might suffer disproportionately from environmental health and safety risks. These risks arise because children's bodily systems are not fully developed; children eat, drink, and breathe more in proportion to their body weight; their size and weight can diminish protection from standard safety features; and their behavior patterns can make them more susceptible to accidents. On the basis of these factors, President Clinton directed each federal agency to make it a high priority to identify and assess environmental health risks and safety risks that might disproportionately affect children. President Clinton also directed each federal agency to ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health or safety risks.

JBA proposes to fully comply with EO 13045 by incorporating the concerns put forth in the order in decision-making processes supporting JBA policies, programs, projects, and activities. In this regard, JBA ensures that it would identify, disclose, and respond to potential adverse social and environmental effects on children in the area affected by a proposed action. Children are present at JBA as residents and visitors (e.g., residing in on-base family housing or lodging, using recreational facilities, at child care facilities). Precaution is taken for child safety through a number of means, including using fencing, limiting access to certain areas, and requiring adult supervision. The Proposed Action would occur on the JBA airfield, which is a secure area not adjacent to housing or facilities where children are present.

3.14.6 Recreation

JBA has a variety of indoor and outdoor recreational opportunities on base. Shops, restaurants, a bowling center, a movie theater, a library, and a gym are all located in the northwest quadrant of JBA. Open fields and forestland in the northeast and southwest portions of JBA are designated for recreational land use. Outdoor recreation activities on base include camping, hiking, picnicking, and fishing. Recreation facilities include athletic fields for baseball, soccer, volleyball, football, and track; golf courses; swimming pools; tennis courts; playgrounds; and

bikeways. Most semi-improved and improved recreational areas are located south and southwest of the airfield, including the West and East Golf Courses, Constitution Park, picnic areas, more than 25 playgrounds, Freedom Lake Recreational Area, and Camp Spring Lake.

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CHAPTER FOUR: ENVIRONMENTAL CONSEQUENCES

4.1 AIRCRAFT OPERATIONS

4.1.1 Proposed Action

No significant adverse effects on aircraft operations would be expected under the Proposed Action. During repair of the airfield stormwater system, there would be some disruptions in the use of runways, but no change in the number of flights, type of aircraft using JBA, or frequency of flights. At all times while the airfield stormwater drainage system was being repaired, at least one runway would be open.

Restoring and upgrading the stormwater drainage system on the airfield would result in long-term beneficial effects on airfield operations by allowing for adequate and timely drainage of the runways by a properly sized and effective drainage system. Increased pipe sizes and repaired pipes would provide appropriate capacity for conveyance of runoff from runways and taxiways. Minimizing ponding would improve visibility of airfield markings, reduce airfield interruptions, reduce potential for hydroplaning, reduce deterioration of pavement, and reduce the number of birds attracted to the area, thereby reducing the BASH potential.

The project would be conducted to minimize interference with airfield operations. Two transitional taxiways and at least one runway would remain open at all times so that the airfield would remain fully operational. During the times when only one runway was operating, the overall number of air operations would not change; however, aircraft approach and departure tracks would be limited to the one operational runway. These effects would be intermittent and temporary and end with the construction phase. These effects would be minor.

4.1.2 No Action Alternative

No significant effects on aircraft operations would result under the No Action Alternative. Ponding on the airfield runways, ramps, and taxiways caused by inadequate conveyance of stormwater would continue to result in unsafe conditions for aircraft. Standing water deteriorates pavement, inhibits visibility of airfield markings, can cause hydroplaning, and increases the BASH probability. Eroded and collapsed drainage gates on the airfield would continue to pose safety risks to aircraft, vehicles, and personnel working in the infield. The existing stormwater drainage system would continue to deteriorate and ponding on runways would occur during increasingly smaller precipitation events. This would result in sediment build-up on runways and other parts of the airfield. All of these issues adversely affect airfield and aircraft operations.

4.2 EARTH RESOURCES

4.2.1 Proposed Action

No significant adverse effects on soils would be expected under the Proposed Action. No effects on geology or topography would be expected. Soil disturbance would occur during repair of the storm drainage system, but all disturbed areas would be restabilized. Soil conditions would not be affected because the airfield lacks natural, undisturbed soils. Staging areas for construction equipment and materials would be established on existing gravel, paved, or mowed areas, but soil disturbance on those sites would be expected to be minimal.

More than 1 acre of ground would be disturbed during project execution, and JBA would submit an erosion and sediment control plan and stormwater management plan to the MDE and obtain coverage for the project under Maryland's NPDES General Permit for Stormwater Associated with Construction Activity. Implementing erosion and sediment control BMPs during construction, as specified in those plans, would minimize impacts on soils.

Erosion control measures would be implemented during construction in accordance with MDE's 2011 *Standards and Specifications for Erosion and Sediment Control* and the 2004 *Erosion and Sediment Control Guidelines for State and Federal Projects*. Upon completion of work at any particular location, disturbed areas would be regraded and revegetated. Beneficial effects would result from a reduction in the quantity of soil lost to infiltration and inflow into the storm drainage system.

Less than significant adverse effects on soils could result from accidental releases of contaminants, such as petroleum products, from equipment during construction. Any accidental release of a contaminant would be addressed in accordance with the SPCC plan. The likelihood of an accidental release would be reduced because JBA and its contractors would follow spill prevention and containment measures outlined in the plan.

4.2.2 No Action Alternative

No significant adverse effects on soils would be expected under the No Action Alternative. Erosion would continue to occur at the stormwater drainage system outfall and inflow locations and continued loss of soil would occur through infiltration and inflow at points where the stormwater drainage system is damaged. There would be no effects on geology or topography under the No Action Alternative.

4.3 WATER RESOURCES

4.3.1 Proposed Action

Surface waters. No significant adverse effects on surface waters would be expected. Short-term adverse effects would be expected from sediment in stormwater runoff during construction. Soil disturbance and sediment transport in stormwater would be minimized through the use of erosion and sediment control BMPs specified in the project erosion and sediment control plan and stormwater management plan. Accidental releases of contaminants, such as petroleum products, from vehicles or equipment during construction could also occur. Any such release would be addressed in accordance with the SPCC plan.

Less than significant beneficial effects on surface waters would be expected from reducing the quantity of sediment and contaminants that enter the stormwater drainage network through infiltration and inflow, therefore, reducing the amount carried to streams. A thorough analysis of the storm drainage system was conducted in planning the repairs, and the repaired system would be configured to control flows to streams to mimic natural runoff rates. This would reduce streambank erosion and occurrences of high flows during and after storms.

The Proposed Action would be implemented in compliance with the current version of the *Maryland Stormwater Management Guidelines for State and Federal Projects* and with the requirements of section 438 of the Energy Independence Security Act. The project would also support JBA in meeting the requirements of EO 13508 by improving water quality in streams that drain to the Chesapeake Bay. JBA sent a consultation letter dated February 16, 2011, to the MDP concerning work on the airfield stormwater drainage system and other stormwater system repairs and improvements throughout the base, requesting agency review of the project (Appendix A). MDP responded on April 16, 2012, stating that Maryland agencies generally found the proposed project consistent with agency plans, programs, and objectives. Later it was decided to analyze the airfield stormwater drainage system repairs separately from the other planned stormwater system improvements on base. JBA sent a separate letter to MDP dated December 3, 2014, that concerned only the planned airfield stormwater drainage system improvements (Appendix A). No response to that letter has been received.

Groundwater: No effects on groundwater would be expected. The potential for spills from equipment is possible, but all contractors would be required to have and implement an SPCC plan to minimize the impact of any accidental spills. No aspect of the Proposed Action would

alter the quantity or quality of groundwater on JBA. If construction is necessary in the area of known groundwater contamination from TCE near Taxiway Whiskey, contractors would be made cognizant of any restrictions that could apply to working in the area. The project would not diminish or extend the area of groundwater contamination already present, however.

Floodplains: No effects on floodplains would be expected. The repairs and upgrade to the airfield drainage system would not occur within the 100-year floodplain.

Wetlands: No significant adverse impacts on wetlands would result from stormwater drainage system work that requires the disturbance of wetlands. Work would be necessary within wetlands in several locations to implement the Proposed Action. It is anticipated that the project would temporarily impact approximately 0.84 acre of nontidal emergent wetlands and 1.66 acres of wetland buffer. Additionally, there would be 0.03 acre of permanent nontidal wetland impacts and 0.35 acre of permanent wetland buffer impact. Because existing stormwater drainage pipes in the airfield pass through and under areas of wetlands and because the repairs to the system must occur at those same locations, no practicable alternative to construction within wetlands exists. Most disturbances to wetlands would be temporary, and impacts on wetlands would be avoided and minimized to the maximum extent practicable. Repairing the airfield stormwater drainage system could reduce localized ponding and alter the hydrology of existing wetlands on the airfield, which could result in a reduction in wetland area on the airfield in the long term. Such a reduction, however, would be in compliance with FAA requirements for airfield surface drainage design and to reduce wildlife attractants on or near airports.

Mitigation could be required for wetland impacts, although mitigation is not anticipated to be needed for the project because the scope of any permanent impacts on wetlands would be less than 5,000 square feet. Temporary impacts would be restored on-site. If MDE or USACE was to determine that permanent impacts associated with the project would need to be mitigated, those impacts would be mitigated off-site; on-site mitigation would not be an option because wetlands on the airfield create a BASH. Acceptable mitigation options would be determined by MDE and USACE. JBA or its contractor would prepare a joint permit application for construction in floodplains, waterways, or wetlands and submit it to MDE and USACE, and comply with all required mitigation, if any, required by the agencies. In accordance with EO 11990, a FONPA has been prepared.

Coastal Zone. No effects on the Maryland Coastal Zone would be expected and no violations of Maryland's Enforceable Coastal Policies would result from implementation of the Proposed

Action. The proposed project is consistent to the maximum extent practicable with Maryland's Enforceable Coastal Policies. A Federal Consistency Determination has been prepared and is Appendix B to this EA. The Maryland Department of Natural Resources (which manages the Maryland Coastal Zone Management Program) found the proposed action to be consistent with its plans, programs, and objectives (see Appendix A).

4.3.2 No Action Alternative

No significant adverse effects on surface water resources and wetlands would be expected under the No Action Alternative. No effects on floodplains or groundwater would be expected under the No Action Alternative. Sediment and contaminants in soils on JBA would continue to enter the damaged stormwater drainage system through infiltration and inflow and drain to local streams, degrading water quality. The existing system does not adequately control runoff to local streams during and after storms, and the uncontrolled flows would continue to degrade stream banks and water quality. Under the No Action Alternative, JBA would have difficulty complying with NPDES MS4 permit conditions, MDE water quality requirements, and Chesapeake Bay TMDL requirements.

Ponding on the airfield after precipitation events could create new wetlands or expand existing wetlands in an area that is needed to carry out the Air Force mission. A goal of the JBA Integrated Natural Resources Management Plan is to minimize wetlands on the airfield, and any newly created wetlands on the airfield would likely need to be filled in. In such a situation, JBA would work with USACE and state regulatory agencies to investigate alternatives for eliminating airfield wetlands and for off-site mitigation.

4.4 AIR QUALITY

4.4.1 Proposed Action

No significant adverse effects on air quality would be expected. In the short term, the project would generate airborne dust and other pollutants during construction. Air quality effects would be insignificant if emissions associated with the Proposed Action would not exceed the general conformity rule de minimis threshold values and the GHG threshold in the draft CEQ guidance, and would not contribute to a violation of any federal, state, or local air regulation.

Construction emissions were estimated for fugitive dust, on- and off-road diesel equipment and vehicles, worker trips, architectural coatings, and paving off-gasses (Table 4-1). The estimated

emissions from the Proposed Action would be below the de minimis thresholds and the general conformity rule would not apply. Detailed emission calculations are provided in Appendix C.

Table 4-1.
Annual Air Emissions Compared to de Minimis Thresholds

Activity/source	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	*De minimis* threshold (tpy)	Exceeds *de minimis* thresholds? (Yes/No)
Construction emissions	3.6	5.4	0.9	1.0	0.9	0.4	100 (50)	No
Operational emissions	<none>						100 (50)	No

Notes: Because the project is in the Ozone Transport Region, the de minimis threshold for VOC is 50 tpy.
CO = carbon monoxide, *de minimis* = of minimal importance, NO_x = oxides of nitrogen, $PM_{2.5}$ = particulate matter, less than 2.5 microns in diameter, PM_{10} = particulate matter less than 10 microns in diameter, SO_x = oxides of sulfur, tpy = tons per year, VOC = volatile organic compound.

For purposes of analysis, it was assumed that all construction activities would be compressed into one 12-month period. Therefore, regardless of the ultimate implementation schedule, annual emissions would be less than those specified herein. Small changes in the scope of the Proposed Action and moderate changes in quantity and types of equipment used would not substantially change those emission estimates and would not change the determination under the general conformity rule or level of effects under NEPA.

There would be no new permanent sources of air emissions associated with the Proposed Action, and air permitting requirements would not apply. However, if any new sources of air emissions were required, they could be subject to federal and state air permitting regulations, including new source review, prevention of significant deterioration, national emission standards for hazardous air pollutants, or new source performance standards. Additionally, they would be added to the facility's air permit, and both a new source construction permit and a modification to the existing construction permit could be required.

