FINAL

Environmental Assessment

for the Proposed Construction, Operation and Maintenance of a 1.875-Megawatt Ground Mounted Solar Photovoltaic Array

Federal Law Enforcement Training Centers Cheltenham

Cheltenham, Maryland

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List of Acronyms

BBTU	billion British thermal unit
BMP	best management practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
COMAR	Code of Maryland Regulations
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
C&D	construction and demolition
dB	decibels
dBA	A-weighted decibels
DHS	United States Department of Homeland Security
DNL	day-night average
DOE	Department of Energy
EA	Environmental Assessment
EBS	Environmental Baseline Survey
ECM	energy conservation measure
EISA	Energy Independence and Security Act
EMS	Environmental Management System
EPAct	Energy Policy Act
EPA	United States Environmental Protection Agency
EO	Executive Order
ESA	Endangered Species Act
ESC	Erosion and Sediment Control
EVS	FLETC Environmental and Safety Division
FCA	Forest Conservation Act
FCP	Forest Conservation Plan
FHWA	Federal Highway Administration
FIDS	forest interior dwelling species
FLETC	Federal Law Enforcement Training Centers
FONSI	Finding of No Significant Impact

FY	fiscal year
GHG	greenhouse gas
HID	high intensity discharge
HVAC	heating, ventilation, and air conditioning
kWh	kilowatt-hour
LED	light emitting diode
MD DNR	Maryland Department of Natural Resources
MDE	Maryland Department of the Environment
MDOT	Maryland Department of Transportation
MDP	Maryland Department of Planning
MHT	Maryland Historic Trust
M-NCPPC	Maryland-National Capital Park and Planning Commission
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NCDC	Naval Communications Detachment Cheltenham
NCPC	National Capital Planning Commission
NEPA	National Environmental Policy Act
NOA	Notice of Availability
NOI	Notice of Intent
NO_x	nitrogen oxides
NO_2	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NZE	Net Zero Energy
O_3	ozone
O&M	operation and maintenance
OMB	Office of Management and Budget
OSPP	Operational Sustainability Performance Plan
PEPCO	Potomac Electric and Power Company
$PM_{10}/PM_{2.5}$	particulate matter equal to or less than 10 and 2.5 microns in diameter
PV	photovoltaic
RCRA	Resource Conservation and Recovery Act
R-E	Residential Estate
ROI	region of influence

R-O-S	Reserved Open Space
R-R	Rural Residential
SIP	State Implementation Plan
SO_2	sulfur dioxide
UESC	Utility Energy Services Contract
U.S.	United States
U.S.C.	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
VOC	volatile organic compound
WGLES	Washington Gas Light Company Energy Systems

Executive Summary

This Environmental Assessment (EA) analyzes the potential environmental consequences resulting from a proposal to construct and operate a 1.875-Megawatt (MW) alternating current photovoltaic (PV) system on approximately 12.09 acres of land located in the northwestern corner of the Federal Law Enforcement Training Centers (FLETC) in Cheltenham, Maryland (Proposed Action). This EA is prepared in accordance with the National Environmental Policy Act of 1969 ([NEPA]; 42 United States Code [U.S.C.] 4321 *et seq*.); the Council on Environmental Quality (CEQ), *Regulations Implementing the Procedural Provisions of NEPA* (40 Code of Federal Regulations [CFR] §§1500-1508); the United States Department of Homeland Security (DHS) Directive 023-01 Revision 01, *Implementation of the National Environmental Policy Act* (October 31, 2014); DHS Instruction Manual 023-01-01 Revision 01 (November 6, 2014); and other pertinent environmental statutes, regulations, and compliance requirements.

Purpose and Need for the Action

The purpose of the Proposed Action is to assist the DHS and FLETC to decrease energy costs, ensure long-term energy price stability, and to reduce reliance upon fossil fuels and environmental impact. The Proposed Action is needed to meet federal government renewable energy directives and DHS's overall sustainability goals while maintaining FLETC's mission of national security. In 2005, the Energy Policy Act (EPAct) was passed by Congress. Section 203 of this Act requires that, of the total amount of electric energy the federal government consumes during any fiscal year (FY), specific amounts shall be from renewable energy sources. Renewable energy sources include wind, solar, geothermal, and other sustainable methods. Further, on May 17, 2018, President Trump signed Executive Order (EO) 13834 *Efficient Federal Operations*, directing federal agencies to meet policy goals for energy efficiency, consumption of renewable energy, electricity and potable and non-potable water, and sustainability, among other requirements, "…in a manner that increases efficiency, optimizes performance, eliminates unnecessary use of resources, and protects the environment." As a result of EO 13834, FLETC is required to reduce energy and water intensity, decrease greenhouse gas (GHG) emissions, and include renewable energy as part of its portfolio. The Proposed Action will assist FLETC and the DHS in meeting their overall sustainability, mission readiness, and resiliency goals, including the optimization of energy use under the future Net Zero Energy (NZE) requirements.

Proposed Action and No-Action Alternative

FLETC proposes to construct and operate a 1.875-MW PV system on approximately 12.09 acres of land located in the northwestern corner of FLETC Cheltenham. Approximately 6,162 modules would be used to obtain a total power output of 1.875 MW of alternating current. The modules are considered to have an estimated operational lifetime of upwards of 30 years. The PV system would consist of 24 vertical rows spaced 15.8 feet apart; the number of modules per row varies. The only permanent impervious surface areas associated with the Proposed Action would be the two concrete pads, the gravel access path, and the steel posts totaling 1,604 square feet of new impervious surface. Site preparation activities prior to the installation of the proposed PV system would involve vegetation removal totaling 12.02 acres followed by fine grading of 10.21 acres within the 12.09-acre Proposed Action Area.

Installation of the PV system and associated infrastructure would involve a variety of powered equipment, such as a crane, bulldozers, feller bunchers, graders, scrapers, post pounders, forklifts, and trenchers. However, most of the work would involve manual labor using hand tools. Installation of the solar array would occur over a 9- to 10-month period (depending on weather conditions). In addition to the Proposed Action, FLETC analyzed the No-Action Alternative.

Summary of Potential Environmental Impacts

This EA provides a description of the affected environment and an analysis of the potential environmental consequences resulting from the Proposed Action and the No-Action Alternative. Resource categories analyzed include: earth resources; air quality; noise; solid and hazardous materials and waste management; water resources; biological resources; cultural resources; land use, aesthetic, and visual resources; infrastructure; socioeconomics and environmental justice; and sustainability and resilience. According to the analysis in this EA, implementation of the Proposed Action or the No-Action Alternative would result in no significant environmental impacts in any resource category. Other than having a moderate beneficial impact on sustainability and resilience, implementation of the Proposed Action would not significantly affect existing conditions at Cheltenham. Table ES-1 summarizes and highlights the results of the analysis by resource category.

Table ES-1. Summary of Potential Environmental Impacts for the No-Action Alternative and the Proposed Action

Resource Area	No-Action Alternative	Proposed Action Alternative	Proposed Action Justification
Earth Resources	No impacts	Negligible impacts	Construction and operation of the Proposed Action would result in negligible impacts to on-site soils and topography and would not impact the regional geologic resources as associated modifications would be restricted to near-surface levels. Excavation and grading activities would result in negligible, short-term, localized increases in erosion and sedimentation from stormwater runoff.
Air Quality	No impacts	Negligible impacts	The emissions associated with construction and operation of the Proposed Action would be well below *de minimis* standards. Cheltenham's Erosion and Sediment Control (ESC) Plan and a Stormwater Management Plan which include best management practices (BMPs) designed to control fugitive dust, were approved by Maryland Department of the Environment (MDE). As a result, there would be a negligible air quality impact associated with construction or operational emissions.
Noise	No impacts	No impacts	No noise impacts are predicted for residential receptors due to the Proposed Action. In addition, the mixed

Resource Area	No-Action Alternative	Proposed Action Alternative	Proposed Action Justification
			deciduous and coniferous forest stand buffer would provide additional noise reduction. Maintenance, which would be the only long-term activity associated with the Proposed Action, only requires hand tools and vehicles. This activity would not have any noise-related impacts to the nearby residences and therefore no mitigation is needed.
Solid and Hazardous Materials and Waste Management	No impacts	Negligible impacts	As required by MDE, management of construction debris resulting from the Proposed Action would include recycling and reuse when possible. The remaining construction debris would be transported to a permitted facility (Ritchie Land Reclamation Project C & D Landfill in Upper Marlboro, Maryland) for disposal. Cheltenham would obtain a permit for soil remediation from MDE if soil contamination is encountered during the duration of the Proposed Action. Additionally, Cheltenham would contact the Waste Diversion and Utilization Program directly to ensure activities that would generate or handle hazardous wastes are being conducted in compliance with applicable state and federal laws and regulations. Similarly, Cheltenham would also contact the Program prior to construction activities to ensure that the treatment, storage or disposal of hazardous wastes and low-level radioactive wastes at the facility will be conducted in compliance with applicable state and federal laws and regulations. As a result, there would be negligible impacts due to management of nonhazardous and hazardous waste generated by construction and operation of the Proposed Action.
Water Resources	No impacts	Negligible impacts to Tier II streams after mitigation Negligible impacts to surface and groundwater, floodplains and wetlands	To minimize impacts to surface waters and protect high-quality Tier II streams, Cheltenham would implement all applicable enhanced BMPs, or additional controls, potentially above those minimally required, during and post-construction. Cheltenham's ESC Plan and Stormwater Management Plan provide detailed BMPs to minimize adverse impacts from stormwater runoff

Resource Area	No-Action Alternative	Proposed Action Alternative	Proposed Action Justification
			caused by construction and impervious surfaces. These plans received MDE approval on August 17, 2020. Cheltenham met the requirements of the MDE General Permit for Stormwater Discharges from Construction Activity for ground disturbances involving one or more acres on September 4, 2020. FLETC will mitigate the loss of 12.02 acres of forest within a Tier II watershed with the on-site planting of 7.24 acres of trees that will be protected in accordance with a long-term protection agreement. In a letter dated September 3, 2020, MDE certified that the Proposed Project has adequately addressed avoidance and minimization alternatives analysis, including an acceptable social and economic justification for unavoidable impacts to Tier II resources, as required by Code of Maryland Regulations (COMAR) 26.08.02.04-1, and therefore has satisfied the Antidegradation Tier II Review. Since Cheltenham's ESC and Stormwater Management plans are compliant with Section 307 of the Federal Coastal Zone Management Act of 1972, as amended (CZMA), National Oceanic and Atmospheric Administration regulations (15 CFR Part 930), and Maryland's anti-degradation policy, there would be negligible impacts to surface and groundwater. There would be negligible impacts to floodplains or wetlands as a result of the Proposed Action.
Biological Resources	No impacts	Negligible impacts to forest resources after mitigation. No impacts to state or federally protected species.	Impacts to vegetative habitat would include the permanent loss of forest resources while impacts to wildlife resources as a result of the Proposed Action would be short-term and minor. Coordination efforts with the Maryland Department of Natural Resources (MD DNR) through the Maryland State Clearinghouse resulted in no project-specific comments concerning state-listed rare, threatened and endangered species (Appendix B). Coordination with MD DNR in 2012 indicated that the forested area on the project site contains forest interior dwelling species (FIDS) habitat (see Appendix B).

Resource Area	No-Action Alternative	Proposed Action Alternative	Proposed Action Justification
			FLETC has incorporated two FIDS site design guidelines into the site design. Additionally, FLETC incorporated FIDS protection elements into mitigation considerations. The U.S. Fish and Wildlife Service (USFWS) indicated that no federally proposed or listed endangered or threatened species are known to exist within the Proposed Action Area. Furthermore, USFWS stated there is no critical habitat within the Proposed Action Area under USFWS jurisdiction. Based on these findings and results from a field assessment performed in 2019 (Appendix D), there would be no indirect or direct effects on state or federally proposed or listed rare, threatened and endangered species. FLETC will mitigate the loss of 12.02 acres of forest with the on-site planting of 7.24 acres of trees within the Piscataway Creek 1 watershed and the areas will be protected in accordance with a long-term protection agreement. This mitigation serves to satisfy State of Maryland's requirements for the Forest Conservation Act (FCA), COMAR 08.19.04.11.
Cultural Resources	No impacts	No impacts	The Maryland Historic Trust (MHT) "found this project to be consistent with their plans, programs, and objectives." There would be no impacts to cultural resources as a result of the Proposed Action.
Land Use, Aesthetic, and Visual Resources	No impacts	No significant impacts to land use. Negligible impacts to visual resources and aesthetics.	The potential for adverse effects to land use of neighboring properties is not significant. The Maryland Department of Planning (MDP) found the Proposed Action to be consistent with their plans, programs, and objectives and Prince George's County did not have comments. The National Capital Planning Commission (NCPC) approved the preliminary site development plans with comments for the Proposed Action. Final approval is anticipated to be obtained in October 2020. The potential for visual impacts due to the Proposed Action's proximity to residential areas and motorists traveling within Cheltenham would be negligible.

Resource Area	No-Action Alternative	Proposed Action Alternative	Proposed Action Justification
Infrastructure	No impacts	Negligible impacts to roadways and traffic. No significant impacts to potable water supplies or the storm drainage system. Beneficial impact to electrical system.	The Maryland Department of Transportation (MDOT) had no project-specific comments concerning roadways and traffic. Impacts to roadways and traffic during installation, construction, and operation of the Proposed Action would be negligible. No significant impacts to potable water supplies are anticipated. No significant impacts are anticipated to the storm drainage system. There would be a minor, beneficial impact to the electrical system as a result of the Proposed Action. Under the Proposed Action there would be no change in Cheltenham's heating and cooling demands.
Socioeconomics and Environmental Justice	No impacts	Beneficial impacts to economy. No impacts to public services or environmental justice.	Short-term beneficial economic impacts would occur as a result of a temporary increase in construction workers hired and the local purchasing of construction materials. Long-term economic benefits could occur due to potential contractual support needs for operation and maintenance of new infrastructure. No impacts to public services would occur. There would be no impact on environmental justice populations or children from the Proposed Action.
Sustainability and Resilience	No impacts	Beneficial impact	The Proposed Action would have a moderate beneficial impact on sustainability and resilience at Cheltenham because it would lower costs, reduce the greenhouse gas footprint of the facility, generate approximately 60 percent of Cheltenham's total annual electricity consumption based on historical utility data, and improve energy security.

Findings and Conclusions

The analyses described in the EA demonstrate that the Proposed Action would not result in a significant adverse effect on the environment. As a result, no additional analysis or documentation (i.e., Environmental Impact Statement) is required under NEPA (42 U.S.C. 4321 *et seq*.) or CEQ's *Regulations Implementing the Procedural Provisions of NEPA* (40 CFR §§1500-1508). FLETC would utilize all practical means to minimize or avoid the potential for adverse impacts to the human and natural environment.

1 Introduction

This Environmental Assessment (EA) has been prepared to identify, analyze, and document the potential direct, indirect, and cumulative effects on the physical, natural, cultural, and socioeconomic environments resulting from the Federal Law Enforcement Training Centers' (FLETC) Proposed Action of constructing, operating, and maintaining a 1.875-megawatt (MW) photovoltaic (PV) system at Cheltenham. FLETC, as a federal agency, is required to incorporate environmental considerations into their decision-making process for the actions they propose to undertake. The Proposed Action will assist FLETC and the U.S. Department of Homeland Security (DHS) in meeting their overall sustainability, mission readiness, and resiliency goals.

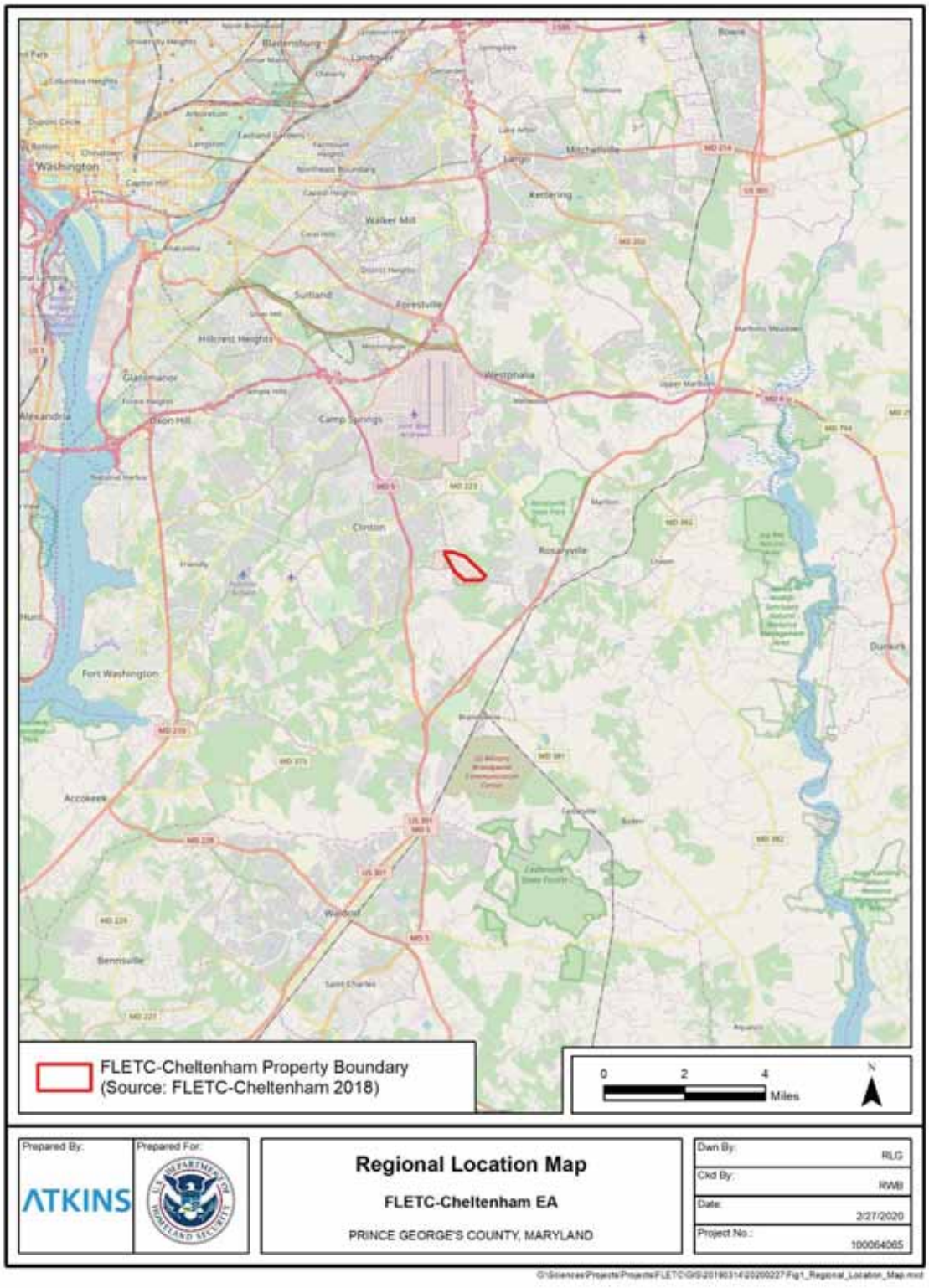
1.1 Background

The DHS FLETC mission is to train those who protect our homeland by serving as an inter-agency law enforcement training organization for over 90 federal Partner Organizations (DHS 2019). FLETC also provides services to state, local, tribal, campus, and international law enforcement officers and agents.

FLETC is comprised of four facilities with the headquarters being located near Brunswick, Georgia. FLETC-Cheltenham (hereafter referred to as Cheltenham) is located in Prince George's County, Maryland (Figure 1), approximately 15 miles southeast of downtown Washington, D.C. Cheltenham is the smallest of the four FLETC sites but offers the most specialized training. The primary mission at Cheltenham is firearms and driver training requalification for law enforcement personnel in the Washington, D.C. region. Over the long term, Cheltenham will continue to focus on providing requalification and in-service training to law enforcement offices in the Capital region.

FLETC environmental policy requires the protection of natural resources, pollution prevention, and waste reduction through the integration of environmental stewardship actions into daily operations. In accordance with this policy, FLETC is reducing current electricity and water consumption and striving to identify alternative renewable energy sources (e.g., wind and solar power). In 2005, the Energy Policy Act (EPAct) was passed by Congress. Section 203 of this Act requires that, of the total amount of electric energy the federal government consumes during any fiscal year (FY), specific amounts shall be from renewable energy sources. Renewable energy sources include wind, solar, geothermal, and other sustainable methods. On December 19, 2007, President Bush signed the Energy Independence and Security Act of 2007 (EISA), reinforcing the energy reduction goals for federal agencies outlined in Executive Order (EO) 13423, *Strengthening Federal Environment, Energy, and Transportation Management*, and introducing more aggressive requirements including Section 432, *Management of energy and water efficiency in Federal buildings*.

Figure 1. Regional Location Map



On October 8, 2009, President Obama signed EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance,* which established federal energy requirements in several areas, including the increased use of renewable energy by federal agencies and implementation of renewable energy generation projects on federal property, which established sustainability goals for federal agencies and required departments to shift toward more sustainable practices. In general, sustainability means to create and maintain conditions under which humans and nature can exist in a productive harmony that permits fulfilling the social, economic, and security requirements of the present and future generations. Sustainable practices increase efficiency, reduce environmental impacts, and conserve resources. In March 2015, EO 13693, *Planning for Federal Sustainability in the Next Decade,* revoked EO 13514, and established new federal sustainability targets and expanded upon requirements established by EO 13514. Under EO 13693, all federal facilities were mandated to be designed as "net zero energy buildings", defined by the Department of Energy (DOE) as "an energy-efficient building where, on a source energy basis, the actual annual delivered energy is less than or equal to the on-site renewable exported energy" (National Renewable Energy Laboratory (NREL) 2016). As per EO 13693, DHS identified the building of a solar array at Cheltenham as a performance contracting strategy that would include onsite renewable energy projects in a percentage of energy performance contracts. On May 17, 2018, EO 13834 *Efficient Federal Operations*, was signed by President Trump, revoking EO 13693 and directing federal agencies to meet policy goals for energy efficiency, consumption of renewable energy, electricity and potable and non-potable water, and sustainability, among other requirements, "…in a manner that increases efficiency, optimizes performance, eliminates unnecessary use of resources, and protects the environment." As a result of EO 13834, FLETC is required to reduce energy and water intensity, decrease greenhouse gas (GHG) emissions and include renewable energy as part of its portfolio. The Proposed Action will assist FLETC and the DHS in meeting their overall sustainability, mission readiness and resiliency goals.

1.2 Description of the Proposed Action

The Cheltenham facility encompasses approximately 247 acres of primarily developed property within Prince George's County, Maryland. FLETC proposes to construct, operate and maintain a 1.875-MW alternating current, ground-mounted solar PV array and all associated infrastructure on approximately 12.09 acres of land located in the northwest portion of Cheltenham, referred to as the Proposed Action Area (Figure 2). The associated infrastructure would include, but is not limited to, a perimeter fence, a permanent gravel access path for service equipment, a temporary gravel access path for construction, two stormwater detention ponds, and two concrete equipment pads (Figure 3).

The PV array would generate electricity which would be consumed by Cheltenham behind the meter and would displace the electricity which would have otherwise been purchased directly from the grid. Electricity which is not consumed by Cheltenham would be sent to the grid and would be read as a negative consumption by the meter. The proposed PV system would produce an estimated 3,464,033 kilowatt-hour (kWh) or 11.7 billion British thermal units (BBTUs) per year, approximately 60 percent of Cheltenham's total annual electricity consumption based on historical utility data (Washington Gas 2017).

Figure 2. Project Location Map

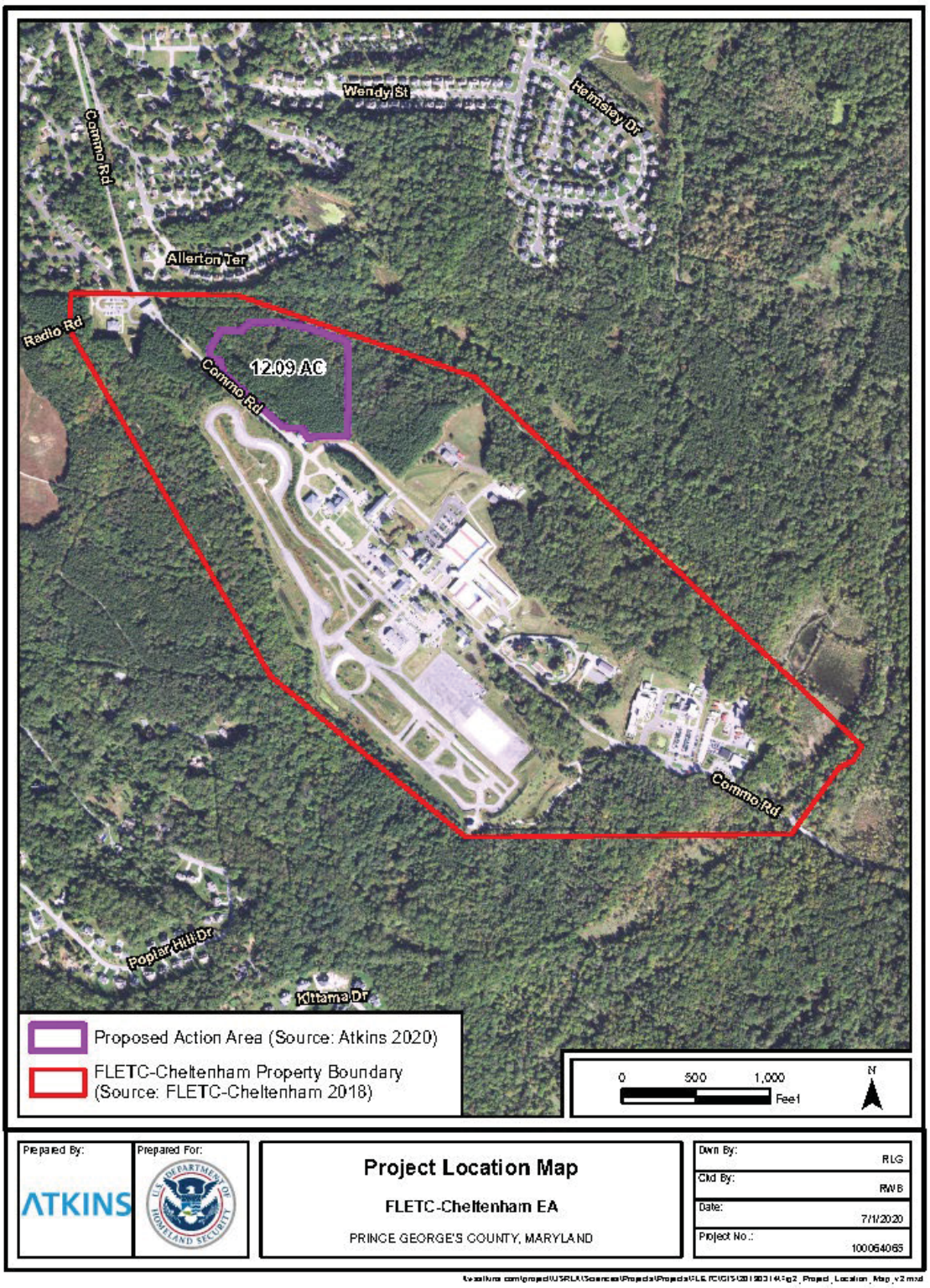
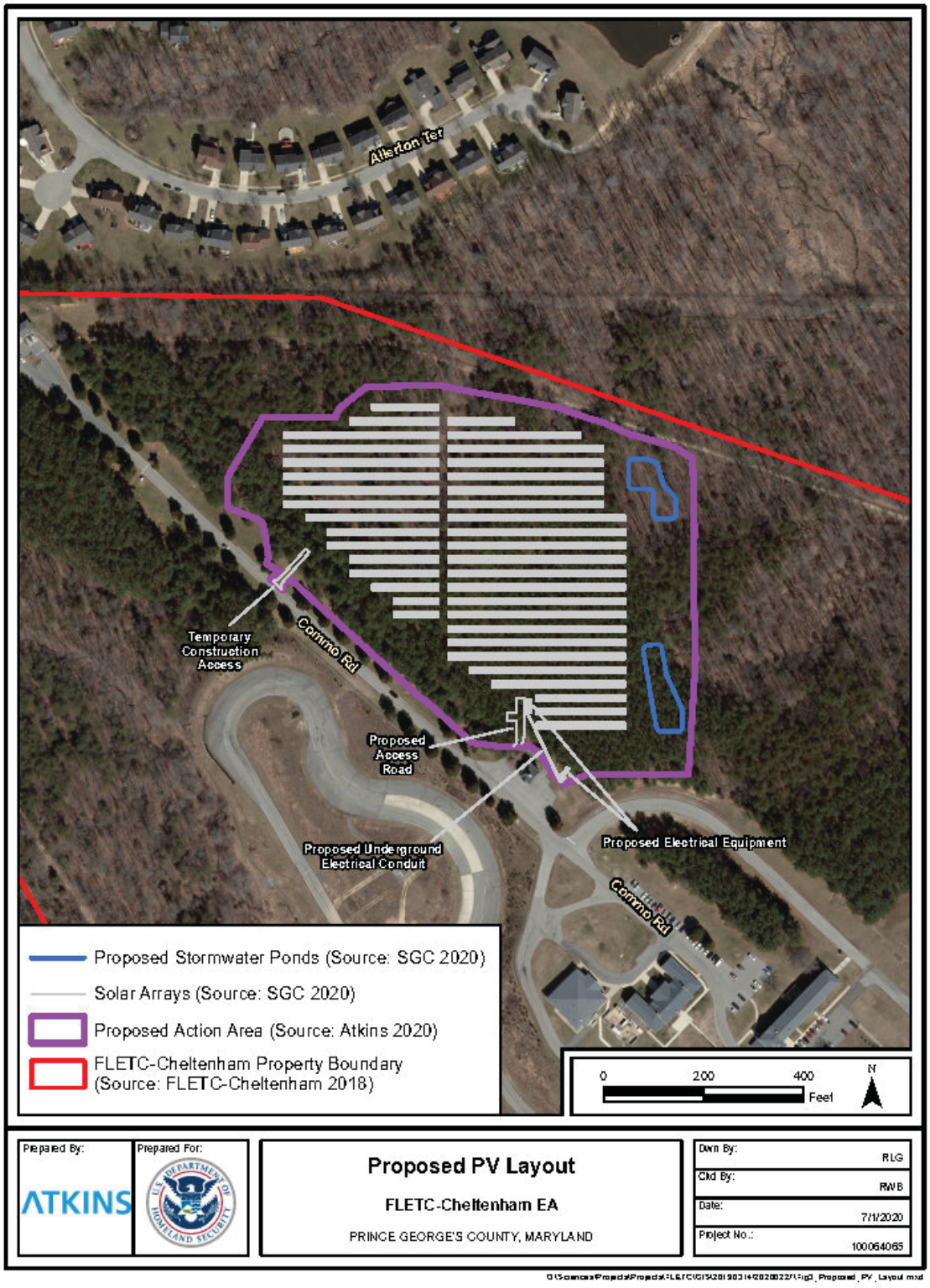


Figure 3. Proposed Photovoltaic (PV) Layout



Site preparation activities prior to the installation of the proposed PV system would involve vegetation removal totaling 12.02 acres followed by fine grading of 10.21 acres. The Cheltenham PV system would be comprised of 6,162 solar modules, each with a standard rating of 400 watts. Approximately 6,162 modules would be used to obtain a total power output of 1.875 MW of alternating current. The modules are considered to have an estimated operational lifetime of upwards of 30 years. The PV system would consist of 24 vertical rows spaced 15.8 feet apart; the number of modules per row varies. The modules would then be placed on racking tables with a fixed tilt angle of 25 degrees from grade and oriented to face due south. The resulting height above grade will be approximately 8 feet. The racking tables will be anchored by driven piles evenly spaced approximately every 15 feet along the length of each row and driven to a depth of 9 feet below the surface of the soil. The only permanent impervious surface areas associated with the Proposed Action would be the two concrete pads, the gravel access path, and the steel posts. All wiring interconnecting the system will be trenched to depths as specified by the National Electric Code.

