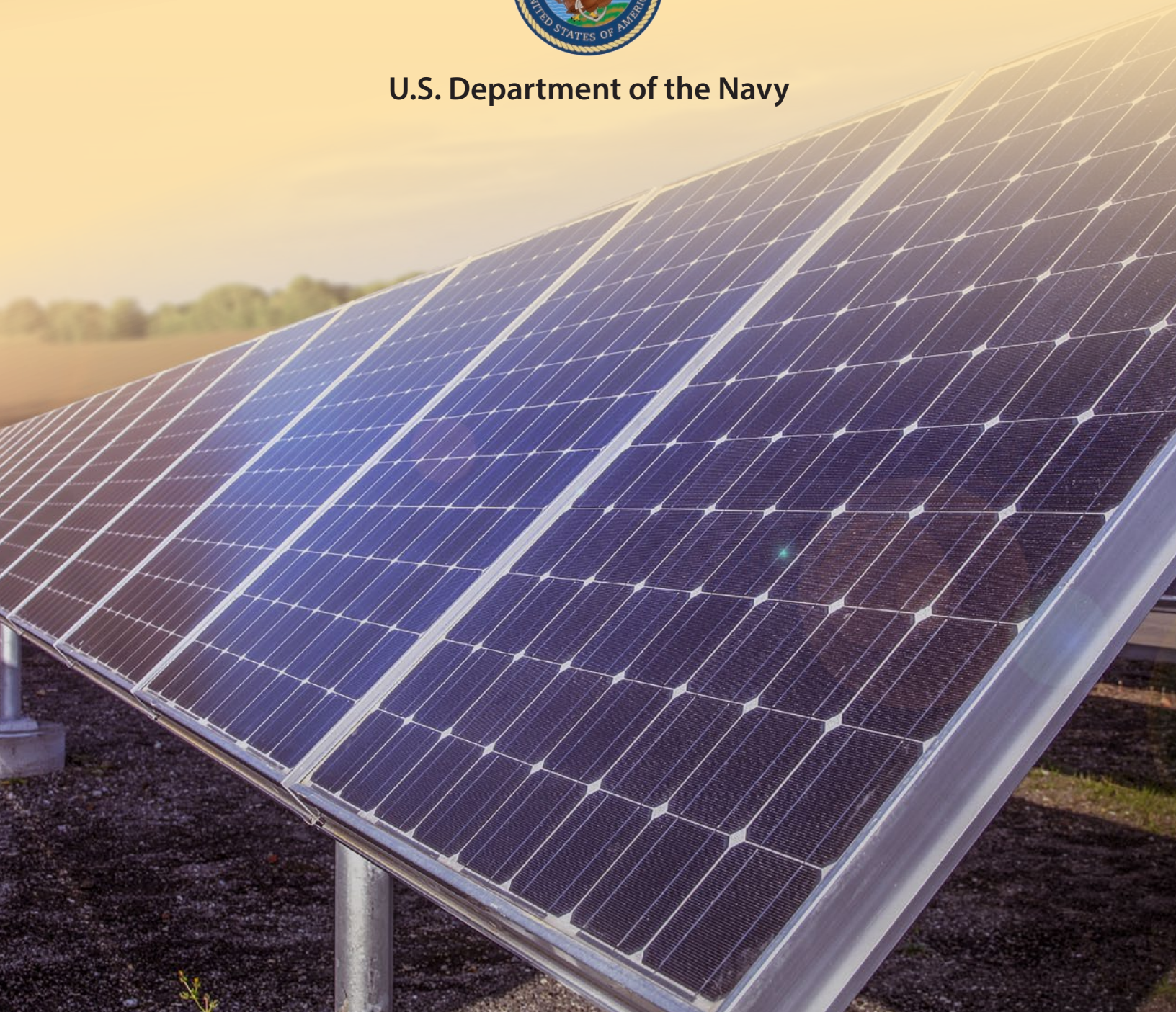
September 2015

Environmental Assessment
for Construction and Operation of Solar Photovoltaic Systems at

Joint Base Anacostia-Bolling, Washington, D.C.

U.S. Department of the Navy



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Lead Agency:

United States Department of the Navy

In accordance with Chief of Naval Operations Instruction 5090.1D

ENVIRONMENTAL ASSESSMENT FOR THE CONSTRUCTION AND OPERATION OF A SOLAR PHOTOVOLTAIC SYSTEM AT JOINT BASE ANACOSTIA-BOLLING WASHINGTON, DISTRICT OF COLUMBIA

September 2015

ABSTRACT

The U.S. Department of the Navy (Navy) is proposing to construct, operate, and decommission a solar photovoltaic (PV) system at Joint Base Anacostia-Bolling (JBAB) located in Washington, District of Columbia. The Navy's proposed action is to enter into a power purchase agreement (PPA) with an independently operated commercial power utility for the construction, operation, and decommissioning of a solar PV system. The utility company would sell all power generated by the solar PV facilities to the Navy at an agreed-upon rate. Upon the expiration date of the PPA, the Navy would decide either to extend or terminate the agreement. In the event the Navy terminates the PPA, the utility company would be required to remove the solar PV facilities and return all utilized site locations to their original condition. As required by the Council on Environmental Quality regulations, this assessment also analyzes the No Action Alternative.

The purpose of the proposed action is to increase Navy installation energy security, operational capability, strategic flexibility, and resource availability through the development of renewable energy-generating assets at Joint Base Anacostia-Bolling. The proposed action is needed to assist in meeting the renewable energy goals of the 1 GW Initiative and the Secretary of the Navy's 2009 energy goals, which include producing 50 percent of the Navy's shore-based energy requirements from alternative sources by 2020, as well as other federal policy directives, including the most recent Executive Order 13693, Planning for Federal Sustainability in the Next Decade.

Resource areas reviewed in the document include land use, visual resources and aesthetics, utilities and infrastructure, cultural resources, air quality, geology, topography, and soils, biological resources, noise, traffic and transportation, water resources, protection of children, and human health and safety. The environmental analysis for these resource areas found no significant impacts.

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Acronyms and Abbreviations

AC	alternating current
AFB	Air Force Base
APE	area of potential effect
AST	aboveground storage tank
BMP	best management practice
°C	degrees Celsius
CAA	Clean Air Act
CDC	child development center
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CSP	concentrating solar power
dB	decibel
dBA	A-weighted sounds levels
dBA Leq	equivalent or average noise level for a given period
DC	direct current
DDOE	District Department of the Environment
DIA	Defense Intelligence Agency
District	overlay district
DOD	Department of Defense
DOE	Department of Energy
EA	environmental assessment
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPAct	Energy Policy Act of 2005
ERP	Environmental Restoration Program
ESQD	explosive safety quantity distance
FAA	Federal Aviation Administration
FY	fiscal year
GHG	greenhouse gas

GW	gigawatt
GWP	global warming potential
HMX-1	Marine Helicopter Squadron One
HVAC	heating, ventilating, and air conditioning
I-	Interstate
ICRP	International Commission on Non-Ionizing Radiation Protection
JBAB	Joint Base Anacostia-Bolling
LBP	lead-based paint
Ldn	day-night average sound level, also known as DNL
LOS	level of service
kV	kilovolt(s)
m	meter
mG	milligauss
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NAVFAC	Naval Facilities Engineering Command
Navy	U.S. Department of the Navy
NEPA	National Environmental Policy Act of 1969
NGVD88	National Geodetic Vertical Datum 1988
NHPA	National Historic Preservation Act of 1966
NIEHS	National Institute of Environmental Health Sciences
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NREL	National Renewable Energy Laboratory
NRHP	National Register of Historic Places
NRL	Naval Research Laboratory
NSF	Naval Support Facility
O_3	ozone
OPNAVINST	Chief of Naval Operations Instruction
PCB	polychlorinated biphenyl
PEPCO	Potomac Electric Power Company
$PM_{2.5}$	particulate matter with a diameter equal to or less than 2.5 micrometers

PM_{10}	particulate matter with a diameter equal to or less than 10 micrometers
PV	photovoltaic
Reagan National Airport	Ronald Reagan Washington National Airport
REPO	Renewable Energy Program Office
SO_2	sulfur dioxide
SO_x	sulfur oxides
Standards	*Secretary of the Interior's Standards for the Treatment of Historic Properties*
U.S.C.	United States Code
UST	underground storage tank
VOC	volatile organic compound

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EXECUTIVE SUMMARY

ES.1 Type of Report

This environmental assessment (EA) evaluates the reasonably foreseeable environmental impacts of the U.S. Department of the Navy's (Navy's) proposed action to enter into a power purchase agreement (PPA) with an independently operated commercial power utility for the construction, operation, and decommission of a solar photovoltaic (PV) system that would generate electricity to supply Joint Base Anacostia-Bolling.

This EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) (42 United States Code [U.S.C.] 4321); Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1500; and Navy procedures for implementing NEPA (32 CFR 775). The Navy is the lead agency for the proposed action. The action proponent is the Commander of Naval District Washington, supported by the Commanding Officer of Joint Base Anacostia-Bolling.

ES.2 Description of the Proposed Action

The purpose of the proposed action is to increase Navy installation energy security, operational capability, strategic flexibility, and resource availability through the development of renewable-energy generating assets at Joint Base Anacostia-Bolling. The proposed action is needed to meet the renewable energy standards put forth by the 1 Gigawatt (GW) Initiative, and the Secretary of the Navy's 2009 energy goals, which include the requirement to produce 50 percent of the Navy's shore-based energy supply from alternative sources by 2020, as well as other federal directives, including the most recent Executive Order (EO) 13693.

ES.3 Alternatives

The Navy proposes to allow a power utility to develop up to approximately 50 acres, including land, parking lots, and building rooftops within Joint Base Anacostia-Bolling for the construction and operation a solar PV system that would generate renewable energy to supply the existing installation electrical energy grid. The proposed action would be a utility-scale project, which is defined as 10 megawatts (MW) or more. The goal is to produce 5 MW on the North side and 5 MW on the South side of the installation because two separate utilities systems exist at JBAB, a legacy of the time when the installation was managed as two separate properties—Naval Support Facility (NSF) Anacostia and Bolling Air Force Base (AFB). Approximately 35 acres are proposed on the North side and 15 acres on the South side. The sites proposed for construction of the solar PV systems are shown in Table ES-1 and Table ES-2.

Table ES-1 Proposed Solar PV Project Sites for Joint Base Anacostia-Bolling (North Side)

Site	Site Area Estimated to be Available for Solar PV Development[a] (acres)	Estimated Generation Capacity (KW)
Building Rooftop		
Building 413 (CDC III)	0.32	0
Building 168	0.91	0
Building 350	0.26	92
Building 351	0.86	301
Building 362	0.39	136
Building 400	0.43	151
Building 421	0.46	0

Site	Site Area Estimated to be Available for Solar PV Development[a] (acres)	Estimated Generation Capacity (KW)
Building 417	0.31	107
Building 419	0.26	0
Building 47	0.37	0
Building Rooftop Total	***4.58***	***786***
Parking Lot		
Parking lot south of Building 168	1.31	228
Parking lot northwest of Building 358	0.76	132
Building 358 (parking garage)	1.11	193
Vehicle storage area	4.79	835
Parking lot east of Building 400	2.64	460
Building 419 parking lot	0.96	167
Parking Lot Total	***11.57***	***2,016***
Land		
North end (ball fields)	12.10	2,017
Vacant/Underutilized land and parking lot south of ball fields (near Firth Sterling Gate)	9.49	1,582
Ground-mounted System Total	***21.59***	***3,598***
Total North side	**37.74**	**6,400**

Notes: CDC – child development center, KW – kilowatt, PV – photovoltaic

[a] Rooftop usability factor is 0.6 (the estimate of the usable SF on each rooftop)

Table ES-2 Proposed Solar PV Project Sites for Joint Base Anacostia-Bolling (South Side)

Site	Site Area Estimated to be Available for Solar PV Development[a] (acres)	Estimated Generation Capacity (kW)
Building Rooftop		
Building 4570 (commissary)	0.89	312
Building 4514 (Navy Exchange)	1.03	358
Building 4472	0.15	52
Building 4455 (CDC II)	0.31	0
Building 4485	0.29	102
Building 4456 (CDC I)	0.38	132
Building 1311	0.22	77
Building 5681	0.28	98
Building 5683	0.20	69
Building B421	0.19	0
Building 370	0.18	63
Building 1310	0.31	107
Building 371	0.47	165
Building 50	0.53	0
Building 520	0.70	0
Building 3620	0.16	54
Building 3619	0.17	59
Building 3618	0.21	0
Building 3621	0.17	0

Site	Site Area Estimated to be Available for Solar PV Development[a] (acres)	Estimated Generation Capacity (kW)
Building 3623	0.17	59
Building 256	0.39	0
Building 3610 (chapel)	0.28	98
Building Rooftop Total	***7.68***	***1,804***
Parking Lot		
Parking lot Building 370	0.98	171
Commissary/Exchange parking lot	6.40	1,115
Parking Lot Total	***7.38***	***1,286***
Land		
Open space off Duncan Avenue (Lemon lot)	2.23	372
Vacant/ Underutilized land west of Building 370	4.93	822
Land Total	***7.16***	***1,194***
Total South side	**22.22**	**4,284**

Notes: CDC – child development center, KW – kilowatt, NRL – Naval Research Laboratory, PV – photovoltaic

[a] Rooftop usability factor is 0.6.

Although the No Action Alternative does not meet the Navy's purpose and need, the inclusion of the No Action Alternative is required by CEQ regulations and is carried forward for analysis in this EA.

Under the No Action Alternative, the installation of solar PV systems would not occur at Joint Base Anacostia-Bolling. Thus, various federal statutes and executive orders that mandate changes in energy consumption and production would not be addressed, and the No Action Alternative would not increase renewable energy production or use. The No Action Alternative would not meet the renewable energy objectives of the Navy or the goals, purpose, and need for the proposed action.

ES.4 Summary of Potential Environmental Impacts

This EA describes the potential environmental impacts of the proposed action and alternatives on the existing environmental resources. Resource areas where a negligible, minor, or equivalent impact was identified consist of:

- Land Use
- Visual Resources and Aesthetics
- Utilities and Infrastructure
- Air Quality
- Geology, Topography, and Soils
- Biological Resources
- Noise
- Traffic and Transportation
- Water Resources
- Protection of Children

- Human Health and Safety (with the exception of aviation-related safety; see Section ES 4.2 below)

Other resource areas for which a direct or indirect impact was identified that was other than negligible, minor, or the equivalent are summarized below. No significant impacts would result from the proposed action.

ES 4.1 Cultural Resources

- Impacts to the National Register of Historic Places-eligible Buildings 168 and 169, as well as in and around the historic district would be direct, moderate, and adverse. PV arrays would be installed in a manner where they are not visible from the ground, which would reduce impacts.
- Visual impacts to the East and West Potomac Parks Historic District, the Fort McNair Historic District/National War College, and the St. Elizabeths Historic District would be minor to moderate and adverse.
- Impacts to the Suitland Parkway would be minor, indirect, and adverse and impacts to the Buzzard Point Power Plant would be minimal.
- The installation of carport solar panels and the ground-mounted solar panels would not affect archaeological resources; however, the installation of ground-mounted solar PV arrays on the South side could have adverse impacts pending an archaeological survey.
- Section 106 consultation concluded there would be no adverse effect to historic resources with specific stipulations (see Appendix D).

ES 4.2 Human Health and Safety

- (Specific to aviation-related safety) A glint and glare analysis performed by the National Renewable Energy Laboratory (NREL) for Reagan National Airport with respect to the proposed solar PV facilities found some potential for glare for final approach paths and the air traffic control tower. NREL recommended that glint/glare be reanalyzed once the solar PV facility designs are available. As a result of following the siting and approval process, as well as federal policy and guidance on aviation safety related to glint/glare from solar facilities, there would be no significant impacts on aviation-related safety associated with glint and glare.

ES.5 Areas of Potential Controversy

Implementation of the proposed action is not expected to generate controversy.

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

The U.S. Department of the Navy (Navy) has prepared this environmental assessment (EA) to evaluate the environmental consequences of the construction and operation of solar photovoltaic (PV) facilities at Joint Base Anacostia-Bolling (JBAB), Washington, D.C. Other renewable technologies were also initially considered for development at JBAB but were eliminated from further analysis in this EA as discussed in Chapter 2, Section 2.3.

The Navy would allow approximately 50 acres of Navy-owned property at one or more sites to be developed by an independently operated commercial power utility company (power utility) for a solar PV system. The utility company would construct and operate one or several solar facilities at one or more sites, consisting of PV cells that collect energy from sunlight for the production of electricity. The renewable energy created would be supplied to the existing electrical energy grid that currently provides power on the installation. Land would be leased under agreement to the power utility for an estimated 37 years, including 2 years for construction, 25 years of operation, and two 5-year options. After the terms of the agreement expire, the Navy and the power utility would consider a range of options, including renewing the agreement or decommissioning the system. The proposed project should be implementable by December 31, 2016.

This EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA); (42 United States Code [U.S.C.] §4321); Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulations [CFR] Part 1500; and Navy procedures for implementing NEPA (32 CFR Part 775). The Navy is the lead agency for the proposed action. The regional Commander, Navy Installations Command (CNIC), supported by the installation, is the action proponent.

1.2 Background

The Navy's energy strategy is centered on energy security, energy efficiency and sustainability while remaining the pre-eminent maritime power.

- Energy security is critical to mission success. Energy security safeguards Navy energy infrastructure and shields the Navy from a volatile energy supply.
- Efficiency increases mission effectiveness. Efficiency improvements minimize operational risks while saving time, money, and lives.
- Sustainable efforts protect mission capabilities. Investment in environmentally responsible technologies afloat and ashore reduces greenhouse gas (GHG) emissions and lessens dependence on fossil fuels.

In October 2009, the Secretary of the Navy established renewable energy goals for the Navy's shore-based installations to meet by 2020. These goals include:

1. The Navy will produce or procure at least 50 percent of the total quantity of electric energy consumed by shore-based facilities and activities each fiscal year from alternative energy sources;
2. Fifty percent of Navy installations will be net zero (i.e., over the course of a fiscal year, an installation matches or exceeds the electrical energy it consumes ashore with electrical energy generated from alternative energy sources) (Navy 2012).

The Navy's goals and energy strategy are aligned with renewable energy policies being developed throughout the federal government and contained in the following executive order (EO) and statutes:

- EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance* (2009): This EO requires federal agencies to set percentage reduction targets for GHG emissions for fiscal year (FY) 2020. Agencies are instructed to consider measures for the targets by increasing energy efficiency, reducing use of fossil fuels, and increasing use of renewable energy and implementing renewable energy generation projects on agency property.[1]
- Energy Policy Act of 2005 (EPAct) (42 U.S.C. §15852): Section 203 of the EPAct requires that the federal government consume not less than 7.5 percent of its electricity from renewable sources after FY 2013.
- Title 10 U.S.C. §2911(e): This statute requires the submission of an energy performance master plan and performance goals, including the goal to produce or procure 25 percent of the total quantity of energy consumed within its facilities from renewable sources by 2025 and each FY thereafter.

In December 2013, President Obama signed a presidential memorandum that requires federal agencies to produce or procure from renewable sources 20 percent of electricity consumed by facilities by FY 2020 and each fiscal year thereafter, an amount that represents a more aggressive goal than under the EPAct or 10 U.S.C. §2911(e). The memorandum also establishes interim goals of 10 percent by 2015, 15 percent by 2016, and 17.5 percent by 2018. The memorandum states that the renewable energy consumption target be achieved by: 1) installing agency-funded renewable energy at federal facilities, or 2) contracting for energy that includes the installation of a renewable energy project on-site at a federal facility. The memorandum implements the goal outlined by President Obama in the June 2013 Climate Action Plan. As part of this effort, agencies are instructed "to consider opportunities, to the extent economically feasible and technically practical, to install or contract for energy installed on current or formerly contaminated lands, landfills, and mine sites." [2]

In support of the EPAct and 10 U.S.C. §2911(e) renewable energy goals, the Secretary of the Navy created the 1 Gigawatt (GW) Initiative—named for the amount of renewable energy generation capacity to be deployed by 2020 (Navy 2012)—either on or near Navy installations. This goal was initially stated in the President's 2012 State of the Union Address and is consistent with the Secretary of the Navy's 2009 alternative energy goal and the 2013 presidential memorandum.

With the 1 GW Initiative, the Navy took a more aggressive approach to implement cost-effective and mission-compatible projects at its shore facilities. The Navy established the Renewable Energy Program Office (REPO) specifically to work with local commercial utilities to use private-sector funds to construct renewable energy facilities on Navy land. Three Regional Program Offices have been established to implement the projects at shore facilities across the country and abroad.

On March 19, 2015, President Obama issued EO 13693, Planning for Federal Sustainability in the Next Decade (80 FR 15872[March 25, 2015]). This EO replaced EO 13514 and the 2013 presidential memorandum and set new goals and timelines for use of renewable electrical energy by federal agencies. EO 13693 requires that:

1) The percentage of the total amount of building electrical energy and thermal energy be clean energy, accounted for by renewable electrical energy and alternative energy, by the following dates:

[1] EO 13514 has been replaced by EO 13693, Planning for Federal Sustainability in the Next Decade, signed March 19, 2015.

[2] The presidential memorandum of December 5, 2013, has been replaced by EO 13693, Planning for Federal Sustainability in the Next Decade, signed March 19, 2015.

- Not less than 10 percent in FYs 2016 and 2017;
- Not less than 13 percent in FYs 2018 and 2019;
- Not less than 16 percent in FYs 2020 and 2021;
- Not less than 20 percent in FYs 2022 and 2023; and
- Not less than 25 percent by FY 2025 and each year thereafter.

2) The percentage of the total amount of building electrical energy consumed by the agency that is renewable electrical energy be met by the following dates.
   - Not less than 10 percent in FYs 2016 and 2017;
   - Not less than 15 percent in FYs 2018 and 2019;
   - Not less than 20 percent in FYs 2020 and 2021;
   - Not less than 25 percent in FYs 2022 and 2023; and
   - Not less than 30 percent by FY 2025 and each year thereafter.

Actions that may be considered to meet the percentage goals for building electrical energy and thermal energy include:

- Installing agency-funded renewable energy on site at federal facilities to include installing fuel cell energy systems; and
- Contracting for the purchase of energy that includes installing renewable energy on site at a federal facility.

1.3 Purpose and Need

The purpose of the proposed action is to increase Navy installation energy security, operational capability, strategic flexibility, and resource availability through the development of renewable energy generating assets at JBAB. The proposed action is needed to meet the renewable energy standards put forth by the 1 GW Initiative, and the Secretary of the Navy's 2009 energy goals, which include the requirement to produce 50 percent of the Navy's shore-based energy requirements from alternative sources by 2020, as well as other federal directives, including the most recent EO 13693.

1.4 Project Location and Description

JBAB occupies an approximately 970-acre long and relatively narrow strip of land in southeast Washington, D.C.; see Figure 1-1. It is bordered by the Potomac and Anacostia Rivers to the west; South Capitol Street, Overlook Avenue, and Interstate (I-) 295 to the east; Naval Research Laboratory (NRL) to the south; and the South Capitol Street Bridge, also known as the Frederick Douglass Memorial Bridge, on the north.

Following the recommendations of the 2005 Base Realignment and Closure Commission, JBAB was established on October 1, 2010, by combining three contiguous properties that were separately managed by the Navy and the U.S. Air Force—Naval Support Facility (NSF) Anacostia (also referred to as Anacostia Annex), Bolling Air Force Base (AFB), and the Bellevue Housing Complex (Navy 2014b). This joint base command structure reports to Naval District Washington. The transition to a joint base began with an initial operating capability on January 31, 2010, and reached full operational capability on October 1, 2010 (Navy 2014a).

1.5 Scope of the Environmental Assessment

This EA evaluates the reasonably foreseeable environmental impacts of the Navy's proposed action to lease approximately 50 acres, including undeveloped land, parking lots (for carports), and building rooftops within JBAB to an independently operated power utility company or companies for the construction, operation, and decommissioning of a solar PV system that would generate electricity for JBAB.

The resource areas that have the potential to be affected by the proposed action evaluated in this EA are as follows:

- Land Use
- Visual Resources
- Utilities and Infrastructure
- Cultural Resources
- Air Quality
- Geology, Topography, and Soils
- Vegetation and Wildlife
- Noise
- Traffic and Transportation
- Water Resources
- Protection of Children
- Health and Safety

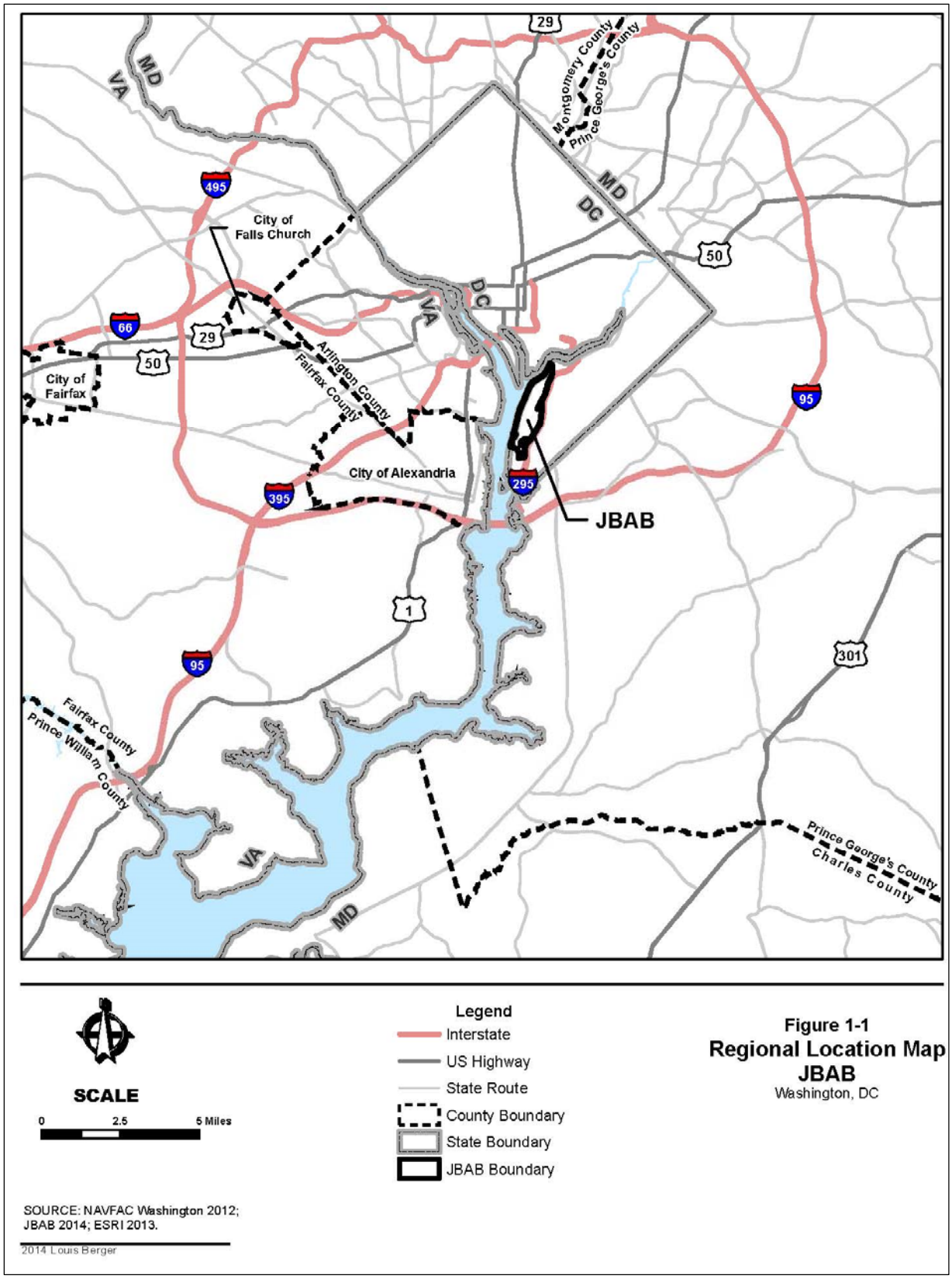

Figure 1-1 Regional Location Map of Joint Base Anacostia-Bolling, Washington, D.C.

The following resource areas are not likely to be affected by the construction and operation of the solar PV array systems on JBAB and are excluded from the analysis for the following reasons:

- Natural Gas; Heating, Ventilating, and Air Conditioning (HVAC); Water Supply and Wastewater Infrastructure; and Solid Waste—These resources are present at the proposed solar PV project sites. However, the proposed action would not require changes to natural gas use or HVAC systems, would not affect drinking water capacity for the project area, and would not generate wastewater that would require transport to and treatment at local wastewater treatment facilities. Therefore, the proposed action would have no impact on these resources. Additionally, the proposed action would only generate solid waste during construction of the solar PV array system, which would be disposed of according to all applicable regulations. As a result, natural gas, HVAC, water supply and wastewater infrastructure, and solid waste are not analyzed in this EA.
- Socioeconomics—The proposed action to construct and operate a solar PV array system at JBAB would not result in changes to population, demographics, income, community services and facilities, or housing. Personnel hired for construction and maintenance activities are unlikely to change their places of residence. Additionally, the proposed action would result in only temporary and negligible additive impacts to the local economy during construction. As a result, socioeconomics are not analyzed in this EA.
- Environmental Justice—EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*, directs agencies to address environmental and human health conditions in minority and low-income communities to avoid the disproportionate placement of any adverse effects from federal policies and actions on these populations. Local residents may include minority and/or low-income populations, but these populations would not be disproportionately affected by the construction or operation of the proposed solar PV array systems. As a result, environmental justice is not analyzed in this EA.
- Threatened and Endangered Species—No species listed under the Endangered Species Act as threatened or endangered are known to occur on JBAB. The Hay's spring amphipod (*Stygobromus hayi*), a small aquatic, subterranean obligate found in groundwater outlets that feed low gradient creeks, and the northern long-eared bat (*Myotis septentrionalis*), which typically hibernates in caves and abandoned mines in the winter and roosts in tree cavities and under exfoliating bark in the summer are listed as endangered or proposed endangered, respectively within the District of Columbia. However, habitat conditions for the Hay's spring amphipod and the northern long-eared bat are not found on the JBAB (Navy 2014c). Additionally, the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and the shortnose sturgeon (*A. brevirostrum*) within the Chesapeake Bay system are listed as endangered by the National Oceanic and Atmospheric Administration. The Atlantic sturgeon is believed to be extirpated from the District of Columbia, and the shortnose sturgeon has been found in the Potomac River as far as Cole's Bridge, north of JBAB (Navy 2014c). However, the proposed action would not occur in the Potomac River, and as a result, threatened and endangered species are not analyzed in this EA.
- Coastal Zone Management—JBAB is located within the municipal limits of Washington, D.C. The District of Columbia does not participate in the National Coastal Zone Management Program. Although Maryland is one of 35 coastal and Great Lakes states and territories (with the exception of Alaska) that do participate in the National Coastal Zone Management Program, Maryland's coastal zone follows the inland boundary of the counties bordering the Potomac River only as far as the municipal limits of Washington, D.C. As a result, Coastal Zone Management is not analyzed in this EA.

- Wetlands—No wetlands are located within the proposed project sites. Installation of rooftop and parking lot solar PV arrays would occur on existing impervious surface.

1.6 Agency Coordination and Permit Requirements

NEPA requires that federal agencies responsible for preparing NEPA analyses and documentation do so "in cooperation with State and local governments" and other agencies with jurisdiction by law or special expertise (42 U.S.C. §§ 4331[a] and 4332[2]). Table 1-1 provides a summary of applicable regulatory requirements and agencies. Agency coordination letters are found in Appendix A.

The EA was released for a 30-day public review period. During that time period, one public comment from the National Capital Planning Commission (NCPC) was received. NCPC provided several substantive concerns regarding the visual, cultural, and environmental impacts of the proposed solar panels. Specifically, NCPC requested that JBAB maximize use of carport and rooftop arrays in order to limit construction in a floodplain, reduce vegetation clearing, limit impacts to Navy operations, and to be consistent with JBAB's Master Plan. NCPC's comment letter and Navy response to NCPC comments are provided in Appendix D.

Table 1-1 Agency Coordination and Permit Requirements

Regulation	Agency	Permit/Application	Regulated Activity
National Environmental Policy Act (42 U.S.C. §4321 et seq.)	U.S. Department of the Navy	Categorical Exclusion, Finding of No Significant Impact or Record of Decision	Federal actions
Clean Air Act (42 U.S.C. §7401 et seq.)	U.S. Environmental Protection Agency	Compliance with National Ambient Air Quality Standards Conformity Determination	Federal actions that result in air emissions Compliance with the General Conformity Rule
Clean Water Act (33 U.S.C. §1251 et seq.)	U.S. Army Corps of Engineers	Sections 401 and 404	Impacts on jurisdictional wetlands and/or other waters of the United States
Water Quality Regulations (Title 21-11, DC Municipal Regulations)	District of Columbia Department of the Environment, Water Quality Division	Water quality certificate	Projects that impact surface and ground waters of the District of Columbia by dredging, filling, water withdrawals, and site disturbances
Clean Water Act (33 U.S.C. §1251 et seq.)	U.S. Environmental Protection Agency	National Pollutant Discharge Elimination System	Construction activities on areas equal to or larger than 1 acre
Regulations for the District of Columbia Pollutant Discharge Elimination System (Title 21-500, DC Municipal Regulations)	District of Columbia Department of the Environment, Stormwater Management Division	District of Columbia Pollutant Discharge Elimination System, General Permit for Stormwater Discharge Associated with Construction Activity	Construction activities within the District of Columbia
Rivers and Harbors Act of 1899 (33 U.S.C. §403 et seq.)	U.S. Army Corps of Engineers	Permit for Work in Navigable Waters (Section 10 Permit)	Obstruction or alteration of any navigable water of the United States

Regulation	Agency	Permit/Application	Regulated Activity
National Historic Preservation Act of 1966 as amended (16 U.S.C. § 470 and amendments)	Advisory Council on Historic Preservation District of Columbia Historic Preservation Office National Capital Planning Commission	Section 106 consultation	Federal undertakings that may affect properties that have been formally listed or determined eligible for listing in the National Register of Historic Places
American Indian Religious Freedom Act of 1978, Archaeological Resources Protection Act of 1979, and Native American Graves Protection and Repatriation Act of 1990 (42 U.S.C. §1996; 54 U.S.C. §300101 et seq. 25 U.S.C. §3001 et seq.)	Appropriate representative of the affected tribes	Consultation with affected tribes	Presence of cultural resources on federal land
Endangered Species Act (16 U.S.C. §§1531–1544)	U.S. Fish and Wildlife Service District of Columbia Department of the Environment, Fisheries and Wildlife Division	Agency consultation for presence of threatened and endangered species	Federal actions potentially affecting threatened and endangered species or resulting in the destruction or adverse modification of the designated critical habitat of such species
Migratory Bird Treaty Act (16 U.S.C. §703–712)	U.S. Fish and Wildlife Service	Agency consultation on migratory birds	Activities with the potential to take, capture, kill, or attempt to take a migratory bird
Bald and Golden Eagle Protection Act (16 U.S.C. §§668–668c)	U.S. Fish and Wildlife Service	Agency consultation on bald or golden eagles	Activities with the potential to take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle or any golden eagle, alive or dead, or any part, nest, or egg thereof
Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. §103)	U.S. Environmental Protection Agency	Agency coordination/approval	Development on Comprehensive Environmental Response, Compensation, and Liability Act sites undergoing remediation
Executive Order 11988, *Floodplain Protection*	Federal Emergency Management Agency	Agency coordination/approval	Actions located in or adversely affecting floodplains

2.0 PROPOSED ACTION AND ALTERNATIVES

Chapter 2 provides a description of the proposed action (Section 2.1), the No Action Alternative (Section 2.2), and Alternatives Considered but Eliminated (Section 2.3). Section 2.4 provides a comparative summary of the environmental consequences of the proposed action and alternatives.

To achieve 1 GW of renewable energy generation capacity by 2020, the Navy recognized the need to develop opportunities for large-scale projects that would be attractive to local public utilities. The Navy used a two-step evaluation to identify potential large-scale projects. Initially, the Navy evaluated commercially available alternative renewable energy technologies that could be implemented by a public utility on Navy-owned land. Projects needed to be cost effective and readily integrated into the existing electrical supply grid to be attractive. Alternative renewable energy technologies considered but eliminated from further consideration based on these considerations are discussed in Section 2.3.

Upon determining that the most viable renewable technology for a public utility to implement at most installations would be a solar PV system, the REPO then requested Naval installations to identify land areas within the installation that could potentially support a solar PV system. The site selection process required the installations to consider a number of site-specific factors to identify suitable land areas for a solar PV system. The site selection process is discussed further under the description of the proposed action in Section 2.1.

Personnel at JBAB identified potential sites for solar PV facilities to be constructed that could be used to supplement the electrical supply that currently services the installation. No single site that would allow development of a ground-mounted utility-scale project is available at JBAB; therefore, personnel identified multiple sites in proximity to facilities that would consume the energy generated, including ground-mounted, carport-mounted, or rooftop-mounted.

All of the potentially viable sites for development of a solar PV facility are considered as part of the proposed action. In the agreement between the Navy and the power utility, one or more of these sites may be developed with a solar PV facility. If more than one site is developed, these facilities would be part of a larger solar PV system.

Chapter 2 also considers the No Action Alternative in Section 2.2. Although the No Action Alternative does not meet the Navy's purpose and need, the inclusion of this alternative is prescribed by CEQ regulations and will be carried forward for analysis in this EA.

2.1 Proposed Action Alternative

Section 2.4 provides a comparative summary of the environmental consequences of construction, operation, and decommissioning of the proposed solar PV facility for each location at JBAB and the No Action Alternative.

The Navy proposes to allow a power utility to develop up to approximately 50 acres, including land, parking lots, and building rooftops within JBAB for the construction and operation of a solar PV system that would generate renewable energy to supply the existing installation electrical energy grid. The proposed action would be a utility-scale project, which is defined as 10 megawatts (MW) or more. The goal is to produce 5 MW on the North side and 5 MW on the South side of the installation because two separate utilities systems exist at JBAB, a legacy of the time when the installation was managed as two separate properties—NSF Anacostia and Bolling AFB. Approximately 35 acres are proposed on the North side and 15 acres on the South side. The sites proposed for construction of the solar PV systems are shown in Figures 2-1a and 2-1b; the site acreage and generation estimates are shown in Tables 2-1 and 2-2.

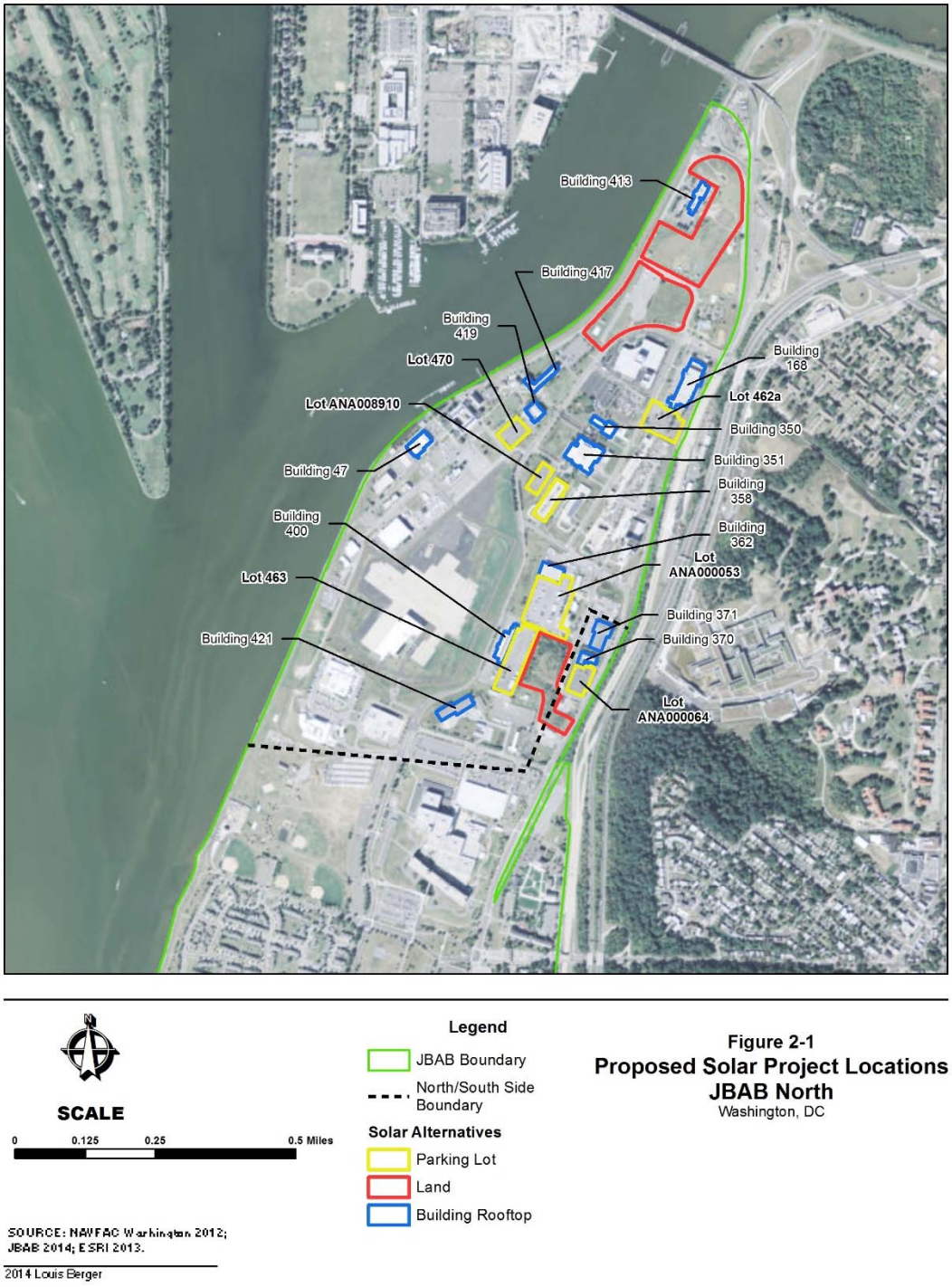

Figure 2-1 Proposed Solar Project Locations on Joint Base Anacostia-Bolling (North Side)

Figure 2-2 Proposed Solar Project Locations on Joint Base Anacostia-Bolling (South Side)

Table 2-1 Proposed Solar PV Project Sites for Joint Base Anacostia-Bolling (North Side)

Site	Site Area Estimated to be Available for Solar PV Development[a] (acres)	Estimated Generation Capacity (KW)
Building Rooftop		
Building 413 (CDC III)	0.32	0
Building 168	0.91	0
Building 350	0.26	92
Building 351	0.86	301
Building 362	0.39	136
Building 400	0.43	151
Building 421	0.46	0
Building 417	0.31	107
Building 419	0.26	0
Building 47	0.37	0
Building Rooftop Total	***4.58***	***786***
Parking Lot		
Parking lot south of Building 168	1.31	228
Parking lot northwest of Building 358	0.76	132
Building 358 (parking garage)	1.11	193
Vehicle storage area	4.79	835
Parking lot east of Building 400	2.64	460
Building 419 parking lot	0.96	167
Parking Lot Total	***11.57***	***2,016***
Land		
North end (ball fields)	12.10	2,017
Vacant/Underutilized land and parking lot south of ball fields (near Firth Sterling Gate)	9.49	1,582
Ground-mounted System Total	***21.59***	***3,598***
Total North side	**37.74**	**6,400**

Notes: CDC – child development center, KW – kilowatt, PV – photovoltaic

[a] Rooftop usability factor is 0.6 (the estimate of the usable SF on each rooftop)

Table 2-2 Proposed Solar PV Project Sites for Joint Base Anacostia-Bolling (South Side)

Site	Site Area Estimated to be Available for Solar PV Development[a] (acres)	Estimated Generation Capacity (KW)
Building Rooftop		
Building 4570 (commissary)	0.89	312
Building 4514 (Navy Exchange)	1.03	358
Building 4472	0.15	52
Building 4455 (CDC II)	0.31	0
Building 4485	0.29	102
Building 4456 (CDC I)	0.38	132
Building 1311	0.22	77
Building 5681	0.28	98
Building 5683	0.20	69
Building B421	0.19	0
Building 370	0.18	63
Building 1310	0.31	107
Building 371	0.47	165
Building 50	0.53	0
Building 520	0.70	0
Building 3620	0.16	54
Building 3619	0.17	59
Building 3618	0.21	0
Building 3621	0.17	0
Building 3623	0.17	59
Building 256	0.39	0
Building 3610 (chapel)	0.28	98
Building Rooftop Total	***7.68***	***1,804***
Parking Lot		
Parking lot Building 370	0.98	171
Commissary/Exchange parking lot	6.40	1,115
Parking Lot Total	***7.38***	***1,286***
Land		
Open space off Duncan Avenue (Lemon lot)	2.23	372

Site	Site Area Estimated to be Available for Solar PV Development[a] (acres)	Estimated Generation Capacity (KW)
Vacant/ Underutilized land west of Building 370	4.93	822
Land Total	***7.16***	***1,194***
Total South side	**22.22**	**4,284**

Notes: CDC – child development center, KW – kilowatt, NRL – Naval Research Laboratory, PV – photovoltaic

[a] Rooftop usability factor is 0.6.

Solar PV technology uses solar cells to convert energy from direct and diffuse solar radiation into electricity. The basic unit in a PV system is a solar cell, made up of semiconductor material that absorbs solar radiation and converts it to an electrical current. Solar cells are contained within solar modules that are assembled into solar panels. A series of panels comprises a solar PV array.

The utility to be constructed would include solar PV arrays, panel mounting brackets on vertical members, and steel tracking structures within the project solar PV system site, as well as miscellaneous electrical equipment at the point of connection (i.e., inverters, combiner boxes, electrical switchgear, associated electrical wiring, and connections) and other items required for the solar PV system.

The sites on the North side would be connected to the Anacostia substation and the sites on the South side to the Bolling substation; the electricity would be directed to locations within the respective sides. The Navy anticipates that all poles and wire-carrying systems involved in the solar installations would need to be replaced or upgraded. The project design might incorporate some form of battery storage to provide dispatchable energy to balance fluctuations caused by weather, seasons, and nighttime darkness. A typical 1-MW battery is approximately the size of a 40-foot shipping container and might require a concrete slab foundation and a roof structure. The battery would typically be located near the power conditioning station described in Section 2.1.2.

Section 2.1.1 provides a description of the site selection process, and Section 2.1.2 provides a description of each of the site locations considered for one or more solar facilities. Section 2.1.3 provides a description of the solar PV technology, including system components and construction and construction, maintenance, and decommissioning activities.

2.1.1 Site Selection Process

In July 2014, the REPO requested that installations identify land areas within the installation that could potentially support a renewable energy, solar PV system. The minimum criterion was that the land area, whether within one or more sites, needed to be of sufficient size to support a utility-scale project. A utility-scale project was considered a facility of 10 MW or more, which for a solar PV facility would require approximately 50 acres of land (i.e., about 5 acres per MW).

When evaluating whether installation land areas could be considered for development of a solar PV facility, installations generally considered the following factors:

- Topography: Land areas for development of a ground-mounted solar PV facility need to be relatively flat (i.e., less than 5 percent slope).

- Separation: The solar PV facility would be operated by an independent power utility company. Therefore, the land area to be leased to the power utility should be able to be isolated from the operational facilities and ongoing functions of the installation.
- Mission compatibility: The land area for site development would need to be compatible with the military missions and training occurring at the installation. Site development and operation of the solar PV facility may not adversely impact military training.
- Future development: Each site would still require to undergo a site approval process to ensure that proper buffers, height restrictions, setbacks are fulfilled per the Installation Appearance Plan and to considering other proposed development as proposed in an Area Development Plan. Once approved, the land area proposed for development would be committed to the solar PV facility for the terms of the lease, up to 37 years. Therefore, future growth and development potential of the site to support the military mission needed to be considered far into the future.
- Formerly contaminated lands and landfills: Consistent with the 2013 presidential memorandum, installations considered use of these land areas that, due to their former use, are not readily convertible to otherwise productive use.
- Protected environmental resources: Installations sought to identify land areas that were not encumbered by wetlands, protected plant or animal species habitat, or known cultural resources.

Additionally for JBAB, the following site selection criteria were also applied in identifying locations for the development of a solar PV facility:

- Operational constraints, such as Air Installation Compatible Use Zones and airfield clearance; ammunition and explosive storage firing areas and explosive safety quantity distance (ESQD) arcs; and secret/restricted areas, were avoided.
- Vacant/underutilized land were set aside to fulfill installation requirements, even if there is no current available funding (i.e., charter school, child development center [CDC] IV, regional hotel/motel, RV park, consolidation of bachelor enlisted quarters, north commercial screening gate and Morale, Welfare, and Recreation Amphitheater).
- Ground-mounted facilities would be properly buffered to reduce the impacts to architectural character.
- The public-private venture for housing was not included as a proposed site but is not necessarily precluded from hosting PV arrays.
- The Central Development Focus Area is an overlay district (District) to focus as the primary area to consolidate bachelor housing, public goods, and commercial services, such as food services and cafeterias, gyms, banks, travel offices, Base Exchange, Commissary, barbershops, open space, indoor and outdoor recreation, CDCs, and similar support uses. The District is meant to increase pedestrian walkability and bicycle friendly facilities through design. It is the long-term goal to encourage compact development with greater density in the District. When funding becomes available, the installation will prioritize employee parking removal within this area to foster the area's walkability, enhance its urban design, and improve the installation's overall parking ratio. Therefore, carport–mounted systems were restricted in the District. The sole exception is the Commissary/Exchange parking lot.

- The Commissary and Exchange offers a large area for PVarrays as long as they are of good quality and are aesthetically pleasing. This shall be determined during the Site Approval Process.
- The three buildings within the JBAB Historic District were selected based on the large square footage of the roof. Proposed actions on cultural resources that involve alterations to the sites, buildings, or landscapes require coordination with DC Historic Preservation Office and compliance to historic preservation laws. After coordination with the DC Historic Preservation Office, two buildings were removed as potential rooftop locations.
- Buildings with roof tops of 5,000 square feet of usable space or less were removed from the inventory because they were determined to be economically unfeasible to develop. For rooftops that have been selected, detailed structural analysis will be needed to ensure that the underlying building can safely support the added load of a solar PV system.
- Rooftop arrays require a particular setback from the roof edge to reduce the visibility of the solar PV array from the street. Consensus from Joint Base Commander and Vice was reached for the Preferred Alternative.
- Two Town Hall meetings were hosted in September 2014 to inform major stake holders and solicit comments. No major issues were expressed at these meetings. There was overall positive feedback for the placement of solar PV arrays.
- A visual preference survey was conducted and results on visual preference will be incorporated in the Installation Appearance Plan.

The locations selected are those that would have the least adverse impact on the land, community character, and valuable environmental and cultural resources. Proposed sites for the development of the solar PV arrays are still subject to the Site Approval Process and will conform to the 2014 Master Plan and the Installation Appearance Plan.

2.1.2 Descriptions of Site Locations

The sites proposed for the solar PV installation at JBAB are located on both the North and South sides. Approximately 35 acres is proposed on the North side and 15 acres on the South side. Together, these sites provide adequate size to allow the construction and operation of a 10-MW PV system. The proposed land area, buildings, and parking lots are described in the following sections. Figures 2-1 and 2-2 show the site locations in relationship to the installation.

2.1.2.1 North Side

The North side has large rooftops, parking lots, and land area that could be used for future PV construction. During the planning meetings held onsite in December 2013, Navy staff prioritized the available land area and helped define the list of potential rooftop and carport PV system locations. During this site visit, the National Renewable Energy Laboratory (NREL) and Naval Facilities Engineering Command (NAVFAC) Washington team visited a number of roofs, and recorded dimensions of shading objects (NREL 2014). Subsequent to this planning effort, using several criteria, JBAB personnel narrowed the list of parking lots, potential land areas, and building rooftops to the proposed sites detailed in Table 2-1.