MDE outlines requirements with which the Air Force and any contractor must comply during construction activities, such as controlling fugitive dust and open burning. All persons responsible for any operation, process, handling, transportation, or storage facility that could result in fugitive dust would take reasonable precautions to prevent the dust from becoming airborne. Reasonable precautions might include using water to control dust from building construction, road grading, or land clearing. In addition, construction would proceed in full compliance with current MDE requirements, with compliant practices and/or products. These requirements include the following:

- Visible emissions (COMAR 26.11.06.02)
- Asphalt paving operations (COMAR 26.11.11.02)
- Open fires allowed without authorization (COMAR 26.11.07.05)
- Portable fuel containers (COMAR 26.11.13.07)
- Architectural coatings (COMAR 26.11.33.00)
- Consumer products (COMAR 26.11.32.00)

This listing is not all-inclusive; the Air Force and any contractors would comply with all applicable air pollution control regulations.

GHGs and Climate Change. All construction activities combined would generate approximately 464 metric tons of carbon dioxide, which would be below the CEQ threshold. These effects would be minor. There would be no operational emissions from the Proposed Action.

4.4.2 No Action Alternative

No effect on air quality would result under the No Action Alternative. There would be no short- or long-term emissions changes; ambient air-quality would remain unchanged when compared to existing conditions.

4.5 NOISE

4.5.1 Proposed Action

No significant adverse effects on the noise environment would be expected under the Proposed Action. Short-term increases in noise would be due to construction activities. There would be no permanent sources of noise associated with the action.

Table 4-2 presents typical noise levels (i.e., dBA at 50 feet) that EPA has estimated for the main phases of outdoor construction. Individual pieces of construction equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 feet. With multiple items of equipment operating concurrently, noise levels can be relatively high during daytime periods at locations within several hundred feet of active construction sites. The zone of relatively high construction noise typically extends to distances of 400 to 800 feet from the site of major equipment operations.

Construction activities typically would be short-term and limited to daylight hours. Construction equipment would be operated on an as-needed basis during those periods and would be maintained to manufacturer's specification to minimize noise impacts. Construction would be within the installation property boundary where air operations are frequent and loud with few

noise receptors near the proposed construction right-of-way. Equipment would not be fixed in one location for long durations but would progress along the construction right-of-way as the project advanced. Construction noise would be temporary and would subside at any particular location as the project progressed. The effects would be minor.

Table 4-2.
Noise Levels Associated with Outdoor Construction

Construction phase	L_{eq} (dBA)
Ground clearing	84
Excavation, grading	89
Foundations	78
Structural	85
Finishing	89

Source: USEPA 1971.

During the times when only one runway was operating, the overall number of air operations would not change; however, aircraft approach and departure tracks would be limited. Aircraft operations and associated noise would, at times, be consolidated to a single runway, effectively increasing the average noise near it by approximately 3 dBA during these periods. This increase would be offset by a comparable reduction in noise at the runway that was temporarily closed. These effects would be intermittent and temporary and would end with the construction phase.

No long-term increases in the overall noise environment (e.g., L_{eq}, A-weighted DNL) would be expected with the implementation of the Proposed Action. There would be no new permanent sources of noise. Therefore, no noticeable long-term changes in the existing noise environment would be expected.

4.5.2 No Action Alternative

No effect on the noise environment would result from the No Action Alternative. No construction would be undertaken; noise conditions would remain unchanged when compared to existing conditions.

4.6 INFRASTRUCTURE

4.6.1 Proposed Action

Beneficial effects on the stormwater drainage system on the airfield would result from implementing the Proposed Action. The system is in a state of disrepair and the Proposed

Action would repair damaged portions of the system, replace undersized pipes with ones of adequate size, and ensure that the system provides efficient and effective stormwater removal on the airfield. No significant adverse effects on other elements of infrastructure at JBA would be expected. Some utility interruptions would likely occur during the repair of the airfield stormwater drainage system, but they would be infrequent, of short duration, and coordinated with base personnel to minimize disruptions in service on JBA.

Terrapin Utilities owns the water and sewer lines at JBA and requires that they perform any required relocation of water lines, new connections, and line abandonment. No impacts on water and sewer mains are anticipated. Storm drain pipe replacements in the vicinity of the water line that is to be relocated as part of the Taxiway Whiskey project would be coordinated with that project. Each location where a new storm drain pipe intersects an individual electrical conduit was examined individually to determine the best overall approach for removing and replacing the associated failed storm drain pipe. Where electrical connections have to be cut, the affected sections would be replaced and new cables would be run. All electrical duct banks would remain intact and the new storm drain pipes would be slid under the existing duct banks. To the extent practicable, all communications duct banks would be protected and supported during replacement of the storm drainage infrastructure. Fuel lines would have to be located and protected during stormwater drainage inlet replacement.

4.6.2 No Action Alternative

No significant adverse effects on the airfield stormwater drainage system would be expected under the No Action Alternative. The airfield stormwater drainage system would continue to provide inefficient stormwater conveyance, and the system would continue to deteriorate and would be periodically maintained and repaired in emergency situations. Intermittent interruptions of other elements of infrastructure on JBA would be expected during maintenance and emergency repair of the airfield stormwater drainage system.

4.7 TRANSPORTATION

4.7.1 Proposed Action

No significant adverse effects on the transportation system would be expected under the Proposed Action. Additional vehicles and day-labor traffic would be expected during construction, but traffic volume would be unaffected in the long term. The Proposed Action would have no appreciable effect on vehicle traffic or rail or other public transportation.

Any adverse effects on transportation and traffic would be due primarily to worker commutes and delivery of equipment and materials to and from the site. Congestion could increase in the immediate area due to additional vehicles and traffic delays near the site. Contractors would enter from the Pearl Harbor Gate, and the laydown area (a 5-acre site off Nevada Avenue in the northeast portion of the base) would be the same as for the Taxiway Sierra project currently in use. During construction, access routes from the laydown site to the work site would follow the perimeter roads and existing maintenance roads that access the airfield. The existing transportation infrastructure would be sufficient to support the increase in vehicle traffic. Although any effects of contractor traffic would be small, contractors would route and schedule construction vehicles to minimize conflicts with other traffic, and strategically locate staging areas to minimize traffic impacts. All construction vehicles would be equipped with backing alarms, 2-way radios, and Slow Moving Vehicle signs, when appropriate.

4.7.2 No Action Alternative

No effects on transportation resources would be expected from implementing the No Action Alternative. Vehicle traffic, rail, and public transportation would remain unchanged when compared to existing conditions.

4.8 HAZARDOUS MATERIALS AND HAZARDOUS WASTE

4.8.1 Proposed Action

No effects on hazardous materials and hazardous waste management would be expected from implementing the Proposed Action. Construction activities involve the use of hazardous materials and generation of hazardous waste, but safety measures and procedures in JBA's SPCC plan for the handling, storage, and disposal of hazardous materials and wastes would be followed and would prevent any long-term or substantial adverse impacts during construction. All hazardous materials and wastes would be handled in accordance with applicable federal and state laws and regulations.

The stormwater drainage system repair contractor would be required to screen, test, and dispose of contaminated soils taken from within the area of contamination. Suspected contaminated materials would be stored in drums until testing could be performed. Removal of any ACM encountered during the project would be conducted in accordance with all applicable regulations for safe handling.

Any construction in an ERP site would require proper precautionary measures, dig permits, Land Use Control waivers, a site-specific Health and Safety Plan, and proper handling and disposal of any contaminated soils. The proposed construction would be evaluated with respect to site activity and environmental risks posed by the construction. Any construction or soil disturbance that would intercept an ERP site would be coordinated with the base and tested to determine contamination levels and associated worker protection. Before and during construction in those areas, workers would be educated on the effects of exposure to chlorinated solvents and volatile petroleum hydrocarbons. Any contaminated soil encountered during construction would be immediately reported to base personnel. A site-specific health and safety plan would be prepared and executed for each phase of the stormwater drainage system repair project. Contaminated soils or groundwater encountered would be managed in accordance with applicable laws and regulations. Environmental program managers would review project designs and inspect construction activities to ensure that appropriate engineering controls were in place.

Contaminated groundwater encountered during the project would be handled in accordance with all regulatory requirements, including being containerized, sampled, and disposed of in accordance with JBA environmental standards. No digging would occur within 10 feet of an environmental monitoring well until such digging was coordinated with appropriate JBA staff.

4.8.2 No Action Alternative

No effects on hazardous materials and hazardous waste management would be expected under the No Action Alternative. Safety measures would be implemented and proper procedures for the handling, storage, and disposal of hazardous materials and wastes as outlined in JBA's SPCC plan would be followed during normal maintenance and emergency repair activities.

4.9 SAFETY AND OCCUPATIONAL HEALTH

4.9.1 Proposed Action

Beneficial effects on safety and occupational health would be expected from repairing the airfield stormwater drainage system. Reducing or eliminating ponding on the airfield and minimizing or eliminating standing water on ramps, taxiways, and runways would result in better pavement conditions, allow full visibility of airfield markings, reduce the risk of hydroplaning, and reduce BASH. All project staff (whether DoD military, civilian, or contractors) would be required to abide by applicable safety requirements. Personnel would be properly trained on the hazards

of the job and completion of that training would need to be documented for JBA. Repairing and replacing the airfield storm water drainage infrastructure would not result in a change in operational safety practices. During and after construction, all airfield operations would continue to be conducted in accordance with JBA safety procedures. Activities involved in the proposed stormwater facility repair, construction, and updates are not unique and would not pose an unacceptable or unnecessary safety risk to contractors, JBA personnel, or the public.

Activities on the airfield would be coordinated with Airfield Management and the 11th Wing Civil Engineer Squadron Asset Management Flight before commencing the work. Special care would be taken during drainage pipe and manhole repair operations to prevent fugitive dust emissions from adversely affecting mission operations and pilot safety through decreased visibility. Any work within the ESQD arc in the southwestern corner of the airfield would require that contractors acquire clearance and permission from the Air Force to gain access to work within the arc.

4.9.2 No Action Alternative

No significant adverse effects on safety and occupational health would be expected under the No Action Alternative. Ponding on the airfield and runways would continue and potentially worsen as the airfield stormwater drainage system deteriorated further, which would pose an increasing safety risk to pilots and aircraft over time, and the stormwater system would continue to be maintained and repaired periodically to remain in compliance with Air Force and OSHA safety requirements. Further erosion and collapsing of drainage gates on the airfield would increase the safety risk to aircraft, vehicles, and personnel working in the aircraft infield.

4.10 BIOLOGICAL RESOURCES

4.10.1 Proposed Action

Beneficial effects on biological resources would be expected under the Proposed Action. The airfield is a developed area with low biological value. Any disturbance to it during execution of the project would have minimal impact on biological communities, and disturbed areas would be revegetated with native species of grasses in accordance with the erosion and sediment control plan as repairs were completed. JBA submitted a letter dated February 16, 2011, to the Maryland Department of Natural Resources (MDNR) concerning work on the airfield stormwater drainage system and other stormwater system repairs and improvements throughout JBA, and requested that MDNR share any concerns regarding the project. MDNR responded on March

14, 2011, stating that anadromous fish have not been documented in streams that could be affected by the work, but that the streams support resident fish species (Appendix A). Instream conditions for resident fish species would be expected to improve after project completion because of reduced sediment intrusion into the stormwater drainage system, and the use of sediment and runoff controls as detailed in the project-specific stormwater management plan and erosion and sediment control plan during project implementation would be expected to minimize any adverse effects on resident fish species during construction.

In recognition of the MOA with the FAA to address aircraft-wildlife strikes, any permanent stormwater drainage system features would be designed to allow a maximum 48-hour detention period for the design storm to discourage wildlife presence on the airfield. Ponding would be less frequent and of shorter duration after the stormwater drainage system was repaired, and fewer birds and other wildlife would be injured or killed in collisions with aircraft.

The Migratory Bird Treaty Act protects most native birds in the United States. Aside from managing Canada Geese under the BASH program, JBA does not actively manage migratory birds (USACE Baltimore District 2007). Under the Migratory Bird Treaty Act, any activity that causes abandonment of eggs or chicks is considered a “take” and is illegal or requires a depredation permit. Because of JBA’s need to control Canada Geese on the airfield, the base has DASH and BASH depredation permits. Therefore, any disruption of breeding birds during project implementation would not violate the Migratory Bird Treaty Act.

No impacts on listed species would occur from work on the airfield storm drainage network. JBA submitted a letter dated February 16, 2011, to the U.S. Fish and Wildlife Service (USFWS) concerning work on the airfield stormwater drainage system and other stormwater system repairs and improvements throughout JBA, and requested concurrence with its findings and determinations (Appendix A). USFWS responded on September 6, 2011, stating that except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project impact area, and that no biological assessment or further section 7 consultation with the agency is required concerning the project. Afterward, JBA determined that the airfield stormwater drainage system would be analyzed separately from the other stormwater system repairs and upgrades on the base, and submitted a letter dated December 3, 2014, to USFWS specifically addressing the Proposed Action (Appendix A). No response to that letter has been received.

In a letter dated March 14, 2011, responding to JBA's request for project review, MDNR stated that streams and tributaries potentially affected by the Proposed Action—including Piscataway Creek—are classified as Use I streams (i.e., Water Contact Recreation and Protection of Aquatic Life) (Appendix A). MDNR noted that generally no instream work is permitted in Use I streams from March 1 through June 15. Therefore, JBA would avoid work in Piscataway Creek between those dates to the extent practicable, and would consult with MDNR before the start of construction if work between March 1 and June 15 was proposed.