Ground Mount Fixed Rack Solar Modules

Installation of the PV system and associated infrastructure would involve a variety of powered equipment, such as a crane, bulldozers, feller bunchers, graders, scrapers, post pounders, forklifts, and trenchers. However, most of the work would involve manual labor using hand tools. Installation of the solar array would occur over a 9- to 10-month period (depending on weather conditions), with an anticipated maximum of 20 workers per day on-site during installation. To ensure adequate access and security, Cheltenham would construct an 8-foot tall perimeter fence around the Proposed Action Area. Cheltenham would also propose the construction of a gravel access path, which would be approximately 60 feet long (Figure 3).

Facility operations would involve operating and maintaining facility equipment, including carrying out electrical tests and inspections, cleaning modules, cleaning around the site, verifying connections, landscaping, maintaining stormwater facilities, and performing corrective maintenance. Monitoring of the PV system would be conducted by utilizing an automated data system. No more than two employees would be occasionally required on-site for the operation and maintenance (O&M) of the facility. O&M would require service contractors to periodically visit the site for planned maintenance (two visits per year), as well as for unplanned corrective actions. However, the components may eventually need to be renovated or replaced over the operational life. These activities would generate waste that would be disposed of or recycled

according to disposal regulations, recycling technologies, and markets applicable at the time of renovation, replacement, or demolition.

Solar PV systems have an estimated lifetime of about 30 years or more. At the end of operational life, using the appropriate metrics, Cheltenham will consider and evaluate two options. Option 1 would be to retrofit the existing PV components (panels and inverters) with new and more efficient components and continue operations. Option 2 would be to decommission the PV system and discontinue operations. If Option 1 is selected, the retrofitted system would continue to supplement the electrical utility power supply. If the system is decommissioned as in Option 2, all existing PV components would be removed and disposed of according to standards. All support structures, fencing, and associated electrical hardware (wiring, conduit, towers, etc.) would also be removed. These activities would generate waste that would be disposed of or recycled according to disposal regulations, recycling technologies, and markets applicable at the time of renovation, replacement, or demolition. The land would then be available for future Cheltenham operations or restoration, including natural re-growth.

1.3 Purpose and Need for the Proposed Action

The purpose of the Proposed Action is to assist the DHS and FLETC to decrease energy costs, ensure long-term energy price stability, and to reduce reliance upon fossil fuels and environmental impact. The Proposed Action is needed to meet federal government renewable energy directives and DHS's overall sustainability goals while maintaining FLETC's mission of national security.

DHS is implementing *EO 13834* by increasing energy efficiency; reducing GHG emissions; conserving and protecting water sources; eliminating waste; recycling; and preventing pollution. Compliance with *EO 13834* requires DHS to adhere to sustainable principles and implement sustainable practices, including the use of renewable energy. In 2011, the Secretary of Homeland Security issued a *Sustainability Policy Letter* designed to transform the DHS into the nation's leader in sustainable law enforcement operations. Within this letter, it was mentioned that the DHS has developed a *Strategic Sustainability Performance Plan* (DHS 2011) to establish aggressive goals for sustainability as well as three primary strategies to achieve sustainability goals. These include:

- ***Strategic Business Transformation*** – DHS will take iterative steps to transform its business methodology to ensure sustainable practices are incorporated at the outset and prioritized in the decision-making process. This means including environmental impact in accounting for full life-cycle costs and return on investment.
- ***Human Capital Investment*** – DHS will actively work to raise employee awareness of sustainable practices through training and outreach programs.
- ***Leadership in Sustainable Law Enforcement*** – DHS will leverage best practices and seek out new innovations to make its law enforcement and emergency response operations more sustainable without compromising mission capabilities.

These DHS-wide goals and strategies rely upon the combined efforts of all components, through their Operational Sustainability Performance Plans (OSPP). It is critical that each component ensures sustainable practices and is integrated into the overall DHS culture. To lead this work, the DHS established a cross-functional Sustainability Council. A Sustainability Working Group was established to perform work on the behalf of the Sustainability Council. The 2017 *Strategic Sustainability Performance Plan* reflects DHS's most recent strategic vision for conducting business in a more efficient and sustainable way (DHS 2017b).

1.3.1 Sustainability and the DHS Mission

DHS is responsible for preventing terrorism and enhancing security; securing and managing the borders; enforcing and administering immigration laws; safeguarding and securing cyberspace; ensuring resilience to disasters; and maturing and strengthening the Homeland Security Enterprise. Sustainability defines a consistent and coherent set of values and goals for all projects and processes and stimulates innovation and excellence. Sustainability serves as a unifying concept for accomplishing the DHS mission.

DHS is dedicated to decreasing GHG emissions, energy, water and waste at DHS facilities, and operating high-performance sustainable buildings and fleets. Through this commitment, DHS strives to enhance sustainability and resilience of its assets and infrastructure by leading the federal government in resiliency and sustainability planning, among other efforts. DHS's three strategic sustainability goals described above focus on providing leadership in sustainable law enforcement, making a strategic transformation towards sustainable business processes, and using human capital investment to raise awareness of sustainable practices and how employees can support the DHS.

As per EO 13834, DHS uses Office of Management and Budget (OMB) Scorecard for Efficient Federal Operations and Management as a standard to identify and track best opportunities to reduce waste, enhance resilience of federal infrastructure and operations, and cut costs. Based on the August 2018 OMB, DHS made notable improvements in facility energy efficiency, water efficiency, efficiency measures and investment, and renewable energy use. In addition to continual improvements in these areas, DHS is committed to reducing fleet petroleum consumption, reducing waste, increasing sustainable buildings, reducing GHG emissions, and leveraging federal purchasing power to support environmentally preferred technologies and products. DHS also continues to look for opportunities to provide energy resilience and savings through leveraging of performance-based contracts. The most recent Strategic Sustainability Performance Plan (DHS 2017b) has been updated to reflect the August 2018 OMB results.

The implementation of distributed energy projects at DHS facilities will increase their operational security by making them less dependent on grid supplied power. This is especially important for DHS operations and data centers that must maintain 24-7 operations. Use of domestically produced biofuels and energy products can also decrease dependency upon imported oil and could help to stabilize energy costs.

1.3.2 DHS GHG Reduction Goals

DHS remains committed to creating a clean energy economy that will increase American prosperity. Reducing GHG emissions supports the DHS mission through promotion of energy security, protecting the interest of taxpayers and safeguarding the public health and the health of the environment.

1.3.2.1 DHS GHG Scope 1, 2 and 3 Targets

Scope 1 GHG emissions are direct emissions from the operation of sources that are owned or controlled by DHS and include those emissions from:

- Stationary fuel combustion equipment such as boilers, furnaces, and emergency generators;
- Mobile sources such as vehicles, aircraft, and marine vessels; and
- Fugitive and process carbon emissions associated with current land use management practices and activities (e.g., forest management practices) and from the operation of

refrigeration and air conditioning systems, electrical switchgear, and other equipment/systems.

Scope 2 GHG emissions are indirect emissions that occur as a result of DHS operations, but are produced by sources owned or controlled by another entity. Scope 2 includes emissions from the consumption of purchased electricity and steam generated by other entities. Scope 3 GHG emissions are from sources not owned or directly controlled by a federal agency but related to agency activities. DHS's target goal for FY 2025 is to reduce its combined Scope 1 and 2 GHG emissions by 61.6 percent and its Scope 3 GHG emissions by 7.5 percent (relative to its FY 2010 baseline).

1.3.2.2 DHS Initiatives to Reduce GHG Scope 1 and 2 Emissions

DHS's Scope 1 and 2 targets will be achieved primarily through four approaches: energy efficiency, the use of renewable energy, reduced fossil fuel use by vehicle fleets, and the capture and use of methane from a landfill. DHS (2017b) provides a description of initiatives to reduce Scope 1, 2, and 3 GHG emission targets, which are described below.

The Proposed Action would reduce Scope 2 (indirect emissions from electrical utility) and Scope 3 (transmission and distribution losses) emissions.

1.3.3 Overall Strategy to Meet Targets

In order to achieve established GHG targets, DHS developed a high-level approach that includes short-, medium- and long-term activities/initiatives. These activities and initiatives build on existing efforts to reduce energy use, reduce the energy intensity of its operations, increase the utilization of alternative fuels, and purchase or generation of renewable energy. In addition, DHS Heads have identified and prioritized actions to achieve these goals and annually evaluate performance (DHS, 2017b).

1.4 Regulatory Compliance

This EA is prepared in accordance with the National Environmental Policy Act of 1969 ([NEPA]; 42 United States Code [U.S.C.] 4321 *et seq*.); the Council on Environmental Quality (CEQ), *Regulations Implementing the Procedural Provisions of NEPA* (40 Code of Federal Regulations [CFR] §§1500-1508); DHS Directive 023-01 Revision 01, *Implementation of the National Environmental Policy Act* (October 31, 2014); DHS Instruction Manual 023-01-01 Revision 01 (November 6, 2014); and other pertinent environmental statutes, regulations, and compliance requirements.

The Draft EA was made available to federal, state, and local agencies on July 11, 2019 in accordance with the Interagency and Intergovernmental Coordination for Environmental Planning Process. This review process is conducted to comply with the Intergovernmental Coordination Act of 1968 and EO 12372, which requires federal agencies to obtain and consider state and local views in implementing a proposal. A list of the agencies participating in this process and the distribution list for this EA are provided in Section 5.

1.5 Agency Coordination and Public Participation

Implementation of this project is part of the DHS initiative to comply with EO 13834, *Efficient Federal Operations,* which directs federal agencies to meet sustainability goals and protect the environment in an efficient manner. Any time delays in project implementation will cause Cheltenham to fail to complete an aggressive construction schedule. The Notice of Availability

(NOA) of the Draft EA was published on July 11, 2019 in the *Prince George's Sentinel*, a weekly newspaper of general circulation. A certificate of publication confirming the publication of this notice, as well as an actual copy of the advertisement is provided in Appendix A. The Draft EA was posted to the DHS NEPA webpage (https://www.dhs.gov/national-environmental-policy-act) and on FLETC's external website (https://www.fletc.gov/national-environmental-policy-act) for review and comment by the public, federal and state agencies, and other stakeholders with an interest in the Proposed Action. Cheltenham provided a 30-calendar day public comment period (July 11 to August 9, 2019) for the Draft EA. No comments were received from the public during the 30-day public comment period; a history of agency correspondence, including that throughout the Draft EA comment period, is described in Section 1.5.1.

The Forest Conservation Plan (FCP) was subject to a separate 30-day public notice period which ran from July 25 to August 23, 2019. The Notice of Application for FCP approval was published on July 25, 2019 in the *Prince George's Sentinel*. A certificate of publication confirming the publication of this notice, as well as an actual copy of the advertisement is provided in Appendix A. No comments were received from the public and no requests were made for an information hearing during the 30-day public comment period.

A General Permit for Stormwater Associated with Construction Activity (National Pollutant Discharge Elimination System [NPDES] general permit) notice of intent (NOI) was accepted by Maryland Department of the Environment (MDE) on July 13, 2020, then a fourteen-day public notification period began. This ended on July 27, 2020 with no requests from citizens to require an individual permit. Cheltenham met the requirements of the MDE General Permit for Stormwater Discharges from Construction Activity for ground disturbances involving one or more acres on September 4, 2020.

The FONSI will be available on FLETC's external website and referenced on the DHS NEPA webpage.

1.5.1 Agency Correspondence History

Throughout the EA process, Cheltenham consulted with the following federal, state, and local government agencies:

- U.S. Department of the Interior
  - U.S. Fish and Wildlife Service (USFWS)
- National Capital Planning Commission (NCPC)
- State of Maryland
  - Maryland Department of Natural Resources (MD DNR)
  - MDE
  - Maryland Department of Planning (MDP)
  - Maryland Department of Transportation (MDOT)
  - Maryland Historical Trust (MHT)
- Prince George's County
- Joint Base Andrews

Coordination letters with all parties and associated responses are provided in Appendix B and summarized below. FLETC submitted details of the Proposed Action to the Maryland State Clearinghouse (Clearinghouse) to coordinate an intergovernmental review on March 11, 2019.

The Clearinghouse responded on April 23, 2019 with a "Consistent with Qualifying Comments and Contingent Upon Certain Actions" recommendation. Through this response, MDE notified FLETC that the Proposed Action was in the Piscataway Creek 1 watershed and Piscataway Creek 1 has been designated as a Tier II stream (Section 3.5.1). MDE also noted that the Proposed Action is located in the Maryland Coastal Zone and was therefore subject to federal consistency review. FLETC released the *Draft Environmental Assessment for the Proposed Construction, Operation and Maintenance of a 1.86-Megawatt Ground-Mounted Solar Photovoltaic Array Federal Law Enforcement Training Centers Cheltenham, Maryland* on July 11, 2019. FLETC submitted information for Negative Determination under Section 307 of the Federal Coastal Zone Management Act of 1972 (CZMA) on July 12, 2019. On August 13, 2019, the Clearinghouse forwarded an additional information request memo regarding Tier II waters from MDE. On August 28, 2019, the Clearinghouse forwarded an adverse comment letter from MDE in coordination with MD DNR dated August 9, 2019. This letter provided comments on the Draft EA and requested information on Tier II waters, forest interior dwelling species (FIDS) habitat, coastal zone consistency, and alternatives that would not impact forest resources.

On September 11, 2019, MDE submitted a letter to FLETC regarding the request for a Federal Consistency determination, pursuant to the CZMA. This letter indicated that MDE and MD DNR did not agree with the Negative Determination and requested additional information. FLETC responded to MDE's August 9, 2019 and September 11, 2019 letters in two separate responses on November 8, 2019. The November 8, 2019 letters provided responses to requests for additional information, a revised alternatives analysis, a Tier II waters checklist, and revised information for a coastal zone consistency determination. MDE's response letter to FLETC dated November 21, 2019 stating that insufficient information regarding social and economic justification applicable to projects within Tier II waters, as well as other requested information, had not been provided. On December 10, 2019, a meeting of FLETC, Washington Gas Light Company Energy Systems (WGLES), Atkins, SGC Power, MDE, and MD DNR representatives was held at MDE offices in Baltimore, Maryland to discuss outstanding information needs. MDE followed up from the in-person meeting with a letter dated December 19, 2019 on erosion and sediment control (ESC) design and December 23, 2019 documenting final information needs.

The *Draft Social and Economic Justification (SEJ) for the Proposed Construction, Operation and Maintenance of a 1.875-Megawatt Ground-Mounted Solar Photovoltaic Array, Federal Law Enforcement Training Centers, Cheltenham*, was submitted on February 28, 2020. The Draft SEJ detailed initial avoidance and minimization measures implemented during siting and design of the Proposed Action, an alternatives analysis evaluating a wide array of feasible alternatives to reduce forest clearing, additional measures to further avoid and minimize environmental impact, and proposed mitigation for unavoidable impacts to forest cover. On April 13, 2020, MDE responded to FLETC's request for a Federal Consistency Determination pursuant to the CZMA. MDE and MD DNR concurred that the proposed project is consistent with the Maryland Coastal Zone Management Program to the maximum extent practicable, provided that FLETC complies with several conditions prior to beginning construction. FLETC submitted the *Final Social and Economic Justification (SEJ) for the Proposed Construction, Operation and Maintenance of a 1.875-Megawatt Ground-Mounted Solar Photovoltaic Array, Federal Law Enforcement Training Centers, Cheltenham* (Appendix C), on August 10, 2020 with additional measures to further avoid and minimize environmental impact and final mitigation for unavoidable impacts to forest cover. In a letter dated September 3, 2020, MDE certified that the Proposed Project has adequately addressed avoidance and minimization alternatives analysis, including an acceptable social and economic justification for unavoidable impacts to Tier II resources, as required by Code of Maryland Regulations (COMAR) 26.08.02.04-1, and therefore has satisfied the Antidegradation Tier II Review.

Stormwater management and ESC coordination with MDE for concept approval began in March 2019 and continued over eight plan submittals. Updated ESC and Stormwater Management plans were submitted for concept approval on June 26, 2020 and the stormwater management concept was approved on July 13, 2020. Revised plans were resubmitted to MDE on August 12, 2020 and final approval was granted on August 17, 2020. Cheltenham met the requirements of the MDE General Permit for Stormwater Discharges from Construction Activity for ground disturbances involving one or more acres on September 4, 2020.

FLETC submitted a letter (long-term protection agreement) to MD DNR on July 21, 2020 regarding proposed mitigation to meet the State of Maryland's requirements for both Tier II Mitigation, COMAR 26.08.02.04-1, and the Forest Conservation Act (FCA), COMAR 08.19.04.11. FLETC's FCP was approved by MD DNR on August 10, 2020.

1.5.2 Federal, State, and Local Permits and Approvals

The Proposed Action would require the approval and acquisition of permits from various regulatory agencies. Table 1 provides a record of all permits and other approvals obtained for the Proposed Project.

Since the Proposed Action would disturb an area greater than 1 acre, an NPDES Storm Water Construction permit would be required prior to construction. This permit would require that a Stormwater Management and Sediment and Erosion Control approval be obtained. Additionally, in Maryland, any activity requiring an application for a subdivision, grading permit, or sediment control permit on areas 40,000 square feet (approximately 1 acre) or greater is subject to the FCA and will require a FCP.

The Proposed Action is located in the Maryland Coastal Zone and is therefore subject to a federal consistency review as per the CZMA.

The Proposed Action is located in the Piscataway Creek 1 watershed and Piscataway Creek 1 has been designated as a Tier II stream. State regulation regarding MDE implementation of the antidegradation policy for Tier II waters is contained in the COMAR 26.08.02.04-1.

The National Capital Planning Act requires federal agencies to submit project plans and development proposals for federal property to the NCPC for review. Depending upon the project's location (within or outside the District of Columbia), the NCPC either approves the project or provides recommendations (advisory authority), respectively (NCPC 2019). The Proposed Action is located outside the District, therefore the NCPC will review the Proposed Action and provide recommendations under its advisory authority.

Table 1. Summary of Proposed Project Permits and Approvals

Permit or Approval	Date of Permit Issuance or Approval
Federal Consistency Determination, pursuant to the CZMA	April 13, 2020
Stormwater Management and Sediment and Erosion Control Approval	August 17, 2020
NPDES Storm Water Construction permit	September 4, 2020
Forest Conservation Plan Approval	August 10, 2020
Tier II Determination through approval of a Social and Economic Justification	September 3, 2020
NCPC Approval	Anticipated October 1, 2020

1.6 Organization of Document

Descriptions of the seven chapters presented in this EA are as follows:

- Chapter 1 provides the purpose and need for and a description of the Proposed Action.
- Chapter 2 provides discussion of the alternatives and alternative development process and a summary of impacts.
- Chapter 3 provides a description of the existing conditions of the affected environment and the analysis of potential impacts to the resources and community characteristics as a result of the implementation of the Proposed Action and the No-Action Alternative.
- Chapter 4 provides a description of cumulative impacts and irreversible and irretrievable commitment of resources.
- Chapter 5 provides a list of agencies and persons contacted during preparation of the EA.
- Chapter 6 provides a list of the preparers of this document.
- Chapter 7 provides a list of references compiled during the development of the EA.

2 Description of the Proposed Alternatives

2.1 Introduction

This Section provides necessary information on the Proposed Action and its alternatives, including those that Cheltenham initially considered but eliminated, the reasons for elimination, and additional avoidance and minimization measures.

2.2 Alternatives

Background - Goals and Project Drivers

The NEPA (42 U.S.C. 4321 et seq.) and the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 C.F.R. Parts 1500-1508) requires reasonable alternatives to be examined. Alternatives to the Proposed Action for the PV system were analyzed, and reasonable alternatives were carried forward for further evaluation in the EA.

The federal government has mandated goals for energy, water, and GHG reduction; renewable energy utilization; fuel oil reduction; and sustainable and resilience design. The primary drivers for these goals are the EPAct 2005 (Public Law 109-58), EISA 2007 (Public Law 110-140), and EO 13693*, Planning for Federal Sustainability in the Next Decade*. The overall emphasized requirements remain the same for both executive orders. Specifically, for energy conservation and sustainability, each agency is required to meet the following goals, which are based on statutory requirements, in a cost-effective manner:

1) Meet statutory requirements related to the consumption of renewable energy and electricity;
2) Reduce potable water and non-potable water consumption, and comply with stormwater management requirements;
3) Ensure that new construction and major renovations conform to applicable building energy efficiency requirements and sustainable design practices;
4) Implement waste prevention and recycling measures and comply with all federal requirements with solid, hazardous, and toxic waste management and disposal;
5) Acquire, use, and dispose of products and services, including electronics, in accordance with statutory mandates for purchasing preference, Federal Acquisition Regulations, and other applicable federal procurement policies;
6) Track and report energy management activities, performance improvements, cost reductions, GHG emissions, energy and water savings, and other appropriate performance measures;
7) Utilize performance contracting to achieve energy, water, building modernization, and infrastructure goals (see also *Utilization of Performance Contracting* below); and
8) Achieve and maintain annual reductions in building energy use and implement energy efficiency measures that reduce cost.

Utilization of Performance Contracting

As the nation's single largest user of energy, the federal government has emphasized energy conservation through legislation and executive orders. In the EPAct of 1992 (P.L. 102-486 (codified as 42 U.S.C. 8256), the Congress authorized federal agencies to use performance contracting as a tool for implementing energy conservation measures (ECMs). Under performance contracting, a federal agency enters into a multiyear, up to 25 years, contract with a qualified energy service company, which then installs improvements for the federal agency. The company assumes all up-front capital costs and, in return, receives a portion of the annual savings attributable to the improvements for the duration of the contract. The company's portion of the energy savings is paid by the agency from funds that the agency would otherwise have used to pay its utility costs. Each Utility Energy Services Contract (UESC) is a task order under an existing General Services Administration area-wide contract and the program is managed by the Department of Energy. By definition, the UESC is a limited-source contract, using a design-build approach, between a federal agency and a serving utility.

This alternative financing mechanism, first authorized by Congress in 1986 as an amendment to the National Energy Policy Act, helps enable federal agencies and installations, such as FLETC, meet their energy conservation and sustainability goals without relying on appropriated funding. For the Cheltenham UESC Project, the PV Array, FLETC had no congressionally appropriated funding available, so the UESC was the only option for funding. All project cost, indirect and direct, was included in the financing/contract between FLETC and WGLES.

In this section, the alternatives evaluated for the Proposed Action included two distinct evaluation phases: the ECMs selection and the PV site selection/design evaluation. Alternative considerations for both evaluation phases are detailed below.

Alternatives – ECM Selection

With the overall deliverable goals as outlined above and under the auspices of a UESC, WGLES completed a Preliminary Energy Audit (PEA) at Cheltenham and submitted a report, dated January 2016. The PEA identified a list of ECMs that could be implemented to reduce energy, implement a renewable energy system, and make Cheltenham more sustainable and resilient. For the following on phases, FLETC reviewed the PEA and selected several recommended ECMs for further evaluation by WGLES in a more in-depth Detailed Feasibility Study (DFS). Note that each individual ECM's construction cost may exceed the "UESC Project" energy savings 25 years window; however, a bundled set of aggregated ECMs, must be self-funding within the required 25-year window.

In September 2016, a contract was signed by FLETC and WGLES for a DFS to further evaluate all six ECMs. These ECMs included:

1) ECM 1 – Solar PV Array
2) ECM 2 – Light Emitting Diodes (LED) Lighting Upgrade
3) ECM 3 – Conversion to Natural Gas-Fired Boilers
4) ECM 4 – Building 5 Air Recirculation
5) ECM 5 – Energy Recovery Units
6) ECM 7 – Ground Source Heat Pump

In the DFS, WGLES completed the necessary engineering and developed recommended ECMs to an approximate 35 percent design level with firm fixed-pricing and estimated savings for each ECM. In May 2017, WGLES delivered the DFS; three of the originally recommended ECMs (Building 5 Air Recirculation, Energy Recovery Units, and Ground Source Heat Pumps) were

removed from consideration during the DFS because they would not provide sufficient energy savings and/or their simple payback was too high to benefit the project. For example, geothermal was considered for the heating and cooling of Building 5, Cheltenham's In-door Firing Range. The number of wells required for the conditioning and cooling of Cheltenham's Building 5 exceeded 1,000 wells, cost approximately $7.7 million and had a simple payback of over 85 years. The Conversion to Natural Gas-Fired Boilers, ECM 3, remained a recommended project even though the simple payback was 34.3 years. This payback is in large part due to the upfront/sunk cost of replacing all aging infrastructure that FLETC would otherwise have to replace separately in the future. This ECM adds a non-interruptible natural gas supply and significant resilience to Cheltenham. For FLETC, the natural gas conversion ECM was a high priority but had to be bundled with other ECMs to move forward without appropriated funds. Therefore, when reviewing the solar PV array alternatives, it is critical to consider financial feasibility as the simple payback of the "UESC Project" rather than the solar ECM project alone.

In summary, the DFS evaluation package included the approximate 35 percent drawings, pricing, and estimated savings for the following three recommended ECMs:

1) ECM 1 – Solar PV Array
2) ECM 2 – LED Lighting Upgrade (3 Buildings)
3) ECM 3 – Conversion to Natural Gas-Fired Boilers (10 Buildings)

As noted in the DFS, the cost to implement the three recommended ECMs is approximately $9 million (not including financing) with a stipulated annual cost savings of $475,324. The resulting simple payback is 19.1 years (not including financing). When financing is included and using the current interest rate of 3.860 percent, the project duration would be approximately 21 years. The ECM's pricing, scope of services, and recommendations contained in the DFS were developed utilizing the terms and conditions established under the existing Public Utility Area Wide Contract No. GS-00P-16-BSD-1206.

Table 2 captures each ECM implementation cost, savings and simple payback associated with this UESC resiliency project through the first year.

Table 2. Summary of ECM Costs and Financial Benefits

ECM #	Measure Description	Total Cost ($) (million)	Electricity Savings (kWh)	Fuel Oil Savings (Gal)	Natural Gas Savings (Therms)	Total Energy Cost Savings ($/yr.)	Total O&M Cost Savings ($/yr.)	Simple Payback (yrs.)
ECM-1	1.875 MW Ground-Mount Solar Array	$5.96	3,464,033	0	0	$321,798	$ -	19.1
ECM-2	LED Lighting Upgrades	$0.73	519,203	0	0	$48,685	$ 8,375	13.2
ECM-3	Conversion to Natural Gas-Fired Boilers	$3.52	325,780	102,658	(152,743)	$104,841	$1,440	34.3

Source: (WGLES 2017)

Based on the cost-benefit analysis above, it is projected that by authorizing this UESC Project, FLETC's total electricity savings will be 4,309,016 kWh. Further, FLETC will save $475,324 in the first year alone which is approximately 71 percent of Cheltenham's FY 2017 utility cost of $666,735.

Because of the federal requirements for on-site renewable energy, FLETC needed a renewable source in this UESC Project. Also, FLETC needed to significantly reduce its fuel oil usage. Other alternative energy sources such as wind energy were also discussed and considered prior to the DFS stage; however, wind energy was eliminated without further evaluation given the lack of required sustained winds greater than 16 miles-per-hour in this location. As a renewable project, solar power was determined to be more feasible given the Proposed Action's geographic location. For on-site renewable energy, a ground-mounted solar PV array generating 1.875 MW alternating current (Proposed Action) was found to add the greatest GHG reduction and renewable energy production for the least cost and least impact to future mission-critical training activities, thereby meeting the purpose and need of the Proposed Action. Table 2 shows that the ground-mount solar array, ECM-1, added economic benefits to the overall UESC Project with under 25-year financing.