Parking Lots—The following parking lots are proposed for construction and operation of carport solar PV arrays:

- Parking lot south of Building 168
- Parking lot northwest of Building 358
- Building 358 (parking garage)

- Vehicle storage area, which is used by the Transportation Department
- Parking lot east of Building 400
- Building 419 parking lot

Land—The following land areas are proposed for construction and operation of ground-mounted solar PV arrays:

- North end (excess ball fields)—This parcel has been set aside as needed space for a future truck inspection facility and a charter school.
- Vacant/underutilized land and parking lot south of ball fields

North End Ball Fields

Building Rooftops—The following buildings are proposed for construction and operation of rooftop solar PV arrays:

- Building 413 (CDC III)
- Building 168 (National Register of Historic Places [NRHP] eligible building)
- Building 350
- Building 351
- Building 362
- Building 400
- Building 421
- Building 417
- Building 419
- Building 47

Figure 2-1 contains a detailed map of the various locations where rooftop, ground-mount, and carport PV systems could be installed on the North side of JBAB.

2.1.2.3 South Side

Land—The following land areas are proposed for construction and operation of ground-mounted solar PV arrays:

- Open space off Duncan Avenue (Lemon lot)
- Vacant/underutilized land west of Building 370

Building rooftop—The following buildings are proposed for construction and operation of rooftop solar PV arrays:

- Building 4570 (Commissary)
- Building 4514 (Exchange)
- Building 4472
- Building 4455 (CDC II)
- Building 4485
- Building 4456 (CDC I)
- Building 1311
- Building 5681
- Building 5683
- Building B421
- Building 370
- Building 1310
- Building 371
- Building 50
- Building 520
- Building 3620
- Building 3619
- Building 3618
- Building 3621
- Building 3623
- Building 256
- Building 3610 (chapel)

Lemon Lot

Parking lot—The following parking lots are proposed for construction and operation of cartop solar PV arrays:

- Parking lot for Building 370
- Commissary/Exchange parking lot

Figure 2-2 contains a detailed map of the various locations where rooftop, ground-mount, and carport PV systems could be installed on the South side of JBAB.

2.1.3 Solar PV Technology

2.1.3.1 Description of the Ground-Mounted Array

The solar PV arrays would be connected to a ground-mounted, fixed-tilt (stationary) system designed to optimize power production of the panels by ensuring proper orientation to the sun throughout the day and seasons (Figure 2-3). The panels may be constructed of glass encasing, which would be dark blue or black in color, with minimal light reflection.

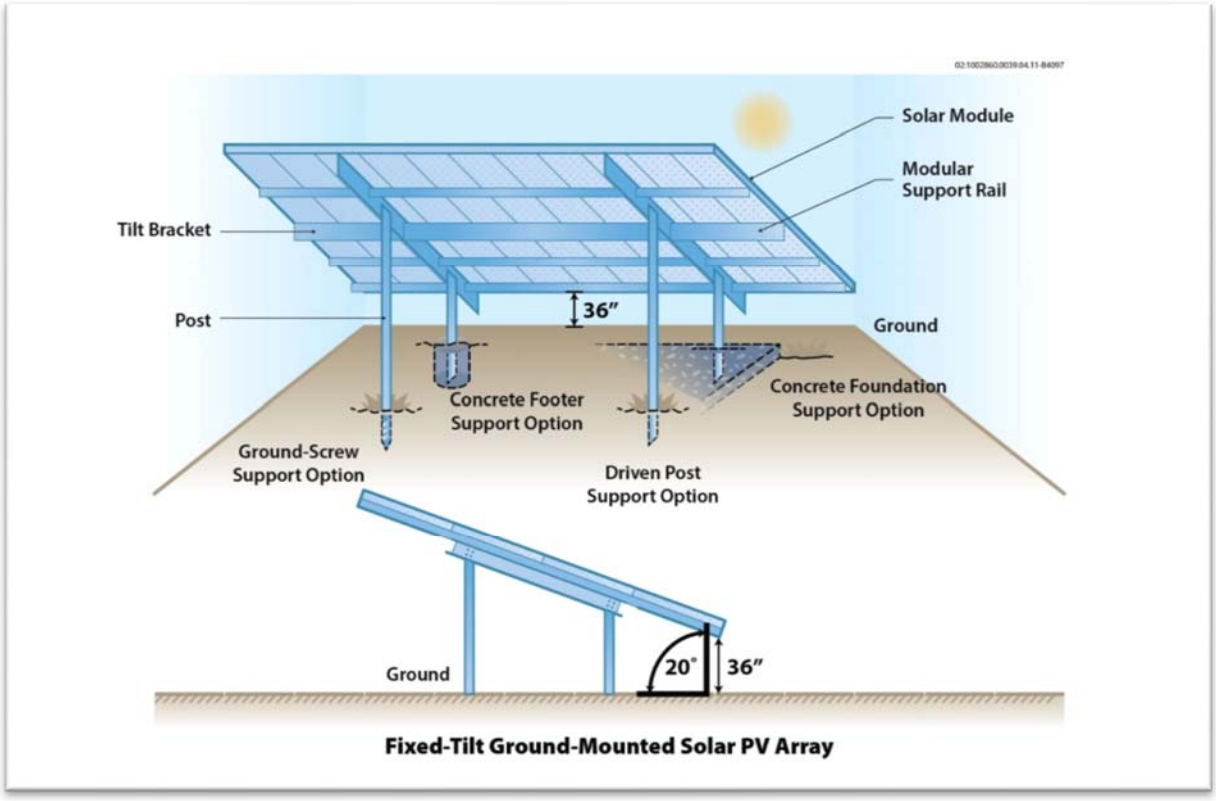

Figure 2-3 Typical Ground-Mounted Solar Array

The highest point of the solar PV array for a ground-mounted solar PV system would not exceed 10 feet (2.4 meters) above the ground surface. The panels would be approximately 5 feet (1.5 meters) wide and 3 feet (0.930 meter) long. The number of panels in each array, the type of ground-mounted system used, and the array configuration would depend on the solar power developer's final site design. Ground-mounted PV panels would require landscape or other visual barriers to protect or enhance existing viewsheds. Final design would be consistent with the Installation Appearance Plan.

PV systems generate direct current (DC) electricity, which is converted to alternating current (AC) for transmission on the electrical grid and ultimate end use in AC form. The ground-mounted solar PV systems would require either an underground or overhead electrical line to transfer electricity to the nearest point of connection. Underground electrical lines would be buried 3 feet [0.9 meter] deep, as required by Unified Facilities Criteria codes.

Materials would be transported to the project site by truck where they would be staged, assembled, and moved into place. Construction duration (from initial site grading and staging of equipment and panels to completed solar PV array) would be approximately 6 to 8 months. A normal configuration for this type of system is to install vertical members into the ground, with either a concrete pier or pile-driven support post, and panel-mounting hardware, frames, motors, and/or the solar panels themselves affixed atop the constructed mounting structure. Foundations would be built on engineered fill or native soil at a minimum of 24 inches (61 centimeters) below adjacent grade or finished grade (typical for combined footings). If pole footings are to be used, each footing would consist of a 4-inch (10-centimeter) cross-sectional area and would require a depth of 4 feet to 6.5 feet (1.2 meters to 2 meters) below ground surface.

In areas with surface vegetation, ground-mounted solar PV systems may require the site to be cleared and grubbed. Minimal ground disturbance and grading are anticipated because the existing site has been previously disturbed and graded and is level.

Access to ground-mounted systems typically would be restricted by a fence. A ground-mounted system would occupy all of the space contained within its fenceline, and the area may include the construction of all-weather gravel roads between the rows of solar panels and around the site perimeter for maintenance access.

2.1.3.2 Description of Carport Solar Arrays on Parking Lots

Carport solar PV systems elevate solar PV components to allow automobiles to park underneath the arrays so that shade and protection from inclement weather are provided (Figure 2-4). Because of the increased elevation of the arrays and safety code requirements, the fundamental consideration in a solar PV carport is the strength of the support structure and foundation. Each carport foundation can be designed to the site-specific soil conditions and code-required loads. A pre-approved system is usually overdesigned to accommodate a range of dimensions, configurations, and loads.

The most common carport structure is a full-cantilever tee type, which is a double-bay, single-post structure with cantilevered beams up to 20 feet long. These are typically erected using light-gauge structural steel with a column spacing of 18 feet—spanning two parking stalls—and no exposed concrete above grade. Design improvements and disability access guidelines have since led to solar support structures using heavier-gauge structural steel columns spaced every 27 feet—spanning three parking stalls—and structural steel beams with light-gauge purlins that support the solar modules. These structures typically have a galvanized finish, and the foundation includes 24 to 36 inches of exposed concrete above grade to protect the columns from vehicle damage. Solar PV module tilt angles vary based on site-specific considerations but typically range between 5 degrees and 10 degrees. Carport solar PV systems at JBAB would not exceed 20 feet in height, and at some locations, the solar PB systems would require designs that are of high architectural quality because of their high visibility. Final design would be consistent with the Installation Appearance Plan.

Figure 2-4 Typical Carport Solar Array

Carport construction is often phased to mitigate impacts on parking space availability in active parking lots. Drilling and excavation of the asphalt surface for the foundations would be followed by rebar, concrete, and steel work for the columns. If space is constrained, inverters can be installed before the steel canopy blocks the overhead access required to lift them into place. Module installation would follow using a crew elevated by a scissor lift or equivalent. Electrically, the modules are circuited in series into strings, which are typically terminated in a combiner box at each carport structure. From the combiner boxes, electrical power is transmitted through underground conduits to inverters. If required, the AC power can be stepped up via transformers as dictated by the local electrical grid.

The installer would conduct a site-specific engineering analysis to determine combiner box sizes and locations relative to the inverter, trench or conduit routes, conductor material, and other basic electrical layout and code-compliance considerations. Electrical considerations can include a distributed inverter design, used for multiple small carports, each with module quantities that match available inverter capacities. In other cases, such as when a fewer number of larger structures are evenly distributed around the point of connection, a centralized inverter design may be preferable. Depending on aesthetic preferences, the solar support structures can be painted or left with their unpainted galvanized finish.

2.1.3.3 Description of Rooftop Solar Arrays

In rooftop-mounted solar PV systems, the arrays are most often retrofitted onto existing buildings and usually mounted on top of mounting brackets affixed to an existing roof structure (Figure 2-5). Many rooftop applications are used at small- and medium-sized installations with the power intended for consumption within the buildings that host the arrays. The arrays are typically treated as rooftop equipment

placed in limited-access areas; therefore, they are not guarded or protected. Rooftop-mounted panels would be approximately 5 feet (1.5 meters) wide and 3 feet (0.9 meter) long, but these dimensions would ultimately depend on the building's roof type. The number of panels in each array and array configuration would depend on the solar power developer's site design. The rooftop-mounted panels would be pitched with a maximum height of 2.5 feet (0.8 meter) relative to the roof's surface and would typically face south or southwest with the arrays "aimed" toward the sun, in cases of a flat roofs. Other types of roofs, such as sloped, barrel, or gable, would require other types of panels, such as thin-film PV, solar shingles, or integrated PV panels. The PV panel surface and mounting devices for rooftop PV systems would be set back not less than 1 foot from the exterior perimeter of a roof for everyone 1 foot that the system extends above the roof surface. Final design would be consistent with the Installation Appearance Plan.

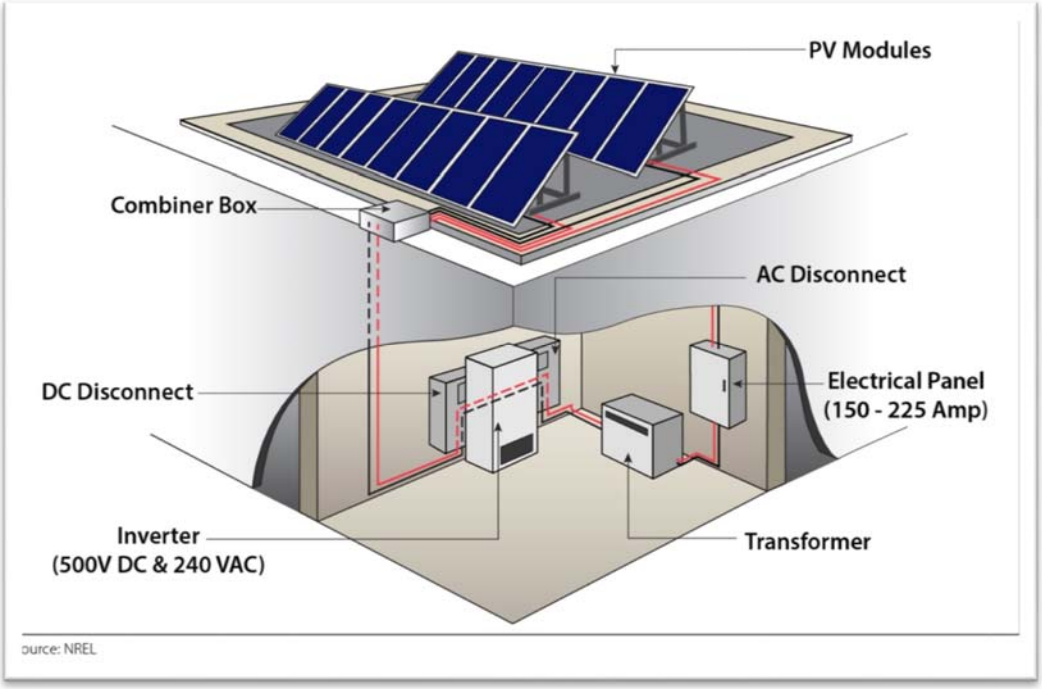

Figure 2-5 Typical Rooftop Solar Array

2.1.4 Interconnection

The project substations are the portion of the system where project power is transformed to match the specification of the interconnection into the existing electrical grid. The North side and the South side each have their own substation, buildings 18 and 168, respectively. The project substations are characterized as having a low side and a high side, as defined by the point of power transformation from 34.5 kilovolt (kV) (low side) stepped up in voltage to match the grid specifications in the transmission system (high side).

The Potomac Electric Power Company (PEPCO), the region's electric service provider, has a standard interconnection agreement for small generators up to 10 MW and any PV system installed at JBAB would have to go through the standard interconnection process. The North side and South side have separate electrical feeders and separate utility accounts. The electrical distribution system for the North side is fed from Building 18 and the installation uses a 13.2-kV distribution system. The proposed ground-mounted system and carport system would interconnect at the facility where they are installed and the main ground-mounted system could interconnect at the main feeder in Building 18.

Four main feeders are supplied by PEPCO into Building 168 on the South side. The four main feeders are split into 20 circuits at this facility and supply electricity to the various facilities and infrastructure based on electrical loads on the installation.

The project includes an electrical transmission line to connect the project to generation facilities owned and operated by the local utility. The overhead electric feeder lines would be installed adjacent to existing roads or utility rights-of-way. Final siting of utility lines would be reviewed by JBAB personnel prior to construction. The length of the electric feeder line would depend on the distance and route of the electric feeder line from the site to the substation.

2.1.5 Operation and Maintenance

Occasional maintenance would be required for the solar PV arrays, including panel washing and panel replacement. Water use for operations and maintenance would include washing of the solar panels when necessary. The estimated water use for panel washing is approximately 0.007 acre-foot/year/MW (NREL 2012). Water trucks would be used to wash panels in accordance with manufacturer specifications and recommended frequencies.

Grass, ground cover, and vegetation beneath and near the panels would be trimmed periodically and could be additionally controlled with herbicides to ensure that vegetation does not obscure or shadow the panels. Access roads would be maintained as needed.

2.1.6 Lease Agreement

Land would be leased under agreement to the power utility company for an estimated 37 years, including 2 years for construction, 25 years of operation, and two 5-year options. After the terms of the agreement expire, the Navy and the power utility would consider a range of options, including renewing the agreement, abandoning the facility in place, or decommissioning the facility.

2.1.7 Removal of Equipment

In the event that the Navy and the power utility decide to decommission the facility, a decommissioning plan would be prepared in accordance with Navy requirements. The plan would ensure that the project facilities would be decommissioned and removed and that the site would be restored to pre-construction conditions. Soils and affected areas would be reclaimed to a level that would, at a minimum, support uses for the land consistent with pre-construction activities.

The decommissioning and restoration process would likely involve the removing aboveground structures, including carports, restoring topsoil, and revegetating and seeding the site. Temporary erosion and sedimentation control BMPs would be used during the decommissioning phase of the project. Rooftop arrays would be removed from the buildings.

2.2 No Action Alternative

In compliance with NEPA and CEQ regulations, the No Action Alternative must be considered and associated potential impacts evaluated. Under the No Action Alternative, the installation of solar PV systems would not occur at JBAB. Thus, various federal statutes and EOs that mandate changes in energy consumption and production would not be addressed, and the No Action Alternative would not increase renewable energy production or use. The No Action Alternative would not meet the near-term renewable energy objectives of the Navy or the goals, purpose, and need for the proposed project, as described in Sections 1.2 and 1.3.

Although the No Action Alternative does not meet the Navy's purpose and need, the inclusion of this alternative is prescribed by CEQ regulations and will be carried forward for analysis in this EA. The No

Action Alternative also serves as a baseline against which the impacts of the proposed action can be evaluated.

2.3 Alternative Renewable Energy Technologies Considered but Eliminated

In 2007, NREL completed a study of renewable strategic opportunities at 70 Navy installations (NREL 2012). The study investigated six renewable energy technologies, including solar PV, concentrating solar power (CSP), solar hot water, solar ventilation pre-heating, wind, and biomass. NREL identified the best application potential of these technologies, based on 2010 energy and technology cost assumptions, technological maturity, maps of renewable resources, capital costs, operations and maintenance costs, land area required, and project life expectancy. Payback estimates, with and without incentives, were estimated for each viable technology. NREL continues to work with Navy installations to evaluate and deploy renewable energy demonstration projects and projects that promote energy efficiency.

With the 1 GW Initiative established in 2009, the Navy took a more aggressive approach to implement cost-effective and mission-compatible projects at its shore facilities. To achieve 1 GW of renewable energy generation capacity by 2020, the Navy recognized the need to develop opportunities for large-scale projects that would be attractive to local commercial utilities. The Navy established REPO specifically to work with local commercial utilities to use private-sector funds to construct renewable energy facilities on Navy land.

As discussed in Section 2.1.1, projects need to be cost-effective and readily integrated into the existing electrical supply grid to be attractive to local commercial utilities. In addition, commercial utilities would receive revenue from the sale of the electricity and would also retain control and ownership of the Renewable Energy Certificates (RECs) associated with the project. RECs represent the environmental, social, and other non-power benefits of renewable electricity generation, and they can be sold separately from the physical generating systems (EPA 2014). Under the federal income tax code, utilities could also receive federal business energy investment tax credit under 26 U.S.C. §48 for eligible systems placed in service on or before December 31, 2016, and some projects can take advantage of state-level incentives.

In evaluating the various renewable technologies, the REPO considered the following key criteria:

- Projects should be implementable by December 31, 2016. Therefore, projects that would require additional study of the availability and reliability of the renewable resource could not be implemented by 2016.
- Projects need to be implemented using a mature, reliable technology.
- Technology used should be inexpensive to implement.

2.3.1 Solar

The project should be implementable by December 31, 2016. Therefore, projects that would require additional study of the availability and reliability of the renewable resource could not be implemented by 2016.

While solar PV technology was determined to be the most viable alternative to meet the purpose and need of the proposed action, other solar technologies and applications were considered but eliminated.

Solar energy electricity-generating technologies are divided into two broad categories: 1) PV, which directly converts sunlight to electricity, and 2) CSP, which generates heat to drive a steam turbine. Solar heat can also be collected in solar hot water systems and solar ventilation pre-heating systems, which are building-integrated renewable energy technologies that can reduce energy use for heating in facilities. They do not generate electricity and are not viable on a large scale.

CSP technologies use heat from solar energy to generate electricity. Multiple designs of CSP technologies have been developed; all are based on the concept of concentrating direct solar radiation to heat a fluid to very high temperatures, and this fluid is then used to generate electricity via a conventional turbine. These technologies include linear concentrators, solar tower, and dish or engine. Parabolic trough CSP collectors capture the sun's energy with large mirrors that reflect and focus the sunlight onto a linear receiver tube. The receiver contains a fluid that is heated by the sunlight and then is used to create superheated steam that spins a turbine that drives a generator to produce electricity. In power tower systems, numerous large, flat, sun-tracking mirrors, known as heliostats, focus sunlight onto a receiver at the top of a tall tower. A heat-transfer fluid heated in the receiver is used to generate steam, which, in turn, is used in a conventional turbine generator to produce electricity. The solar concentrator dish, which looks like a satellite dish, gathers the solar energy coming directly from the sun. The resulting beam of concentrated sunlight is reflected onto a thermal receiver that absorbs the concentrated beams of solar energy, converts them to heat, and transfers the heat to the engine/generator. The engine/generator system is the subsystem that takes the heat from the thermal receiver and uses it to produce electricity.

CSP facilities range in height from approximately 30 feet for the linear concentrators, 20 to 30 feet for the heliostats, and 180 to 700 feet for the solar towers.

CSP technologies have been in operation since the early 1980s. In 2014, more than 1,400 MW of CSP were produced in the U.S., with 390 MW currently in development that will be available in 2015 (SEIA 2014). Although the technology is mature, the number of CSP facilities in operation has not increased at the same pace as solar PV facilities. While DOD has 511 solar PV systems in operation on DOD lands, no CSP facilities have been implemented (DOD 2014). The acreage requirements for CSP technologies vary greatly due to the limited number of case studies of their application but can range between 5 and 8 acres/MW. However, CSP technologies are most cost-effective at a scale of 50 to 100 MW, which would require land areas of 300 to 400 acres for a 50 MW facility and 600 to 700 acres for a 100 MW facility (NREL 2012). In addition, CSP technologies require large volumes of water ranging from 1.1 million to 180 million gallons of water per year for a 100 MW CSP Plant (NREL 2012).

Although CSP technologies may be viable in certain locations and could be considered at Navy installations, particularly in the southwest where large land areas are available, the Navy determined that the Navy and/or local commercial utility would need to conduct extensive studies to implement a CSP facility project, given the large land requirements, water demands, and potential operational impacts (i.e., regarding the solar towers). Therefore, a CSP project would not be viable in the expedited timeframe.

2.3.2 Wind Power

Wind energy is the transformation of wind into mechanical power through a turbine, which is then converted into electricity through a generator. Turbines can range in size from small, residential units with capacities under 100 kilowatts to large-scale, 2- to 3-MW turbines used in commercial wind farms. The U.S. wind energy capacity in 2014 was 62,300 MW, with an additional 13,600 MW of wind energy capacity under construction (AWEA 2014). Therefore, the technology is a mature technology, and its use is growing. Small wind turbine technology is still emerging and applications would be too small for a utility-sized project. In some cases, large turbine wind generation can pose challenges to the missions of many Navy installations because of the height of the towers and the effects they can produce on various types of radars and aircraft operations and on bats and migratory birds. Tower heights typically range from 190 to 260 feet tall (NREL 2012).

As of 2013, the DOD operated 27 wind energy projects, which represented only 1 percent of renewable energy production throughout the DOD (DOD 2014a). Although wind turbines may be viable in certain locations and could be considered at Navy installations, the Navy determined that the Navy and/or local commercial utility would need to conduct extensive studies to implement a wind energy project, and such a project would not be viable in the expedited timeframe. NREL recommends that at least a year of wind

resource data would be required for a developer to obtain project financing, as the cost-effectiveness of a project is directly related to location and size (NREL 2012). Technology that would operate in areas of lower wind resources is being researched; however, this technology is still emerging (NREL 2012)

2.3.3 Geothermal Energy

Geothermal power is energy generated by heat stored beneath the Earth's surface, or the collection of absorbed heat in the atmosphere and oceans. This heat can be used directly to heat facilities or to drive steam turbines to generate electricity. As a base load source of energy, geothermal is distinct from other renewable energy sources, such as wind and solar, because it can provide consistent electricity without being part of a broader system. In 2013, the U.S. had 3,442 MW of installed geothermal electricity capacity, with more than 1,000 MW capacity in development (Geothermal Energy Association 2014).

Geothermal energy can be harnessed through direct use, electrical generation, or heat pumps. Direct-use applications include heating buildings, growing plants in greenhouses, drying crops, heating water at fish farms, and several industrial processes such as pasteurizing milk. Electrical generation occurs when steam from underground wells rotates a turbine, which activates a generator to produce electricity. Geothermal heat pumps are able to heat, cool, and, if so equipped, supply homes and buildings with hot water. A geothermal heat pump system consists of a heat pump, an air delivery system (ductwork), and a heat exchanger (a system of pipes buried in shallow ground). In the winter, the heat pump removes heat from the heat exchanger and pumps it into the indoor air delivery system. In the summer, the process is reversed, and the heat pump moves heat from the indoor air into the heat exchanger. The heat removed from the indoor air during the summer can also be used to provide a free source of hot water.

Where heat sources exist, geothermal is an excellent source of energy for Navy installations, though exploration can be difficult and expensive. The Navy's Geothermal Program Office at China Lake, California, is actively exploring for resources in the southwest. At present, some of the Navy's geothermal potential exists on Department of the Interior, Bureau of Land Management land withdrawn by legislation for military use, and future development will have to be carefully coordinated. However, the exploration and production costs of geothermal wells are increased in the absence of proven resources.

The largest renewable energy project across the DOD is the Navy's China Lake geothermal power plant in California, which supplies nearly half of the DOD's renewable energy production. Throughout the DOD, 155 ground source heat pump projects contribute approximately 4 percent to the supply mix (DOD 2014).

Although geothermal energy may be viable in certain locations and could be considered at Navy installations, the Navy determined that the Navy and/or local commercial utility would need to conduct extensive studies to implement a geothermal energy project, and such a project would not be viable in the expedited timeframe.

2.3.4 Biomass Energy

Biomass electricity is generated from the burning of waste materials, such as wood or agricultural residue, for use as fuel in the cogeneration of heat and electricity in steam-driven generators. The use of landfill methane to drive electricity generation or waste-to-energy facilities is also considered a viable source of biomass energy with widespread use throughout the U.S.

In some parts of the country, various types of biomass sources may be very competitive with traditional fossil or "brown" power. As with geothermal, biomass has the advantage of providing base load power, enhancing an installation's energy security on a continuous basis. Power projects could use various sources of biomass or other waste streams, including leftover plant material (from farming or logging), animal waste, landfill gas capture, wastewater treatment methane generation, or municipal solid waste. One challenge for biomass projects is securing a long-term contract for a low-cost and locally available fuel source.

Land requirements for biomass facilities range from 1 to 2 acres/MW (NREL 2012), although available space is not the defining issue for these projects. Availability of feed stock, requirements for emissions control and waste disposal represent the biggest challenges for biomass projects. In addition, the best use of biomass energy is in co-generation (i.e., combined heat and power [CHP]) technology that produces both electricity and heat and therefore requires nearby buildings to take advantage of the heat generation (NREL 2012).Although biomass energy may be viable in certain locations and could be considered at Navy installations, the Navy determined that the Navy and/or local commercial utility would need to conduct extensive studies to implement a project. To construct and operate biomass facility, a steady source of fuel would need to be identified to determine the cost-effectiveness of the project and such a project would not be viable in the expedited timeframe.

2.3.5 Review of Renewable Energy Technologies

Solar PV technology was chosen to meet the purpose and need of this action because it is very mature technology and compatible with most installations' missions. It is also readily available and cost- effective as a result of the recent expansion and efficiency of solar PV as a technology and a market. In 2013, new solar electricity generation provided 29 percent of the total U.S new electricity capacity, second only to natural gas installation (EIA 2014). New solar power capacity increased 41 percent from 2012 while the average price dropped 15 percent at the same time (SEIA and GTM Research 2014). These trends support the availability of the technology for the large-scale projects planned by the Navy.

2.4 Comparison of Environmental Consequences of Site Alternatives

Table 2-3 presents a summary of the environmental consequences associated with construction and operation of a solar PV system at each of the proposed alternative sites and the No Action alternative.

Table 2-3 Comparison of Alternatives

Resource	Proposed Action Alternative	No Action Alternative
Land Use	• With the exception of ground-mounted solar PV arrays, the solar PV facility would be consistent with existing land use designations and future land use designations under the Future Land Use Framework. Minor impacts to land use would occur where ground-mounted solar PV arrays are proposed on parcels designated as Open Space/Outdoor Recreation at the northern-most portion of the installation, which would necessitate amendments to land use designations. However, such amendments would not impact the required LOS, which is 2 acres per 1,000 residents. • Impacts to land uses proposed as part of the Future Land Use Framework at JBAB under the 2014 Master Plan would be long term, minor, and adverse.	• No changes in current land use classifications.
Visual Resources	• Impacts to visual resources on the installation and in the surrounding area would be long term, negligible to minor, and adverse. The view sheds would not change; however, the solar panels would not be strongly noticeable due to the developed nature of the installation.	• No changes to visual resources.

Table 2-3 Comparison of Alternatives

Resource	Proposed Action Alternative	No Action Alternative
Utilities and Infrastructure	• Impacts to stormwater would be long term, negligible, and adverse. • Impacts to electric systems would be beneficial due to the implementation of solar panels.	• No contribution to Navy renewable energy goals. • No changes to existing infrastructure or stormwater management practices. • No changes to existing electrical infrastructure.
Cultural Resources	• Impacts to the NRHP-eligible Buildings 168 and 169, as well as Buildings 20 and 21, as well as in and around the Bolling AFB and Naval Air Station Anacostia historic districts would be direct, moderate, and adverse. • Visual impacts to the East and West Potomac Parks Historic District, the Fort McNair Historic District/National War College, Suitland Parkway, and the St. Elizabeths Historic District would be minor and adverse. • Adverse impacts to the Buzzard Point Power Plant would be minimal. • The installation of carport solar panels and the ground-mounted solar panels would not affect archaeological resources; however, the installation of ground-mounted solar PV arrays on the South side could have adverse impacts pending an archaeological survey. • Section 106 consultation concluded with no adverse effect to historic resources with specific stipulations, including any panels on Buildings 169, 520, and B421 would be installed in a manner where they are not visible from the ground.	• No changes to architectural or archaeological resources. • No Section 106 effects.
Air Quality	• Impacts to air quality due to construction would be short term, minor, and adverse. • Impacts to air quality during operation would be beneficial because energy requirements from boilers on JBAB would be reduced.	• No changes in criteria air pollutants.
Geology, Topography, and Soils	• Impacts to topography and geology would be negligible and adverse due to little or no grade changes. • Potential impacts to soils due to the construction activities associated with the solar PV installation would be minor and adverse.	• No changes to topography or geology, • No changes to soils,
Vegetation and Wildlife	• Impacts to vegetation from installing the ground-mounted solar PV panels would be negligible to minor and adverse. • Impacts to wildlife would be long term, minor, and adverse because of the loss of managed lawns that	• No changes to vegetation. • No changes to wildlife or wildlife habitat.

Table 2-3 Comparison of Alternatives

Resource	Proposed Action Alternative	No Action Alternative
	serve as habitat for common species found throughout the larger geographic area.	
Noise	• Construction of the solar panels would not result in long-term, adverse impacts. Operational noise would only occur during daytime hours and would be completely inaudible outside the JBAB. • In the short term, impacts to noise would be negligible and adverse due to the construction of the solar panels.	• No changes to noise.
Traffic and Transportation	• Construction activities would result in short-term, adverse impacts to traffic and transportation.	• No changes to traffic and transportation network.
Surface Water and Water Quality	• Impacts to surface water features would be indirect, minor, and adverse resulting from ground disturbance and potential runoff during the construction of ground-mounted solar PV arrays. • Groundwater would not be affected. • Impacts to floodplains during the installation of the ground-mounted solar PV arrays would be short term and adverse, under the assurance that JBAB would implement all appropriate BMPs.	• No changes to water resources.
Protection of Children	• Children on the installation would not be affected because the solar panels are anticipated to be inaccessible to children and they would not create an attractive nuisance that could harm children. • Other resource topics are anticipated to result in no changes or impacts to populations of children on the installation.	• Children on the installation would not be impacted.
Human Health and Safety	• No changes or impacts to human health and safety are expected due to ERP sites, hazardous materials/hazardous waste, asbestos-contain buildings, lead-based paint, other hazardous materials, or ESQD arcs. • Depending on orientation and design, the solar PV facilities could result in glare to some airfield operations at Reagan National Airport. NREL recommended that glint/glare be reanalyzed once the solar PV facility designs are available. By following the siting and approval process, as well as federal policy and guidance on aviation safety related to glint/glare from solar facilities, there would be no significant impacts on aviation-related safety associated with glint and glare. • Impacts to human health and safety would be negligible to minor and adverse due to the increased frequency of electromagnetic fields in the area, but at extremely low levels.	• No changes to human health and safety.

Notes: BMP – best management practice, ERP – Environmental Restoration Program, ESQD - explosive safety quantity distance, JBAB – Joint Base Anacostia-Bolling, LOS – level of service, NRHP – National Register of Historic Places, PV – photovoltaic

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3.0 AFFECTED ENVIRONMENT

3.1 Introduction

This chapter describes the existing condition of environmental resources potentially affected by the proposed project. The boundaries of the affected environment vary according to the nature of the potential impact and the aspect of the environment under consideration. Certain potential impacts (e.g., impacts to soils or vegetation) are site specific and are likely to be contained entirely within the project boundaries. Other impacts (e.g., potential impacts to air quality and water quality) may affect areas outside of the identified project area.

Information in this chapter is derived from both primary and secondary sources, as noted. Primary sources of information involved site visits and analysis by project personnel, which are referenced as such. Secondary information includes documents such as the 2013 Integrated Natural Resources Management Plan (Navy 2014c) and 2014 Master Plan (Navy 2014a). To comply with the CEQ NEPA statute and the CEQ regulations directive to avoid unnecessary paperwork, delay, and bulk in environmental documents, this EA incorporates information from these environmental documents by reference wherever appropriate and relevant (see 40 CFR Parts 1500.4(j) and 1502.21). Other secondary sources of information are referenced as appropriate.

3.2 Land Use

3.2.1 Current Existing Land Uses

JBAB is located in Washington, D.C., on the east side of the Anacostia and Potomac Rivers and west of I-295. It occupies part of a long and relatively narrow strip of land that is bounded to the north by the Frederick Douglass Memorial Bridge and South Capitol Street and to the south by institutional facilities, such as the NRL and the District of Columbia's Blue Plains Wastewater Treatment Plant. The installation is surrounded by a perimeter fence and is accessed through three guarded gates: Firth Sterling Gate (accessed via Firth Sterling Avenue), Arnold Gate (accessed via Malcolm X Avenue), and South Gate (accessed via Overlook Avenue). JBAB can also be accessed by two other gates—one exclusively for Bellevue Naval Housing access and the seldomly used Northern Gate.

Land uses within a mile of JBAB consist of a mix of open space, commercial, light industrial, governmental, and residential uses. The primary land uses on JBAB are government office space, community support services, presidential helicopter operations, family housing, light industrial, and waterfront recreation. The North side is a low-density, loosely organized facility dominated by light industrial, maintenance, and scattered mission and administrative uses. The South side is characterized and organized more by similar uses such as mission/administrative, community support and family housing (Navy 2010).

JBAB's current land use reflects the continuation of the mission functions before the joint basing. The North side of the installation is characterized by loosely organized large facilities dedicated to mission/administrative, airfield operations, industrial and installation support functions. The South side is characterized by a more geometrical arrangement of roads and facilities, dominated by installation support and housing functions. Open spaces and recreational uses occur along the waterside portions of the installation and the installation's perimeter fence (Navy 2014a).

Figure 3-1 illustrates the different types of land uses currently existing at JBAB. The following description provides further detail regarding the functions being performed at each of the current land uses where the proposed solar PV alternatives may be located (Navy 2014a).

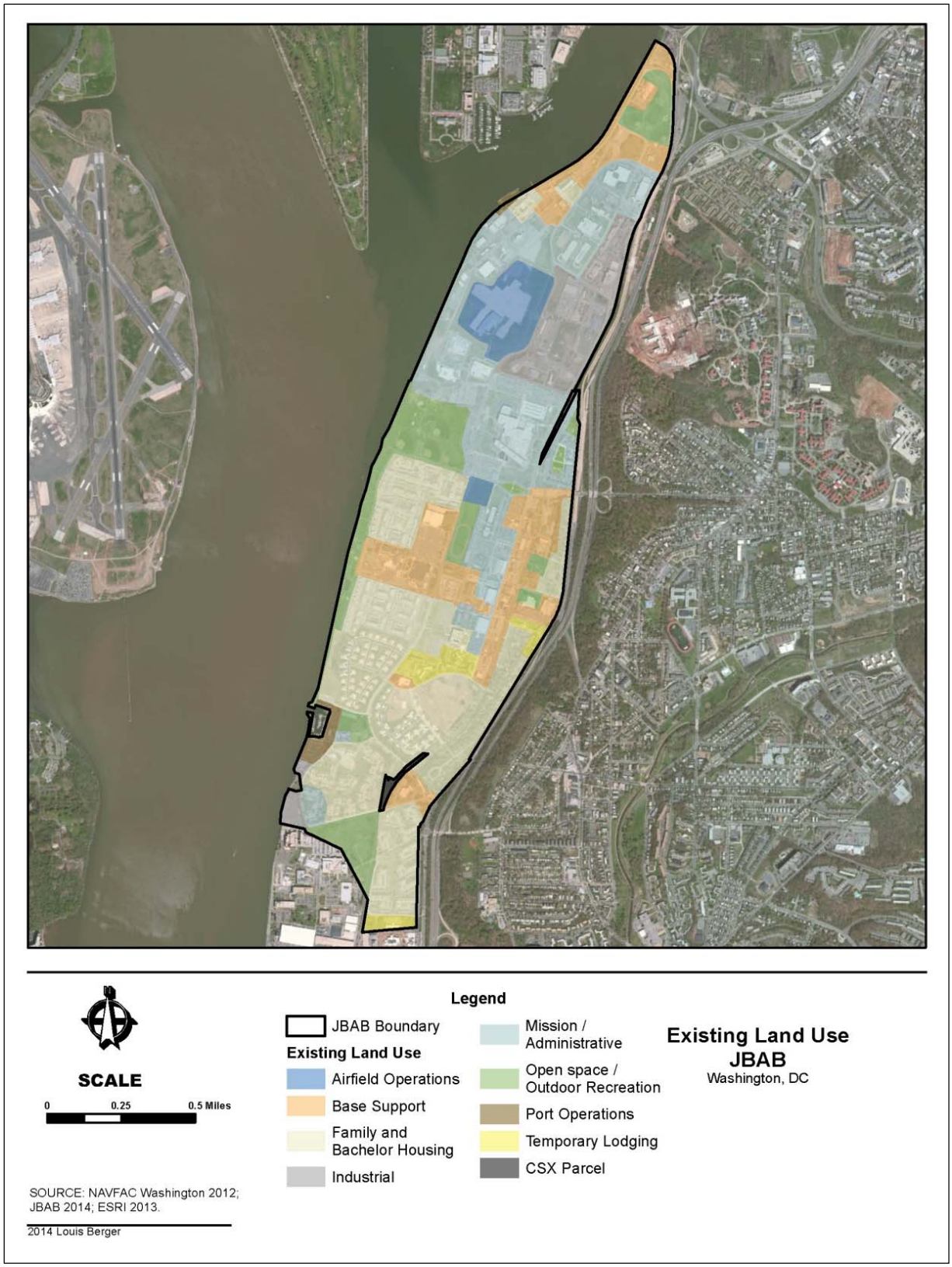


Figure 3-1 Current Land Uses at Joint Base Anacostia-Bolling

- *Base Support*—Base Support land use refers to facilities associated with public safety and installation-wide services. These uses include fire/emergency, police/security, conference centers, dependent schools, CDCs, religious facilities, military working dog kennels, transit stations, and installation gates. The functions are essential operations that serve all installation personnel and essential visitors.
- *Family and Bachelor Housing*—The Family and Bachelor Housing is the largest land use at JBAB and refers to residential dwellings and associated grounds that serve as the primary place of habitation for eligible personnel and any of their dependents. Eligible personnel are commissioned officers, warrant officers, or enlisted members and key civilian employees. All family housing is privatized and located at the southern portion of the installation, including Bellevue Housing at the southern end of the installation and six communities of Bolling Family Housing between the South Gate and the Arnold Gate.
- *Industrial*—Industrial land use refers to facilities associated with industrial, logistics, and weapons training/storage functions. Examples of these types of functions include logistics operations such as supply management, and industrial operations such as vehicle maintenance and storage, weapons training ranges, and facilities maintenance. Real property associated with these facilities may entail safety quantity distance arcs, buffers, storage lots, and public works facilities.
- *Mission/Administrative*—Mission/Administrative land use facilities are grouped toward the northern and central portion of the installation. This land use refers to facilities associated with the installation's primary mission activities and office-oriented functions, such as headquarters, program management, information technology, personnel support, and other administrative activities. Some supporting functions are also permitted in this land use, including food service, auditoriums, banks, postal services, data processing centers, libraries, and gyms.
- *Open Space/Recreation*—Open Space/Recreation land use refers to real property dedicated for outdoor public use or for the protection of natural/cultural features. Examples include parks, recreation fields, ceremonial parade fields, habitat preservation areas, and view sheds. Outdoor facilities include athletic fields/courts, swimming pools, dog parks, playgrounds, marinas, and amphitheaters. The installation shoreline constitutes the major open space and recreational resource on the site. The waterfront jogging trail connects the marina on the south, Giesboro Park in the middle, and extends into the mission area northwest to the Airfield Operations compound. This area provides not only recreational opportunities for installation personnel, but favorable views of the Anacostia and Potomac rivers, historic Fort McNair, and the U.S. Capitol Building. The northern tip of the installation and the family housing area also contain large open spaces with various sports fields.
- *Temporary Lodging*—Temporary Lodging land use refers to facilities that provide temporary living accommodations normally rented for overnight or short-term use to authorized personnel. Eligible personnel include official military or civilian personnel of the installation, visitors to the installation, and transient personnel/families awaiting assignment to quarters. Facilities can be apartment-style, hotel-style, motel-style, or dormitory-style living quarters. Additional amenities may be included such as outdoor recreation areas, dining halls or kitchenettes, and laundering facilities.

3.2.2 Proposed Future Land Use Framework at Joint Base Anacostia-Bolling under the 2014 Master Plan

The Land Use Framework Plan describes future land use planning undertaken to identify site opportunities for future developments or redevelopments at JBAB. The Future Land Use Plan provides a long-term vision for JBAB's development, which will help direct future detailed planning and design efforts. Because the current missions and tenants are expected to remain at JBAB in the long term, most land use areas will not change. However, some uses will change and are already reflected as such in the Land Use Framework Plan. For instance, a few sites have been identified as areas where future functions, including Mission/Administrative, Base Support, Housing, Temporary Lodging, and Open Space/Outdoor Recreation, are mostly likely to occur (Navy 2014a).

The proposed land use map (Figure 3-2) illustrates the planned land use changes anticipated at JBAB. Each of these land uses is briefly described below (Navy 2014a):

- *Family and Bachelor Housing*—The housing functions located on the North side will be relocated and consolidated with housing functions on the South side. In addition, the land use rights for 46.47 acres of privatized family housing areas will be returned to the government and open to new development by JBAB. The future land use designation in this area is not currently known.
- *Industrial*—Scattered industrial functions will be consolidated to the major industrial area east of Defense Boulevard.
- *Open Space/Outdoor Recreation*—A 200- to 300-foot continuous greenway/open space buffer will be created along the waterfront, and JBAB will keep the open space level of service (LOS) at a minimum of 2 acres per 1,000 residents.
- *Mixed Use*—This is a new land use category that is also called Flex Use. It was created for areas that can be used for a variety of approved functions in the future. Some of these sites are large enough to accommodate a combination of different uses, while some smaller sites are surrounded by more than one type of function and therefore can be developed into any of the surrounding uses when the need for a specific program arises. This Mixed Use designation allows for flexibility in future development.
- *Central Development Focus Area*—This overlay district is delineated as the primary area to consolidate bachelor housing, public goods, and commercial services, such as food services and cafeterias, gyms, banks, travel offices, Base Exchange, Commissary, barbershops, open space, indoor and outdoor recreation, CDCs, and similar commercial and support uses. An Area Development Plan will be prepared in the future to further plan and design this area to ensure compact, mixed-use, pedestrian-oriented development.
- Three sites will be designated as future transit hubs. The site on the south side of the marina has been identified as a potential waterfront memorial site by the National Capital Planning Commission's Memorials and Museums Master Plan. Future development on this site will require coordination between the National Capital Planning Commission and the installation. Additional land near the Firth Sterling Gate and South Gate will be reserved for future gate improvements. The southern-most lot on the waterfront is currently being used by the NRL for storage. It is an active Environmental Restoration Program (ERP) site due to underground landfill and contamination, therefore the existing impervious surface cap must remain until there is funding in place to restore the site for other uses.

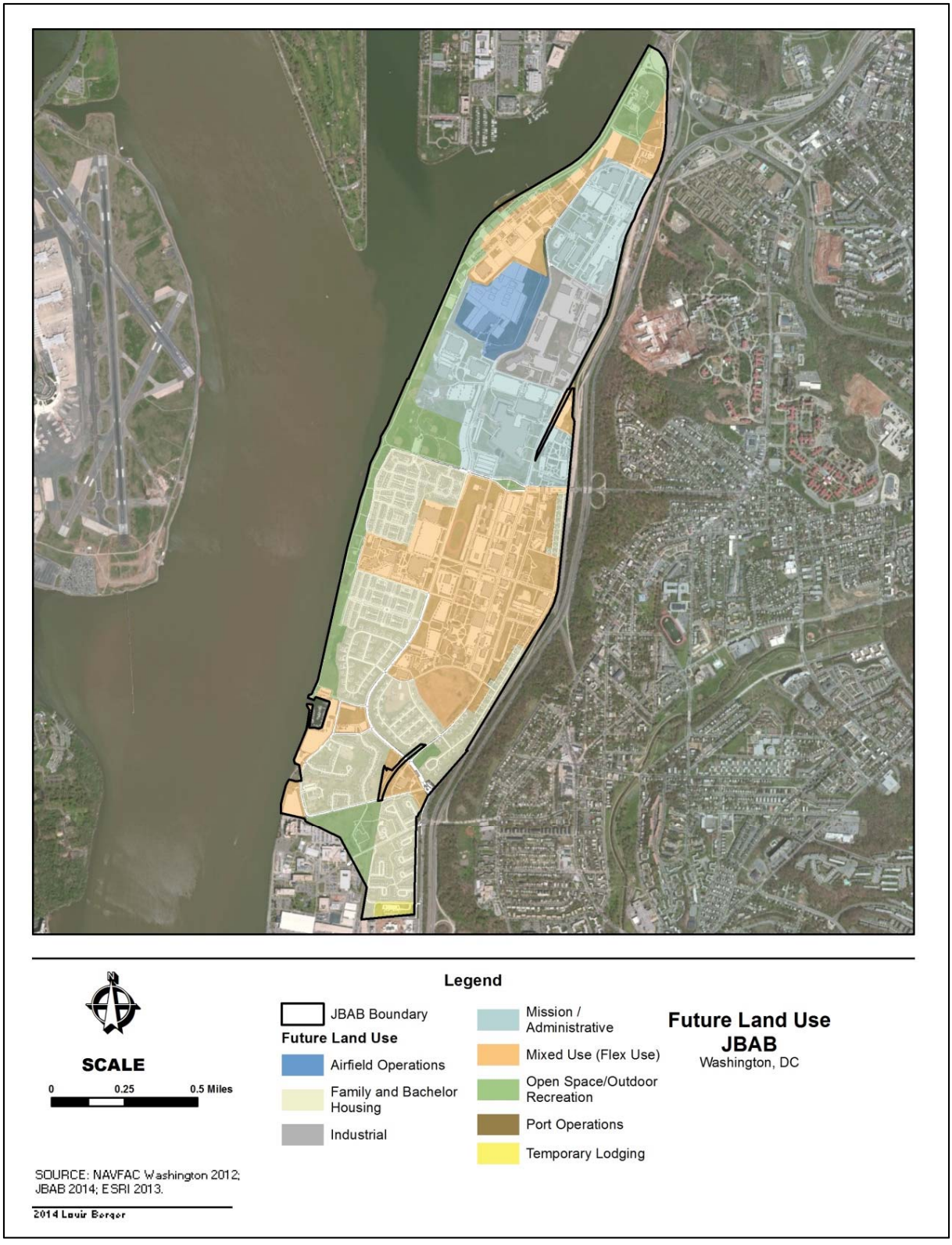


Figure 3-2 Proposed Land Use Framework at Joint Base Anacostia-Bolling under the 2014 Master Plan

3.3 Visual Resources and Aesthetics

This section documents the visual character of the installation and the surrounding area. Visual resources for JBAB were determined by assessing the visibility of the installation to viewers from public places. The installation itself is secure, so it is not considered a public place. Because of its geographic location near roadways and rivers, however, there are multiple public views of the installation from the surrounding area.

3.3.1 Current Visual Character of Joint Base Anacostia-Bolling

JBAB historically operated as two installations under two different commands with two distinct functions and appearances. NSF Anacostia, now known as the North side, housed a number of light industrial functions that require storage space or larger areas for secure tenant activities. Bolling AFB, now known as the South side, was home to the 11th Wing and the Chief's Own. As a result, the North side and the South side exhibit different visual characteristics.

3.3.1.1 North Side

The boundaries for the North side begin north of the Defense Intelligence Agency (DIA) building. The North side is generally characterized by large, interspersed buildings separated by wide open spaces with small landscaped areas and large surface parking lots. Because of the operations these buildings house, they are often industrial or utilitarian in their design and material construction (reinforced concrete, metal frame, and brick). The buildings typically range in size from one to three stories in height, creating a fairly low-scale visual context currently unpunctuated by a dominant building like Blanchard Barracks or the DIA building. Several old, deteriorated hangars are close to the western shoreline near the floodwall. Two secure tenant facilities also sit near the shoreline. These structures are visible from some public viewing points across the Anacostia and Potomac Rivers. Three brick buildings sit near the western shoreline—Enterprise Hall, a new barracks, and a galley—that feature similar design characteristics and provide a small pocket of visual consistency in size, scale and materials. The very northern tip of the installation is characterized by a new, one-story brick building surrounded by several athletic fields, creating an open visual context in the northernmost portion of the installation. Buildings 168 and 169, located on the northeastern side of the installation adjacent to South Capitol Street are individually eligible architectural resources. More information pertaining to these buildings can be found in Section 3.5.

3.3.1.2 South Side

The center of JBAB, just north of MacDill Boulevard marks the beginning of a visual transition and the South side. Near Arnold Gate sits a small and orderly formal campus along the eastern perimeter that is included in the Bolling AFB Historic District. This campus has a number of historic and non-historic, two- to three-story, brick buildings organized around ceremonial grounds that are visible from portions of South Capitol Street and I-295. Directly west of this small campus is the DIA building—a sprawling, six-story, modern facility with support structures. This building is another visual magnet because of its large mass and scale, dominating the skyline above the installation.

The South side features a broad range of buildings contributing to a varying visual environment. Historic two-story, brick homes also included in the Bolling AFB Historic District line the majority of Westover Avenue near the installation's eastern perimeter. Some of these buildings are visible from portions of Overlook Avenue, South Capitol Street, and I-295 between the trees depending on the season and the elevation of the roadways. Modern, two-story family housing occupies a large area of land between Chappie James Boulevard and the western shoreline, between Arnold Avenue and MacDill Boulevard. This housing is often visible from public viewing points across the Potomac River because the shoreline is generally clear of obstructions such as trees. Newly built two-story suburban-style family housing occupies a small area between Tyndall Street and Hartz Drive SW but is generally not visible from public viewing points across the river. Housing north of Tyndall Street to Angell Street was recently demolished. The mission services, operations, and administrative core of the South side are centered on Brookley Avenue and

McChord Street. Brookley Avenue is generally compact in scale with buildings set closer to the street and in relationship to one another. Other buildings in the area vary in size and age from smaller, historic, one- and two-story buildings to contemporary, two- to four-story buildings with the exception of one large, nine-story barracks built in the 1960s—Blanchard Barracks—that dominates the skyline above this portion of the installation.