4.10.2 No Action Alternative

No significant adverse effects on biological resources would result under the No Action Alternative. The airfield stormwater drainage system would be maintained and spot repaired as the need arose, but ponding would continue to worsen as more areas of the system failed or collapsed. New wetlands could form on the airfield and attract more wildlife, increasing the probability of wildlife deaths through aircraft-wildlife strikes and the hazard to personnel working within the airfield infields. No impacts on listed species would be expected under the No Action Alternative.

4.11 CULTURAL RESOURCES

4.11.1 Proposed Action

No effects on cultural resources would be expected under the Proposed Action since it entails repairs and upgrades to the airfield stormwater infrastructure, and there are no cultural resources on the airfield. JBA sent a letter dated December 3, 2014, to the Maryland SHPO (Maryland Historic Trust) concerning work on the airfield stormwater drainage system. The Maryland Historic Trust responded on December 18, 2014, stating that it determined that no historic properties would be affected by the Proposed Action (Appendix A).

The Proposed Action would have no significant impacts on traditional cultural properties or sites of religious and cultural significance to federally recognized tribes. All project activities would be conducted in compliance with the American Indian Religious Freedom Act and Native American Graves and Repatriation Act of 1990. If there was a discovery of Native American remains, funerary items, sacred objects, or items of cultural patrimony, the JBA Cultural Resources Manager would contact the Maryland Commission of Indian Affairs and the National Park Service. Standard protocols for the inadvertent discovery of cultural items as detailed in the JBA

Integrated Cultural Resources Management Plan (USACE Baltimore District 2009) would be followed.

4.11.2 No Action Alternative

No effects on cultural resources would result under the No Action Alternative.

4.12 LAND USE

4.12.1 Proposed Action

No effects on land use would be expected. No changes in land use or conflicts with future land-use plans would result from repairing the airfield stormwater drainage infrastructure.

4.12.2 No Action Alternative

No effects on land use would be expected. Implementing the No Action Alternative would not change any land-use designations on JBA or create any land-use conflicts.

4.13 SOCIAL AND ECONOMIC ENVIRONMENT

4.13.1 Proposed Action

Regional Economy. The economic effects of implementing the Proposed Action are estimated using the Economic Impact Forecast System (EIFS) model, a computer-based economic tool that calculates multipliers to estimate the direct and indirect effects resulting from a given action. Appendix D discusses the methodology in more detail and presents the model inputs and outputs developed for this analysis.

Beneficial effects would be expected on the regional economy under the Proposed Action, as determined by the EIFS model. Expenditures and employment associated with the Proposed Action would increase regional employment, income, and sales volume (Table 4-3 and Appendix D). The economic benefits would be short-term, lasting for the duration of the construction period. Such changes in sales volume, employment, and income would fall within historical fluctuations (i.e., within the Rational Threshold Value [RTV] ranges) and would be considered minor. No effects would be expected on population. The Proposed Action does not include assigning new, permanent personnel from outside the region to JBA; therefore, this action would not change the population of JBA or the region.

Table 4-3.
EIFS Model Output

Variable	Projected Total Change	Percent change	RTV range
Sales (business) volume	$23,772,000	0.08%	-5.32% to 13.74%
Income	$4,346,558	0.02%	-4.48% to 11.72%
Employment	100	0.03%	-4.17% to 4.59%
Population	0	0.00%	-0.85% to 3.30%

Source: EIFS model.

Environmental Justice and Protection of Children. No effects on environmental justice and protection of children would be expected under the Proposed Action. It would not result in disproportionate adverse environmental or health effects on low-income or minority populations or children. Implementing the Proposed Action does not have the potential to substantially affect human health or the environment by excluding persons, denying persons benefits, or subjecting persons to discrimination. All activity associated with the Proposed Action would occur on the JBA airfield, which is a secure area not in close proximity to residential areas, commercial districts, or facilities where children are present.

Recreation. No effects on recreation would result from repairing the airfield stormwater drainage system. No recreational areas are on or near the airfield.

4.13.2 No Action Alternative

No significant adverse economic effects would be expected under the No Action Alternative. JBA could experience interruptions in airfield operations due to insufficient storm water removal from the airfield, which would adversely affect operational costs. Maintenance of the existing stormwater system would be conducted by JBA staff or current contractors. No effects on environmental justice and protection of children would be expected. The No Action Alternative would not result in disproportionate adverse environmental or health effects on low-income or minority populations or children. No effects on recreation would result because there are no recreational areas on or near the airfield.

4.14 CUMULATIVE EFFECTS

4.14.1 Introduction

The CEQ defines cumulative effects as the “impact on the environment, which results from the incremental impact of the action(s) 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" (40 CFR 1500). Cumulative impacts can result from individually minor, but collectively substantial, actions undertaken over a period of time by various agencies (federal, state, and local) or individuals. In accordance with NEPA, this section provides a discussion of cumulative impacts resulting from projects that are proposed (or anticipated over the foreseeable future).

The scope of the cumulative effects analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur, as well as a description of what resources could potentially be cumulatively affected. Resources potentially affected include those on which the Proposed Action could have an adverse effect: airfield operations, soils, surface waters, wetlands, air quality, noise, and the local transportation system.

4.14.2 Projects Considered in Addition to the Proposed Action

The geographic extent for cumulative effects on airfield operations is the JBA airfield; on soils, it is the footprint of disturbance of any individual project area; on surface waters and wetlands analysis, it is the watershed; on air quality, it is AQCR 47; on noise, it is the region of influence, or about 800 feet from any airfield work at the time it is being done; and on the local transportation system, it is the roads affected by the Proposed Action. The time frame for the cumulative effects analysis centers on the timing of the Proposed Action and would continue foreseeably for the next 6 years.

As an active military installation, JBA and its tenant organizations undergo changes in mission and training requirements in response to defense policies, current threats, and tactical and technological advances. Therefore, new construction, facility improvements, infrastructure upgrades, and ongoing maintenance and repairs are required on a continual basis. Known actions proposed over the next several years at JBA are shown in Table 4-4. Although some known construction and upgrades are a part of the analysis contained in this section, some future requirements cannot be predicted. As those requirements surface, future NEPA analysis would be conducted, as necessary.

4.14.3 Description of Potential Cumulative Impacts

4.14.3.1 Aircraft Operations

The stormwater system repair and upgrades described under the Proposed Action would result in insignificant adverse and beneficial effects on airfield operations and aircraft safety by

Table 4-4. Proposed Projects at JBA

Project Name/Description	Anticipated Fiscal Year					
	2015	2016	2017	2018	2019	2020+
Construct Helicopter Operations Facility	X					
Consolidated Communications Center				X		
Demolish 1558, 1539, 1560					X	X
Construct Type IV Fuel Hydrant System for the Aerospace Control Alert Facility		X	X	X		
21 Point Enclosed Firing Range			X	X		
Security Forces Group Complex			X	X		
Relocate East Runway						2023
Replace Child Development Center #1			X	X	X	
Base Civil Engineer Complex					X	
Replace West Fitness Center				X	X	
Relocate JADOC for New Large Hangar Complex			X			
Relocate MWD K9 Kennels for New Large Hangar Complex			X			
Relocate Hazardous Cargo Pad/EOD Range for New Large Hangar Complex			X			
Construct New Large Hangar Complex				X		
Fire Station Addition for New Large Hangar Complex				X		
Demolish Munitions Storage Area		X	X	X		
Replace USAPAT Facility			X			
Taxiway Whiskey Reconstruction and Extension		X	X	X		
Taxiway Charlie Reconstruction		X	X	X		
Taxiway November Reconstruction		X	X	X		
Replace Airfield Storm Drains	X	X	X	X	X	
Replace East/West Deluge Line		X	X	X		
Repair Paynes Branch			X	X		
Construct EOD Addition		X	X			
Addition to Base Exchange	X	X	X			
Construct Logistics Readiness Squadron Addition		X	X	X		
Construct Chapel Addition		X	X	X		
Construct Facility at Davidsonville		X	X			
Construct Taxi Lane for the Aerospace Control Alert Facility	X	X				
Construct 2nd Taxiway Hangar 20					X	X
Construct Addition to Visiting Quarters (B 1380)						2020
Upgrade Main, Pearl Harbor, VA, North Gates			X	X		
Demolish Library B 1642		X	X			
Demolish T-Line B 3602		X	X			
Demolish 1713, 3603, 3605, 3808		X	X			
Demolish 1522, 1524, 1527		X	X			
Facility Demolition (Ongoing)	X	X	X	X	X	

allowing for adequate and timely drainage of the runways. Projects listed in Table 4-4 that could also affect aircraft operations are those that replace, relocate, or reconstruct taxiways and runways. Each of those projects would affect operations temporarily. JBA would permit interruptions only to the extent that they would not interfere with normal airfield operations, and project work would be suspended in the case of any emergency. Therefore, cumulative impacts on aircraft operations are anticipated to be minimal.

4.14.3.1 Soils

The work proposed for the activities under the Proposed Action and projects listed in Table 4-4 involve shallow excavations of soil on the airfield that would have the potential to cause soil erosion. Existing soil conditions on the airfield would not be substantially altered by the disturbances because the soils of the airfield have been previously disturbed. Implementation of erosion and sediment control BMPs during construction, as specified in the stormwater management and erosion and sediment control plans for each project, would minimize adverse effects from soil erosion.

Accidental release of contaminants from equipment used during projects or during routine activities could affect soils. Any accidental release of contaminants would be addressed in accordance with the SPCC plan, so the impacts of any accidental release would be less than significant and cumulative adverse impacts on soils are anticipated to be minimal.

4.14.3.2 Surface Waters

Under the Proposed Action and projects listed in Table 4-4, potential soil erosion and accidental releases of contaminants have the potential to affect surface waters via stormwater runoff. Any adverse impacts would be short-term and would be minimized through the use of erosion and sediment control BMPs and adherence to the SPCC plan. As work on the airfield stormwater drainage system progressed, the effect on surface water quality, even with the minor soil disturbances for individual system repairs, would be beneficial because infiltration of sediment-laden water into the stormwater drainage system through damaged pipes would be reduced. Cumulative impacts to surface waters are, therefore, anticipated to be minimal.

4.14.3.3 Wetlands

Work under the Proposed Action would occur within wetlands. Additionally, some of the new construction projects listed in Table 4-4 could also occur within existing streams or wetlands.

The Proposed Action would result in a reduction of wetlands on the airfield and wetland creation (as mitigation) could be required with some of the new construction projects.

It is Air Force policy not to construct new facilities within areas containing wetlands where practicable. Where wetlands do or could be present in a project footprint, a site-specific wetland delineation is conducted to determine the precise location and size of the wetland areas and a jurisdictional determination is requested from the USACE. Section 404 permits from USACE and nontidal wetland permits from MDE are obtained prior to construction and mitigation is implemented as necessary to mitigate adverse impacts, thus reducing any necessary impacts to below the level of significance. Where wetland impacts are unavoidable, in accordance with EO 11990, a FONPA is prepared. Because wetland impacts from all projects are mitigated in accordance with permit and regulatory requirements, cumulative impacts on wetlands are not significant.

4.14.3.4 Air Quality and Climate Change

No significant cumulative impacts on air quality would be expected. The state of Maryland takes into account the effects of all past, present, and reasonably foreseeable emissions during the development of the State Implementation Plan. The state accounts for all significant stationary, area, and mobile emission sources in the development of the plan. Estimated emissions generated by the airfield stormwater drainage repair project and other construction and demolition projects of similar scope, all of which involve temporary emissions but do not establish new permanent major sources of air emissions, would be de minimis and it is understood that activities of this limited size and nature would not contribute significantly to adverse cumulative effects on air quality. Also, the amount of GHGs associated with the Proposed Action and actions listed in Table 4-4 are negligible. Cumulative impacts to climate change are anticipated to be minimal.

4.14.3.5 Noise

No significant cumulative impacts from noise would be expected. The Proposed Action would introduce short-term intermittent and incremental increases to the noise environment, which is primarily that of an active airfield. Noise-sensitive receptors are generally not within the area that would be affected by noise from the Proposed Action and other projects that would occur primarily on the airfield. Noise from projects that would occur on other parts of the base would remain separate from noise associated with the airfield projects. The acoustic environment on

and near JBA under all proposed activities is expected to remain relatively unchanged from existing conditions.

4.14.3.6 Transportation

With implementation of mitigation and safety measures related to transportation, adverse effects would be minimized and cumulative adverse effects on transportation would be temporary and insignificant. The size and scope of changes in the transportation system would be extremely minor compared to baseline conditions. Vehicle traffic impacts during construction projects do not contribute appreciably to cumulative effects because the quantity of traffic they generate is small compared to background levels and because their effects end with project termination. The potential consequences of individual projects on local and regional transportation systems is considered during each project's planning phase, and adjustments (e.g., intersection realignments, new signalization, lane additions) are made as necessary to limit the adverse transportation effects.

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CHAPTER FIVE: LIST OF PERMITS AND APPROVALS

The following list of potential permits, licenses, and approvals are likely to be required for the Proposed Action. The agency responsible for each item is included after the identified permit, license, or required consultation. Any required permits, licenses, or approvals would be obtained prior to construction.