Table 3 lists anticipated outcomes for implementing ECMs 1, 2, and 3, the 1.875 MW ground-mount solar array, the LED lighting upgrades, and the conversion to natural gas-fired boilers, respectively.

Table 3. Summary of the Recommended ECMs Anticipated Outcomes

ECM	Anticipated Outcomes
ECM 1 - 1.875 MW Ground-Mount Solar Array	• Reduce GHG emissions • Electricity produced by the PV solar array will cost less to produce than electricity produced by the utility Potomac Electric and Power Company (PEPCO) • The PV solar array will produce more than 60 percent of Cheltenham's Electricity • Electricity production for 30 years or more • Allows FLETC to develop a net zero energy plan • Meet EO 13693 renewable energy requirements for Cheltenham
ECM 2 – LED Lighting Upgrades	• Save electricity • Building 5, 6 and 11 Energy Intensity rates will decrease • Reduce O&M costs since bulbs will last longer and be changed less

ECM	Anticipated Outcomes
ECM 3 - Conversion to Natural Gas-Fired Boilers	• More resilient delivery method than trucking • Reduction of GHG emissions since natural gas is a "cleaner" burning fuel • Cost avoidance and manpower savings since fuel oil tanks go away • Requirement for related environmental spill safety plans go away • O&M savings associated with natural gas boilers verses the existing fuel oil boilers • Building 12's building energy intensity will decrease since existing electric boilers will be replaced with natural gas boilers • Savings in nine buildings related to the cheaper natural gas cost verses the fuel oil cost • Savings in Building 12 from the natural gas cost verses the electricity cost • Future avoided cost of new boilers • Replace aging infrastructure • Nine #2 fuel oil tanks will be removed from nine buildings • Meet EISA, Section 433 fuel oil reduction requirements (Relative to 2003, fuel oil is to be reduced by: 65 percent in 2015; 80 percent in 2020, 90 percent in 2025, and 100 percent in 2030)

Alternatives – PV Site Selection

As detailed in Section 1.3.1, the purpose and need for the Proposed Action specifies that FLETC's mission of national security be maintained. Off-site locations for the solar system were discussed and considered; however, the federal statutes require the renewable production be located on-site. Also, for resilience and future micro-grid and/or backup battery capability, the energy production is required to be located on-site within the FLETC property boundary. Furthermore, on-site production allows FLETC to develop a net-zero building plan and control security access. For these reasons, off-site locations were eliminated from further consideration in the EA.

In the evaluation and siting of the solar PV array, different on-site locations and alternatives were considered. As in the ECM selection, screening criteria were used to evaluate the potential solar PV array alternatives. In comparing their differences, the following criteria were used:

1. No impacts to mission-critical activities
2. Meets energy production for purpose and need (at least 60 percent of FLETC's consumable energy)

3. Financial feasibility (i.e., construction cost would not exceed the "UESC Project" energy savings in under 25 years)
4. Environmental impact (acreage of forest resources lost)

Screening criteria 1, 2, and 3 above are associated with federal mandates. As such, these screening criteria must be met in order to implement the proposed action; if these criteria are not met, the alternative would be considered unfeasible. While FLETC will make all efforts to minimize environmental impacts, a loss of forest resources alone would not eliminate an alternative from further consideration.

In order to evaluate each alternative against the four screening criteria listed above, the following measurements were calculated:

- **Specific Production** – The ratio of kilowatt hours of energy produced for every kilowatt of power (DC) installed. This estimated ratio considers all system losses including sub-optimal orientation and/or tilt, shading, temperature, weather, wiring lengths, equipment inefficiencies, etc. It can be used as a measure of relative system design effectiveness, allowing comparison between installations with different locations, orientations, and design and installation parameters.
- **Annual Production** – The total amount of electrical energy expected to be generated by the PV solar system in the first year.
- **Percent Energy Usage Offset** – Shows what percentage of FLETC's annual electricity usage is offset by this alternative. FLETC's goal is to offset 60 percent of their annual usage.
- **Acres of Trees Cleared** – The total area of trees that would need to be cleared to install the PV solar array and also ensure the array is not shaded during the summer when potential for production of electrical energy is highest. The designs do allow for some shading fall through spring.
- **Price Per Watt** – Total construction costs divided by the system size. Provides a quick comparison of the cost efficiency of an alternative.
- **System Price** – The total construction costs for a system. This includes design, engineering, materials, installation, interconnection to the utility, overhead, and profit. This does not include O&M costs as O&M costs do not need to be financed as part of the UESC contract. O&M costs were explored under each individual alternative.
- **Operation and Maintenance Cost (30 years)** – Includes estimated costs for all parts and labor required to ensure optimum performance of the solar array over the 30-year expected lifetime. This includes costs for removing and replacing the inverters every 10 years; costs for maintenance of the other electrical equipment over 30 years; and costs for on-going maintenance of the site including mowing, trash/debris removal, re-seeding, and maintenance of any stormwater features. Inflation is taken into account.
- **Solar ECM Simple Payback Period** – The number of years required to pay back the total construction costs for the PV solar array via the energy savings generated by the array. This does not consider financing costs such as interest.
- **Project ECM Simple Payback Period** – The number of years required to pay back the total construction costs for all implemented ECMs via energy savings generated by all the ECMs. This does not consider financing costs such as interest.

Various on-site locations and solar array variations were considered. Alternatives 1 through 4 address individual on-site location types and structures, while Alternatives 5 through 8 represent combinations/hybrids of Alternatives 1 through 4. As multiple sites (e.g., more than one building rooftop) may be considered for viability within a specific alternative, only those portions identified as viable through the evaluation of Alternatives 1 through 4 were carried forward for consideration in other configurations as part of the respective hybrid alternatives. The solar array alternatives considered include:

Alternative 1. Ground-Mounted Array in the Proposed Action Area

Alternative 2. Rooftop Solar Arrays

Alternative 3. Parking Lot Arrays

Alternative 4. Ground-Mounted Array in Existing Open Area

Alternative 5. Hybrid of Alternatives 1 (Ground-Mounted Array in the Proposed Action Area) and 2 (Rooftop Solar Arrays)

Alternative 6. Hybrid of Alternatives 1 (Ground-Mounted Array in the Proposed Action Area) and 4 (Ground-Mounted Array in Existing Open Area)

Alternative 7. Hybrid of Alternatives 2 (Rooftop Solar Arrays) and 4 (Ground-Mounted Array in Existing Open Area)

Alternative 8. Hybrid of Alternatives 1 (Ground-Mounted Array in the Proposed Action Area), 2 (Rooftop Solar Arrays), and 4 (Ground-Mounted Array in Existing Open Area)

The individual on-site locations and associated structure types identified in Alternatives 1 through 4 are shown on the following Cheltenham map, Figure 4. The hybrid alternatives (Alternatives 5 through 8), limited to only those sites identified as viable through the evaluation of Alternatives 1 through 4, are shown in Figure 5.

Relative to the noted criteria, the specifics related to each alternative are discussed in the following pages. The long-term use of each alternative would have an estimated lifetime of about 30 years or more (see Section 1.2).

Figure 4. Locations of Alternatives 1 through 4

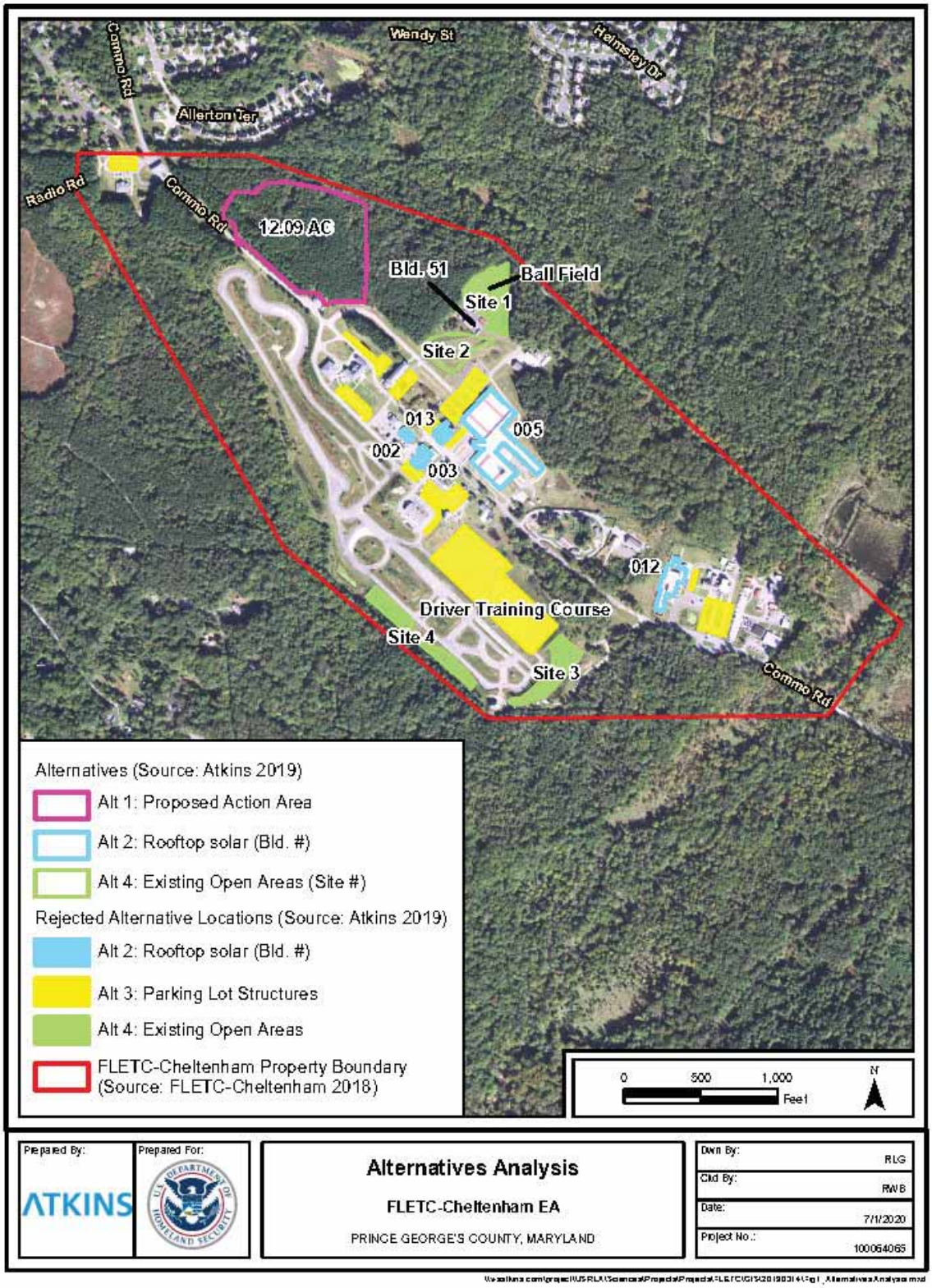
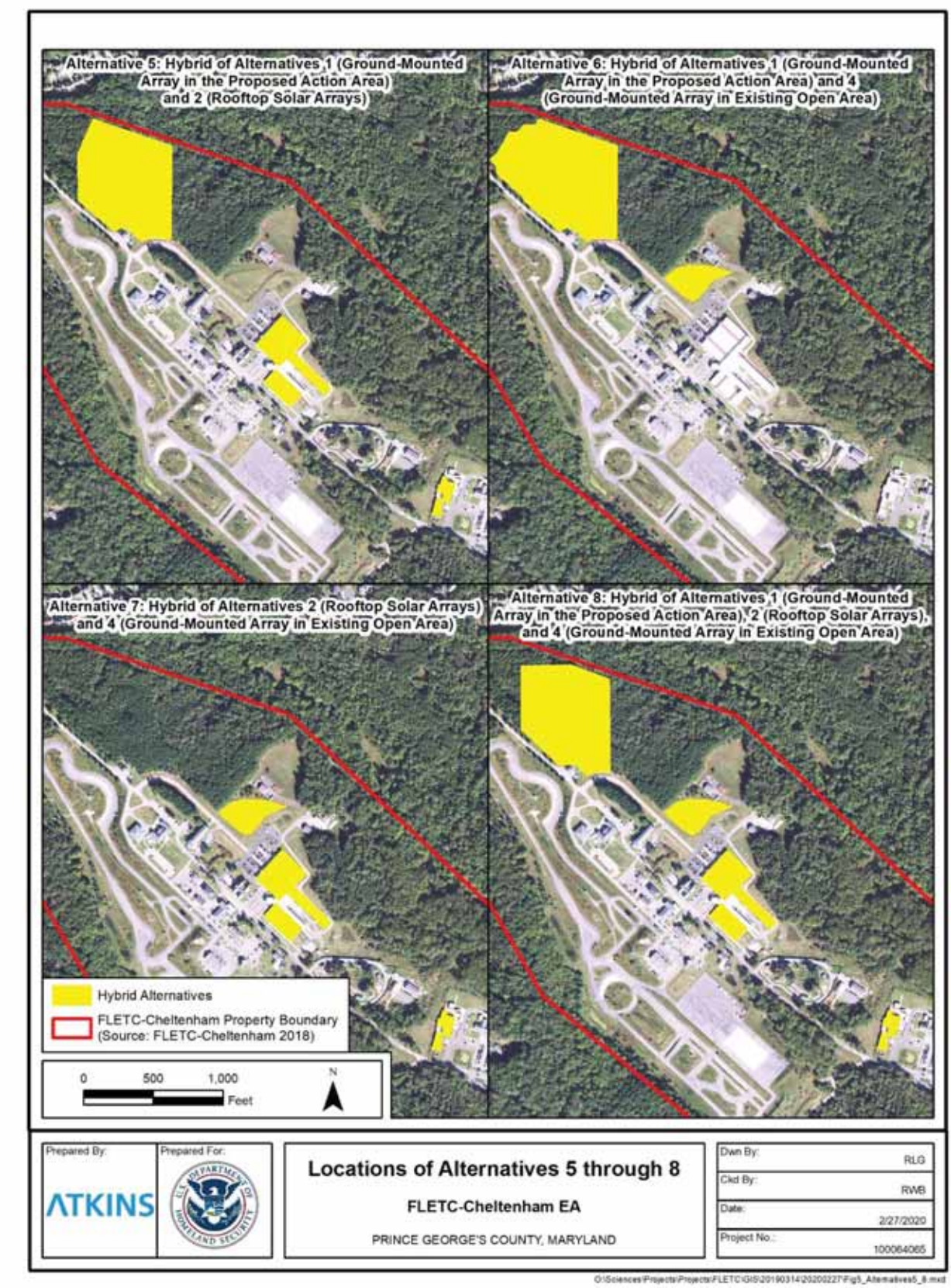


Figure 5. Locations of Alternatives 5 through 8



2.2.1 No-Action Alternative

While the No-Action Alternative would not satisfy the purpose or need for the Proposed Action, inclusion of the No-Action Alternative is prescribed by the CEQ regulations (40 CFR §1502.14). The No-Action Alternative reflects the *future without project* and provides a comparative baseline against which to analyze the effects of the Proposed Action.

Under the No-Action Alternative, the Proposed Action would not be implemented. FLETC would continue to receive all its electricity for Cheltenham from Potomac Electric and Power Company (PEPCO), the primary electric utility provider for the region. No renewable energy sources would be installed on the property. Therefore, the electric grid would not receive the proposed 1.875 MW of clean renewable electricity produced by the proposed PV array and the associated demand would be accommodated through conventional measures, such as fossil fuel plants, along with the associated airborne emissions, and demand for fuels, water and other resources. FLETC would miss the opportunity to be more resilient and to meet the future Net Zero Energy (NZE) requirements. Further, Cheltenham would not contribute to DHS' ability to meet the requirements set forth in EO 13834, the EPAct of 2005, EISA, and DHS's overall sustainability goals.

2.2.2 Alternative 1: Ground-Mounted Array in the Proposed Action Area

Early in the design phase of the solar PV array, it was calculated that 20.9 acres of the 26.2 forested area (Figure 6) would be required to support the number of modules needed to completely offset FLETC's consumable power. This design also included removal of the large trees immediately adjacent to Cheltenham's Commo Road to reduce shading of the solar array. Later in the design phase, it was determined that FLETC could meet statutory requirements related to the consumption of renewable energy and electricity and decrease GHG emissions while minimizing impacts to planted forest resources. A simulation analysis demonstrated that the design for the proposed ground-mounted solar PV array would remove 12.98 acres of planted forest and offset approximately 60 percent of FLETC's consumable power. This acreage reflected a 38 percent reduction in net forest loss resulting from early environmental impact minimization efforts. Due to technological advances in modules and inverters that have occurred since the 12.98-acre design, the system was redesigned to produce the same amount of energy utilizing fewer modules and less supporting equipment and wiring. The updated design allows for the avoidance of areas with steeper slopes, significantly reducing the amount of grading required, while also reducing the acreage of trees to be cleared, and stormwater management requirements. The limits of disturbance were reduced from 13.17 to 12.09 acres and forest clearing reduced from 12.98 to 12.02 acres. This final acreage reflects a 42 percent reduction in net forest loss resulting from early environmental impact minimization efforts. Also, an earlier version of the plans for the Proposed Action included removing several of the large trees along Commo Road due to shading the panels. While a minor production loss would result from keeping these trees, FLETC decided to keep the trees to reduce tree loss.

Additional avoidance and minimization measures were taken early in the design process. During initial environmental review in January and February 2019, one isolated area (0.14 acres) was identified as a wetland within the Proposed Action Area. The existence of this wetland was communicated to the solar design team and the design was revised to include a 25-foot buffer between the wetland and the Proposed Action Area.

Figure 6. Original Solar PV Array Design Area

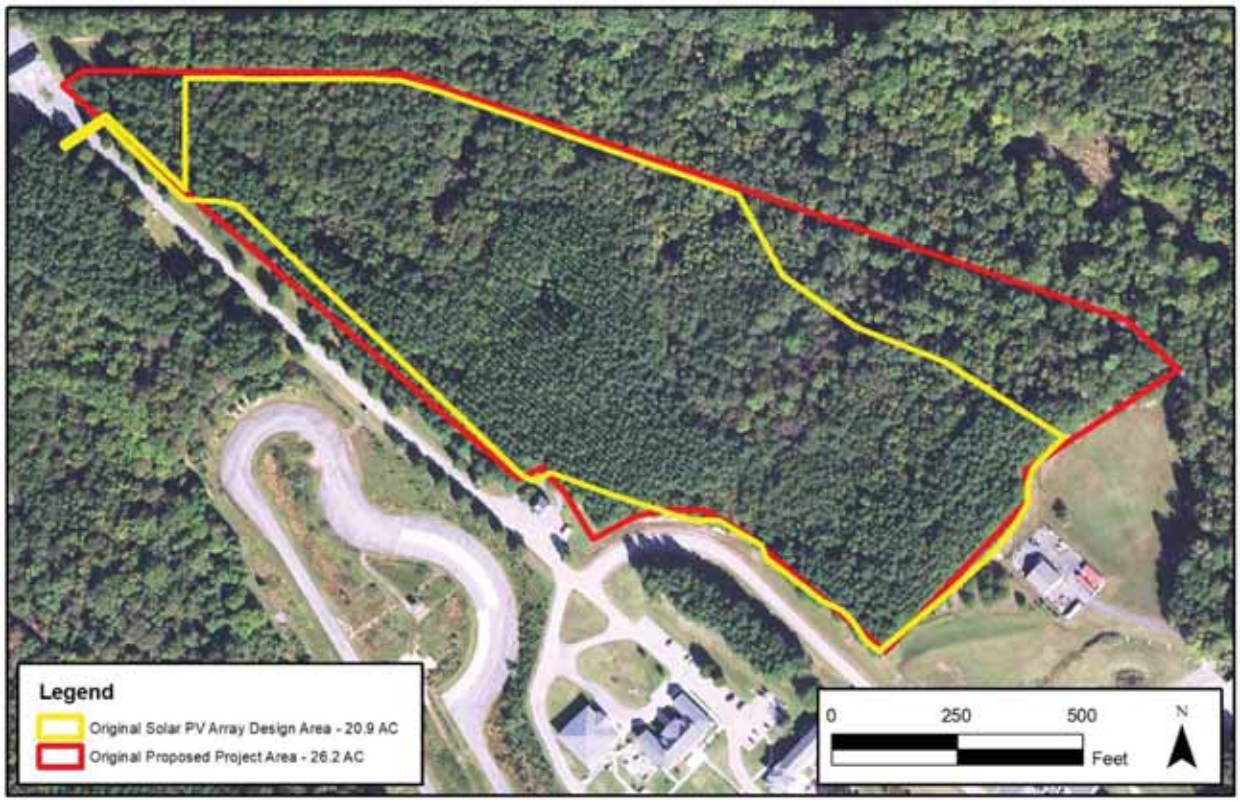
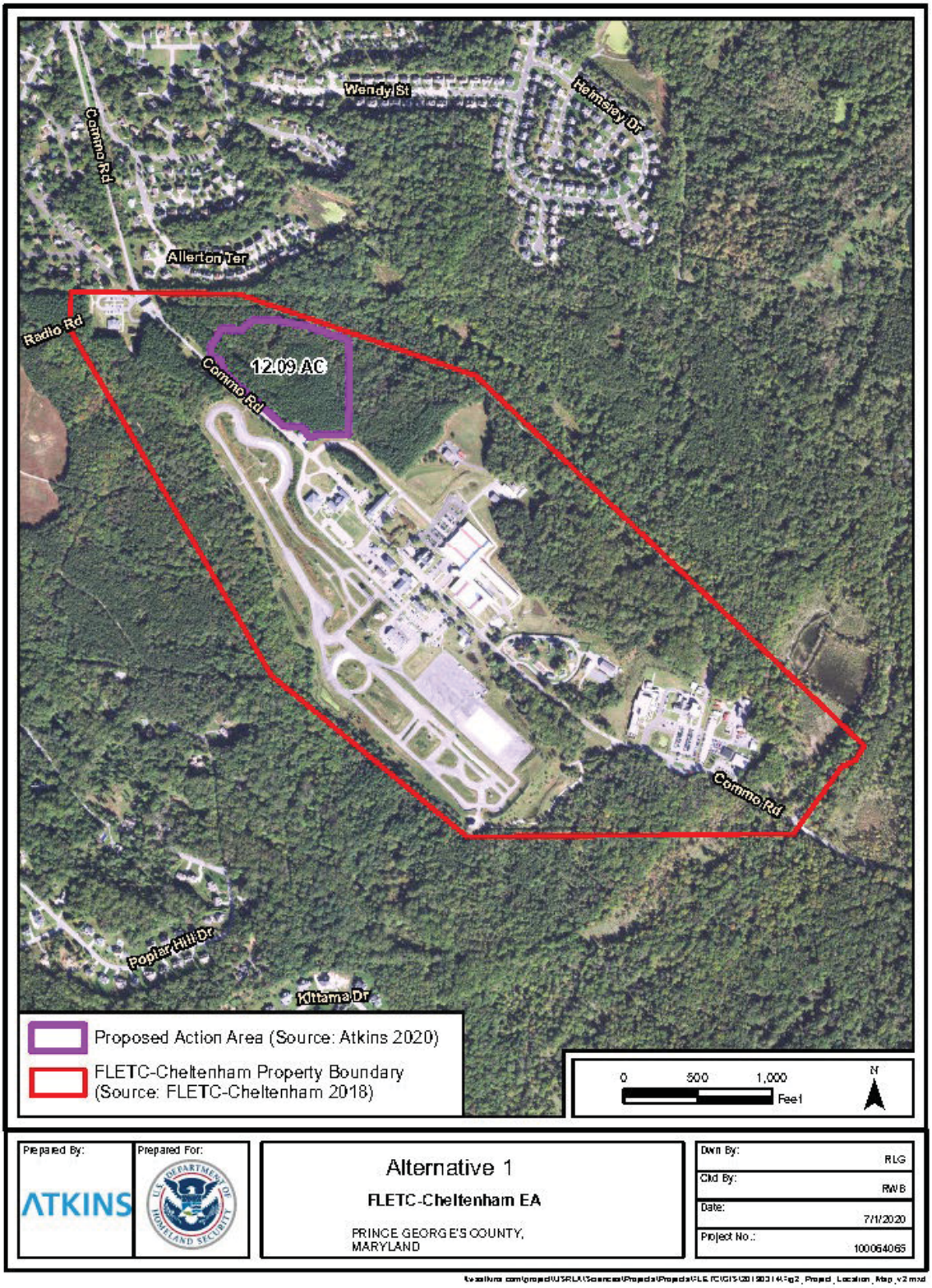


Figure 7. Alternative 1: Ground-Mounted Array in the Proposed Action Area



Screening Criteria 1: No impacts to mission-critical activities

There would be no impacts to mission-critical activities associated with Alternative 1.

Screening Criteria 2: Meets energy production for purpose and need (at least 60 percent of FLETC's consumable energy)

To generate at least 60 percent of Cheltenham's consumable power and therefore meet the purpose and need of the Proposed Action, 6,750 ground-mounted solar modules were specified for the Proposed Action (Table 5). The Proposed Action Area (approximately 12.09 acres; Figure 7) could support this number of modules.

Screening Criteria 3: Financial feasibility (i.e., construction cost would not exceed the "UESC Project" energy savings in under 25 years)

Alternative 1 is the most cost-effective alternative evaluated, as demonstrated by the low price per watt of $2.41 (see Table 5), for the following reasons:

- Ground-mounted racking has the lowest installation costs and the fastest installation times.
- This type of array allows for installation of the system at optimal tilt and orientation to maximize efficiency and electrical output.
- The selected site has low sloping topography ideal for solar panel installation with little-to-no grading required.
- The selected site is in close proximity to the existing PEPCO electrical connection, thereby eliminating the need for upgrading the facility's internal electrical grid (e.g., additional transformers, trunk lines) in multiple locations and significantly reducing overall construction cost. Additionally, short wire runs needed to connect to existing electrical infrastructure would minimize losses.
- The entire array would fit within a single location on campus resulting in minimal required security escorting and reduced data collection and monitoring equipment, thereby decreasing O&M costs.
- O&M parts could be kept near the ground-mounted array in a single location which decreases the need for FLETC to escort O&M contractors to storage areas throughout the campus to perform service.

This alternative has a simple payback of 19.1 years. The "UESC Project" has a 21.5-year payback with inclusion of this solar array alternative (Table 5) and is therefore considered financially feasible.

Screening Criteria 4: Environmental impact (acreage of forest resources lost)

Approximately 12.02 acres of forest resources would be permanently lost. FLETC intends to mitigate the loss of 12.02 acres of forest on Cheltenham as specified in Section 3.5.4.

2.2.3 Alternative 2: Rooftop Solar Arrays

Figure 8. Alternative 2: Rooftop Solar Arrays

Efficient implementation of rooftop solar arrays requires buildings that can support the additional load of the solar PV arrays and have roofs made of suitable roofing materials. On the FLETC campus, the majority of buildings have sloped roofs with slate shingles. It is very expensive to install solar panels on slate-shingled roofs due to significant labor costs (three to four times higher than installation on roofs with asphalt shingles) involved with preventing breakage (and/or replacing breakage) of the slate shingles during installation. It is typically more cost-effective to remove the slate shingles and replace them with asphalt shingles. Additionally, many of the sloped-roof buildings were built in the 1950s and 60s, prior to modern day building codes. As a result, installation of solar panels on these rooftops would involve installing structural upgrades so they could support the additional loads. Removing existing roofing material, replacing with new roofing material, and implementing structural modifications would greatly increase overall project construction cost relative to other solar PV alternatives. Accordingly, all slate-roofed buildings were eliminated from further evaluation.

Only two buildings on FLETC's campus have flat roofs; Building 5, with an ethylene propylene diene monomer roof, and Building 12, with a built-up roof of asphalt and stones. These buildings may still require time consuming and expensive structural modification upgrades to support the additional loads of the solar PV arrays per today's building codes. Solar panels installed on flat roofs require 6-foot setbacks from all roof edges, additional setbacks from other roof structures, as well as fire access paths through the centers of the arrays per National Fire Protection Association 1 (National Fire Code, Section 11.12.2.2).

Screening Criteria 1: No impacts to mission-critical activities

There would be no impacts to mission-critical activities as a result of Alternative 2.

Screening Criteria 2: Meets energy production for purpose and need (at least 60 percent of FLETC's consumable energy)

The available building rooftops capable of supporting solar PV arrays (Figure 8) could accommodate 2,480 solar modules. In addition to the limited appropriate rooftop space available resulting in the placement of fewer solar modules, this alternative would result in reduced output and system efficiency due to sub-optimum tilt and orientation as well as shading from nearby roof obstructions (e.g., vent pipes; heating, ventilation, and air conditioning (HVAC) units). As a result, this alternative would generate only approximately 21 percent of Cheltenham's consumable power (Table 5), therefore not meeting the purpose and need of the Proposed Action.

Screening Criteria 3: Financial feasibility (i.e., construction cost would not exceed the "UESC Project" energy savings in under 25 years)

This alternative would cost over 70 percent more per watt than Alternative 1 as demonstrated by the price per watt of $4.12 (Table 5), due to a variety of reasons:

- Multiple separate, smaller, and more involved arrays result in increased design, installation, and maintenance costs stemming from:
    - Multiple electrical interconnections requiring additional electrical design, materials, installation, and maintenance.
    - Increased equipment needed to monitor the PV system's performance, with each separate location and/or orientation requiring an additional set of equipment.
    - Increased security escorting required for both installation and maintenance.
    - Increased site coordination required during install for managing multiple crews in various locations and necessitating multiple sets of tools and equipment.
- Electrical interconnections through existing electrical infrastructure in the buildings may require expensive upgrades to existing transformers, switchboards, and/or wiring.
- Increased installation and maintenance costs stemming from safety measures required for working on rooftops as well as the additional equipment needed to transport materials and labor onto rooftops.
- Increased material costs over those for Alternative 1 due to the concrete ballast required to hold the solar racking to the rooftops as well as the electrical safety equipment required to meet rapid shutdown code when solar is located on buildings.