Near the southern boundary of the South side sits Bellevue Naval Housing Complex. This area consists of modern, two-story, family housing with front-loading garages and yards. The housing is laid out in a typical suburban neighborhood pattern with houses surrounding cul-de-sacs. Bellevue is visible from portions of Overlook Avenue and I-295.

3.3.2 Public Views of Joint Base Anacostia-Bolling

3.3.2.1 Frederick Douglass Memorial Bridge (South Capitol Street Southeast)

The Frederick Douglass Memorial Bridge crosses Anacostia River to the north of JBAB. It is a four-lane bridge with a pedestrian walkway that features an unobstructed view of South Capitol Street running south, JBAB's northern buildings and the earth levee shoreline. The Naval Media Center building, White House Communications building, new dormitory, galley, and Enterprise Hall can all be seen from the bridge. The DIA building is visible farther to the south due to its height and scale. Old Town Alexandria's Masonic Temple can be seen rising in the distant skyline to the southwest. The roofs of Barry Farms housing and the two St. Elizabeths' smoke stacks can also be seen through the tree line in the southeast.

3.3.2.2 South Capitol Street Southwest

This roadway features views of JBAB, particularly in the north as it parallels the eastern boundary. Because the northern end of the installation is enclosed by a chain link fence and the roadway sits at a similar elevation, some installation facilities, such as the athletic fields, the CDC, the Family Housing Welcome Center, and a few parking lots, are visible to the passerby and individuals using the bus stops. South of the Firth Sterling Gate and the Naval Media Center, the fence is accompanied by trees and shrubs, which obstruct the view of many buildings on the installation. The South side features a brick boundary fence that adds to the screening. However, the upper levels of facilities such as the 11th Wing Headquarters and several historic homes on Westover Avenue are sometimes visible from the roadway between the trees, depending on the season and the elevation of the roadway.

3.3.2.3 Interstate 295

Similar to South Capitol Street, I-295 offers some views of JBAB as it parallels the installation's eastern boundary. Typically, the roadway sits at a higher elevation than the installation and the views are more apparent traveling southbound due to the proximity of these lanes to the installation. The majority of the installation is visually obstructed by trees, but some buildings, such as the 11th Wing Civil Engineering Squadron building, DIA building, Arnold Gate, the Officers Club, Blanchard Barracks, several Westwood Avenue homes and the Bellevue Naval Housing Complex, are momentarily visible through gaps in the tree line.

3.3.2.4 Malcolm X Avenue

Malcolm X Avenue features a view from the hills above JBAB, through Arnold Gate, and across to Ronald Reagan Washington National Airport (Reagan National Airport) and to Crystal City in the background. The I-295 overpass obstructs clear views of the southern side of the installation, but the professional appearance of Arnold Gate with its manicured grounds is still seen, as is a portion of family housing close to the Potomac River. Across the river, the runways of Reagan National Airport and the high-rise buildings of Crystal City are visible as well. This view does change depending on the elevation of the viewer and distance from JBAB.

3.3.2.5 Overlook Avenue

When South Capitol Street veers away from the installation, the passerby must travel south along Overlook Avenue in order to access the South Gate of JBAB, Bellevue Naval Housing Complex, and the NRL. Overlook Avenue provides intermittent views of historic housing on Westover Avenue and a clear view of the homes contained within the Bellevue Naval Housing Complex.

3.3.2.6 Daingerfield Island

Daingerfield Island is located across the Potomac River in Virginia, just south of Reagan National Airport. Much of Daingerfield Island is covered in trees, except Indigo Landing Marina on the northern side. The NRL, shoreline housing, Blanchard Barracks, and the DIA building are visible from the marina. Reagan National Airport, however, has a pier extending south into the Potomac River, obscuring the clarity of structures to the ground-level viewer. A consistent tree line extends along the length of JBAB in the background above the installation.

3.3.2.7 George Washington Memorial Parkway

George Washington Memorial Parkway is a four-lane parkway that runs north to south from the Capital Beltway (I-495) to its transition into N Washington Street in Alexandria, Virginia. JBAB is visible only on the section between Reagan National Airport and Indigo Landing Marina. The pier extending from Reagan National Airport south into the Potomac River, however, obscures the clarity of structures across on ground level. A consistent tree line extends along the length of JBAB in the background above the installation.

3.3.2.8 Ronald Reagan Washington National Airport

Reagan National Airport is located directly across the Potomac River from JBAB in Virginia. Aerial views of JBAB during take-off and landing exist only for passengers on the aircraft. As mentioned above, the airport has a pier extending into the Potomac River. This pier, however, is prohibited for the public.

3.3.2.9 Mount Vernon Trail

The Mount Vernon Trail is an 18-mile, multi-use recreation trail for pedestrians and cyclists. It follows the Potomac River and links George Washington's Mount Vernon home in Virginia to Washington, D.C. The trail often delivers unobstructed views of the river across to Maryland and Washington, D.C. Directly north of Reagan National Airport is a portion of the trail that features a direct view of the South side. Several buildings are visible including shoreline housing, Blanchard Barracks, the DIA building, one of the Secret Service buildings, and the Marine Helicopter Squadron One (HMX-1) airfield facility. Blanchard Barracks and the DIA building act as clear visual magnets because of their size and height. However, the North side is obscured by Hains Point/East Potomac Park's jutting out into the waterway. A consistent tree line extends along the length of JBAB in the background above the installation with a slight interruption by two smoke stacks and a structure on St. Elizabeths' property.

3.3.2.10 Hains Point/East Potomac Park

Hains Point/East Potomac Park provides an expansive panoramic view of JBAB from buildings, such as the White House Communications building in the north to shoreline housing in the south. A consistent tree line extends along the length of JBAB in the background above the installation with a slight interruption by two smoke stacks on the St. Elizabeths' property. Hains Point is located in the East and West Potomac Park Historic Districts. More information about the Historic District is presented in Section 3.5.

3.3.2.11 Buzzard Point Park

This park in southwest, Washington, D.C., offers the closest view of the northern tip of JBAB. The athletic fields and lights, White House Communications building, new dormitory, galley, Enterprise Hall, and hangars are all visible above the earth levee and floodwall. The tree line that extends along the length of

JBAB in the background above the installation is difficult to see the farther south one looks due to the viewing angle. The tree line is visible from the White House Communications building, looking north. Within the tree line to the north, viewers can see multi-family housing as well as the two smoke stacks on St. Elizabeths' property.

3.4 Utilities and Infrastructure

To prepare the Utilities and Infrastructure analysis, the 2014 Master Plan (Navy 2014a) was referenced. Primary utility systems and infrastructure that service JBAB include electricity, natural gas, water, wastewater, stormwater, and solid waste. These utility systems and infrastructure operate under a variety of ownership with maintenance responsibilities on JBAB, utility providers, and contractors.

3.4.1 Electrical System

PEPCO provides electric service to JBAB. On the North side, electrical power service is delivered to the main substation located in the rear of Building 168. The current three 13.2-kV feeders serving this portion of the installation are undersized and inadequate for current loads and future growth. A project is planned to correct the inadequacies of the current loads on the system by adding a forth 13.2-kV feeder from new re-distribution switchgear and changing the operating system from a "radial" system to a "loop" system. This project will not support future growth but rather remedy current issues. Any additional load connected to the installation electrical distribution system would need to be directly connected to the main substation.

Electrical power service on the South side is served by five 13.2-kV feed lines, four connected to the main switching station located at Building 18 and the fifth connected to the switchgear room at the DIA building. Electric distribution lines are all underground on the South side. While PEPCO's electrical supply is adequate for current and future uses on the South side, the existing electrical system is in need of upgrades, such as new transformers, switch replacements, and the conversion of any remaining dual-radial feeds in series to looped feeds.

Installation power feeders on the North side and the South side are close to maximized capacity.

3.4.2 Stormwater

As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutant-containing stormwater into surface waters of the United States, such as the Anacostia and Potomac Rivers. Point sources are discrete conveyances, such as pipes or man-made ditches. Industrial, municipal, and facilities including military bases must obtain permits if their discharges go directly to surface waters. The U.S. Environmental Protection Agency (EPA) administers the NPDES permit program and issues permits for the District of Columbia. Stormwater discharges for the North side are covered by an existing NPDES permit, 2008 EPA Multisector General Permit for Stormwater Associated with Industrial Activity. With the exception of construction discharge, an NPDES permit is not required for the South side.

The natural shoreline of the study area has been altered and originally terminated near the present-day installation boundary between the North side and the South side. The North side occupies land that consists of man-placed fill, whereas the South side land sits primarily on natural land, although portions of the South side also consist of man-placed fill. Historically, the North side was characterized by mud flats; however, these flats were filled in to make the area serviceable to the military. This has resulted in an area of land that it is relatively flat, sits at a low elevation, and experiences poor drainage. Effective stormwater management following heavy rains can be a challenge for the installation, especially on the North side.

On the North side, stormwater runoff from impervious surfaces, such as roofs, roads, and parking lots, drains by gravity to pump stations that discharge into the Anacostia River. Stormwater is conveyed through four outfalls that drain different portions of the installation into the river. Three outfalls have undergone extensive renovation in recent years to help control the flooding experienced on the installation; one outfall

is still in need of upgrades. Installation personnel operate and maintain the stormwater system on this portion of the installation. The North side retains a great deal of open space since it is not developed as intensely as the South side. Some of this open space is used for dry ponds and Low impact development design techniques such as the use of bioswales (a low area planted with plants tolerant of wet conditions to absorb runoff) to help regulate stormwater runoff on the installation. However, the installation still experiences standing water in parking lots, roadways, and open spaces following storm events.

On the South side, stormwater runoff from impervious surfaces is managed by a stormwater system of roadway curb and gutter drop inlets and yard inlets that drain into the Potomac River through 31 outfalls. The water is not treated for sediment prior to discharge. A number of improvements to control surface flooding have been completed such as adding and replacing system lines, but additional improvements are still needed. Like the North side, the South side is operated and maintained by installation personnel. On occasion, isolated flooding occurs around roads and open spaces, especially in the vicinity of the recreational marina during high tides and heavy storm events.

3.5 Cultural Resources

Cultural resources include archaeological sites, buildings, structures, objects, and historic landscapes and districts. A historic property, as defined in the National Historic Preservation Act of 1966 (NHPA), as amended, is a cultural resource that is included or eligible for inclusion in NRHP. Under Section 106 of the NHPA and its implementing regulations in 36 CFR Part 800, *Protection of Historic and Cultural Properties*, federal agencies must take into account the effects of their undertakings on historic properties. These regulations also require that federal agencies consult with the State Historic Preservation Office on their undertakings and that they afford the Advisory Council on Historic Preservation the opportunity to comment on their undertakings. Section 110 of the NHPA further requires federal agencies to assume responsibility for the identification and preservation of historic properties on land owned or controlled by the agency. The State Historic Preservation Office for Washington, D.C., is the DC Historic Preservation Office.

Because the proposed action is considered a federal undertaking, the Navy must comply with Section 106 of the NHPA. In accordance with Section 106, the Navy has determined an area of potential effect (APE) for the proposed action. The APE encompasses JBAB because the solar PV sites under this alternative are spread across almost the entire installation. Given the visibility of the installation along the Potomac River and from elevated areas to the east, a secondary APE was created to assess potential visual effects to NRHP-eligible or NRHP-listed cultural resources adjacent to the installation. This secondary APE includes Saint Elizabeths Hospital Historic District, The National War College (Fort McNair), East and West Potomac Parks Historic District, Buzzard Point Power Plant, and the Suitland Parkway Historic District. The primary and secondary APEs are shown in Figure 3-3.

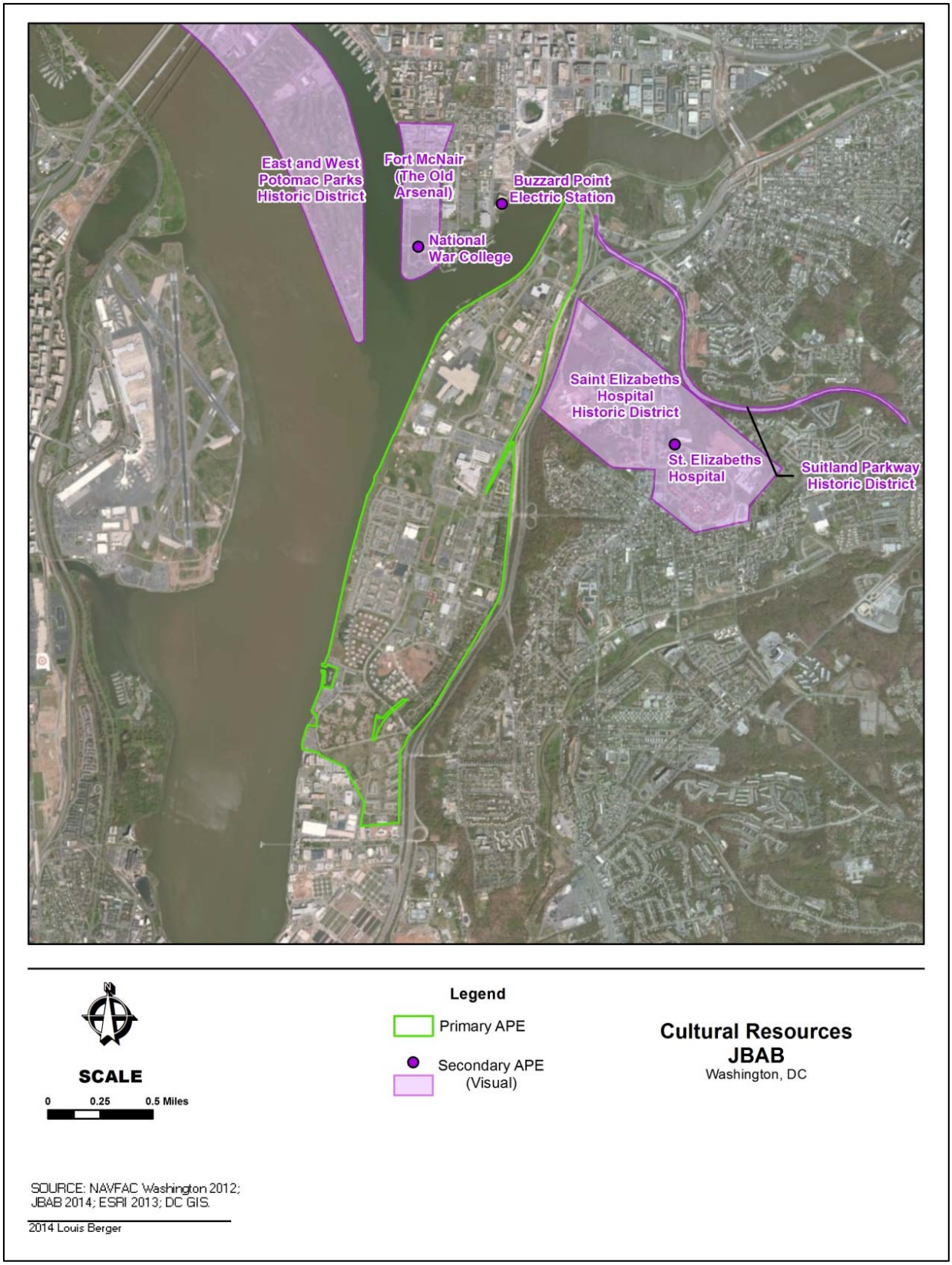


Figure 3-3 Primary and Secondary Areas of Potential Effect

3.5.1 Architectural Resources and Historic Properties

Historic architectural resources within the primary APE at JBAB include six individually eligible buildings and two historic districts. A 2009 survey identified Buildings 168 and 169, located on the east side of Mitscher Avenue just south of Defense Boulevard, as individually eligible under Criteria A and C, significant as the primary photography laboratory for the Navy during World War II and the Cold War (Criterion A) and as modified Government Deco buildings designed by the Eastman Kodak Company (Criterion C) (Smith and Stone 2009; Louis Berger 2012). The DC Historic Preservation Office responded to the survey with the statement that several more buildings in the former Naval Air Station Anacostia appeared to be NRHP-eligible. The Navy is therefore treating the Naval Air Station Anacostia Complex as an eligible resource. The former Naval Air Station Anacostia occupies the strip of land northwest of the HMX-1 facility and Defense Boulevard and southeast of the Anacostia River. The historic buildings range from the 1920s to the 1940s. Naval Air Station Anacostia is significant under Criterion A for its contributions to aviation-related defense from 1919 through 1961 and under Criterion C for its range of government building styles, including Government Deco and Georgian Revival. The Bolling AFB Historic District is located on the east side of the installation (Figure3-4). Current boundaries of the historic district include buildings on both sides of Brookley Avenue just south of its intersection with MacDill Boulevard, beginning at Buildings 5 and 16 to the west and Building 10 to the east. The historic district extends to the northeast to include Duncan Avenue and Westover Avenue, continuing north and crossing MacDill Boulevard to include Building 20. South of Dinger Street the east boundary of the historic district runs along the east side of Duncan Avenue and expands to include Buildings B431 and B432. The boundary extends to the south along Brookley Avenue, SW, as far as Building 2 on the west and Building 3 on the east. The boundary continues to the southeast along Rice Street, SW, to Westover Avenue, encompassing buildings on both sides of Westover Avenue from Building 628 south to Building 74. The historic district was determined eligible in 1996 under Criterion A for its association with military and aviation history and local defense during World War II. The historic district also meets Criterion C for Architecture and Design as a good example of an early military complex. The period of significance recommended in 1996 was 1930–1945, to include the acquisition of land for "New Bolling Field," gradual construction through the 1930s, and World War II construction. Four buildings within the Bolling AFB Historic District are also individually eligible for the NRHP—Buildings B1, 2, 20, and 21 (Martin et al. 1996).

The Buzzard Point Power Plant is located along the west side of the Anacostia River, occupying the entire block bounded by Half Street, SW; 1st Street, SW; U Street, SW; and V Street, SW. The plant, which was constructed by PEPCO, was planned as a modular, expandable building in the "stripped Deco" style. The plant was expanded in 1940 and 1943 and was closed in 1983. The plant was nominated as a D.C. historic landmark in 1989 and listed in 1990 and is eligible for the NRHP under Criterion C for exemplifying the late period of the Art Deco style.

The East and West Potomac Parks Historic District is located along the Potomac River from Constitution Avenue to Hains Point. The parks are part of Washington's monumental core, part of the McMillan Commission Plan for Washington and the setting for the Lincoln and Jefferson Memorials, the Franklin D. Roosevelt Memorial, Vietnam and Korean War Veterans Memorial, and others. The parks were created through land reclamation in the late nineteenth century by the U.S. Army Corps of Engineers. The parks are characterized by open space framed by mature landscape plantings and historic boulevards and drives. Views from the parks are an important features of the park space; East Potomac Park and Hains Point have uninterrupted views toward local landmarks, such as Ft. McNair and St. Elizabeths Hospital, and toward points in Virginia. The historic district was listed in the NRHP in 1973 and the nomination revised in 2001. The parks are also contributing resources in the L'Enfant Plan of the City of Washington, DC, NRHP nomination (NPS 1999).

Figure 3-4 Bolling AFB Historic District

Fort McNair and the National War College occupy Reservation No. 5, part of the original Plan of the City of Washington, a strategic point of land at the confluence of the Potomac and Anacostia Rivers known as Greenleaf Point. Defenses were built in 1774 and the site was laid out for the Washington Arsenal by 1803. It is the third oldest U.S. Army installation in continuous use. The fort was destroyed by British troops in 1814 and rebuilt and enlarged by 1816. A federal penitentiary added to the grounds in 1821 was the site of the detention and hanging of the Lincoln assassination conspirators. In 1881, the Army converted the site to the Washington Barracks, and in 1902-03, architects McKim, Mead & White designed the Army War College and other buildings constructed between 1903 and 1915. The Fort McNair Historic District was listed in the NRHP in 1972 and the same year the National War College was designated as a National Historic Landmark. Reservation No. 5 is also a contributing resource in the L'Enfant Plan of the City of Washington, D.C., NRHP nomination.

The Suitland Parkway extends from the east side of the Frederick Douglass Memorial Bridge to the northern entrance of Andrews AFB in Maryland, linking Andrews AFB's military airport to the Capitol, allowing a direct route for the President, U.S. government officials, and visiting foreign dignitaries. The parkway was planned beginning in 1937 but was not constructed because of budget limitations. Construction began in 1943 and the parkway was opened in December 1944. The parkway is an example of a late-1930s grade-separated parkway, a divided highway with east and westbound lanes separated by a grass median. The Suitland Parkway was listed in the NRHP in 1995 along with the George Washington Memorial Parkway, the Rock Creek and Potomac Parkway, and the Baltimore-Washington Parkway as part of a multiple-property nomination for significance under NRHP Criteria A and C in the areas of transportation and landscape architecture. The parkway is characterized by its park-like character created by its median grass strip, gently-rolling topography, and stone-clad structures (NPS 1995).

St. Elizabeths Hospital Historic District is located to the east of JBAB. The hospital is one of the nation's first and most significant institutions for the treatment of mental illness, chartered by Congress in 1852 as the Government Hospital for the Insane. The hospital opened in 1855; during the Civil War, it was used as a general hospital to treat sick and wounded soldiers. The Center Building was an early example of the "linear plan" for mental hospital wards developed by reformer Thomas Kirkbride. The hospital continued to grow throughout the second half of the nineteenth century into a large complex of buildings. It is also notable for its picturesque landscapes; gardening and work on the hospital farm became part of patient therapy into the twentieth century. The historic district was listed in the NRHP in April 1979 and designated a National Historic Landmark in December 1990.

3.5.2 Archaeological Resources

JBAB occupies a position along the Potomac River that was intensively settled by Native American Groups during prehistoric times; however, much of the JBAB property consists of reclaimed land that was created by twentieth-century landfilling processes. Essentially all of the former NSF Anacostia (the North side) property consists of reclaimed land with no potential for archaeological resources (Navy 2014a). Further inland, the same landfilling processes have obscured the ancient landscapes that contained important Native American sites. One of the most remarkable archaeological sites that has ever been recorded in the District of Columbia was an ossuary site that excavated in the 1930s by the Smithsonian Institution; this site was discovered during grading for expansion of the Bolling airfield, and it contained the remains of an estimated 63 to 70 individuals (Stewart and Wedel 1937). Most of the eight recorded archaeological resources within the JBAB property were initially identified in the late nineteenth and early twentieth centuries, and their exact location cannot be pinpointed. Of the eight archaeological sites in the resource inventory, two have been found to be eligible for the NRHP (Sites 51SW7 and 51SW22) and the remainder has not been evaluated. Both of the eligible sites are Native American camps with remains dating to the Late Archaic and Early Woodland Periods, c. 2500 to 500 BC (Bedell et al. 2013; Katz and LeeDecker 2010).

3.6 Air Quality and Greenhouse Gases

EPA has established National Ambient Air Quality Standards (NAAQS) for six air pollutants, referred to as criteria pollutants (40 CFR Part 5). The six air pollutants include: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10}, diameter equal to or less than 10 micrometers, and $PM_{2.5}$, diameter equals to or less than 2.5 micrometers), lead, and sulfur dioxide (SO_2). EPA established primary and secondary NAAQS standards under the requirements of the 1970 Clean Air Act (CAA) as amended in 1977 and 1999. Primary standards were set at levels sufficient to protect public health with an adequate margin of safety; secondary standards were set to protect the public welfare from the adverse effects associated with pollutants in the ambient air such as visibility.

Areas across the U.S. are monitored for their criteria pollutant level. Areas with criteria pollutant that stay within allowable NAAQS levels are classified as "in attainment." Areas that exceed the criteria pollutant level are designated as "nonattainment" areas. Nonattainment of NAAQS standards has different levels of severity depending on the criteria measured.

Washington, D.C., is in marginal nonattainment for O_3, a moderate nonattainment area for $PM_{2.5}$, and an attainment area for all other criteria pollutants. The Washington, D.C., airshed was previously in nonattainment for CO but was designated as in attainment in 1996 (EPA 2014). Emissions from vehicles, electric utilities, and industrial facilities are the major sources of O_3-causing chemical compounds. Particulate matter, or particle pollution, consists of very small particles found in the air such as dirt, soot, smoke, dust and liquid droplets. In the case of $PM_{2.5}$, the particle pollution is made up of fine particles that are the result of combustion activities from sources such as motor vehicles and industrial processes. Table 3-1 provides the NAAQS for all criteria pollutants as well as local monitoring data from nearby monitors.

Table 3-1 Local Ambient Air Quality in 2013

Pollutant	Primary Standard	Monitor Data	Monitoring Site
Carbon monoxide 8-hour 1-hour	 9 ppm 35 ppm	 2.3 ppm 1.9 ppm	420 34th Street, N.E.
Lead 3-month	 0.15 µg/m^3	 0.009 µg/m^3	2500 1st Street, N.W.
Nitrogen dioxide 1-hour Annual	 100 ppb 53 ppb	 65 ppb N/A	420 34th Street, N.E.
Ozone 8-hour	 0.075 ppm	 0.071 ppm	420 34th Street, N.E.
Particulate matter (2.5) Annual 24-hour	 15 µg/m^3 35 µg/m^3	 N/A 27.6 µg/m^3	2500 1st Street, N.W. (two PM10 monitors at this location)
Particulate matter (10) 24-hour	 150 µg/m^3	 32 µg/m^3 / 32 µg/m^3	2500 1st Street, N.W. (two PM10 monitors at this location)
Sulfur dioxide 1-hour	 75 ppb	 15 ppb	420 34th Street, N.E.

Source: EPA (2011, 2013)

As Table 3-1 indicates, the local ambient air quality measurements are currently below the NAAQS standards. Although the O_3 and $PM_{2.5}$ levels for the installation are below the NAAQS threshold, the region as a whole is still in nonattainment status for these pollutants.

3.6.1 Air Emissions at Joint Base Anacostia-Bolling

Stationary sources of air pollutants on JBAB are emissions from boilers, fuel storage, generators, paint booth operations, printing operations, and woodworking.

Additionally, mobile emission sources on JBAB include personal vehicles, trucks and buses entering and leaving the installation. Adjacent mobile emission sources include motor vehicles using the major transportation corridors around the area: I-295, South Capitol Street, the Frederick Douglass Memorial Bridge and the 11th Street Bridges (Navy 2010).

3.6.2 General Conformity

The CAA (as amended in 1990) mandates that state agencies adopt state implementation plans (SIPs) that target the elimination or reduction of the severity and number of violations of the NAAQS. SIPs outline policies to achieve and maintain standards attainment.

Two SIPs target the Washington, D.C., region's non-attainment status for O_3 and fine particulate matter: the *Plan to Improve Air Quality in the Washington, DC-MD-VA Region, State Implementation Plan for 8-Hour Ozone* (MWCOG 2007) and the *Plan to Improve Air Quality in the Washington, DC-MD-VA Region, State Implementation Plan for Fine Particulate Matter ($PM_{2.5}$)* (MWCOG 2008). Both plans offer steps to bring the area into attainment status. In 2013, MWCOG submitted a $PM_{2.5}$ Maintenance Plan and Redesignation Request for EPA approval (MWCOG 2013).

Under Section 176(c) of the CAA Amendments of 1990, a project is in "conformity" if it corresponds to a SIP's purpose of elimination or reduction of the severity and number of violations of NAAQS standards. EPA published final rules on general conformity (40 CFR Parts 51 and 93 in the *Federal Register* in 1993) that apply to federal actions in nonattainment areas. Federal agencies responsible for an action in a nonattainment area are required to determine that the action either conforms with the region's attainment plan or is exempt from determining conformity. Federal actions are exempt from conformity determinations where the total of all reasonably foreseeable direct and indirect emissions of nonattainment pollutants would either be: 1) less than their specified emission rate thresholds, known as *de minimis* limits, or 2) less than 25 percent of the area's annual emissions budget. The rules indicated threshold emission levels by pollutant to determine the applicability of conformity requirements for a project.

In this particular instance, the project area—JBAB—is located in a marginal nonattainment area for O_3 in an ozone transport region and a moderate nonattainment area for particulate matter ($PM_{2.5}$). Therefore, based on the threshold level (*de minimis*), no more than 100 tons per year of nitrogen oxides (NO_x), $PM_{2.5}$, and sulfur oxides (So_x) (a $PM_{2.5}$ precursor) and 50 tons per year of volatile organic compounds (VOCs; NO_x, and VOC are precursors of O_3) are permitted.

3.6.3 Greenhouse Gases

There is broad scientific consensus that humans are changing the chemical composition of Earth's atmosphere. Activities such as fossil fuel combustion, deforestation, and other changes in land use are resulting in the accumulation of trace GHGs, such as CO_2, in the atmosphere. An increase in GHG emissions is said to result in an increase in the Earth's average surface temperature, which is commonly referred to as global warming. Global warming is expected, in turn, to affect weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates, commonly referred to as climate change. The Intergovernmental Panel on Climate Change best estimates are that the average global temperature rise between 2000 and 2100 could range from 0.6 degrees Celsius (°C) (with no increase in GHG emissions above year 2000 levels) to 4.0°C (with substantial increase in GHG emissions). Even small increases in global temperatures could have considerable detrimental impacts on natural and human environments.

GHGs include water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), O_3, and several hydrocarbons and chlorofluorocarbons. Each GHG has an estimated global warming potential (GWP), which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared energy emitted

from the Earth's surface. A gas's GWP provides a relative basis for calculating its carbon dioxide equivalent (CO_2e), which is a metric measure used to compare the emissions from various GHGs based upon their GWP. CO_2 has a GWP of 1 and is, therefore, the standard to which all other GHGs are measured.

Water vapor is a naturally occurring GHG and accounts for the largest percentage of the greenhouse effect. Next to water vapor, CO_2 is the second-most abundant GHG. Uncontrolled CO_2 emissions from power plants, heating sources, and mobile sources are a function of the power rating of each source, the feedstock (fuel) consumed, and the source's net efficiency at converting the energy in the feedstock into other useful forms of energy (e.g., electricity, heat, and kinetic). Because CO_2 and the other GHGs are relatively stable in the atmosphere and essentially uniformly mixed throughout the troposphere and stratosphere, the climatic impact of these emissions does not depend upon the source location on the earth (i.e., regional climatic impacts/changes would be a function of global emissions).

No significant environmental regulations have been enacted in the U.S. at the national level to specifically address increasing concentrations of GHGs or climate change for facilities that are not a major source of emissions. In April 2007, the U.S. Supreme Court determined that EPA had the regulatory authority to list GHGs as pollutants under the federal CAA. EPA has sought comments from the public and other federal agencies, but it has not yet proposed or adopted any regulations pertaining to GHGs. Numerous proposals and bills have been circulated and have been considered in the U.S. Congress to regulate GHGs, but no legislation has been adopted.

Currently, federal agencies address emissions of GHGs by reporting and meeting reductions mandated in laws, EOs and policies. The most recent of these are EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, of October 5, 2009, and EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, of January 26, 2007.

3.7 Geology, Topography, and Soils

3.7.1 Geology

JBAB is located in the Inner Coastal Plain physiographic province, on the east bank of the Potomac River (Navy 2014b). The Inner Coastal Plain is a rolling upland underlain by unconsolidated marine and riverine deposits of gravel, sand, silt, and clay that range in age from Cretaceous to Recent. The JBAB landmass looks like a broad river terrace, but much of the landmass has been formed by the placement of artificial fills along the historical river shoreline, a process that extended the shoreline into the former river channel. To the east of JBAB, the land rises toward the Coastal Plain uplands that overlook the Potomac River valley (Navy 2014b).

3.7.2 Topography

Surface elevations throughout JBAB range from sea level along the riverfront up to a maximum of about 60 feet above mean sea level (Navy 2014b). Much of JBAB falls within the 100-year floodplain, generally at an elevation of about 15 feet above mean sea level; areas at greatest risk of flooding are concentrated in the northern part of JBAB and include virtually all of the North side property. The highest elevations are found along in the southeastern area of the installation in the Bellevue Naval Housing Complex. Slopes vary from less than 2 percent throughout most of the tract to 25 percent or more along the waterfront due to the presence of an earth levee (Navy 2014b).

3.7.3 Soils

Soils are classified by a complex taxonomy that includes soil associations, series, and phases. Soil associations represent the largest and most general classification. A soil association is a landscape that has a distinctive proportional pattern of soils and is named for the major soil types that it represents. It normally consists of one or more major soil series and at least one minor soil series. A soil series is a collection of

soils that have major layers similar in thickness, arrangement, and other important characteristics, but may differ in surface layer texture. Each soil series is named for a town or other geographic feature near the location where the series was first observed and mapped. Soil phases are more detailed classifications that differentiate soils of the same series based on characteristics that affect the use of the soils, such as the texture of the surface soil, slope, or stoniness (USDA Natural Resources Conservaton Service 1999).

JBAB has been mapped to show the common soil series (see Figure 3-5). Two major soil series exist: the Udorthents series and the Urban Land multiseries. These series were anthropogenically deposited in the river channel or on the low-lying terrace and mudflats that existed along the Potomac River. Udorthent soils consist of unconsolidated material and material from excavation and river dredging. Various local sources of fill were used, including industrial waste and soil cuttings from Washington, D.C., metro construction. The Udorthents association is characterized by areas of nearly level to steep slopes that have been created or strongly influenced by human activity. Typically, Udorthent soils have little potential for urban development because of instability and subsidence and have only fair potential for landscaping because of slope, dryness, and compaction (USDA Natural Resources Conservaton Service 1999). Special foundation design is required for all but the lightest building loads. Areas along the western and eastern margins of JBAB, including most of the Bellevue Naval Housing Complex, fall within the Urban Land soil multiseries, which includes urban land, Christiana-urban, Galestown-urban, and Keyport-urban soils. Each is characterized by a certain level of deviation or alteration from the historical soil characteristics of the site (USDA Natural Resources Conservaton Service 2005). These soils are often well drained, have varying water capacities, are prone to very rapid runoff, and have a high hazard of water erosion (USDA Natural Resources Conservaton Service 2005).

3.8 Biological Resources

3.8.1 Vegetation

Vegetation throughout JBAB consists of native and introduced species of turf grasses, shrubs, and trees. Turf grasses are used in lawns and on recreational sites, such as playgrounds, parks, and athletic fields. Shrubs are used primarily as ornamentals along sidewalks and around the foundation of buildings. Planted trees line the streets as well as occurring individually or in small groves on JBAB (Navy 2014c). Collectively, vegetation accounts for less than 20 percent of ground cover on the installation.

3.8.2 Wildlife

Wildlife species common to urban areas, such as squirrels, eastern cottontail rabbits, groundhogs, rodents, Virginia opossums, and raccoons, can be found on JBAB. Herpetofauna also present may include frogs, toads, snakes, and turtles. Several avian species, such as cardinals, pigeons, doves, sparrows, starlings, crows, and various species of gulls and terns, are regularly observed on the installation. Other bird species, such as migratory ducks and geese, wading birds (herons and egrets), and passerines (warblers and vireo's) can be observed during spring and fall migration at Anacostia Park and Shepherd Parkway adjacent to JBAB (Navy 2014c). Raptors (hawks, falcons, and eagles) perched on branches overlooking the Anacostia River can also be observed at Anacostia Park.

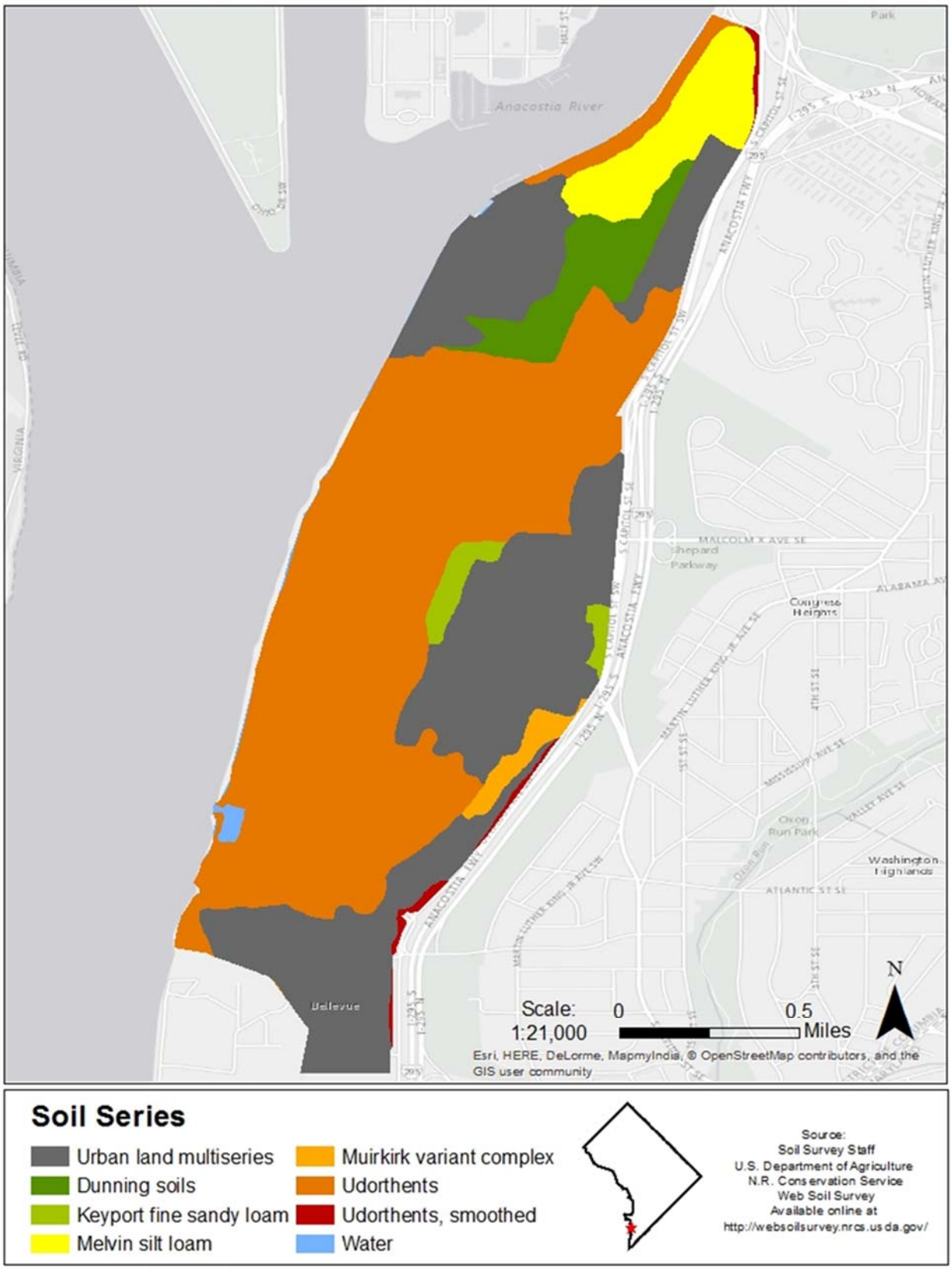


Figure 3-5 Common Soil Series at Joint Base Anacostia-Bolling

3.9 Noise

Noise is generally defined as unwanted or objectionable sound that alters or disturbs quality of life, communication, or may affect physical health. Most environmental noise, particularly in urban areas, consists of a variety of frequencies of common, distant noises that create relatively steady background noise levels. Periodic loud noises, such as honking horns or passing trucks, are easily perceived above background noise levels.

Noise levels are usually measured and expressed in decibels (dB) that are weighted to frequencies perceivable by the human ear, known as A-weighted sound levels and expressed as dBA. Noise levels are typically measured over a set period (1 hour, 8 hours, or 24 hours) and commonly expressed as dBA Leq, representing the equivalent or average noise level for a given period. Noise experienced by an individual is a function of the noise source and the physical conditions between the source and receptors (e.g., topography/structures, weather, background noise, and time of day). Because of the location of JBAB within Washington D.C., ambient noise levels would generally be higher during the daytime and evening hours and lower during the night.

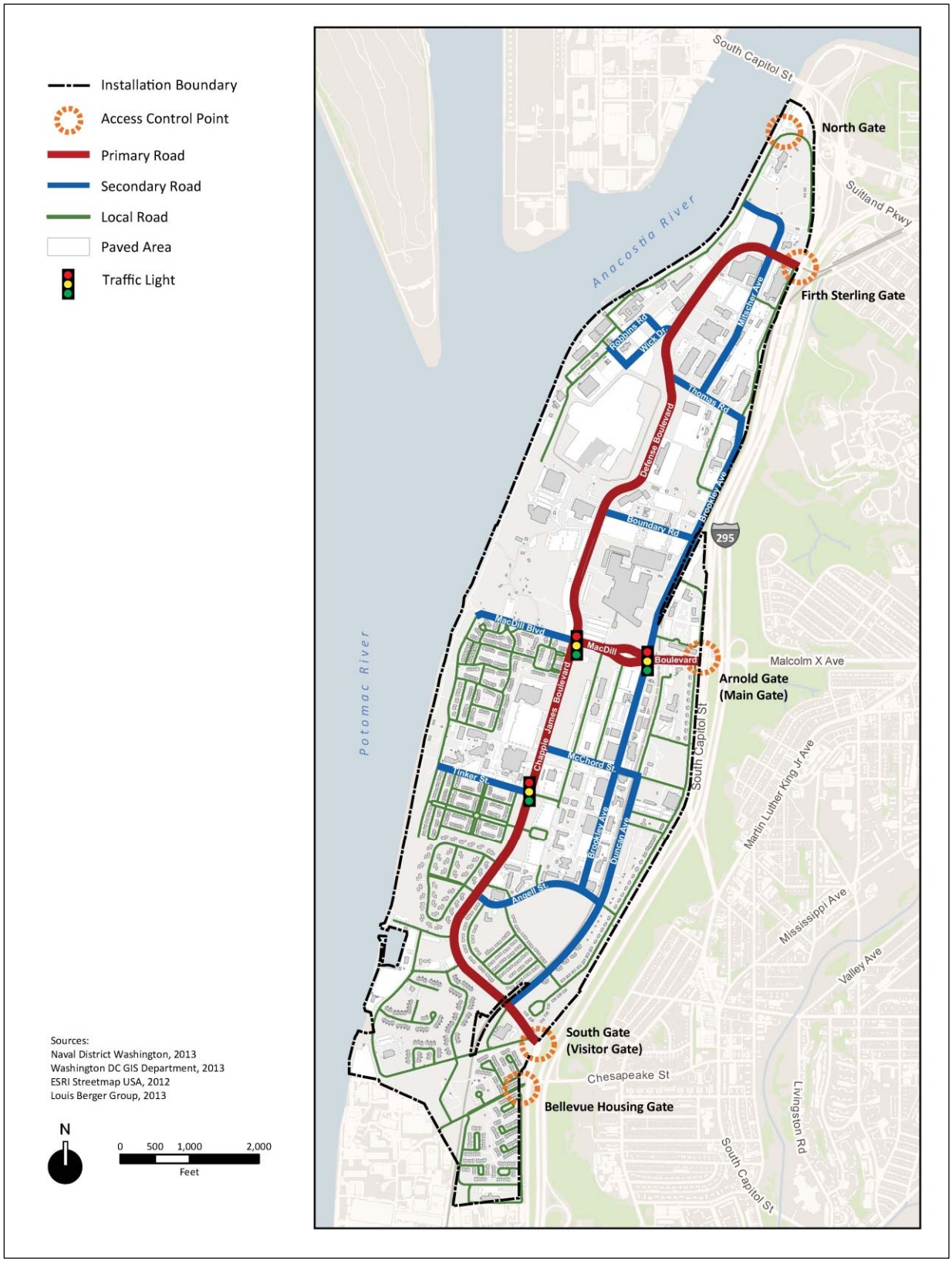
The predominant sources of noise at JBAB include military helicopter operations on the installation, air traffic from Reagan National Airport across the Potomac River, and vehicular traffic from South Capitol Street and I-295, which run adjacent to the installation (Navy 2010). Helicopter operations at the HMX-1 airfield or the small landing area on the installation are sporadic and not a consistent source of noise. Although noise from Reagan National Airport is steady, the installation and nearby neighborhoods are well outside the 65-dBA day-night average level contour, the accepted threshold for incompatibility with residential land uses (Navy 2014a). Flight paths from Reagan National Airport typically follow the Potomac and Anacostia Rivers; however, commercial air traffic control may modify the path of aircraft in the interest of safety leading to occasional overflights at the installation. Flight operations at the airport used to create day-night average sound level noise contours of 65 Ldn, which reached the interior of JBAB. An Ldn (also known as day-night average sound level or DNL) is a unit of noise awareness. Areas within a 65-Ldn contour would be somewhat less noisy than the interior of a department store. However, recent studies show that these noise contours no longer reach JBAB due in large part to the use of quieter aircraft at Reagan National Airport (WMAA 2004). Secondary sources of noise on the installation include traffic and equipment operation.

3.10 Traffic and Transportation

3.10.1 Road Network and Access

Regional access to JBAB is provided via I-295, I-95, I-495, I-395, Maryland (MD) 270, U.S. 50, and I-66. I-295 provides the primary access from JBAB to all other routes, except MD 210, which connects to South Capitol Street. Local access to JBAB is provided by a number of arterial routes. These include Suitland Parkway, Martin Luther King Jr. Avenue, and South Capitol Street. Public transit modes including buses and Metrorail systems also provide services in the vicinity of JBAB. Additionally, JBAB is served by seven shuttle routes operated separately by the Navy and DIA. The shuttle routes connect the installation with other agency offices and Metrorail stations in the nearby areas (Anacostia and Congress Heights Metro Stations). The installation has five gates and approximately 28 miles of internal roadways that include primary, secondary, and tertiary roads (Navy 2014d).

The primary roads of Defense Boulevard and Chappie James Boulevard serve as a continuous spine route between the Firth Sterling Gate and the South Gate, and intersect with primary road MacDill Boulevard at the approximate center of the installation. The basic design intent of the spine road and its three principal gates is to distribute peak ingress and egress traffic to the South Capitol Street corridor more uniformly among the length of the installation (see Figure 3-6).



Source: Navy (2014d)

Figure 3-6 Internal Circulation and Gate Access

3.10.2 Existing traffic operations

Peak arrival and departure times for the installation occur between 6:30 a.m. to 7:30 a.m. and 3:30 p.m. to 4:30 p.m. The key intersections within JBAB all operate at an acceptable LOS during the morning and afternoon peak hours. The poorest LOS occurs at the intersection of Defense Boulevard and Mitscher Road. Arnold Gate has the highest peak hour gate volumes (Navy 2014d).

3.10.3 Parking

JBAB facilities are currently served by a total of 8,259 employee parking spaces (Navy 2014d). This total does not include additional parking within residential areas, customer parking at service facilities, or vehicle storage and maintenance yards. The 2014 Master Plan has developed a 5-year goal of reducing employee parking by 10 percent by the year 2018, which would bring the number of employee parking spaces down to 7,426. The current parking ratio for JBAB is one parking space for every 1.67 employees; after reaching the 2018 parking goals (by removing 833 parking spaces), one parking space would be available for every 1.86 employees (Navy 2014a).

3.11 Water Resources

3.11.1 Surface Water and Water Quality

Most of JBAB is located within the Four Mile Run-Potomac River subwatershed with a small portion of the northern section within the Anacostia River subwatershed (DC OCTO 2013a). The Anacostia River, which drains into the Potomac River, forms the western border of the installation in the north, whereas the Potomac River forms the border in the south. Adjacent to the installation, the Anacostia and Potomac Rivers are tidally influenced and the Potomac eventually drains to the Chesapeake Bay. While not within the installation boundary, the Washington Channel meets the Anacostia River just upstream of the confluence with the Potomac River. The surface waterbodies located on the installation are limited. Two stormwater retention ponds encompass approximately 1 acre on the eastern side of the installation (Navy 2014a).

Water quality for both the Potomac River and Anacostia River adjacent to the installation is impaired due to natural and urban land uses. The Potomac River headwaters are located within forested and agricultural land, whereas the lower reaches flow through urban areas. In 2012, the Potomac River impairments included nitrogen, phosphorus, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons, and turbidity (EPA 2012a). The Anacostia River was designated as impaired due to metals (i.e., arsenic, copper, lead, and zinc), biological oxygen demand, fecal coliform, pesticides, trash, nitrogen and phosphorus, oil and grease, PCBs, polycyclic aromatic hydrocarbons, and turbidity (EPA 2012b).

Although nitrogen and phosphorus concentrations in the Potomac River are generally greater than those that would occur naturally, the majority of the elevated nutrient concentrations do not exceed drinking water standards and therefore do not pose a threat to human health or wildlife. Nutrient contributions to the Potomac River are from both agricultural (i.e., animal manure) and developed (i.e., commercial fertilizers) land uses (Ator et al. 1998).

Toxic organic compounds, metals, and pesticides are present in the streambed sediment of the mainstem Potomac River, especially in the urbanized areas, such as the District of Columbia. Many of these chemicals are legacy compounds, such as chlordane, DDT, and PCBs that have been banned for many years. However, these compounds take a long time to degrade and therefore persist in the environment for decades. Metals, such as mercury and lead, can accumulate in fish tissue and can have adverse effects on aquatic life in the river, as well as human health (Ator et al. 1998). Fish consumption advisories are in effect for various fish caught in the Anacostia and Potomac Rivers in Washington, D.C. (DDOE 2014a). A total maximum daily load for PCBs was developed for the Potomac River and its tributaries (ICPRB 2007).

Combined sewer overflows, stormwater runoff polluted with pet and wildlife waste, and direct inputs from wildlife contribute bacteria loads to the Potomac and Anacostia Rivers. Much of the District of Columbia

is served by combined sanitary and stormwater drainage pipes, including much of the area upstream from the installation. Frequently during heavy precipitation events the combined system cannot handle the volume leading to the overflow being discharged to into the Potomac River and its tributaries, including the Anacostia River. However, the Potomac River has a high assimilative capacity and is generally better able to attain water quality standards for bacteria and other pollutants than smaller waterbodies. Bacteria total maximum daily loads were developed for the Potomac River, Anacostia River, and their tributaries in 2003 and 2004 (DOH 2003, 2004).

3.11.2 Groundwater

Groundwater conditions differ depending on local topography, geologic characteristics, location, season, precipitation, and groundwater affecting activities (USGS 2010; Navy 2014a). Groundwater flow at JBAB follows the topography in an east to west direction, eventually recharging the Anacostia and Potomac Rivers. The average depth to the water table varies from 10 feet in the northern portion of the installation to 15 feet in the southern portion (Navy 2014a). Near the Potomac and Anacostia Rivers, the water table is closer to the surface. As part of the Coastal Plain physiographic province, the installation overlies the North Atlantic Coastal Plain Aquifer (USGS 2009). Although a shallow, surficial aquifer exists beneath the installation, this groundwater is not used to meet any water supply demands of the installation.

Environmental site assessments and other investigations found that landfills, solid waste disposal sites, discharges, and site uses may have contaminated portions of the groundwater beneath the installation (DDOE 2014b). Although numerous substances were detected in groundwater samples, it was determined that the observed constituents did not pose unacceptable risks to human health or to the environment. Groundwater quality in the District of Columbia is subject to District of Columbia Municipal Regulations Parts 1150–1158.

3.11.3 Floodplains

EO 11988, *Floodplain Management*, requires federal agencies to avoid floodplain development and any adverse impacts from the use or modification of floodplains when there is a feasible alternative. Specifically, Section 1 of the EO states that an agency is required "to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities." The EO details an eight-step process for floodplain management decisions. These steps include: (1) determine whether a proposed action is in the base floodplain; (2) conduct a public review of the action; (3) identify and evaluate practicable alternatives to locating in the base floodplain; (4) identify the impacts of the proposed action; (5) develop measures to reduce unavoidable impacts and restore floodplain values; (6) reevaluate alternatives; (7) issue findings and a public explanation; and (8) implement the action. The District Department of the Environment (DDOE) and the District Department of Consumer and Regulatory Affairs regulate floodplain development within the District of Columbia through District of Columbia Municipal Regulations Title 12, *DC Construction Codes*, and Title 20, *Flood Hazard Rules*.