- Nontidal Wetlands Permit, MDE
- Section 404 Wetland Permit, USACE
- NPDES Permit for Stormwater Associated with Construction Activities, MDE
- Stormwater Management Plan and Erosion and Sediment Control Plan approval, MDE
- Approval of any new construction within ERP sites, AFCEC/CZOE

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CHAPTER EIGHT: REFERENCES

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APPENDIX A
AGENCY CORRESPONDENCE

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 11TH WING (AFDW)
ANDREWS AIR FORCE BASE, MARYLAND 20762

3 December 2014

MEMORANDUM FOR: SEE DISTRIBUTION

FROM: 11 CES/CEIE
3466 North Carolina Avenue
Joint Base Andrews, MD 20762-4803

SUBJECT: Description of Proposed Action and Site Map for Repair of Airfield Storm Drain System at Joint Base Andrews-Naval Air Facility Washington, Maryland

1. Joint Base Andrews is preparing an Environmental Assessment (EA) for repairing the airfield storm drain system at Joint Base Andrews-Naval Air Facility, Washington, MD (JBA). Pursuant to the National Environmental Policy Act (NEPA) of 1969 (42 *United States Code* [USC] 4321–4347), Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 *Code of Federal Regulations* [CFR] Sections 1500–1508), and 32 CFR Part 989, *et seq*., JBA will prepare an EA that considers the potential consequences to human health and the natural environment. The EA will examine the effects of the proposed project and will include analysis of the required no-action alternative.

2. In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we invite your agency to comment on the Proposed Action described in the enclosed attachment and provide any relevant information about resources under your jurisdiction that may be present in the project area as indicated on the new site plan in the attachments.

3. Also enclosed is a copy of the distribution list for those federal, state, and local agencies to be contacted regarding this EA. If you consider any additional agencies should review and comment on this proposal, please feel free to include them in a re-distribution of this letter and the attached materials.

4. An attachment to this letter describes the project being analyzed in the EA. If undertaken, the project will be completed in accordance with applicable federal, state, and local laws and regulations and federal Executive Orders.

5. Your assistance in providing information is greatly appreciated. Please provide written comments within 15 days from the date of this letter to Anne Hodges, 11 CES/CEIE, 3466 North Carolina Avenue, Joint Base Andrews, MD 20762 or send via e-mail to anne.m.hodges2.civ@mail.mil. If you need further information, please contact Ms. Hodges at 301-981-1426.

STEVE RICHARDS
Chief of Environmental Management

Attachments:

Vicinity Map and Site Plans
Distribution List (listed on next page)

Distribution List

Mr. Greg Golden
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Tawes State Office Building B-3
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ggolden@dnr.state.md.us

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Director, Maryland State Clearinghouse
Maryland Office of Planning, Room 1104
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ljaney@mdp.state.md.us

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Planning Director
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Mr. Matthew Rowe
Deputy Director
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SSA-Director's Office
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Ms. Genevieve Larouche
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Maryland Historical Trust
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Ms. Fern Piret
Director of Planning
Prince George's County Department of Planning
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Fern.piret@ppd.mncppc.org

Mr. Shane Dettman, Director
Urban Design and Plan Review Division
National Capital Planning Commission
401 9th Street, NW
North Lobby, Suite 500
Washington, DC 20004
shane.dettman@ncpc.gov

Actions Proposed in the EA

Joint Base Andrews (JBA) proposes to repair approximately 37,000 linear feet of storm sewer pipe and 110 manholes of the airfield stormwater drainage network (Figure 1). The system's manholes include storm drainage grate inlets, pedestal-top drop inlets, headwalls, and junction boxes.

In general, the stormwater pipes on the airfield are in a condition suitable for lining. Therefore, wherever practicable, existing drainage pipes would remain in place and would be lined using the Cured-In-Place Pipe method, which is for pipe diameters between 6 inches and 96 inches. Storm drain pipes at JBA range in size from 12 inches to 90 inches in diameter.

Federal Aviation Administration Advisory Circular 150/5320-5C, Surface Drainage Design requires that airfield storm drainage systems be designed to accommodate the stormwater runoff associated with the two-year rainfall event with no encroachment of runoff on runways or taxiways. Additionally, these regulations specify that the center 50 percent of runways and taxiways must be free from ponding associated with runoff from the ten-year rainfall event. JBA would comply with these requirements by upsizing some pipes. These pipes would be replaced with new Reinforced Concrete Pipe.

Upsizing some pipes to reduce flooding in the infield area would increase flow to the system, and overall peak flow to the system outfall south of the airfield (to Piscataway Creek) would be increased. Two weir and orifice structures would be installed at system locations FS-56 and FS-300 to prevent any increase in peak flow from the system to Piscataway Creek. The weir and orifice structures would restrict peak flows to Piscataway Creek to less than or equal to the existing condition peak flows for each of the design storms. Piscataway Creek is listed by the State of Maryland as a waterbody that is impaired bacterially and biologically.

Existing pipes that are in operation would be abandoned in two places and flow would be re-directed into new pipes to reduce the risk of a pipe collapse in the future, reduce maintenance, and accommodate system improvements. Several pipes abandonments that were previously begun would be completed as appropriate and inactive pipe connections would be removed.

No increase in the amount of impervious pavement area on the airfield would result from the Proposed Action. The existing pavement geometry, elevations, centerline alignments, full strength pavement widths, and shoulder widths for areas impacted by storm drain improvements would remain in their current locations.

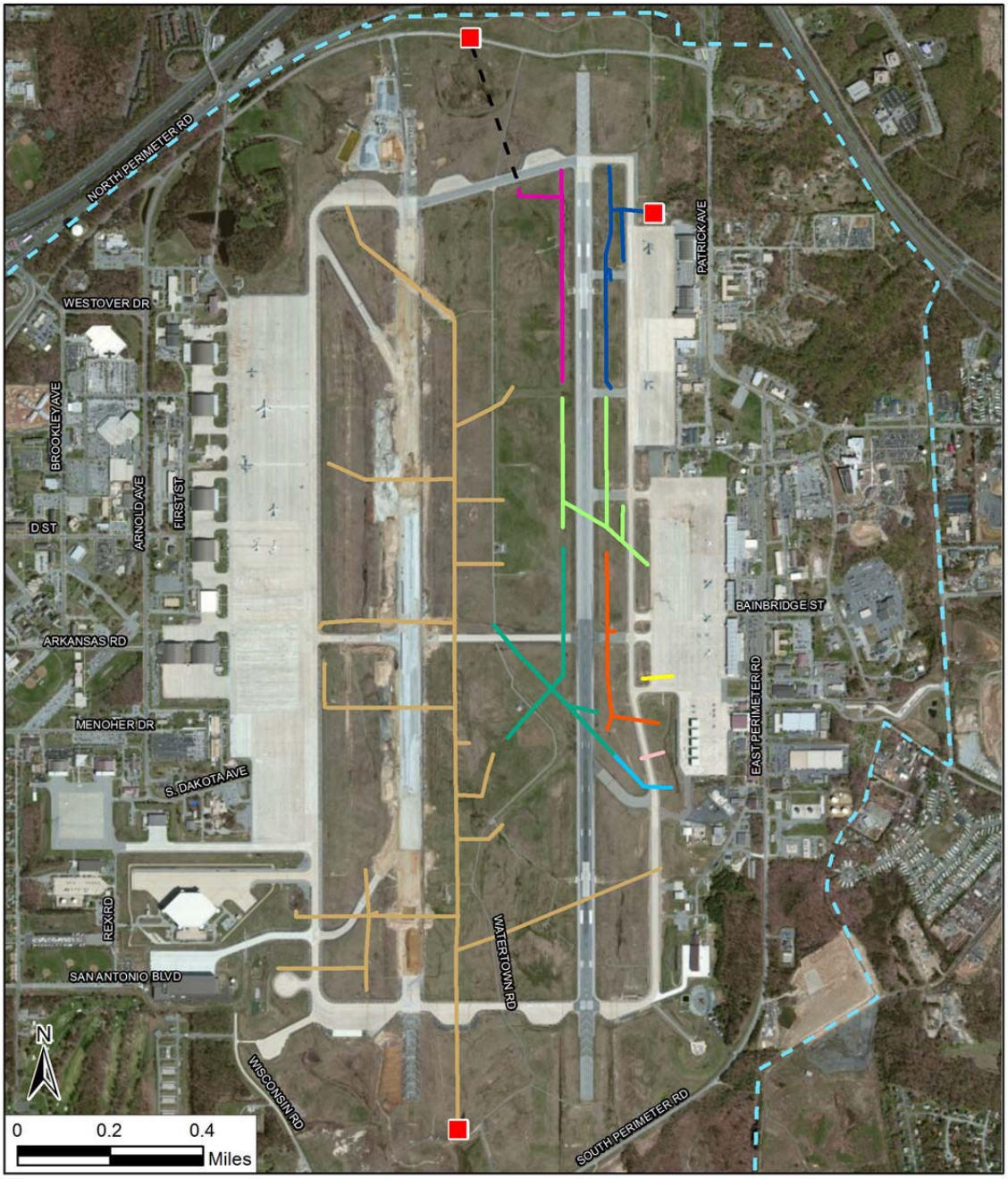
Areas within the airfield where there is groundwater contamination are subject to Institutional Controls (ICs). Ground disturbance within the IC areas would require an IC Waiver from the JBA Environmental Restoration Program. The stormwater system repair contractor could be required to prepare a health and safety plan directing the use of appropriate personal protective equipment and airspace monitoring to ensure worker protection when excavating within the IC areas.

Construction Schedule

The Proposed Action would be implemented in five construction phases, with each phase addressing storm drainage on a discreet area of the airfield. The conceived phasing scheme is sequential, meaning Phase 3 could not be constructed until Phases 1 and 2 were constructed. Storm pipes that would be impacted by future construction related to the 2020 Conceptual Plan would be repaired in Phases 4 and 5 to minimize disruption of airfield operations. If funding were available, Phases 1, 2, and 3 could be awarded and constructed concurrently. Phases 4 and 5 would be coordinated with future runway and taxiway improvements on the east side of the airfield.

- Phase 1: September 2015 to October 2016: Replace or rehabilitate storm drain pipes between the West Runway and Taxiway Whiskey.

Figure 1


NORTH PERIMETER RD
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BROOKLEY AVE
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ARNOLD AVE
FIRST ST
ARKANSAS RD
MENOHER DR
S. DAKOTA AVE
REX RD
SAN ANTONIO BLVD
WISCONSIN RD
WATERTOWN RD
SOUTH PERIMETER RD
PATRICK AVE
BAINBRIDGE ST
EAST PERIMETER RD
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LEGEND
JBA Boundary
Outfall
Storm Drainage Network
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B
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Airfield Storm Drainage Network
Figure 1
Source: ESRI 2011.

Phase 2: September 2016 to October 2017: Line or replace the main trunk line from the upland section south of Taxiway November to the outfall south of Taxiway Sierra.

- Phase 3: September 2017 to September 2018: Line or replace storm drain pipes that connect into the main trunk line.
- Phase 4: September 2018 to December 2019: Line or replace storm drain pipes near the East Runway.
- Phase 5: September 2019 to December 2020: Line or replace storm drain pipes near Taxiway Echo.

The project would be conducted to minimize interference with airfield operations. Two transitional taxiways and at least one runway would remain open at all times so that the airfield would remain fully operational.

The need for an onsite concrete batch plant is not anticipated. Relatively small quantities of cast-in-place concrete would be needed.

Contractor access to the Base would be from the Pearl Harbor gate on the east side of the Base. The laydown area would be at the site used by the West Runway Project contractor and that is being used by the Taxiway Sierra Project contractor, a 5-acre site off Nevada Avenue in the northeast portion of the Base. During construction, access routes from the laydown site to the work site would follow the perimeter roads and existing maintenance roads that access the airfield.

Any required relocation of water lines, new connections, and line abandonment during implementation of the Proposed Action would be completed by Terrapin Utilities, which owns the water and sewer lines at JBA.

Any contaminated soil encountered during implementation of the Proposed Action would be handled in full accordance with applicable regulations.

Several areas of existing wetlands would be temporarily disturbed in the course of repairing the storm drainage network. Temporary impacts to wetlands would be restored on site. Permanent impacts would be less than 5,000 square feet, so no mitigation for wetland impacts is anticipated. If the Maryland Department of the Environment (MDE) or the U.S. Corps of Engineers were to determine that permanent impacts to wetlands need to be mitigated, those impacts would be mitigated off site. Acceptable mitigation options would be determined by MDE and the Corps.

Alternatives

JBA did not consider alternatives other than repairing the airfield stormwater drainage system (the Proposed Action) and the No Action Alternative. The airfield stormwater drainage system does not meet regulatory requirements for stormwater runoff on airfields and in its current condition poses a danger to airfield operations at JBA. Repairing the airfield stormwater drainage system is the only feasible alternative to achieve the purpose of and need for the Proposed Action.

No Action Alternative

Under the No Action Alternative, JBA would not implement the proposed stormwater system repair project. Routine maintenance of the stormwater systems would continue and JBA would operate with an inefficient, outdated, and damaged airfield stormwater system. These deficiencies would impair JBA's future ability to successfully meet National Pollutant Discharge Elimination System permit conditions, the Maryland Stormwater Management Guidelines for State and Federal Projects, the Energy Independence Security Act Section 438, Executive Order 13508, "Chesapeake Bay Protection and

Restoration," and the Chesapeake Bay Total Maximum Daily Load requirements, and therefore they would not be in compliance with State and Federal water quality regulations. Inadequate conveyance of stormwater from the airfield would continue to cause unsafe airfield operations during larger precipitation events. Standing water deteriorates pavement, inhibits visibility of airfield markings, can cause hydroplaning, and increases the probability for bird strikes because birds are attracted to the water. Collapsing drainage infrastructure would continue to pose a hazard to personnel working in the airfield infield.