- Additional costs would be incurred when roof replacements are required due to age.
- Roof warranties would need to be renegotiated/revised to address mounting of a solar array.

This alternative has a simple payback of 27.1 years. The "UESC Project" has a 30.1-year payback with inclusion of this solar array alternative (Table 5) and is therefore not considered financially feasible.

Screening Criteria 4: Environmental impact (acreage of forest resources lost)

There would be no impacts to forest resources associated with this alternative.

2.2.4 Alternative 3: Parking Lot Arrays

Screening Criteria 1: No impacts to mission-critical activities

There would be impacts to mission-critical activities as a result of this alternative. There is only one large area (approximately 256,223 square feet) of asphalt on the FLETC campus (Figure 4); however, this is part of the driver training range facility which is central to Cheltenham's mission as a driver training re-qualification center for law enforcement agencies in the Washington, D.C. region. Cars maneuver on this area during training and the poles required to support a solar parking lot structure would render this area unsafe for driver training. Also, driver training is conducted in all weather conditions to simulate various field situations so this area could not be covered. Finally, there is an instructor training tower that must maintain a line-of-sight to all areas of the driver training track. All other parking areas distributed across the FLETC campus were also evaluated and determined to be associated with mission-critical training activities. Further, these areas cannot be covered due to security and surveillance requirements. Due to associated impacts to mission-critical training activities and the compromise of security and surveillance requirements, this alternative has been rejected and further evaluation is not provided.

Screening Criteria 2: Meets energy production for purpose and need (at least 60 percent of FLETC's consumable energy)

Not applicable due to unavoidable impacts to mission-critical training activities.

Screening Criteria 3: Financial feasibility (i.e., construction cost would not exceed the "UESC Project" energy savings in under 25 years)

Not applicable due to unavoidable impacts to mission-critical training activities.

Screening Criteria 4: Environmental impact (acreage of forest resources lost)

Not applicable due to unavoidable impacts to mission-critical training activities.

2.2.5 Alternative 4: Ground-Mounted Array in Existing Open Area

Figure 9. Alternative 4: Ground-Mounted Array in Existing Open Area

All existing open areas greater than 1 acre were evaluated resulting in four potential sites (Figure 4). Table 4 provides a summary of site characteristics used to determine each site's viability for inclusion in Alternative 4. If use of a site would impact mission-critical training activities, it was determined to be unfeasible and was not considered further.

Table 4. Alternative 4: Summary Site Considerations

Site	Impacts to Mission-Critical Training Activities	Topography Conducive to Solar Array	Potential Safety Hazard	Use for Stormwater Management
1	Yes	--	--	--
2	No	Yes	No	No
3	No	No	Yes	Yes
4	No	No	Yes	No

Site 1 – Ball Field

- The ball field site has been used, and will continue to be used, as a training area.
- Currently the only area available on-site for conducting open-field tactical training.

Use of Site 1 would impact mission-critical training activities and was not evaluated further as part of this alternative.

Site 2 – South of Building 51

- The only open space that is not associated with mission-critical activities.
- Would not pose a safety hazard to drivers using the training course.
- The low sloping topography of this site is ideal for solar panel installation with little-to-no grading required.

Site 2 was included for further evaluation of Alternative 4.

Site 3 – South of Driver Training Course

- Currently functions as part of a stormwater feature.
- Has steep slopes that are not conducive to siting solar PV arrays.
- Adjacent to the existing driver training course. Structures within this site would therefore constitute a safety hazard for drivers.

Site 3 is located within an existing stormwater feature and would present a potential safety hazard. As a result, Site 3 was not evaluated further as part of this alternative.

Site 4 – West of Driver Training Course

- Has steep slopes that are not conducive to siting solar PV arrays.
- Adjacent to the existing driver training course. Structures within this site would therefore constitute a safety hazard for drivers.

Site 4 would present a potential safety hazard and was therefore not evaluated further as part of this alternative.

Only Site 2 was considered for further evaluation as Alternative 4.

Screening Criteria 1: No impacts to mission-critical activities

There would be no impacts to mission-critical activities as a result of this alternative.

Screening Criteria 2: Meets energy production for purpose and need (at least 60 percent of FLETC's consumable energy)

The available existing open (non-forested) areas on the FLETC campus (Figure 9) could support 684 solar modules and would generate only approximately 6 percent of Cheltenham's consumable power, therefore not meeting the purpose and need of the Proposed Action.

Screening Criteria 3: Financial feasibility (i.e., construction cost would not exceed the "UESC Project" energy savings in under 25 years)

Due to its small size and low annual production (approximately 10 percent of that generated by Alternative 1), Alternative 4 is the least cost-effective alternative evaluated, as demonstrated by the highest price per watt of $9.23 (see Table 5).

This alternative has a simple payback of 62.8 years. The “UESC Project” has a 68.0-year payback with inclusion of this solar array alternative and is therefore not considered financially feasible.

Screening Criteria 4: Environmental impact (acreage of forest resources lost)

There would be no impacts to forest resources as a result of this alternative.

2.2.6 Alternative 5: Hybrid of Alternatives 1 (Ground-Mounted Array in the Proposed Action Area) and 2 (Rooftop Solar Arrays)

Figure 10. Alternative 5: Hybrid of Alternatives 1 (Ground-Mounted Array in the Proposed Action Area) and 2 (Rooftop Solar Arrays)

Alternative 5 is a hybrid of Alternatives 1 and 2 (Figure 10) and is being considered to determine the feasibility and environmental impact of combining the rooftop arrays with the ground-mounted array in the Proposed Action Area.

Screening Criteria 1: No impacts to mission-critical activities

There would be no impacts to mission-critical activities as a result of this alternative.

Screening Criteria 2: Meets energy production for purpose and need (at least 60 percent of FLETC's consumable energy)

As discussed above, solar PV arrays installed on available building rooftops capable of supporting the structures would result in sub-optimum tilt and orientation as well as shading from nearby roof obstructions (e.g., vent pipes, HVAC units). In order to generate at least 60

percent of Cheltenham's consumable power and meet the purpose and need of the Proposed Action, 7,052 solar modules would be required for this hybrid alternative.

Screening Criteria 3: Financial feasibility (i.e., construction cost would not exceed the "UESC Project" energy savings in under 25 years)

This alternative would result in a price per watt of $3.52, approximately 46 percent more than Alternative 1 alone (Table 5). This is due to a variety of reasons.

- Multiple separate, smaller, and more involved arrays result in increased design, installation, and maintenance costs stemming from:
    - Multiple electrical interconnections requiring additional electrical design, materials, installation, and maintenance.
    - Increased equipment needed to monitor the PV system's performance, with each separate location and/or orientation requiring an additional set of equipment.
    - Increased security escorting required for both installation and maintenance.
    - Increased site coordination required during install for managing multiple crews in various locations and necessitating multiple sets of tools and equipment.
- Electrical interconnections through existing electrical infrastructure in the buildings may require expensive upgrades to existing transformers, switchboards, and/or wiring.
- Increased installation and maintenance costs stemming from safety measures required for working on rooftops as well as the additional equipment needed to transport materials and labor onto rooftops.
- Increased material costs over those for Alternative 1 due to the concrete ballast required to hold the solar racking to the rooftops as well as the electrical safety equipment required to meet rapid shutdown code when solar is located on buildings.
- Additional costs would be incurred when roof replacements are required due to age.
- Roof warranties would need to be renegotiated/revised to address mounting of a solar array.

This alternative has a simple payback of 25.1 years. The "UESC Project" has a 27.1-year payback with inclusion of this solar array alternative and is therefore not considered financially feasible.

Screening Criteria 4: Environmental impact (acreage of forest resources lost)

Approximately 10.18 acres of forest resources would be permanently lost as compared to 12.02 acres with implementation of Alternative 1 alone (a net difference of -1.84 acres; approximately 15 percent reduction in lost resources).

2.2.7 Alternative 6: Hybrid of Alternatives 1 (Ground-Mounted Array in the Proposed Action Area) and 4 (Ground-Mounted Array in Existing Open Area)

Figure 11. Alternative 6: Hybrid of Alternatives 1 (Ground-Mounted Array in the Proposed Action Area) and 4 (Ground-Mounted Array in Existing Open Area)

Alternative 6 is a hybrid of Alternatives 1 and 4 (Figure 11) and is being considered to determine the feasibility and environmental impact of combining the existing open (non-forested) areas alternative with the ground-mounted array in the Proposed Action Area. As with Alternative 4, available existing open areas on the FLETC campus that could be used to supplement the Proposed Action Area in Alternative 1 are limited to one site (Site 2).

Screening Criteria 1: No impacts to mission-critical activities

There would be no impacts to mission-critical activities as a result of this alternative.

Screening Criteria 2: Meets energy production for purpose and need (at least 60 percent of FLETC's consumable energy)

In order to generate at least 60 percent of Cheltenham's consumable power and meet the purpose and need of the Proposed Action, 6,894 solar modules would be required for this hybrid alternative.

Screening Criteria 3: Financial feasibility (i.e., construction cost would not exceed the "UESC Project" energy savings in under 25 years)

This alternative would result in a price per watt of $2.80, approximately 16 percent more than Alternative 1 alone (Table 5). Despite benefits associated with ground-mounted racking systems (e.g., installation at optimal tilt and orientation to maximize efficiency and electrical output, relatively low installation costs, fast installation times), the use of two separate locations would increase costs due to:

- The design and installation of these separate, smaller systems, including infrastructure required to connect each both sites to the facility's electrical grid.
- Increased equipment needed to monitor the PV system's performance, with each separate location and/or orientation requiring an additional set of equipment.
- Increased security escorting required for both installation and maintenance.

This alternative has a simple payback of 22.6 years. The "UESC Project" has a 25.5-year payback with inclusion of this solar array alternative and is therefore not considered financially feasible.

Screening Criteria 4: Environmental impact (acreage of forest resources lost)

Approximately 11.91 acres of forest resources would be permanently lost as compared to 12.02 acres with implementation of Alternative 1 alone (a net difference of -0.11 acre; approximately 0.9 percent reduction in lost forest resources).

2.2.8 Alternative 7: Hybrid of Alternatives 2 (Rooftop Solar Arrays) and 4 (Ground-Mounted Array in Existing Open Area)

Figure 12. Alternative 7: Hybrid of Alternatives 2 (Rooftop Solar Arrays) and 4 (Ground-Mounted Array in Existing Open Area)

Alternative 7 is a hybrid of Alternatives 2 and 4 (Figure 12) and is being considered to determine the feasibility of combining the rooftop arrays with the ground-mounted array in existing open areas. As with Alternative 4, available existing open areas on the FLETC campus that could be used to supplement the Proposed Action Area in Alternative 1 are limited to one site (Site 2).

Screening Criteria 1: No impacts to mission-critical activities

There would be no impacts to mission-critical activities as a result of this alternative.

Screening Criteria 2: Meets energy production for purpose and need (at least 60 percent of FLETC's consumable energy)

As discussed above, solar PV arrays installed on available building rooftops capable of supporting the structures would result in sub-optimum tilt and orientation as well as shading from nearby roof obstructions (e.g., vent pipes, HVAC units). In addition, this hybrid alternative

would be limited to approximately 3,200 solar modules and would generate only approximately 27 percent of Cheltenham's consumable power, therefore not meeting the purpose and need of the Proposed Action.

Screening Criteria 3: Financial feasibility (i.e., construction cost would not exceed the "UESC Project" energy savings in under 25 years)

This alternative would cost $4.55 per watt, approximately 89 percent more per watt than Alternative 1 (Table 5). The relatively high cost is due to the following:

- Multiple separate, smaller, and more involved arrays result in increased design, installation, and maintenance costs stemming from:
    - Multiple electrical interconnections requiring additional electrical design, materials, installation, and maintenance.
    - Increased equipment needed to monitor the PV system's performance, with each separate location and/or orientation requiring an additional set of equipment.
    - Increased security escorting required for both installation and maintenance.
    - Increased site coordination required during install for managing multiple crews in various locations and necessitating multiple sets of tools and equipment.
- Electrical interconnections through existing electrical infrastructure in the buildings may require expensive upgrades to existing transformers, switchboards, and/or wiring.
- Increased installation and maintenance costs stemming from safety measures required for working on rooftops as well as the additional equipment needed to transport materials and labor onto rooftops.
- Increased material costs over those for Alternative 1 due to the concrete ballast required to hold the solar racking to the rooftops as well as the electrical safety equipment required to meet rapid shutdown code when solar is located on buildings.
- Additional costs would be incurred when roof replacements are required due to age.
- Roof warranties would need to be renegotiated/revised to address mounting of a solar array.

This alternative has a simple payback of 26.4 years. The "UESC Project" has a 29.1-year payback with inclusion of this solar array alternative and is therefore not considered financially feasible.

Screening Criteria 4: Environmental impact (acreage of forest resources lost)

There would be no impacts to forest resources as a result of this alternative.

2.2.9 Alternative 8: Hybrid of Alternatives 1 (Ground-Mounted Array in the Proposed Action Area), 2 (Rooftop Solar Arrays), and 4 (Ground-Mounted Array in Existing Open Area)

Figure 13. Alternative 8: Hybrid of Alternatives 1 (Ground-Mounted Array in the Proposed Action Area), 2 (Rooftop Solar Arrays), and 4 (Ground-Mounted Array in Existing Open Area)

Alternative 8 is a hybrid of Alternatives 1, 2, and 4 (Figure 13) and is being considered to determine the feasibility and environmental impact of combining the rooftop arrays and the existing open (non-forested) area alternatives with the ground-mounted array in the Proposed Action Area. As with Alternative 4, available existing open areas on the FLETC campus that could be used to supplement the Proposed Action Area in Alternative 1 are limited to one site (Site 2).

Screening Criteria 1: No impacts to mission-critical activities

There would be no impacts to mission-critical activities as a result of this alternative.

Screening Criteria 2: Meets energy production for purpose and need (at least 60 percent of FLETC's consumable energy)

In order to generate at least 60 percent of Cheltenham's consumable power and meet the purpose and need of the Proposed Action, 7,070 solar modules would be required for this hybrid alternative.

Screening Criteria 3: Financial feasibility (i.e., construction cost would not exceed the "UESC Project" energy savings in under 25 years)

This alternative would result in price per watt of $3.56, approximately 47 percent more than Alternative 1 (Table 5). Despite benefits associated with ground-mounted racking systems (e.g., installation at optimal tilt and orientation to maximize efficiency and electrical output) associated with Alternatives 1 and 4, this alternative would be less cost-effective due to a variety of reasons:

- Multiple separate, smaller, and more involved arrays result in increased design, installation, and maintenance costs stemming from:
    - Multiple electrical interconnections requiring additional electrical design, materials, installation, and maintenance.
    - Increased equipment needed to monitor the PV system's performance, with each separate location and/or orientation requiring an additional set of equipment.
    - Increased security escorting required for both installation and maintenance.
    - Increased site coordination required during install for managing multiple crews in various locations and necessitating multiple sets of tools and equipment.
- Electrical interconnections through existing electrical infrastructure in the buildings may require expensive upgrades to existing transformers, switchboards, and/or wiring.
- Increased installation and maintenance costs stemming from safety measures required for working on rooftops as well as the additional equipment needed to transport materials and labor onto rooftops.
- Increased material costs over those for Alternative 1 due to the concrete ballast required to hold the solar racking to the rooftops as well as the electrical safety equipment required to meet rapid shutdown code when solar is located on buildings.
- Additional costs would be incurred when roof replacements are required due to age.
- Roof warranties would need to be renegotiated/revised to address mounting of a solar array.

This alternative has a simple payback of 25.2 years. The "UESC Project" has a 27.2-year payback with inclusion of this solar array alternative and is therefore not considered financially feasible.

Screening Criteria 4: Environmental impact (acreage of forest resources lost)

Approximately 9.3 acres of forest resources would be permanently lost as compared to 12.02 acres with implementation of Alternative 1 alone (a net difference of -2.72 acres; approximately 29 percent reduction in lost forest resources).

2.3 Comparison of Alternatives

In the process of site location, each of four individual and four hybrid preliminary on-site alternatives for a PV system was evaluated using the noted screening criteria in Section 2.2. A detailed comparison of the associated measurements used to evaluate the four screening criteria is provided in Table 5. A summary of the results of this alternatives analysis in relation to the four screening criteria is provided in Table 6.

Table 5. Detailed Comparison of Alternatives

Name	# of Modules	Specific Production (kWh/kW)	Annual Production (kWh)	Percent Energy Usage Offset[1]	Acres of Trees Cleared	Price Per Watt	System Price	O&M Cost (30 years)	Solar ECM Simple Payback Period	Combined Simple Payback Period[2]
Alternative 1 – Ground-Mounted Array in the Proposed Action Area	6,162	1,406	3,464,033	60	12.02[3]	$2.41	$5,937,638	$938,959	19.1	21.5
Alternative 2 – Rooftop Solar Arrays	2,480	1,309	1,184,907	21	0.00	$4.12	$3,726,263	$298,986	27.1	30.1
Alternative 3 – Parking Lot Arrays	1,656	1,294	782,145	14	0.00	$6.97	$4,215,754	$231,288	52.1	55.4
Alternative 4 – Ground-Mounted Array in Existing Open Area	684	1,413	352,770	6	0.00	$9.23	$2,304,910	$115,626	62.8	68.0
Alternative 5 – Hybrid of Alternatives 1 and 2	7,052	1,372	3,531,501	60	10.18	$3.52	$9,052,688	$978,486	25.1	27.1
Alternative 6 – Hybrid of Alternatives 1 and 4	6,894	1,407	3,539,771	60	11.91	$2.80	$7,033,385	$955,972	22.6	25.5
Alternative 7 – Hybrid of Alternatives 2 and 4	3,200	1,332	1,556,243	27	0.00	$4.55	$5,317,133	$986,138	26.4	29.1
Alternative 8 – Hybrid of Alternatives 1, 2, and 4	7,070	1,373	3,542,289	60	9.30	$3.56	$9,173,855	$430,593	25.2	27.2

Source: A. Weber, SGC Power, personal communication, February 10, 2020.

[1]Threshold for meeting energy production for purpose and need is at least 60 percent of FLETC's consumable energy

[2]Threshold for financial feasibility is a combined simple payback period of under 25 years

[3]FLETC intends to mitigate the loss of 12.02 acres of forest on Cheltenham as specified in Section 3.5.4.

Grey shading indicates that federally mandated screening criteria were not met.

Table 6. Summary Comparison of Alternatives

Alternative	Impacts to Mission- Critical Activities	Environmental Impact (acres of forest resources lost)	Meets Energy Production for Purpose and Need	Financial Feasibility*
1. Proposed Action (Ground-Mounted Array in the Proposed Action Area)	No	12.02	Yes	Yes
2. Rooftop Solar Arrays	No	0	No	No
3. Parking Lot Arrays	Yes**	--	--	--
4. Ground-Mounted Array in Existing Open Area	No	0	No	No
5. Hybrid of Alternatives 1 and 2	No	10.18	Yes	No
6. Hybrid of Alternatives 1 and 4	No	11.91	Yes	No
7. Hybrid of Alternatives 2 and 4	No	0	No	No
8. Hybrid of Alternatives 1, 2, and 4	No	9.3	Yes	No

*Construction cost would not exceed the "UESC Project" energy savings in under 25-years.

**Not evaluated further due to associated impacts to mission-critical training activities that would compromise security and surveillance requirements

As noted above, Alternative 3 was rejected due to unavoidable impacts to mission-critical activities that would compromise security and surveillance requirements. Given that Alternatives 2, 4, and 7 did not meet the energy production requirements to meet the purpose and need of the Proposed Action, they are unfeasible and were also rejected. Alternatives 5, 6, and 8 could be configured to meet the energy production requirements of the purpose and need for the Proposed Action; however, the simple payback of the "UESC Project" with the inclusion of the respective solar array alternatives would exceed 25 years and therefore be financially unfeasible. For FLETC, the natural gas conversion ECM was a high priority but had to be bundled with other ECMs to move forward without appropriated funds. Therefore, when reviewing the solar PV array alternatives, it is critical to consider financial feasibility as the simple payback of the "UESC Project" rather than the solar ECM project alone. Therefore, Alternatives 5, 6, and 8 have also been eliminated from additional analysis. As a result, the alternatives considered in this EA include:

1. The "No-Action" Alternative or the "Status Quo"; and
2. The Proposed Action.

3 Affected Environment and Environmental Consequences

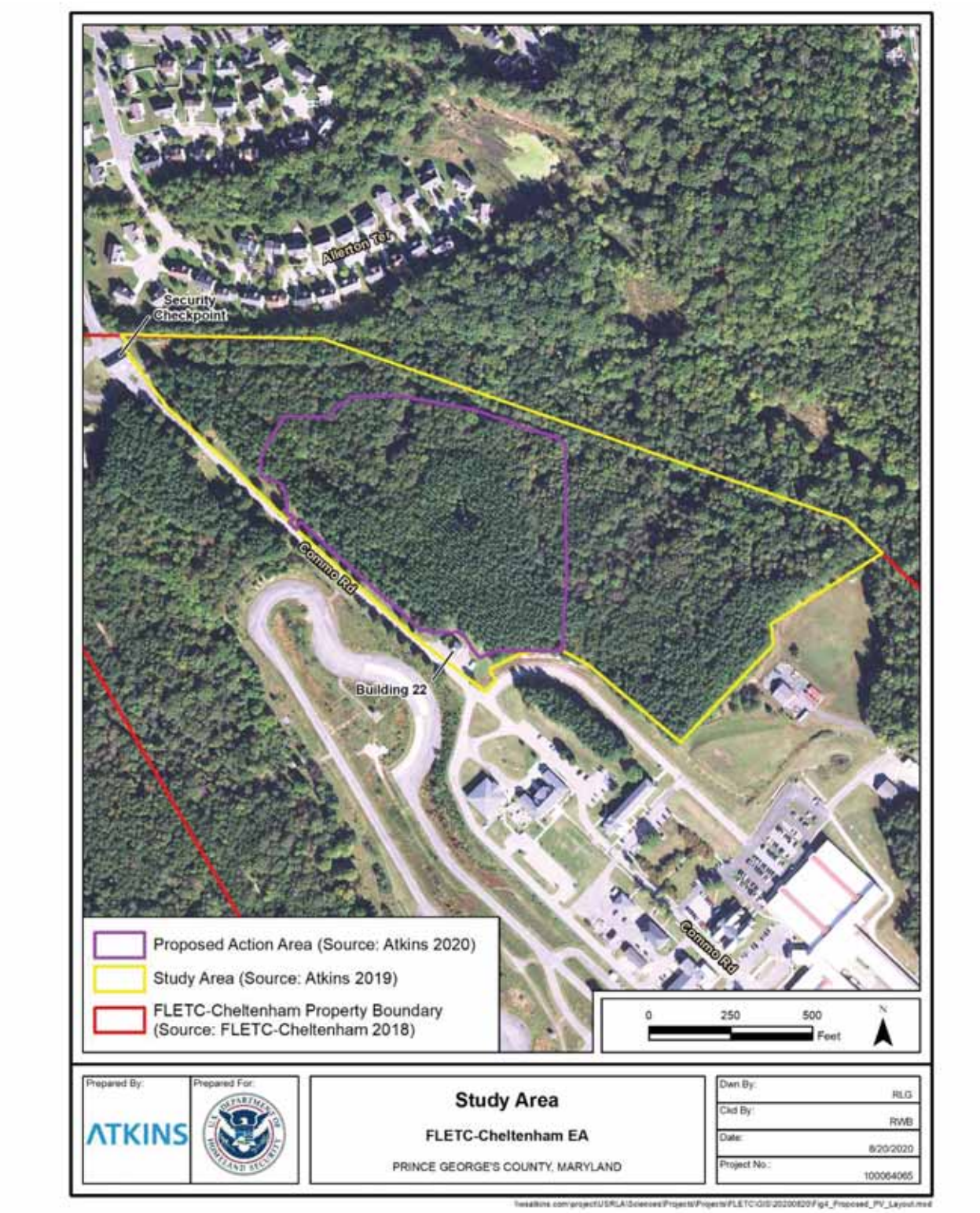
This section presents the baseline natural and human conditions and the potential environmental effects that could result from implementing the No-Action Alternative and the Proposed Action. Resources that are not present within the Proposed Action Area and region of influence (ROI) and those that would not be directly affected by the Proposed Action were not included for evaluation.

The environmental baseline discussion addresses the 12.09-acre Proposed Action Area and the ROI wherein impacts due to implementation of the Proposed Action may be anticipated. In January and February 2019, field reconnaissance was conducted in a Study Area of approximately 30.63 acres (Figure 14; Study Area), including the Proposed Action Area (Appendix D)[1]. The Study Area borders are residential development to the north, park land (Crotona and Cheltenham parks) to the north and northeast, Cheltenham Building 51 to the east, and Commo Road to the south and west. The purpose of the field effort was to review existing site conditions, specifically to assess the overall habitat and associated wildlife; identify wetlands and the presence of threatened and endangered species; and evaluate the presence of historic structures, cultural resources and hazardous materials/hazardous waste. The ROI for a resource may be the same as the Study Area, when they differ, a specific ROI is defined in Chapter 3.

Under the No-Action Alternative, the Proposed Action would not be implemented, and Cheltenham would continue to purchase all of its electric energy requirements from PEPCO as a source of non-renewable energy. FLETC would therefore not meet the renewable energy goals established by DHS or realize the direct and indirect benefits associated with solar PV electricity production, including opportunities to mitigate future rising utility costs, be more resilient and execute the ability to meet energy mandates and the future NZE requirements. Additional resource-specific impacts resulting from the No-Action Alternative are detailed in each resource's applicable subsection below.

[1] In Appendix D, the area reviewed in January and February 2019 was approximately 40 acres. A larger area was studied to include the project area for a separate potential natural gas-fired boiler conversion project not evaluated in this EA.

Figure 14. Study Area



3.1 Earth Resources

3.1.1 Definition of the Resource

Several physical factors can influence the selection and design of a PV system similar to the one proposed at Cheltenham. These include earth resources such as geology, soils, and topography. The lithology and geologic structure (both external and internal) control not only the stability of cut slopes, suitability of excavated materials as fill, ease of excavation, settlement of embankment and stability of pavements, but also the residual soil cover and ground water conditions. The term “soils” refers to unconsolidated materials formed from the underlying bedrock or other parent material. Soils play a critical role in both the natural and human environment. Soil drainage, texture, strength, shrink/swell potential, and erodibility all determine the suitability of the ground to support man-made structures and facilities. Topography refers to an area’s surface features including its vertical relief. These resources may have scientific, historical, economic, and recreational value.

The evaluation of soil and geologic conditions for the Proposed Action Area is based upon research of published literature on soils and geology of the area, a review of the available subsurface information, and contacts with appropriate federal, state and local agencies. For the purposes of this EA, the ROI for earth resources includes the area within the Cheltenham fence line. The geologic description for the Proposed Action is general to the region surrounding Cheltenham including the Proposed Action Area, while the soils discussion focuses on the Study Area.

3.1.2 Affected Environment

3.1.2.1 Geology

Cheltenham lies on the western edge of the Coastal Plain Province. The Coastal Plain Province is situated above a wedge of unconsolidated sediments (including gravel, sand, silt, and clay), which overlaps the rocks of the eastern Piedmont along an irregular line of contact known as the Fall Zone. This wedge of sediments thickens toward the east to more than 8,000 feet at the Atlantic coastline. Beyond this line is the submerged continuation of the Coastal Plain, the Atlantic Continental Shelf Province, which stretches to the east for at least another 75 miles where the sediments reach a maximum thickness of about 40,000 feet (Maryland Geological Survey 2019b).

Maryland’s geologic map depicts three bands of sediments (Cretaceous, Tertiary and Quaternary) which run southwest to northeast. The sediments become older as you move to the north and west, with the youngest sediments being located along Maryland's lower Eastern Shore. These bands appear because the sediments are not completely horizontal but are tilted eastward at a slight angle.

Because the formations are sedimentary, the Coastal Plain is rich in fossils. Miocene and Eocene fossils can be found in the Tertiary formations in southern Maryland as well on the Eastern Shore. Cretaceous fossils can be found in Kent and Cecil counties.

The *Geologic Map of Maryland* (Maryland Geological Survey 2019a) describes the Quaternary, Tertiary, and Cretaceous-aged strata of continental and marine origin (Cenozoic Era) that underlie the site. Quaternary units include upland deposits composed primarily of gravel and sand. These deposits are commonly orange-brown, and locally limonite-cemented. It includes minor silt and red, white, or gray clay. The total thickness of this formation is approximately 50 feet. Tertiary units include sediments from the Calvert Formation, which is composed of two

separate members – the Plum Point Marls and the Fairhaven formations. The Plum Point Marls member is interbedded dark green to dark bluish-gray, fine-grained argillaceous sand and sandy clay. It contains prominent shell beds and locally silica-cemented sandstones. The Fairhaven Member is composed of greenish-blue diatomaceous clay. It weathers to pale gray. It also includes pale brown to white, fine-grained argillaceous sand and greenish-blue sandy clay. The total thickness of the Calvert Formation is approximately 150 feet. The Cretaceous-aged Magothy Formation underlies the Tertiary units. This formation consists of loose white, cross-bedded, lignitic sands, and dark gray, laminated silty clays. The total thickness of the Magothy Formation is approximately 60 feet.

3.1.2.2 Soils

A soil profile was developed for the Study Area using the *Soil Survey of Prince George's County, Maryland* (Natural Resources Conservation Service (NRCS) United States Department of Agriculture (USDA) 2019). The characteristics and properties of each complex were derived from a review of this published document. Figure 15 illustrates the soils present within the Study Area and the paragraphs below provide more detailed descriptions of each soil complex.