Storm surges, tidal influences, and high river flow conditions from the Potomac and Anacostia Rivers are the general causes of flooding in the area surrounding the installation (Navy 2010). The northern portion of the installation is particularly susceptible to flooding due to low elevation and flat topography (Navy 2014b). A seawall and levee protect the 3.3-mile shoreline along the western border of the installation; however, portions are in poor condition. The majority of the North side is within the 100-year floodplain special flood hazard area Zone AE and has a 1 percent chance of flooding in any given year (DC OCTO 2013b). Most of the southern portion of the North side and the South side are outside the floodplain and within an area of minimal flood hazard. The southwest portion of the installation has areas of 100-year floodplain as well as 500-year floodplain. Areas within the 500-year floodplain have a 0.2 percent chance of flooding in any given year. Base flood elevations of the 100-year floodplain within or along the western installation boundary are 10 feet above National Geodetic Vertical Datum 1988 (NGVD88) in the south

and 11 feet NGVD88 toward the north. Approximately 290 acres of the installation are located within the 100-year floodplain and 130 acres are within the 500-year floodplain (Navy 2014b). Figure 3-7 illustrates the water resources, including floodplains, on JBAB.

3.12 Protection of Children

EO 13045, *Protection of Children from Environmental Health and Safety Risk*, requires federal agencies, to the extent permitted by law and mission, to identify and assess environmental health and safety risks that might disproportionately affect children. This EO, dated April 21, 1997, further requires federal agencies to ensure that their policies, programs, activities, and standards address these disproportionate risks. EO 13045 defines environmental health and safety risks as "risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink and use for recreation, the soil we live on and the products we use or are exposed to)."

Children reside in homes, attend day care, play in parks, fields, and recreational areas, and walk along the sidewalks of the roadways within the installation. Impacts to children specific to the action alternatives are identified in the following impacts analysis.

3.13 Human Health and Safety

3.13.1 Environmental Restoration Program

JBAB has been investigating and remediating past hazardous waste contamination areas as part of the DOD's ERP, formerly referred to as the Installation Restoration Program. This program was created in response to the requirements of the Superfund Amendments and Reauthorization Act, which amended the Comprehensive Environmental Response, Compensation, and Liability Act as well as the Resource Conservation and Recovery Act for former and current hazardous waste sites. The ERP identifies, targets, and remediates those areas on the installation that have experienced environmental contamination due to past practices.

The ERP consists of a preliminary assessment, site investigation, remedial investigation, feasibility study, remedial action, and Record of Decision (close out). Each phase can take anywhere from 1 to 3 years, including regulator review and additional sampling, if necessary. All sites require regulator concurrence to be closed out; therefore, future actions are difficult to determine at times.

NAVFAC manages the ERP for JBAB. Decisions under this program are made through a cooperative process involving the Navy, EPA, and DDOE. JBAB's proposed solar PV sites that are within an ERP site are listed in Table 3-2 and illustrated on Figure 3-8a and Figure 3-8b. The ERP sites are in various stages of investigation, study, review, and remediation (Navy 2014a).

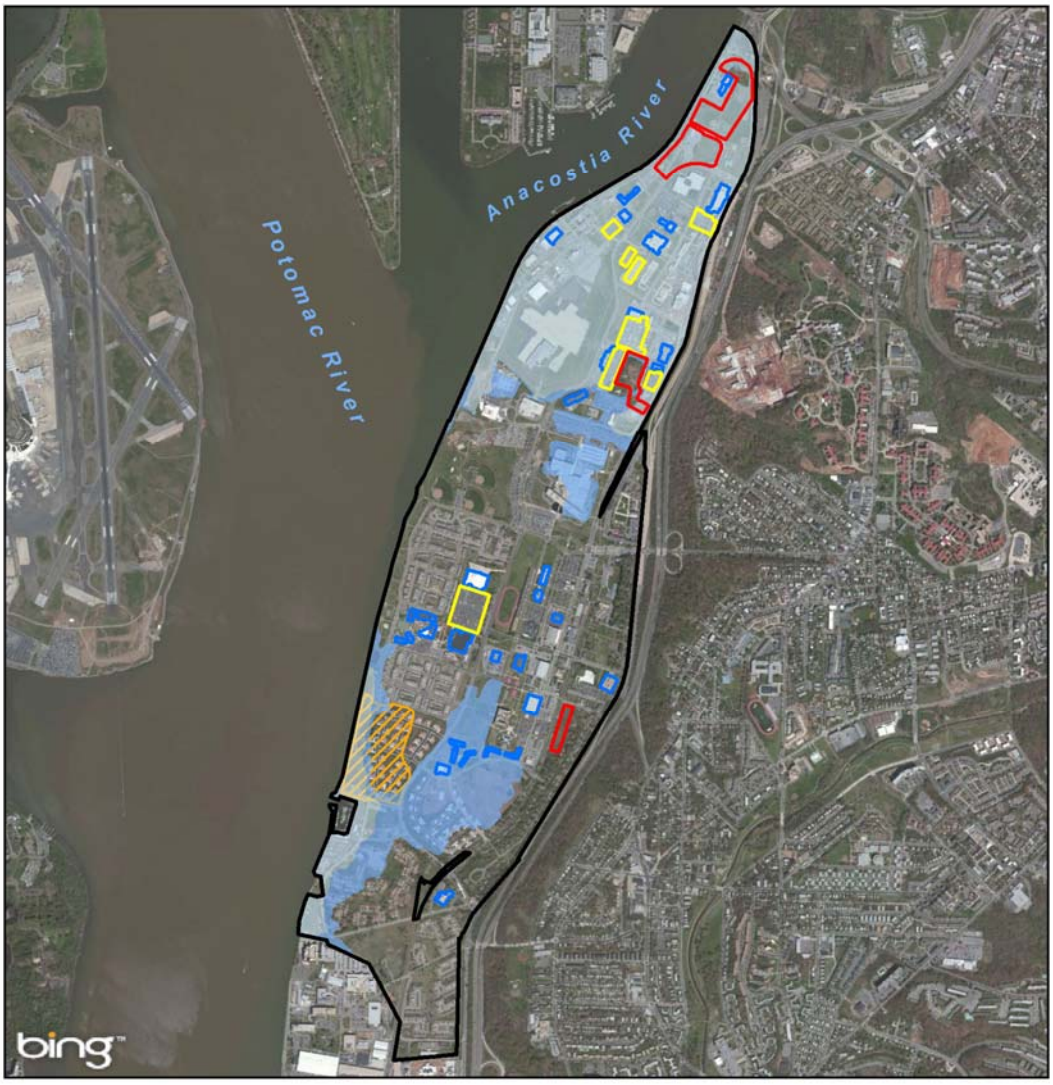


Figure 3-7 Water Resources on Joint Base Anacostia-Bolling

Table 3-2 Proposed Solar PV Locations and Related Environmental Restoration Program Sites

JBAB Location	Proposed Solar PV Locations	ERP Site Description	ERP Site Number	Active / Inactive Site	Narrative
North	Land beside Building 413	Athletic Fields	3	Active site	Active site
North	Building 168	Building 168 crawlspace	1	Active site	Active site
North	Lot 463	Metro fill and waterfront fill areas	2	Active site	Active site
North	Building 400	Metro fill and waterfront fill areas	2	Active site	Active site
North	Building 370	Metro fill and waterfront fill areas	2	Active site	Active site
North	Lot ANA000064	Metro fill and waterfront fill areas	2	Active site	Active site
North	Building 421	Metro fill and waterfront fill areas	2	Active site	Active site
North	Land between Lot 463 and Lot ANA000064	Metro fill and waterfront fill areas	2	Active site	Active site– no restrictions on solar panel installation
South	Building 4485	Former aircraft parking center	11B	Inactive site	No breaching of clay layer below perched groundwater
South	Building 4456	Former aircraft parking center	11B	Inactive site	No breaching of clay layer below perched groundwater
South	Building 5681	Former liquid fuel line zone	21B	Inactive site	No remediation needed unless disturbed
South	Building 5683	Former liquid fuel line zone	21B	Inactive site	No remediation needed unless disturbed
South	Building 1310	Former liquid fuel line zone	21B	Inactive site	No remediation needed unless disturbed
South	Building 3623	Former liquid fuel line zone	21B	Inactive site	No remediation needed unless disturbed
South	Building B421	Hanger zone	20B	Inactive site	No remediation needed unless disturbed
South	Building 520	Hanger zone	20B	Inactive site	No remediation needed unless disturbed

Notes: ERP – Environmental Restoration Program, JBB – Joint Base Anacostia-Bolling, PV – photovoltaic

Figure 3-8a Environmental Restoration Sites at Joint Base Anacostia-Bolling (North Side)

Figure 3-8b Environmental Restoration Sites at Joint Base Anacostia-Bolling (South Side)

3.13.2 Munitions Response Program

Fourteen facilities at JBAB accommodate storage of ammunition and explosives. While most are inconsequential, a few of them influence planning efforts at JBAB. For those facilities, ESQD arcs are maintained to protect personnel at the installation against potential explosions. Within those arcs, new development is severely constrained and restricted. Personnel may need special permission via a waiver for security requirements. Existing facilities within those arcs would require hardening if they undergo major renovation.

3.13.3 Unexploded Ordnance

A significant portion of the current Anacostia waterfront area was once mud flats within the firing fan of the Washington Navy Yard experimental battery operated in the mid- to late nineteenth century. Ordnance may remain at depths in areas near the water because the land area was created by historical fill of dredge spoil. Unexploded ordnance was found within the subsurface of the Anacostia side during construction projects in 2007 and 2009. The potential of future unexploded ordnance finds and their remediation pose concerns on future development. New construction in the vicinity of the unexploded ordnance may require a survey prior to commencing construction (Navy 2014a).

3.13.4 Hazardous Materials and Waste

The activities on JBAB generate different types of hazardous waste, such as JP-8 fuels, cleaning solvents, contaminated oils, paints, mercury bulbs, propane cylinders, aerosols, and batteries (Navy 2014a). The installation is regulated as a Large Quantity Generator of hazardous waste under the Resource Conservation and Recovery Act of 1976 40 CFR Parts 260.40(b) and 262.41 (a)(1)–(5), Title 20, *D.C. Municipal Regulations Rules*, 4260–4265 by DDOE; Office of the Chief of Naval Operations Instruction (OPNAVINST) 5090.1C, *Environmental Policy and Organization*; and the 2012 JBAB Hazardous Waste Management Plan (Navy 2014a). JBAB generates more than 2,500 pounds of hazardous waste every other month (Navy 2014a). Hazardous waste that is not treated onsite must be sent to an offsite treatment, storage, and disposal facility permitted to handle hazardous waste or sent to an approved designated facility (such as a recycling facility). Hazardous waste at JBAB is handled, stored, and disposed of in accordance with applicable laws and regulations.

The Hazardous Material Minimization Program at JBAB is in accordance with Fleet and Industrial Supply Centers, Hazardous Material Control and Management, Federal Acquisition Regulation, Hazardous Material Standard Operation Procedures, OPNAVINST 5100.23G, and Hazardous Material Concept of Operations guidance. The Fleet and Industrial Supply Centers is responsible for carrying out the Navy's Hazardous Material Control and Management Program. The Regional Consolidated Hazardous Material Reutilization Inventory Management Program is responsible for planning, procurement, requisition, receipt, stowage, distribution and use of hazardous materials. Several locations on JBAB use and store hazardous materials (Navy 2014a). Hazardous materials are consolidated at the HAZMAT Pharmacy in Building 41 and moved off the installation for disposal by a contractor (Navy 2010).

JBAB's hazardous materials and waste facilities are illustrated in Figure 3-9. The installation maintains two hazardous waste vaults in the North Side of the installation. One vault contains used batteries; corrosive 8, and the other vault contains flammable gas 2. Neither hazardous waste vault lies within the boundary of a potential solar PV site. Twenty-one hazardous materials storage facilities are located on the installation. The parking lot south of Lot 462A is the only solar PV site on a hazardous materials facility.

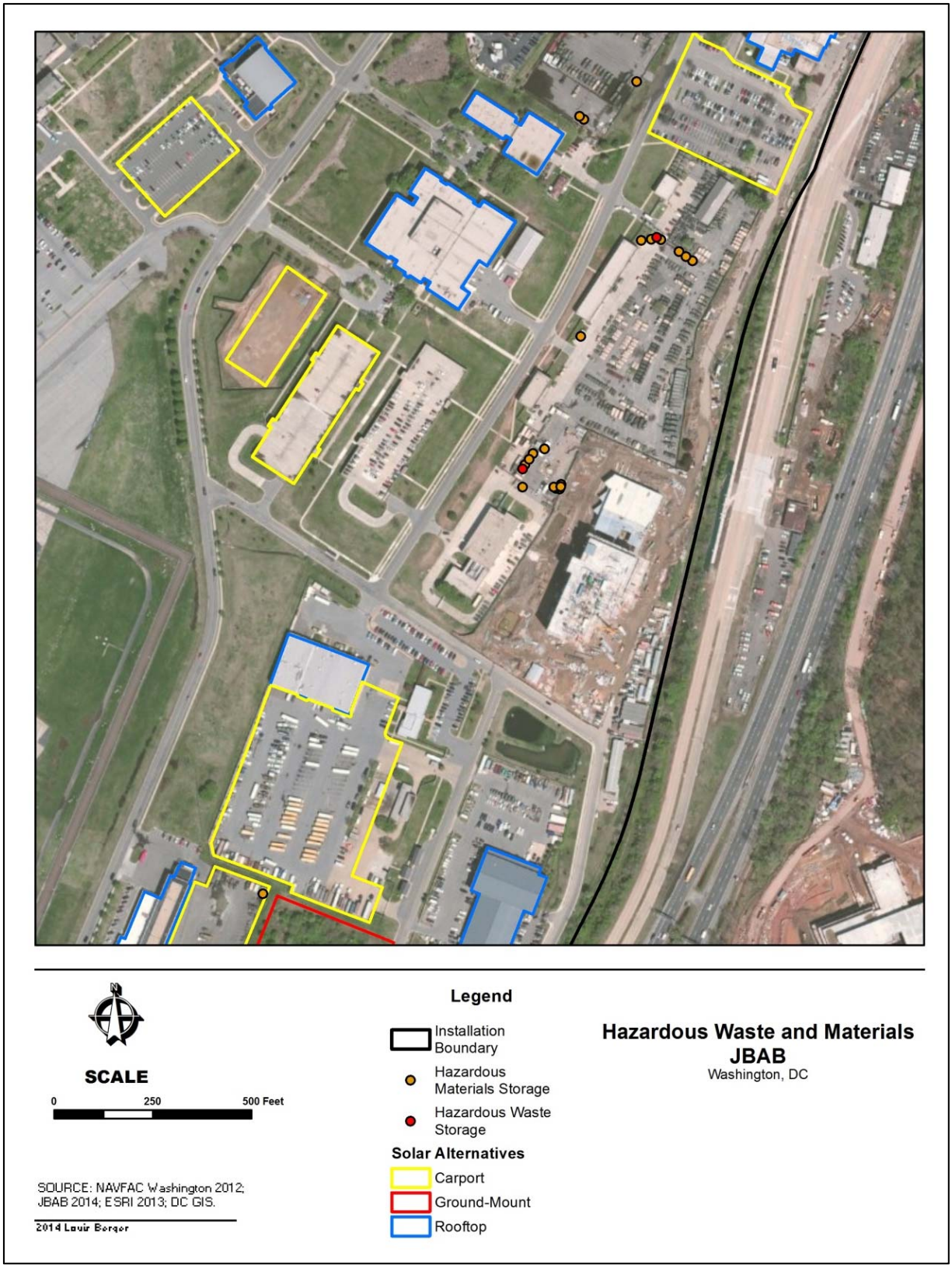


Figure 3-9 Hazardous Materials and Hazardous Waste Locations on Joint Base Anacostia-Bolling

3.13.5 Underground and Aboveground Storage Tanks

Twenty-two underground storage tanks (USTs) are located on JBAB; however, only 12 of them are registered, regulated, and managed under the installation's UST Program. The remaining 10 USTs maintain reduced UST requirements, have a deferral, or are exempt because they are normally empty or have a negligible amount of a substance in them at any given point in time. The only PV site with USTs is the parking lot south of Building 362: Lot ANA000053 (vehicle storage area). Buildings 256 and 362 have USTs within 25 feet of their border, and there is a UST 50 feet from Building 1311.

Seventy-five aboveground storage tanks (ASTs) located on the installation require monthly inspections. Additionally, there are 45 drum sites on JBAB which are considered ASTs as per the Spill Prevention, Control, and Countermeasure guidelines. Of these ASTs, 13 are located at facilities proposed for solar PV arrays. On the north side of JBAB, Building 351 has one ground-level tank on its southwest side, Building 400 has three ASTs at its facility, and Building 370 has one ground-level tank. On the south side of the installation, there are two ASTs at Building 1311, one ground-level tank on the northeast side of Building 520, one ground-level tank on the east lawn of Building 421, and one tank at Building 5681. Additionally, the NRL owns and manages three ASTs located at Building 256.

3.13.6 Asbestos-Containing Building Materials, Lead-Based Paint, and Other Hazardous Materials

3.13.6.1 Asbestos-Containing Building Materials

Asbestos is a naturally occurring fibrous mineral, and the most common types of asbestos are chrysotile (white) and amosite (brown/off-white). Because it is fire-resistant, resists many chemicals, and is an excellent insulator, asbestos was added to a variety of building materials and other products and was routinely used in buildings constructed prior to 1980. These materials included pipe insulation, floor tiles, cement siding, and wall/ceiling coverings. Exposure to asbestos can cause lung cancer and a cancer of the lung lining called mesothelioma. While lung cancer has a number of associated causes, asbestosis and mesothelioma are uniquely associated with exposure to asbestos. Multiple facilities in JBAB were constructed before 1980, making them potential asbestos-containing buildings. The buildings built before 1980 that are also involved in the solar PV installation include 5 buildings on the North side and 14 buildings on the South side.

3.13.6.2 Lead-Based Paint

Lead-based paint (LBP) was used as coatings and finishes before the hazards associated with lead accumulation in children were identified. Regulating LBP began in 1978, long after many of the facilities at JBAB were constructed; therefore, there is a potential for LBPs to be present in these buildings. The buildings built before 1978 that are proposed for the Solar PV installation include 5 buildings on the North side and 14 buildings on the South side. Given the age of the buildings, it is likely that many of the JBAB facilities contain LBP.

3.13.6.3 Other Hazardous Materials

EPA regulates pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act, which provides the basis for the regulation, sale, distribution, and use of pesticides in the United States. The term pesticide encompasses all pesticides, herbicides, and algaecides used on JBAB. All JBAB pest management personnel who apply or supervise the application of pesticides must be trained and certified within 2 years of employment in accordance with the DOD Plan for the Certification of Pesticide Applicators of Restricted, and all contractor pesticide applicator must hold a Pesticide Applicator Certificate issued by DDOE. Pesticide usage must be reported using the NAVFAC Online Pesticides Reporting System.

3.13.7 Glint/Glare and Airspace

In 1962, fixed-wing flying activities at NSF Anacostia and Bolling AFB moved to Andrews AFB and since then JBAB has shifted to mainly support administrative operations (Navy 2010). JBAB is home to two separate air operations areas—the HMX-1 area, the Executive Flight Detachment, and the 1st 415 Helicopter Squadron Air Force helipad near the intersection of MacDill Boulevard and Chappie James Boulevard/Defense Boulevard. Both landing facilities consist of two rotary-wing landing facilities. The HMX-1 facility is the larger and more significant of the two. The squadron performs approximately 125 flights per week as the sole helicopter transport for the President of the United States. It is located on the North side.

The smaller helicopter-landing zone on Bolling AFB south of the DIA building is a limited use helicopter landing zone designated for high-ranking personnel transport and medical evacuation flights (Navy 2010).

Directly west of the southern end of JBAB across the Potomac River is Reagan National Airport. Most planes at Reagan National Airport take off and land using the airport's north-south runways; occasionally, they use the runway that requires an approach from the southeast. When airplanes land and take off using the southeast runway, their flight path falls directly above military housing on JBAB (Navy 2010).

Airfield operations create high noise levels and potential accident hazards. To buffer the surrounding activities from these identified dangers, an Air Installation Compatible Use Zone is created. This zone encompasses land surrounding the air facility requiring special consideration to ensure the health, safety, and welfare of the community without affecting the mission of the air field. An Air Installation Compatible Use Zone identifies areas of high noise and accident hazards, as well as land uses and activities incompatible with those areas, including imaginary surfaces, noise contours, accident potential zones, and compatible land use recommendations (Navy 2009).

In conjunction with DOE, the Federal Aviation Administration (FAA) has determined that glint/glare from some types of solar renewable energy systems could result in ocular impact to pilots and/or air traffic controllers, and thus potentially compromise the safety of the air transportation system.

Reflectivity refers to the light that is reflected off of a surface, this reflectivity can create glint and glare. (Navy 2014e). Glint is defined as the momentary flash of bright light specifically as reflected from a shiny surface. Glare is a continuous source of bright light that could be visually unpleasant or possibly unsafe due to the potential for temporary blindness (DOD 2014b). Glare may be caused by light from artificial sources or the sun reflecting off of light-colored or smooth surfaces such as metal, glass, water, or snow. Glare intensity varies depending on the source and intensity of the light, time of day, time of year, angle of reflectance, weather, atmospheric conditions, color and texture of material surface finish, length of exposure, nature and sensitivity of receptors, and other factors (Navy 2014e).

3.13.8 Electromagnetic Field

EMF consists of invisible fields of electric and magnetic force associated with the movement of charged particles. Wherever electric currents flow, EMF is produced. These fields rapidly decrease in strength with distance from the source. Power lines and electrical equipment generate EMF.

Electric power is considered to be an extremely low-frequency electromagnetic energy that is typically generated at a frequency of about 60 hertz (Hz). (Examples of high-frequency EMF would be that generated by cellular telephone communication and radio and television broadcasts.) Typical electric field strengths in homes in the United States range up to about 10 volts per meter (V/m) (or 0.01 kilovolts per meter [kV/m]) (National Institute of Environmental Health Sciences [NIEHS] 2002). Electric field strengths directly beneath high-voltage power lines can reach several thousand V/m. The electric field strength at the edge of a 50-foot ROW for a 230 kV transmission line is approximately 1.5 kV/m. Electric field strengths for distribution lines, which are lower in voltage (typically from 4 to 24 kV), are less than those for transmission lines.

Background magnetic field strength is considered to be about 0.8 milligauss (mG). Magnetic fields associated with common electrical appliances and equipment (such as computer terminals, photocopiers, hair dryers, power saws, and can openers) range from less than 10 mG up to about 1,000 mG at a distance of about 0.5 foot from the operating appliance. The average magnetic field for a home has been reported to be about 0.9 mG. The magnetic field strength at the edge of a 50-foot ROW for a 230-kV transmission line is about 20 mG (NIEHS 2002).

Few adverse health effects have been definitively associated with exposure to low-frequency EMF, and any causal link to cancer induction is uncertain (International Commission on Non-Ionizing Radiation Protection [ICNIRP] 2010; NIEHS 2002). Because of the uncertain relationship between exposure to EMF and possible health effects, there currently are no U.S. standards for occupational or public exposure to EMF. At least six U.S. states have set EMF exposure standards for transmission lines; Washington, D.C., has not set such standards. The ICNIRP has established EMF exposure guidelines for workers and the general public based on the available health effects information. ICNIRP guidelines for 60-Hz electric power components are 8.3 kV/m (occupational) and 4.2 kV/m (general public) for the electrical component of EMF, and 10,000 mG (occupational) and 2,000 mG (general public) for the magnetic component of EMF (ICNIRP 2010).

EMF has not been measured at the proposed solar PV project sites at JBAB. Aboveground electrical lines are not present at the sites. There are no other known sources of EMF at the project sites.

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4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

This chapter evaluates the potential environmental consequences of the proposed action. Implementation of the proposed action would involve leasing approximately 50 acres, including land, parking lots, and building rooftops, within JBAB to construct and operate a solar PV system that would generate renewable energy to supply the existing installation electrical energy grid. The No Action Alternative, required by NEPA to establish a baseline, was also evaluated.

Potential direct and indirect impacts of the alternatives are discussed in this chapter. Most impacts are direct—an immediate effect from proposed construction and operation. The impacts are also discussed in terms of short- and long-term impacts. Short-term, temporary impacts are those of a limited duration, such as the impacts that would occur during construction of the solar PV system. Long-term impacts are those of greater duration, including those that would occur after implementation of the proposed project or during its operation. For impacts judged to be less than significant, a range is given to facilitate comparisons among the alternatives, using the terms of negligible, minor, and moderate. Cumulative impacts are evaluated in Chapter 5.0.

4.2 Land Use

An impact to land use could be considered significant if the impacts resulted in land uses that conflicted with existing coastal zone management efforts, necessitated a change in land use that conflicted with either existing land uses at the installation, or resulted in conflicts with land uses proposed as part of the Future Land Use Framework at JBAB under the 2014 Master Plan for the installation.

4.2.1 Solar PV System Installation

Under the Proposed Action Alternative, JBAB would lease approximately 50 acres, including land, parking lots, and building rooftops, on the installation to construct and operate a solar PV system that could generate renewable energy to supply the existing installation electrical grid.

Impacts to current existing land uses are illustrated in Figure 4-1, which displays the location of the proposed solar PV panels on the backdrop of existing land uses. The location of the carport, roof, and ground arrays would coincide with five existing land use categories: Base Support; Industrial; Temporary Lodging; Airfield Operations; and Open Space/Outdoor Recreation. The installation of carport and rooftop solar PV arrays would not conflict with any land uses, and the installation of ground-mounted solar PV arrays would not conflict with the majority of these land uses. However, approximately 30 acres would be occupied by the proposed ground-mounted solar PV arrays with approximately 15 acres occurring on land designated as Open Space/Outdoor Recreation. Impacts would occur from incompatible uses where ground-mounted solar PV arrays are proposed on land designated as Open Space/Outdoor Recreation near the athletic fields on the North side of the installation. Additionally, ground-mounted solar PV arrays are proposed on land, which is designated as Open Space/Outdoor Recreation and is also within an "Approved Planting Focus Area" as indicated in the 2014 Master Plan's Landscape Framework Plan. This area is located near the northeast corner of the 9-acre parcel adjacent to the west side of Mitscher Avenue near the Firth-Sterling Gate. Installation of the ground-mounted solar PV arrays on this portion of JBAB would necessitate a change in land use designation at time of 2014 Master Plan update and entail amendments to the land use designations of affected parcels to a different or new future land use designation. However, because the current LOS for Open Space/Outdoor Recreation is 21 acres per 1,000 residents, amendments to existing land use designations would not affect the required LOS of 2 acres per 1,000 residents. As a result, adverse impacts to land use would be long term and minor.

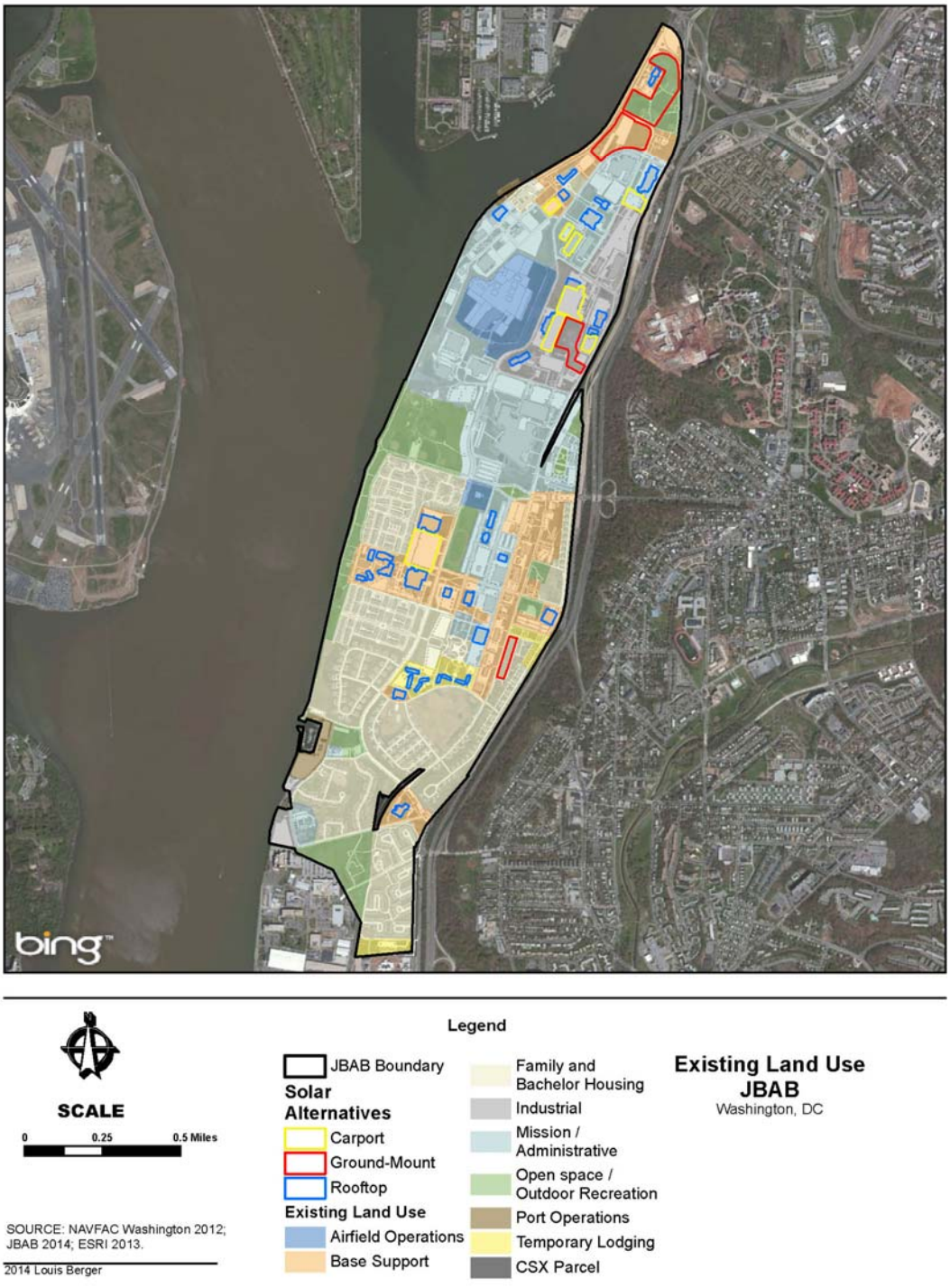

Figure 4-1 Impacts to Existing Land Uses at Joint Base Anacostia-Bolling

Similarly, impacts to future land uses under the Land Use Framework at JBAB would be minor. Impacts to proposed future land uses are illustrated in Figure 4-2. The solar PV installation would overlie four proposed land use categories: Industrial, Mission/Administrative, Mixed Use, and Open Space/Outdoor recreation. The installation of carport and rooftop solar PV arrays would not conflict with any land uses proposed as part of the Future Land Use Framework at JBAB under the 2014 Master Plan. However, impacts to land use designations would occur where ground-mounted solar PV arrays are proposed on parcels designated as Open Space/Outdoor Recreation at the northern-most portion of the installation. Construction of the ground-mounted solar PV arrays in this portion of JBAB would necessitate changes to the Future Land Use Framework. Approvals of such changes would be made at the discretion of Base Command and would involve appropriate mitigation, such as ensuring that, if necessary, additional parcels are designated for Recreation/Open Space to avoid impacts resulting from a substantial reduction in the LOS for the Open Space/Outdoor Recreation designation. The majority of proposed solar PV arrays would not require major changes to the Future Land Use Framework or necessitate special permitting or land use review. Thus, no significant short- or long-term, adverse effects on land use at the installation are anticipated as a result of the project.

Overall, construction and operation of the proposed solar technologies would not result in significant impacts to land use on JBAB.

4.2.2 No Action Alternative

Under the No Action Alternative, JBAB would not pursue the development of solar renewable energy resources. Current and future proposed land uses would not be affected under this alternative. Therefore, implementation of the No Action Alternative would result in no changes to land use.

4.3 Visual Resources

The impacts on visual resources for JBAB were determined by assessing the visibility of the solar PV array systems on the installation to viewers from public places.

4.3.1 Solar PV System Installation

Under the proposed action, solar PV systems would be installed on building rooftops, carports, and ground-mounted arrays. Visual resources on the installation and in the surrounding area would be affected. On the installation, all types of solar PV systems would be viewable to individuals with access to JBAB. Views would change based on where an individual is on JBAB and their observation height relative to the height-location of the array. The National Capital Planning Commission/DC Historic Preservation Office/Commission on Fine Arts have expressed concern about the visibility of site. While there would be changes in the views, it would not be strongly noticeable due to developed nature of the installation. As a result, the installation of solar PV systems would result in a negligible to minor, long-term, adverse impact to visual resources.

To assess visibility from public places, photo simulations were created for high traffic locations with clear views of the proposed solar PV locations on the installation. Selected public places include Hains Point/East Potomac Park, Buzzard Point Park, Frederick Douglass Memorial Bridge (South Capitol Street Southeast) pedestrian walkway, and South Capitol Street Southwest (bus stop by the Department of Public Works building). Ground-mount, rooftop, and carport solar PV systems were superimposed at their potential locations on the photographs. Figure 4-3 is a map showing the proposed solar PV system locations, and the location and direction of photographs taken from each selected public place toward JBAB. Figures 4-4 through 4-9 show current views of JBAB from selected public locations and these same views with simulation overlays of the installed solar PV systems.

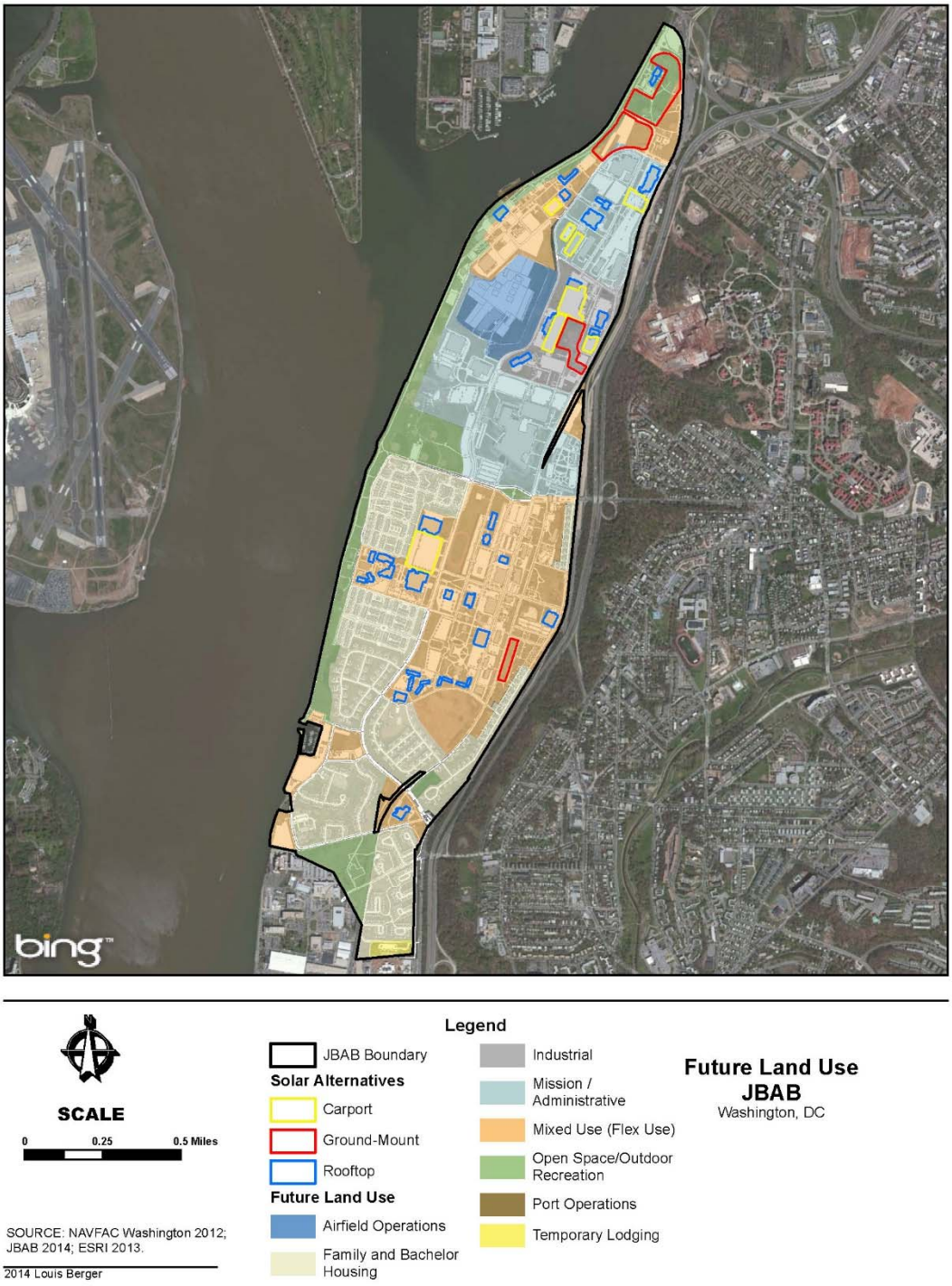

Figure 4-2 Impacts to Future Land Use Framework at Joint Base Anacostia-Bolling under the 2014 Master Plan

Figure 4-3 Photo Simulation Locations and Directions for Selected Solar PV Systems

Figure 4-4 View from Hains Point/East Potomac Park without (above) and with (below) Ground-mounted Solar PV Systems Looking Northeast toward the Ball Field/Recreation Area in the Northern Portion of Joint Base Anacostia-Bolling

Figure 4-5 View from Hains Point/East Potomac Park without (above) and with (below) Rooftop and Carport Solar PV Systems Looking East at Building 400 and Two Surrounding Parking Lots in the Northern Portion of Joint Base Anacostia-Bolling

Figure 4-6 View from Buzzard Point Park without (above) and with (below) Ground-mounted Solar PV Systems Looking East toward the Ball Field/Recreation Area in the Northern Portion of Joint Base Anacostia-Bolling

Figure 4-7 View from Frederick Douglass Memorial Bridge (South Capitol Street Southeast) without (above) and with (below) Ground-mounted Solar PV Systems Looking South toward the Ball Field/Recreation Area in the Northern Portion of Joint Base Anacostia-Bolling

Figure 4-8 View from South Capitol Street Southwest without (above) and with (below) Rooftop and Carport Solar PV Systems Looking Northwest at Building 168 and the Adjoining Parking Lot

Figure 4-9 View from South Capitol Street Southwest without (above) and with (below) Rooftop and Ground-mounted Solar PV Systems Looking Northwest at Building 168 and the Adjoining Parking Lot

Final design would in accordance with the Installation Appearance Plan. BMPs would be employed for design measures to minimize visual impacts from rooftop, carport, and ground-mounted solar PV systems. Roof types would be taken into consideration when determining the height of the solar PV system, and solar PV systems would be as low-profile as possible. In accordance with coordination with the DC Historic Preservation Office, PV arrays on Buildings 168, 520, and B421 would be installed in a manner where they are not visible from the ground. Rooftop solar PV systems would be set back not less than 1 foot from the exterior perimeter of the roof for every 1 foot the system extends above the roof surface. Carport solar PV systems would not exceed 20 feet in height, unless site-specific requirements dictate otherwise. Each carport solar PV system would be designed on a site-specific basis. Carport solar PV systems in proximity to Defense Boulevard and Chappie James Boulevard, including the Commissary/Exchange, Building 419, and Building 351 parking lots, would require superior architectural quality designs because of their high visibility. Information and regulatory/warning signage associated with carport solar PV systems would be kept to a minimum. For ground-mounted solar PV systems, no more than 1 percent of the gross site area would be occupied by enclosed buildings and structures. Ground-mounted solar PV systems would be as close to the ground as possible and not exceed 10 feet in height above the ground. Landscape or other visual buffers are required for ground-mounted solar PV systems, especially those adjacent to roads, to protect or enhance existing viewsheds. Ground-mounted solar PV systems would be laid out in a regular, orderly pattern, avoiding a haphazard appearance. As with carport solar PV systems, information and regulatory/warning signage would be kept to a minimum. Signs may be free-standing or attached to fencing surrounding the ground-mounted solar PV system. Permanent free-standing signs would not be mounted on unfinished lumber. If fencing is needed, it would match the existing fencing on the southern portion of the installation or be either black ornamental steel or black chain link in other locations. Associated lighting would coordinate with the rest of the installation. Mounting framework for all solar PV systems would be neutral in color and would not include unfinished lumber. When possible, the rooftop solar PV system mounting framework would match the roof color.

4.3.2 No Action Alternative

Under the No Action Alternative, JBAB would not install solar PV systems and the visual resources would remain as they currently are.

4.4 Utilities and Infrastructure

4.4.1.1 Electrical System

PEPCO, the provider of electrical service to JBAB, has a standard interconnection agreement for small generators up to 10 MW. Any solar PV system installed on JBAB would have to go through the standard interconnection process. Because the North side and South side have separate electrical feeders and utility accounts, a separate interconnection would have to be set up for each one. On the North side, the proposed rooftop and carport systems would interconnect at the facility where they are installed and the ground-mounted systems would interconnect at the main feeder in Building 168. On the South side, the proposed rooftop and carport systems would interconnect at the facility where they are installed and the ground-mounted systems would interconnect at the main feeder in Building 18. Room is available to build out additional switch gear for the ground-mounted solar PV systems on both the North side and South side. The electricity generated by the solar PV installation would not fully meet the current demand of JBAB; therefore, PEPCO would also continue to provide electrical service to JBAB. However, the electricity supplied by the solar PV arrays would be beneficial to JBAB by reducing its reliance on outside power sources.

4.4.1.2 Stormwater

For ground-mounted solar PV systems, three of the potential sites (approximately 20 acres total) are open fields, while one site is half parking lot and half open field (approximately 9 acres). Much of the surface is

currently pervious and would remain pervious after the installation of the solar PV arrays. Any required clearing and grading during construction would expose soils to erosion, and compaction of near-surface soils by heavy equipment could result in increased runoff and sedimentation. Accidental release of petroleum, oil, and lubricants from construction equipment could affect both surface water and groundwater quality. However, employing engineering controls; using BMPs, including sediment and erosion control practices in keeping with federal sediment and erosion control requirements; and following industry standards would minimize potential adverse effects, resulting in no significant impacts to surface and groundwater from construction activities. Ground-mounted solar PV systems should not adversely affect overall stormwater management patterns. If adverse impacts are expected, mitigation must be provided. Solar PV panels should be incorporated into a larger landscape design for the site that improves stormwater management.

For rooftop and carport solar PV systems, an impervious surface already exists below them. As a result, impacts to stormwater would be negligible under the assumption JBAB would follow industry standards to minimize potential adverse effects.

4.4.2 No Action Alternative

Under the No Action Alternative, JBAB would not install solar PV systems and the primary utility systems and infrastructure that service the installation, including electrical and stormwater, would remain as at present. These systems would not be affected.

4.5 Cultural Resources

This section discusses cultural resources identified for the proposed action at JBAB. Cultural resources at JBAB include architectural resources (buildings and structures) and archaeological resources (prehistoric and historic archaeological sites or archaeologically sensitive areas). These cultural resources are associated with JBAB's prehistory and history, which have been documented through various cultural resource investigations.

For each valid alternative in the EA, an assessment has been made of what NRHP-eligible resources, if any, are present within its APE, and the nature of any impact. This assessment is based on a review of available information about the installation, conducted at the installation, and using the files of the DC Historic Preservation Office.

4.5.1 Section 106 Scale

The following provides an explanation of the terminology of "no effect, no adverse effect, and adverse effect" used in Section 106 of the NHPA (Section 106). Section 106 reviews are a process of information gathering and evaluations, and effect determinations are the outcome of the process.

Per 36 CFR Part 800.11(i) effect means alteration to the characteristics of a historic property that qualify it for inclusion on the NRHP. These characteristics involve the resource's significance and state of integrity.

An initial agency review may determine that a project has no potential to cause effects on historic properties. An example of this may be the resurfacing of a modern roadway. Alternatively, a historic resource identification study may result in the finding that there are no historic properties in the APE. In both instances the resulting effect determination would be that there are no historic properties affected, or "*no effect*." For NEPA purposes, this would be a finding of no impact.

A "*no adverse effect*" finding indicates that although historic resources are affected by the proposed project, the impacts to these resources are such that they would not alter the properties listing or eligibility for the NRHP. For NEPA purposes, this would be a finding of negligible or minor impacts.

Per 36 CFR Part 800.5(a)(1), the effect becomes an "*adverse effect*" when "an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion

in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association." For NEPA purposes, this would be a finding of moderate or major impacts.

Examples of adverse effects include: the physical destruction of all or part of the historic property; an alteration of the property that is not consistent with the *Secretary of Interior's Standards for the Treatment of Historic Properties* (Standards) (36 CFR Part 68); the removal of the property from its historic setting; changing the character of the property's use or of the physical features of its setting that contribute to its significance; and the introduction of visual, aural, and atmospheric elements that diminish the integrity of the property's significant historic features.

In the practice of Section 106 consultation, adverse effects can often but not always be mitigated, when the loss of integrity of the NRHP resource is justified, balanced against other competing interests. The results of the consultation process are usually formalized in a Section 106 MOA containing mitigation stipulations. The initial determination of adverse effect under Section 106 does not necessarily preclude a Finding of No Significant Impact under NEPA. The loss of NRHP cultural resources would have to be major in scale and importance and without acceptable feasible mitigation measures to negate a Finding of No Significant Impact.

4.5.2 Solar Panels on Historic Architectural Resources

The Technical Preservation Services section of the National Park Service (NPS) has developed guidance on how to apply the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (Standards) to the installation of solar panels on historic resources. Generally, solar panels installed in a location that cannot be seen from the ground meet the Standards, while those that negatively impact the historic character of the property do not. While each project is different and should be evaluated individually through Section 106 consultation, the NPS provides general guidelines on how to apply the Standards to installation of solar panels.

The roof of a historic structure, while an obvious location for solar panels in order to take advantage of unobstructed sunlight, is often a distinctive or character-defining feature of the resource. As such, installation of panels must conform to guidance for rooftop additions: additions should be minimally visible to avoid altering its character. Generally, buildings with flat roofs or parapets are better suited because panels will be hidden, while buildings with hipped or gabled roofs are less suited for installation. Solar panels should not be visible from the public right of way such as nearby streets, sidewalks, or other public spaces (Parker 2009).

Solar collectors not placed on rooftops should be located in limited or no-visibility locations in secondary areas of the property. Vegetation or compatible screen can be used to reduce impacts to historic properties. Some examples of treatment compatible with the Standards include:

- *Installation on a New Addition*: Solar panels installed on a compatible new addition at the back of a historic property may be acceptable, especially on properties that have an industrial character.
- *On a Flat Roof*: Solar panels should be placed at an angle, so they do not detract from the original roofline. In some cases, the angle of the panel may need to be changed to reduce their prominence so that the historic roofline remains the dominant feature of the building.
- *Pole-Mounted Array*: These may be acceptable if installed at the rear of a site, away from primary viewpoints and if in keeping with the historic character of the property.
- *On a Low-Slope Gable*: Low profile solar panels may be flush mounted on a sloped roof of a building if the roof is not a prominent feature of the building. In these cases, though panels are visible they do not diminish the historic character of the building.

- *On a Cross Gable*: In some cases, panels may be flush-mounted on the street-facing slope of gable roof, set back behind a prominent pediment. Though visible, panels can be flush-mounted so as to not be conspicuous (Technical Preservation Services 2013).

4.5.3 Solar PV System Installation

4.5.3.1 Architectural Resources and Historic Properties

The installation of solar PV systems would affect historic architectural resources at JBAB. Solar PV systems would be located on or an adjacent to eligible architectural resources at JBAB, including Buildings 168 and 169 and the Bolling AFB Historic District.

The Proposed Action would add rooftop solar panels to Building 168, carport panels in the parking area directly south of Buildings 168 and 169, and ground-mounted panels in open areas to the west and northwest of the buildings. Building 168's flat roofline with metal coping is a character-defining feature of the structure. The roof's parapet is approximately 3 feet high; solar PV panels could be visible from the ground and alter the visual character of the building by altering its flat roofline. Additionally, the construction of carport panels in the parking area to the south of the building would be located in a high-visibility area directly adjacent to Buildings 168 and 169. The ground-mounted panels to the northwest of the buildings would have a limited impact on the integrity of the historic resources given their distance from the building. Overall, the addition of a solar PV system to the rooftop of Building 168 and the carport panels in the adjacent parking area would have a moderate impact (adverse effect) to NRHP-eligible Buildings 168 and 169. If the Navy follows NPS guidance on solar panels by setting them back from the edge of the roofline and changing the angle of panels to reduce their prominence so that the historic roofline remains the dominant feature of the building, the rooftop panels could be compatible with the Standards pending Section 106 consultation with the DC Historic Preservation Office. The DC Historic Preservation Office concluded that the panels would have no adverse effect on Building 168 so long as they are not visible from the ground.

In the area of Naval Air Station Anacostia Complex, solar PV system installation would include rooftop panels on Buildings 47, 417, and 419, and parking lot panels are proposed for Lot 470. Building 47, a seaplane hangar constructed in1923, would have a solar PV array installed flush in the paired gable roof, visible on the low slope gable roof, but this array would not detract from the overall shape, massing, or industrial character of the building. Buildings 417 and 419, constructed in 1998, would have flush-mounted arrays installed on their gable and bowstring truss roofs. The carport array would be installed in Lot 470, adjacent to Building 419. Several PV arrays would be constructed within the viewshed of Naval Air Station Anacostia, including rooftop arrays on Building 350, 351, and 362. Carport arrays would be constructed on Garage 358 and Lots 53 and 8910. The proposed arrays would alter the buildings' settings; however, changes including new buildings, large parking lots, and other features have already affected Naval Air Station Anacostia's setting. The installation of solar PV arrays would have minor impacts (no adverse effect) on Naval Air Station Anacostia. Following NPS guidance on the installation of solar panels and the Installation Appearance Plan's PV Panel Siting and Design Standards, such as flush-mounting panels to the roof and maintaining setbacks, could lessen any potential impacts to these buildings.

In the Bolling AFB Historic District, rooftop panels would be added to non-contributing Building B421. Rooftop panels would be added to buildings adjacent to the boundaries of the historic district on Buildings 50, 453, 1310, 5683, and 5681. Ground-mounted panels in the open space off Duncan Avenue are located directly adjacent to the boundaries of the historic district.

The addition of solar PV panels in and around the historic district would result in direct, moderate impacts (adverse effect) to the historic character of the district. While a non-contributing building, panels on Building B421 would be highly visible given the steeply pitched slope of its hipped roof. The reflectivity of the panels would also have a visual impact on the character of the historic district. For those buildings outside of the district, Buildings 50, 453, 575, 5683, and 5681, solar panels would have an indirect visual

impact on the district. Impacts to the district would be mitigated or minimized if the Navy follows NPS guidance for applying the Standards to solar panel installation and by following the Installation Appearance Plan's PV Panel Siting and Design Standards. Panels should be installed in such a way to not change the roofline of historic buildings or be placed on slopes facing away from the district, such as on Buildings 520 and 1310. Panels on Buildings 50, 5683, and 5681 would have no impact (*no effec*t) on the district if they were low profile and not visible from within the district.

The ground-mounted panels along Duncan Avenue are partially screened from the family housing in the historic district to the east by trees, but still visible from the rear yards of the quarters. Panels would likely be visible from inside the housing because the dwellings are set on higher ground than the proposed site for ground-mounted panels. The ground-mounted panel would be visible from the historic district on the northeast and northwest sides of the open space.

There would be minimal, indirect impacts (no adverse effect) to individually eligible Buildings 20 and 21 because no potential solar PV panels are located in the immediate vicinity of these buildings. Views of the closest locations to the north and south would be partially or entirely screened by other buildings or vegetation.

The secondary APE is composed of historic resources adjacent to the installation that would be visually affected by the installation of solar PV panels, namely: East and West Potomac Parks Historic District; Fort McNair Historic District/National War College; Buzzard Point Power Plant, the Suitland Parkway, and St. Elizabeths Hospital Historic District.