Maryland Department of Planning

Martin O'Malley
Governor
Anthony G. Brown
Lt. Governor

Richard Eberhart Hall
Secretary
Matthew J. Power
Deputy Secretary

April 26, 2012

Ms. Anne Hodges
Environmental Manager
U.S. Department of the Air Force
11 CES/CEAO
3466 North Carolina Avenue
Joint Base Andrews, MD 20762

STATE CLEARINGHOUSE RECOMMENDATION
State Application Identifier: MD20120228-0125
Applicant: U.S. Department of the Air Force
Project Description: E.A. & FONSI: Stormwater System Repair and Upgrades: restore and improve condition and effectiveness of existing stormwater management system at Joint Base Andrews
Project Location: Prince George's County
Approving Authority: U.S. Department of Defense

Recommendation: Consistent with Qualifying Comments and Contingent Upon Certain Actions

Dear Ms. Hodges:

In accordance with Presidential Executive Order 12372 and Code of Maryland Regulation 34.02.01.04-.06, the State Clearinghouse has coordinated the intergovernmental review of the referenced project. This letter constitutes the State process review and recommendation based upon comments received to date. This recommendation is valid for a period of three years from the date of this letter.

Review comments were requested from the Maryland Departments of Business and Economic Development, Transportation, the Environment, Natural Resources, the Maryland Military Department, Prince George's County, and the Maryland Department of Planning, including the Maryland Historical Trust. As of this date, the Maryland Departments of Business and Economic Development, Natural Resources, and the Environment have not submitted comments. **This recommendation is contingent upon the applicant considering and addressing any problems or conditions that may be identified by their review. Any comments received will be forwarded.**

The Maryland Department of Transportation, and Prince George's County found this project to be generally consistent with their plans, programs, and objectives, but included certain qualifying comments summarized below. The Maryland Department of Transportation stated that as far as can be determined at this time, the subject has no unacceptable impacts on the plans or programs of the Department of Transportation.

Prince George's County addressed these issues in the attached memorandum: flooding, stream-bank stabilization, water quality, and off-site stormwater management. See the attached memorandum.

The Maryland Military Department; the Maryland Department of Planning, including the Maryland Historical Trust found this project to be consistent with their plans, programs, and objectives.

The Maryland Historical Trust has determined that the project will have "no effect" on historic properties.

Any statement of consideration given to the comments should be submitted to the approving authority, with a copy to the State Clearinghouse. The State Application Identifier Number must be placed on any correspondence pertaining to this project. The State Clearinghouse must be kept informed if the approving authority cannot accommodate the recommendation.

Please remember, you must comply with all applicable state and local laws and regulations. If you need assistance or have questions, contact the State Clearinghouse staff person noted above at 410-767-4490 or through e-mail at brosenbush@mdp.state.md.us

Thank you for your cooperation with the MIRC process.

Sincerely,

Linda C. Janey, J.D., Assistant Secretary

LCJ:BR

cc: Beth Cole - MHT
Tammy Edwards - DBED
Melinda Gretsinger - MDOT
Joane Mueller - MDE
Greg Golden - DNR
Lawrence Leone - MILT
Beverly Warfield - PGEO

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MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

Martin O'Malley, Governor
Anthony G. Brown, Lt. Governor
John R. Griffin, Secretary
Joseph P. Gill, Deputy Secretary

11-MIS-111

March 14, 2011

Steve Richards
Department of the Air Force
11 CES/CEAN
3466 North Carolina Avenue,
Andrews AFB, MD 20762

Subject: Fisheries Information for Proposed Stormwater System Repairs and Upgrades at Joint Base Andrews in Prince George's County, Maryland.

Dear Mr. Richards,

The above referenced project has been reviewed to determine fisheries species in the vicinity of the proposed project. The proposed activities include the stormwater system repairs and upgrades at Joint Base Andrews in Prince George's County, Maryland.

Streams and tributaries near the site include Piscataway Creek, Henson Creek, Paynes Branch, and Meetinghouse Branch in the Washington Metropolitan Basin, and Cabin Branch and Charles Branch in the Patuxent River Basin. Tributaries near the site are classified as Use I streams (Water Contact Recreation, and Protection of Aquatic Life). Generally, no instream work is permitted in Use I streams during the period of March 1 through June 15, inclusive, during any year.

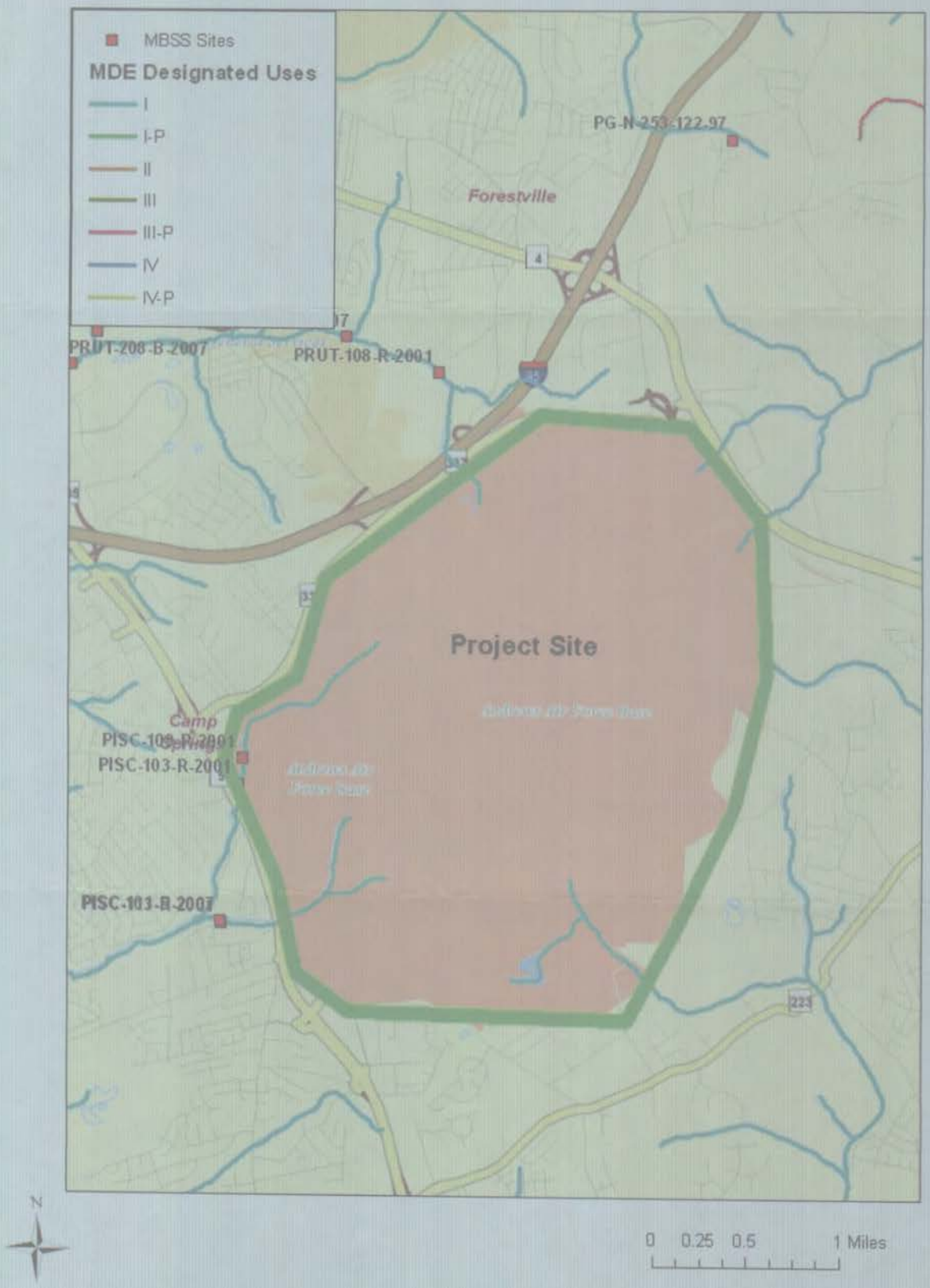
No anadromous fish have been documented near the project site. However, these streams may support many resident fish species documented by our Maryland Biological Stream Survey. There are Maryland Biological Stream Survey (MBSS) stations near the project location. The species collected at two of these stations have been itemized in the attached list. MBSS data can be accessed via the MDDNR web page at http://mdimap.towson.edu/streamhealth/, allowing access to resource surveys in neighboring tributaries.

If you have further questions, please contact the Environmental Review Program at 410-260-8799.

Sincerely,

Ken Yetman
Environmental Review Program

Attachments



The following fishes were collected at PRUT-108-R-2001

Common name	Percent of total
BLACKNOSE DACE	75.2
CREEK CHUB	16.4
SWALLOWTAIL SHINER	3.8
AMERICAN EEL	1.3
WHITE SUCKER	1.3
PUMPKINSEED	0.8
TESSELLATED DARTER	0.8
REDBREAST SUNFISH	0.4

The following fishes were collected at PISC-109-R-2001

Common name	Percent of total
BLACKNOSE DACE	44.2
GREEN SUNFISH	21.4
CREEK CHUB	14.3
ROSYSIDE DACE	3.7
SWALLOWTAIL SHINER	3.4
WHITE SUCKER	2.7
PUMPKINSEED	2.4
REDBREAST SUNFISH	2.4
COMMON SHINER	1.7
TESSELLATED DARTER	1.4
CREEK CHUBSUCKER	1.0
AMERICAN EEL	0.7
EASTERN MUDMINNOW	0.7

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, Maryland 21401
http://www.fws.gov/chesapeakebay

September 6, 2011

Steve Richards
Dept. of the Air Force
Head Quarters 11th Wing (AFDW)
Andrews Air Force Base, Md 20762

RE: Proposed Storm water System Restoration and upgrades at base Andrews, Prince Georges County, Md

Dear Mr. Richards:

This responds to your letter, received February, 16, 2011, requesting information on the presence of species which are federally listed or proposed for listing as endangered or threatened within the vicinity of the above reference project area. We have reviewed the information you enclosed and are providing comments in accordance with section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

Except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project impact area. Therefore, no Biological Assessment or further section 7 Consultation with the U.S. Fish and Wildlife Service is required. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

This response relates only to federally protected threatened or endangered species under our jurisdiction. For information on the presence of other rare species, you should contact Lori Byrne of the Maryland Wildlife and Heritage Division at (410) 260-8573.

Effective August 8, 2007, under the authority of the Endangered Species Act of 1973, as amended, the U.S. Fish and Wildlife Service (Service) removed (delist) the bald eagle in the lower 48 States of the United States from the Federal List of Endangered and Threatened Wildlife. However, the bald eagle will still be protected by the Bald and Golden Eagle Protection Act, Lacey Act and the Migratory Bird Treaty Act. As a result, starting on August 8, 2007, if your project may cause "disturbance" to the bald eagle, please consult the "National Bald Eagle Management Guidelines" dated May 2007.

If any planned or ongoing activities cannot be conducted in compliance with the National Bald Eagle Management Guidelines (Eagle Management Guidelines), please contact the Chesapeake Bay Ecological Services Field Office at 410-573-4573 for technical assistance. The Eagle

Management Guidelines can be found at:
http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf.

In the future, if your project can not avoid disturbance to the bald eagle by complying with the Eagle Management Guidelines, you will be able to apply for a permit that authorizes the take of bald and golden eagles under the Bald and Golden Eagle Protection Act, generally where the take to be authorized is associated with otherwise lawful activities. This proposed permit process will not be available until the Service issues a final rule for the issuance of these take permits under the Bald and Golden Eagle Protection Act.

An additional concern of the Service is wetlands protection. Federal and state partners of the Chesapeake Bay Program have adopted an interim goal of no overall net loss of the Basin's remaining wetlands, and the long term goal of increasing the quality and quantity of the Basin's wetlands resource base. Because of this policy and the functions and values wetlands perform, the Service recommends avoiding wetland impacts. All wetlands within the project area should be identified, and if construction in wetlands is proposed, the U.S. Army Corps of Engineers, Baltimore District, should be contacted for permit requirements. They can be reached at (410) 962-3670.

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interests in these resources. If you have any questions or need further assistance, please contact Devin Ray at (410) 573-4531.

Sincerely,

Leopoldo Miranda
Supervisor

20140623O

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 11TH WING (AFDW)
ANDREWS AIR FORCE BASE, MARYLAND 20762

F
USAF
EJR

3 December 2014

MEMORANDUM FOR: SEE DISTRIBUTION

FROM: 11 CES/CEIE
3466 North Carolina Avenue
Joint Base Andrews, MD 20762-4803

SUBJECT: Description of Proposed Action and Site Map for Repair of Airfield Storm Drain System at Joint Base Andrews-Naval Air Facility Washington, Maryland

PR Co.