Croom-Marr Complex (CwC, CwE)

The Croom-Marr complex map unit is composed of Croom and similar soils (60 percent), Marr and similar soils (25 percent) and other minor components (15 percent). This complex consists of well-drained, deep soils located mainly in the side slopes and head slopes of ravines and knolls. Croom-Marr soils are composed of anywhere from gravelly sandy loam to fine sandy loam in the upper profile to extremely gravelly sandy clay loam to loamy fine sand in the lower profile. Slopes range from 5 to 10 percent for the CwC map unit and from 15 to 25 percent for the CwE map unit. The soil properties exhibit no frequency of flooding or ponding, while ranging from a low available water capacity in the Croom series to high available water capacity in the Marr series. Parent material for the Croom series consists of gravelly fluviomarine deposits, while parent material for the Marr series consists of loamy fluviomarine deposits. Croom dominant vegetation where wooded is typically cutover and second growth forest consisting of oaks, Virginia pine, yellow poplar, dogwood, and sweetgum. Marr soils have been farmed for nearly 300 years, and there are very few areas that have not at one time been tilled. Most of the present woodlands over Marr soils consist of mixed hardwoods, dominated by oaks. Some areas have moderate to heavy stands of Virginia pine, and in places shortleaf pine. A small portion of the Proposed Action Area is comprised of soils from the Croom-Marr Complex (Figure 15).

Croom-Marr-Urban Land Complex (CxD)

The Croom-Marr-Urban complex map unit is composed of Croom and similar soils (45 percent), Marr and similar soils (30 percent), urban land (20 percent), and other minor components (5 percent). Other characteristics of this complex which differ from the Croom-Marr Complex described above include slopes ranging from 5 to 15 percent and parent material for the Urban series consisting of human-transported material. Urban land in this complex has been disturbed in construction; properties are highly variable and cannot be estimated.

Urban Land-Beltsville Complex (UrbB)

The Urban Land-Beltsville complex map unit is composed of urban land (80 percent), Beltsville and similar soils (15 percent), and other minor components (5 percent). The Beltsville series consists of moderately well drained sandy loam and silt loams over a dense impervious,

compact layer (fragipan). It is underlain by sand, silt, clay, or gravel, with 1 to 2 feet to water table seasonally perched above the fragipan. Slopes are 0 to 5 percent. Parent material consists of silty eolian over loamy fluviomarine deposits. Typical vegetation of the Beltsville series where wooded includes black oak, white oak, pin oak, yellow poplar, sweetgum, red maple, American Holly, beech, and shortleaf and Virginia pine. Urban land in the UrbB complex has been disturbed in construction; properties are highly variable and cannot be estimated. The Proposed Action Area is comprised mainly of soils from the Urban Land-Beltsville Complex (Figure 15).

Farmland Protection Policy Act

Prime farmland soils, as defined by the USDA, are those soils that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and are available for agriculture (NRCS USDA 2012). The concern that continued conversion of prime farmland to nonagricultural use would deplete the Nation's resources of productive farmland prompted enactment of the 1981 Federal Farmland Protection Policy Act (7 U.S.C. 4201 et seq.). This Act set guidelines that require all federal agencies to identify prime farmland proposed to be converted to nonagricultural use and evaluate the impact of the conversion. The NRCS soil survey was consulted to determine if there are any prime farmland soils in the Study Area; none of the farmland classification for all soil map units found in the Study Area (CwC, CwE, CxD, UrbB) are prime farmland.

3.1.2.3 Topography

The Study Area is characterized by flat to rolling terrain with several gently sloping valleys and one ridge as indicated on Figure 16. The property generally slopes gently from the southwest towards the northeast with steeper slopes occurring as the property nears the valley for a tributary to the Piscataway Creek. Approximately one half of the Study Area gently slopes towards the southwest. The majority of the Study Area is located on flat terrain with slopes <1.5 percent towards the southwest. Most of the proposed developed land within the Study Area is at an elevation of approximately 235 feet above mean sea level, with the highest elevation located at the southwestern end of the site (241 feet).

3.1.3 Environmental Consequences

3.1.3.1 Proposed Action

Construction and operation of the Proposed Action would result in negligible impacts to on-site soils and topography and would not impact the regional geologic resources as associated modifications would be restricted to near-surface levels. A portion (12.02 acres) of the Proposed Action Area (Figure 15) would undergo a forest harvesting operation to remove the planted slash pine and other scattered hardwood trees, due to clearing requirements, to ensure adequate visibility of the solar panels to the sun. This area would be cleared and graded to prepare the site. The area can be readily leveled or contoured with bulldozers and land graders. It is expected that most of the fill required for the site would be met with materials that must be cut from other areas on site. Relatively small volumes of borrow material, including sand and gravel aggregate, may be required for site grading and foundation construction, but these materials would be obtained from local off-site sources.

Figure 15. Soil Complexes

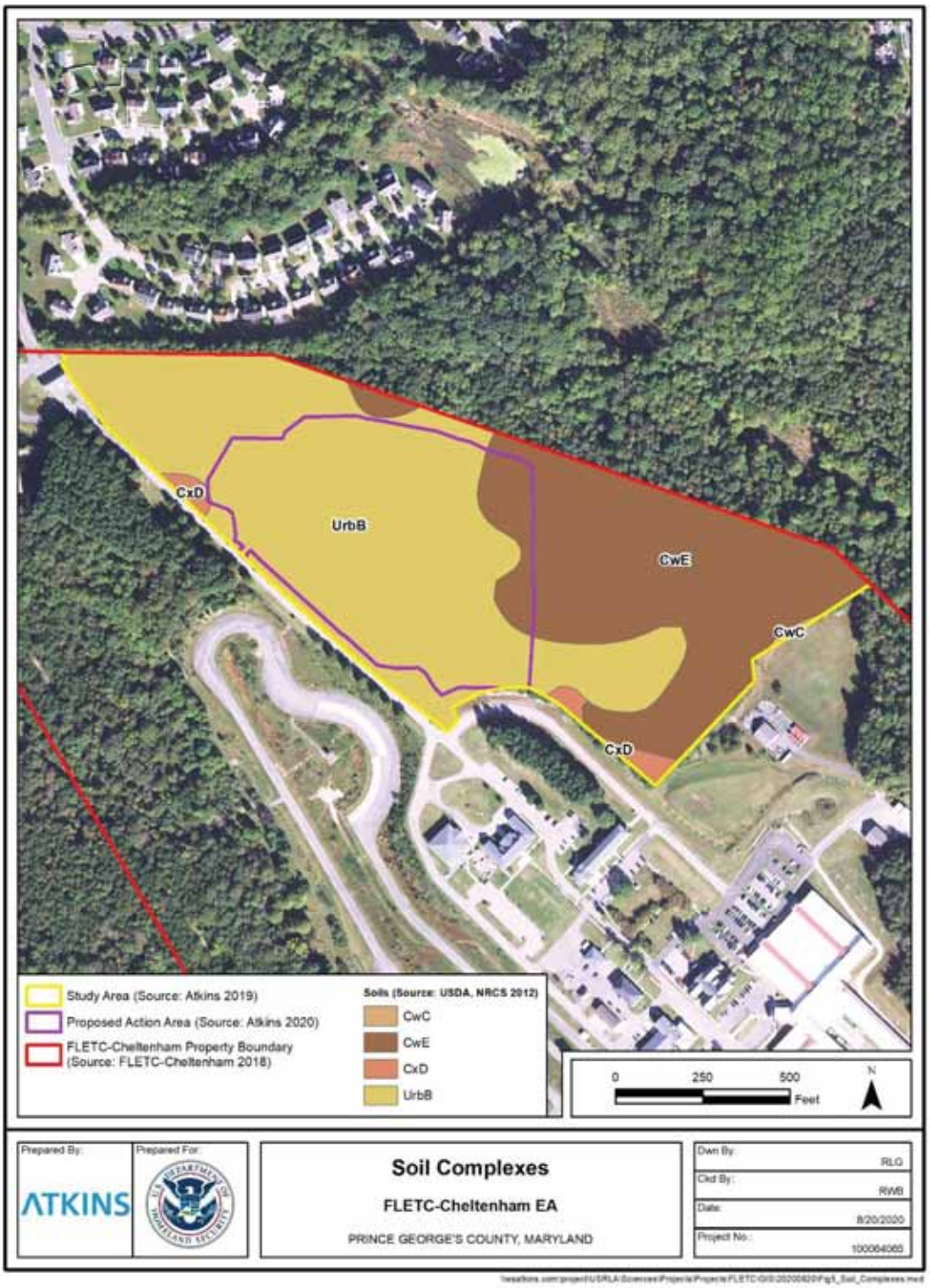
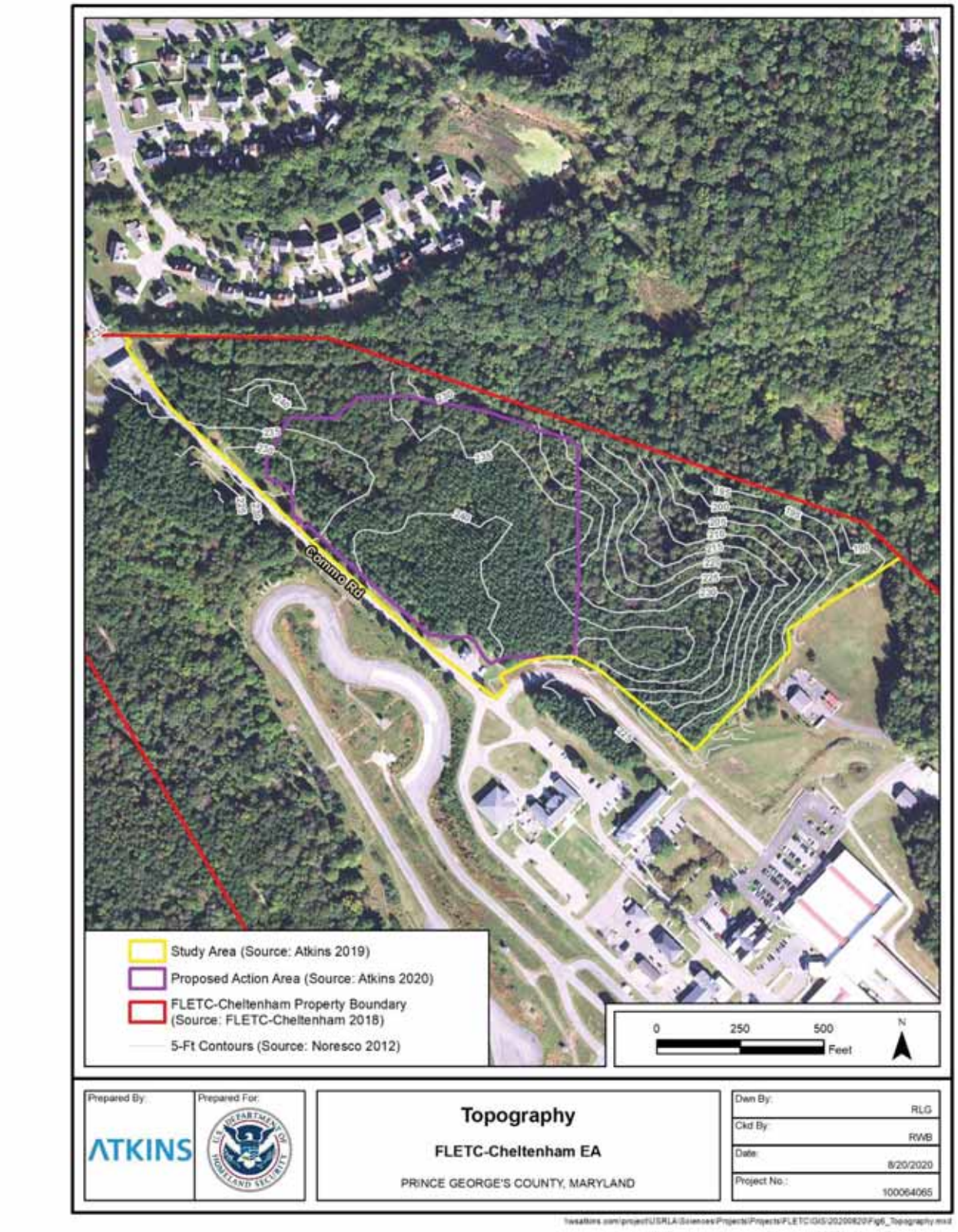


Figure 16. Topography



Potentially affected soils are generally stable and acceptable for standard construction techniques. Excavation and grading activities would result in negligible, short-term, localized increases in erosion and sedimentation. Section 3.5 provides details regarding Cheltenham's proposed ESC Plan and Stormwater Management Plan. With best management practices (BMPs), the Proposed Action would have negligible impact to geologic features or topography within the Study Area.

3.1.3.2 No-Action Alternative

Under the No-Action Alternative, the Proposed Action would not be constructed, and the Proposed Action Area would remain vegetated without modification to soils from excavation and grading activities. The No-Action Alternative would have no impact to geologic features or topography within the Study Area.

3.2 Air Quality

3.2.1 Definition of the Resource

Air quality in a given location is based on the concentration of various pollutants in the atmosphere. The federal Clean Air Act (CAA) stipulates that emissions sources must comply with the air quality standards and regulations that have been established by federal, state, and county regulatory agencies. The U.S. Environmental Protection Agency (EPA) established the National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: ozone (O_3), carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2), particulate matter equal to or less than 10 and 2.5 microns in diameter (PM_{10}/$PM_{2.5}$), and lead. EPA designates all areas of the United States as having air quality better than ("attainment") or worse than ("nonattainment") the NAAQS. Areas that exceed the NAAQS require preparation of a State Implementation Plan (SIP) detailing how the state would attain the standard within mandated time frames. Section 176(c) of the CAA provides that a federal agency cannot support an activity in any way unless the federal agency determines that the activity would conform to the SIP for attaining and maintaining the NAAQS. If emissions from a federal action do not exceed *de minimis* (minimal risk) thresholds (based on the degree of nonattainment of the area) it is exempt from further conformity analysis.

Prince George's County is currently designated as a "marginal" nonattainment area under the 2008 and 2015 O_3 standards with certain parts of the county being designated as "maintenance" nonattainment area for CO. As such, a Federal General Conformity Analysis may be required if the anticipated air emissions of NOx, volatile organic compounds (VOCs), or possibly CO are above certain *de minimis* levels (EPA 2019a) as identified under 40 CFR Part 93, *Determining Conformity of Federal Actions to State or Federal Implementation Plans*.

3.2.2 Affected Environment

EPA designates the area within Prince George's County as being in nonattainment of the NAAQS for O_3 (marginal) and CO (maintenance), while remaining criteria pollutants are in attainment (Table 7; EPA 2019b). Maryland is one of the states in the ozone transport region (Ozone Transport Commission 2019). The applicable *de minimis* thresholds for Prince George's County are shown in Table 7.

Table 7. Applicable General Conformity *De Minimis* Thresholds

Pollutant	Attainment/Nonattainment	De Minimis Threshold (tons)
Ozone (ozone transport region)	Nonattainment “marginal”	N/A
Nitrogen dioxide	Attainment	100
Volatile organic compounds	N/A	50
Carbon monoxide	Nonattainment “maintenance”	100
Sulfur dioxide	Attainment	100
Particulate matter less than or equal to 10 micrometers in diameter	Attainment	100
Particulate matter less than or equal to 2.5 micrometers in diameter	Attainment	100
Lead	Attainment	25

(EPA 2019b, a)

3.2.3 Environmental Consequences

The methodology, including the assumptions, methods, and calculations used to quantify construction and operational emissions of criteria pollutants for the Proposed Project and No-Action Alternative is discussed in Appendix E. Criteria pollutants of concern include CO, nitrogen dioxide (NO_2), O_3, particulate matter ($PM_{2.5}$ and PM_{10}) and SO_2. NO_2 impacts were evaluated by analyzing NO_x. O_3 is not directly emitted, but rather formed in the air through a photochemical reaction of NO_x and VOCs) referred to as O_3 precursors. O_3 impacts are evaluated by analyzing NOx and VOC emissions. Sources of criteria pollutant emissions that were reasonably foreseeable during construction (Appendix E) were included in this analysis. In addition, criteria pollutant emissions for operational traffic were included in this analysis. Operational emissions were evaluated for the current year (2019) and the year of operation (2020). The emissions modeling methodology is outlined below.

3.2.3.1 Proposed Action

Construction

Construction activities that have the potential to result in air emissions impacts include emissions from construction equipment (e.g., loader, rubber tired feller buncher, rubber tired skidder, rough terrain cranes) exhaust, on-road mobile sources, and worker commute to and from the construction sites. Additionally, particulate matter would be emitted from surface disturbance activities and on-road vehicle activity. Any impact to ambient air quality associated with construction of the Proposed Action would be temporary in nature and easily mitigated by applying BMPs, such as wetting the ground on a regular basis during construction to reduce fugitive dust and minimizing the idling of trucks. Construction activities from the equipment included in Appendix E would cause a temporary increase in all NAAQS criteria pollutants. The emissions associated with construction are shown in Table 8 and would be well below *de minimis* standards. As a result, there would be a negligible air quality impact associated with construction emissions.

Table 8. Construction Emissions

Year	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$
Construction Emissions (tons/year)	0.71	1.55	0.16	0.00	2.91	0.35
De minimis Standard (tons)	100	100	50	100	100	100
Emissions Below *De minimis*	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

NOx = nitrogen oxides

CO = carbon monoxide

VOC = volatile organic compounds

SO_2 = sulfur dioxide

PM_{10} = particulate matter less than or equal to 10 micrometers in diameter

$PM_{2.5}$ = particulate matter less than or equal to 2.5 micrometers in diameter

In a letter dated April 23, 2019 from the Maryland State Clearinghouse (Appendix B), MDE stated that their finding of consistency is contingent upon the applicant undertaking the following actions:

> Construction, renovation and/or demolition of buildings and roadways must be performed in conformance with state regulations pertaining to "Particulate Matter from Materials Handling and Construction" requiring that during any construction and/or demolition work, reasonable precaution must be taken to prevent particulate matter, such as fugitive dust, from becoming airborne.

FLETC has prepared an ESC Plan and Stormwater Management Plan, which include the following BMPs designed to control fugitive dust. Construction activities producing dust shall implement control measures to avoid the suspension of dust particles and/or prevent dust from blowing off site or to areas without treatment. Therefore, there would be a negligible air quality impact associated with particulate matter such as fugitive dust from construction. The ESC Plan and Stormwater Management Plan were submitted to MDE for concept approval on March 20, 2019 and continued over eight plan submittals. Updated ESC and Stormwater Management plans were submitted for concept approval on June 26, 2020 and the stormwater management concept was approved on July 13, 2020 (Appendix B). Revised plans were resubmitted to MDE on August 12, 2020 and final approval was granted on August 17, 2020 (Appendix B).

Operation

The primary contributors to air emissions in the operation phase of the Proposed Action are from the routine use of pickup trucks to maintain the solar arrays. The emissions associated with operations and maintenance are shown in Table 9. As a result, there would be a negligible air quality impact associated with operation emissions.

Table 9. Operational Emissions (tons)

Year	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$
Operational Emissions (tons/year)	8.70E-05	9.92E-04	3.68E-05	8.54E-07	1.93E-06	1.71E-06
De minimis Standard (tons)	100	100	50	100	100	100
Emissions Below *De minimis*	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

3.2.3.2 No-Action Alternative

Under the No-Action Alternative, the Proposed Action would not be constructed. Therefore, no project-related air emissions from construction or operation would result.

3.3 Noise

3.3.1 Definition of the Resource

Sound is defined as vibrations that travel through the air or another medium and can be heard when they reach a person's or animal's ear. It is produced from a given source, for instance, a vehicle’s tires rolling on asphalt or a human’s vocal cords. Noise is defined as unwanted sound. It can be continuous or erratic and involve many sources and frequencies. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day. How certain individuals respond to the sound source will determine if it is perceived as noise. Affected receptors are specific (i.e., residences, schools, restaurants with outdoor dining) or broad areas (e.g., nature preserves or national cemeteries) in which occasional or persistent sensitivity to noise above ambient levels exists.

Multiple federal agencies have established noise guidelines and regulations for protecting citizens from potential hearing damage and from various other adverse effects associated with noise. For outdoor activities, the EPA recommends a day-night average (DNL) of 55 A-weighted decibels (dBA) as the sound level below which there is no reason to suspect that the general population would be at risk from any of the effects of noise. DNL is the average noise level over a 24-hour period and the metric recognized by the U.S. government for measuring noise and its effects on humans.

Noise levels vary depending on the density of buildings and proximity to parks and open space, major traffic areas, or industrial facilities. As shown in Table 10, a typical quiet urban daytime area has a sound level of about 50 decibels (dB), which decreases to 40 dB for a quiet urban and suburban nighttime area (Federal Highway Administration (FHWA) 2019).

Table 10. Common Sound Levels

Decibels (dB)	Location
20	Quiet Rural Nighttime
40	Quiet Urban and Suburban Nighttime
50	Quiet Urban Daytime
60	Large Business Office
65	Commercial Area
70	Vacuum Cleaner at 3 meters
80	Shouting at 1 meter

(FHWA 2019)

3.3.2 Affected Environment

Maryland's Title 26 Department of the Environment, Subtitle 02 Occupational, Industrial and Residential Hazards, Chapter 03 Control of Noise from the Annotated Code of Maryland ordinance (Maryland Noise Ordinance) (Maryland Division of State Documents 2019) requires that noise originating from an industrial or commercial setting must be equal to or lower than 90 dBA when it enters a residential property emanating from a construction site during the daytime hours and 55 dBA during the nighttime. Daytime hours are defined as 7 a.m. to 10 p.m., local time and nighttime hours are 10 p.m. to 7 a.m., local time. Using the edge of the Cheltenham property line as a boundary, the closest noise-sensitive receptors, residences in the Cheltenham South residential development, would be within approximately 150 feet.

Current noise generators/activities on the Cheltenham property include training exercises such as, driving courses, (indoor) small arms fire, and staged training scenarios. An Environmental Acoustic Assessment was conducted in 2001 to assess the acoustic impacts of the Cheltenham's planned training facilities on the Cheltenham environment. Average sound levels from indoor firing ranges were found to not be audible within 500 feet of the range building. Average sound levels produced by driver training exercises on the ranges were expected to be less than the 65 dBA at the property line during the daytime, which is lower than the 90 dBA sound level limit required by the Maryland Noise Ordinance (Siebein Associates Inc. 2001).

Of note, Maryland's Noise Ordinance does not require that peak sound levels be measured, nor does it require that the peak levels meet noise ordinance limits. The FLETC Environmental Acoustic Assessment determined that peak sound levels from Cheltenham's driver training range, while periodically audible above ambient noise, would be below 65 dBA at distances of 2,500 feet or greater (Siebein Associates Inc. 2001). Typical sound levels for suburban to urban residential areas in the daytime and nighttime range from approximately 40-50 dB (Table 10). These residential areas are the closest noise-sensitive sites and are located to the north/northwest of the existing Cheltenham facility, with the closest residence being approximately 150 feet from the Cheltenham property line.

The FLETC Environmental Acoustic Assessment states that nighttime sounds near the proposed Cheltenham facility are dominated by insects which were louder than the 55 dBA nighttime standard in the Maryland Noise Ordinance. In fact, insect sounds were louder than most of the ambient sounds during the daylight hours. Ambient sounds for daylight hours were dominated by airplane and roadway traffic noise. Typical to most residential areas, normal ambient levels consisted of residential traffic, commercial trucks, lawn-cutting equipment, and general construction (Siebein Associates Inc. 2001).

Table 11. Worst Case Scenario Noise Levels per Activity

Activity	Noise Source	Activity Duration	*dBA at 50 feet	dBA at 100 feet	dBA at 150 feet	dBA at 200 feet	**dBA at 250 feet
Timber Harvest	Chainsaw	4 weeks	85	79	75	73	71
Onsite Construction	Excavator	4 weeks	85	79	75	73	71
On-Road Construction	Flatbed Truck	3-4 months	84	78	74	72	70
Maintenance	Pickup	Ongoing after construction	55	49	45	43	41

dBA = A-weighted decibels

*(FHWA 2019)

**Property boundary of nearest residence is 250 feet from the limits of construction.

3.3.3 Environmental Consequences

An inventory of required equipment per activity (timber harvesting, onsite construction, on road construction, and maintenance) and their time durations was compiled by the solar construction contractor. For a worst-case scenario trial, the loudest noise-generating piece of equipment for each of the four activities at the closest point to the noise-sensitive receptors was determined. Noise levels for the noise-generating equipment were referenced from the FHWA's Construction Noise Handbook (2019).

For each activity, source, and distance from the noise levels at 50 feet were calculated by using the inverse square law formula (Appendix F). These levels were compared to the Maryland Noise Ordinance, 90 dBA, which was the threshold for this study. The closest noise-sensitive receptors, residences in the Cheltenham South residential development, to construction activity would be within approximately 250 feet. If the sound level exceeds 90 dB at 250 feet, mitigation measures will be developed to ensure that sound emanating from the construction will be minimized and timed appropriately.

3.3.3.1 Proposed Action

Noise levels for various construction and timber equipment were referenced in the FHWA's Construction Noise Handbook (2019). In this study, different types and manufacturers of equipment were analyzed and the noise levels averaged together to get an actual noise level per equipment type. Table 11 shows the highest noise generators for each of the four activities. Using the inverse square law formula, the noise levels were calculated for each distance. For example, for a chainsaw with 85 dBA at 50 feet, the resulting noise level at 250 feet would be lessened by 14 dBA to 71 dBA.

As shown in Table 11, the worst-case scenario noise levels will be below the 90-dBA threshold for timber harvesting and onsite construction activities under the Proposed Action. These noise levels would be temporary as shown in the activity duration (8 weeks total for both activities). The on-road construction will require 3-4 months duration and maintenance activity will be ongoing if the solar facility is in use.

Using Table 11, it is estimated that the highest predicted noise levels will be 71 dBA by the time they reach 250 feet away from the noise source. This is the distance from the limits of construction to the property boundary of the closest residences, located to the north of the Cheltenham facility. The formula does not consider any vegetation or sound-dampening/blocking material between the noise generator and noise-sensitive receptor. A mixed deciduous and conifer forest stand defines the perimeter of the facility and will assist in providing additional reduction in noise levels from all noise generators at the Cheltenham facility.

Sound levels were compared to the levels allowed in an existing Maryland Noise Ordinance. The noise ordinance requires that noise levels not exceed 90 dBA from construction or demolition site activities and operational noise levels not exceed 65 dBA during daytime hours and 55 dBA during nighttime hours. Daytime hours are defined as 7 a.m. to 10 p.m., local time and nighttime hours are 10 p.m. to 7 a.m., local time. All four construction activities (timber harvest, onsite construction, on-road construction, and maintenance) will be conducted during daytime hours only and no work will occur during nighttime. No noise impacts are predicted for residential receptors due to the Proposed Action. In addition, the mixed deciduous and conifer forest stand buffer will provide additional noise reduction. Maintenance, which will be the only long-term activity associated with the Proposed Action, only requires hand tools and vehicles. This activity will not have any noise related impacts to the nearby residences and therefore no mitigation is needed.

3.3.3.2 No-Action Alternative

Under the No-Action Alternative, the Proposed Action would not be constructed. Therefore, no project-related noise impacts from construction or operation would result.

3.4 Solid and Hazardous Materials and Waste Management

3.4.1 Definition of the Resource

This section describes the affected environment and environmental consequences resulting from the Proposed Action associated with solid waste management and hazardous materials and wastes.

The terms “hazardous materials” and “hazardous waste” refer to substances defined as hazardous by the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. 9601 et seq.) and the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA; 42 U.S.C. 6901 et seq.). In general, hazardous materials include substances that, because of their quantity; concentration; or physical, chemical, or infectious characteristics; may present substantial danger to public health or the environment when released into the environment. Storage and usage of hazardous materials are regulated by a variety of statutes, including the Emergency Planning and Community Right-to-Know Act (42 U.S.C. 116 et seq.) and RCRA. Hazardous wastes that are regulated under RCRA are defined as any solid, liquid, contained gaseous, or semisolid waste or any combination of wastes that exhibits one or more of the hazardous characteristics of ignitability, corrosivity, toxicity, or reactivity or is listed as a hazardous waste under Title 40 of the CFR, Part 261.

3.4.2 Affected Environment

In the 1990s, several investigations were conducted to characterize the extent of lead and other heavy metal contamination in Cheltenham soils. Elevated levels of lead, silver, barium, cadmium, chromium, arsenic, mercury, and selenium were found. Subsequently in 1997, 618 tons of hazardous soil were excavated and removed along with 2,396 tons of non-hazardous soil. A total of 27 underground storage tanks have been removed from Cheltenham, and the majority of them contained No. 2 diesel fuel throughout their life. One closed, 10,000-gallon, diesel fuel tank remains beneath Building 31. Observation wells were installed in the vicinities of six tank excavations for monitoring and observation. After successful completion, these wells were closed. The 2001 EA for the renovation and demolition of facilities at Cheltenham concluded that there were no outstanding waste management issues remaining at the Cheltenham site (DHS 2010, Nexsen 2001).

As per Clark Nexsen (2001), a base-wide Environmental Baseline Survey (EBS) of the then Naval Communications Detachment Cheltenham (NCDC) facility was conducted in 1994 prior to the acquisition of the property by the DHS for the FLETC. The purpose of the EBS was to "compile information regarding environmental conditions on the base, document the nature and extent of known environmental contamination on the base, and identify uncontaminated and potentially contaminated on-base and adjacent parcels" (Geoscience Consultants, Ltd., December 1994, as referenced in Nexsen (2001)). According to the EBS, there are no outstanding waste management issues remaining at the Cheltenham facility. In addition, no hazardous materials/hazardous waste were observed during the January and February 2019 field reconnaissance effort of the Study Area (Appendix D).