The Proposed Action Alternative would have minor visual impacts (no adverse effect) to the East and West Potomac Parks Historic District. Views are a character-defining feature of the historic district; the NRHP nomination for the historic district specifically names views from Hains Point east toward St. Elizabeths. Solar panels installed under the Proposed Action Alternative would be visible from the south end of Hains Point, primarily the ground-mounted panels that would be installed at the north end of the installation. Any impacts to the historic resource are lessened because of the modern development in the area and the setting has always been industrial. Additionally, a glint/glare study of solar PV panels at JBAB showed low potential for any glare from roof mount, carport systems, and ground-mounted systems. The panels are designed to be absorptive rather than reflective of light and would not disrupt views from the historic resource.

The Proposed Action Alternative would have minor visual impacts (no adverse effect) to the Fort McNair Historic District/National War College. Views from this area are an important characteristic of the resources because they are located at a prominent point at the mouth of the Anacostia River. There are sweeping views to the west, south, and east/northeast toward East Potomac Park and Hains Point, the Potomac River, and the east side of the Anacostia River. Solar PV panels installed under the Proposed Action Alternative would be visible from the south point of the Naval War College, primarily the ground-mounted panels that would be installed at the north end of the installation. Impacts to the historic resource are lessened because of the modern development in the area and the adjacent NPS marina that partially screens views to the northeast. Additionally, a glint/glare study of solar PV panels at JBAB showed low potential for any glare from roof-mounted systems, carport systems, and ground-mounted systems. The panels are designed to be absorptive rather than reflective of light and would not disrupt views from the historic resource.

The Proposed Action Alternative would have a negligible impact (no adverse effect) on the Buzzard Point Power Plant. The building is significant for its architectural design and is an industrial building for which setting and views are not important features. Therefore, although the power plant is directly west of the ground-mounted panels at the north end of JBAB, their installation would only minimally affect the resource.

The project would have minor, indirect impacts (no adverse effect) on the Suitland Parkway. The parkway was designed to have a park-like setting with gently rolling topography and green space. The area of the

parkway adjacent to JBAB, however, has been heavily developed with buildings and interchanges and does not retain a park-like setting. Therefore, impacts to the resource would be minor.

The Proposed Action Alternative would have minimal impacts (no adverse effect) on St. Elizabeths Historic District. The district's prominent location overlooking Washington, D.C., affords it panoramic views of the city and surrounding area. Views from the district have been affected by the recent development of the Department of Homeland Security Complex to the west of the district. The northern end of the district and views from its lookout point have not been affected by this development, and it retains unimpeded views toward the city. The field of ground-mounted solar PV panels at the north end of JBAB are visible from this view but would not impact them because the setting of the area has always been industrial. The glint/glare study of solar PV panels at JBAB showed low potential for any glare from roof-mounted systems, carport systems, and ground-mounted systems. The panels are designed to be absorptive rather than reflective of light and would not disrupt views toward Washington, D.C., from St. Elizabeths.

4.5.3.2 Archaeological Resources

Installation of rooftop and carport solar panels would have no impacts on archaeological resources.

As mentioned in Section 3.5.2, the North side is composed of reclaimed land with no potential for archaeological resources. Therefore, the installation of ground–mounted PV arrays at the north end of JBAB would not affect archaeological resources.

Installation of ground-mounted solar PV arrays on the South side may have adverse impacts on archaeological resources. Phase I archaeological survey would be necessary wherever excavation is carried out for the installation of solar PV arrays or the burial of power lines.

The open space off Duncan Avenue (Lemon lot) has recently been surveyed for archaeological resources. It was determined that this area is highly disturbed and has no potential for archaeological remains. An archaeological report, which is currently being prepared to document the disturbance, will be submitted to the DC Historic Preservation Office for its review.

4.5.4 No Action Alternative

Under the No Action Alternative, JBAB would not install solar PV systems; therefore, there would be no changes or impacts to cultural resources. Cultural resources would continue to be managed by JBAB in accordance with federal laws and Navy regulations.

4.6 Air Quality and Greenhouse Gases

4.6.1 Solar PV System Installation

The construction of ground-mounted solar PV arrays and arrays on carports and rooftops would require the operation of heavy equipment for site preparation and installation of the solar PV arrays. The proposed areas for ground arrays are mostly flat and would not require significant grading. Ground disturbance would occur only where poles would be installed into the ground and would not require a full clearing of vegetation of the site; however, there may be some trenching in limited locations to install necessary electrical lines to connect the solar PV panels to the existing grid. The limited ground-disturbing activities would minimize the amount of $PM_{2.5}$ emissions from fugitive dust during construction. Heavy equipment for the rooftop arrays would also include the use of cranes, while pile drivers would be used to dig holes for footers at the carport locations. Overall, the solar PV arrays would require clearing of a few landscape trees with construction impacts from heavy equipment limited to delivery trucks, cranes, and digging holes for the panel footers. Construction activities have the potential to produce dust and result in short-term increases in vehicle emissions in the vicinity of the proposed project site. However, the production of dust and the increase in vehicle emissions would be minimal due to the size and scope of the construction activities and would be temporary in nature as they would only occur during construction. Additional impacts during

construction would include delivery trucks and emissions from commuting to and from the site by construction workers. Construction would result in short-term, minor, adverse impacts to air quality.

Overall, project emissions from construction and operation would not be expected to exceed the *de minimis* values for marginal nonattainment ozone areas in an ozone transport region and moderate nonattainment for $PM_{2.5}$ (100 tons per year for NO_x, $PM_{2.5}$, and SO_2, and 50 tons per year for VOCs). A Record of Non-Applicability is provided in Appendix B.

4.6.2 No Action Alternative

Under the No Action Alternative, solar PV panels would not be installed on JBAB. Air quality would not be affected.

4.7 Geology, Topography, and Soils

4.7.1 Solar PV System Installation

Under the Solar PV Installation Alternative, JBAB would lease approximately 50 acres, including land, parking lots, and building rooftops, within the installation to construct and operate a solar PV system that could generate renewable energy to supply the existing installation electrical grid.

Impacts to topography and geology would be negligible because there would be very little to no grade changes. However, there could be minor, adverse impacts to soils at JBAB. Construction activities associated with solar PV installation, especially for the ground-mounted panels, could temporarily compact, expose, disturb, and modify the structure of 30 acres of soil during earth-moving activities. The Udorthents series and the Urban Land multiseries, which are anthropogenically modifiedsoils, are the major soils found at JBAB. Construction of the solar panels could result in disturbance to these soils in their footprint, as well as reduced vegetative productivity beneath the solar materials. Utility trenching could result in soil compaction, disturbance, and exposure increasing the potential for erosion. BMPs, including erosion control matting, silt fencing, using gravel on maintenance and access roads, storm drain outlet protection, stone check dams, construction exits, and temporary and permanent seeding, could reduce the potential for erosion from construction, construction activities, and operation of any of the solar PV systems as well as the susceptibility of the area to wind erosion, which would reduce impacts to soils.

Construction of the ground-mounted arrays would require support posts below ground, which could also displace existing soils in the area of the posts. Overall, construction of the ground-mounted arrays could result in increased potential for erosion, short-term displacement of soils, minimal loss of soils in the footprints, and reduced productivity of the vegetation directly below the solar mirrors. It is not anticipated that these impacts would be substantial in nature, and, overall, they would not be significant.

4.7.2 No Action Alternative

Under the No Action Alternative, the current soil conditions at JBAB would be maintained and JBAB would not pursue the install solar PV panels. The excavation of soils or removal of vegetation would not occur under this alternative. Implementation of the No Action Alternative would result in no changes to soils.

4.8 Biological Resources

4.8.1 Solar PV System Installation

4.8.1.1 Vegetation

Rooftop solar PV installation would not require the removal of any vegetation and thus would have no impact. Construction and placement of equipment would be limited to building rooftops and paved areas such as parking lots and sidewalks.

Similar to rooftops, the installation of solar PV panels on top of carports in parking lots would not have an impact on vegetation. The use of equipment and installation of solar panels would be limited to parking lots and other paved areas.

Ground-mounted installation of solar PV panels would result in the loss of vegetation, limited to turf grasses regularly cut and maintained and trees and shrubs. Regularly, maintained turf grasses within the proposed project sites account for about 30 acres of land on JBAB, or about 3 percent of the total installation area. However, of the 30 acres, only a small percentage of turf grasses would be removed to install pole structures to mount the solar PV panels. The remaining turf grasses could continue to be regularly cut and maintained underneath and surrounding the solar PV array.

Trees and shrubs are planted along roads, around buildings, and individually or within small groves in some of the open areas on JBAB. Installation of the ground-mounted solar PV array would result in the removal of a small grove of trees and shrubs, about 0.5 acre between Defense Boulevard and Brookley Avenue, SW. Most of the trees and shrubs within the small grove are remnant species with a few invasive species introduced to the mix.

Additional vegetation may be removed but would be dependent on the layout and number of solar PV panels. Overall, the impacts to vegetation would minor with limited loss and/or removal.

4.8.1.2 Wildlife

Impacts to wildlife due to the installation of rooftop solar PV systems are generally assumed negligible given such areas are exceptionally limited in biodiversity (Katzner et al. 2013). Rooftops generally do not provide viable habitat to wildlife, except for example offering birds a place to perch. Other wildlife, such as squirrels and rodents, may run along the edge of rooftops but make no use of the rooftop surface for feeding or sleeping.

The introduction of solar PV panels, such as carports, is not likely to have adverse impacts on wildlife because parking lots are barren and provide little (if any) useable resources to wildlife (Katzner et al. 2013). The introduction of solar PV panels on carports does however create a location to perch, and to a lesser extent nesting for birds but would not be of significant benefit to the larger population. The introduced structures and, subsequently, potential nesting sites for smaller birds such as sparrows and swallows would possibly be more of a nuisance to car owners and people passing by.

The installation of ground-mounted solar PV panels would cause a loss of usable habitat to small mammals, such as squirrels and some species of birds (e.g., European starlings and sparrow species). Such species forage for insects, wind-blown seeds, and general debris in open spaces. However, such species are readily common and found throughout urban, developed areas. The loss of a small grove of trees and shrubs and managed lawns would have minor impacts to such common species that are found throughout a larger geographic area.

Wildlife typically found in urban areas are accustomed to disturbances and other noises created by moving vehicles and other human activity. The additional noise created by heavy trucks, fork-lifts and other construction equipment though may cause wildlife to temporarily move to adjacent areas to forage. Once construction is complete, wildlife would likely return to the area.

4.8.2 No Action Alternative

The No Action Alternative would not affect vegetation and wildlife. The installation of solar PV panels and subsequent use of construction equipment would not occur having no adverse impact on wildlife and vegetation.

4.9 Noise

4.9.1 Solar PV System Installation

Several construction sites on the South side are near residential areas. Specifically, these sites are Buildings 3620B, 3619, 3610, and 256, and the section of land in the southwesternmost corner of the installation. Noise associated with the operation of machinery on construction sites is typically short term, intermittent, highly localized, and occurs during daytime hours. Construction noise varies greatly depending on the construction process, type and condition of equipment used, and layout of the construction site. Construction and demolition activities associated with the implementation of solar PV systems would involve the use of heavy equipment, such as cranes, pile drivers, and delivery trucks. Construction noise would be temporary and noise generated from construction equipment would be confined within the installation boundary and only occur during daylight hours. Overall, construction noise levels are governed primarily by the noisiest pieces of equipment or impact devices (e.g., jackhammers and pile drivers). The loudest machinery generally produces maximum sound pressure levels ranging from the mid-70s to the low 100s dBA at 50 feet from the source. The dB level of a sound attenuates exponentially as the distance from the source increases (National Institute on Deafness and Other Communication Disorders 1990). Despite the solar PV installation site's proximity to the residential areas, noise generated during the construction period and would not cause prolonged, adverse effects on local residents. Consequently, construction of the solar panels at JBAB would result in negligible, short-term, adverse impacts from noise.

During operation, the sources of noise produced by solar PV systems are electric fans and inverters. The proposed solar PV systems produce low levels of noise compared to other solar technologies, which are due largely to the lack of a power block. Heat is dissipated from solar module assemblies either passively or actively through the use of the electric fans. In addition to the potential for low-level noise from fans, other sources could include pad-mounted inverters and transformers. Noise associated with high capacitor inverters is typically less than 30 dBA at a distance of 50 feet (DOI and DOE 2012). Operational noise would occur during daytime hours only and be completely inaudible outside JBAB, resulting in no long-term impacts from noise.

4.9.2 No Action Alternative

Under the No Action Alternative, existing noise levels would not change at JBAB; therefore, no changes related to noise would occur under the No Action Alternative.

4.10 Traffic and Transportation

4.10.1 Solar PV System Installation

Under this alternative, JBAB would lease approximately 50 acres, including land, parking lots, and building rooftops, within the installation to construct and operate a solar PV system.

Impacts on transportation from the implementation of the Solar PV Installation Alternative are expected to be temporary and minor and attributed to construction traffic. The proposed construction activities related to installation of solar PV technology may temporarily affect local JBAB traffic. Site work may generate greater volumes of localized traffic due to the movement of workers, materials, and equipment. Interruptions in on-installation traffic patterns could be expected during the construction period; however, these temporary impacts would likely be minor because all the main intersections within JBAB currently operate at an acceptable LOS during the morning and afternoon peak hours (Navy 2014d). The impact of

construction activities on the installation's road network can potentially be mitigated by staggering construction peak travel times to ensure that construction traffic does not conflict with existing base traffic peak travel times (thus preventing travel time delays).

Rooftop solar PV installation would not alter traffic in any way and would not have long-term, adverse impacts. Short-term, adverse impacts to transportation would likely be temporary and minor because of construction traffic during the construction phase.

The installation of solar PV panels on top of carports would likely have a short-term, minor, adverse impact on the traffic and transportation, especially due to disruptions in the parking spaces available during the construction phase; however, this impact would not be significant because carport construction is often phased to mitigate impacts on parking space availability in active parking lots. This phased approach would ensure that there are minimal disruptions in the parking spaces available. Additionally, short-term, minor, adverse impacts would likely result from added traffic during the construction phase, as described above.

Multiple existing parking lots have been proposed for the construction and operation of carport solar PV arrays. Use of these identified lots may be disrupted during construction phases. However, it is worth noting that the 2014 Master Plan has established a 5-year goal of reducing employee parking by 10 percent by the year 2018, reducing the number of employee parking spaces by 833. Given this Master Plan priority, as well as the various transportation management strategies in place in order to realize the installation-wide goal of reducing available parking spaces, it is likely that the temporary disruption of identified parking lots during construction would have minimal, adverse impacts. Overall impacts to traffic and transportation would not be significant.

4.10.2 No Action Alternative

The No Action Alternative would not change the existing transportation system at JBAB; therefore, no long-term impacts or changes to the use and capacity of the transportation system are expected.

4.11 Water Resources

4.11.1 Solar PV System Installation

4.11.1.1 Surface Water and Water Quality

No surface waters are located within the proposed site and there would be no direct impacts to the existing surface water resources. The installation of rooftop and parking lot solar PV arrays would occur on existing impervious surfaces and therefore would not affect surface waters. Indirect, minor adverse impacts to surface water features could result from ground disturbance and potential runoff during the construction of ground-mounted solar PV arrays. However, implementation of construction BMPs, stormwater management plans, and sediment and erosion control plans would minimize adverse impacts to water quality from sedimentation and runoff. Additionally, appropriate measures would be employed in the use and handling of hazardous materials and wastes to prevent the contamination of surface waters. Because surface water flow would not be altered under the proposed action, impacts to surface water would not be significant and would be short term and negligible.

4.11.1.2 Groundwater

Impacts to groundwater are not expected under the proposed action. Rooftop and parking lot solar PV arrays would be installed on existing impervious surfaces and therefore would not affect the groundwater resources. Construction of ground-mounted solar PV arrays would only disturb the ground surface and would not reach underlying aquifers. Groundwater flow would not be altered under the proposed action. Appropriate BMPs and minimization measures would be implemented during construction to prevent any groundwater contamination, including the use and handling of any hazardous materials during construction.

In addition, all construction and operation of the proposed action would comply with applicable groundwater regulations, including those enforced by DDOE and DC Municipal Regulations, Parts 1150–1158.

4.11.1.3 Floodplains

Installation of rooftop, parking lot, and ground-mounted solar PV arrays would occur in the 100-year floodplain. Rooftop and parking lot arrays would be installed over existing impervious surfaces and therefore would not have an impact on floodplain functions. Temporary, adverse impacts would result during installation of the ground-mounted solar PV arrays. Implementation of the proposed action must follow all federal and local regulations in order to offset the effects of flooding. As stated in the 2014 Master Plan, JBAB would develop and use all appropriate BMPs and stormwater management measures to minimize short-term and long-term impacts to the floodplain and to preserve and restore the floodplain, if possible. All necessary construction permits must be obtained and a flood management plan would be developed. The ground-mounted solar PV arrays would require placement of footings with 4-inch cross sections; however, most of the area within the proposed footprints would remain pervious. Additional infrastructure, including temporary roadways, would be gravel and would not increase impervious surface. Any increase in pervious surface would be minimal and would not affect the flood capacity. Over the long term, the placement of the ground-mounted solar PV arrays would not significantly affect the ability of the land to attenuate flood waters. As a result of the required mitigation, no net loss of the beneficial natural values of the floodplain is expected. Therefore, the proposed action would have temporary, minor, adverse impacts on the floodplain during installation.

4.11.2 No Action Alternative

Under the No Action Alternative, JBAB would not lease any property for the development of renewable energy resources, and there would be no construction and operation of a solar PV system. Therefore, there would be no changes from the existing surface water, groundwater, water quality, or floodplains associated with the site.

4.12 Protection of Children

4.12.1 Solar PV System Installation

Rooftop arrays are typically treated as rooftop equipment placed in limited-access areas; therefore, they are not guarded or protected. Fields of solar panels, including those surrounding the northern most CDC, would be fenced off and inaccessible and parking lot solar panels would be placed on top of carports. Therefore, in the long term, solar panels are anticipated to be inaccessible to children, and they are not anticipated to create an attractive nuisance that could harm children.

Air quality would be minimally affected during construction and installation of solar PV panels as a result of soil disturbing activities, construction vehicle traffic, and general construction activities. However, no significant impacts to air quality are anticipated (see Section 4.6). Furthermore, it is anticipated that construction BMPs, such as the limiting of ground-disturbing activities that could cause dust and debris to enter the air, would be used to mitigate any impacts to air quality around places where children congregate. Therefore, no impacts to children would occur as a result of impacts to air quality.

Noise from construction activities is anticipated to be localized to the areas of solar PV panels only during the period of construction and installation of the panels. Construction activities would occur during times when children are anticipated to be inside buildings during the work day. The outer wall of buildings would protect children from any significant construction noise. It is anticipated that children would not be allowed to access recreational fields where solar panels would be placed once construction of the solar panels commences. Therefore, no impacts to children as a result of noise are anticipated.

Traffic is expected to increase on the installation during the construction period as a result of the movement of workers, materials, and equipment around the installation. This increase in traffic is anticipated to be minor. Additionally, it is anticipated that construction vehicles would maintain the speed limit and follow traffic laws on the installation, which would mitigate any impacts that could occur to children on the installation as a result of this increase in traffic.

The three CDCs on the installation are not anticipated to be closed during the installation of solar PV panels on their roofs and during the installation of new power invertors in these buildings. If children remain in the CDCs during the installation of solar PV panels, it is anticipated that this installation would occur while children remain inside the building and construction would not interfere with activities inside the building. The construction of ground mount sites adjacent to the CDCs, minimal site preparation would be required, and construction is expected for only 2-3 weeks. Any construction that could affect children is anticipated to occur either on the weekends or during the evenings, times when children would not be in the buildings.

No changes from other resource topics are anticipated to result in impacts to populations of children on the installation. Therefore, overall, no impacts to children are anticipated under this alternative.

4.12.2 No Action Alternative

Under this alternative, existing conditions would remain the same and no construction or installation of solar panels would occur on the installation. Therefore, no impact to children is anticipated under this alternative.

4.13 Human Health and Safety

4.13.1 Solar PV System Installation

4.13.1.1 Environmental Restoration Program

Installation of solar PV systems planned at 18 locations would occur on ERP sites—8 on active ERP sites and 10 on inactive ERP sites. Solar PV locations on parking lots or buildings would not cause disturbance to the soil or the ERP sites and, therefore, would not affect human health and safety. Of the 18 locations, only 2 locations would cause disturbance to soil—the athletic fields beside Building 413 and the land between Lot 463 and Lot 000064.

Prior to the beginning of any soil-disturbing activities, JBAB would review the status of ERP sites and conduct any additional investigations, as needed. If the presence of contaminated soils is confirmed, appropriate measures would be taken to remove and dispose of the soils in accordance with the applicable regulations. As a result, human health and safety would not be affected.

4.13.1.2 Munitions Response Program

As part of the Navy site approval process, impacts associated with ESDQ arcs would be verified with appropriate personnel; however, the locations selected for solar PV systems do not overlap with the ammunition and explosive storage facilities or the facilities' ESQD arcs. As a result, there would be no changes on the installation or on the ammunition and explosive storage facilities due to the installation of solar PV systems.

4.13.1.3 Unexploded Ordnance

Three solar PV locations boarder the shore at JBAB—the athletic fields next to Building 413, the land north of Building 417, and the land in the southwest corner of the installation. Regardless of project sites' proximity to the waterfront, the installation of the solar PV systems would not cause disturbance to the shoreline. There would be impacts to human health and safety.

4.13.1.4 Hazardous Materials/Hazardous Waste

During construction, JBAB would be responsible for determining whether construction debris meets the criteria of a hazardous waste; if the criteria are met, JBAB would manage the waste as a hazardous waste. Any soil suspected of contamination or hazardous wastes generated by the project would be tested and disposed of in accordance with applicable federal and state laws and regulations.

If additional hazardous materials and hazardous waste that have not been identified are encountered during demolition activities and if those substances could be hazardous to human health upon disturbance, the contractor would be required to stop that portion of work and notify the Contracting Officer immediately. JBAB would then determine in a timely manner if the material is hazardous. If the material is not hazardous or poses no danger, JBAB would direct the contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, JBAB would issue an appropriate modification to the contract.

Solar PV cells can contain toxic materials, such as gallium arsenide, copper-indium-gallium-diselenide, and cadmium-telluride; however, release of these materials would not occur during normal operation. JBAB would ensure that all hazardous materials and waste involved with possible breakage of the solar PV systems are handled in accordance with applicable Navy guidelines and requirements and federal and state laws and regulations (UCSUSA 2014). Proper use, storage, handling, and disposal of hazardous materials and waste would ensure no adverse impacts on the environment. As a result, hazardous materials or hazardous waste would not affect human health and safety.

4.13.1.5 Underground and Aboveground Storage Tanks

If needed, documentation would be reviewed or surveys completed to identify the exact positions of USTs on the proposed solar PV sites; these locations would be avoided. If required to build on a location of a known UST, the tank and any contaminated material would be removed before construction of the solar PV arrays commenced. ASTs on proposed solar PV sites would be avoided. No changes to human health and safety would occur from USTs or ASTs.

4.13.1.6 Asbestos-Containing Building Materials, Lead-Based Paint, and Other Hazardous Materials

Asbestos-Containing Building Materials—Compliance with applicable federal, state, and Navy regulations and adherence to the Navy guidance would ensure human health or safety would not be affected. Demolition activities would be conducted per all applicable federal, state, Navy regulations, guidelines and management plans. As a result of the adherence to the Navy guidance, implementation of the proposed action would not result in asbestos exposure and would not adversely affect human health and safety.

Lead-Based Paint—Painted surfaces in buildings built before 1978 that are included in the proposed action may contain lead at some level. However, the area of construction on the roof should not overlap with areas that may contain lead. If construction occurs in an area where lead paint may be present, JBAB would test and dispose of it in accordance with applicable federal and state laws and regulations. As a result, implementation of the proposed action would not result in LBP exposure and would not adversely affect human health and safety.

Other Hazardous Materials—Contractors applying pesticides, including algaecides or herbicides, must have an account in the NAVFAC Online Pesticides Reporting System and would submit daily application records. Pesticides would be used to control vegetation near and around the solar PV panels; however, all application would be conducted in compliance with all JBAB and local state, and federal regulatory requirements. No changes to human health are expected from the use of pesticide.

4.13.1.7 Glint/Glare and Airspace

Glint and glare from solar PV facilities are potential concerns for nearby aviation operations due to the potential for ocular impacts on pilots or air traffic controllers, thereby affecting air traffic safety. The amount of light reflected off of a solar panel surface depends on two primary factors: the amount of sunlight hitting the surface and the reflectivity of the surface (FAA 2010). The solar PV panels used for the proposed action would be dark blue or black in color, having minimal light reflection. According to FAA, today's solar PV panels are constructed of dark, light-absorbing materials and are covered with an anti-reflective coating. As a result, they reflect as little as 2 percent of the incoming sunlight, depending on the angle of the sun (FAA 2010). In addition to the potential for glare from the panel surfaces, other metal components that are part of solar PV facilities, such as the support poles and inverter boxes that house the electrical equipment, may reflect sunlight in the form of glare.

From a study the FAA conducted of pilots and air traffic controllers at six airports where solar facilities have been operational for 1 to 3 years, FAA concluded that significant glare is not occurring during operation of the airports, or if it is occurring, it is not creating a negative effect (FAA 2010). A recent NREL study of the impacts of siting solar PV systems at airports and airfields (NREL 2014a) cites current policy and guidance, including the potential for ocular impacts to pilots from glint and glare from the solar facilities. In addition to the FAA 2010 guidance discussed above, which is under review, two other recent documents address glint and glare with respect to solar facilities sited at airports. In *Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports* (78 FR 63276) (Federal Register 2013), the FAA and DOE established a standard for measuring the ocular impact of glint and glare from reflective surfaces, as well as thresholds for when glint and glare would impact aviation safety. The solar glare hazard analysis plot and associated Solar Glare Hazard Analysis Tool (SGHAT) are the methods recommended in the interim policy. The policy also encourages the use of the guidance and tools for non-federally obligated airports or solar energy systems adjacent to airports.

The DOD memorandum "Glint and Glare Issues on or Near Department of Defense (DoD) Aviation Operations" (DOD 2014b) similarly acknowledges the FAA's conclusion that glint and glare from some solar energy systems could result in ocular impact to pilots and addresses DOD requirements for assessing it (relative to military aviation operations and mission compatibility) using the SGHAT and other methods. The DOD memorandum addresses solar PV projects that are within 2 nautical miles (2.3 statute miles) of military aviation operations, whether those projects are within or outside of installation boundaries.

The SGHAT is used to calculate the potential for after-image and eye damage, which is divided into three categories: 1) potential for permanent eye damage (retinal burn), 2) potential for temporary after-image, and 3) low potential for temporary after-image. The FAA interim policy (78 FR 63276, Federal Register 2013) states that a solar energy system constructed at a federally obligated airport must meet the following standards:

1. No potential for glint or glare in the existing or planned Airport Traffic Control Tower cab, and

2. No potential for glare or low potential for after-image along the final approach path for any existing landing threshold or future landing thresholds as shown on the current FAA-approved airport layout plan. The final approach path is defined as two miles from 50 feet above the landing threshold using a standard three degree glidepath.

NREL conducted a glint and glare analysis for JBAB, using the SGHAT, to evaluate the potential impacts to aircraft operations at Reagan National Airport. The NREL study evaluated the potential for glint/glare for six final approach paths at Reagan National Airport, located about 2 miles southwest of JBAB, across

the Potomac River, and found a low potential for glare for the solar PV facilities studied. The study found a potential or a low potential for glare to the Reagan National Airport air traffic control tower, depending on the solar PV facility studied. NREL recommended that none of the proposed solar PV facilities be eliminated from consideration based on its analysis because adjustments to tilt and orientation of some of the panels could reduce or eliminate the glare. NREL further recommended that glint/glare be reanalyzed once the solar PV designs are available (NREL 2015).

Although not addressed in the NREL study, some of the solar PV facilities would be near an air traffic control tower and visual flight rule approaches to the helipad at JBAB that is used for Marine Helicopter Squadron One.

During the project siting and approval process, the FAA Interim Policy and the DOD memorandum would continue to be consulted as appropriate. The Navy and the developer may "request FAA review and approval to depict certain proposed solar installations . . . before construction begins" and "notify the FAA of its intent to construct any solar installation by filing FAA Form 7460-1," if applicable according to the FAA interim policy (Federal Register 2013). The Navy and the developer would coordinate regarding the solar PV designs selected for the sites and any requirements for further evaluating glint and glare for air traffic. As a result of following the siting and approval process, as well as federal policy and guidance, there would be no significant impacts on aviation-related safety associated with glint and glare from the proposed action.

The installed panels are planned to consist of dark-colored and light-absorptive materials, which would lessen any impacts. Certain measures could be used to further minimize impacts from glint and glare, such as optimizing panel placement (both in the direction the panels face and the tilt of the panels) to reduce glint and glare, the use of anti-reflective coatings on the solar panels, and the use of matte finishes and dark paints on metal surfaces where feasible.

4.13.1.8 Electromagnetic Fields

There are no U.S. standards for public exposure to EMF, and Washington, D.C. has not established EMF exposure standards for power facilities. The ICNIRP has established EMF exposure guidelines for the general public. For 60-Hz electric power components (including electrical lines, inverters, and interconnection areas), the ICNIRP exposure guidelines for the general public are 4.2 kV/m for the electrical component of EMF and 2,000 mG for the magnetic component of EMF (ICNIRP 2010).

There is little information in published literature concerning EMF measurements for solar PV facilities. Using results from a study conducted at three utility-scale PV facilities in Massachusetts (Tech Environmental 2012), EMF levels for ground-mounted facilities were approximated for the nearest receptor to a large ground-mounted facility proposed for JBAB, such as the facility proposed for the North End Ball Fields and the vacant/underutilized land and a parking lot south of the ball fields. The nearest receptor was assumed to be approximately 50 feet from those facilities. A ground-mounted solar PV facility such as the one proposed for JBAB would typically situate multiple sets of 1 MW inverters throughout the facility in groups of two inverters that are located in conjunction with a transformer on a concrete pad. According to the study, a group of two 1 MW inverters and its associated transformer would generate less than 5 V/m from the electrical field and about 1,000 mG from the magnetic field at a distance of about 5 feet from the inverter pad. EMF radiation decreases quickly with distance. If an inverter pad were to be located 50 feet away from the nearest receptor (a conservative assumption since inverter pads would not typically be situated near a site boundary because each inverter pad services multiple solar panels), extrapolations from the study indicate that the electrical field strength at that receptor would not be measurable and the magnetic field strength would be a maximum of 5 mG. Both of those measurements would be well below the ICNIRP-recommended exposure guidelines for the general public. Potential EMF exposures to the nearest receptor to each of the other proposed ground-mounted solar PV facilities would be no greater because the nearest receptor to any facility would not likely be closer than 50 feet.

EMF exposure for rooftop installations was evaluated using a study conducted in 2013 (Safigianni and Tsimtsios 2013) for rooftop installations with power ratings ranging from 5 to 10 kW per installation. No information could be found in the published literature regarding EMF field strength for rooftop installations with generating capacities greater than 10 kW, such as those proposed for JBAB (see Table 2-1). According to the Safigianni and Tsimtsios study, a rooftop inverter (and its associated insulation transformer) for a 5-to-10-kW installation would generate up to 1,200 mG at the inverter/transformer itself but no more than 70 mG at any other location across the rooftop. The magnetic field strength at most of the rooftop locations would typically be about 4 mG. Magnetic fields in interior areas below the roof of this type of installation would be negligible. Electric field strengths in interior areas below the rooftop installation would not exceed about 30 V/m. Those magnetic and electric field measurements would be well below the ICNIRP-recommended exposure guidelines for the general public. If the inverters/transformers are not located on the roof itself and are instead located nearby in other interior or exterior areas of the building, the same relationship would be seen—EMF levels near the inverter would be high but would decrease below recommended exposure guidelines within a few feet of the inverter. Although the rooftop systems planned for JBAB would be more powerful than the rooftop systems evaluated by Safigianni and Tsimtsios, both the 2012 study for ground-mount installations and the 2013 study for rooftop installations indicate that EMF levels 10 feet away from the inverters in those studies would be below the ICNIRP-recommended exposure guidelines for the general public. It is assumed that the nearest occupant in any building below a solar PV rooftop installation proposed for JBAB would be at least 10 feet away from the solar components.

There would be no EMF exposure from electrical connection lines installed for the solar PV project because at JBAB such lines are located underground. Therefore there would be no change in EMF exposure from electrical lines at JBAB.

Implementation of the proposed action at any of the proposed sites would have a negligible impact on safety associated with EMF from electrical components associated with the action, including inverters/transformers, electrical lines, and interconnection areas. The impact would not be significant. For most individual receptors, the collective impact from developing solar PV facilities at multiple locations also would be negligible because few receptors would be exposed to EMF generated by more than one site. However, the collective impact from developing solar PV facilities at all of the sites could be potentially greater for a person who happens to be standing among the solar PV facilities at Lot ANA000053 (vehicle storage area), Lot 463, and the vacant / underutilized land west of Building 370 because those three ground-based facilities conjoin in the center (see Figure 2-1). Although the combined EMF exposure to that person would be greater, it is unlikely that someone would be standing among those three solar PV facilities. Therefore, the collective EMF exposure to any individual receptor from developing all of the proposed solar PV facilities at JBAB also would be below the ICNIRP-recommended guidelines, and the impact would be negligible and not significant. As part of the Navy site approval process, impacts associated with EMF would be verified with appropriate personnel.

4.13.2 No Action Alternative

Under the No Action Alternative, no solar PV systems would be installed; therefore, there would be no changes on human health and safety.

5.0 CUMULATIVE IMPACTS

5.1 Introduction

Cumulative impacts are defined as "the impacts on the environment that result from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertake such other action" (40 CFR Part 1508.7). The section goes on to note: "such impacts can result from individually minor but collectively significant actions taking place over a period of time."

Past, present, and future foreseeable projects with impacts to which the impacts of the solar PV system be added to determine cumulative impacts include other solar PV projects in proximity to JBAB, where the proposed action would occur. These would be the projects closest to the proposed action and most likely to involve cumulative impacts. Their implementation would take place over the next several years when the proposed action is also expected to be scheduled.

5.2 Projects to be Evaluated

Past project includes:

1. The NRL installed solar PV panels on Building A-69 in 2011.

In-progress projects that are located in proximity to the project area include:

1. Installation of roof-mounted solar PV panels to Building 6000—JBAB-DIA is constructing a solar PV panel array on the roof of Building 6000. The panels consist of 2,141 panels divided into 7 sections on the roof. The array will have the capacity to generate approximately 500 kilowatts of renewable electric energy.
2. Development of solar PV panels project at Blue Plains Wastewater Treatment Plant—The District of Columbia's Water and Sewer Authority is undertaking an 8- to 10-MW solar power project at the Blue Plains Wastewater Treatment Plant.
3. Development of solar panels on nearly 50 District-owned buildings, including on the St. Elizabeths' property, with the goal of generating 10 MW of electricity.
4. Construction and operation of a combined heating and power cogeneration facility at the NRL and at the Blue Plains Wastewater Treatment Plant.

5.3 Cumulative Impact Analysis

Potential cumulative impacts of the proposed action with other past, present, and reasonably foreseeable actions are discussed below. The time frame for cumulative impacts is 2011 through 2020 and is based on the span of time encompassing the actions analyzed. The geographic area considered for cumulative impacts is determined separately for each resource listed below. All of the proposed solar PV project sites were assessed in total when considered with other actions in order to present the most conservative analysis of cumulative impacts. The resource areas that are evaluated herein for cumulative impacts consist of land use; visual resources; utilities and infrastructure; cultural resources; air quality; geology, topography, and soils; vegetation and wildlife; noise; traffic and transportation; water resources; protection of children; and health and safety.

5.3.1 Land Use

5.3.1.1 Proposed Action Alternative

Installation of solar PV panels at the Blue Plains Wastewater Treatment Plant could affect land use. However, these solar PV panel projects would not result in changes to land use designations at JBAB. Therefore, when combined with the cumulative actions, the proposed action would result in a negligible contribution to overall cumulative impacts on land use.

5.3.1.2 No Action Alternative

Under the No Action Alternative, existing land uses at the installation and those land uses proposed under the 2014 Master Plan would not change. Therefore, there would be no cumulative impacts to land use.

5.3.2 Visual Resources

5.3.2.1 Proposed Action Alternative

Past and present projects would have an impact on visual resources. Solar PV panels installed by the NRL on Building A-69 along with the current installation of solar PV panels on Building 6000 and at the Blue Plains Wastewater Treatment Plant would be viewable to individuals with access to the installation. Specific views, however, would change based on an individual's observation height. Due to the obscured view of the South side of the installation from public places PV panels installed by the NRL on Building A-69 and the current installation of PV panels at the Blue Plains Wastewater Treatment Plant would have minimal to no impact on views from public places. Considering the height of Building 6000, the installation of roof-mounted solar PV panels would have negligible impact on views from public places. When combined with the cumulative actions, the proposed action would result in a minimal contribution to overall cumulative impacts on visual resources.

5.3.2.2 No Action Alternative

Under the No Action Alternative, visual resources would not be affected; therefore, there would be no cumulative impacts to visual resources.

5.3.3 Utilities and Infrastructure

5.3.3.1 Proposed Action Alternative

Past and present projects would have an impact on utilities and infrastructure. A standard interconnection with the existing electric system would have been set up for solar PV panels installed by the NRL on Building A-69, and new interconnections would be set up for the installation of solar PV panels on Building 6000 and at the Blue Plains Wastewater Treatment Plant. PEPCO will still have to provide electrical service because the electricity generated by past and present projects will not fully meet JBAB's demand. Adverse impacts to stormwater from past and present project would be minimal. However, on a regional level, construction and operation of a combined heating and power cogeneration facility at the NRL and at the Blue Plains Wastewater Treatment Plant would result in beneficial impacts by improving energy security, increase energy efficiency, and lower energy costs consistent with EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*. When combined with the cumulative actions, the proposed action would result in a minimal contribution to overall cumulative impacts on utilities and infrastructure.

5.3.3.2 No Action Alternative

Under the No Action Alternative, utilities and infrastructure would not be affected; therefore, there would be no cumulative impacts to utilities and infrastructure.

5.3.4 Cultural Resources

5.3.4.1 Proposed Action Alternative

Past and present activities within the project vicinity have not resulted in significant, adverse impacts to archaeological resources because all major projects have been covered by the Historic Preservation Act. Therefore, archaeological resources would not be cumulatively affected by the proposed action.

Past and present actions would have an impact on architectural resources within the primary APE, but these impacts would be indirect and minimal. The solar PV panels at the NRL and the Blue Plains Wastewater Treatment plant would not be visible from the NRHP-eligible Bolling AFB Historic District or Buildings 168 and 169 and therefore would have no impact and thus no cumulative impact. The solar PV panels on Building 6000 would have an visual impact to the Bolling AFB Historic District if the panels would be visible from above the roofline of the building. However, given the height of Building 6000, it is unlikely that the panels would be visible, resulting in a minimal contribution to cumulative impacts on architectural resources within the APE.

Past and present actions would also have an impact on architectural resources in the secondary APE. Because of their distance from architectural resources in the secondary APE, the past project at the NRL and the panels at the Blue Plains Wastewater Treatment Plant would not be visible and would not have an impact. The combined heating and power cogeneration facility at the NRL and at the Blue Plains Wastewater Treatment Plant is also expected to not have an impact on architectural resources in the secondary APE. The solar PV panels on Buildings 6000 would have an impact on architectural resources if they are visible above the roofline. This impact would be a minor to moderate, indirect impact on resources within the secondary APE, if solar panels on Building 6000 are visible. When combined with the cumulative actions, the proposed action would result in a minimal contribution to overall cumulative impacts on cultural resources.

5.3.4.2 No Action Alternative

The No Action Alternative would not result in any impacts to architectural or archaeological resources, therefore, no cumulative impacts would occur.

5.3.5 Air Quality

5.3.5.1 Proposed Action Alternative

Past and present activities within the project vicinity have resulted in adverse impacts to air quality during the construction period from use of construction equipment. In addition, construction activities associated with proposed renewable energy developments and other reasonably foreseeable future projects in the vicinity are likely to involve similar activities with potential to cause temporary, adverse impacts to air quality. When combined with the cumulative actions, the proposed action would result in a minimal contribution to overall cumulative impacts on air quality.

5.3.5.2 No Action Alternative

Air quality would not be affected under the No Action Alternative; therefore, there would be no cumulative impacts.

5.3.6 Geology, Topography, and Soils

5.3.6.1 Proposed Action Alternative

Past and present activities within the project vicinity have resulted in adverse effects to soils, including disturbance. These activities include clearing, grading, compaction, and related soil disturbance associated with urban development and infrastructure. In addition, construction activities associated with proposed

renewable energy developments and other reasonably foreseeable future projects in the vicinity are likely to involve similar activities with potential to cause soil disturbance. The extent and magnitude of effects caused by these future projects would depend on mitigation measures implemented during their construction and operation, among other factors. Impacts to topography and geology from the proposed action would be negligible because there would be very little to no grade changes. Impacts to soils would be minor adverse. When combined with the cumulative actions, the proposed action would result in a minimal contribution to overall cumulative impacts on geology, topography, and soils.

5.3.6.2 No Action Alternative

Geology, topography, and soils would not be affected under the No Action Alternative; therefore, there would be no cumulative impacts.

5.3.7 Vegetation and Wildlife

5.3.7.1 Proposed Action Alternative

The present project at the Blue Plains Wastewater Treatment Plant could have an impact on vegetation. Any impacts to vegetation would most likely be to turf grasses. The Blue Plains Wastewater Treatment Center is located just south of JBAB. Wildlife occurring on that facility would be similar to those found at JBAB, limited to species common to urban areas. Under the proposed action, only the ground-mounted installation of solar PV panels would affect vegetation and wildlife. The loss of vegetation would be limited to turf grasses and a small grove of trees and shrubs that provide little ecological benefit. Wildlife affected would be limited to species common to urban areas and can be found over an extended geographic area. When combined with the cumulative actions, the proposed action would result in a minimal contribution to overall cumulative impacts on vegetation and wildlife.

5.3.7.2 No Action Alternative

Under the No Action Alternative, vegetation and wildlife would not be affected; therefore, there would be no cumulative impacts.

5.3.8 Noise

Cumulative noise impacts are time, location, duration, and magnitude dependent. For one noise event to have a cumulative impact with another noise event, the events need to occur during the same averaging period, i.e., during the same day for dBA Leq (24-hour) or DNL. Multiple noise events would need to occur within earshot of a specific location in order to have a cumulative impact. The duration of an impact is important cumulatively because occasional short and very loud impulse noise may cause a startle, but this type of noise is not necessarily as intrusive as a long, drawn-out, medium-loud noise event. On the other hand, many short, loud noises can be extremely intrusive. The magnitude of the two events needs to be similar to have a cumulative impact.

The geographic area, timing, and nature of the action for each of the projects with the potential to cause cumulative impacts were compared to the alternatives to determine whether there would be a cumulative impact.

5.3.8.1 Proposed Action Alternative

The construction of the solar PV panels under the alternative in theory has the potential to increase noise levels and add cumulatively to impacts to the surrounding land uses if construction involving loud noise were to occur simultaneously with that of other construction projects sufficiently close for combined effects. However, construction noise resulting from the proposed action is both sufficiently distant from other projects and from sensitive receptors. Combined with the rapid drop in dB in a relatively short distance, the proposed action would not add to other noise in a manner to produce significant incremental impacts.

5.3.8.2 No Action Alternative

Under the No Action Alternative, there would be no noise impacts; therefore, there would be no cumulative noise impacts.

5.3.9 Traffic and Transportation

In considering the cumulative impacts of the proposed solar PV Installation in the context of past, present, and reasonably foreseeable future projects, the geographic boundary for traffic and transportation is the immediate and nearby area of the project footprint, as well as the overall traffic patterns of JBAB.

5.3.9.1 Proposed Action Alternative

The proposed action would use existing access and traffic flow to access potential sites identified for the solar PV Installation until the completion of the project. No new roads would be developed for the project. Regardless of the type of solar PVs installed (rooftop, ground-mounted, or carport), the increase in traffic from installation would only be attributed to construction vehicles going to and from the project areas; this may temporarily have an adverse effect on local JBAB traffic. No additional employees are expected; therefore no additional employee traffic would be created from the proposed action.

Based on the past and in-progress projects, limited to only those discussed in Section 5.2, there are no long-term transportation and traffic impacts expected, as no changes would made to existing traffic flow or parking. Potential adverse impact could be caused by construction traffic from the Proposed Action Alternative in additive to increased construction traffic from the aforementioned in-progress construction projects in the immediate area (listed in Section 5.2). This construction traffic could be scheduled to avoid peak hours if necessary and would be coordinated with other projects' construction traffic in order to ensure that significant cumulative traffic impacts do not occur. Therefore, cumulative impacts to transportation and traffic from the implementation of this alternative would minor and not significant.

5.3.9.2 No Action Alternative

Under the No Action Alternative, there would be no changes in traffic volumes, traffic patterns, or parking. The current traffic and transportation system would be maintained. Therefore there would be no cumulative impacts to traffic and transportation.

5.3.10 Water Resources

5.3.10.1 Proposed Action Alternative

Past and present projects that could have an impact on water resources include the installation of solar PV panels at the Blue Plains Wastewater Treatment Plant. Although there is the potential for indirect impacts on water resources from sedimentation related to ground-disturbing activities, these projects are required to follow all sediment and erosion control practices, thereby minimizing adverse impacts. Under the proposed action, there would be short-term, adverse impacts to floodplains; however, required mitigation would result in no net loss of the beneficial natural values of the floodplain. When combined with the cumulative actions, the proposed action would have a minimal, adverse contribution to cumulative impacts on water resources.

5.3.10.2 No Action Alternative

Under the No Action Alternative, there would be no changes to and no impact on the existing surface water, groundwater, water quality, or floodplains associated with the site. Therefore, there would be no cumulative impacts to water resources.

5.3.11 Protection of Children

5.3.11.1 Proposed Action Alternative

Past and present projects that could have an impact on populations of children include the past installation of solar PV panels on Building A-69 and the current installation of roof-mounted PV panels to Building 6000. The installation of solar PV panels on Building A-69 in 2011 would have resulted in no impacts to children because it is assumed that BMPs, such as closure of the construction site during construction and making the panels inaccessible after they were installed, were used during the installation of this solar PV panel array. The installation of roof-mounted PV panels to Building 6000 is anticipated to result in no impacts to children because it is anticipated that BMPs would be used and that the construction site would be closed during construction and the panels would be inaccessible after they are installed. Therefore, no impacts to children are anticipated as a result of either of these projects. Under the proposed action, children would not be affected; therefore, when combined with the cumulative actions, the proposed action would have no cumulative impact to populations of children.

5.3.11.2 No Action Alternative

Children would not be affected under the No Action Alternative; therefore, there would be no cumulative impacts to children under this alternative.

5.3.12 Health and Safety

5.3.12.1 Proposed Action Alternative

JBAB would comply with the applicable regulations and adhere to standard safety practices regarding ERP sites, hazardous materials/hazardous waste, asbestos, LBP, the Munitions Response Program, unexploded ordnance, and other hazardous material past and present activities within the project vicinity; therefore, there would be no adverse impacts to human health and safety. Pilots would continue to use BMPs to ensure minimal, adverse effects to human health and safety due to glint and glare from the solar PV panels. In addition, surrounding projects in the area expect to produce electromagnetic fields at a level that would have negligible impact to human health and safety. Therefore, the proposed action would not add to cumulative impacts on human health and safety.

5.3.12.2 No Action Alternative

Human health and safety would not be affected under the No Action Alternative; therefore, there would be no cumulative impacts.

6.0 MITIGATION MEASURES

Construction of the proposed solar PV project at JBAB would be conducted in accordance with BMPs as discussed in Chapter 4, as well as conditions of any requisite permit, such as the General Permit for Stormwater Associated with Construction Activity.

Implementation of the proposed action at JBAB would not result in significant impacts; however, a number of minimization and protection measures would be incorporated into the design and construction of the solar PV system to protect important views and further reduce impacts to pilots and nearby air transportation. These measures are presented in Table 6-1.

Table 6-1 Proposed Minimization/Protection Measures

Measure	Anticipated Benefit	Responsible Party	Estimated Completed Date
Visual Resources			
Implement design measures and BMPs consistent with the Installation Appearance Plan, including but not limited to: • Dark blue or black solar panels • Visual screening consisting of existing vegetation or fencing covered with dark-colored material • Dark-finished roads • Dark, matte finishes on metallic components. • Site lighting so it is shielded, directed downward, and of minimum power/lumens	Decrease visual impacts to sensitive receptors	Solar developer	Associated with design, construction, and operation
Glint/Glare			
Reduce glare from panels by installing solar PV panels constructed with an anti-reflective coating, glass texturing, and installation of blinds/screens	Decrease the amount of sunlight that is reflected to reduce the safety risk to pilots and air transportation	Solar developer	Associated with construction and operation
Cultural Resources			
Solar panels installed in a manner where they are not visible from the ground on Buildings 168, 520, B421	Reduce or eliminate impacts to the buildings' visual character	Solar developer	Associated with design and construction

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APPENDIX A
CONSULTATION AND COORDINATION

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5090.1D
Ser J4/0019
December 22, 2014

Ms. Genevieve LaRouche
Field Supervisor
Chesapeake Bay Field Office
U.S. Fish and Wildlife Service
177 Admiral Cochrane Drive
Annapolis, MD 21401

Subject: Environmental Assessment for Construction and Operation of Renewable Energy Facilities at Joint Base Anacostia-Bolling, Washington D.C.

Dear Ms. LaRouche:

The U.S. Department of the Navy (Navy) is preparing an Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) of 1969 for the construction and operation of a solar photovoltaic (PV) system at Joint Base Anacostia-Bolling (JBAB), Washington, D.C. The proposed action is to meet the renewable energy goals of the EPAct, 10 U.S.C. 2911(e), the 2013 presidential memorandum, and the Secretary of the Navy, including the goal to produce 50 percent of the Navy's shore-based energy requirements from alternative sources by 2020.

JBAB occupies an approximately 970-acre long and relatively narrow strip of land in southeast Washington, D.C.; see Figure 1. It is bordered by the Potomac and Anacostia Rivers to the west; South Capitol Street, Overlook Avenue, and Interstate 295 (I-295) to the east; Naval Research Laboratory (NRL) to the south; and the South Capitol Street Bridge, also known as the Frederick Douglass Memorial Bridge, on the north. JBAB is located in the northeast corner of USGS Quadrangle Alexandria in the District of Columbia (USGS Quad ID, 38077-G1).

The EA evaluates the reasonably foreseeable environmental impacts of the Navy's proposed action to lease approximately 50 acres, including land, parking lots (for carports), and building rooftops, within JBAB to one or more independently operated power utility companies for the construction and operation of a solar PV systems that would generate electricity to supply the existing electrical energy grid and be reallocated by the utility to local consumers.

The purpose of this initial correspondence is to request a list of any federally-listed species or habitats that may occur on the proposed project site and to solicit any early input or concerns that you may have regarding this proposed action. A similar letter is also being sent to the D.C. Department of the Environment to solicit its input.

Please direct all correspondence to: Melissa Mertz, 370 Brookley Ave., Joint Base Anacostia-Bolling, Washington, D.C. 20032. For more information, please contact Melissa Mertz, at (202) 767-1254 Thank you in advance for your assistance.