1. Joint Base Andrews is preparing an Environmental Assessment (EA) for repairing the airfield storm drain system at Joint Base Andrews-Naval Air Facility, Washington, MD (JBA). Pursuant to the National Environmental Policy Act (NEPA) of 1969 (42 *United States Code* [USC] 4321–4347), Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 *Code of Federal Regulations* [CFR] Sections 1500–1508), and 32 CFR Part 989, *et seq*., JBA will prepare an EA that considers the potential consequences to human health and the natural environment. The EA will examine the effects of the proposed project and will include analysis of the required no-action alternative.

2. In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we invite your agency to comment on the Proposed Action described in the enclosed attachment and provide any relevant information about resources under your jurisdiction that may be present in the project area as indicated on the new site plan in the attachments.

3. Also enclosed is a copy of the distribution list for those federal, state, and local agencies to be contacted regarding this EA. If you consider any additional agencies should review and comment on this proposal, please feel free to include them in a re-distribution of this letter and the attached materials.

4. An attachment to this letter describes the project being analyzed in the EA. If undertaken, the project will be completed in accordance with applicable federal, state, and local laws and regulations and federal Executive Orders.

The Maryland Historical Trust has determined that there are no historic properties affected by this undertaking.
Beth Cole 12/18/14 Date

#1A BC 12/18/14

prior CAE/mDE review 20140575 1A 11/12/14

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 11TH WING (AFDW)
JOINT BASE ANDREWS, MARYLAND 20762

21 April 2015

MEMORANDUM FOR 11 WG/CC

FROM: 11 CES/CEIE
3466 North Carolina Ave
Joint Base Andrews, MD 20762-4803

SUBJECT: 30-Day Comment Period - Draft Environmental Assessment for Repair of Airfield Storm Drain System at Joint Base Andrews-Naval Air Facility Washington, Maryland

1. Joint Base Andrews has prepared an Environmental Assessment (EA) for repairing the airfield storm drain system at Joint Base Andrews-Naval Air Facility, Washington, MD (JBA). Pursuant to the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] 4321–4347), Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Sections 1500–1508), and 32 CFR Part 989, et seq., JBA has prepared an EA that considers the potential consequences to human health and the natural environment. The EA examines the effects of the proposed project and includes analysis of the required no-action alternative.

2. In accordance with Executive Order 12372, Intergovernmental Review of Federal Programs, we invite your agency to comment on the Draft EA and the draft Finding of No Significant Impact/Finding of No Practicable Alternative (FONSI/FONPA) and provide comments regarding any issues under your agency's jurisdiction.

3. The Draft EA and Draft FONSI/FONPA are available online at http://www.andrews.af.mil/library/environmental/index.asp. Please provide written comments to Anne Hodges, 11th Civil Engineer Squadron, 3466 North Carolina Avenue, Joint Base Andrews, MD 20762-4803 or send via email to anne.m.hodges2.civ@mail.mil. All comments must be received by 23 May 2015. If you need further information please contact Ms. Hodges at 301-981-1426.

Anne Hodges for

STEVE RICHARDS
Chief of Environmental Management

Attachment:
Distribution List (On next page)

Distribution List

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U.S. Fish & Wildlife Service
Chesapeake Bay Field Office
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Annapolis, MD 1401

Lucy Kempf, Director
Urban Design and Plan Review Division
National Capital Planning Commission
401 9th Street, NW
North Lobby, Suite 500
Washington, DC 20004

May 28, 2015

Ms. Anne Hodges
Asset Optimization
Department of the Air Force
11 Civil Engineer Squadron
3466 North Carolina Avenue
Joint Base Andrews, MD 20762

STATE CLEARINGHOUSE RECOMMENDATION

State Application Identifier: MD20150421-0285
Applicant: Department of the Air Force
Project Description: Draft Environmental Assessment, Finding of No Significant Impact (FONSI) and Finding of No Practicable Alternative (FONPA) for the Repair of Airfield Storm Drain System at Joint Base Andrews-Naval Air Facility Washington, Maryland
Project Address: Andrews AFB, 1191 Menoher Drive, MD 20762
Project Location: Prince George's County
Approving Authority: U.S. Department of Defense DOD/USAF
Recommendation: Consistent with Qualifying Comment(s)

Dear Ms. Hodges:

In accordance with Presidential Executive Order 12372 and Code of Maryland Regulation 34.02.01.04-.06, the State Clearinghouse has coordinated the intergovernmental review of the referenced project. This letter constitutes the State process review and recommendation. This recommendation is valid for a period of three years from the date of this letter.

Review comments were requested from the Maryland Department(s) of Natural Resources, Transportation, the Environment and the Maryland Department of Planning, including the Maryland Historical Trust; and Prince George's County.

The Maryland Department(s) of Transportation and the Maryland Department of Planning, including the Maryland Historical Trust; and Prince George's County found this project to be consistent with their plans, programs and objectives.

The Department of Transportation stated that "as far as can be determined at this time, the subject has no unacceptable impacts on plans or programs."

The Maryland Historical Trust has determined that the project will have "no effect" on historic properties and that the federal and/or State historic preservation requirements have been met.

The Maryland Department(s) of Natural Resources (DNR) and Environment (MDE) found this project to be generally

consistent with their plans, programs and objectives, but included certain qualifying comments summarized below.

The Maryland Department of Natural Resources stated that this project will improve the effectiveness of stormwater collection at Joint Base Andrews-Naval Air Facility (JBA) to enhance airfield safety and operations. Please coordinate with DNR and MDE to ensure collected stormwater is adequately treated with Best Mangement Pratices (BMPs) to protect nearby streams and groundwater in the vicinity of JBA. BMPs should be designed to manage and treat deicing agents and additives to avoid or minimize environment impacts such as aquatic toxicity and low dissolved oxygen from nutrient loads. Please recycle collected deicing agents and additives where possible and consider using innovative technologies such as cost-saving anaerobic treatment systems that yield rather than consume energy. As indicated in the Environmental Assessment, this project is part of a larger effort to rehabilitate JBA facilities including runway demolition and reconstruction. Please consider using solar geothermal systems to utilize stored summer heat to keep runways free of ice and snow and avoid or minimize the use of deicing agents as well as snow and ice removal equipment. Several prominent airports around the world are applying such inter-seasonal thermal management as a cost-effective and environmentally preferable option.

The Maryland Department of Environment comments are as follows:

1. Any solid waste including construction, demolition and land clearing debris, generated from the subject project, must be properly disposed of at a permitted solid waste acceptance facility, or recycled if possible. Contact the Solid Waste Program at (410) 537-3315 for additional information regarding solid waste activities and contact the Waste Diversion and Utilization Program at (410) 537-3314 for additional information regarding recycling activities.

2. The Waste Diversion and Utilization Program should be contacted directly at (410) 537-3314 by those facilities which generate or propose to generate or handle hazardous wastes to ensure these activities are being conducted in compliance with applicable State and federal laws and regulations. The Program should also be contacted prior to construction activities to ensure that the treatment, storage or disposal of hazardous wastes and low-level radioactive wastes at the facility will be conducted in compliance with applicable State and federal laws and regulations.

3. The proposed project may involve rehabilitation, redevelopment, revitalization, or property acquisition of commercial, industrial property. Accordingly, MDE's Brownfields Site Assessment and Voluntary Cleanup Programs (VCP) may provide valuable assistance to you in this project. These programs involve environmental site assessment in accordance with accepted industry and financial institution standards for property transfer. For specific information about these programs and eligibility, please contact the Land Restoration Program at (410) 537-3437.

Any statement of consideration given to the comments(s) should be submitted to the approving authority, with a copy to the State Clearinghouse. The State Application Identifier Number must be placed on any correspondence pertaining to this project. The State Clearinghouse must be kept informed if the approving authority cannot accommodate the recommendation.

Please remember, you must comply with all applicable state and local laws and regulations. If you need assistance or have questions, contact the State Clearinghouse staff person noted above at 410-767-4490 or through e-mail at nasrin.rahman@maryland.gov. **Also please complete the attached form and return it to the State Clearinghouse as soon as the status of the project is known.** ***Any substitutions of this form must include the State Application Identifier***

Number. **This will ensure that our files are complete.**

Thank you for your cooperation with the MIRC process.

Sincerely,

Linda C. Janey

Linda C. Janey, J.D., Assistant Secretary

LCJ:NR
cc:

Tina Quinichette - MDOT	Kathleen Herbert - PGEO	Dan Rosen - MDPI-R
Amanda Degen - MDE	John Leocha/LaVerne Gray -	Peter Conrad - MDPL
Greg Golden - DNR	MDPLR&WC	Beth Cole - MHT

15-0285_CRR.CLS.doc

PROJECT STATUS FORM

Please complete this form and return it to the State Clearinghouse upon receipt of notification that the project has been approved or not approved by the approving authority.

TO: **Maryland State Clearinghouse**
Maryland Department of Planning
301 West Preston Street
Room 1104
Baltimore, MD 21201-2305

DATE: _____
(Please fill in the date form completed)

FROM: _____
(Name of person completing this form.)

PHONE: ____-____-_____
(Area Code & Phone number)

RE: **State Application Identifier:** **MD20150421-0285**
Project Description: Draft Environmental Assessment, Finding of No Significant Impact (FONSI) and Finding of No Practicable Alternative (FONPA) for the Repair of Airfield Storm Drain System at Joint Base Andrews-Naval Air Facility Washington, Maryland

PROJECT APPROVAL

This project/plan was: ☐ **Approved** ☐ **Approved with Modification** ☐ **Disapproved**

Name of Approving Authority: _____

Date Approved: _____

FUNDING APPROVAL

The funding (if applicable) has been approved for the period of:

_____, 201____ **to** _____, 201____ **as follows:**

Federal $:	**Local $:**	**State $:**	**Other $:**
_____	_____	_____	_____

OTHER

☐ *Further comment or explanation is attached*

Rushern L. Baker, III
County Executive

THE PRINCE GEORGE'S COUNTY GOVERNMENT
Department of Permitting, Inspections and Enforcement
Office of the Director

DEPARTMENT OF PERMITTING, INSPECTIONS AND ENFORCEMENT

MEMORANDUM

May 27, 2015

TO: Dawn Hawkins-Nixon, Clearinghouse Coordinator
Department of the Environment

FROM: Haitham A. Hijazi, Director HAH
Department of Permitting, Inspections and Enforcement

RE: Scooping: Draft Environmental Assessment, Finding of No Significant Impact and Finding of No Practicable Alternative for the Repair of Airfield Storm Drain System at Joint Base Andrews-Naval Facility
Clearinghouse Referral Number: MD 20150421-0285

This is in response to your April 24, 2015, request for review and comments on the Scooping: Draft Environmental Assessment, Finding of No Significant Impact and Finding of No Practicable Alternative for the Repair of Airfield Storm Drain System at Joint Base Andrews-Naval Facility.

Joint Base Andrews (JBA) proposes to repair 51,200 linear feet of storm sewer pipe and 122 manholes of the airfield storm water drainage network. Storm drain pipes at JBA range in size from 12 inches to 90 inches in diameter. Approximately 85 percent of the pipes are to be lined.

JBA will use some new pipes to replace the existing pipes to accommodate the stormwater runoff to avoid ponding on part of the runways and taxiways. Upsizing some pipes in the system will increase flow to the system and overall peak flow to the system outfall in Piscataway Creek. Peak control structures, two weir and orifice structures, would be installed to prevent any increase in the peak flow (2-year and 10-year) from the system to Piscataway Creek. Tinkers Creek, Piscataway Creek, Meetinghouse Branch, Paynes Branch and Henson Creek drain into the Potomac River. Cabin Branch, Charles Branch and Western Branch drain into the Patuxent River.

This proposed storm drain system will be constructed in five construction phases during September 2015 to December 2020 time period. This project does not cause increase in impervious area on site. Several wetland areas on site will be temporarily disturbed during the construction. Permanent impacts will be less than 5,000 square feet and no mitigation for wetland impacts is anticipated. We have no objection to this proposed work.

As indicated in our August 9, 2013, memorandum we do not agree with the JBA's report asserting that the proposed construction activities will have no significant impact on the adjoining water resources. Therefore, as stated in that memorandum we repeat:

> "We do not concur with the above statement. Please be advised that the Prince George's County Department of Permitting, Inspections and Enforcement (DPIE) would like to inform you that the uncontrolled on site stormwater runoff from the Base has been creating severe soil erosion in the Paynes Branch (a tributary of Tinkers Creek) downstream of Old Branch Avenue in Camp Springs. The Base will need to initiate stream restoration work to mitigate continuing downstream erosion problems."

Thank you for the opportunity to review this referral. If you need additional information, please contact Mansukh Senjalia, the District Engineer for the area, Site/Road Plan Review Division, at 301.636.2060.

HAH:MS:dar

cc: Gary E. Cunningham, Deputy Director, DPIE
Dawit Abraham, P.E., Associate Director, DO, DPIE
Mary C. Giles, P.E. Associate Director, S/RPRD, DPIE
Rey de Guzman, P.E., Chief, Site/Road Section, S/RPRD, DPIE
Mansukh Senjalia, P.E., District Engineer, S/RPRD, DPIE
Mary Rea, Senior Planner, S/RPRD, DPIE

APPENDIX B

COASTAL ZONE CONSISTENCY DETERMINATION

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Consistency with Maryland Coastal Program Enforceable Coastal Policies

Joint Base Andrews-Naval Air Facility Washington (JBA) is within Maryland's designated coastal zone, and as such is regulated under the federal Coastal Zone Management Act (CZMA) and Maryland's federally approved Coastal Zone Management Program.