Solid waste in Prince George's County is managed by the County Waste Management Division located in Upper Marlboro. The Brown Station Road Sanitary Landfill is owned and operated by the Prince George's County Government and only accepts municipal solid waste. Construction and demolition (C&D) debris are accepted at the Ritchie Land Reclamation Project C&D Landfill in Upper Marlboro, Maryland. The facility operates under State of Maryland Permit # 2010 WFP0590 and as of September 2012, the facility has approximately 20-30 years of capacity (Ensor 2012). Also, FLETC requires contractors to provide quantities and weights of C&D and non-C&D debris to the Contracting Officer for forwarding to the Cheltenham Environmental Protection Specialist. FLETC tracks and reports these wastes annually to DHS.

3.4.3 Environmental Consequences

3.4.3.1 Proposed Action

Nonhazardous Waste Management

Construction and operation of the Proposed Action would result in the generation of nonhazardous solid wastes, including construction materials such as aluminum, steel, copper scraps, and concrete and asphalt debris.

It is not anticipated that land-clearing and grading activities would generate a need for disposal of soil and woody waste. The grading plan incorporates a design allowing for reuse of all excavated or graded soil. Topsoil would be handled separately to ensure its reuse for final grade finish, where possible. Green waste from the tree clearing activities would be used to the maximum extent possible on-site as ESC measures. Excess green waste would be transported to a proper disposal center or stored on-site to decompose, if allowed. Project operations and maintenance would also generate nonhazardous solid wastes typical of solar PV power generation facilities. These wastes would include wood, metal bands, cardboard packing

material, and other miscellaneous solid wastes. These materials would be collected for recycling or transferred to a landfill site in accordance with applicable regulatory requirements.

In a letter dated April 23, 2019 from the Maryland State Clearinghouse (Appendix B), MDE stated that their finding of consistency is contingent upon the applicant properly disposing of any solid waste including construction, demolition and land clearing debris, generated from the subject project, at a permitted solid waste acceptance facility, or recycled if possible. Management of construction debris resulting from the Proposed Action would include recycling and reuse when possible. The remaining construction debris would be transported to a permitted facility (Ritchie Land Reclamation Project C & D Landfill in Upper Marlboro, Maryland) for disposal. All installation and construction activities would comply with federal, state, and local statutes and regulations related to solid waste.

Hazardous Waste Management

Installation of the PV would be conducted using normal installation/construction methods, which would limit, to the extent possible, the use of hazardous materials. Petroleum, oil, and lubricants would be used in the O&M of heavy construction equipment and vehicles, and there would also be some use of paints, solvents, and cleaners. While there would be a small chance of a spill from installation and construction equipment, these risks would be low due to the small amounts of these materials that would be present on-site. These risks would be further mitigated by implementation of proper emergency response plans and deployment of equipment to quickly contain and clean up any accidental spills. Otherwise, only nonhazardous waste would be generated from installation and construction activities. With the exception of the potential use of various herbicides to control vegetation around the roads and PV arrays, no hazardous materials would be used as part of operational and maintenance activities of the Proposed Action. Any herbicide use would be controlled in accordance with regulatory requirements and manufacturers' recommendations to avoid introduction of herbicides into the surface and groundwater at the site. Hazardous materials that could potentially contaminate groundwater would not be used or stored at the site.

Individual PV panels may contain hazardous materials and, although the panels are sealed under normal operating conditions, there is the potential for environmental contamination if damaged or improperly disposed of during decommissioning. In all cases, hazardous materials would be stored and handled in accordance with all federal, state, and local regulations and codes. Incompatible materials would be stored in separate storage and containment areas. Containerized hazardous materials would be stored in original containers appropriately designed for the individual characteristics of the contained material. Maintenance and service personnel would be trained to handle these materials. Additionally, BMPs that prevent or minimize releases to the environment would be used in all chemical storage areas, and any released regulated materials would be immediately cleaned up, managed, and properly disposed of in accordance with all applicable standards. Finally, the Cheltenham Environmental Protection Specialist must approve all waste profiles and sign all hazardous waste manifests for regulated wastes generated on and shipped from Cheltenham. Cheltenham currently has an EPA Hazardous waste identification number and complies with Maryland regulations for the identification, generation, storage, packaging, and shipment of regulated wastes.

In a letter dated April 23, 2019 from the Maryland State Clearinghouse (Appendix B), MDE stated that their finding of consistency is contingent upon the applicant undertaking the following actions:

- If soil contamination is encountered during the duration of the project, a permit for soil remediation from MDE would be obtained.

- Those facilities that generate, or propose to generate or handle hazardous wastes, contact the Waste Diversion and Utilization Program directly to ensure these activities are being conducted in compliance with applicable state and federal laws and regulations. The Program should also be contacted prior to construction activities to ensure that the treatment, storage or disposal of hazardous wastes and low-level radioactive wastes at the facility will be conducted in compliance with applicable state and federal laws and regulations.

There would be negligible impacts due to management of nonhazardous and hazardous waste generated by construction and operation of the Proposed Action.

3.4.3.2 No-Action Alternative

Under the No-Action Alternative, the Proposed Action would not be constructed and no grading, clearing, installation, or operating activities would generate a need for disposal of non-hazardous or hazardous waste. There would be no risk of spills as heavy construction equipment and vehicles would not access the Proposed Action Area.

3.5 Water Resources

3.5.1 Definition of the Resource

Water resources analyzed in this EA include surface water, groundwater, floodplains, and wetlands. Further, this section provides descriptions of the qualitative and quantitative characteristics of water resources. Stormwater infrastructure is discussed in Section 3.9, *Infrastructure*.

Surface water resources include lakes, rivers, and streams, and are important for a variety of reasons including irrigation, power generation, recreation, flood control, and human health. Under the Clean Water Act (CWA), it is illegal to discharge pollutants from a point source into any surface water without a NPDES permit. As of September 05, 1974, the EPA authorized Maryland to operate the NPDES Permit Program. The EPA has the authority to set standards for the quality of wastewater discharges. The goal of the CWA Section 402 is the “restoration and maintenance of the chemical, physical, and biological integrity of the Nation’s waters.”

Under CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into “waters of the U.S.” must obtain certification from the state in which the discharge would originate, or if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects that have a federal component and may affect state water quality (including projects that require federal agency approval [such as issuance of a Section 404 permit]) must also comply with CWA Section 401. The State of Maryland has the legal authority to implement and enforce the provisions of the CWA, while the EPA retains oversight responsibilities. In addition, the MDE ESC regulations require any state or federal project that involves excavation, landfilling or disturbance of the existing ground to have ESC measures in accordance with the *Maryland Stormwater Management and Erosion and Sediment Control Guidelines for State & Federal Projects*. MDE also requires construction projects that disturb more than one acre of land to obtain a permit via the MDE ePermits online system in accordance with the Maryland General Permit for Storm Water Discharges.

In a letter dated April 23, 2019 from the Maryland State Clearinghouse (Appendix B), MDE provided the following information regarding the state’s anti-degradation of water quality policy:

> "Maryland requires special protections for waters of very high quality (Tier II waters). The policies and procedures that govern these special waters are commonly called 'anti-degradation policies.' This policy states that 'proposed amendments to county plans or discharge permits for discharge to Tier II waters that will result in a new, or an increased, permitted annual discharge of pollutants and a potential impact to water quality, shall evaluate alternatives to eliminate or reduce discharges or impacts.' These permitted annual discharges are not just traditional Point Sources but can include all discharges such as Stormwater."

As per MDE's December 23, 2019 letter (Appendix B), the CWA requires three components to water quality standards that set goals for and protect state waters. One of the three components requires states to implement an antidegradation policy that maintains high-quality waters (aka Tier II waters) so they are not allowed to degrade to minimum (Tier I) standards [40 CFR 131.12]. State regulation regarding MDE implementation of the antidegradation policy is contained in the COMAR 26.08.02.04-1. Maryland's antidegradation implementation policy requires that in order to complete the Tier II review, applicants must first consider alternatives that avoid discharges to Tier II waters, and when those options are exhausted, to continue the alternatives analysis to minimize discharges. Scientific literature supports that watershed forest cover is a critical factor in maintaining healthy watersheds. Net forest cover loss can result in a negative water quality impact, regardless of post-development land use, and losses may cumulatively impact already degraded Tier II waters. In-kind resource replacement at a 1:1 ratio is required to mitigate net forest loss. While full mitigation is not always feasible, applicants must adequately demonstrate that they exhausted all opportunities available before MDE will make a final Tier II determination.

Groundwater includes the subsurface hydrologic resources of the physical environment and is by and large a safe and reliable source of fresh water for the general population, especially for those in areas of limited precipitation, and is commonly used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater plays an important role in the overall hydrologic cycle. Its properties are often described in terms of depth to aquifer or water table, water quality, and surrounding geologic composition.

Floodplains are defined by EO 11988, *Floodplain Management*, as "the lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands, including at a minimum, the area subject to a one percent or greater chance of flooding in any given year" (that area inundated by a 100-year flood). Floodplains and riparian habitat are biologically unique and highly diverse ecosystems providing a rich diversity of aquatic and terrestrial species, as well as promoting stream bank stability and regulating water temperatures. EO 11988 requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.

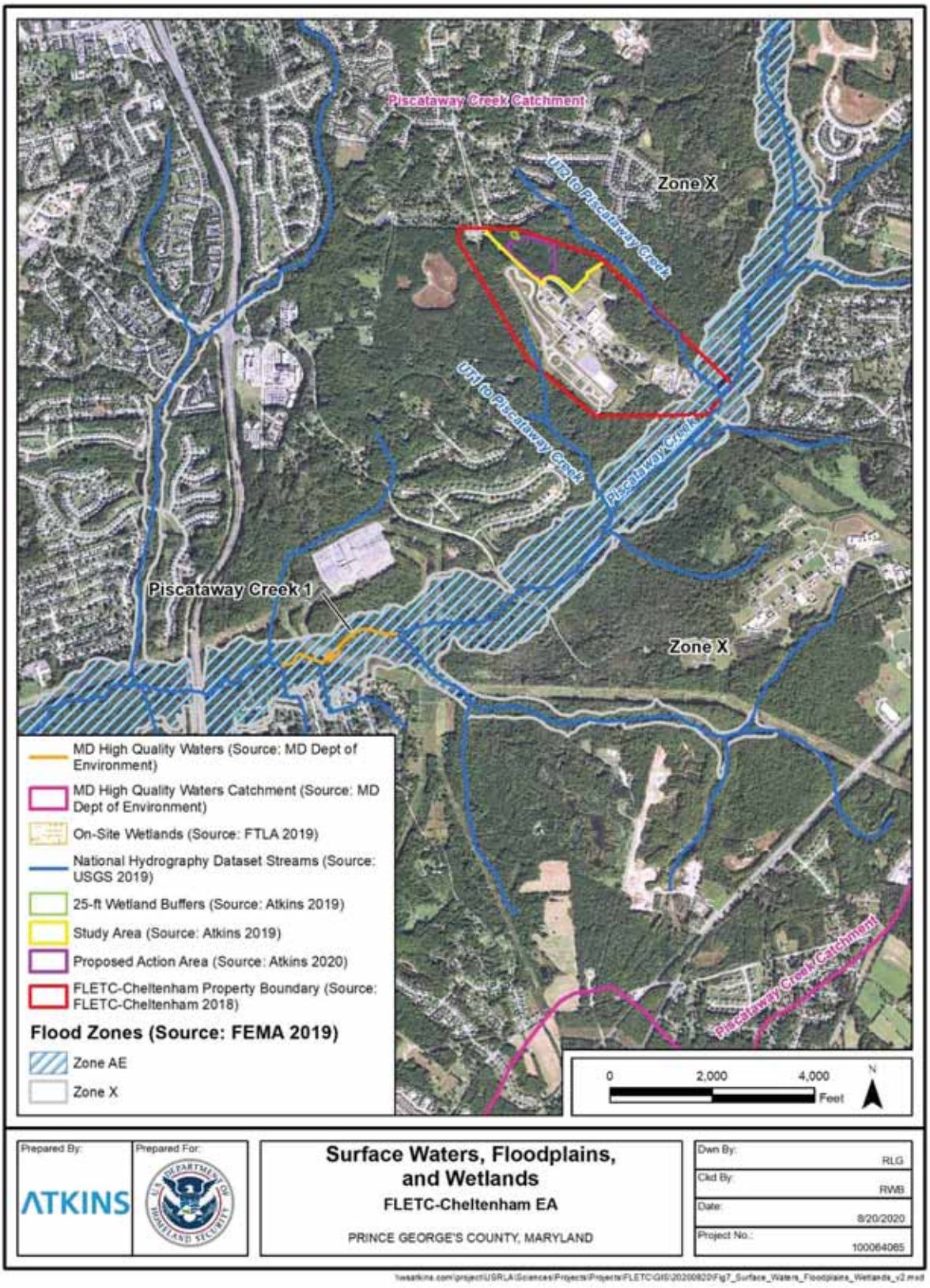
As defined by 33 CFR §328.3[c], wetlands are "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas." A state permit and associated mitigation requirements or letter of exemption through the MDE is required for development activities that occur in non-tidal wetlands, 25-foot buffer or 100-foot expanded buffer areas or are exempted based on the level of impact and type of nontidal wetland.

3.5.2 Affected Environment

3.5.2.1 Surface Water

No rivers designated as Wild and Scenic Rivers (16 U.S.C. §§ 551, 1278[c], 1281[d]) are located in Maryland. The Study Area is located within Maryland 8-digit watershed number 2140203 (Piscataway Creek) which is part of the 6-digit watershed number 021402 (Washington Metropolitan). Two tributaries to the Piscataway Creek are located within the Study Area, outside of the Proposed Action Area (Figure 17). One tributary (UT1) is located just southwest of the Cheltenham training track and extending south to the confluence with Piscataway Creek. The other tributary (UT2) runs southeast, roughly parallel to Cheltenham's northern property line, entering the facility's boundary southeast of the Proposed Action Area before converging with Piscataway Creek south of the Cheltenham property boundary. No tributaries or ephemeral drainages were identified within the Proposed Action Area during the January and February 2019 field assessment.

Figure 17. Surface Waters, Floodplains, and Wetlands



In the Maryland State Clearinghouse letter, dated April 23, 2019 (Appendix B), MDE provided information regarding the state's anti-degradation of water quality policy. Piscataway Creek 1 (Figure 17), which is located within the vicinity of the Proposed Action, has been designated as a Tier II stream; the Proposed Action is located within the Tier II catchment called Piscataway Creek 1. A second Tier II catchment, Piscataway Creek 2, is located downstream of Piscataway Creek 1 and the Proposed Action Area. According to MDE, there is no Remaining Capacity for Piscataway Creek 1. Assimilative capacity is defined as 25 percent of the difference between the Tier II value and the applicable criterion, an index of biotic integrity score of 3 [COMAR 26.08.02.04-1 G(3)(a) and J(2)].

3.5.2.2 Groundwater

The Study Area is located within the Northern Atlantic Coastal Plain aquifer system, which consists of six regional aquifers in sedimentary deposits that range in age from Early Cretaceous to Holocene. The Study Area is underlain by the Surficial, Chesapeake, Castle Hayne – Aquia, Severn-Magothy, and Potomac Aquifers. The boundaries of the aquifers are irregular and none of them extend across the entire Coastal Plain (Trapp and Horn 1997).

3.5.2.3 Floodplains

As per the U.S. Department of Housing and Urban Development, Federal Insurance Administration Flood Hazard Boundary Map revised September 16, 2016, the eastern portion of the Study Area lies within a designated 100-year flood zone and a Special Flood Hazard Area (Zone AE); however, the Proposed Action Area is located outside of any designated 100-year flood zone and no acreage occurs within the base floodplain boundary of Piscataway Creek (Zone AE) (see Figure 17). Further, the entire Proposed Action Area is located within an area designated as having little to no flood risk (Zone X).

3.5.2.4 Wetlands

One isolated area (0.14 acres) was identified as a wetland within the Study Area (see Figure 17) as assessed in January and February 2019. A 25-foot buffer separates this wetland from the Proposed Action Area. A detailed description of the wetland is included in Appendix D. There were no wetlands identified within the remainder of the Study Area or within the Proposed Action Area.

3.5.3 Environmental Consequences

3.5.3.1 Proposed Action

The nearest surface water to the Proposed Action Area is a tributary (UT2) to the Piscataway Creek. No perennial, intermittent, or ephemeral tributaries to Piscataway Creek were identified within the Proposed Action Area, thereby minimizing the potential for impacts to surface water. Excavation and grading activities would result in the potential for minor, short-term, localized increases in erosion and sedimentation which could affect the quality of stormwater runoff through a potential increase in soil erosion. These activities could expose soils that could be picked up by rain, thereby increasing sediment loading of stormwater runoff, especially during storm events. Additionally, the Proposed Action would result in the creation of a total of approximately 1,604 square feet of new impervious surface or 0.30 percent of the Proposed Action Area. As a result, increases in stormwater runoff would be minimal. However, there would be an average of approximately 500 feet of forested buffer between the Proposed Action Area and the closest tributary to Piscataway Creek (UT2). Since the Proposed Action would

disturb an area greater than 1 acre, an NPDES Storm Water Construction permit would be required prior to construction. Strict adherence to state regulations would reduce any adverse impacts associated with the Proposed Action.

MDE's Antidegradation Policy is described in Section 3.5.1. In the Maryland State Clearinghouse letter, dated April 23, 2019 (Appendix B), pursuant to Maryland's anti-degradation of water quality policy, without any remaining assimilative capacity or no remaining capacity, any additional discharge would likely result in adverse impacts and degrade water quality beyond allowable limits. As per MDE, "…as a result of the assimilative capacity determination findings, there must either be zero discharge upstream of, or to, the high-quality segments, or complete offset of or compensation for the impact, or an applicant must complete and submit to the Department a Social and Economic Justification to support allowing degradation of the State's high quality waters (Tier II)." MDE also stated that during and post-construction, enhanced BMPs or additional controls, potentially above those minimally required, should be utilized to protect high-quality Tier II stream resources. A *Draft Social and Economic Justification (SEJ) for the Proposed Construction, Operation and Maintenance of a 1.875-Megawatt Ground-Mounted Solar Photovoltaic Array, Federal Law Enforcement Training Centers, Cheltenham*, was submitted on February 28, 2020. The Draft SEJ detailed initial avoidance and minimization measures implemented during siting and design of the Proposed Action, an alternatives analysis evaluating a wide variety of feasible alternatives to reduce forest clearing, additional measures to further avoid and minimize environmental impact, and proposed mitigation for unavoidable impacts to forest cover. On April 13, 2020, MDE provided FLETC with several conditions to finalize the SEJ and satisfy the Tier II Review. FLETC submitted the *Final Social and Economic Justification (SEJ) for the Proposed Construction, Operation and Maintenance of a 1.875-Megawatt Ground-Mounted Solar Photovoltaic Array, Federal Law Enforcement Training Centers, Cheltenham* (Appendix C), on August 10, 2020 with additional measures to further avoid and minimize environmental impact and final mitigation for unavoidable impacts to forest cover. In a letter dated September 3, 2020, MDE certified that the Proposed Project has adequately addressed avoidance and minimization alternatives analysis, including an acceptable social and economic justification for unavoidable impacts to Tier II resources, as required by COMAR 26.08.02.04-1, and therefore has satisfied the Antidegradation Tier II Review.

All construction activities that are implemented at Cheltenham are required to proceed in accordance with applicable federal, state, and local regulations for maintaining water quality and providing protection to water resources. This includes preparing and implementing an ESC Plan, implementing applicable BMPs for Tier II Catchment waters (COMAR 26.08.02.04), and meeting the requirements of the MDE General Permit for Stormwater Discharges from Construction Activity for ground disturbances involving one or more acres. Cheltenham prepared an ESC Plan and Stormwater Management Plan which provide detailed BMPs to minimize adverse impacts from stormwater runoff caused by construction and impervious surfaces. It is a violation of the MDE stormwater law for any discharge to either cause or contribute to a violation of water quality standards as contained in the COMAR. Stormwater management and sediment and erosion control coordination with MDE for concept approval began in March 2019 and continued over eight plan submittals. Updated plans were submitted for concept approval on June 26, 2020 and the stormwater management concept was approved on July 13, 2020 (Appendix B). Revised plans were resubmitted to MDE on August 12, 2020 and final approval was granted on August 17, 2020 (Appendix B).

ESC during construction would include utilization of silt fence around the perimeter of the site with super silt fence being installed at the runoff discharge points of two sediment traps. It would also include use of two stabilized construction entrances and culvert inlet protection. Existing

stormwater runoff from Commo Road is intercepted by and conveyed through existing ditches and swales which are located outside of the limits of disturbance. No increase in stormwater discharge along the existing roadway is expected. Two stabilized construction entrances will be installed to prevent sediment tracking onto the roadway. All disturbed areas would be stabilized immediately following construction with the appropriate temporary or permanent seed mixture, vegetation and matting as per the approved ESC Plan and sequence of construction to prevent excess runoff from leaving the site. Upon completion of construction activities, all areas would be permanently stabilized prior to the removal of sediment control measures. During operation, stormwater management would include five drainage areas with a proposed micro bio-retention area and two detention ponds to intercept stormwater runoff from the Proposed Action Area. Cheltenham met the requirements of the MDE General Permit for Stormwater Discharges from Construction Activity for ground disturbances involving one or more acres on September 4, 2020.

Regarding activities within the coastal zone, in the April 23, 2019 letter from the Maryland State Clearinghouse (Appendix B), MDE and MD DNR stated that their findings of consistency are contingent upon the applicant undertaking a federal consistency review because the Proposed Action is in the Maryland Coastal Zone. Cheltenham submitted information over the course of a year to the State of Maryland for a federal consistency determination under Section 307 of the CZMA, and National Oceanic and Atmospheric Administration regulations (15 CFR Part 930) (Section 1.5.1). On April 13, 2020, MDE responded to FLETC's request for a Federal Consistency Determination pursuant to the CZMA. MDE concurred that the proposed project is consistent with the Maryland Coastal Zone Management Program to the maximum extent practicable, provided the FLETC complied with several conditions prior to beginning construction. MDE's September 3, 2020 letter documented that conditions had been met (Appendix B).

As the Proposed Action Area is located outside of the designated 100-year flood zone and does not include any identified wetlands or wetland buffer areas, there would be no impacts to floodplains or wetlands as a result of the Proposed Action.

Potable water would be used to wash dust off the solar panels to increase efficiency; however, this maintenance activity would be infrequent, and the contractor would primarily rely on precipitation to wash the solar panels. Cheltenham's two on-site wells and associated 100,000-gallon storage tanks can more than adequately supply the amount of non-potable water necessary for washing the solar modules. Nonhazardous water from washing the solar modules would be re-absorbed into the ground under the modules. Operation of the proposed facilities would require maintenance of the grounds to maintain roadways and the solar infrastructure. This would require mowing and the possible use of various herbicides to control vegetation around the roads and PV arrays. As discussed in Section 3.4, any herbicide use would be controlled in accordance with regulatory requirements and manufacturers' recommendations to avoid introduction of herbicides into the surface and groundwater at the site. Hazardous materials that could potentially contaminate groundwater would not be used or stored at the site. However, during installation and construction, there would be a small chance of a spill of diesel fuel or hydraulic fluid from installation and construction equipment. These risks would be low due to the small amounts of these materials that would be present on-site; these risks would be further mitigated by implementation of proper emergency response plans and deployment of equipment to quickly contain and clean up any accidental spills.

Since Cheltenham's ESC and Stormwater Management plans are compliant with the CZMA and Maryland's anti-degradation policy, there would be negligible impacts to surface and groundwater resources.

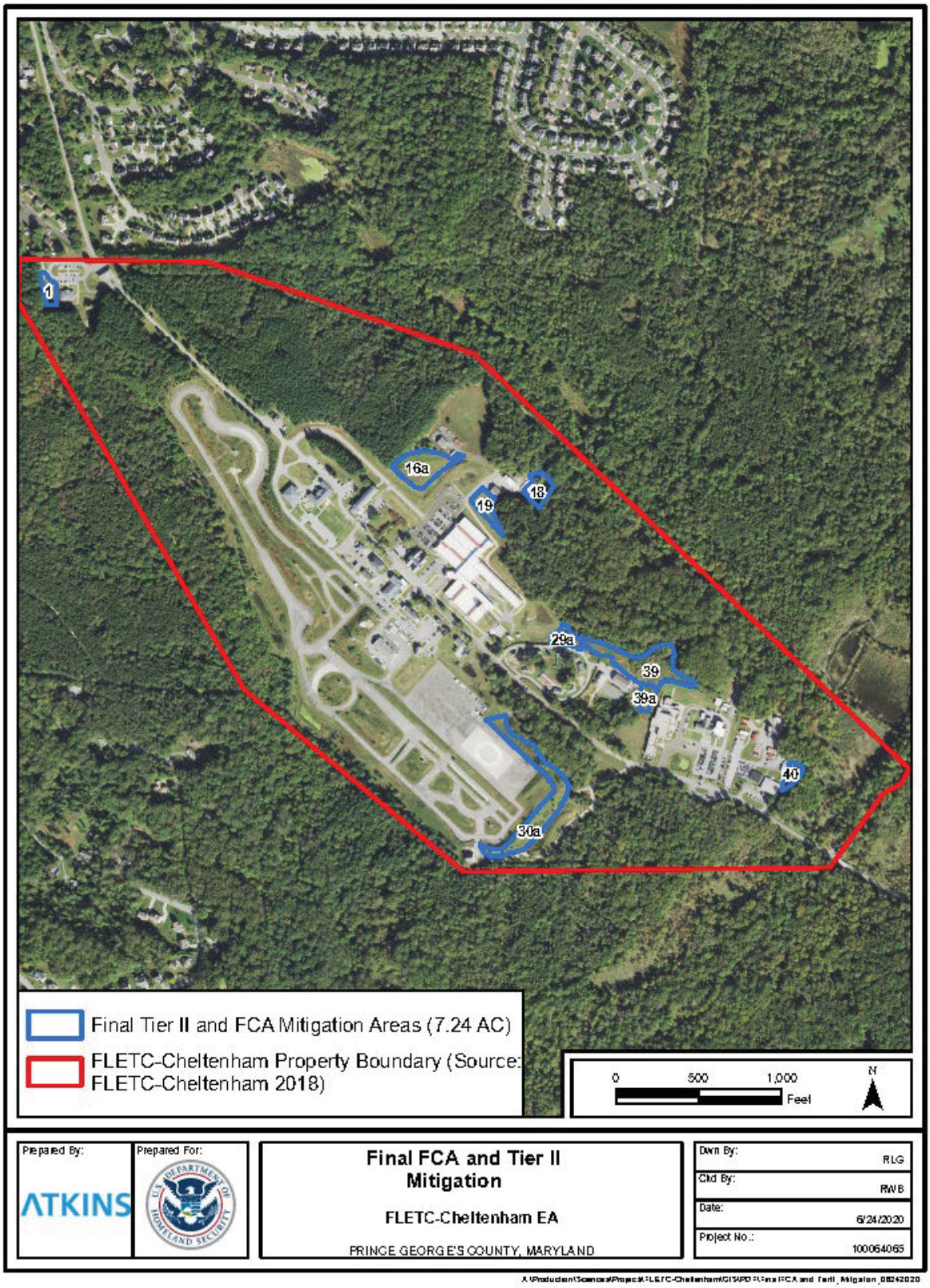
3.5.3.2 No-Action Alternative

Under the No-Action Alternative, the Proposed Action would not be constructed, and no excavating or grading activities would be performed that would potentially increase localized erosion and sedimentation. There would be no increase in impervious surface or resulting stormwater runoff to Tier II stream resources and no additional use of potable water for maintenance of solar panels. Under the No-Action Alternative, there would be no risk of spills as heavy construction equipment and vehicles would not access the Proposed Action Area.

3.5.4 Mitigation

FLETC considered a range of on-site and off-site alternatives to mitigate net forest loss in a Tier II watershed. FLETC will mitigate the loss of 12.02 acres of forest on Cheltenham with the on-site planting of 7.24 acres (Figure 18) of trees within the Piscataway Creek 1 watershed at Maryland Grid Coordinates centroid: 394,773 feet North 1,353,695 feet East. Planting will follow FCA requirements [Forest Conservation, Annotated Code of Maryland Natural Resources Article Title 5, Subtitle 16 and COMAR 08.19, May 2003] and the areas will be protected in accordance with a long-term protection agreement (Appendix G). FLETC as part of the DHS, cannot put its real property in a conservation easement. FLETC pursued final approval of the mitigation proposal within FLETC's chain of command. This included obtaining a Real Property commitment, commitment of funds, and overall approval of the process. The long-term protection agreement (Appendix G) was signed by FLETC on August 3, 2020 and approved by MD DNR on August 10, 2020. The acreage covered under the agreement will be set-aside in perpetuity to remain undisturbed by future construction activity. FLETC will serve as the planting contractor and will plant the designated areas shown in Figure 18. FLETC will maintain the subject plants for 2 years as described in the Forest Planting and Maintenance Agreement in accordance with the long-term protection agreement (Appendix G). This mitigation serves to satisfy State of Maryland’s requirements for Tier II Mitigation, COMAR 26.08.02.04-1.

Figure 18. Final FCA and Tier II Mitigation



3.6 Biological Resources

3.6.1 Definition of the Resource

Biological resources consist of native or naturalized plants and animals, along with their habitats. Although the existence and preservation of biological resources are both intrinsically valuable, these resources also provide essential aesthetic, recreational, and socioeconomic benefits to society. This section focuses on plant and animal species and vegetation types that typify or are important to the function of the ecosystem, are of special societal importance, or are protected under federal or state law or statute. For purposes of this assessment, sensitive biological resources are defined as those plant and animal species listed as threatened or endangered by the USFWS and species that are listed for conservation-related reasons by the State of Maryland or other entities. Three categories of protection status are included in this section: 1) federally listed threatened and endangered species, 2) state listed species, and 3) other sensitive species.

Federally Listed Threatened and Endangered Species. The Endangered Species Act (ESA) of 1973 provides protection to species listed under this category. Endangered species are those species that are at risk of extinction in all or a significant portion of their range. Threatened species are those that could be listed as endangered in the near future.