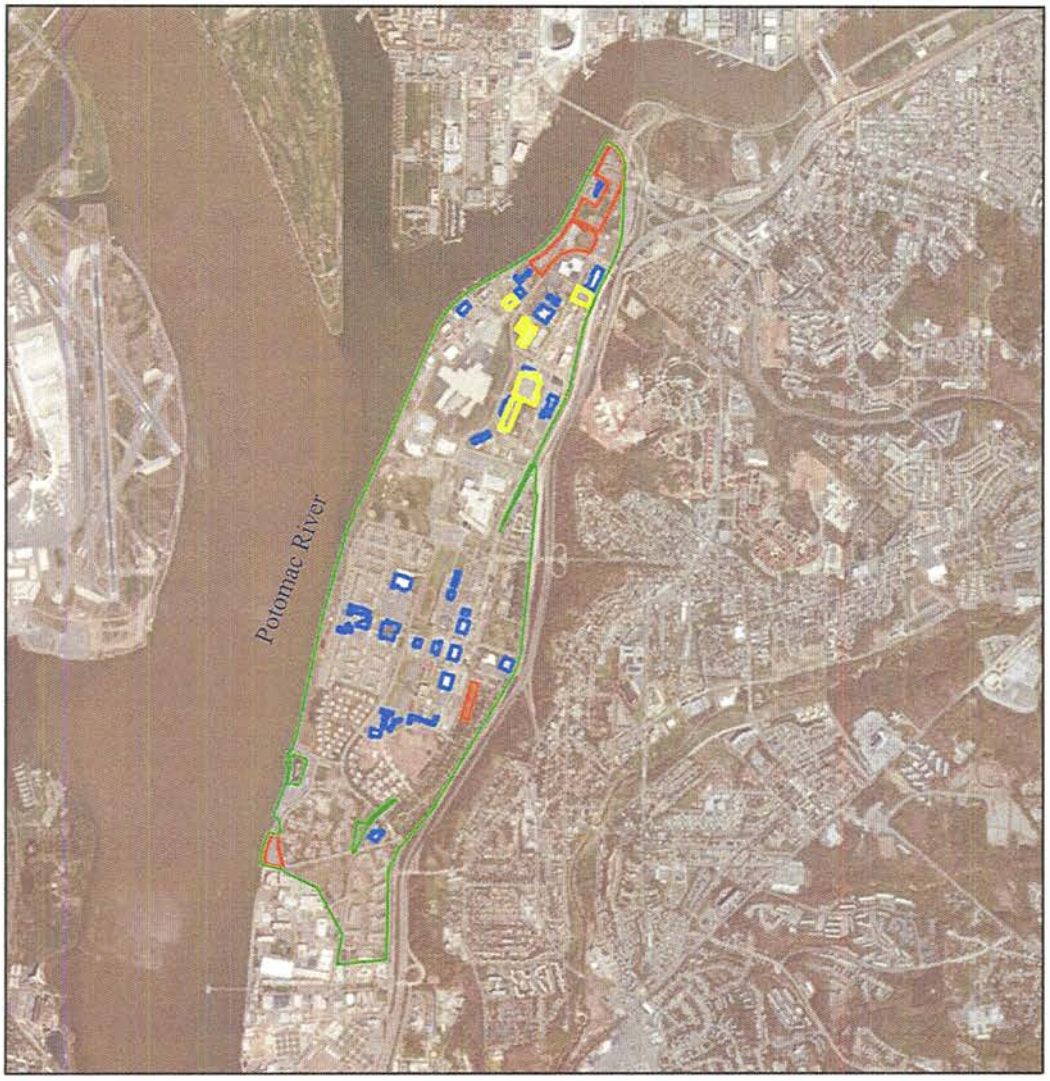
Sincerely,

Joseph Cook, Lt Col, USAF
Public Works Officer

Encl: Proposed Project Locations

cc: Madina Alharazim, Installation Environmental Program Director, JBAB
Tara Meadows, Planner in Charge, NAVFAC Washington

Enclosure: Proposed Project Locations



SCALE

0 0.25 0.5 Miles

Legend

- JBAB Boundary
- Parking Lot
- Land
- Building Rooftop

Proposed Solar Project Locations
JBAB
Washington, DC

SOURCE: NAVFAC Washington 2012
JBAB 2014, ESRI 2013

DEPARTMENT OF THE NAVY
JOINT BASE ANACOSTIA-BOLLING
20 MACDILL BLVD, SUITE 300
WASHINGTON, D.C. 20032-7711

5090.1D
Ser J4/0018
December 22, 2014

Mr. Keith A. Anderson
Director
D.C. Department of the Environment
1200 First Street NE, 5th Floor
Washington, DC 20002

Subject: Environmental Assessment for Construction and Operation of Renewable Energy Facilities at Joint Base Anacostia-Bolling, Washington D.C.

Dear Mr. Anderson:

The U.S. Department of the Navy (Navy) is preparing an Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) of 1969 for the construction and operation of a solar photovoltaic (PV) system at Joint Base Anacostia-Bolling (JBAB), Washington, D.C. The proposed action is to meet the renewable energy goals of the EPAct, 10 U.S.C. 2911(e), the 2013 presidential memorandum, and the Secretary of the Navy, including the goal to produce 50 percent of the Navy's shore-based energy requirements from alternative sources by 2020.

JBAB occupies an approximately 970-acre long and relatively narrow strip of land in southeast Washington, D.C.; see Figure 1. It is bordered by the Potomac and Anacostia Rivers to the west; South Capitol Street, Overlook Avenue, and Interstate 295 (I-295) to the east; Naval Research Laboratory (NRL) to the south; and the South Capitol Street Bridge, also known as the Frederick Douglass Memorial Bridge, on the north. JBAB is located in the northeast corner of USGS Quadrangle Alexandria in the District of Columbia (USGS Quad ID, 38077-G1).

The EA evaluates the reasonably foreseeable environmental impacts of the Navy's proposed action to lease approximately 50 acres, including land, parking lots (for carports), and building rooftops, within JBAB to one or more independently operated power utility companies for the construction and operation of a solar PV systems that would generate electricity to supply the existing electrical energy grid and be reallocated by the utility to local consumers.

The purpose of this initial correspondence is to request a list of any state listed species or habitats that may occur on the proposed project site and to solicit any early input or concerns that you may have regarding this proposed action. A similar letter is also being sent to the U.S. Fish and Wildlife Service to solicit its input.

Please direct all correspondence to: Melissa Mertz, 370 Brookley Ave., Joint Base Anacostia-Bolling, Washington, D.C. 20032. For more information, please contact Melissa Mertz, at (202) 767-1254 Thank you in advance for your assistance.

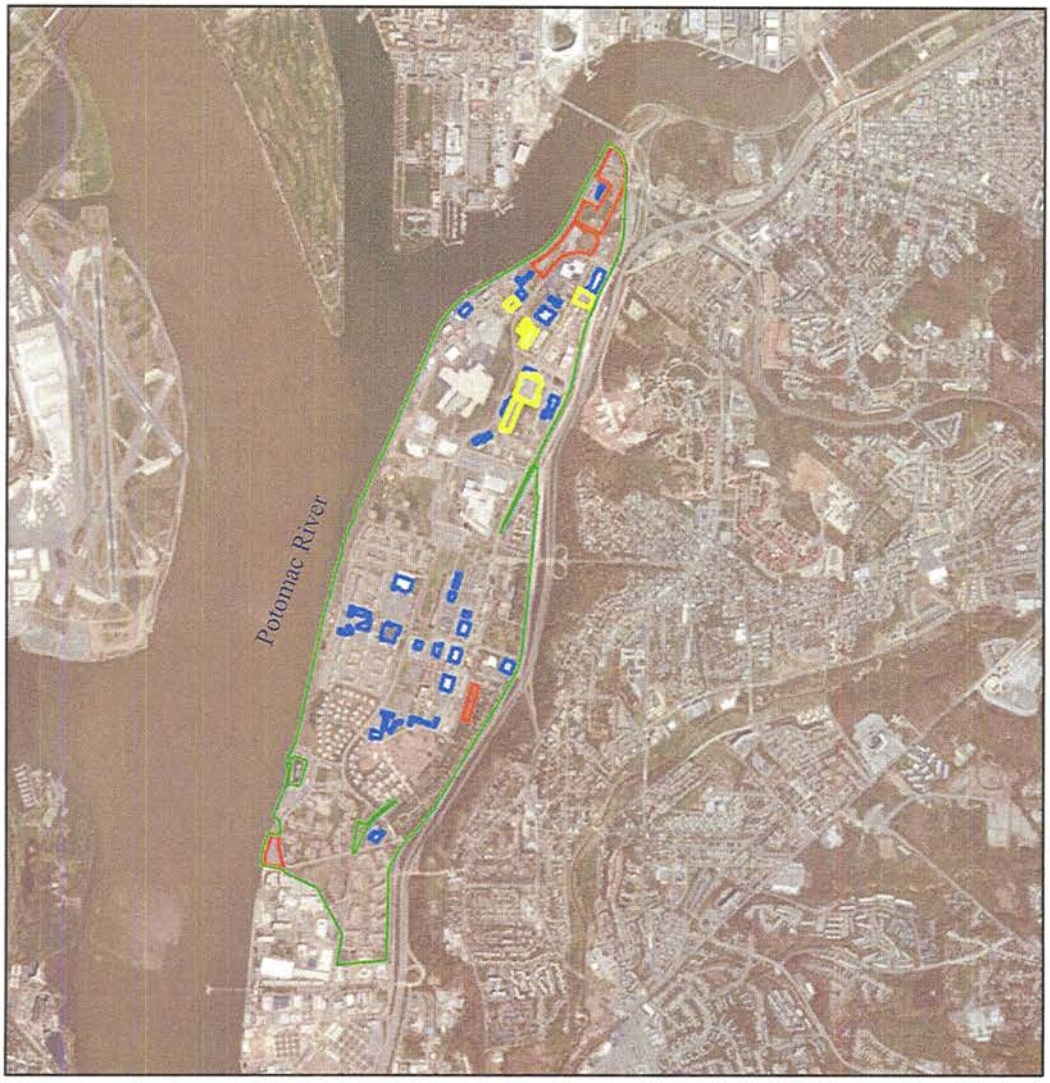
Sincerely,

Joseph Cook, Lt Col, USAF
Public Works Officer

Encl: Proposed Project Locations

cc: Madina Alharazim, Installation Environmental Program Director, JBAB
Tara Meadows, Planner in Charge, NAVFAC Washington

Enclosure: Proposed Project Locations



SCALE

0 0.25 0.5 Miles

Legend

- JBAB Boundary
- Parking Lot
- Land
- Building Rooftop

Proposed Solar Project Locations
JBAB
Washington, DC

SOURCE: NAVFAC Washington 2012
JBAB 2014 ESRI 2013

From:	Marcus.Brundage@faa.gov
To:	Meadows, Tara CIV NAVFAC Washington
Cc:	Andrew.Brooks@faa.gov; Chad.Carper@faa.gov; Tony.Jenkins@faa.gov; Terrell.Rooks@faa.gov; joey.l.medders@faa.gov; donna.warren@faa.gov
Subject:	RE: PV Panel Installation across from Ronald Reagan National Airport
Date:	Wednesday, December 03, 2014 7:04:06

Good morning Tara:

Per FAA Order 1050.1E/5050.4B there is no federal action that would trigger NEPA at DCA. Thanks for checking though.

Thanks,

Marcus Brundage,REM,CHS-V
Environmental Protection Specialist
FAA Washington Airport District Office-AEA-WAS-ADO
23723 Air Freight Lane, Suite 210
Dulles, VA 20166
(O) 703-661-1365; (F) 703-661-1370
marcus.brundage@faa.gov

"We're Only As Strong As Our Weakest Link"

-----Original Message-----
From: Brooks, Andrew (FAA)
Sent: Wednesday, November 26, 2014 11:26 AM
To: Carper, Chad (FAA); Brundage, Marcus (FAA)
Subject: RE: PV Panel Installation across from Ronald Reagan National Airport

I concur with Chad. The appropriate venue for this is a 7460-1 with the required glare analysis. There is no Federal Action at DCA.

Andrew Brooks
Environmental Program Manager
Federal Aviation Administration
Eastern Regional Office
1 Aviation Plaza
Jamaica, NY 11434
Phone: 718-553-2511

-----Original Message-----
From: Carper, Chad (FAA)
Sent: Friday, November 21, 2014 4:28 PM
To: Brundage, Marcus (FAA); Brooks, Andrew (FAA)
Subject: RE: PV Panel Installation across from Ronald Reagan National Airport

I do not see a "Federal Action" so I do not think FAA has a role in NEPA. As far as glint glare, I would encourage the proponent file a 7460-1 (using "Is Located" on an airport)

https://oeaaa.faa.gov/oeaaa/external/portal.jsp

They will need to do a glint/glare analysis per the attached MOU

Chad Carper, Engineer
Washington Airports District Office
23723 Air Freight Lane, Suite 210
Dulles, VA 20166
703.661.1358 chad.carper@faa.gov

-----Original Message-----
From: Brundage, Marcus (FAA)
Sent: Tuesday, November 18, 2014 8:14 AM
To: Brooks, Andrew (FAA); Carper, Chad (FAA)
Subject: PV Panel Installation across from Ronald Reagan National Airport

Andrew/Chad:

Please see email below.

Andrew, from a NEPA perspective what level of involvement, if any, do we (ARP) need to be with this? This action is not on the Airport but may have a direct "impact".

Thanks,

Marcus Brundage,REM,CHS-V
Environmental Protection Specialist
FAA Washington Airport District Office-AEA-WAS-ADO
23723 Air Freight Lane, Suite 210
Dulles, VA 20166
(O) 703-661-1365; (F) 703-661-1370
marcus.brundage@faa.gov

"We're Only As Strong As Our Weakest Link"

-----Original Message-----
From: Jenkins, Tony (FAA)
Sent: Monday, November 17, 2014 3:58 PM
To: Meadows, Tara CIV NAVFAC Washington
Cc: Rooks, Terrell (FAA); Brundage, Marcus (FAA); Medders, Joey L (FAA); Warren, Donna (FAA)
Subject: RE: PV Panel Installation across from Ronald Reagan National Airport

Tara,

We, Operations Support Group, would not have interest in the review of the environmental document but perhaps Environmental Specialist in Washington Airports Division (ADO, Marcus Brundage) or Engineering Services/Tech Ops (Terrell Rooks) may want to weigh in on the environmental document. I've copied them on this response.

In regards to other necessary coordination, I'm assuming the Navy knows that you should file FAA Form 7460-1, Notice of Proposed Construction with the Washington ADO when you have a proposal established.

The ADO will then coordinate the NRA study across FAA lines of business to assess the potential impact of the proposed action. The potential for glare should be addressed within the case study. In other words, the environmental impacts contained in the EA study should be identified within the NRA case so that other LOBs can provide input/comments relative to the proposed project's impact on their area of responsibility.

Myron A (Tony) Jenkins
Operations Support Group Manager, AJV-E2

Office: 404-305-5571
Mobile: 404-604-6855

-----Original Message-----
From: Meadows, Tara CIV NAVFAC Washington [mailto:tara.meadows@navy.mil]
Sent: Monday, November 10, 2014 10:26 AM
To: Jenkins, Tony (FAA)
Subject: PV Panel Installation across from Ronald Reagan National Airport

Good Morning,

I'm the Navy Environmental PM for a project at our Joint Base Anacostia-Bolling (JBAB) facility, which is located across the Potomac/Anacostia Rivers from the Ronald Reagan National Airport. The purpose of this email is to provide you with some background on the project and inquire as to the FAA's potential for interest in participating in the NEPA process. I was passed on your information as the point of contact - however, if this is in error, please let me know or refer me on to the appropriate party.

We are currently engaged in an Environmental Assessment for the installation of photovoltaic (PV) panels on up to 50 acres on our JBAB facility. The 50 acres is comprised of a combination of roof-mounted, carport and ground-mounted arrays. The proposed action is in support of the Energy Policy Act of 2005 (EPAct) (42 U.S.C. 15852, 10 U.S.C. 2911(e) renewable energy goals and the Secretary of the Navy 1 Gigawatt (GW) Initiative. In addition to the EA, we are undertaking a glint/glare analysis of the project, which is being handled by our renewable energy office. Based on my research, I'm unclear as to the level of participation the FAA usually takes with such undertakings. Would the FAA be an interested party to the EA for this project and, if so, what information would you require regarding the project to provide review/comment? Would the FAA's interest be limited to the glint/glare study? Thanks!

v/r,

Tara Meadows
Natural Resources Specialist
Washington Navy Yard
1314 Harwood Street, SE
Washington, DC 20374-5018
P: (202)685-8415
F: (202) 685-0615

From: Meadows, Tara CIV NAVFAC Washington
To: Marcus.Brundage@faa.gov; Tony.Jenkins@faa.gov
Cc: Terrell.Rooks@faa.gov; joey.l.medders@faa.gov; donna.warren@faa.gov
Subject: RE: PV Panel Installation across from Ronald Reagan National Airport
Date: Monday, December 01, 2014 13:55:00

Thank you. Please let me know if you need additional information. However, I do have one question as I sometimes get lost within the acronyms especially between agencies - what is the NRA study and who typically conducts it? Thanks!

v/r,

Tara Meadows
Natural Resources Specialist
P: (202)685-8415
F: (202) 685-0615

-----Original Message-----
From: Marcus.Brundage@faa.gov [mailto:Marcus.Brundage@faa.gov]
Sent: Tuesday, November 18, 2014 8:06 AM
To: Tony.Jenkins@faa.gov; Meadows, Tara CIV NAVFAC Washington
Cc: Terrell.Rooks@faa.gov; joey.l.medders@faa.gov; donna.warren@faa.gov
Subject: RE: PV Panel Installation across from Ronald Reagan National Airport

Thanks Tony and Tara.

Tara,

I will get back with you per the Washington ADO level of involvement regarding NEPA.

Thank you,

Marcus Brundage,REM,CHS-V
Environmental Protection Specialist
FAA Washington Airport District Office-AEA-WAS-ADO
23723 Air Freight Lane, Suite 210
Dulles, VA 20166
(O) 703-661-1365; (F) 703-661-1370
marcus.brundage@faa.gov

"We're Only As Strong As Our Weakest Link"

-----Original Message-----
From: Jenkins, Tony (FAA)
Sent: Monday, November 17, 2014 3:58 PM
To: Meadows, Tara CIV NAVFAC Washington
Cc: Rooks, Terrell (FAA); Brundage, Marcus (FAA); Medders, Joey L (FAA); Warren, Donna (FAA)
Subject: RE: PV Panel Installation across from Ronald Reagan National Airport

Tara,

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Services/Tech Ops (Terrell Rooks) may want to weigh in on the environmental document. I've copied them on this response.

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The ADO will then coordinate the NRA study across FAA lines of business to assess the potential impact of the proposed action. The potential for glare should be addressed within the case study. In other words, the environmental impacts contained in the EA study should be identified within the NRA case so that other LOBs can provide input/comments relative to the proposed project's impact on their area of responsibility.

Myron A (Tony) Jenkins
Operations Support Group Manager, AJV-E2
Office: 404-305-5571
Mobile: 404-604-6855

-----Original Message-----
From: Meadows, Tara CIV NAVFAC Washington [mailto:tara.meadows@navy.mil]
Sent: Monday, November 10, 2014 10:26 AM
To: Jenkins, Tony (FAA)
Subject: PV Panel Installation across from Ronald Reagan National Airport

Good Morning,

I'm the Navy Environmental PM for a project at our Joint Base Anacostia-Bolling (JBAB) facility, which is located across the Potomac/Anacostia Rivers from the Ronald Reagan National Airport. The purpose of this email is to provide you with some background on the project and inquire as to the FAA's potential for interest in participating in the NEPA process. I was passed on your information as the point of contact - however, if this is in error, please let me know or refer me on to the appropriate party.

We are currently engaged in an Environmental Assessment for the installation of photovoltaic (PV) panels on up to 50 acres on our JBAB facility. The 50 acres is comprised of a combination of roof-mounted, carport and ground-mounted arrays. The proposed action is in support of the Energy Policy Act of 2005 (EPAct) (42 U.S.C. 15852, 10 U.S.C. 2911(e) renewable energy goals and the Secretary of the Navy 1 Gigawatt (GW) Initiative. In addition to the EA, we are undertaking a glint/glare analysis of the project, which is being handled by our renewable energy office. Based on my research, I'm unclear as to the level of participation the FAA usually takes with such undertakings. Would the FAA be an interested party to the EA for this project and, if so, what information would you require regarding the project to provide review/comment? Would the FAA's interest be limited to the glint/glare study? Thanks!

v/r,

Tara Meadows
Natural Resources Specialist
Washington Navy Yard
1314 Harwood Street, SE
Washington, DC 20374-5018
P: (202)685-8415
F: (202) 685-0615

APPENDIX B
RECORD OF NON-APPLICABILITY

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GENERAL CONFORMITY – RECORD OF NON-APPLICABILITY

Project/Action Name: Environmental Assessment for Construction and Operation of a Solar Photovoltaic System at Joint Base Anacostia-Bolling, Washington, D.C.

Project/Action Point of Contact: Madina Alharazim

General Conformity under the Clean Air Act, Section 176 has been evaluated for the project described above according to the requirements of 40 CFR 93, Subpart B. The General Conformity Rule applies to Federal actions occurring in regions designated as being in nonattainment for the National Ambient Air Quality Standards (NAAQS) or attainment areas subject to maintenance plans (maintenance areas). Threshold (de minimis) rates of emissions have been established for Federal actions with the potential to have significant air quality impacts. If a project/action located in an area designated as nonattainment or maintenance exceeds these de minimis levels, a general conformity analysis is required.

Washington, D.C. is in marginal nonattainment for ozone (O_3), moderate nonattainment for $PM_{2.5}$, and in attainment area for all other criteria pollutants. For situations of non-attainment for ozone, the criteria pollutants considered for conformity are the precursors for ozone: nitrogen oxide (NOx) and volatile organic compounds (VOCs). Short-term impacts from the Proposed Action Alternative include minor increases in emissions of criteria air pollutants from construction equipment (worker vehicles and construction equipment) and particulate matter from limited ground clearing activities.

Based on a review of the proposed action alternatives and on analysis completed for previous similar actions for slightly longer construction periods at the adjoining Naval Research Laboratory, a General Conformity Analysis of this project/action is not required because maximum annual direct and indirect emissions from this project/action are below the de minimis levels established in 40 CFR 93.153 (b) of:

NOx: 100 tons;
VOC: 50 tons;
$PM_{2.5}$: 100 tons;
SOx: 100 tons

ALHARAZIM-PLUMMER.MADINA.M.1362686136

Digitally signed by ALHARAZIM-PLUMMER.MADINA.M.1362686136
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USN, cn=ALHARAZIM-PLUMMER.MADINA.M.1362686136
Date: 2015.08.11 15:41:21 -04'00'

Madina Alharazim, Director - Environmental Division

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APPENDIX C
SECTION 106 CONSULATION

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GOVERNMENT OF THE DISTRICT OF COLUMBIA
STATE HISTORIC PRESERVATION OFFICE

DC STATE HISTORIC PRESERVATION OFFICE
FEDERAL AGENCY SECTION 106 REVIEW FORM

TO: Ms. Melissa Mertz, NEPA/Cultural/Natural Resource Manager, Joint Base Anacostia-Bolling (JBAB)

PROJECT NAME/DESCRIPTION: **Joint Base Anacostia-Bolling photovoltaic installations**

PROJECT ADDRESS/LOCATION DESCRIPTION: multiple locations, ground-mounted and building-mounted

DC SHPO PROJECT NUMBER: 15-141

The DC State Historic Preservation Office (DC SHPO) has reviewed the above-referenced federal undertaking(s) in accordance with Section 106 of the National Historic Preservation Act and has determined that:

☐	This project will have **no effect** on historic properties. No further DC SHPO review or comment will be necessary.
☐	There are **no historic properties** that will be affected by this project. No further DC SHPO review or comment will be necessary.
☐	This project will have **no adverse effect** on historic properties. No further DC SHPO review or comment will be necessary.
☒	This project will have **no adverse effect** on historic properties **conditioned** upon fulfillment of the measures stipulated below.
☐	**Other Comments / Additional Comments** (see below):

1. **There shall be no installation on the Bolling Hangars 1 and 2.**
2. **The panels on NR-eligible Building 168 be installed so as not to be visible from the ground.**
3. **The panels on Buildings 520 and 3421, because of being within or near the Bolling AFB historic district, not be visible from the ground.**

BY: 

DATE: May 6, 2015

DEPARTMENT OF THE NAVY
JOINT BASE ANACOSTIA-BOLLING
20 MACDILL BLVD, SUITE 300
WASHINGTON, D.C. 20032-7711

5090
Ser J4/0024
February 25, 2015

Mr. David Maloney
D.C. Historic Preservation Office
Office of Planning
1100 4TH Street, SW
Suite E650
Washington, DC 20024
Attn: Mr. Timothy Dennee

SUBJECT: CONSTRUCTION AND OPERATION OF A SOLAR PHOTOVOLTAIC SYSTEM AT JOINT BASE ANACOSTIA-BOLLING, WASHINGTON, DC

Dear Mr. Dennee:

Joint Base Anacostia-Bolling (JBAB) in Washington, D.C. anticipates undertaking the construction and operation of a solar photovoltaic (PV) system at locations across the installation that will have effects on various historic properties. The purpose of this letter is to initiate consultation with the D.C. Historic Preservation Office on the proposed undertakings per Section 106 of the National Historic Preservation Act of 1966, as amended. The projects have not been designed and this consultation pertains primarily to site selection and seeks input from the D.C. Historic Preservation Office on these undertakings at this stage of planning.

The undertaking will consist of construction of solar PV arrays (ground, roof and carport mounted) on up to 50 acres, including land, parking lots and building rooftops within JBAB. Approximately 35 acres will be on the north side and 15 acres will be on the south side of the installation. The potential locations of the arrays are depicted on Figure 1. Due to the distribution of potential project sites across the length and breadth of the installation, this project consists of a primary area of potential effect (APE) of the installation boundary and a secondary APE to assess potential visual effects on National Historic Landmarks and NRHP-eligible or listed properties adjacent to the installation (Figure 2). This secondary APE includes Saint Elizabeth's Hospital Historic District, the National War College NHL and Fort McNair Historic District, East and West Potomac Parks Historic District, Buzzard Point Power Plant, and the Suitland Parkway.

Enclosure 1 to this letter contains a project narrative with a more in-depth description of the undertaking, identification of cultural resources with the area of potential effect, and an assessment of effect on those resources. The figures are located in enclosure 1, (Figures 1-3). A tabular summary (Table 1) of the potential PV locations is also included in Enclosure 1.

Enclosure 2 contains typical examples of the types of arrays (ground, roof and carport mounted) anticipated. While the appearance of the arrays will be similar at the various sites, the details of the designs will vary somewhat from location to location.

In summary and as described in Enclosure 1, the Navy believes that this project will have no adverse effect on historic properties with the following conditions for the potential arrays on Buildings B1 and 2: 1) thin film solar cells will be used at these locations, and 2) the solar arrays will follow and fully cover the arch of the buildings' roofs to avoid a "patchy" appearance. The Navy will continue to consult with the D.C. Historic Preservation Office during design to ensure that these conditions are met.

In accordance with Section 106 of the National Historic Preservation Act of 1966, we request your review of and concurrence with this project. If you need additional information or would like to visit the installation, please call Ms. Melissa Mertz, JBAB Cultural Resources Manager at (202) 767-1254 or email: melissa.mertz@navy.mil.

Respectfully,

Joseph Cook, Lt Col USAF
Public Works Officer

Enclosures:

1. Project Narrative and Effect Assessment w/ attachments
2. Typical PV array examples

cc. Tara Meadows, NAVFAC
Jennifer Hirsch, National Capitol Planning Commission

The District of Columbia Historic Preservation Office concurs that the PV systems will have no adverse effect on historic properties with the following conditions for the arrays on Buildings B1 and 2: 1) thin film solar cells will be used at these locations and 2) the solar arrays will follow and fully cover the arch of the buildings' roofs to avoid a "patchy" appearance. The Navy will continue to consult with the D.C. Historic Preservation Office during design to ensure that these conditions are met.

_____ _____

District of Columbia
Historic Preservation Office

Date

Project Narrative
Joint Base Anacostia Bolling
Construction and Operation of a Solar Photovoltaic System at Joint Base Anacostia-Bolling, Washington, DC

1. DESCRIPTION OF UNDERTAKING AND AREA OF POTENTIAL EFFECTS

Joint Base Anacostia-Bolling (JBAB) in Washington, DC anticipates that the undertaking of the construction and operation of a solar photovoltaic (PV) system at several locations within the installation will have multiple effects on various historic properties. The undertaking will consist of construction of solar PV arrays (ground-mounted, roof-mounted and carport) on up to 50 acres, including land, parking lots and building rooftops within JBAB. Approximately 35 acres will be on the north side, and 15 acres will be on the south side. The proposed locations include approximately 13.37 acres of rooftop over 33 buildings, 11.57 acres of carport over eight parking lots, and 25.7 acres of ground-mount over four tracts of land. Construction will include the arrays, panel mounting brackets on vertical members, and steel tracking structures within the project solar PV system sites, as well as miscellaneous electrical equipment at the point of connection (i.e., inverters, combiner boxes, electrical switchgear, associated electrical wiring, and connections) and other items required for the solar PV system.

As shown in Figures 1 (north side) and 2 (south side), the locations selected for the installation of the PV arrays are scattered across the length of the JBAB installation, with the heaviest concentration on the northern side. For this reason, the Area of Potential Effect (APE) for this project consists of a primary APE of the installation boundary and a secondary APE to assess potential visual effects on properties adjacent to the installation (refer to Figure 3). Figures 1, 2 and 3, and a list of the potential PV sites (Tables 1 and 2) are included as Attachment A to this narrative.

2. SURVEY PROCESS AND FINDINGS

Archaeological Resources

All of the three potential ground-mount sites on the north side of JBAB are located on made land with no potential for archaeological resources. No further investigations are necessary (*Geoarchaeological Investigations for the New Federal Building at Anacostia Annex, District of Columbia,* The Louis Berger Group Inc., 2008). The potential ground-mount site on the south side is an approximately 2.2 acre landscaped area located on Duncan Avenue adjacent to the Bolling AFB Historic District (HD). A geoarchaeological survey of this parcel was recently completed and revealed that the entire site consist of disturbed soils. A report on the survey is forthcoming.

Built Resources

Within the primary APE, architectural surveys at JBAB were undertaken beginning in the early 1990s. On the north side, a 2009 survey identified the Navy Photographic Science Laboratory (Buildings 168 and 169) as National Register eligible. The District of Columbia Historic Preservation Office (DCHPO) responded to the survey with the statement that several more buildings in the former Naval Air Station Anacostia appeared to be National Register –eligible. The Navy is therefore treating the Naval Air Station Anacostia complex as an eligible resource. On the south side, a 1996 survey delineated the National Register-eligible Bolling Air Force Base Historic District and found four buildings within the District to be individually eligible. Outside the installation boundary, the D.C. Inventory of Historic Sites identifies the following historic resources within the secondary APE: East and West Potomac Park, Fort McNair Historic District, Roosevelt Hall (National War College), Buzzard Point Electric Station; the Suitland Parkway Historic District, and the St. Elizabeth's Hospital Historic District (Refer to Figure 3).

3a. AFFECTED HISTORIC PROPERTIES WITHIN THE PRIMARY APE

Archaeological Resources

There are no previously-identified archaeological sites on potential ground-mount sites within the primary APE. Of the four potential ground-mount sites, three are located on made land with no potential for archaeological resources. The fourth underwent a geoarchaeological survey that revealed that the soils are disturbed.

Built Resources

The following built historic resources are within the Primary APE:

<u>Naval Air Station Anacostia</u>
The former Naval Air Station Anacostia occupies the strip of land northwest of the HMS facility and Defense Boulevard and southeast of the Anacostia River. The historic buildings range from the 1920s to the 1940s. Naval Air Station Anacostia is significant under Criterion A for its contributions to aviation-related defense from 1919 through 1961, and under Criterion C for its range of government building styles, including Government Deco and Georgian Revival.

<u>Navy Photographic Science Laboratory (Buildings 168 and 169)</u>
The Navy Photographic Science Laboratory (Buildings 168 and 169) is located on the east side of Mitscher Avenue just south of Defense Boulevard. Building 168 was built in 1942-1943 as the Navy's Photographic Science Laboratory. Building 169 was constructed in 1943 as the boiler house for Building 168. The complex is eligible under Criteria A and C, significant as the primary photography lab for the Navy during World War II and the Cold War (Criterion A) and as modified Government Deco buildings designed by the Eastman Kodak Company (Criterion C).

Bolling AFB Historic District

The Bolling AFB Historic District is located on the east side of the installation. Current boundaries of the Historic District include buildings on both sides of Brookley Avenue just south of its intersection with McDill Boulevard, beginning at Building 16 to the west and Building 10 to the east. The District extends to the northeast to include Duncan Avenue and Westover Avenue, continuing north and crossing MacDill Boulevard to include Building 20. South of Dinger Street the east boundary of the Historic District runs along the east side of Duncan Avenue, and expands to include Buildings B431 and B432. The boundary extends to the south along Brookley Avenue, SW as far as Building 2 on the west and Building 3 on the east. The boundary continues to the southeast along Rice Street, SW to Westover Avenue, encompassing buildings on both sides of Westover Avenue from Building 628 south to Building 74. The District was determined eligible in 1996 under Criterion A for its association with military and aviation history and local defense during World War II. The Historic District also meets Criterion C for Architecture and Design as a good example of an early military complex. The period of significance recommended in 1996 was 1930-1945, to include the acquisition of land for "New Bolling Field," gradual construction through the 1930s, and World War II construction.

As part of the 1996 evaluation, four buildings were determined to be individually eligible for the National Register, all under the same areas of significance as the Bolling AFB Historic District:

- Building B1 (Hangar 1), constructed 1939
- Building 2 (Hangar 2, now Band Center), constructed 1939
- Building 20 (Air Corps Barracks, now Installation Command HQ), constructed 1933
- Building 21 (Flight Surgeon's Dispensary, now Security Police Facility), constructed 1933

3b. AFFECTED HISTORIC PROPERTIES WITHIN THE SECONDARY APE

The built historic resources are located outside of the installation boundary but within the Secondary APE:

East and West Potomac Parks Historic District

East and West Potomac Parks are listed in the NRHP and are part of the collection of national parklands around Washington, DC. The parks provide open spaces framed by mature landscape plantings and by views of major memorials. These parks provide the setting for nationally recognized memorials and landscape features such as the Lincoln Memorial and Reflecting Pool, the Jefferson Memorial, the Franklin Delano Roosevelt Memorial, the Vietnam Veterans and Women's Memorials, the Korean War Veterans Memorial, Constitution Gardens, the 56 Signers Memorial, the Tidal Basin and many lesser-known memorials of various types.

Fort McNair Historic District

The military reservation, which later became Ft. McNair, was established in 1791 on about 28 acres at the tip of Greenleaf Point. Major Pierre (Peter) Charles L'Enfant included it in his plans for Washington, the Federal City, as a major site for the defense of the capital. It is the third oldest Army installation in continuous use in the United States. Originally known as the Washington Arsenal, the reservation was later known as the Washington Barracks. Determined

eligible December 22, 1978, the Fort McNair Historic District includes 51 contributing buildings with a period of significance from 1791 to1944. During the course of its history, the reservation expanded to encompass the entire peninsula and has housed the first federal penitentiary, an Army General Hospital, the Army Engineer School, the Army Music School, the Army War College and other activities.

Roosevelt Hall (Army War College)
Roosevelt Hall is a Beaux Arts-style building that originally housed the Army War College at Fort McNair. It faces the Potomac River across from JBAB. It was designated a National Historic Landmark and listed in the National Register of Historic Places in 1972. Roosevelt Hall was constructed from 1903 to 1907 on the site of the Washington Arsenal as part of President Theodore Roosevelt's vision for a revitalized Fort McNair. Roosevelt Hall housed the Army War College from 1907 to 1946 and the National War College from 1946 to the present.

Buzzard Point Electric Station
Opened by PEPCO in 1933, the Buzzard Point Power Plant was designed according to a modular concept, and is now longer (deeper) than it is wide as a result of two separate expansions that occurred in 1940 and 1943. Following its closure in 1983, the Buzzard Point Power Plant was nominated as a D.C. Historic Landmark in December 1989 and listed in 1990. The plant is recommended as eligible for listing in the NRHP, as it possesses significance under Criterion C, in the areas of Architecture and Engineering.

Suitland Parkway Historic District
The Suitland Parkway, one of several parkways in the Washington, D.C., area, was conceived by the National Capital Park and Planning Commission as an appropriate entryway to the federal city. With construction commencing in 1943, the entire length of Suitland Parkway opened in mid-December 1944. The Suitland Parkway, in conjunction with George Washington Memorial Parkway, Rock Creek and Potomac Parkway, and Baltimore-Washington Parkway, is listed in the NRHP as a multiple-property of historical significance under Criteria A for transportation and C for landscape architecture.

Saint Elizabeth's Hospital Historic District
Chartered in 1852 and opened in 1855, Saint Elizabeth's Hospital was initially established as the federal government's first mental hospital designed to care for the nation's mentally ill military personnel. Saint Elizabeth's served as a model for later institutions, both as a pioneer of humane treatment of the mentally ill and for its advancement of innovative therapeutic and diagnostic techniques. Saint Elizabeth's Hospital was listed in the NRHP in 1979 and was designated an NHL in 1990. It is historically significant as the first large-scale psychiatric hospital established by the United States.

4. EFFECT OF UNDERTAKING ON HISTORIC RESOURCES

Archaeological Resources

The potential ground-mount site on the south side of the installation in an area that is considered archaeologically sensitive underwent a geoarchaeological survey and was found to consist of disturbed soils. The undertaking will have no effect on archaeological resources.

Built Resources

Within the primary APE, roof mounted arrays will have direct physical effects on the Naval Air Station Anacostia, Navy Photographic Science Laboratory (Buildings 168 and 169), Building B1, Building 2, and the Bolling AFB Historic District. The undertaking will have direct visual effects on the Naval Air Station Anacostia, Naval Photographic Science Laboratory, Building B1, Building 2, Building 20, Building 21 and the Bolling AFB Historic District through installation of ground-mounted arrays, carport arrays, and roof-mounted arrays. Within the secondary APE, the undertaking will have indirect visual effects on the East and West Potomac Parks Historic District, Fort McNair Historic District, Buzzard Point Electric Station; the Suitland Parkway Historic District, and the Saint Elizabeth's Hospital Historic District.

5. *APPLICATION OF CRITERIA OF ADVERSE EFFECT*

Within the Primary APE

<u>Naval Air Station Anacostia</u>
Within the Naval Air Station Anacostia complex, roof-mounted arrays are proposed for Buildings 47, 417 and 419. A carport array is proposed for Lot 470. Building 47 is a seaplane hangar constructed in 1923. The solar array will be installed flush on the paired-gable roof. The array will be visible on the low-slope gable roof but will not detract from the overall shape, massing or industrial character of the building. Buildings 417 and 419 are a barracks and fitness center constructed in 1998. The arrays will be installed flush on their gable and bowstring truss roofs. The carport array will be installed on Lot 470 adjacent to Building 419. The proposed arrays will have no adverse effect on the Naval Air Station Anacostia complex. The complex is significant under Criterion A for its association with aviation and defense from 1919 to 1961 and under Criterion C for its Government Deco and Georgian Revival style buildings. The proposed arrays will not alter the historic character, design or association of the complex, as it already includes new buildings, large parking lots and other features not associated with the original design.

Several PV arrays are proposed for areas within the viewshed of Naval Air Station Anacostia, including the rooftops of Buildings 350, 351, and 362. Carport arrays are proposed for Garage 358 and Lots 53 and 8910. Ground mount arrays are proposed for the open area north of the complex. The proposed arrays within the viewshed of Naval Air Station Anacostia will have no adverse effect on the resource because the arrays will not alter the characteristics of the complex that make it eligible for the National Register. The proposed arrays will not have an adverse

effect on the integrity of the resource because the complex has already lost its integrity of location and setting due to demolition of the adjacent original airfield and construction of new buildings in its place.

Navy Photographic Science Laboratory

Building 168 is one of the potential locations for a roof-mounted PV array. The roof of Building 168 is flat with a parapet wall. The size, height, and angle of the PV array will be adjusted so that the array will not be visible from the ground and will not change the appearance of the building. Therefore, the installation of the roof-mounted PV array on Building 168 will have no adverse effect on the Naval Photographic Science Laboratory.

Other solar arrays are proposed within the viewshed of the Navy Photographic Science Laboratory. Rooftop arrays are proposed for Buildings 350 and 351, located to the southwest. A carport array is proposed for the parking lot immediately to the south. Two ground-mounted arrays are proposed for the land to the north and northwest. The proposed arrays within the viewshed would have no adverse effect on the Navy Photographic Science Laboratory. The complex is eligible under Criterion A for its association with World War II and the Cold War and under Criterion C for its design. Changes to the viewshed would not alter those characteristics. In addition, the complex's integrity of setting previously was compromised with the demolition of the Anacostia Naval Air Station.

Bolling AFB Historic District

Within the Bolling Air Force Base Historic District, thin film solar cells are proposed for the roofs of Buildings B1 and 2. These two buildings are individually eligible, and the effect on them is evaluated in the sections below. A roof-mounted PV array is proposed for Building B421. Building B421 is a non-contributing building constructed in 2006. It is a 1-story structure with hipped and flat-roofed sections. The roof mounted array on Building B421 would have no adverse effect on the Bolling Air Force Base Historic District. The Historic District is significant under Criterion A for its association with military and aviation history and local defense during the 1930s and World War II. The Historic District also meets Criterion C for Architecture and Design as a good example of an early military complex constructed according the Army Quartermaster General designs in the Georgian Revival style. The addition of a roof-mounted PV array on the roof of a non-contributing building will not alter these characteristics. The array will have no adverse effect on the integrity of the Historic District because the District has already been substantially altered by the addition of new buildings, large parking lots and other features not associated with the original design.

Several PV arrays are proposed for areas within the viewshed of the Bolling Air Force Base Historic District, including the rooftops of Buildings 50, 520, 1310, 3618, 3621, 5681, and 5683. A ground-mount array is proposed for the 2.2 acre parcel adjacent to the Historic District. The proposed arrays within the viewshed of the Historic District will have no adverse effect on the District because the arrays will not alter the characteristics of the District that make it eligible for the National Register. The proposed arrays will not have an adverse effect on the integrity of the District because the District has already lost its integrity of location and setting due to demolition of the adjacent original airfield and construction of new buildings in its place.

Building B1
Building B1 is proposed for installation of thin film solar cells. Building B1 has a bowstring truss roof. The thin film solar cells come in strips that will follow the arch of the roof and fully cover the roof (i.e. no "patchy" appearance). The cells will be visible from high points within the Historic District but will not alter the appearance or character of the building. Therefore, the installation of thin film solar cells will have no adverse effect on Building B1 or the Bolling Air Force Base Historic District.

Other solar arrays are proposed within the viewshed of Building B1. Rooftop arrays are proposed for Building 421 immediately to the north and Building 1310 to the southwest. The proposed arrays within the viewshed would have no adverse effect on Building B1. Building B1 is eligible under Criterion A for its association with World War II and under Criterion C for its Army Quartermaster General design. Changes to the viewshed would not alter those characteristics.

Building 2
Building 2 is proposed for installation of thin film solar cells. Building 2 has a bowstring truss roof. The thin film solar cells come in strips that will follow the arch of the roof and fully cover the roof (i.e. no "patchy" appearance). The cells will be visible from high points within the Historic District but will not alter the appearance or character of the building. Therefore, the installation of thin film solar cells will have no adverse effect on Building 2 or the Bolling Air Force Base Historic District.

Other solar arrays are proposed within the viewshed of Building 2. Rooftop arrays are proposed for Building 1310 to the west and Building 520 to the south. The proposed arrays within the viewshed would have no adverse effect on Building 2. Building 2 is eligible under Criterion A for its association with World War II and under Criterion C for its Army Quartermaster General design. Changes to the viewshed would not alter those characteristics.

Building 20
No roof-mounted PV array is proposed for Building 20, and there are no arrays proposed within its viewshed. The undertaking will have no effect on Building 20.

Building 21
No roof-mounted PV array is proposed for Building 21, and there are no arrays proposed within its viewshed. The undertaking will have no effect on Building 21.

Within the Secondary APE

East and West Potomac Parks Historic District
The proposed PV arrays at Joint Base Anacostia-Bolling will have an effect on the viewshed from the East and West Potomac Parks Historic District. However, that part of the installation that is visible from the Historic District will have arrays only in areas that are set well back from

the shoreline. Therefore, the undertaking will have no adverse effect on East and West Potomac Parks Historic District.

Fort McNair Historic District

The proposed PV arrays, particularly those at the north end of the installation, will have an effect on the viewshed from the Fort McNair Historic District. However, the viewshed toward Joint Base Anacostia-Bolling has already lost its integrity due to demolition of the 1930s airfield and many buildings associated with it, as well as construction of many new buildings. Therefore, the undertaking will have no adverse effect on the Fort McNair Historic District.

Roosevelt Hall (Army War College)

The proposed PV arrays, particularly those at the north end of the installation, will have an effect on the viewshed from the Roosevelt Hall. However, that viewshed has already lost its integrity due to demolition of the 1930s airfield and many buildings associated with it, as well as construction of many new buildings. Therefore, the undertaking will have no adverse effect on Roosevelt Hall.

Buzzard Point Electric Station

The proposed ground-mount PV arrays at the north end of the installation will have an effect on the viewshed from the Buzzard Point Electric Station. However, that viewshed has already lost its integrity due to demolition of the 1930s airfield and many buildings associated with it, as well as construction of many new buildings. Therefore, the undertaking will have no adverse effect on the Buzzard Point Electric Station.

Suitland Parkway Historic District

The proposed ground-mount PV arrays at the north end of the installation will have an effect on the viewshed from the western terminus of the Suitland Parkway Historic District. From the time of its construction through 1962, the viewshed of Suitland Parkway toward Anacostia Naval Air Station was of an airfield lined with buildings. That historic viewshed was lost when the site was converted to administrative and recreational use. Because the integrity of the viewshed has already been lost, the undertaking will have no adverse effect on the Suitland Parkway Historic District.

Saint Elizabeth's Hospital Historic District

The proposed PV arrays will have an effect on the viewshed from St. Elizabeth's Hospital Historic District. In addition to its significance as a hospital, St. Elizabeth's is a significant cultural landscape within the Anacostia community. The hilltop on which St. Elizabeth's stands was a traditional gathering place for families from Anacostia on Sundays and holidays. The viewshed from that hilltop toward the city and the Capitol is a character defining feature of St. Elizabeth's. However, that part of the viewshed that is now Joint Base Anacostia-Bolling has variously been mud flats, farm land, an airfield, an administrative building complex, and recreational fields. The installation of PV arrays represents another change in use and appearance, but it would not obstruct the view of the rivers, the city, or the Capitol. Therefore, the undertaking will have no adverse effect on the St. Elizabeth's Hospital Historic District.

6. VIEWS PROVIDED BY CONSULTING PARTIES AND THE PUBLIC

NAVFAC Washington is communicating with the following consulting parties: National Capitol Planning Commission (NCPC), the U.S. Commission of Fine Arts (CFA), the Federal Aviation Administration (FAA), the U.S. Fish and Wildlife Service (FWS) and the District of Columbia Department of the Environment (DDOE). Copies of the correspondence with these agencies is included as Attachment B.

The project was submitted for review to the NCPC on October 31, 2014. A response letter dated December 18, 2014 was received from NCPC regarding their review of the project. The NCPC provided a number of scoping comments for impacts to be analyzed in the Environmental Assessment (EA; ongoing) for the project. These comments included evaluating consistency with the installation master plan and NCPC plans and policies, as well as impacts to visual resources (including historic resources), floodplains, wildlife, vegetation/open space/ outdoor recreation, storm water management and transportation. The NCPC staff recommended the Navy initiate early-consultation with NCPC and other relevant federal and District of Columbia agencies soon after the selection process, and to plan on submitting the project to NCPC for concept, preliminary and final reviews. The NCPC also requested Cooperating Agency status throughout the EA. However, subsequent discussions lead to an agreement for a less formal role for NCPC in the EA process.

The project was submitted to the CFA on November 6, 2014 and presented at the public commission meeting on November 20, 2014 for initial review. A formal response letter dated December 1, 2014 was received from the CFA following the presentation. The CFA recommended that the design of the arrays celebrate the technological aspect of the project while giving priority to the shaping of civic areas (roads, pathways, parks and the transition between these spaces). The CFA indicated they are particularly supportive of parking lot/carport applications. The CFA requested the presentation of site-specific concept designs for the installations for the next submission package.

The FAA was contacted on November 10, 2014 to assess their interest in participating in the NEPA process with regards to this project. The FAA declined to participate in the NEPA process but indicated they would require FAA Form 7460-1 and a glint/glare analysis be submitted for their review.

Letters describing the project were sent to both the FWS and DDOE on December 22, 2014. The purpose of the letters was to request lists of listed species and habitats within the proposed project area and to solicit early input or concerns the agencies may have regarding the project. As of February 9, 2015, no response has been received from either agency.

Public participation will be through the NEPA process and will involve an upcoming public review/comment period on the draft EA.