The project proposed in the environmental assessment (EA) would be fully consistent with Maryland's Enforceable Coastal Policies (effective April 11, 2011), implemented by the Maryland Department of the Environment (MDE). No effects or beneficial effects on Maryland's coastal resources would be expected from implementing the project in the EA. All activities would be conducted in accordance with applicable laws, regulations, and policies governing erosion and sediment control and stormwater management, which would ensure that the project would occur in a manner consistent with the applicable Maryland Coastal Program enforceable policies. A synopsis of how the project would be consistent with the enforceable coastal policies is provided below.

Maryland's Enforceable Coastal Policies are divided into three general sections: General Policies, Coastal Resources, and Coastal Uses. The General Policies are further divided into Core Policies, Water Quality, and Flood Hazards. Compliance of the project proposed in the EA with each of the applicable enforceable policies is discussed below. Policies not applicable to the proposed project are noted.

GENERAL POLICIES Core Policies

Policy: It is State policy to maintain that degree of purity of air resources which will protect the health, general welfare, and property of the people of the State. MDE (C9) Md. Code Ann., Envir. §§ 2-102 to -103.

As noted in Section 4.4 of the EA, the Air Force and any contractors would comply with all applicable air pollution control regulations when implementing the project proposed in the EA. Section 4.4 of the EA contains a detailed discussion of the projected air emissions associated with the proposed project. No new permanent sources of air emissions are associated with the proposed project. If a new source of air emissions was required, JBA would obtain a permit to construct from MDE's Air and Radiation Management Administration for the equipment.

Policy: The environment shall be free from noise which may jeopardize health, general welfare, or property, or which degrades the quality of life. MDE (C9) COMAR 26.02.03.02.

Section 3.5 of the EA provides a discussion of the noise environment, and Section 4.5 provides a discussion of the expected noise-related impacts associated with the implementation of the project proposed in the EA. Noise associated with the project would be associated with equipment use only and would occur on an active airfield. All noise would cease upon completion of the project and no significant new sources of environmental noise would be introduced.

Policy: Soil erosion shall be prevented to preserve natural resources and wildlife; control floods; prevent impairment of dams and reservoirs; maintain the navigability of rivers and harbors; protect the tax base, the public lands, and the health, safety and general welfare of the people of the State, and to enhance their living environment. MDA (C4) Md. Code Ann., Agric. § 8-102(d).

Soil disturbance will occur during the project at the locations where storm drainage system repairs are performed. All disturbed areas will be restabilized and revegetated upon completion of work at the location. JBA will comply with the requirements described in the MDE (2010) document Maryland Stormwater Management Guidelines for State and Federal Projects and Maryland's Stormwater Management Act of 2007.

Policy: Controlled hazardous substances may not be stored, treated, dumped, discharged, abandoned, or otherwise disposed anywhere other than a permitted controlled hazardous substance facility or a facility that provides an equivalent level of environmental protection. MDE (D4) Md. Code Ann., Envir. § 7-265(a).

All contractors involved with implementing the proposed project would be required to comply with JBA's Environmental Protection Standards for contracts, which includes managing, storing, transporting, and disposing of hazardous materials and wastes, and taking all necessary precautions to prevent spills of hazardous materials (including oils and hazardous wastes) in accordance with all applicable federal, state, and local laws and regulations.

Water Quality Policies

Policy: No one may add, introduce, leak, spill, or emit any liquid, gaseous, solid, or other substance that will pollute any waters of the State without State authorization. MDE (A5) Md. Code Ann., Envir. §§ 4- 402, 9-101, 9-322.

The EA discusses compliance with laws, regulations, and policies related to the use, storage, and disposal of hazardous wastes and materials in Section 4.8. All contractors involved with implementing the proposed action would be required to use hazardous materials; manage, store, transport, and dispose of hazardous wastes; and take all necessary precautions to prevent spills of hazardous materials (including oils and hazardous wastes) in accordance with all applicable JBA environmental standards and federal, state, and local laws and regulations.

Policy: All waters of the State shall be protected for water contact recreation, fish, and other aquatic life and wildlife. Shellfish harvesting and recreational trout waters and waters worthy of protection because of their unspoiled character shall receive additional protection. MDE (A1) COMAR 26.08.02.02.

JBA would protect the water quality of state waters by implementing erosion and sediment control measures at all project locations and would control stormwater runoff, including erosion, sedimentation, and nonpoint source pollution in accordance with Maryland Stormwater Management Guidelines for State and Federal Projects (MDE 2010) and Maryland's Stormwater Management Act of 2007. Additionally, all contractors would be required to manage, store, transport, and dispose of hazardous materials and wastes properly.

Policy: The discharge of any pollutant which will accumulate to toxic amounts during the expected life of aquatic organisms or produce deleterious behavioral effects on aquatic organisms is prohibited. MDE (A4) COMAR 26.08.03.01.

The project will not involve the discharge of any pollutant that could be toxic to aquatic organisms. Flow will be diverted from entering the storm drain being repaired and no toxic pollutants will be released from the drain pipe after repairs at any location have been completed.

Policy: Before constructing, installing, modifying, extending, or altering an outlet or establishment that could cause or increase the discharge of pollutants into the waters of the State, the proponent must hold a discharge permit issued by the Department of the Environment or provide an equivalent level of water quality protection. MDE (D6) Md. Code Ann., Envir. § 9-323(a).

Policy: The use of best available technology is required for all permitted discharges into State waters, but if this is insufficient to comply with the established water quality standards, additional treatment shall be required and based on waste load allocation. MDE (D4) COMAR 26.08.03.01C.

JBA holds a National Pollutant Discharge Elimination System (NPDES) permit. The proposed project will help JBA meet the conditions of its NPDES permit by controlling and improving the water quality of discharges of stormwater from its airfield to local streams.

Flood Hazards Policies

Policy: Proposed unlined earth channels may not change the tractive force associated with the 2-year and the 10-year frequency flood events, by more than 10 percent, throughout their length unless it can be demonstrated that the stream channel will remain stable. MDE (C2) COMAR 26.17.04.01, .07, .11.

An unlined earth channel is proposed at one location that is within an area of flooding during the 2-year and 10-year frequency flood events. The improved channel will not significantly change the tractive force associated with the 2-year and the 10-year frequency flood events.

COASTAL RESOURCES POLICIES

The Chesapeake and Atlantic Coastal Bays Critical Area

The Chesapeake and Atlantic Coastal Bays Critical Area Policies are not applicable to the proposed project in the EA. The proposed project would not occur in a Chesapeake and Atlantic Coastal Bays Critical Area.

Tidal Wetlands

The Tidal Wetlands Policies are not applicable to the proposed project in the EA. The proposed project would not occur in a tidal wetland.

Non-Tidal Wetlands

Policy: Removal, excavation, grading, dredging, dumping, or discharging of, or filling a non-tidal wetland with materials of any kind, including the driving of piles and placing of obstructions; changing existing drainage characteristics, sedimentation patterns, flow patterns, or flood retention characteristics; disturbing the water level or water table; or removing or destroying plant life that would alter the character of a non-tidal wetland is prohibited unless:

- *The proposed project has no practicable alternative;*
- *Adverse impacts are first avoided and then minimized based on consideration of existing topography, vegetation, fish and wildlife resources, and hydrological conditions;*
- *Comprehensive watershed management plans are considered; and*
- *The proposed project does not cause or contribute to an individual or cumulative effect that degrades:*
    - *Aquatic ecosystem diversity, productivity, and stability,*
    - *Plankton, fish, shellfish, and wildlife,*
    - *Recreational and economic values, and*
    - *Public welfare;*
    - *Surface water quality; or*
    - *Ground water quality.*

Mitigation measures are required to replace the ecological values associated with non-tidal wetlands that are impaired by activities described above. MDE (C3) COMAR 26.23.01.01; COMAR 26.23.02.04, .06; COMAR 26.23.04.02.

Several areas of existing non-tidal wetlands would be temporarily disturbed in the course of repairing the storm drainage network, and there is no practicable alternative to the disturbance of these wetland areas. Temporary impacts to wetlands would be restored on-site. Less than 5,000 square feet of wetland area would be permanently impacted, so no mitigation for wetland

impacts is anticipated. If MDE or the U.S. Army Corps of Engineers (USACE) determines that permanent impacts to wetlands should be mitigated, those impacts would be mitigated off site. Acceptable mitigation options would be determined by MDE and USACE.

Forests

The Forests Policies are not applicable to the proposed project in the EA. The proposed project would not occur in a forested area and would not involve the removal of any trees.

Historical and Archaeological Sites

The Historical and Archaeological Sites Policies are not applicable to the proposed project. The proposed project would not involve a submerged archaeological historic property, a cave feature or archeological site under state control, or a burial site or cemetery.

Living Aquatic Resources

The Living Aquatic Resources Policies are not applicable to the proposed project.

COASTAL USES

The Coastal Uses Policies are not applicable to the proposed project.

APPENDIX C
AIR SUPPORTING DOCUMENTATION

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Table C-1. Construction Equipment Use

Equipment Type	Number of Units	Days on Site	Hours Per Day	Operating Hours
Excavators	2	230	4	1,840
Plate Compactors	2	230	4	1,840
Trenchers	2	230	8	3,680
Cement Mixers	2	230	4	1,840
Generator Sets	1	230	4	920
Loaders/Backhoes	2	230	7	3,220
Pavers	1	58	8	464
Paving Equipment	1	58	8	464

Table C-2. Construction Equipment Emission Factors (lbs/hour)

Equipment	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Excavators	0.5828	1.3249	0.1695	0.0013	0.0727	0.0727	119.6
Plate Compactors	0.0263	0.0328	0.0052	0.0001	0.0021	0.0021	4.3
Trenchers	0.5080	0.8237	0.1851	0.0007	0.0688	0.0688	58.7
Cement Mixers	0.0447	0.0658	0.0113	0.0001	0.0044	0.0044	7.2
Generator Sets	0.3461	0.6980	0.1075	0.0007	0.0430	0.0430	61.0
Loaders/Backhoes	0.4063	0.7746	0.1204	0.0008	0.0599	0.0599	66.8
Pavers	0.5874	1.0796	0.1963	0.0009	0.0769	0.0769	77.9
Paving Equipment	0.0532	0.1061	0.0166	0.0002	0.0063	0.0063	12.6

Source: CARB 2014.

Table C-3. Construction Equipment Emissions (tons)

Equipment	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Excavators	0.5362	1.2189	0.1559	0.0012	0.0669	0.0669	110.0
Plate Compactors	0.0242	0.0302	0.0047	0.0001	0.0019	0.0019	4.0
Trenchers	0.9347	1.5156	0.3405	0.0013	0.1267	0.1267	108.0
Cement Mixers	0.0412	0.0605	0.0104	0.0001	0.0041	0.0041	6.7
Generator Sets	0.1592	0.3211	0.0494	0.0003	0.0198	0.0198	28.1
Loaders/Backhoes	0.6542	1.2470	0.1939	0.0012	0.0964	0.0964	107.6
Pavers	0.1363	0.2505	0.0455	0.0002	0.0178	0.0178	18.1
Paving Equipment	0.0123	0.0246	0.0038	0.0000	0.0015	0.0015	2.9
Total	2.50	4.67	0.80	<0.1	0.34	0.34	385.3

Table C-4. Emissions from Delivery of Equipment and Supplies

Number of Deliveries	4						
Number of Trips	2						
Miles Per Trip	30						
Days of Construction	230						
Total Miles	55,200						
Pollutant	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Emission Factor (lbs/mile)	2.2E-02	2.4E-02	3.0E-03	2.6E-05	8.6E-04	7.4E-04	2.7E+00
Total Emissions (lbs)	1,211.6	1,308.9	165.2	1.4	47.3	40.8	150,112.8
Total Emissions (tons)	0.61	0.65	<0.1	<0.1	<0.1	<0.1	75.1

Source: CARB 2014.

Table C-5. Particulates from Surface Disturbance

TSP Emissions	37.4	lb/acre				
PM_{10}/TSP	0.45					
$PM_{2.5}$/PM_{10}	0.15					
Period of Disturbance	30	days				
Capture Fraction	0.5					
Building/Facility	Area [acres]	TSP [lbs]	PM_{10} [lbs]	PM_{10} [tons]	$PM_{2.5}$ [lbs]	$PM_{2.5}$ [tons]
All Facilities	2.3	2,535	1,141	0.57	86	0.04
Total	2.3	2,535	1,141	0.57	86	<0.1

Source: USEPA 1995.

Table C-6. Emissions from Construction Worker Commutes

Number of Workers	28						
Number of Trips	2						
Miles Per Trip	30						
Days of Construction	58						
Total Miles	97,440						
Pollutant	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	CO_2
Emission Factor (lbs/mile)	1.1E-02	1.1E-03	1.1E-03	1.1E-05	8.5E-05	5.3E-05	1.1E+00
Total Emissions (lbs)	1,028	107	105	1	8	5	107,138
Total Emissions (tons)	0.51	<0.1	0.05	1.0	<0.1	<0.1	53.6

Source: CARB 2014.