State Listed Species. The State of Maryland Wildlife and Heritage Service Natural Heritage Program tracks the status of over 1,250 native plants and animals that are among the rarest in Maryland and most in need of conservation efforts. Of these species, the MD DNR officially recognizes 615 species and subspecies as endangered, threatened, in need of conservation, or endangered extirpated. Of which, only 37, or 3 percent of the total tracked species, are listed by the USFWS as nationally endangered or threatened (MD DNR 2019b). The primary State law that allows and governs the listing of endangered species is the Nongame and Endangered Species Conservation Act (Annotated Code of Maryland 10-2A-01). This Act is supported by regulations (COMAR 08.03.08) which contain the official State Threatened and Endangered Species list. Secondarily, MD DNR's Fisheries Service maintains an official list of game and commercial fish species that are designated as threatened or endangered in Maryland (COMAR 08.02.12; MD DNR 2019b). MD DNR published a list of rare, threatened, and endangered species of Prince Georges County in February of 2018 (Appendix H).

Other Sensitive Species. Species under this heading are those that are federal species of concern or species listed that are identified as rare or on a watch list under the State of Maryland Wildlife and Heritage Service Natural Heritage Program state ranking system. These are usually species of regional concern and may or may not be adopted as state or federally threatened or endangered. At present, these species receive no legal protection under the ESA.

In addition, EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds* (2001), recognized the ecological and economic importance of migratory birds to this and other countries. It requires federal agencies to evaluate the effects of their actions and plans on migratory birds (with an emphasis on species of concern) in their NEPA documents. Species of concern are those identified in 1) the report *Birds of Management Concern and Focal Species* (USFWS 2011), 2) birds protected by the Migratory Bird Treaty Act, or 3) listed species in 50 CFR §17.11, *Endangered and Threatened Wildlife*.

3.6.2 Affected Environment

3.6.2.1 Vegetative Habitat

Historically, the Proposed Action Area was part of a site that was deactivated by the Navy in 1998 and FLETC took ownership in 2001. Prior to purchase of the site by the Navy in 1935, the land was predominantly comprised of farmland. Approximately 7.4 acres of the 12.09-acre Proposed Action Area were planted with loblolly pine by the Navy in the early 1990s in an effort to buffer the site from nearby developing residential areas.

1993 historical aerial photo from PGAtlas.com depicting portions of the Proposed Action Area planted with loblolly pine.

The Study Area evaluated in the January and February field assessment, encompassing the Proposed Action Area, included at least 26.5 acres of woodland covering the entire Proposed Action Area and connecting to over 2,000 acres of contiguous forest. The overall vegetated habitat of the Study Area was a combination of a planted-pine community and a natural third-generation mixed pine/hardwood forest. The habitat was dominated by planted loblolly pine (*Pinus taeda)* and a variety of other naturally occurring species including Virginia pine (*Pinus virginicus*), pignut hickory (*Carya glabra*), black gum (*Nyssa sylvatica*), black cherry (*Prunus serotina*), sassafras (*Sassafras albidum*), scarlet oak (*Quercus coccinea*), American persimmon (*Diospyros virginiana*), sweet gum (*Liquidambar styraciflua*), white oak (*Quercus alba*), and red maple (*Acer rubrum*). The planted pine was installed in the early 1990s and has not been commercially thinned. Nuisance canopy species included tree of heaven (*Ailanthus altissima*) and Bradford pear (*Pyrus calleryana*). Canopy cover was approximately 75 to 90 percent throughout the entire 26.5-acre Study Area. Herbaceous species cover was limited and clumped into areas where the canopy was thin and along the fence line. Japanese stilt grass (*Microstegium vimineum*), a nuisance species, was observed in several areas. A complete list of

observed species is provided in Table 1.0 of Appendix D. The remainder of the Study Area is comprised of landscaped and maintained areas adjacent to the security checkpoint and Building 22 (Figure 3).

Coordination with MD DNR in 2001 indicated that at the time, the state endangered dense-flowered knotweed (*Polygonum densiflorum*) and the small bedstraw (*Galium trifidum*), a species with uncertain state status in 2001, were known to occur within the vicinity of the project site (Appendix B). Neither of these species were found during a field assessment conducted on approximately 26.5 acres within the FLETC Cheltenham site in 2012 (Appendix D), nor during the January and February 2019 field assessment (*personal communication, Gino Pompa, Floura Teeter Landscape Architects, January 2, 2020*). Further, neither species are currently listed in Maryland as species of concern (Appendix H).

In Maryland, any activity requiring an application for a subdivision, grading permit or sediment control permit on areas 40,000 square feet (approximately 1 acre) or greater is subject to the FCA and will require a FCP. A forest stand delineation is required by the FCA. The field survey was completed for the entire 230.7-acre Cheltenham property and was submitted to MD DNR on March 18, 2019. Approximately 98.8 acres were determined to be forested. Additional details on the forest resources are included in a forest stand delineation included in Appendix G.

3.6.2.2 Wildlife Resources

The forested portions of the Proposed Action Area provide suitable habitat for a variety of wildlife species. The January and February 2019 field assessment was conducted to characterize and assess the overall habitat and to specifically identify the potential presence of threatened and endangered species occurring within the Study Area. Wildlife was identified utilizing the habitat through either direct observation or evidence of previous use including burrows and scat. Deer, raccoon and fox were visibly using the area. The forest within the Study Area did not contain a complex vegetative structure (i.e., variety of canopy, lower and midstory vegetation). No large old hardwood-dominated forest was present within the Study Area. Over 50 percent of the Study Area would be considered “edge” habitat (i.e., forest area within 300 feet of a forest edge). The majority of observed bird use was limited to a couple of small song birds, hairy woodpecker, pileated woodpecker, and some raptor species within the Study Area. FIDS habitat has been defined as a forest tract that meets either of the following conditions: (a) Greater than 50 acres in size and containing at least 10 acres of forest interior habitat (forest greater than 300 feet from the nearest forest edge); or (b) Riparian forests that are, on average, at least 300 feet in total width and greater than 50 acres in total forest area (MD DNR 2019a). Based on the above conditions and other habitat characteristics, the area likely supports FIDS. Coordination with MD DNR in 2012 also indicated that the forested area within a portion of the Study Area contains FIDS habitat (Appendix B). FIDS include colorful songbirds (i.e., tanagers, warblers, vireos) that breed in North America and winter elsewhere as well as residents and short-distance migrants (i.e., woodpeckers, hawks, owls) (Jones et al., 2001). The most researched and well known FIDS include the scarlet tanager, American redstart, hooded warbler, and barred owl, among others (MD DNR 2019a).

3.6.2.3 Protected Species and Critical Habitat

In compliance with the ESA of 1973 (Public Law 93-205), information pertaining to federally and state-listed rare, threatened and endangered species was collected through correspondence and coordination with the USFWS and the MD DNR. As of October 16, 2012, MD DNR had determined that there are no state or federal records for rare, threatened or endangered species within a portion of the Study Area (Appendix B). More recent agency coordination efforts through the Maryland State Clearinghouse in 2019 resulted in no project-specific comments

concerning state-listed rare, threatened and endangered species. Correspondence and coordination efforts with these agencies are included in Appendix B.

The USFWS indicated that no federally proposed or listed endangered or threatened species are known to exist within the Proposed Action Area. Furthermore, USFWS stated there are no critical habitats within the Proposed Action Area under USFWS jurisdiction. Based on these findings and results from the January and February 2019 field assessment, no Biological Assessment or Section 7 Consultation with the USFWS is required.

The field assessment conducted in January and February 2019 to characterize and assess the overall habitat found no threatened, endangered, or candidate species within the Study Area. Appendix D contains the field memorandum which characterizes the results of the field survey.

3.6.3 Environmental Consequences

3.6.3.1 Proposed Action

Construction of the Proposed Action would require the clearing of approximately 12.02 acres of vegetation and grading of approximately 10.21 acres for installation of the PV array and associated infrastructure within the 12.09-acre Proposed Action Area. Merchantable trees would be harvested and sold to the nearest wood products facility, if feasible. The majority of the canopy trees are planted loblolly pine and other common hardwoods. Impacts associated with the Proposed Action would result in a permanent loss of forest resources, including potential FIDS habitat. In Maryland, any activity requiring an application for a subdivision, grading permit or sediment control permit on areas 40,000 square feet (approximately 1 acre) or greater is subject to the FCA and will require a FCP. The Proposed Action was reviewed in the field by MD DNR on July 3, 2019 and determined to be subject to review under the State of Maryland FCA (Annotated Code of Maryland §5-1602; COMAR 08.19.04) (Appendix B).

Given the potential for FIDS occurring within the project site, in a letter dated October 16, 2012, MD DNR suggested that forest habitat not be removed or disturbed between April and August, the breeding season for most FIDS. It was also noted that this seasonal restriction may be expanded to between February and August if certain early nesting FIDS (e.g., barred owl) are present (Appendix B). In this letter, MD DNR also suggested that impacts to FIDS habitat could be minimized by concentrating or restricting development to the portions of the forest with low-quality FIDS habitat (areas that are already heavily fragmented, relatively young, exhibit low structural diversity, etc.). Further, if loss or disturbance is unavoidable, development should be concentrated or restricted to the perimeter of the forest (i.e., within 300 feet of existing forest edge); thin strips of upland forest less than 300 feet wide; or small, isolated forests less than 50 acres in size.

MD DNR FIDS recommendations implemented in FLETC's design of the Proposed Action include restricting development to portions of the forest with low-quality FIDS habitat and concentrating development to the perimeter of the forest. As noted in Section 3.6.2, the forest within the Proposed Action Area is primarily comprised of loblolly pine trees that were planted in rows in the early 1990s (less than 30 years old) and lacks a complex vegetative structure (i.e., variety of canopy, lower and midstory vegetation). The Proposed Action Area also borders Commo Road, so approximately 60 percent of the potential wildlife habitat is within 300 feet of an existing forest edge.

Wildlife which utilize this habitat are common in the area and not considered to be rare, threatened, or endangered. Wildlife will face short-term impacts such as noise, habitat displacement, and possible mortality; however, the majority of the species are mobile and should be able to avoid long-term impacts by moving to adjacent areas. Impacts to vegetative

habitat and wildlife resources as a result of the Proposed Action would be short-term and minor. There will be no indirect or direct effects on state or federally proposed or listed rare, threatened and endangered species.

3.6.3.2 No-Action Alternative

Under the No-Action Alternative, the Proposed Action would not be constructed, and vegetation would not be cleared and graded. The currently available habitat for biological resources would remain similar to existing conditions. There would be no construction activities resulting in short-term impacts or possible mortality to wildlife.

3.6.4 Mitigation

FLETC considered a range of on-site and off-site alternatives to mitigate net forest loss due to the Proposed Action. FLETC will mitigate the loss of 12.02 acres of forest on Cheltenham as specified in Section 3.5.4. This mitigation serves to satisfy State of Maryland's requirements for both Tier II Mitigation, COMAR 26.08.02.04-1, and the FCA, COMAR 08.19.04.11. FLETC's mitigation includes 9 areas totaling 7.24 acres; eight of these areas are located adjacent to existing FIDS habitat (Figure 18).

3.7 Cultural Resources

3.7.1 Definition of Resource

Cultural resources are any prehistoric or historic district, site, or building, structure, or object considered important to a culture, subculture, or community for scientific, traditional, religious or other purposes. They include archaeological resources, historic architectural resources, and traditional resources. Archaeological resources are locations where prehistoric or historic activity measurably altered the earth or produced deposits of physical remains (e.g., arrowheads, bottles). Historic architectural resources include standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance. Traditional resources are associated with cultural practices and beliefs of a living community that are rooted in its history and are important in maintaining the continuing cultural identity of the community. Historic properties (as defined in 36 CFR §60.4) are significant archaeological, architectural, or traditional resources that are either eligible for listing, or listed in, the National Register of Historic Places (NRHP). Historic properties are evaluated for potential adverse impacts from an action, as are significant traditional resources identified by American Indian tribes or other groups.

3.7.2 Affected Environment

As per Nexsen (2001), in March 1999, R. Christopher Goodwin & Associates, Inc., on behalf of the United States Army Corps of Engineers, Baltimore District, conducted a Phase I Architectural and Archaeological Investigation at the former NCDC facility. The objectives of this project included:

1. The development and preliminary testing of an updated archaeological predictive model, and
2. Phase I architectural investigations.

The archaeological objectives were met through a series of disturbance studies that included systematic shovel testing of a sample of areas defined as No, Low, and High Probability Areas

to contain archaeological sites. The study also included research of archival data and the development of a revised predictive model.

Architectural investigations included a combination of archival research and field survey techniques. Study findings were applied to the National Register Criteria for Evaluation. The field survey included the assessment of 102 buildings and structures on site.

No cultural surveys have been conducted for the Cheltenham facility in the last 5 years.

3.7.2.1 Archaeological Resources

As per Nexsen (2001), background research for archaeological resources at the former NCDC facility involved personnel interviews, an examination of site files, a review of historical and archaeological literature, and disturbance tests. The following text derived from Nexsen (2001) summarizes the findings.

Several archaeological surveys have been conducted in the vicinity of the former NCDC facility, eight of which have been recorded since 1978. From those surveys, six archaeological sites were identified within a 2-mile radius of the Cheltenham facility. Following review by the Maryland Department of Housing and Community Development, most sites were removed from further consideration and action.

The archaeological investigation conducted within the Cheltenham facility was successful in updating the 1991 archaeological predictive model. One archaeological site was discovered within the property evaluated in 1998. Site discovery included the unearthing of quartz and rhyolite flakes. Further testing did not identify additional artifacts. It was determined that this archaeological site did not contribute to the knowledge of the prehistory of the Cheltenham site.

Based on the findings of the archaeological investigations, the MHT, in a letter dated February 18, 1999, indicated that no additional archaeological investigation was warranted (Appendix B).

3.7.2.2 Architectural Resources

As per (Nexsen 2001), Phase I architectural investigations at the former NCDC facility, originally commissioned in 1939 as a radio receiving station, included a combination of archival research and field survey techniques. The following text derived from Nexsen (2001) summarizes the findings.

In 1998, 102 buildings and other structures at the NCDC facility were evaluated for eligibility in the NRHP. Forty-four buildings were constructed between 1938 and 1945 and 58 were constructed after 1946. For the duration of the facility's operation, all buildings were associated with the Navy's communication program; however, the mission of the facility changed to one for an administration role during the Cold War.

An intensive architectural evaluation of the entire complex was performed in response to a recommendation by the MHT and the scheduled closure of the detachment facility, and in accordance with Guidelines for Completing the Maryland Inventory of Historic Properties Form and the NRHP Program. The investigations involved a combination of archival research and field survey of buildings that included the Proposed Action Area. The Phase I Architectural Survey and Archaeological Investigations report stated the following:

> “Based on the results of the archival research and field survey, the U.S. Naval Radio Station, Cheltenham, does not appear to possess the qualities of significance for listing in the NRHP under Criterion A for its association with World War II. The installation does

not possess direct, important associations with the communications activities of World War II operations."

In a letter dated February 18, 1999, the MHT concurred that the station "…does not possess significance for inclusion in the NRHP under Criterion A or sufficient physical integrity under Criterion C. Therefore, further architectural investigations are not warranted." Finally, under the Section 106 Determination of Effect, the MHT concluded that, based on the findings of the archaeological and architectural investigations, the federal surplus of the facility would have no effect on historic properties (Appendix B).

3.7.3 Environmental Consequences

3.7.3.1 Proposed Action

Construction of the Proposed Action would not result in any impacts to cultural resources and no visible historic structures were observed during the January and February 2019 field assessment (see Appendix D). The Study Area is undeveloped and has been examined for archaeological and architectural resources during previous investigations. In a letter dated April 23, 2019 from the Maryland State Clearinghouse, the MHT "found this project to be consistent with their plans, programs, and objectives" (Appendix B). Therefore, there would be no impacts to cultural resources.

3.7.3.2 No-Action Alternative

Under the No-Action Alternative, there would be no impact on cultural resources.

3.8 Land Use, Aesthetic and Visual Resources

3.8.1 Definition of Resource

Land use is the classification of either natural or human-modified activities occurring at a given location. Natural land use includes open or undeveloped areas. Human-modified land use classifications include residential, commercial, industrial, recreational, and other developed areas. Land use is regulated by management plans, policies, and regulations determining the type and extent of land use allowable in specific areas and protection specially designated for environmentally sensitive areas.

Visual resources consist of the natural elements (e.g., vegetation and waterbodies) and the man-made structures which typically make up the viewing environment. Visual resources are reviewed to determine the compatibility of construction projects within a surrounding environment.

Established by Congress in 1924, the NCPC is the federal government's central planning agency for the National Capital Region, which includes Prince George's County, Maryland where the Proposed Action is located. Through planning, policymaking, and project review, NCPC protects and advances the federal government's interest in the region's development. The NCPC provides overall planning guidance for federal land and buildings in the region by reviewing the design of federal and certain local projects, overseeing long-range planning for future development, and monitoring capital investment by federal agencies. The National Capital Planning Act requires federal agencies to submit project plans and development proposals for federal property to the NCPC for review. Depending upon the project's location (within or outside the District of Columbia), the NCPC either approves the project or provides recommendations (advisory authority), respectively (NCPC 2019). The Proposed Action is

located outside the District, therefore the NCPC will review the Proposed Action and provide recommendations under its advisory authority.

NCPC's review includes an assessment of consistency with the Comprehensive Plan's Federal Elements. Federal Elements of the Comprehensive Plan contain goals, policies, and implementation proposals addressing a variety of subjects, such as locations of federal facilities, employee services, affordable housing for federal employees, and energy conservation in the design and construction of federal facilities (NCPC 2019).

The ROI for land use and visual resources consists of Cheltenham's property boundary, as well as adjacent portions of Prince George's County as depicted by the map extent in Figure 19.

3.8.2 Affected Environment

3.8.2.1 Land Use

The Proposed Action Area is located in Cheltenham, in Prince Georges County, Maryland, within the Cheltenham property boundary, approximately 15 miles southeast of downtown Washington, D.C., and approximately 13 miles from the consolidated DHS Headquarters. Joint Base Andrews is located approximately 2 miles to the north. Surrounding land uses are predominantly low-density suburban residential neighborhoods, with several wooded areas, including parks, to the south and east (The Maryland-National Capital Park and Planning Commission (M-NCPPC) 2013a). Low-density residential areas border the Cheltenham facility to the north and comprise a small area of the western boundary. M-NCPPC's Cheltenham Park comprises over 200 acres and borders Cheltenham to the east and partially to the south. A small portion of Cheltenham is bounded to the southeast by M-NCPPC's Piscataway Creek Stream Valley Park II (Figure 19). The DOE owns approximately 124 acres to the west of Cheltenham and is used to operate a 24-hour nationwide high-frequency mobile radio relay station.

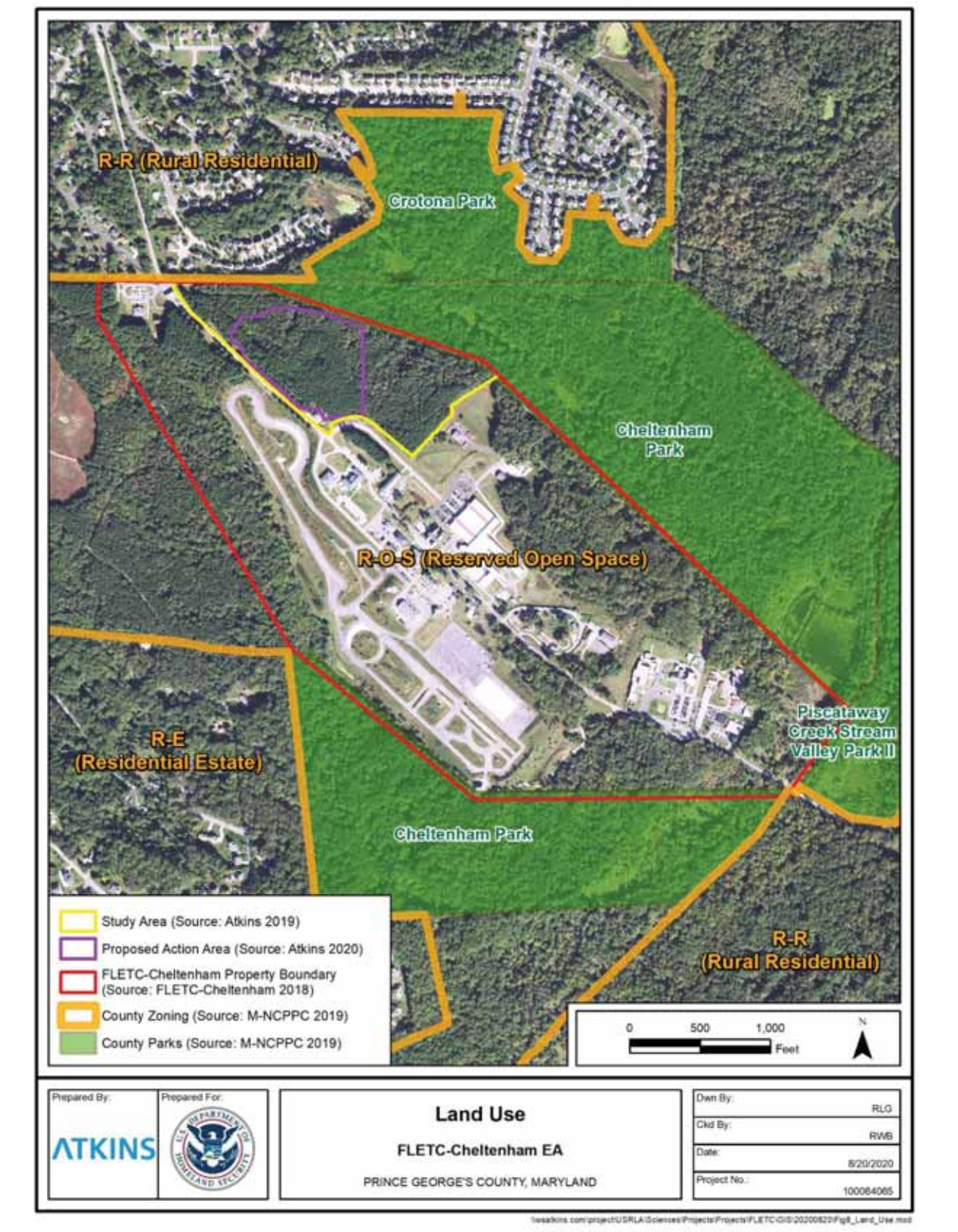
The Cheltenham property is under federal jurisdiction and is therefore not subject to the requirements of the Prince George's County Zoning Ordinance; however, the comprehensive rezoning process is meant to apply a zoning category to all land, including government property (M-NCPPC 2013b). The Reserved Open Space (R-O-S) Zone is generally applied to federal properties and therefore, Cheltenham is zoned 100 percent R-O-S (M-NCPPC 2019; Figure 19). The land use zoning for parcels adjacent to the Cheltenham facility boundary are as follows: Rural Residential (R-R) and R-O-S to the north, R-O-S and Residential Estate (R-E) to the west, and R-O-S to the east and south (M-NCPPC 2019). As per M-NCPPC (2010), the R-O-S district provides for maintenance of certain areas of land in an undeveloped state, with the consent of the property owners. The preservation of large areas of trees and open space are encouraged, and these areas are designed to ensure retention of land for nonintensive active or passive recreational uses. This district also provides for a limited range of public, recreational, and agricultural uses, among other uses. The R-R district permits one-half-acre residential lots and allows a number of nonresidential special exception uses. The R-E district permits large-lot (1 acre or larger) estate subdivisions.

3.8.2.2 Aesthetic and Visual Resources

The *1985 NCDC Master Plan Update* indicates that there are 38 major buildings and facilities within the former NCDC facility, in addition to many other smaller structures (Nexsen 2001). Buildings were categorized as being permanent (designed to serve for at least 25 years) or semi-permanent (designed to serve a specific purpose for five to 24 years duration). Temporary structures were characterized as serving for less than five years. The main buildings are an

architectural mixture of Georgian colonial revival style found on several United States military installations of the era between the world wars while construction following World War II was more contemporary. Brick continued to be used in some of the more modern structures (Nexsen 2001).

Figure 19. Land Use



The site was deactivated and abandoned by the Navy in 1998 and became part of Cheltenham in 2001 consisting of 247 acres and 42 buildings. Many of the existing buildings have suffered some interior and exterior deterioration since the 1998 deactivation. Today, Cheltenham consists of approximately 30 buildings, none of which are eligible for inclusion on the NRHP according to a previous study (Nexsen 2001) and confirmation from the MHT (Appendix B).

Large stands of trees ring the main or central complex area and are present at the property's fenceline, blocking views offsite. Mature trees line Commo Road in the main complex. The site rises topographically from the southern gate at Commo Road towards the northern or main gate, with an elevation drop-off to the west of Commo Road through the center of the site (Nexsen 2001; Figure 16). The trees noted above also prevent unobstructed views into the site from beyond the property, except for areas to the east/southeast. The only populated area proximal to the Proposed Action Area is the Cheltenham South neighborhood, located approximately 250 feet to the northwest. A site visit to Cheltenham and the nearest residential neighborhood on February 13, 2019 confirmed that the area behind the homes closest to Cheltenham is comprised of stands of large trees. The two water towers are somewhat visible because of their height.

Photographs taken of the Cheltenham facility perimeter northwest of the main gate (left) and from in front of homes within the Cheltenham South neighborhood along Allerton Terrace located northwest of the Proposed Action Area (right) on February 13, 2019 show stands of large trees blocking views both on- and off-site.

3.8.3 Environmental Consequences

3.8.3.1 Proposed Action

Land use within the Proposed Action Area would change from tree coverage/forested to cleared with a solar array as detailed in Section 1.2. The installation and O&M of the proposed solar arrays would not change the type of activities/operations performed at the Cheltenham facility, and would have no effect on off-site land use.

The Cheltenham facility is under federal jurisdiction and county laws governing land use and planning do not apply. However, in a letter dated April 23, 2019 from the Maryland State Clearinghouse (Appendix B), the MDP commented that:

> "The project is located in a Priority Funding Area. While the County comp plan does not have specific policies in support of FLETC Cheltenham, it does have policies supporting industry clusters. The 2013 Economic Development Strategic Plan for the County identifies federal agencies and supportive industries as a primary cluster to support. This energy production and conversion upgrade project supports the work of Federal Law Enforcement training facility. Energy Infrastructure policy 9 on page 178 of PLAN Prince George's 2035 states 'Encourage investment in energy infrastructure, renewable energy, and the use of smart grid technologies to improve the efficiency reliability, affordability, and sustainability of energy production and distribution.'"

The MDP found the Proposed Action to be consistent with their plans, programs, and objectives and Prince George's County did not have comments (Appendix B).

The NCPC's *Comprehensive Plan for the National Capital: Federal Elements* (Comprehensive Plan; (NCPC 2016) establishes goals and planning policies that guide federal growth and development and provide a decision-making framework for future initiatives. Coordination with the NCPC for providing recommendations on the Proposed Action began on March 22, 2019. At the June 6, 2019 meeting, the NCPC approved the preliminary site development plans with comments for the Proposed Action (Appendix B). The NCPC requires that DHS and FLETC provide, as part of the final submission, details regarding the approved mitigation developed in coordination with the MD DNR. Coordination with the NCPC is anticipated to be completed in October 2020. In the Commission Action, the NCPC reminded DHS that a master plan for the FLETC-Cheltenham campus should be submitted for the Commission's review as the last time the Commission reviewed the master plan was in 2002.

At its closest point, the limits of construction for the Proposed Action would be approximately 250 feet from the nearest residential property boundary. The majority of the proposed solar arrays would not be seen from off-site given their low vertical profile and the extensive wooded buffer surrounding the Cheltenham property; therefore, visual impacts associated with the Proposed Action would be negligible. The southwestern edge of the array would be visible, though partially obscured by over 100 feet of dense forested tree cover, to motorists traveling northwest along Commo Road within the Cheltenham facility. PV panels are commonly believed to cause or create glint (a momentary flash of bright light) and glare (a reflection of bright light for a longer duration) resulting in irritation to neighbors or a danger to pilots (Meister Consultants Group 2014); however, solar panels are covered with anti-reflective coatings and are designed to absorb, rather than reflect light. As a result, the potential for visual impacts due to the reflectivity of the solar panels would be negligible.

Based on the Proposed Action's alignment with current zoning, potential consistency with the NCPC's Comprehensive Plan, and the passive nature of the Proposed Action, no significant impacts to land use of neighboring properties are anticipated.

3.8.3.2 No-Action Alternative

Under the No-Action Alternative, vegetation would not be cleared and no direct impacts on land use, or aesthetic and visual resources would occur.

3.9 Infrastructure

3.9.1 Definition of Resource

The infrastructure elements at Cheltenham include transportation and utility systems, which service all areas of the facility. Infrastructure with the potential for more than negligible impacts resulting from the Proposed Action, and therefore evaluated in this EA, are limited to roadways and traffic, potable water, stormwater, electricity, heating and cooling, and natural gas. The ROI for these resources consists of Cheltenham's property boundary (Figure 2).

3.9.2 Affected Environment

3.9.2.1 Roadways and Traffic

As described in (Nexsen 2001), Cheltenham is well connected to the regional transportation network. It is located in southern Prince George's County, approximately 5.5 miles south of I-495, also known as the Capital Beltway, and approximately 3 miles south of Joint Base Andrews (Figure 1). Several state arterial highways surround Cheltenham, while direct access is provided via county collector roadways. Primary access to Cheltenham is provided by Commo Road via Dangerfield Road. Dangerfield Road provides a direct connection to Maryland State Highway 223 to the north and access to MD 5 to the west via Surratts Road. Secondary access is provided on Commo Road at the southeast corner of the facility, which provides access to US 301 to the east via Frank Tippett Road. Each of the county roadways are two-lanes and connect to state highways at signalized intersections. MD 5 is a six-lane divided highway connecting to I-95 and Washington, DC to the north and merges with US 301 to the south. US 301 is a four-lane divided highway connecting with US 50 to the north and provides access to Upper Marlboro, Annapolis, and other points north and east. MD 223 is a two-lane arterial that connects to MD 5 to the west and MD 4 to the north as illustrated in Figure 1.