Attachment A

Figures and Tables

Figure 1: Potential PV Locations at JBAB (North side)

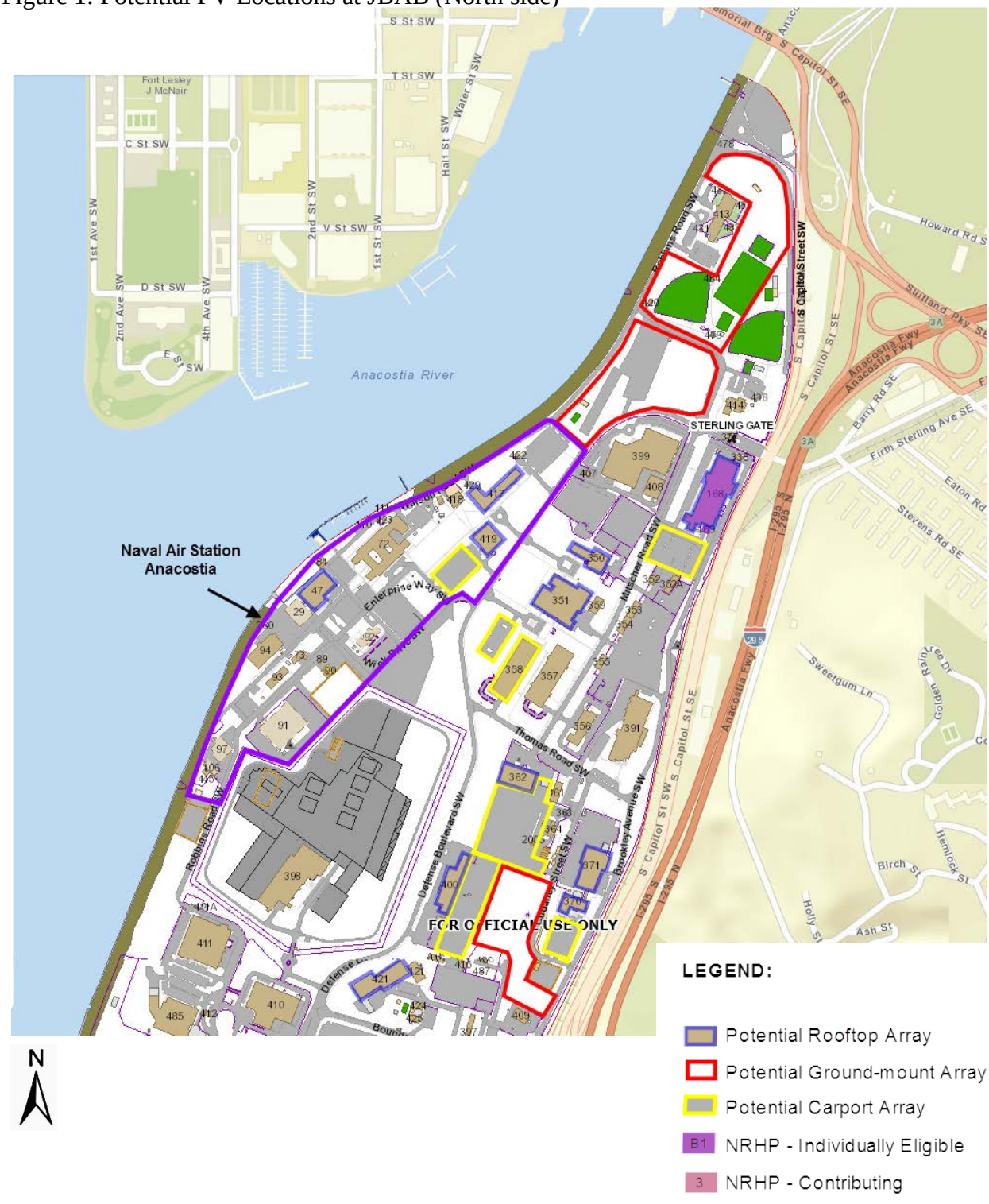


Figure 2: Potential PV Locations at JBAB (South side)

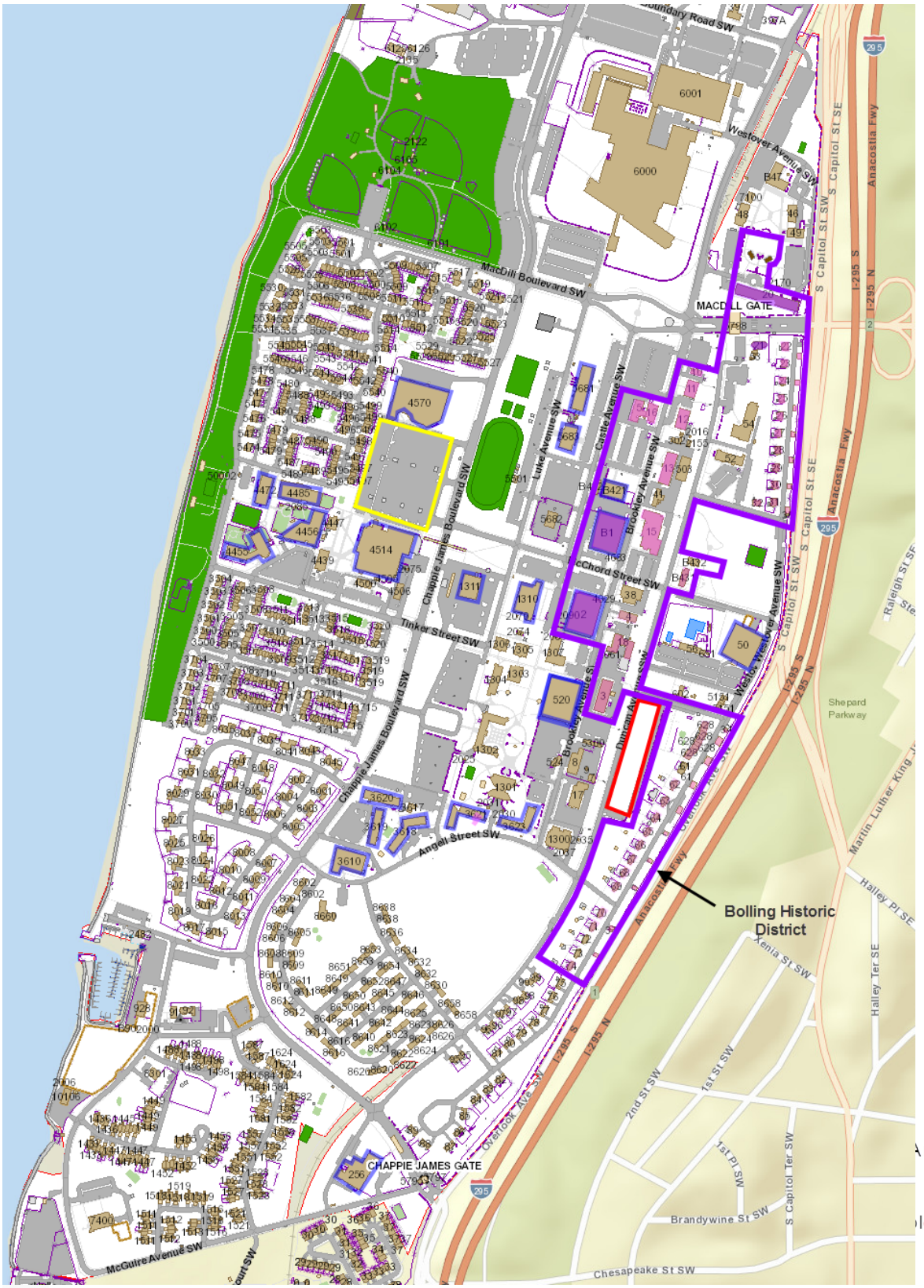


Figure 3: Primary and Secondary Areas of Potential Effect

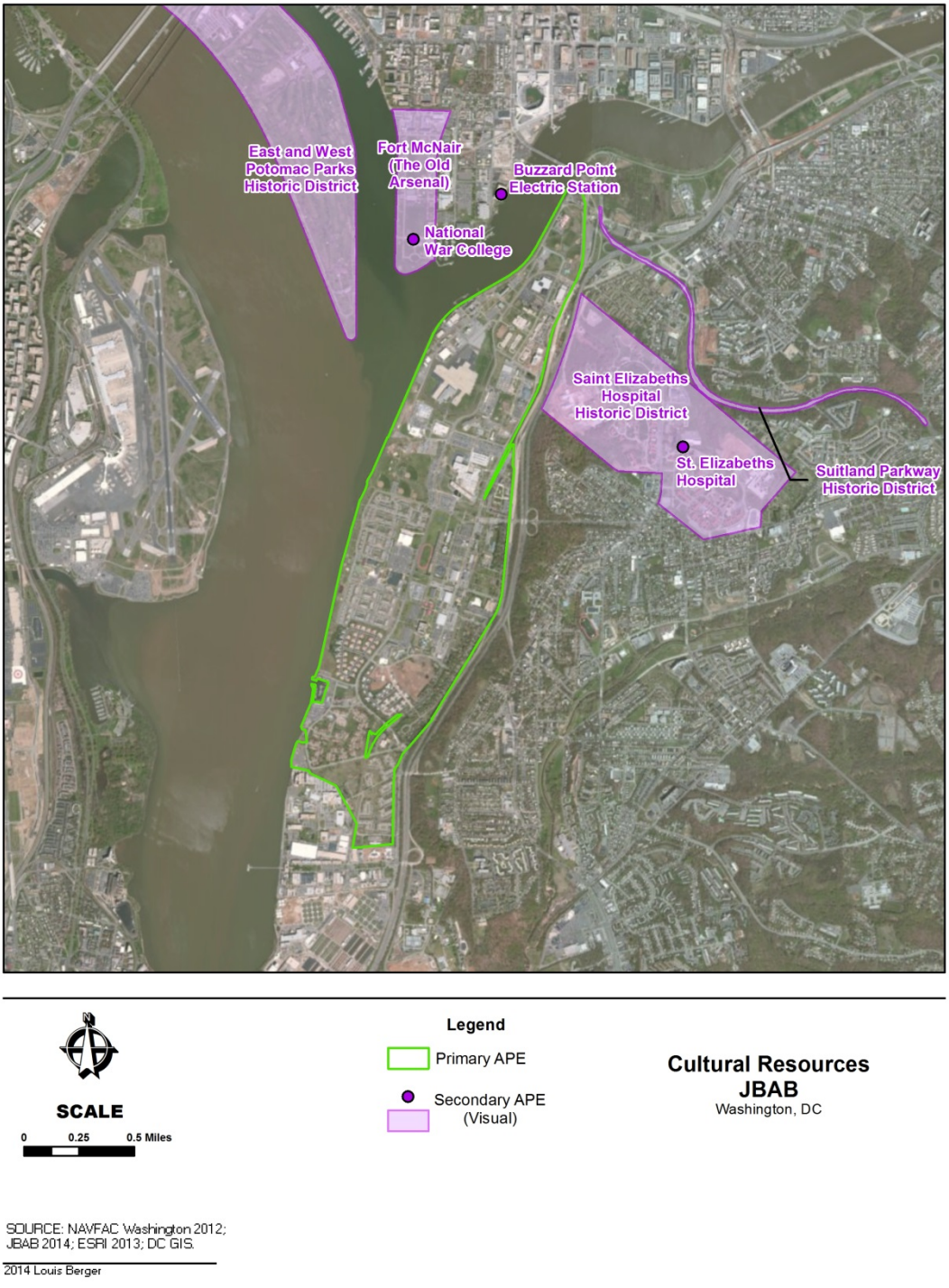


Table 1. Summary of Potential PV Locations – North Side

Side	PV Type	Location Description	Estimated Usable Acreage
North	Rooftop	Building 413 (CDC III)	0.32
North	Rooftop	Building 168	0.91
North	Rooftop	Building 350	0.26
North	Rooftop	Building 351	0.86
North	Rooftop	Building 362	0.39
North	Rooftop	Building 400	0.43
North	Rooftop	Building 421	0.46
North	Rooftop	Building 417	0.31
North	Rooftop	Building 419	0.26
North	Rooftop	Building 47	0.37
North	Ground-mount	North end (ball fields)	14.07
North	Ground-mount	Vacant/Underutilized land and parking lot south of ball fields (near Firth Sterling Gate)	9.49
North	Carport	Parking lot south of Building 168	1.31
North	Carport	Parking lot northwest of Building 358	0.76
North	Carport	Building 358 (Parking Garage)	1.11
North	Carport	Vehicle storage area	4.79
North	Carport	Parking lot east of Building 400	2.64
North	Carport	Building 419 parking lot	0.96
		TOTAL NORTH SIDE	**39.71**

Table 2. Summary of Potential PV Locations – South Side

Side	PV Type	Location Description	Estimated Usable Acreage
South	Carport	Parking lot Building 370	0.98
South	Carport	Commissary/Exchange parking lot	6.40
South	Ground-mount	Open space off Duncan Ave (Lemon lot)	2.23
South	Ground-mount	Vacant/ Underutilized land west of Building 370	4.93
South	Rooftop	Building B1 (Hangar)	0.55
South	Rooftop	Building 2 (Hangar)	0.57
South	Rooftop	Building 4570 (Commissary)	0.89
South	Rooftop	Building 4514 (Exchange)	1.03
South	Rooftop	Building 4472	0.15
South	Rooftop	Building 4455 (CDC II)	0.31
South	Rooftop	Building 4485	0.29
South	Rooftop	Building 4456 (CDC I)	0.38
South	Rooftop	Building 1311	0.22
South	Rooftop	Building 5681	0.28
South	Rooftop	Building 5683	0.20
South	Rooftop	Building B421	0.19
South	Rooftop	Building 370	0.18
South	Rooftop	Building 1310	0.31
South	Rooftop	Building 371	0.47
South	Rooftop	Building 50	0.53
South	Rooftop	Building 520	0.70
South	Rooftop	Building 3620	0.16
South	Rooftop	Building 3619	0.17
South	Rooftop	Building 3618	0.21
South	Rooftop	Building 3621	0.17
South	Rooftop	Building 3623	0.17
South	Rooftop	Building 256	0.39
South	Rooftop	Building 3610 (Chapel)	0.28
		TOTAL SOUTH SIDE	**23.34**

Attachment B

Correspondence

U.S. COMMISSION OF FINE ARTS

ESTABLISHED BY CONGRESS 17 MAY 1910

401 F STREET NW SUITE 312 WASHINGTON DC 20001-2728 202-504-2200 FAX 202-504-2195 WWW.CFA.GOV

1 December 2014

Dear Commander Benson:

In its meeting of 20 November, the Commission of Fine Arts reviewed an initial proposal submitted by the U.S. Department of the Navy for a large-scale installation of solar panels at Joint Base Anacostia-Bolling in Southwest Washington. The Commission commended the Navy for the scope and ambition of the undertaking and expressed support for the general goals of the project.

The Commission members observed that the installation of solar panels at this scale could be a successful model for future installations if careful attention is paid now to siting and design. They recommended that the design for the installation celebrate the technological aspect of the undertaking, while also giving priority to the shaping of civic spaces such as roads, pathways, and parks, as well as attention to the transitions between these spaces. Acknowledging that the Navy had not yet determined which of the potential locations on the base would be necessary to meet the energy goals for the project, they particularly supported locations at parking lots, citing successful examples of similar installations at airports. Given the promise of this project as a prototype for many military locations, they emphasized the importance of a strong design process, which may be difficult to achieve through the intended design-build procurement process.

For the next review, the Commission requested the presentation of a site-specific concept design for each of the proposed installations. As always, the staff is available to assist you with the next submission.

Sincerely,

Thomas E. Luebke, FAIA
Secretary

LCDR Keith Benson
Washington Navy Yard
1314 Harwood Street, SE
Washington, DC 20374-5018

cc: Peter May, National Park Service

From:	Marcus.Brundage@faa.gov
To:	Meadows, Tara CIV NAVFAC Washington
Cc:	Andrew.Brooks@faa.gov; Chad.Carper@faa.gov; Tony.Jenkins@faa.gov; Terrell.Rooks@faa.gov; joey.l.medders@faa.gov; donna.warren@faa.gov
Subject:	RE: PV Panel Installation across from Ronald Reagan National Airport
Date:	Wednesday, December 03, 2014 7:04:06

Good morning Tara:

Per FAA Order 1050.1E/5050.4B there is no federal action that would trigger NEPA at DCA. Thanks for checking though.

Thanks,

Marcus Brundage,REM,CHS-V
Environmental Protection Specialist
FAA Washington Airport District Office-AEA-WAS-ADO
23723 Air Freight Lane, Suite 210
Dulles, VA 20166
(O) 703-661-1365; (F) 703-661-1370
marcus.brundage@faa.gov

"We're Only As Strong As Our Weakest Link"

-----Original Message-----
From: Brooks, Andrew (FAA)
Sent: Wednesday, November 26, 2014 11:26 AM
To: Carper, Chad (FAA); Brundage, Marcus (FAA)
Subject: RE: PV Panel Installation across from Ronald Reagan National Airport

I concur with Chad. The appropriate venue for this is a 7460-1 with the required glare analysis. There is no Federal Action at DCA.

Andrew Brooks
Environmental Program Manager
Federal Aviation Administration
Eastern Regional Office
1 Aviation Plaza
Jamaica, NY 11434
Phone: 718-553-2511

-----Original Message-----
From: Carper, Chad (FAA)
Sent: Friday, November 21, 2014 4:28 PM
To: Brundage, Marcus (FAA); Brooks, Andrew (FAA)
Subject: RE: PV Panel Installation across from Ronald Reagan National Airport

I do not see a "Federal Action" so I do not think FAA has a role in NEPA. As far as glint glare, I would encourage the proponent file a 7460-1 (using "Is Located" on an airport)

https://oeaaa.faa.gov/oeaaa/external/portal.jsp

They will need to do a glint/glare analysis per the attached MOU

Chad Carper, Engineer
Washington Airports District Office
23723 Air Freight Lane, Suite 210
Dulles, VA 20166
703.661.1358 chad.carper@faa.gov

-----Original Message-----
From: Brundage, Marcus (FAA)
Sent: Tuesday, November 18, 2014 8:14 AM
To: Brooks, Andrew (FAA); Carper, Chad (FAA)
Subject: PV Panel Installation across from Ronald Reagan National Airport

Andrew/Chad:

Please see email below.

Andrew, from a NEPA perspective what level of involvement, if any, do we (ARP) need to be with this? This action is not on the Airport but may have a direct "impact".

Thanks,

Marcus Brundage,REM,CHS-V
Environmental Protection Specialist
FAA Washington Airport District Office-AEA-WAS-ADO
23723 Air Freight Lane, Suite 210
Dulles, VA 20166
(O) 703-661-1365; (F) 703-661-1370
marcus.brundage@faa.gov

"We're Only As Strong As Our Weakest Link"

-----Original Message-----
From: Jenkins, Tony (FAA)
Sent: Monday, November 17, 2014 3:58 PM
To: Meadows, Tara CIV NAVFAC Washington
Cc: Rooks, Terrell (FAA); Brundage, Marcus (FAA); Medders, Joey L (FAA); Warren, Donna (FAA)
Subject: RE: PV Panel Installation across from Ronald Reagan National Airport

Tara,

We, Operations Support Group, would not have interest in the review of the environmental document but perhaps Environmental Specialist in Washington Airports Division (ADO, Marcus Brundage) or Engineering Services/Tech Ops (Terrell Rooks) may want to weigh in on the environmental document. I've copied them on this response.

In regards to other necessary coordination, I'm assuming the Navy knows that you should file FAA Form 7460-1, Notice of Proposed Construction with the Washington ADO when you have a proposal established.

The ADO will then coordinate the NRA study across FAA lines of business to assess the potential impact of the proposed action. The potential for glare should be addressed within the case study. In other words, the environmental impacts contained in the EA study should be identified within the NRA case so that other LOBs can provide input/comments relative to the proposed project's impact on their area of responsibility.

Myron A (Tony) Jenkins
Operations Support Group Manager, AJV-E2

Office: 404-305-5571
Mobile: 404-604-6855

-----Original Message-----
From: Meadows, Tara CIV NAVFAC Washington [mailto:tara.meadows@navy.mil]
Sent: Monday, November 10, 2014 10:26 AM
To: Jenkins, Tony (FAA)
Subject: PV Panel Installation across from Ronald Reagan National Airport

Good Morning,

I'm the Navy Environmental PM for a project at our Joint Base Anacostia-Bolling (JBAB) facility, which is located across the Potomac/Anacostia Rivers from the Ronald Reagan National Airport. The purpose of this email is to provide you with some background on the project and inquire as to the FAA's potential for interest in participating in the NEPA process. I was passed on your information as the point of contact - however, if this is in error, please let me know or refer me on to the appropriate party.

We are currently engaged in an Environmental Assessment for the installation of photovoltaic (PV) panels on up to 50 acres on our JBAB facility. The 50 acres is comprised of a combination of roof-mounted, carport and ground-mounted arrays. The proposed action is in support of the Energy Policy Act of 2005 (EPAct) (42 U.S.C. 15852, 10 U.S.C. 2911(e) renewable energy goals and the Secretary of the Navy 1 Gigawatt (GW) Initiative. In addition to the EA, we are undertaking a glint/glare analysis of the project, which is being handled by our renewable energy office. Based on my research, I'm unclear as to the level of participation the FAA usually takes with such undertakings. Would the FAA be an interested party to the EA for this project and, if so, what information would you require regarding the project to provide review/comment? Would the FAA's interest be limited to the glint/glare study? Thanks!

v/r,

Tara Meadows
Natural Resources Specialist
Washington Navy Yard
1314 Harwood Street, SE
Washington, DC 20374-5018
P: (202)685-8415
F: (202) 685-0615

National Capital Planning Commission 401 9th Street, NW North Lobby, Suite 500 Washington, DC 20004 Tel: 202.482.7200 Fax: 202.482.7272 www.ncpc.gov

IN REPLY REFER TO:
NCPC File No. 7627

December 18, 2014

Mr. Thomas Lewis
Naval Facilities Engineering Command Washington
1314 Harwood Street SE, Building 212
Washington Navy Yard,
Washington, DC 20374

Re: Photovoltaic Solar Panel Arrays Environmental Assessment Scoping Comments

Dear Mr. Lewis,

Thank you for the opportunity to provide comments on the scope of the Environmental Assessment (EA) being prepared to analyze the potential environmental impacts caused by the installation of photovoltaic (PV) solar arrays throughout Joint Base Anacostia-Bolling (JBAB). We understand the EA will inform the selection of array locations as part of a "design-build" energy performance contract, whereby a private company will contract with the Navy to design, construct, manage, and maintain the future system. The project will help JBAB transition into a more sustainable, resilient installation, allowing the Navy to reduce its operating costs and meet various federal sustainability goals.

The comments below are based on the conceptual information provided to National Capital Planning Commission (NCPC) staff, dated October 31, 2014, which shows several potential array sites, conceptual array schematics, and photo-simulations from several off-site perspectives. As a general response to this information, NCPC staff recommends the Navy maximize the number of rooftop and canopy-mounted PV locations before considering ground-mounted locations due to potential impacts to JBAB's operations, future development, and the natural environment. Based on recent discussions with NAVFAC staff, it is our understanding that specific array locations and designs will be developed following selection of a design-build team. Given the scale and complexity of the project, NCPC staff recommends the Navy initiate early-consultation with NCPC and other relevant federal and District of Columbia agencies soon after the selection process, and to plan on submitting the project to NCPC for concept, preliminary, and final reviews. This early involvement by review agencies, and regular feedback from the Commission, will assist the Navy in moving through the NCPC review process in an efficient manner.

Pursuant to the National Capital Planning Act, the National Capital Planning Commission is the central planning agency for the federal government in the National Capital Region (NCR), responsible for the preservation and protection of the region's natural and historical features. NCPC carries out this mission, in part, through its responsibilities to develop the Comprehensive Plan for the National Capital, the Federal Capital Improvement Program, and other special

planning initiatives. The preparation of these plans and programs is consistently informed by NCPC's special expertise with respect to environmental issues throughout the NCR. Furthermore, pursuant to Section 610(a) of Public Law 93-166, NCPC has jurisdiction by law to review development projects at JBAB. Based on the foregoing, we respectfully request cooperating agency status throughout the EA process.

NCPC's early involvement in the development of the EA will assist the Navy in selecting PV sites that balance energy production and cost feasibility with impacts to environmental and cultural resources. Specifically, we recommend the EA assess the potential direct, indirect, and cumulative impacts of the project on the following topic areas: NCPC Plans and Policies, Visual Resources, Floodplains, Wildlife, Vegetation/Open Space/Outdoor Recreation, Stormwater Management, and Transportation/Circulation. These impact topic areas are described in greater detail below.

Plans and Policies

JBAB Master Plan

In September 2014, the Commission approved the JBAB Master Plan for use by the Commission as a guide for future reviews of individual site and building projects at the installation. The Master Plan includes a 20-year Framework Plan that is intended to guide long-term development toward achieving the Master Plan's vision of transforming JBAB into a sustainable community with walkable development, enhanced recreational amenities, and protected historic assets linked by park-like corridors and multi-modal transportation networks. As such, it is important not to impede any of the Framework Plan's various "systems" (land use, stormwater management, open space/outdoor recreation, landscape design, circulation) with near-term projects so as to adversely limit JBAB's future development. The EA should analyze each PV array location for consistency with the Master Plan, and assess how the PV project's future adverse impacts will be mitigated.[1] Based on the conceptual materials, NCPC staff notes several possible inconsistencies between the project and the JBAB Master Plan, which are described in the following sections.

According to the Master Plan, the northernmost ground-mounted site located near the South Capitol Street Bridge is shown as future Open Space/Outdoor Recreation, which is defined as "real property dedicated for outdoor public use or for the protection of natural/cultural features." However, use of this area for a ground-mounted array could substantially impact future open space and outdoor recreational potential. In addition, the Master Plan's Stormwater Management Framework Plan identifies this area as "green space with Low Impact Development (LID) improvements." The EA should address this apparent Master Plan inconsistency by analyzing the loss of this area for stormwater management and open space/outdoor recreation purposes. Using

[1] A master plan modification could be required if the project significantly deviates from the recently approved JBAB Master Plan. NCPC guidelines state that a master plan modification could be necessary where: 1) a major change in the character or intensity of an existing use is proposed, or 2) the proposed modification or revisions would significantly change the off-site impact of the Federal activities and uses carried out within the site.

this site for a ground-mounted array might also require modification to JBAB's future commercial vehicle inspection facility/operations; impact the planned transit hub location and related on-site transit operations; and limit a future extension to the Firth-Sterling access road.

The EA should analyze the potential environmental impacts of the proposed action on historic resources. In particular, a number of rooftop sites are shown within or near the Bolling Air Force Base Historic District and atop historic Buildings 168 and 169, which could directly cause adverse effects to these resources. In addition, staff notes the potential ground array site directly adjacent to the Bolling AFB Historic District could also cause adverse effects. NCPC staff recommends the Navy initiate Section 106 consultation as soon as possible to gain early input from the District of Columbia State Historic Preservation Officer.

There is one potential ground-mounted PV site located within an "Approved Planting Focus Area" as designated by the Master Plan's Landscape Framework Plan. Specifically, the site is located in the northeast corner of the 9.10-acre parcel, adjacent to the west-side of Mitscher Avenue, near Firth-Sterling Gate. The conceptual project information describes the site as "vacant/underutilized land and parking lot south of ball fields." The Navy should consider the impact to this area's potential for future tree/vegetation-planting and stormwater management as part of the EA analysis. The siting of solar arrays on this land, in addition to the potential loss of land directly to the north, adjacent to the South Capitol Street Bridge, would have a cumulative impact to the installation-wide network of open space and stormwater management area as shown in the Master Plan.

Though the Master Plan identifies the surface lot in the extreme southwest corner of JBAB for possible PV use, restoring this land to open/recreation space would extend the riverfront buffer, improve the installation's off-site visual appearance, and likely result in a significant environmental benefit to the river. The use of this site for PV energy production, as well as others located near the waterfront at the north end of the installation, could also have safety impacts (glare) to air traffic associated with Washington National Airport.

Comprehensive Plan for the National Capital

The EA should analyze the project's consistency with the policies of the Comprehensive Plan for the National Capital, both the Federal and District Elements, including, but not limited to, the following policies taken directly from the .Preservation and Historic Features, Parks and Open Space, and Federal Environment Elements. These policies are highlighted in particular to help influence the project's design, and to help eliminate apparent inconsistencies between the project and various aspects of the Comprehensive Plan early in the development process.

- Conserve portions of military reservations that add significantly to the inventory of park, open space, and natural areas... (*Preservation and Maintenance*)
- Discourage large paved parking areas and other non-water-related development along the Anacostia and Potomac Rivers. Where large paved areas are required, preference should be given to using pervious surfaces. (*Rivers and Waterways*)

- Regulate the scale and use of nearby development. (*Gateways*)
- Improve South Capitol Street between the Suitland Parkway and the U.S. Capitol with open space amenities consistent with the Legacy Plan. (*Gateways*)
- Minimize tree cutting and other vegetation removal to reduce soil disturbance and erosion, particularly in the vicinity of waterways. When tree removal is necessary, trees should be replaced to prevent a net tree loss. (*Water Quality*)
- Discourage investment in floodplain areas unless related to correcting flood hazards, restoring floodplain values, or supporting appropriate recreational or memorial uses. (*Land Resources*)
- Consider the impacts, including cumulative impacts, of environmental changes on wildlife habitats and the biodiversity of an ecosystem. Consideration should extend to non-protected areas, as well as areas protected by designations such as parks and wetlands. (*Land Resources*)
- Protect and enhance the vistas and views, both natural and designed, which are an integral part of the national capital's image. (*National Capital Image*)
- Encourage the practice of good design principles throughout the region to continually strengthen the image of the nation's capital. (*National Capital Image*)

Visual Resources

The EA should analyze the potential visual impacts of the proposed action to multiple off-site locations including: Daingerfield Island, Washington National Airport, Malcolm X Boulevard, I-295 and South Capitol Street, the Frederick Douglass Memorial Bridge, Shepherd Parkway, Hains Point, Buzzard Point, and the St. Elizabeths West Campus. The analysis should utilize photo-simulations from all of these vantage points with superimposed PV arrays on each potential site. In addition, the EA should include an analysis of potential visual impacts to historic resources located at JBAB, including, but not limited to, the Bolling Air Force Base Historic District and historic Buildings 168 and 169.

Floodplains

Based upon information provided by the Navy describing the project, several potential ground, canopy, and rooftop PV sites are located within the 100-year and 500-year floodplains, and the EA should analyze the project's impact to these floodplains. The analysis should account for any special design considerations necessary for ground-mounted sites to ensure continued operation and maintenance during flood events, which are expected to increase in frequency and intensity by multiple federal agencies, including the Department of Defense. In addition, sites located within the 100-year floodplain will require compliance with Executive Order 11988, which requires federal agencies "to avoid ...long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development whenever there is a practicable alternative." The EA should document why these sites must be used rather than alternative sites outside of the 100-year floodplain. A cumulative

impact analysis is especially important for this impact topic since additional impervious area within the floodplain could expand its limits within the installation.

Wildlife

The EA should include an analysis of potential impacts to migratory bird patterns. The assessment should utilize the best scientific data available to determine what species of migratory birds occur on or near JBAB. Special consideration should be given to priority habitats, such as important nesting areas, migration stopover areas, and wintering habitats. The Navy should consider inviting the U.S. Fish and Wildlife Service to participate in the NEPA process to ensure accurate analysis of this impact topic.

Vegetation / Open Space / Outdoor Recreation

The EA should consider potential impacts to existing tree canopy and vegetative areas, and identify areas that could accommodate new trees/vegetation as mitigation, if necessary. In addition, several proposed PV sites are situated directly adjacent to streets that are identified in the JBAB Master Plan's Open Space/Outdoor Recreation Framework Plan as future "park-like" corridors. Should these sites be selected, the potential to transform these corridors into park-like streetscapes through planting and other related improvements could be negatively impacted. Finally, it appears the project has considerable potential to reduce the total amount of land area identified as open/outdoor recreation space in the Master Plan, particularly in the far north end of the installation - near the South Capitol Street Bridge and Firth-Sterling Gate. As such, the Navy should analyze the trade-offs between PV installation opportunities and potential urban design, open space, and outdoor recreation impacts, including an analysis of additional demand placed on remaining open space/recreation areas, and how this will be accommodated if necessary.

Stormwater Management

The EA should analyze how much additional stormwater runoff will be generated from the project (resulting from aggregating impervious surface area increases from each site), and how the overall increase will be accommodated by the installation's infrastructure. The analysis should account for the potential loss of open/green/stormwater management space resulting from development at each identified array site. The Navy should encourage the use of stormwater management BMPs such as bio-swales, pervious pavement, and green roofs for all carport and rooftop PV installations to the maximum extent feasible.

Transportation/Circulation

As previously mentioned, the northern-most ground array sites may have potential impacts to various transportation/circulation-related projects shown in the JBAB Master Plan including: the future relocated Commercial Vehicle Inspection facility, future transit hub, and the planned extension of the Firth-Sterling Gate access road further to the west. In addition, several future shuttle routes that are identified in the JBAB Master Plan for this area could be affected as well.

The EA should analyze these potential operational impacts. Lastly, considering the number of array locations shown near South Capitol Street (along the east-side of the installation) and along the riverfront, the EA should address the potential for glare to affect user behavior/safety along South Capitol Street and potential safety impacts to air traffic from National Airport.

These comments have been prepared in accordance with NCPC's Environmental and Historic Preservation Policies and Procedures. We refer the Navy to NCPC's Comprehensive Plan for the National Capital to reference policies and guidelines for which the future array installations will be evaluated against. The Comprehensive Plan and other NCPC plans/policies can be found on our website at www.ncpc.gov; hard copies are available if needed.

We look forward to working with you on this project. If you have any questions, please contact Michael Weil at (202) 482-7253 or michael.weil@ncpc.gov.

Sincerely,

Shane L. Dettman
Director, Urban Design and Plan Review Division

cc: Frederick J. Lindstrom, Assistant Secretary, US Commission of Fine Arts
Andrew Lewis, State Historic Preservation Office, District of Columbia
Peter May, National Park Service
Dawud Abdur-Rahman, US General Services Administration
Medina Alharazim, NAVFAC Washington (Joint Base Anacostia-Bolling)
Tara Meadows, NAVFAC Washington (EV2)
David McLaughlin, DC Water, Blue Plains Advanced Wastewater Treatment Pl

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND WASHINGTON
1314 HARWOOD STREET SE
WASHINGTON NAVY YARD DC 20374-5018

IN REPLY REFER TO
5090
Ser EV/693-14

NOV -6 2014

Mr. Frederick J. Lindstrom, Assistant Secretary
U.S. Commission of Fine Arts
401 F Street NW, Suite 312
Washington, DC 20001-2728

SUBJECT: PROPOSED INSTALLATION OF CARPORT, GROUND- AND ROOF-MOUNTED PHOTOVOLTAIC PANELS AT VARIOUS LOCATIONS, JOINT BASE ANACOSTIA-BOLLING, WASHINGTON, DISTRICT OF COLUMBIA

Dear Mr. Lindstrom,

The Department of the Navy (Navy) is requesting a review of the proposed installation of carport, ground- and roof-mounted photovoltaic panels at various locations, at the Joint Base Anacostia-Bolling, Washington, DC. The proposed action is in support of the Energy Policy Act of 2005 (EPAct) (42 U.S.C. 15852, 10 U.S.C. 2911(e) renewable energy goals and the Secretary of the Navy 1 Gigawatt (GW) Initiative. Please refer to the enclosed materials for further details.

The Navy is seeking a concept review at your November 20, 2014 meeting. An Environmental Assessment is being prepared and is anticipated to be completed in April 2015. Consultation with the Federal Aviation Administration, District of Columbia Historic Preservation Office and National Capital Planning Commission is in progress concurrent with this submission.

If you have any questions, please contact Tara Meadows at (202) 685-8415.

Sincerely,

THOMAS P. LEWIS
Environmental Business Line
Coordinator
By direction

Copy to: Medina Alharazim, NAVFAC Washington (Joint Base Anacostia-Bolling)
Tara Meadows, NAVFAC Washington (EV2)

U.S. Commission of Fine Arts Project Narrative – Concept Review

PROPOSED INSTALLATION OF CARPORT, GROUND- AND ROOF-MOUNTED PHOTOVOLTAIC PANELS AT VARIOUS LOCATIONS

Joint Base Anacostia-Bolling
Washington, District of Columbia
November 6, 2014

The sponsoring agency for this project is the Naval Facilities Engineering Command, Washington District, Washington Navy Yard (WNY) acting for the project proponent. P.O.C.'s for these organizations are as follows:

Naval Facilities Engineering Command, Washington District
1314 Harwood St. SE
Washington Navy Yard, DC 20374-5018

Tara Meadows, 202-685-8415

This Project Report has been prepared for the PROPOSED INSTALLATION OF CARPORT, GROUND- AND ROOF-MOUNTED PHOTOVOLTAIC PANELS AT VARIOUS LOCATIONS project at Joint Base Anacostia-Bolling. This report has been prepared for submission to the U.S. Commission of Fine Arts for their review and approval.

Project Description:

In support of the Energy Policy Act of 2005 (EPAct) (42 U.S.C. 15852) and 10 U.S.C. 2911(e) renewable energy goals, the Secretary of the Navy created the 1 Gigawatt (GW) Initiative—named for the amount of renewable energy generation capacity to be deployed by 2020 (Navy 2012), either on or near Navy installations. This goal was initially stated in the President's 2012 State of the Union Address and is consistent with the Secretary of the Navy's 2009 alternative energy goal and the 2013 presidential memorandum. With the 1 GW Initiative, the Navy took a more aggressive approach to implement cost-effective and mission-compatible projects at its shore facilities. The Navy established the Renewable Energy Program Office (REPO) specifically to work with local commercial utilities to use private-sector funds to construct renewable energy facilities on Navy land.

To aid in the accomplishment of the 1 GW initiative, the Navy proposes the construction of photovoltaic (PV) solar panel arrays on up to 50 acres including land, parking lots and building rooftops within Joint Base Anacostia-Bolling (JBAB). The Navy would enter into a long-term lease agreement with the successful bidder to construct and operate a solar PV system that would generate renewable energy to supply the existing installation electrical energy grid. The proposed action would be a utility-scale project, which is defined as 10 MW or more.

The goal is to produce 5 MW on the north side and 5 MW on the south side of the installation because two separate utilities systems exist at JBAB, a legacy of the time when the installation was managed as two separate properties—NSF Anacostia and Bolling Air Force Base. Approximately 35 acres are proposed on the North side and 15 acres on the South side. The facility to be constructed would include solar PV arrays, panel mounting brackets on vertical members, and steel tracking structures within the project solar PV system site, as well as miscellaneous electrical equipment at the point of connection (i.e., inverters, combiner boxes, electrical switchgear, associated electrical wiring, and connections) and other items required for the solar PV system. The sites on the North side would be connected to the Anacostia substation and the South sites to the Bolling substation; the electricity would be directed to locations within the respective sides.

By increasing its use and reliance upon sources of renewable energy, the Navy will necessarily reduce its use and reliance upon fossil fuels and this, in turn, will meet a need with respect to energy security to the extent that it reduces reliance upon foreign sources of fossil fuels. Navy use of renewable energy will also reduce GHG emissions that contribute to climate change.

Total Area of Building Site and Allocation of Land to Proposed Uses:

The proposed project would be located on approximately 13.37 ac of rooftops, 11.57 ac of parking lots, and 25.7 ac of land. Figures showing the proposed locations and a complete list of the proposed PV sites are attached as Appendix A. Graphics of 'typical' PV arrays and visualizations of 'typical PV arrays' at select site locations are included as Appendix B.

Existing Assigned Employment and Projected Assigned Employment over a 20-Year Period, in 5-Year Increments:
No new employees would be added as a result of this project.

Description of the Relationship of the Project to the Agency's Master Plan, Where Applicable, Including Rationale for any Deviations:
Joint Base Anacostia-Bolling (JBAB) is an approximate 970-acre military installation located in Southeast Washington, D.C. It was established on 1 October 2010 under the 2005 Base Realignment and Closure (BRAC) act, which resulted in the congressional legislation ordering the consolidation of Naval Support Facility (NSF) Anacostia and Bolling Air Force Base (AFB) into one joint base. JBAB is home to many DoD commands and units. The installation's mission is to provide exceptional mission support and base services to those DoD entities. The Joint Base Anacostia Master Plan states, that the base will seek to incorporate alternative energy production systems into building and site designs to make use of solar power and wind power. Solar power can be used to generate electricity on-site through the use of photovoltaic panels, or PVs which could be linked into the existing utility grid. The use of on-site renewable energy will reduce the overall demand placed on the local electric utility, producing energy cost savings for the Joint Base. Renewable energy also provides the installation greater independence from fossil fuels and the power grid.

Status of Coordination with Affected Local and State Governments: Consultation with the Federal Aviation Administration (FAA), District of Columbia Historic Preservation Office (DC HPO) and National Capital Planning Commission (NCPC) - In progress (concurrent with CFA coordination).

Status of Community Participation, including Summary of Community Views: No coordination beyond that incorporated in the NEPA process and through consultation was needed for this project as it only affects Joint Base Anacostia Bolling.

Schedule for Construction and Occupancy: Project is scheduled to begin construction in late 2015, or early 2016.

Environmental Documentation: This action is being analyzed in an Environmental Assessment under the National Environmental Policy Act, Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations Parts 1500-1508), and OPNAVIST 5090.1D. The EA is anticipated to be completed in April 2015.

Historic Preservation Documentation: This action will involve coordination with the DC HPO to avoid or mitigate impacts on historic resources as some of the proposed locations include rooftops of eligible resources or sites within the view shed of historic districts/eligible resources – consultation in progress.

Maps and Drawings

The following PROPOSED INSTALLATION OF CARPORT, GROUND- AND ROOF-MOUNTED PHOTOVOLTAIC PANELS AT VARIOUS LOCATIONS project at Joint Base Anacostia-Bolling, drawings and documents are included with this submission:

A – Site Location Figures and Summary Tables

B – 'Typical' PV installation graphics and select site-specific visualizations

APPENDIX A

Site Location Figures and Summary Tables

SCALE

0 0.125 0.25 0.5 Miles

Legend

- JBAB Boundary
- North/South Side Boundary

Solar Alternatives

- Parking Lot
- Land
- Building Rooftop

Figure 2-1a
Proposed Solar Project Locations
JBAB North
Washington, DC

SOURCE: NAVFAC Washington 2012; JBAB 2014; ESRI 2013.

Proposed Solar PV Project Sites for JBAB (North Side)		
Site	**Site Area Estimated to be Available for Solar PV Development[a] (acres)**	**Estimated Generation Capacity—Low/High[b] (MW/SF)**
Building Rooftop		
Building 413 (CDC III)	0.32	
Building 168	0.91	
Building 350	0.26	
Building 351	0.86	
Building 362	0.39	
Building 400	0.43	
Building 421	0.46	
Building 417	0.31	
Building 419	0.26	
Building 47	0.37	
Building Rooftop Total	***4.57***	***1.20/1.60***
Parking Lot/Carport		
Parking lot south of Building 168	1.31	
Parking lot northwest of Building 358	0.76	
Building 358 (Parking Garage)	1.11	
Vehicle storage area	4.79	
Parking lot east of Building 400	2.64	
Building 419 parking lot	0.96	
Parking Lot/Carport Total	***11.57***	***3.02/4.03***
Land		
North end (ball fields)	10.56	
Vacant/underutilized land and parking lot south of ball fields	9.10	
Land Total	***19.66***	***5.14/6.85***
Total North Side	***35.8***	***9.36/12.48***

[a] Rooftop usability factor is 0.6

[b] Low (6 watts/square feet), high (8 watts/square feet)

SCALE

0 0.125 0.25 0.5 Miles

Legend

- JBAB Boundary

Solar Alternatives

- Parking Lot
- Land
- Building Rooftop

Figure 2-1b
Proposed Solar Project Locations
JBAB South
Washington, DC

SOURCE: NAVFAC Washington 2012; JBAB 2014; ESRI 2013.

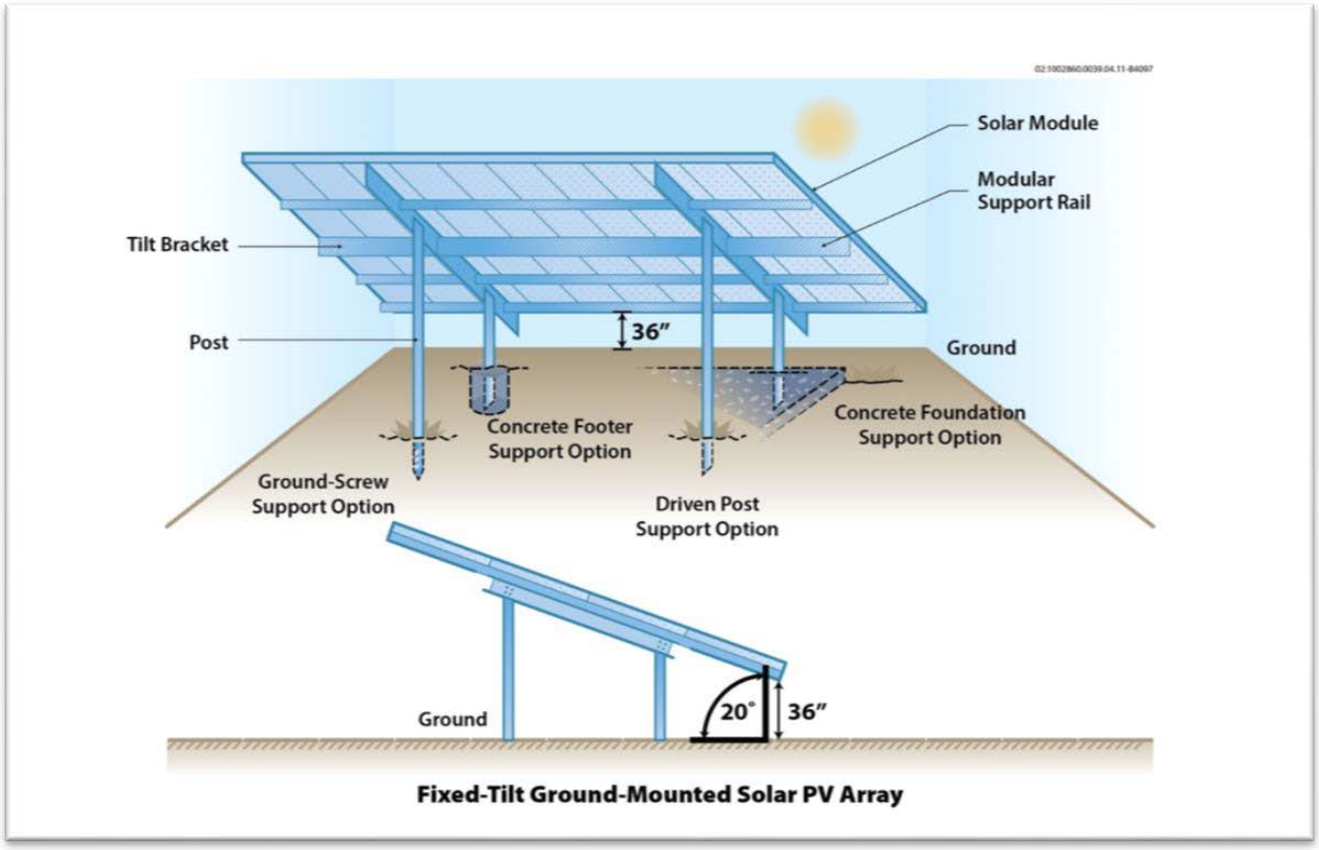
Proposed Solar PV Project Sites for JBAB (South Side)		
Site	**Site Area Estimated to be Available for Solar PV Development[a] (acres)**	**Estimated Generation Capacity—Low/High[b] (MW/SF)**
Building Rooftop		
Building 4570 (Commissary)	0.89	
Building 4514 (Exchange)	1.03	
Building 4472	0.15	
Building 4455 (CDC II)	0.31	
Building 4485	0.29	
Building 4456 (CDC I)	0.38	
Building 1311	0.22	
Building 5681	0.28	
Building 5683	0.20	
Building B421	0.19	
Building 370	0.18	
Building B1 (Hangar)	0.55	
Building 1310	0.31	
Building 371	0.47	
Building 2 (Hangar)	0.57	
Building 50	0.53	
Building 520	0.70	
Building 3620	0.16	
Building 3619	0.17	
Building 3618	0.21	
Building 3621	0.17	
Building 3623	0.17	
Building 256	0.39	
Building 3610 (Chapel)	0.28	
Building Rooftop Total	***8.80***	***2.30/3.07***
Parking Lot/Carport		
Commissary/Exchange parking lot	6.4	
Parking Lot/Carport Total	***6.4***	***1.67/2.23***
Land		
Open space off Duncan Ave (Lemon lot)	2.22	
NRL-leased storage area	3.82	
Land Total	***6.04***	***1.58/2.10***
Total South Side	***21.24***	***5.55/7.4***

[a] Rooftop usability factor is 0.6

[b] Low (6 watts/square feet), high (8 watts/square feet)

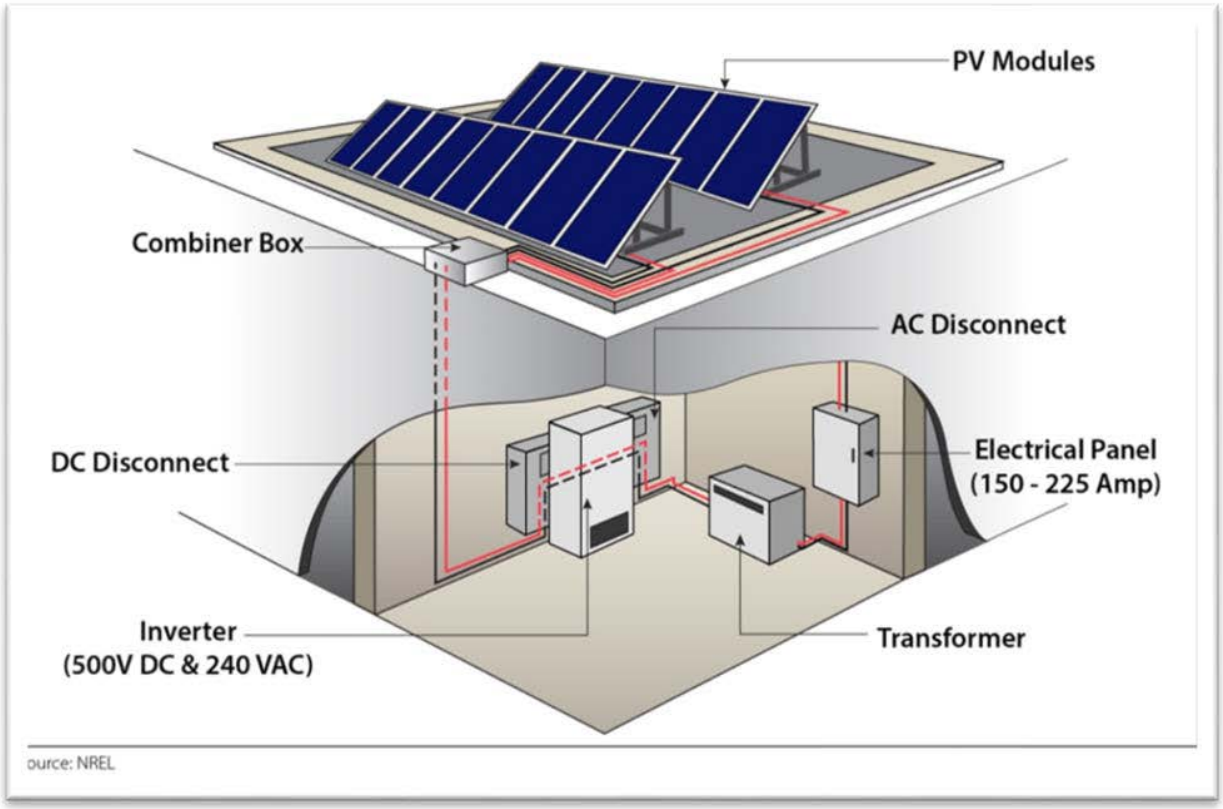
APPENDIX B

'Typical' PV Installation Graphics and Select Site-specific Visualizations

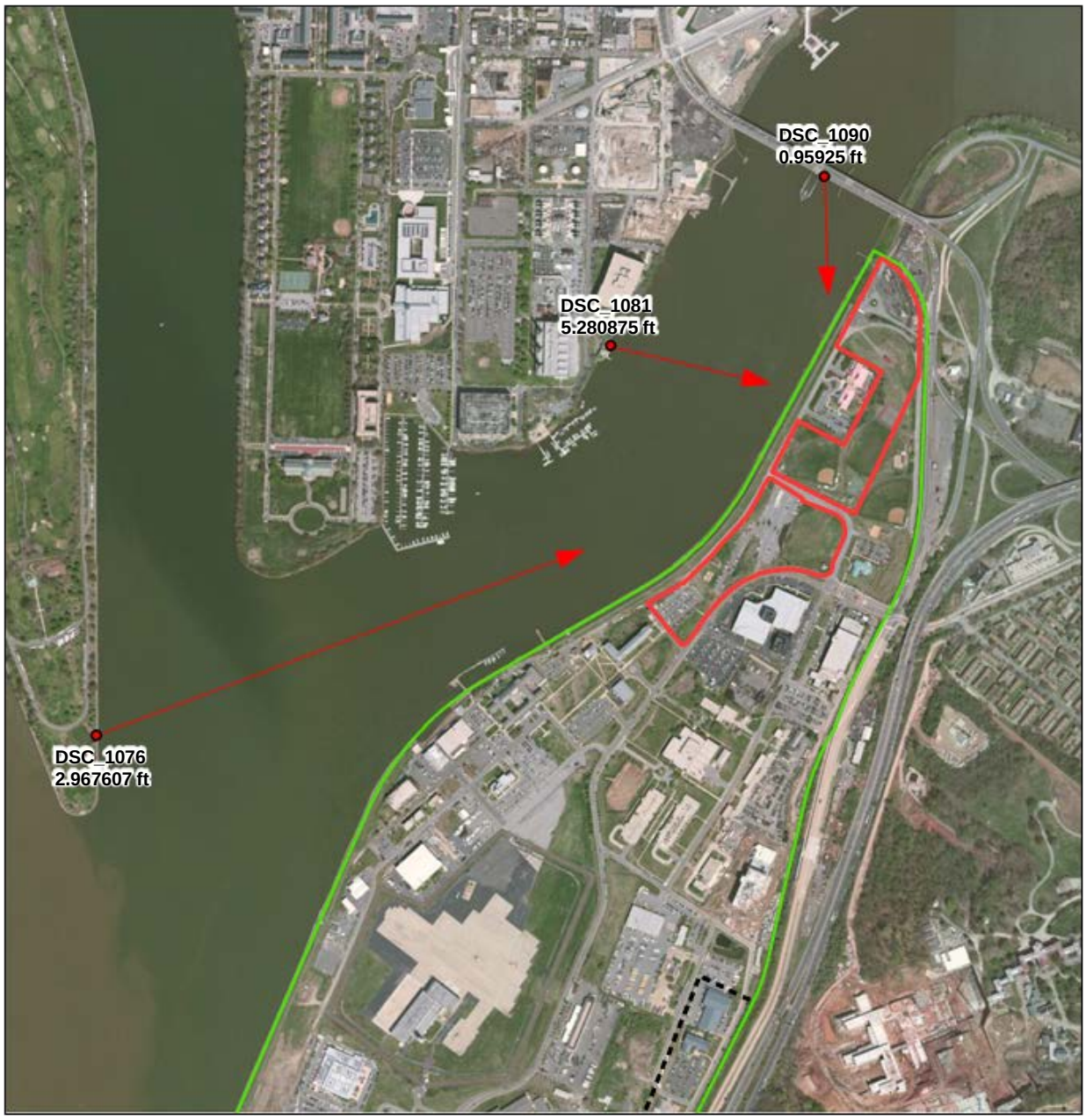


Typical Ground-Mounted Solar Array

Typical Carport Solar Array



Typical Rooftop Solar Array



SCALE

1 inch = 1,000 feet

0 0.125 0.25 0.5 Miles

Legend

- Ground Mounted Site
- JBAB Boundary
- North/South Side Boundary

Photo Sim Locations for

Proposed Solar Project Locations

JBAB North

Washington, DC

Site Specific Visualizations For Ground Mount

SOURCE: NAVFAC Washington 2012; JBAB 2014; ESRI 2013.