Table C-7. Total Construction Emissions (tons)

Activity/Source	**CO**	**NO_x**	**VOC**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**
Heavy Equipment	2.50	4.67	0.80	0.0045	0.34	0.34	385.32
Delivery of Equipment	0.61	0.65	0.08	0.0007	0.02	0.02	75.06
Surface Disturbance	0.00	0.00	0.00	0.0000	0.57	0.04	0.00
Worker Commutes	0.48	0.05	0.05	0.9724	0.00	0.00	49.74
Total Emissions	3.6	5.4	0.9	1.0	0.9	0.4	510.1

Sources: CARB 2014, SCAQMD 1993, USEPA 1995.

APPENDIX D
ECONOMIC IMPACT FORECAST SYSTEM MODEL OUTPUT

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ECONOMIC IMPACT FORECAST SYSTEM (EIFS) MODEL

SOCIOECONOMIC IMPACT ASSESSMENT

Socioeconomic impacts are linked through cause-and-effect relationships. Military payrolls and local procurement contribute to the economic base for the region of influence (ROI). In this regard, the proposed JBA airfield storm drainage repair project would have a multiplier effect on the local and regional economy. With the proposed action, direct jobs would be created (e.g., construction jobs), generating new income and increasing personal spending. This spending generally creates secondary jobs, increases business volume, and increases revenues for schools and other social services.

THE ECONOMIC IMPACT FORECAST SYSTEM

The U.S. Army, with the assistance of many academic and professional economists and regional scientists, developed EIFS to address the economic impacts of NEPA-requiring actions and to measure their significance. As a result of its designed applicability and in the interest of uniformity, EIFS should be used in NEPA assessments. The entire system is designed for the scrutiny of a populace affected by the actions being studied. The algorithms in EIFS are simple and easy to understand, but still have firm, defensible bases in regional economic theory.

EIFS was developed under a joint project of USACE, the U.S. Army Environmental Policy Institute, and the Computer and Information Science Department of Clark Atlanta University. EIFS is implemented as an online system supported by USACE, Mobile District. The system is available to anyone with an approved user ID and password. USACE staff is available to assist with the use of EIFS.

The databases in EIFS are national in scope and cover the approximately 3,700 counties, parishes, and independent cities that are recognized as reporting units by federal agencies. EIFS allows the user to define an economic ROI by identifying the counties, parishes, or cities to be analyzed. Once the ROI is defined, the system aggregates the data, calculates multipliers and other variables used in the various models in EIFS, and prompts the user for forecast input data.

THE EIFS MODEL

The basis of the EIFS analytical capabilities is the calculation of multipliers that are used to estimate the impacts resulting from federal-related changes in local expenditures or employment. In calculating the multipliers, EIFS uses the economic base model approach, which relies on the ratio of total economic activity to basic economic activity. Basic, in this context, is defined as the production or employment engaged to supply goods and services outside the ROI or by federal activities (e.g., military installations and their employees). According to economic base theory, the ratio of total income to basic income is measurable (as the multiplier) and sufficiently stable so that future changes in economic activity can be forecast. This technique is especially appropriate for estimating aggregate impacts and makes the economic base model ideal for the environmental assessment and environmental impact statement process.

The multiplier is interpreted as the total impact on the economy of the region resulting from a unit change in its base sector (e.g., a dollar increase in local expenditures because of an expansion of its military installation). EIFS estimates its multipliers using a location quotient

approach based on the concentration of industries within the region relative to the industrial concentrations for the nation.

The user inputs into the model the data elements that describe the action: the change in expenditures, or dollar volume of the construction project(s); change in civilian or military employment; average annual income of affected civilian or military employees; the percent of civilians expected to relocate because of the proposed action; and the percent of military personnel living on base. Once these elements are entered into the EIFS model, a projection of changes in the local economy is provided. These are projected changes in sales volume, income, employment, and population. These four indicator variables are used to measure and evaluate socioeconomic impacts. Sales volume is the direct and indirect change in local business activity and sales (total retail and wholesale trade sales, total selected service receipts, and value-added by manufacturing). Income is the total change in local wages and salaries because of the proposed action, which includes the sum of the direct and indirect wages and salaries, plus the income of the civilian and military personnel affected by the proposed action. Employment is the total change in local employment because of the proposed action, including not only the direct and secondary changes in local employment, but also those personnel who are initially affected by the military action. Population is the increase or decrease in the local population as a result of the proposed action.

The current working estimate for the cost of the proposed JBA airfield storm drainage repair and replacement project (about $42,000,000) was divided over the estimated phased 5-year construction period and input in to the EIFS model as the change in expenditures (about $8,400,000 per year).

THE SIGNIFICANCE OF SOCIOECONOMIC IMPACTS

Once model projections are obtained, the Rational Threshold Value (RTV) profile allows the user to evaluate the significance of the impacts. This analytical tool reviews the historical trends for the defined region and develops measures of local historical fluctuations in sales volume, income, employment, and population. These evaluations identify the positive and negative changes within which a project can affect the local economy without creating a significant impact. The greatest historical changes define the boundaries that provide a basis for comparing an action's impact on the historical fluctuation in a particular area. Specifically, EIFS sets the boundaries by multiplying the maximum historical deviation of the following variables:

		Increase	*Decrease*
Sales Volume	X	100%	75%
Income	X	100%	67%
Employment	X	100%	67%
Population	X	100%	50%

These boundaries determine the amount of change that will affect an area. The percentage allowances are arbitrary, but sensible. The maximum positive historical fluctuation is allowed with expansion because economic growth is beneficial. While cases of damaging economic growth have been cited, and although the zero-growth concept is being accepted by many local

planning groups, military base reductions and closures generally are more injurious to local economics than are expansion.

The major strengths of the RTV are its specificity to the region under analysis and its basis on actual historical data for the region. The EIFS impact model, in combination with the RTV, has proven successful in addressing perceived socioeconomic impacts. The EIFS model and the RTV technique for measuring the intensity of impacts have been reviewed by economic experts and have been deemed theoretically sound.

The following are the EIFS input and output data for the proposed action and the RTV values for the ROI.

EIFS REPORT

PROJECT NAME

JBA Airfield Storm Drainage Repair

STUDY AREA

Prince George's County, MD

FORECAST INPUT

Change In Local Expenditures	$8,400,000
Change In Civilian Employment	0
Average Income of Affected Civilian	$0
Percent Expected to Relocate	0
Change In Military Employment	0
Average Income of Affected Military	$0
Percent of Military Living On-post	0

FORECAST OUTPUT

Employment Multiplier	2.83	
Income Multiplier	2.83	
Sales Volume–Direct	$8,400,000	
Sales Volume–Induced	$15,372,000	
Sales Volume–Total	$23,772,000	0.08%
Income–Direct	$1,535,886	
Income–Induced	$2,810,672	
Income–Total (place of work)	$4,346,558	0.02%
Employment–Direct	35	
Employment–Induced	65	
Employment–Total	100	0.03%
Local Population	0	
Local Off-base Population	0	0.00%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	13.74%	11.72%	4.59%	3.30%
Negative RTV	-5.32%	-4.48%	-4.17%	-0.85%

RTV DETAILED

SALES VOLUME

Year	Value	Adj Value	Change	Deviation	%Deviation
1969	1311821	5732658	0	0	0
1970	1486616	6139724	407067	153154	2.49
1971	1666838	6600679	460954	207041	3.14
1972	1883086	7212219	611541	357628	4.96
1973	2110529	7619009	406790	152877	2.01
1974	2307655	7499879	-119131	-373044	-4.97
1975	2453531	7311522	-188356	-442269	-6.05
1976	2699624	7612939	301417	47504	0.62
1977	2935901	7750779	137839	-116074	-1.5
1978	3254441	8005925	255146	1233	0.02
1979	3631494	8025602	19677	-234236	-2.92
1980	4028557	7815401	-210201	-464114	-5.94
1981	4430916	7798412	-16989	-270902	-3.47
1982	4577146	7598062	-200350	-454263	-5.98
1983	4970975	8003270	405208	151295	1.89
1984	5600643	8624990	621720	367807	4.26
1985	6376749	9501356	876366	622453	6.55
1986	7047456	10289286	787930	534017	5.19
1987	7885395	12222362	1933076	1679163	13.74
1988	8587537	11679050	-543311	-797224	-6.83
1989	9197479	11864748	185697	-68216	-0.57
1990	10021287	12326183	461436	207523	1.68
1991	9955098	11747015	-579168	-833081	-7.09
1992	10238359	11671729	-75286	-329199	-2.82
1993	10633391	11803064	131335	-122578	-1.04
1994	11010346	11891174	88110	-165803	-1.39
1995	11317030	11882881	-8293	-262206	-2.21
1996	11880862	12118479	235598	-18315	-0.15
1997	12781994	12781994	663515	409602	3.2
1998	13284829	13019133	237139	-16774	-0.13
1999	13818444	13265706	246573	-7340	-0.06
2000	14900935	13857870	592164	338251	2.44

INCOME

Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	2711417	11848892	0	0	0
1970	3132753	12938270	1089378	755077	5.84
1971	3439625	13620915	682645	348344	2.56
1972	3741997	14331848	710933	376632	2.63
1973	4069014	14689140	357292	22991	0.16
1974	4399110	14297108	-392033	-726334	-5.08
1975	4719196	14063204	-233903	-568204	-4.04
1976	5083661	14335924	272720	-61581	-0.43
1977	5448505	14384054	48130	-286171	-1.99
1978	5881297	14467991	83937	-250364	-1.73
1979	6417356	14182357	-285634	-619935	-4.37
1980	7049501	13676032	-506325	-840626	-6.15
1981	7818331	13760262	84230	-250071	-1.82
1982	8432835	13998506	238243	-96058	-0.69
1983	9096525	14645405	646900	312599	2.13
1984	10119271	15583677	938272	603971	3.88
1985	11083235	16514020	930343	596042	3.61
1986	11916961	17398764	884743	550442	3.16
1987	12959671	20087489	2688726	2354425	11.72
1988	14076285	19143748	-943742	-1278043	-6.68
1989	15176568	19577772	434024	99723	0.51
1990	16172648	19892357	314585	-19716	-0.1
1991	16716212	19725129	-167228	-501529	-2.54
1992	17356581	19786502	61373	-272928	-1.38
1993	18039887	20024275	237773	-96528	-0.48
1994	18746733	20246472	222198	-112103	-0.55
1995	19165209	20123469	-123004	-457305	-2.27
1996	19671905	20065343	-58126	-392427	-1.96
1997	20616650	20616650	551307	217006	1.05
1998	21712782	21278527	661877	327576	1.54
1999	22554116	21651951	373424	39123	0.18
2000	24243561	22546512	894561	560260	2.48

EMPLOYMENT

Year	Value	Change	Deviation	%Deviation
1969	190249	0	0	0
1970	198932	8683	2018	1.01
1971	208284	9352	2687	1.29
1972	221176	12892	6227	2.82
1973	229967	8791	2126	0.92
1974	232606	2639	-4026	-1.73
1975	232320	-286	-6951	-2.99
1976	234526	2206	-4459	-1.9
1977	239433	4907	-1758	-0.73
1978	250626	11193	4528	1.81
1979	257679	7053	388	0.15
1980	264693	7014	349	0.13
1981	267346	2653	-4012	-1.5
1982	261973	-5373	-12038	-4.6
1983	271284	9311	2646	0.98
1984	287076	15792	9127	3.18
1985	307866	20790	14125	4.59
1986	324453	16587	9922	3.06
1987	340835	16382	9717	2.85
1988	356225	15390	8725	2.45
1989	366294	10069	3404	0.93
1990	378979	12685	6020	1.59
1991	363077	-15902	-22567	-6.22
1992	356169	-6908	-13573	-3.81
1993	359769	3600	-3065	-0.85
1994	364674	4905	-1760	-0.48
1995	369723	5049	-1616	-0.44
1996	378225	8502	1837	0.49
1997	387407	9182	2517	0.65
1998	390484	3077	-3588	-0.92
1999	395371	4887	-1778	-0.45
2000	403532	8161	1496	0.37

POPULATION

Year	Value	Change	Deviation	%Deviation
1969	639024	0	0	0
1970	666136	27112	21969	3.3
1971	687757	21621	16478	2.4
1972	697949	10192	5049	0.72
1973	693012	-4937	-10080	-1.45
1974	689495	-3517	-8660	-1.26
1975	683044	-6451	-11594	-1.7
1976	680269	-2775	-7918	-1.16
1977	674922	-5347	-10490	-1.55
1978	671171	-3751	-8894	-1.33
1979	665610	-5561	-10704	-1.61
1980	666369	759	-4384	-0.66
1981	670209	3840	-1303	-0.19
1982	671811	1602	-3541	-0.53
1983	674430	2619	-2524	-0.37
1984	679390	4960	-183	-0.03
1985	683487	4097	-1046	-0.15
1986	688863	5376	233	0.03
1987	694845	5982	839	0.12
1988	708095	13250	8107	1.14
1989	719550	11455	6312	0.88
1990	731076	11526	6383	0.87
1991	743058	11982	6839	0.92
1992	749080	6022	879	0.12
1993	753273	4193	-950	-0.13
1994	762733	9460	4317	0.57
1995	770861	8128	2985	0.39
1996	779187	8326	3183	0.41
1997	780666	1479	-3664	-0.47
1998	789037	8371	3228	0.41
1999	795048	6011	868	0.11
2000	803612	8564	3421	0.43

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