DSC1076 – View facing northeast from west bank of Anacostia River at Hains Point looking toward selected PV ground-mount sites on JBAB (as indicated by arrows).

DSC1081 – View facing east from west bank of Anacostia River looking toward selected PV ground-mount sites on JBAB (as indicated by arrows).

DSC1090 – View facing south-southeast from middle of South Capitol Street Bridge looking toward selected PV ground-mount sites on JBAB (as indicated by arrows).

APPENDIX D
NATIONAL CAPITAL PLANNING COMMISSION COORDINATION

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National Capital Planning Commission 401 9th Street, NW North Lobby, Suite 500 Washington, DC 20004 Tel: 202.482.7200 Fax: 202.482.7272 www.ncpc.gov

IN REPLY REFER TO:
NCPC File No. 7627

July 14, 2015

Mr. Thomas Lewis
Naval Facilities Engineering Command Washington
1314 Harwood Street SE, Building 212
Washington Navy Yard, DC 20374

Re: Photovoltaic Solar Panel Arrays Draft Environmental Assessment Comments

Dear Mr. Lewis:

Thank you for the opportunity to participate in the Joint Base Anacostia-Bolling photovoltaic project review process under the National Environmental Policy Act (NEPA). Previously, we provided scoping comments to the Navy in a letter dated December 18, 2014 with specific issues that the EA document should address. We understand that the EA will ultimately inform where the arrays are located as part of a "design-build" energy performance contract, whereby a private company will contract with the Navy to design, construct, manage, and maintain the future system. The project will help JBAB transition into a more sustainable, resilient installation, allowing the Navy to reduce its operating costs and meet various federal sustainability goals, which is consistent with multiple NCPC Comprehensive Plan policies.

Given the scale and complexity of the project, once the contractor is selected, we urge the Navy to host a consultation meeting with NCPC and other relevant federal and District agencies to review the concept system (with selected sites) prior to the project submission. This will help identify specific issues and concerns with each array site, as well as other planned project-related infrastructure such as roads, sub-stations, and fencing that are undetermined at this time. Initially, each project site should be submitted for NCPC concept review, and then submitted for preliminary and final reviews with designs that are responsive to NCPC's concept comments. Our guidelines recommend a minimum level of development of 20-25% for preliminary submissions and a minimum development level of 60-70% for final project submissions.

As a general position, NCPC staff recommends that the Navy maximize the number of rooftop and canopy-mounted PV locations before considering ground-mounted locations due to potential impacts to JBAB's operations, future development, and the natural environment. In addition, we discourage project locations within the floodplain for environmental impact and operational reasons during flood events. The following comments are based on the pre-final EA document, dated April, 2015, and should be used to help guide the EA study and for all future project submissions as appropriate.

Visual Resources

The EA provides several helpful photo-simulations from different perspectives; however, additional simulations may be necessary with project sites closer to Frederick Douglass Memorial Bridge, St. Elizabeths West Campus, Fort McNair, and the Bolling Historic District. The NCPC Comprehensive Plan includes several policies that relate to minimizing visual impacts to "gateway" views toward downtown Washington, DC.[1] In particular, several vantage points looking across the North End Site from elevated positions along the Anacostia Freeway and South Capitol Street may require additional simulations with the selection of the North End Site. The potential rectangular ground site located directly adjacent to the Historic District may require several different simulations from various perspectives with its selection, to be determined in coordination with NCPC, U.S. Commission of Fine Arts (CFA), and the District of Columbia State Historic Preservation Office (DC SHPO). The final EA should reference the potential need for additional photo-simulations in future project submissions with sites that are situated close to visually-sensitive locations.

Floodplains

Pursuant to Executive Order 11988 and NCPC's Comprehensive Plan, with project sites located both within and outside of floodplain areas, we encourage use of the sites located outside of the floodplain before developing sites within the floodplain.[2] In addition, the Navy should recognize that though the ground-mounted arrays may only minimally affect floodplain sites, the entire network will require additional infrastructure (maintenance roads, sub stations, fencing, etc.) that will increase the project's impact to the natural environment. This should be reflected in the final EA, and once specific project sites are known, additional environmental mitigation will likely be necessary. Lastly, JBAB should consider how and if ground sites located within the floodplain will be operated during a multi-day flood event since this should be a consideration during the site selection process.

Vegetation

The EA states that installation of the ground-mounted solar array would result in the removal of a small grove of trees and shrubs, about 0.5 acres, between Defense Boulevard and Brookley Avenue, SW (page 4-19). Based on NCPC's "no tree loss" policy, the Commission will expect tree replacement (at a minimum one-to-one ratio) as mitigation for any future tree removal, either on-site or in close proximity to the site.[3] In addition, if land designated as an Approved

---

[1] NCPC Comprehensive Plan policy: "Protect and enhance the vistas and views, both natural and designed, which are an integral part of the national capital's image." (*National Capital Image*)

[2] NCPC Comprehensive Plan policy: "Discourage investment in floodplain areas unless related to correcting flood hazards, restoring floodplain values, or supporting appropriate recreational or memorial uses." (*Land Resources*)

[3] NCPC Comprehensive Plan policy: "Minimize tree cutting and other vegetation removal to reduce soil disturbance and erosion, particularly in the vicinity of waterways. When tree removal is necessary, trees should be replaced to prevent a net tree loss." (*Water Quality*)

Planting Focus Area (identified in the 2014 Master Plan) is used for solar array development, then the land should be replaced elsewhere on the installation.

JBAB Master Plan / Future Land Use

In September 2014, the Commission approved the JBAB Master Plan for use by the Commission as a guide for future site and building project reviews at the installation. The Master Plan includes a 20-year Framework Plan to help JBAB achieve its vision of "a sustainable community with walkable development, enhanced recreational amenities, and protected historic assets linked by park-like corridors and multi-modal transportation networks." As such, it is important not to impede any of the Framework Plan's planned future networks (land use, stormwater management, open space/outdoor recreation, circulation, etc.) with near-term development that could adversely impact the installation's ability to ultimately achieve its Master Plan vision. Future development of the two northern-most sites, which are identified for ground-mounted arrays, appear to have the greatest probability for adversely impacting the Master Plan as described in the following sections.

North End Site (12.10 acres)

The EA document accurately describes JBAB's northern tip as open land, and the Master Plan shows this site as a future Open Space/Outdoor Recreation land use, defined as, "...dedicated for outdoor public use or for the protection of natural/cultural features." The EA document however, concludes that "minor impacts to land use would occur where ground-mounted solar PV arrays are proposed on parcels designated as Open Space/Outdoor Recreation at the northern-most portion of the installation..."[4] Though the EA does not define impact levels (minor vs. major), a common definition for "major" impact is, "widespread and substantially altering the resource", which more accurately describes the potential installation of solar arrays on open land. The Navy should justify the use of "minor" to describe development of this site in the final EA, and recognize that use of the North End for an array will likely require modification to the recently-approved 2014 JBAB Master Plan.

Regarding other impacts to the Master Plan, a North End solar array could impact the site's future use as "green space with Low Impact Development (LID) improvements", which is identified in the Stormwater Management Framework Plan. Loss of this LID capability might adversely affect JBAB's future stormwater system if the planned function is not replaced elsewhere. The Navy should identify where this LID function will be relocated and if not, how its net loss will impact the overall future stormwater network. The Master Plan also identifies the North End as a future truck inspection facility (relocated from the South Gate), which may be impacted through construction of a solar array here. JBAB should identify another site that could accommodate a screening facility, and should consider characterizing these potential impacts as "adverse" in the final EA document.

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[4] The EA states that "An impact to land use could be considered significant if the impacts resulted in land uses that conflicted with existing coastal zone management efforts, necessitated a change in land use that conflicted with either existing land uses at the installation, or resulted in conflicts with land uses proposed as part of the Future Land Use Framework at JBAB under the 2014 Master Plan for the installation." (page 4-1)

South Adjacent of North End Site (9.49 acres)

The Master Plan shows a planned "transit hub" facility adjacent to the east-side of this site. Ideally, use of this land as a solar array would not preclude or limit the use of the land for a future transit facility. However, if the array installation does adversely impact the site's planned use, then JBAB should identify another feasible site to preserve the future transit system's operability. The Navy should recognize the potential long-term adverse impact to the adjacent site as a future transit facility and reflect that accordingly in the final EA.

Regarding other potential future systemic impacts, the 2014 Master Plan identifies three planned networks that could be adversely impacted by development of this site. First, the Master Plan shows a future roadway extension from Firth-Sterling Gate (to the west) for more direct waterfront access. Second, the Master Plan shows a portion of the site as an "Approved Planting Focus Area" for use as a strategic future planting area. Third, the Open Space/Outdoor Recreation Framework Plan identifies two north-south, aligned, "park-like corridors" through the site. An array development on this site could impact the quality of the planned adjacent park corridors. The Navy should recognize the potential adverse impact to these planned networks and reflect those accordingly in the final EA.

These comments have been prepared in accordance with NCPC's Environmental and Historic Preservation Policies and Procedures. We refer the Navy to NCPC's Comprehensive Plan for the National Capital to reference policies and guidelines for which the future array installations will be evaluated against. The Comprehensive Plan and other NCPC plans/policies can be found on our website at www.ncpc.gov; hard copies are available if needed.

We look forward to continuing our work with you on this project. If you have any questions, please contact Michael Weil at (202) 482-7253 or michael.weil@ncpc.gov.

Sincerely,

Lucy Kempf

Lucy Kempf
Director, Urban Design and Plan Review Division

cc: Frederick J. Lindstrom, Assistant Secretary, US Commission of Fine Arts
Andrew Lewis, State Historic Preservation Office, District of Columbia
Peter May, National Park Service
Dawud Abdur-Rahman, US General Services Administration

National Capital Planning Commission Comment Letter Response	
NCPC Comment	**Navy Response**
Given the scale and complexity of the project, once the contractor is selected, we urge the Navy to host a consultation meeting with NCPC and other relevant federal and District agencies to review the concept system (with selected sites) prior to the project submission. This will help identify specific issues and concerns with each array site, as well as other planned project-related infrastructure such as roads, sub-stations, and fencing that are undetermined at this time. Initially, each project site should be submitted for NCPC concept review, and then submitted for preliminary and final reviews with designs that are responsive to NCPC's concept comments. Our guidelines recommend a minimum level of development of 20-25% for preliminary submissions and a minimum development level of 60-70% for final project submissions.	Thank you for your comment. The Navy will consider this during the detailed design review phase of this project.
As a general position, NCPC staff recommends that the Navy maximize the number of rooftop and canopy-mounted PV locations before considering ground-mounted locations due to potential impacts to JBAB's operations, future development, and the natural environment.	The proposed action includes a combination of rooftop/carport/ground mount sites to maximize the potential energy production capacity while continuing to support installation operations.
The EA provides several helpful photo-simulations from different perspectives; however, additional simulations may be necessary with project sites closer to Frederick Douglass Memorial Bridge, St. Elizabeths West Campus, Fort McNair, and the Bolling Historic District. The NCPC Comprehensive Plan includes several policies that relate to minimizing visual impacts to "gateway" views toward downtown Washington, DC.1 In particular, several vantage points looking across the North End Site from elevated positions along the Anacostia Freeway and South Capitol Street may require additional simulations with the selection of the North End Site. The potential rectangular ground site located directly adjacent to the Historic District may require several different simulations from various perspectives with its selection, to be determined in coordination with NCPC, U.S. Commission of Fine Arts (CFA), and the District of Columbia State Historic Preservation Office (DC SHPO). The final EA should reference the potential need for additional photo-simulations in future project submissions with sites that are situated close to visually-sensitive locations.	Thank you for your comment. The Navy will consider these comments during the detailed design review phase of this project. No changes were made to the Final EA as a result of this comment.

Pursuant to Executive Order 11988 and NCPC's Comprehensive Plan, with project sites located both within and outside of floodplain areas, we encourage use of the sites located outside of the floodplain before developing sites within the floodplain. In addition, the Navy should recognize that though the ground-mounted arrays may only minimally affect floodplain sites, the entire network will require additional infrastructure (maintenance roads, sub stations, fencing, etc.) that will increase the project's impact to the natural environment. This should be reflected in the final EA, and once specific project sites are known, additional environmental mitigation will likely be necessary. Lastly, JBAB should consider how and if ground sites located within the floodplain will be operated during a multi-day flood event since this should be a consideration during the site selection process.	Page 4-22 of the Final EA has been revised to include additional associated infrastructure and the minimal increase in pervious surface, which would not impact the flood capacity.
The EA states that installation of the ground-mounted solar array would result in the removal of a small grove of trees and shrubs, about 0.5 acres, between Defense Boulevard and Brookley Avenue, SW (page 4-19). Based on NCPC's "no tree loss" policy, the Commission will expect tree replacement (at a minimum one-to-one ratio) as mitigation for any future tree removal, either on-site or in close proximity to the site. In addition, if land designated as an Approved Planting Focus Area (identified in the 2014 Master Plan) is used for solar array development, then the land should be replaced elsewhere on the installation.	In accordance with the Joint Base Anacostia-Bolling Appearance Plan, tree replacement will be required on a 1:1 basis. Compatibility with the Planting Focus Areas will be evaluated following detailed site selection.
In September 2014, the Commission approved the JBAB Master Plan for use by the Commission as a guide for future site and building project reviews at the installation. The Master Plan includes a 20-year Framework Plan to help JBAB achieve its vision of a sustainable community with walkable development, enhanced recreational amenities, and protected historic assets linked by park-like corridors and multi-modal transportation networks." As such, it is important not to impede any of the Framework Plan's planned future networks (land use, stormwater management, open space/outdoor recreation, circulation, etc.) with near-term development that could adversely impact the installation's ability to ultimately achieve its Master Plan vision. Future development of the two northern-most sites, which are identified for ground-mounted arrays, appear to have the greatest probability for adversely impacting the Master Plan...	The concepts for the proposed solar project locations were included in the NCPC-approved Master Plan and are overall consistent with the proposed long-term plan for JBAB. Any changes to the PV systems as a result of the specific designs will be addressed in the next Master Plan update, to be completed in accordance with DoD Instruction 4165.70 §6. The PV arrays will not result in permanent land use changes as the infrastructure impacts would be reversible upon the end of the lease term and decommissioning of the equipment. This would not result in a permanent loss of this land for long-term open space purposes.

Regarding other impacts to the Master Plan, a North End solar array could impact the site's future use as "green space with Low Impact Development (LID) improvements", which is identified in the Stormwater Management Framework Plan. Loss of this LID capability might adversely affect JBAB's future stormwater system if the planned function is not replaced elsewhere. The Navy should identify where this LID function will be relocated and if not, how its net loss will impact the overall future stormwater network.	The project will comply will all appropriate local stormwater permits such that there would not be a significant loss of stormwater management capacity at the proposed sites.
The Master Plan also identifies the North End as a future truck inspection facility (relocated from the South Gate}, which may be impacted through construction of a solar array here. JBAB should identify another site that could accommodate a screening facility, and should consider characterizing these potential impacts as "adverse" in the final EA document.	The solar project was sited to be compatible with the proposed truck screening facility and would not have any impact on the viability of that project.
The Master Plan shows a planned "transit hub" facility adjacent to the east-side of this site. Ideally, use of this land as a solar array would not preclude or limit the use of the land for a future transit facility. However, if the array installation does adversely impact the site's planned use, then JBAB should identify another feasible site to preserve the future transit system's operability. The Navy should recognize the potential long-term adverse impact to the adjacent site as a future transit facility and reflect that accordingly in the final EA.	The solar project, as part of the Master Plan, was planned collectively with the proposed Transit Hub. Adequate space remains to accommodate both functions.
Regarding other potential future systemic impacts, the 2014 Master Plan identifies three planned networks that could be adversely impacted by development of this site. First, the Master Plan shows a future roadway extension from Firth-Sterling Gate (to the west) for more direct waterfront access. Second, the Master Plan shows a portion of the site as an "Approved Planting Focus Area" for use as a strategic future planting area. Third, the Open Space/Outdoor Recreation Framework Plan identifies two north-south, aligned, "park-like corridors" through the site. An array development on this site could impact the quality of the planned adjacent park corridors. The Navy should recognize the potential adverse impact to these planned networks and reflect those accordingly in the final EA.	The project will have no impact on these potential corridors. They are long-term planning goals and could still be accommodated with construction of the ground-mounted PV arrays.

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND WASHINGTON
1314 HARWOOD STREET SE
WASHINGTON NAVY YARD DC 20374-5018

IN REPLY REFER TO
5090
Ser EV/671-14

Mr. Marcel Acosta, Executive Director
National Capital Planning Commission
401 Ninth Street NW, North Lobby, Suite 500
Washington, DC 20576

Attn: Jeffrey Hinkle

SUBJECT: PROPOSED INSTALLATION OF CARPORT, GROUND- AND ROOF-MOUNTED PHOTOVOLTAIC PANELS AT VARIOUS LOCATIONS, JOINT BASE ANACOSTIA-BOLLING, WASHINGTON, DISTRICT OF COLUMBIA

Dear Mr. Acosta,

The Department of the Navy (Navy) is requesting Preliminary review for the proposed installation of carport, ground- and roof-mounted photovoltaic panels at various locations, at the Joint Base Anacostia-Bolling, Washington, DC. The proposed action is in support of the Energy Policy Act of 2005 (EPAct) (42 U.S.C. 15852, 10 U.S.C. 2911(e) renewable energy goals and the Secretary of the Navy 1 Gigawatt (GW) Initiative. Please refer to the enclosed project narrative for further details.

The Navy is seeking Preliminary review at your December 4, 2014 meeting. An Environmental Assessment is being prepared and is anticipated to be completed in April 2015. Consultation with the Federal Aviation Administration (FAA), District of Columbia Historic Preservation Office (DC HPO) and Commission of Fine Arts is in progress concurrent with this submission.

If you have any questions, please contact Tara Meadows at (202) 685-8415.

Sincerely,

THOMAS P. LEWIS
Environmental Business Line
Coordinator
By direction

Copy to: Medina Alharazim, NAVFAC Washington (Joint Base Anacostia-Bolling)
Tara Meadows, NAVFAC Washington (EV2)

National Capital Planning Commission Project Narrative

PROPOSED INSTALLATION OF CARPORT, GROUND- AND ROOF-MOUNTED PHOTOVOLTAIC PANELS AT VARIOUS LOCATIONS

Joint Base Anacostia-Bolling
Washington, District of Columbia
October 31, 2014

The sponsoring agency for this project is the Naval Facilities Engineering Command, Washington District, Washington Navy Yard (WNY) acting for the project proponent. P.O.C.'s for these organizations are as follows:

Naval Facilities Engineering Command, Washington District
1314 Harwood St. SE
Washington Navy Yard, DC 20374-5018

Tara Meadows, 202-685-8415

This Project Report has been prepared for the PROPOSED INSTALLATION OF CARPORT, GROUND- AND ROOF-MOUNTED PHOTOVOLTAIC PANELS AT VARIOUS LOCATIONS project at Joint Base Anacostia-Bolling. This report has been prepared for submission to the National Capital Planning Commission for their review and approval.

Project Description:

In support of the Energy Policy Act of 2005 (EPAct) (42 U.S.C. 15852) and 10 U.S.C. 2911(e) renewable energy goals, the Secretary of the Navy created the 1 Gigawatt (GW) Initiative—named for the amount of renewable energy generation capacity to be deployed by 2020 (Navy 2012), either on or near Navy installations. This goal was initially stated in the President's 2012 State of the Union Address and is consistent with the Secretary of the Navy's 2009 alternative energy goal and the 2013 presidential memorandum. With the 1 GW Initiative, the Navy took a more aggressive approach to implement cost-effective and mission-compatible projects at its shore facilities. The Navy established the Renewable Energy Program Office (REPO) specifically to work with local commercial utilities to use private-sector funds to construct renewable energy facilities on Navy land.

To aid in the accomplishment of the 1 GW initiative, the Navy proposes the construction of photovoltaic (PV) solar panel arrays on up to 50 acres including land, parking lots and building rooftops within Joint Base Anacostia-Bolling (JBAB). The Navy would enter into a long-term lease agreement with the successful bidder to construct and operate a solar PV system that would generate renewable energy to supply the existing installation electrical energy grid. The proposed action would be a utility-scale project, which is defined as 10 MW or more.

The goal is to produce 5 MW on the north side and 5 MW on the south side of the installation because two separate utilities systems exist at JBAB, a legacy of the time when the installation was managed as two separate properties—NSF Anacostia and Bolling Air Force Base. Approximately 35 acres are proposed on the North side and 15 acres on the South side. The facility to be constructed would include solar PV arrays, panel mounting brackets on vertical members, and steel tracking structures within the project solar PV system site, as well as miscellaneous electrical equipment at the point of connection (i.e., inverters, combiner boxes, electrical switchgear, associated electrical wiring, and connections) and other items required for the solar PV system. The sites on the North side would be connected to the Anacostia substation and the South sites to the Bolling substation; the electricity would be directed to locations within the respective sides.

By increasing its use and reliance upon sources of renewable energy, the Navy will necessarily reduce its use and reliance upon fossil fuels and this, in turn, will meet a need with respect to energy security to the extent that it reduces reliance upon foreign sources of fossil fuels. Navy use of renewable energy will also reduce GHG emissions that contribute to climate change.

Total Area of Building Site and Allocation of Land to Proposed Uses:

The proposed project would be located on approximately 13.37 ac of rooftops, 11.57 ac of parking lots, and 25.7 ac of land. Figures showing the proposed locations and a complete list of the proposed PV sites are attached as Appendix A. Graphics of 'typical' PV arrays and visualizations of 'typical PV arrays' at select site locations are included as Appendix B.

Existing Assigned Employment and Projected Assigned Employment over a 20-Year Period, in 5-Year Increments:
No new employees would be added as a result of this project.

Description of the Relationship of the Project to the Agency's Master Plan, Where Applicable, Including Rationale for any Deviations:
Joint Base Anacostia-Bolling (JBAB) is an approximate 970-acre military installation located in Southeast Washington, D.C. It was established on 1 October 2010 under the 2005 Base Realignment and Closure (BRAC) act, which resulted in the congressional legislation ordering the consolidation of Naval Support Facility (NSF) Anacostia and Bolling Air Force Base (AFB) into one joint base. JBAB is home to many DoD commands and units. The installation's mission is to provide exceptional mission support and base services to those DoD entities. The Joint Base Anacostia Master Plan states, that the base will seek to incorporate alternative energy production systems into building and site designs to make use of solar power and wind power. Solar power can be used to generate electricity on-site through the use of photovoltaic panels, or PVs which could be linked into the existing utility grid. The use of on-site renewable energy will reduce the overall demand placed on the local electric utility, producing energy cost savings for the Joint Base. Renewable energy also provides the installation greater independence from fossil fuels and the power grid.

Status of Coordination with Affected Local and State Governments: Consultation with the Federal Aviation Administration (FAA), District of Columbia Historic Preservation Office (DC HPO) and Commission of Fine Arts (CFA) - In progress (concurrent with NCPC coordination).

Status of Community Participation, including Summary of Community Views: No coordination beyond that incorporated in the NEPA process and through consultation was needed for this project as it only affects Joint Base Anacostia Bolling.

Schedule for Construction and Occupancy: Project is scheduled to begin construction in late 2015, or early 2016.

Total Estimated Cost of Project and Funding Status:
Total cost is not known at this time, but funding is available.

Transportation Management Program:
This project does not increase employment at Joint Base Anacostia Bolling; therefore, a Transportation Management Plan is not applicable.

Environmental Documentation: This action is being analyzed in an Environmental Assessment under the National Environmental Policy Act, Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations Parts 1500-1508), and OPNAVIST 5090.1D. The EA is anticipated to be completed in April 2015.

Historic Preservation Documentation: This action will involve coordination with the DC HPO to avoid or mitigate impacts on historic resources as some of the proposed locations include rooftops of eligible resources or sites within the view shed of historic districts/eligible resources – consultation in progress.

Executive Order 13514 and EISA, Section 438:
At this point, it is unknown what combination of the sites available will be selected for development by the successful bidder. Thus, the requirements for storm water management cannot be ascertained at this time. However, as with all Navy projects, the project will take measures to adhere to Executive Order 13514 concerning sustainability and will minimize storm water impacts, GHG emissions, energy consumption and water usage. Specific storm water information will be submitted with the final submission.

Maps and Drawings

The following PROPOSED INSTALLATION OF CARPORT, GROUND- AND ROOF-MOUNTED PHOTOVOLTAIC PANELS AT VARIOUS LOCATIONS project at Joint Base Anacostia-Bolling, drawings and documents are included with this submission:

A – Site Location Figures and Summary Tables

B – 'Typical' PV installation graphics and select site-specific visualizations

APPENDIX A

Site Location Figures and Summary Tables

SCALE

0 0.125 0.25 0.5 Miles

Legend

- JBAB Boundary
- North/South Side Boundary

Solar Alternatives

- Parking Lot
- Land
- Building Rooftop

Figure 2-1a
Proposed Solar Project Locations
JBAB North
Washington, DC

SOURCE: NAVFAC Washington 2012; JBAB 2014; ESRI 2013.

Proposed Solar PV Project Sites for JBAB (North Side)		
Site	**Site Area Estimated to be Available for Solar PV Development[a] (acres)**	**Estimated Generation Capacity—Low/High[b] (MW/SF)**
Building Rooftop		
Building 413 (CDC III)	0.32	
Building 168	0.91	
Building 350	0.26	
Building 351	0.86	
Building 362	0.39	
Building 400	0.43	
Building 421	0.46	
Building 417	0.31	
Building 419	0.26	
Building 47	0.37	
Building Rooftop Total	***4.57***	***1.20/1.60***
Parking Lot/Carport		
Parking lot south of Building 168	1.31	
Parking lot northwest of Building 358	0.76	
Building 358 (Parking Garage)	1.11	
Vehicle storage area	4.79	
Parking lot east of Building 400	2.64	
Building 419 parking lot	0.96	
Parking Lot/Carport Total	***11.57***	***3.02/4.03***
Land		
North end (ball fields)	10.56	
Vacant/underutilized land and parking lot south of ball fields	9.10	
Land Total	***19.66***	***5.14/6.85***
Total North Side	***35.8***	***9.36/12.48***

[a] Rooftop usability factor is 0.6

[b] Low (6 watts/square feet), high (8 watts/square feet)

SCALE

0 0.125 0.25 0.5 Miles

Legend

- JBAB Boundary

Solar Alternatives

- Parking Lot
- Land
- Building Rooftop

Figure 2-1b
Proposed Solar Project Locations
JBAB South
Washington, DC

SOURCE: NAVFAC Washington 2012; JBAB 2014; ESRI 2013.

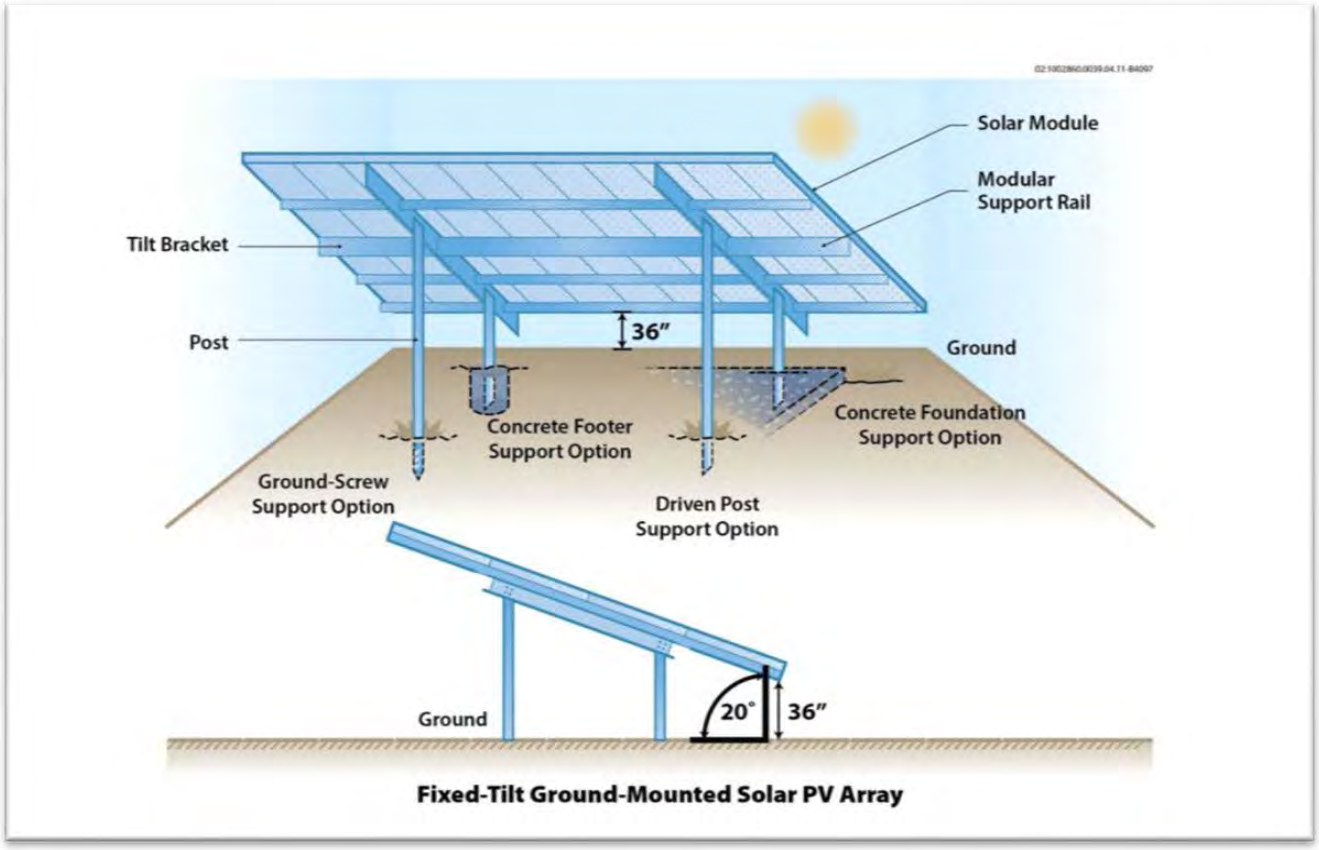
Proposed Solar PV Project Sites for JBAB (South Side)		
Site	**Site Area Estimated to be Available for Solar PV Development[a] (acres)**	**Estimated Generation Capacity—Low/High[b] (MW/SF)**
Building Rooftop		
Building 4570 (Commissary)	0.89	
Building 4514 (Exchange)	1.03	
Building 4472	0.15	
Building 4455 (CDC II)	0.31	
Building 4485	0.29	
Building 4456 (CDC I)	0.38	
Building 1311	0.22	
Building 5681	0.28	
Building 5683	0.20	
Building B421	0.19	
Building 370	0.18	
Building B1 (Hangar)	0.55	
Building 1310	0.31	
Building 371	0.47	
Building 2 (Hangar)	0.57	
Building 50	0.53	
Building 520	0.70	
Building 3620	0.16	
Building 3619	0.17	
Building 3618	0.21	
Building 3621	0.17	
Building 3623	0.17	
Building 256	0.39	
Building 3610 (Chapel)	0.28	
Building Rooftop Total	***8.80***	***2.30/3.07***
Parking Lot/Carport		
Commissary/Exchange parking lot	6.4	
Parking Lot/Carport Total	***6.4***	***1.67/2.23***
Land		
Open space off Duncan Ave (Lemon lot)	2.22	
NRL-leased storage area	3.82	
Land Total	***6.04***	***1.58/2.10***
Total South Side	***21.24***	***5.55/7.4***

[a] Rooftop usability factor is 0.6

[b] Low (6 watts/square feet), high (8 watts/square feet)

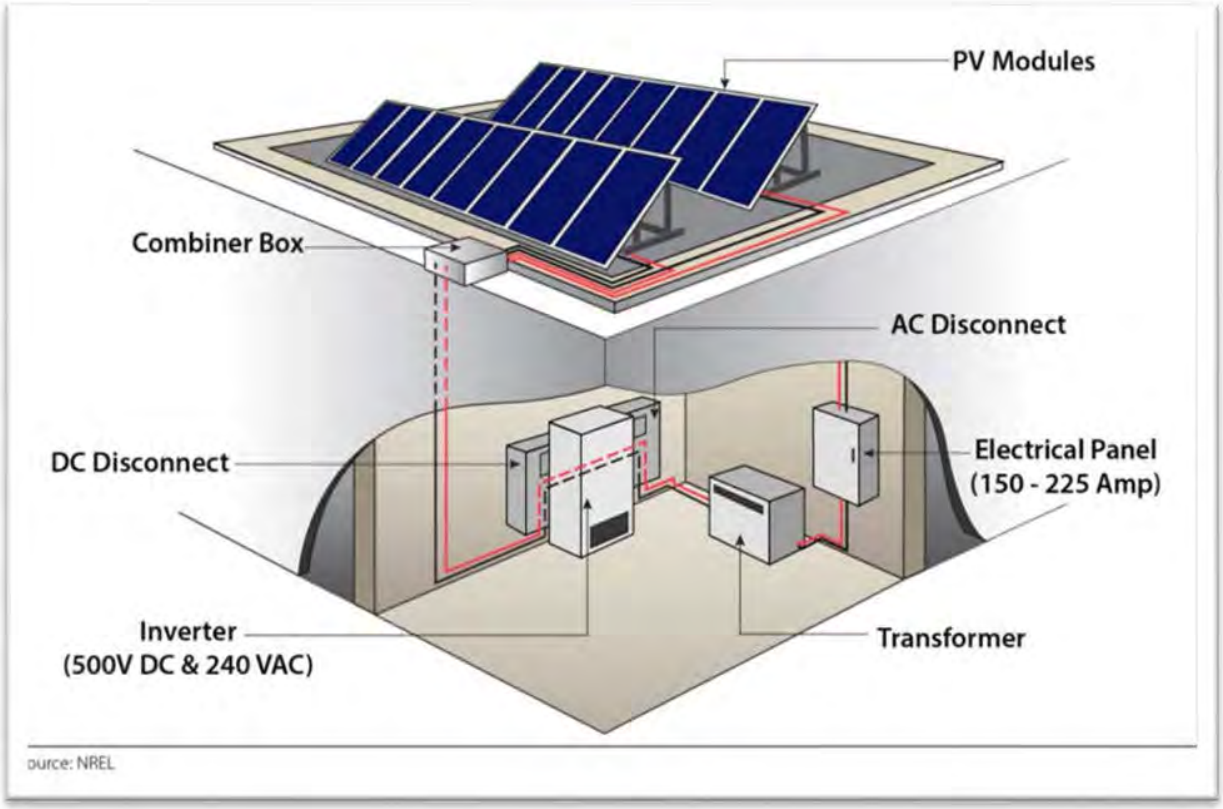
APPENDIX B

'Typical' PV Installation Graphics and Select Site-specific Visualizations



Typical Ground-Mounted Solar Array

Typical Carport Solar Array



Typical Rooftop Solar Array

SCALE

1 inch = 1,000 feet

0 0.125 0.25 0.5 Miles

Legend

- Ground Mounted Site
- JBAB Boundary
- North/South Side Boundary

Photo Sim Locations for
Proposed Solar Project Locations
JBAB North
Washington, DC

Site Specific Visualizations For Ground Mount

SOURCE: NAVFAC Washington 2012; JBAB 2014; ESRI 2013.

DSC1076 – View facing northeast from west bank of Anacostia River at Hains Point looking toward selected PV ground-mount sites on JBAB (as indicated by arrows).

DSC1081 – View facing east from west bank of Anacostia River looking toward selected PV ground-mount sites on JBAB (as indicated by arrows).

DSC1090 – View facing south-southeast from middle of South Capitol Street Bridge looking toward selected PV ground-mount sites on JBAB (as indicated by arrows).

DSC 1096 – View facing northwest looking across South Capitol Street toward parking lot of Building 168 (building is NRHP-eligible). View of potential carport PV panels.

DSC 1093 – View facing north-northwest looking across South Capitol Street toward Building 168 (NRHP-eligible). View of potential roof-mounted and carport PV panels.

U.S. COMMISSION OF FINE ARTS

ESTABLISHED BY CONGRESS 17 MAY 1910

401 F STREET NW SUITE 312 WASHINGTON DC 20001-2728 202-504-2200 FAX 202-504-2195 WWW.CFA.GOV

1 December 2014

Dear Commander Benson:

In its meeting of 20 November, the Commission of Fine Arts reviewed an initial proposal submitted by the U.S. Department of the Navy for a large-scale installation of solar panels at Joint Base Anacostia-Bolling in Southwest Washington. The Commission commended the Navy for the scope and ambition of the undertaking and expressed support for the general goals of the project.

The Commission members observed that the installation of solar panels at this scale could be a successful model for future installations if careful attention is paid now to siting and design. They recommended that the design for the installation celebrate the technological aspect of the undertaking, while also giving priority to the shaping of civic spaces such as roads, pathways, and parks, as well as attention to the transitions between these spaces. Acknowledging that the Navy had not yet determined which of the potential locations on the base would be necessary to meet the energy goals for the project, they particularly supported locations at parking lots, citing successful examples of similar installations at airports. Given the promise of this project as a prototype for many military locations, they emphasized the importance of a strong design process, which may be difficult to achieve through the intended design-build procurement process.

For the next review, the Commission requested the presentation of a site-specific concept design for each of the proposed installations. As always, the staff is available to assist you with the next submission.

Sincerely,

Thomas E. Luebke, FAIA
Secretary

LCDR Keith Benson
Washington Navy Yard
1314 Harwood Street, SE
Washington, DC 20374-5018

cc: Peter May, National Park Service

National Capital Planning Commission 401 9th Street, NW North Lobby, Suite 500 Washington, DC 20004 Tel: 202.482.7200 Fax: 202.482.7272 www.ncpc.gov

IN REPLY REFER TO:
NCPC File No. 7627

December 18, 2014

Mr. Thomas Lewis
Naval Facilities Engineering Command Washington
1314 Harwood Street SE, Building 212
Washington Navy Yard,
Washington, DC 20374

Re: Photovoltaic Solar Panel Arrays Environmental Assessment Scoping Comments

Dear Mr. Lewis,

Thank you for the opportunity to provide comments on the scope of the Environmental Assessment (EA) being prepared to analyze the potential environmental impacts caused by the installation of photovoltaic (PV) solar arrays throughout Joint Base Anacostia-Bolling (JBAB). We understand the EA will inform the selection of array locations as part of a "design-build" energy performance contract, whereby a private company will contract with the Navy to design, construct, manage, and maintain the future system. The project will help JBAB transition into a more sustainable, resilient installation, allowing the Navy to reduce its operating costs and meet various federal sustainability goals.

The comments below are based on the conceptual information provided to National Capital Planning Commission (NCPC) staff, dated October 31, 2014, which shows several potential array sites, conceptual array schematics, and photo-simulations from several off-site perspectives. As a general response to this information, NCPC staff recommends the Navy maximize the number of rooftop and canopy-mounted PV locations before considering ground-mounted locations due to potential impacts to JBAB's operations, future development, and the natural environment. Based on recent discussions with NAVFAC staff, it is our understanding that specific array locations and designs will be developed following selection of a design-build team. Given the scale and complexity of the project, NCPC staff recommends the Navy initiate early-consultation with NCPC and other relevant federal and District of Columbia agencies soon after the selection process, and to plan on submitting the project to NCPC for concept, preliminary, and final reviews. This early involvement by review agencies, and regular feedback from the Commission, will assist the Navy in moving through the NCPC review process in an efficient manner.

Pursuant to the National Capital Planning Act, the National Capital Planning Commission is the central planning agency for the federal government in the National Capital Region (NCR), responsible for the preservation and protection of the region's natural and historical features. NCPC carries out this mission, in part, through its responsibilities to develop the Comprehensive Plan for the National Capital, the Federal Capital Improvement Program, and other special

planning initiatives. The preparation of these plans and programs is consistently informed by NCPC's special expertise with respect to environmental issues throughout the NCR. Furthermore, pursuant to Section 610(a) of Public Law 93-166, NCPC has jurisdiction by law to review development projects at JBAB. Based on the foregoing, we respectfully request cooperating agency status throughout the EA process.

NCPC's early involvement in the development of the EA will assist the Navy in selecting PV sites that balance energy production and cost feasibility with impacts to environmental and cultural resources. Specifically, we recommend the EA assess the potential direct, indirect, and cumulative impacts of the project on the following topic areas: NCPC Plans and Policies, Visual Resources, Floodplains, Wildlife, Vegetation/Open Space/Outdoor Recreation, Stormwater Management, and Transportation/Circulation. These impact topic areas are described in greater detail below.

Plans and Policies

JBAB Master Plan

In September 2014, the Commission approved the JBAB Master Plan for use by the Commission as a guide for future reviews of individual site and building projects at the installation. The Master Plan includes a 20-year Framework Plan that is intended to guide long-term development toward achieving the Master Plan's vision of transforming JBAB into a sustainable community with walkable development, enhanced recreational amenities, and protected historic assets linked by park-like corridors and multi-modal transportation networks. As such, it is important not to impede any of the Framework Plan's various "systems" (land use, stormwater management, open space/outdoor recreation, landscape design, circulation) with near-term projects so as to adversely limit JBAB's future development. The EA should analyze each PV array location for consistency with the Master Plan, and assess how the PV project's future adverse impacts will be mitigated.[1] Based on the conceptual materials, NCPC staff notes several possible inconsistencies between the project and the JBAB Master Plan, which are described in the following sections.

According to the Master Plan, the northernmost ground-mounted site located near the South Capitol Street Bridge is shown as future Open Space/Outdoor Recreation, which is defined as "real property dedicated for outdoor public use or for the protection of natural/cultural features." However, use of this area for a ground-mounted array could substantially impact future open space and outdoor recreational potential. In addition, the Master Plan's Stormwater Management Framework Plan identifies this area as "green space with Low Impact Development (LID) improvements." The EA should address this apparent Master Plan inconsistency by analyzing the loss of this area for stormwater management and open space/outdoor recreation purposes. Using

[1] A master plan modification could be required if the project significantly deviates from the recently approved JBAB Master Plan. NCPC guidelines state that a master plan modification could be necessary where: 1) a major change in the character or intensity of an existing use is proposed, or 2) the proposed modification or revisions would significantly change the off-site impact of the Federal activities and uses carried out within the site.

this site for a ground-mounted array might also require modification to JBAB's future commercial vehicle inspection facility/operations; impact the planned transit hub location and related on-site transit operations; and limit a future extension to the Firth-Sterling access road.

The EA should analyze the potential environmental impacts of the proposed action on historic resources. In particular, a number of rooftop sites are shown within or near the Bolling Air Force Base Historic District and atop historic Buildings 168 and 169, which could directly cause adverse effects to these resources. In addition, staff notes the potential ground array site directly adjacent to the Bolling AFB Historic District could also cause adverse effects. NCPC staff recommends the Navy initiate Section 106 consultation as soon as possible to gain early input from the District of Columbia State Historic Preservation Officer.

There is one potential ground-mounted PV site located within an "Approved Planting Focus Area" as designated by the Master Plan's Landscape Framework Plan. Specifically, the site is located in the northeast corner of the 9.10-acre parcel, adjacent to the west-side of Mitscher Avenue, near Firth-Sterling Gate. The conceptual project information describes the site as "vacant/underutilized land and parking lot south of ball fields." The Navy should consider the impact to this area's potential for future tree/vegetation-planting and stormwater management as part of the EA analysis. The siting of solar arrays on this land, in addition to the potential loss of land directly to the north, adjacent to the South Capitol Street Bridge, would have a cumulative impact to the installation-wide network of open space and stormwater management area as shown in the Master Plan.

Though the Master Plan identifies the surface lot in the extreme southwest corner of JBAB for possible PV use, restoring this land to open/recreation space would extend the riverfront buffer, improve the installation's off-site visual appearance, and likely result in a significant environmental benefit to the river. The use of this site for PV energy production, as well as others located near the waterfront at the north end of the installation, could also have safety impacts (glare) to air traffic associated with Washington National Airport.

Comprehensive Plan for the National Capital

The EA should analyze the project's consistency with the policies of the Comprehensive Plan for the National Capital, both the Federal and District Elements, including, but not limited to, the following policies taken directly from the .Preservation and Historic Features, Parks and Open Space, and Federal Environment Elements. These policies are highlighted in particular to help influence the project's design, and to help eliminate apparent inconsistencies between the project and various aspects of the Comprehensive Plan early in the development process.

- Conserve portions of military reservations that add significantly to the inventory of park, open space, and natural areas... (*Preservation and Maintenance*)
- Discourage large paved parking areas and other non-water-related development along the Anacostia and Potomac Rivers. Where large paved areas are required, preference should be given to using pervious surfaces. (*Rivers and Waterways*)

- Regulate the scale and use of nearby development. (*Gateways*)
- Improve South Capitol Street between the Suitland Parkway and the U.S. Capitol with open space amenities consistent with the Legacy Plan. (*Gateways*)
- Minimize tree cutting and other vegetation removal to reduce soil disturbance and erosion, particularly in the vicinity of waterways. When tree removal is necessary, trees should be replaced to prevent a net tree loss. (*Water Quality*)
- Discourage investment in floodplain areas unless related to correcting flood hazards, restoring floodplain values, or supporting appropriate recreational or memorial uses. (*Land Resources*)
- Consider the impacts, including cumulative impacts, of environmental changes on wildlife habitats and the biodiversity of an ecosystem. Consideration should extend to non-protected areas, as well as areas protected by designations such as parks and wetlands. (*Land Resources*)
- Protect and enhance the vistas and views, both natural and designed, which are an integral part of the national capital's image. (*National Capital Image*)
- Encourage the practice of good design principles throughout the region to continually strengthen the image of the nation's capital. (*National Capital Image*)

Visual Resources

The EA should analyze the potential visual impacts of the proposed action to multiple off-site locations including: Daingerfield Island, Washington National Airport, Malcolm X Boulevard, I-295 and South Capitol Street, the Frederick Douglass Memorial Bridge, Shepherd Parkway, Hains Point, Buzzard Point, and the St. Elizabeths West Campus. The analysis should utilize photo-simulations from all of these vantage points with superimposed PV arrays on each potential site. In addition, the EA should include an analysis of potential visual impacts to historic resources located at JBAB, including, but not limited to, the Bolling Air Force Base Historic District and historic Buildings 168 and 169.

Floodplains

Based upon information provided by the Navy describing the project, several potential ground, canopy, and rooftop PV sites are located within the 100-year and 500-year floodplains, and the EA should analyze the project's impact to these floodplains. The analysis should account for any special design considerations necessary for ground-mounted sites to ensure continued operation and maintenance during flood events, which are expected to increase in frequency and intensity by multiple federal agencies, including the Department of Defense. In addition, sites located within the 100-year floodplain will require compliance with Executive Order 11988, which requires federal agencies "to avoid ...long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development whenever there is a practicable alternative." The EA should document why these sites must be used rather than alternative sites outside of the 100-year floodplain. A cumulative

impact analysis is especially important for this impact topic since additional impervious area within the floodplain could expand its limits within the installation.

Wildlife

The EA should include an analysis of potential impacts to migratory bird patterns. The assessment should utilize the best scientific data available to determine what species of migratory birds occur on or near JBAB. Special consideration should be given to priority habitats, such as important nesting areas, migration stopover areas, and wintering habitats. The Navy should consider inviting the U.S. Fish and Wildlife Service to participate in the NEPA process to ensure accurate analysis of this impact topic.

Vegetation / Open Space / Outdoor Recreation

The EA should consider potential impacts to existing tree canopy and vegetative areas, and identify areas that could accommodate new trees/vegetation as mitigation, if necessary. In addition, several proposed PV sites are situated directly adjacent to streets that are identified in the JBAB Master Plan's Open Space/Outdoor Recreation Framework Plan as future "park-like" corridors. Should these sites be selected, the potential to transform these corridors into park-like streetscapes through planting and other related improvements could be negatively impacted. Finally, it appears the project has considerable potential to reduce the total amount of land area identified as open/outdoor recreation space in the Master Plan, particularly in the far north end of the installation - near the South Capitol Street Bridge and Firth-Sterling Gate. As such, the Navy should analyze the trade-offs between PV installation opportunities and potential urban design, open space, and outdoor recreation impacts, including an analysis of additional demand placed on remaining open space/recreation areas, and how this will be accommodated if necessary.

Stormwater Management

The EA should analyze how much additional stormwater runoff will be generated from the project (resulting from aggregating impervious surface area increases from each site), and how the overall increase will be accommodated by the installation's infrastructure. The analysis should account for the potential loss of open/green/stormwater management space resulting from development at each identified array site. The Navy should encourage the use of stormwater management BMPs such as bio-swales, pervious pavement, and green roofs for all carport and rooftop PV installations to the maximum extent feasible.

Transportation/Circulation

As previously mentioned, the northern-most ground array sites may have potential impacts to various transportation/circulation-related projects shown in the JBAB Master Plan including: the future relocated Commercial Vehicle Inspection facility, future transit hub, and the planned extension of the Firth-Sterling Gate access road further to the west. In addition, several future shuttle routes that are identified in the JBAB Master Plan for this area could be affected as well.

The EA should analyze these potential operational impacts. Lastly, considering the number of array locations shown near South Capitol Street (along the east-side of the installation) and along the riverfront, the EA should address the potential for glare to affect user behavior/safety along South Capitol Street and potential safety impacts to air traffic from National Airport.

These comments have been prepared in accordance with NCPC's Environmental and Historic Preservation Policies and Procedures. We refer the Navy to NCPC's Comprehensive Plan for the National Capital to reference policies and guidelines for which the future array installations will be evaluated against. The Comprehensive Plan and other NCPC plans/policies can be found on our website at www.ncpc.gov; hard copies are available if needed.

We look forward to working with you on this project. If you have any questions, please contact Michael Weil at (202) 482-7253 or michael.weil@ncpc.gov.

Sincerely,

Shane L. Dettman
Director, Urban Design and Plan Review Division

cc: Frederick J. Lindstrom, Assistant Secretary, US Commission of Fine Arts
Andrew Lewis, State Historic Preservation Office, District of Columbia
Peter May, National Park Service
Dawud Abdur-Rahman, US General Services Administration
Medina Alharazim, NAVFAC Washington (Joint Base Anacostia-Bolling)
Tara Meadows, NAVFAC Washington (EV2)
David McLaughlin, DC Water, Blue Plains Advanced Wastewater Treatment Pl

From:	Weil, Michael
To:	Childs, Katherine D CIV NAVFAC Washington
Cc:	Montgomery, Kevin P CIV NAVFAC Washington; Meadows, Tara CIV NAVFAC Washington
Subject:	RE: NCPC Review of JBAB of PVs
Date:	Friday, January 09, 2015 9:47:10

That's fine since we don't have approval authority over the project, and you have assured me that we will continue work very closely together throughout the NEPA and project development process anyways. Thanks for checking. - Mike

-----Original Message-----
From: Childs, Katherine D CIV NAVFAC Washington [mailto:katherine.childs@navy.mil]
Sent: Friday, January 09, 2015 8:11 AM
To: Weil, Michael
Cc: Montgomery, Kevin P CIV NAVFAC Washington; Meadows, Tara CIV NAVFAC Washington
Subject: NCPC Review of JBAB of PVs

Hi Mike,
To wrap up our conversation yesterday afternoon, instead of NCPC being a cooperating agency the Navy will continue to have close communication through the planning and review process with NCPC for this project. We look forward to working with you on this exciting renewable energy project.

v/r,
Katherine