DHS (2010) describes the Cheltenham road system as having a single primary road (Commo Road) which traverses through the center of the facility from the main gate to the rear gate; capacity and flow are not issues. The loop road provides access to the Tactical/Practical Training area, while the road that runs parallel and south of Commo Road provides access to the rear of several buildings and parking lots.

3.9.2.2 Utilities

Potable Water. Potable water for the Cheltenham site comes from two on-site water wells that draw groundwater from the Magothy formation. The well at Pump House 108 was renovated in 2017, while the well at Pump House 9 is out of service and currently being replaced. There are two 100,000-gallon capacity elevated storage tanks at Cheltenham, one each at Tower 107 and Tower 7. The elevated storage tank at Tower 7 is out of service and is isolated from the water distribution system. Currently the well at Pump House 108 and elevated storage tank at Tower 107 are fully operational and supplying potable water to the distribution system. Sodium hypochlorite solution renders the water potable before distribution. Prince George's County fire fighting training also uses water from the Cheltenham's well (DHS 2010). Their usage is subtracted from the Cheltenham's permitted use allowance. The water distribution system is

approximately 90 percent ductile iron pipe and has incurred many repairs over the years rendering the system in fair condition. New regulations effective in 2016 require Cheltenham to convert to city water (DHS 2017a). Cheltenham has plans to connect to the Washington Suburban Sanitary Commission water distribution network. This process is expected to take 3 to 5 years.

***Stormwater Management*.** Cheltenham facilities drain to two tributaries of Piscataway Creek. Stormwater drainage is accomplished through a combination of piping and sheet flow. The site has approximately 12,000 linear feet of storm sewers including catch basins, culverts, and drainage swales. Piping primarily consists of corrugated metal and concrete with PVC being used for underdrain systems. Cheltenham currently maintains two bio-retention areas, nine wet ponds, sixteen grass channels, three rock-lined channels, and three rock check dams.

***Electricity, Heating and Cooling, and Natural Gas*.** The electrical system on Cheltenham is owned and maintained by FLETC. PEPCO provides electricity to Cheltenham and #2 Fuel Oil is trucked in and used for building heat in nine buildings. Building 12 has two electric boilers that produce building heat via 13.2 kilovolt overhead distribution from PEPCO's substation located on Surratts Road. The substation (Building 18) switchgear for Cheltenham was upgraded in 2007-08 and the feeders and transformers on the electrical distribution system were upgraded in 2008-09. Cheltenham's annual electrical usage was 19.6 BBTUs in FY 2017. In 2016, Cheltenham used 5,251,806 kWh (17.9 BBTUs) at a cost of $498,677.69 (at a rate of $0.095/kWh). The Cheltenham site has no central steam, hot or chilled water plants or distribution systems. Buildings have individual electric or fuel oil heating and air conditioning systems. There is currently no natural gas distribution system at Cheltenham, but a system is planned to be installed in 2019 (Section 4.1.2).

3.9.3 Environmental Consequences

3.9.3.1 Proposed Action

Roadways and Traffic

During installation and construction, the Proposed Action Area would be accessed via Commo Road through the security gate on the southeast side of Cheltenham. As part of the Proposed Action, a permanent gravel access path (approximately 60-feet long) to the solar PV array would be constructed to connect the construction site to Commo Road. Project installation and construction would result in a short-term increase in the number of trips on the local transportation network based on additional construction employees and material and equipment deliveries. Due to the relatively low volume of construction traffic, there is no need to reroute traffic inside or outside of the facility during construction. Given the capacity on existing roadways in the vicinity of Cheltenham, potential impacts to roadways and traffic during installation and construction of the Proposed Action would be negligible. In a letter dated April 23, 2019 from the Maryland State Clearinghouse, the MDOT had no project-specific comments concerning roadways and traffic (Appendix B).

Once construction is completed and the system is fully operational, it is anticipated that the solar PV array would require an estimated two maintenance visits per year, consisting of a one- or two-person team. Due to the minimal nature of O&M, no traffic impacts would be anticipated during the operation of the solar array.

Utilities

Potable Water. Potable water would be used to wash dust off of the solar panels to increase efficiency; however, this maintenance would be infrequent and the contractor would primarily rely on precipitation to wash the solar panels. Thus, the capacity of the existing well, and future city-supplied water, would be capable of meeting any minimal increase associated with the Proposed Action. No significant impacts are anticipated.

Stormwater. Impacts to stormwater due to the Proposed Action are detailed in Section 3.5.3.

***Electricity, Heating and Cooling, and Natural Gas*.** The proposed PV array would produce an estimated 3,464,033 kWh or 11.7 BBTUs per year. This production would be valued at $329,083 annually based on FY 2016 data ($0.095/kWh). The PV array would be connected to the existing electrical distribution lines at Cheltenham in order to supplement the facility energy requirements. The contractor would be required to install all of the necessary components to make the energy generated by the solar array compatible with the existing system. Generation of renewable energy would be contributing to DHS renewable energy goals as detailed in Section 1.3 as established by the EPAct of 2005, EO 13423, EISA, and EO 13834, resulting in a small, beneficial impact to the electrical system.

Details for the end of the operational life of the PV array (estimated to be 30 years or more) are discussed in Section 1.2. FLETC will consider and evaluate two options (retrofit the existing PV components and continue operations or decommission the PV system and discontinue operations). If the option to retrofit the system is selected, FLETC will continue to supplement the electrical utility power supply. If the PV array is dismantled, FLETC would no longer provide solar-derived electrical power to the electrical utility company. The utility would be expected to anticipate for this change in electrical demand and revert back to providing the previous electrical power demand prior to the construction and operation of the PV array. The Cheltenham facility would maintain normal operations and would continue to obtain service from a local electrical utility company.

Under the Proposed Action there would be no change in Cheltenham's heating and cooling demands. No significant impacts would be anticipated.

3.9.3.2 No-Action Alternative

Under the No-Action Alternative, there would be no effect on the availability of utilities at Cheltenham. There would be no impacts to roadways and traffic, potable water, stormwater, heating and cooling, and natural gas; all would remain similar to existing conditions.

3.10 Socioeconomics and Environmental Justice

3.10.1 Definition of Resource

Socioeconomic resources are defined as the basic attributes associated with the human environment, particularly population and economic activity. Population is described by the change in magnitude, characteristics, and distribution of people. Economic activity is typically composed of employment distribution, personal income, and business growth. Any impact on these two fundamental socioeconomic indicators can have ramifications for secondary considerations, like housing availability and public service provision.

3.10.1.1 EO 12898 and 13045

To comply with NEPA, the planning and decision-making process for actions proposed by federal agencies involves a study of other relevant environmental statutes and regulations, including EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. The essential purpose of EO 12898 is to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, tribal, and local programs and policies.

The State of Maryland has enacted the Commission on Environmental Justice and Sustainable Communities through EO on January 1, 2001 and statutorily signed into law on May 22, 2003. The Commission examines environmental justice and community sustainability issues that may be associated with creating healthy, safe, economically vibrant, environmentally sound communities for all Marylanders in a manner that allows for democratic processes and community involvement. Maryland's approach to Environmental Justice is consistent with the approach advocated by the EPA. EPA calls for States to address Environmental Justice issues as appropriate and for improvements in efficiency and sustainability in the use of resources and production processes. EPA defines Environmental Justice as,

> *"The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." Fair treatment means that no group of people including a racial, ethnic, or socio-economic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.*

Because children may suffer disproportionately from environmental health risks and safety risks, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, was introduced in 1997 to prioritize the identification and assessment of environmental health risks and safety risks that may affect children and to ensure that federal agency policy, programs, activities, and standards address environmental risks and safety risks to children. This section identifies the distribution of children and locations where the number of children in the affected area may be proportionately high (e.g., schools, childcare centers, etc.).

The ROI for socioeconomics and environmental justice for this analysis includes Prince George's County.

3.10.2 Affected Environment

3.10.2.1 Socioeconomics

The Cheltenham population consists of staff (instructors and support), partnering organizations, students, and contractors which fluctuates relative to the FLETC budget and student through-put from year to year.

This workforce represents a relatively minor portion of the Prince George's County Maryland estimated population of 905,161 and average estimated labor force of 516,509. Only 6.5 percent of families in Prince Georges County are below the poverty level (U.S. Census Bureau 2019); therefore, the threshold[2] for environmental justice status for low-income population was not met.

3.10.2.2 Environmental Justice and Protection of the Children

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, is designed to focus the attention of federal agencies on the human health and environmental conditions in minority communities and low-income communities. Prince Georges County's population does not meet the threshold for environmental justice status.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, requires federal agencies to identify and assess if its activities, including the Proposed Action, would have a disproportionate effect on infants and children. As children's bodily systems, including neurological, immunological and digestive systems, are still developing, it is important to address any potential impacts that a proposed project may have on the health and well-being of children who are in the vicinity of, or could come in contact with, a proposed project. There are no facilities within the Cheltenham facility grounds to which children would have unsupervised access.

3.10.3 Environmental Consequences

3.10.3.1 Proposed Action

Socioeconomic impacts from the Proposed Action are expected to be minimal because of the temporary nature of the proposed activities and the non-substantial changes in the labor force at Cheltenham or the surrounding community. The Proposed Action would not create any direct, full-time-equivalent jobs at Cheltenham or in the surrounding communities and would not increase the local population. As with most building projects, the associated construction employment would be limited and temporary and does not represent a permanent change in local employment. Short-term negligible beneficial economic impacts would occur as a result of a temporary increase in construction workers hired and the local purchasing of construction materials. Long-term negligible economic benefits could occur due to potential contractual support needs for O&M of new infrastructure. The Proposed Action would not significantly impact sales volume, income, employment, or the local tax base. Additionally, because the Proposed Action would occur entirely on the interior of Cheltenham and would not result in any increase in population, no impacts to public services (e.g., fire protection, police enforcement, medical services, education, etc.) would occur.

Environmental Justice and Protection of Children

The Proposed Action would not be expected to cause adverse or disproportionately high impacts to minority or low-income communities. Although Cheltenham resides within the proximity of residential areas, the Proposed Action's potential impacts would be contained to the

[2] CEQ guidance (2019) identifies the presence of minority or low-income populations when the percentage of the population group exceeds 50 percent.

Cheltenham grounds. Further, Prince Georges County's population does not meet the threshold for environmental justice status, therefore, there would be no significant impact on environmental justice from the Proposed Action.

The Proposed Action would not produce any environmental impacts that could disproportionately affect infants or children. There would be no potential for releases of gases, particulate matter, or noise that is outside the scope of a similar construction project. The Proposed Action would not produce excessive noise during construction or operation, and construction noise is expected to only occur during daytime hours (Section 3.3). Additionally, any increases in truck or large vehicle traffic would take place during working business hours and travel to the site would follow any vehicular restrictions to protect children. The Proposed Action would not be expected to cause adverse or disproportionately high impacts to infants or children. Therefore, there would be no significant impact on children from the Proposed Action.

3.10.3.2 No-Action Alternative

Under the No-Action Alternative, Cheltenham would maintain their existing facilities at Cheltenham and would not build the PV array, as proposed. Failure to implement the Proposed Action would also not generate any of the negligible short-term or potential long-term beneficial economic impacts associated with the Proposed Action.

3.11 Sustainability and Resilience

3.11.1 Definition of Resource

3.11.1.1 EO 13423, 13783 and 13834

In January 2007 President George W. Bush issued EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management* which mandated changes in the way governmental agencies conduct their activities. Among these mandates are requirements to implement "green purchasing" programs, improve fleet management by using more fuel-efficient vehicles and hybrid vehicles, better manage computers and other electronics throughout their useful life, reduce water and energy use, reduce solid waste by recycling, and implement an overall Environmental Management System (EMS). An EMS is a management tool designed to make the organization more proactive in its management of activities that could harm the environment.

In accordance with EO 13653, *Preparing the United States for the Impacts of Climate Change,* and EO 13693, *Planning for Federal Sustainability in the Next Decade*¸ during FY 2016, DHS formally chartered the governance and oversight of climate change adaptation and resilience within the Department. On March 28, 2017, President Trump signed EO 13783, *Promoting Energy Independence and Promoting Economic Growth*, revoking EO 13653. Shortly after, on May 17, 2018, President Trump's EO 13834, *Efficient Federal Operations,* revoked EO 13693.

EO 13834 directs federal agencies to meet policy goals for energy efficiency, consumption of renewable energy, electricity and potable and non-potable water, and sustainability, among other requirements, "…in a manner that increases efficiency, optimizes performance, eliminates unnecessary use of resources, and protects the environment." Implementation of this policy requires agencies to prioritize actions that decrease waste, cut costs, improve the resilience of federal infrastructure and operations, and allow more effective accomplishment of its mission. As a result, among other goals, FLETC is required to achieve and maintain annual reductions in building energy use, implement energy efficiency measures that reduce costs, and meet statutory requirements relating to the consumption of renewable energy and electricity. The

Proposed Action would assist FLETC and the DHS in meeting their overall sustainability, mission readiness and resiliency goals.

3.11.2 Affected Environment

The FLETC Environmental and Safety Division (ESD) and other divisions have implemented environmental awareness activities and other programs in order to reduce the impact of law enforcement training on the environment in accordance with EO 13834. ESD met the requirement to implement an EMS in late 2006.

The FLETC EMS currently implements approximately 20 environmental programs, including a Green Purchasing Program, an Energy Conservation Program, a Fleet Management Program, a Hazardous Waste Management Program, a Storm Water Management Program, a Fuel Tank Management Program, a Recycling Program, as well as several others. Each of these programs has been implemented at all FLETC campuses and is under the day-to-day control of an environmental protection specialist and other site staff.

As per EO 13834, DHS uses OMB Scorecard for Efficient Federal Operations and Management as a standard to identify and track best opportunities to reduce waste, enhance resilience of federal infrastructure and operations, and cut costs. Based on the August 2018 OMB, DHS made notable improvements in facility energy efficiency, water efficiency, efficiency measures and investment, and renewable energy use. In addition to continual improvements in these areas, DHS is committed to reducing fleet petroleum consumption, reducing waste, increasing sustainable buildings, reducing GHG emissions, and leveraging federal purchasing power to support environmentally preferred technologies and products. DHS also continues to look for opportunities to provide energy resilience and savings through leveraging of performance-based contracts. The most recent Strategic Sustainability Performance Plan (DHS 2017b) has been updated to reflect the August 2018 OMB results. For each DHS component, including FLETC, an annual OSPP is required. FLETC submitted its first OSPP to DHS in 2010; this document presents the ninth annual update to the FLETC's original OSPP.

This OSPP reflects the FLETC's strategic vision for doing business in an efficient and sustainable way. The OSPP was developed through an examination of sustainability activities across the FLETC's four training delivery points or sites. This OSPP adheres to the template developed by DHS Headquarters. The template clearly establishes how the FLETC will implement its energy conservation and sustainability programs to fully support the DHS efforts to meet the goals of EO 13834.

In addition to the annual OSPP, FLETC is developing an "enterprise-wide" Sustainability and Resilience Plan which is due to DHS in August 2019.

3.11.3 Environmental Consequences

3.11.3.1 Proposed Action

The Proposed Action is an opportunity to provide energy resilience and savings through leveraging a performance-based contract. The PV array would produce renewable power which is more sustainable than purchasing power generated by non-renewable resources and would help to minimize the stresses on energy infrastructure and provide more energy security. Generally, it is agreed that on-site renewable energy generation helps mitigate the risk of power failure from the electrical utility while providing clean sustainable energy. With this project, the on-site PV solar array would provide a redundant electricity supply source. The PV array would generate electricity which is consumed by Cheltenham behind the meter and displaces the

electricity which would have otherwise been purchased directly from the grid. Electricity which is not consumed by Cheltenham would be sent to the grid and would be read as a negative consumption by the meter. Electricity savings for the Proposed Action would be 3,431,817 kWh and was calculated by the stipulated solar electricity generation, 3,260,226 kWh, multiplied by the rate of electricity, $0.098 / kWh. The Proposed Action would generate approximately 60 percent of the Cheltenham's total annual electricity consumption based on historical utility data (Washington Gas 2017). As a result of the Proposed Action, Cheltenham would be able to mitigate future rising utility costs and invest savings into Cheltenham's facilities while funding for infrastructure improvement continues to decline. In addition, the GHG output associated with operation of the Proposed Action is considerably lower than power generation from combustion of fossil fuels. Carbon dioxide (CO_2) output was compared against generation of electricity by common fossil fuel combustion methods. The average output of CO_2 per kWH of solar power was 105 versus power generation from the combustion of fossil fuels such as coal (909 kWH) and natural gas (465 kWH), (BlueSkyModel 2019), resulting in an 88 and 77 percent reduction in average CO_2 output compared to the combustion of coal and natural gas, respectively.

Therefore, the Proposed Action would have a moderate beneficial impact on sustainability and resilience at Cheltenham by lowering costs, reducing the GHG footprint of the facility, replacing approximately 60 percent of the Cheltenham's total annual non-renewable electricity consumption with a renewable and sustainable energy source, improving energy security.

3.11.3.2 No-Action Alternative

Under the No-Action Alternative, FLETC would maintain their existing facilities at Cheltenham and would not build the PV array, as proposed, and thus continue to purchase power generated by less sustainable energy sources.

4 Cumulative Impacts and Irreversible and Irretrievable Commitment of Resources

4.1 Background and Methods

As defined in 40 CFR §1508.7, a cumulative impact is the impact on the environment which results from the incremental impact of an action in the ROI when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. In accordance with the DHS Instruction Manual 023-01-001-01, Revision 01, Implementation of the NEPA, a discussion of cumulative impacts resulting from projects that are proposed (or anticipated over the foreseeable future) is required.

In this EA, an effort has been made to identify all actions within the ROI that have been completed, are being considered, and that are in the planning phase at this time. To the extent that details regarding such actions exist and the actions have a potential to interact with the Proposed Action and the No-Action Alternative in this EA, these actions are included in this cumulative analysis. This approach enables decision makers to have the most current information available so that they can evaluate the environmental consequences of the Proposed Action and the No-Action Alternative.

4.1.1 Identification of Past, Present, and Reasonably Foreseeable Actions

Relevant projects, plans, and programs that could interact with the Proposed Action were identified and included below. To identify past, present, and reasonably foreseeable future actions, a review of previous master plans and existing land use plans around the facility, as well as consultation with Cheltenham staff, were conducted.

For future actions, FLETC is developing an “enterprise-wide” Sustainability and Resilience Plan. The focus areas include critical infrastructure, information communication technology, energy and water, facilities, and transportation and their interdependencies. The plan will review and consider FLETC’s “critical” operations and vulnerabilities relative to the FLETC mission - training students. With stakeholders engaged, a criticality assessment will be conducted and a plan for addressing gaps/vulnerabilities in the FLETC process/operations will be developed. Related to the FLETC mission, resilience readiness and preparedness will be determined. This plan, with the input of FLETC stakeholders, will be a long-term dynamic plan (typically 25 years) where sited gaps/vulnerabilities are addressed with both available and requested assets and will be a driver for future FLETC operations. The initial FLETC Sustainability and Resilience Plan was submitted to DHS in August 2019.

4.1.1.1 Cheltenham

Cheltenham is an active firearms and driver training re-qualification center for law enforcement agencies in the Washington D.C. region. In 2009, FLETC prepared the *FY 2010 FLETC Comprehensive Master Plan Update* (DHS 2010; hereafter referred to as the 2010 Master Plan), which provided an update for all its facilities including Cheltenham. The *2015 Update to the FY 2010 FLETC Comprehensive Master Plan* (DHS 2017a; hereafter referred to as the 2015 Master Plan) addresses several initiatives that were included in the 2010 Master Plan, as well

as construction or renovation of replacement and growth projects. Cheltenham anticipates that the campus will require occasional new construction, facility improvements, and infrastructure upgrades.

Several projects included in the previous master planning documents that were in line with training requirements and the Master Plan vision have been completed. These past projects are detailed below:

New Auditorium (Building 64)

The new auditorium building has been constructed. It has 200 seats and the flexibility to be partitioned into two separate large classrooms. This building assists in meeting the need for a space for large gatherings on site.

Renovate Building 1, Demolish Buildings 1A and 1B

Building 1 was renovated and Buildings 1A and 1B were demolished. The telecommunications room was relocated from Building 1A to Building 1.

Renovate Building 3

Building 3 was renovated into a modern and efficient classroom instruction facility. Improvements included a new heating system, roof, and thorough renovation.

Renovation of Tactics Facility

Upgrade or replace the tactics facility to accommodate the biggest growth area in training at Cheltenham. Subject matter areas include active shooter, protective operations, pre-deployment, and building entry/room clearing. Planned renovations include installing HVAC, adding restroom facilities, developing interior training space and a classroom within the building, constructing a gravel parking lot, and installing audio/video systems. Additional enhancements include construction of a safety and security perimeter barrier, and creation of sidewalk paths and equipment cart loading zones and paths. Construction of an access road at the tactics facility to accommodate the biggest growth area in training at Cheltenham was completed in FY 2019.

Sanitary Sewer System Renovation/Replacement

Implement a broad repair plan to address the sewer-related issues that have occurred repeatedly. In addition, Cheltenham will explore infrastructure improvements to support the potential addition of training venues and buildings. The phase 1 survey and investigation for this project are complete.

Several projects included in the previous master planning documents that were in line with training requirements and the Master Plan vision are in progress, have been funded, or are otherwise planned. These projects are detailed below:

Renovation of Tactics Facility

Restoration of exterior and interior finishes at the facility is programmed in the FY 2019-2020 projects.

Roads and Driver Training Track Repavement

Implement a comprehensive plan to repave the Center and the driver training range facility in coordination with the timeline for other potential infrastructure projects such as the sewer system, conversion to city water, and/or future natural gas service. This project is programmed in the FY 2020-2025 real property construction plan.

Sanitary Sewer System Renovation/Replacement

Implement a broad repair plan to address the sewer-related issues that have occurred repeatedly. In addition, Cheltenham will explore infrastructure improvements to support the potential addition of training venues and buildings. Phase 2 of this renovation project, including development of scope of work, cost estimate, and contracting, was approved for FY 2019 funding, started in 2019 and will be completed in 2020. Phase 3 (construction) is programmed for FY 2020.

Skid Pan Renovation

Renovation of the skid pan with a modern system that uses advanced technology, such as a skid-plate system that incorporates a water collection system and/or draws water from a surficial aquifer, will enhance training and also will meet requirements of environmental sustainability. This project was approved for FY 2019 funding. Currently the development of scope of work, cost estimate, and contracting is underway. The design has been completed and the estimated construction start date is FY 2023.

Several projects included in the previous master planning documents that were in line with training requirements and the Master Plan vision are in the concept phase. These projects are detailed below:

Expand Combined Skills Driving Course

Two additional lanes approximately 1,500 feet long were constructed on the east side of the combined skills driving course.

Renovation to Reconfigure Trainee Break Area

This project is a renovation to an existing space in Building 3, a classroom facility. Construction of a trainee break area will provide students with adequate facilities to eat lunch and interact during lunch and break times.

Conversion to City Water

New regulations effective in 2016 require Cheltenham to convert to city water (DHS 2017a). Cheltenham has developed a concept to connect to the Washington Suburban Sanitary Commission water distribution network. A preliminary assessment and technical feasibility study were initiated in FY 2020. This process is expected to take 3 to 5 years.

Additional 12-Point 50-Yard Firing Ranges at Building 5

Cheltenham's 50-yard firing ranges are the most heavily requested resource in Cheltenham. Construction of two additional 50-yard ranges will increase Cheltenham's capacity to accommodate needed firearms training.

Landscaping/Reforestation

Implement a comprehensive landscaping/reforestation plan to enhance the usability and appearance of open space and unused tarmac located across the Center. Instituting a broad reforestation plan will increase the permeable surfaces, restore natural habitat, and reduce the long-term cost of groundskeeping. This project will return approximately 5,000 square feet cumulatively to permeable surface by removing unneeded blacktop area in support of environmental sustainability objectives. This project is in the concept phase and will be developed in concert with Municipal Separate Storm Sewer System stormwater permit compliance.

Additional projects recommended to Cheltenham after evaluation in a *Detailed Feasibility Study* (Washington Gas 2017) include two ECMs that can be implemented as part of a turn-key

energy savings and infrastructure upgrade project utilizing the UESC. The two recommended ECMs are detailed below:

Natural Gas-Fired Boilers Conversion

The conversion to natural gas-fired boilers project will provide a new natural gas utility service to the campus and routing to 13 boilers located in buildings 1, 3, 4, 5, 11, 12, 13, 31, 50, and 64. A new gas line will be installed at Cheltenham, entering from the north end of the campus and following Commo Road through the facility. Depending on site conditions, the gas line will be installed using a direct-bury (open trench) method or by directional drill. The gas line will be installed up to each building receiving gas service; a new gas meter will also be installed at each of these buildings. The conversion will include removal of existing #2 fuel oil-fired boilers and associated storage tanks, fuel oil piping, fuel pumps, and vent. The new natural gas-fired boilers will be installed in the same location as the old boilers and will utilize the existing footprints, when possible. The need for #2 fuel oil would be eliminated and the risk of fuel oil spills and requirements for fuel oil spill plans would be eliminated. The gas line will be installed in previously disturbed and maintained roadside or landscaped areas adjacent to existing buildings. The gas line installer will seek a letter of exemption from the MDE to cover potential wetland and 25-foot wetland buffer impact as a result of the installation of the underground utility line, if needed. The estimated completion date is FY 2020.

Light Emitting Diode Lighting Upgrade (3 Buildings)

Lighting will be upgraded from the current source to LEDs in buildings 5, 6, and 11, along with the exterior complex lighting. A total of 2,377 fixtures will be upgraded. The estimated completion date is FY 2020.

Each of the projects detailed above, as well as the project analyzed within this EA, have been or will be coordinated with Cheltenham trainers, planners and environmental staff. None of the future infrastructure actions would be expected to result in more than negligible impacts either individually or cumulatively. All actions affect very specific previously developed areas and the magnitude of the actions is minimal. Therefore, the combined impacts of these actions would remain well below the threshold of significance for any resource category. Detailed discussion of each resource category is discussed in further detail below.

4.1.1.2 Outside of Cheltenham

As detailed in Section 3.8.2.1, Land Use, Cheltenham is surrounded by low-density residential, parks, and property owned by the DOE. Therefore, these land uses will not have future development beyond the current state and would not be expected to result in more than negligible impacts to any resources either individually or cumulatively.

4.1.2 Methods

The analysis of cumulative impacts related to the Proposed Action followed the steps described below. Project-related impacts identified in Chapter 3 were reviewed to determine which environmental resources would likely be affected both by the Proposed Action and by other Past, Present, and Future Actions. The environmental resources not likely to be affected by the Proposed Action, and therefore not likely to be affected by cumulative impacts associated with the Proposed Action, were screened and then excluded from further consideration (Table 12). Environmental resources that could be affected by cumulative impacts were analyzed further. The geographic scope for the cumulative impacts analysis included Cheltenham and the

surrounding area depicted in Figure 19. Future Actions that fell within the geographic scope were identified and evaluated.

Each resource area was researched, reviewed, and evaluated to determine whether Proposed Action-related impacts on that resource, in concert with other Future Actions, would result in the potential for cumulative impacts. This screening revealed that Proposed Action-related impacts in one resource category addressed in Chapter 3 has the potential to contribute in more than a minor way to cumulative impacts. Other resource areas were determined unlikely to be cumulatively affected. Sustainability and resilience were determined to have the potential for more than minor beneficial cumulative impact and was carried forward for further consideration and analysis. The rationale for these conclusions is presented in Table 12 with additional detail on impacts included in the corresponding section in Chapter 3.0.

Table 12. Screening of Potential Cumulative Impacts by Resource Area

Resource Area	Potential to Contribute to Cumulative Impacts in More Than a Minor Way?	Rationale
Earth Resources	**No**	Construction and operation of the Proposed Action would result in negligible impacts to on-site soils and topography and would not impact the regional geologic resources as associated modifications would be restricted to near-surface levels. Excavation and grading activities would result in negligible, short-term, localized increases in erosion and sedimentation from stormwater runoff. The interaction of the Proposed Action with other Future Actions is not anticipated to result in any cumulative impacts to earth resources.
Air Quality	**No**	The emissions associated with construction and operation of the Proposed Action would be well below *de minimis* standards. As a result, there would be a negligible air quality impact associated with construction or operational emissions. The interaction of the Proposed Action with other Future Actions is not anticipated to result in any cumulative impacts to air quality.
Noise	**No**	No noise impacts are predicted for residential receptors due to the Proposed Action. In addition, the mixed deciduous and coniferous forest stand buffer will provide additional noise reduction. Maintenance, which would be the only long-term activity associated with the Proposed Action, only requires hand tools and vehicles. This activity would not have any noise-related impacts to the nearby residences and therefore no mitigation is needed. Other Future Actions are not expected to interact with the Proposed Action in a way that would result in cumulative noise impacts.

Resource Area	Potential to Contribute to Cumulative Impacts in More Than a Minor Way?	Rationale
Solid and Hazardous Materials and Waste Management	**No**	As required by MDE, management of construction debris resulting from the Proposed Action would include recycling and reuse when possible. The remaining construction debris would be transported to a permitted facility (Ritchie Land Reclamation Project C & D Landfill in Upper Marlboro, Maryland) for disposal. Cheltenham would obtain a permit for soil remediation from MDE if soil contamination is encountered during the duration of the Proposed Action. Additionally, Cheltenham would contact the Waste Diversion and Utilization Program directly to ensure activities that would generate or handle hazardous wastes are being conducted in compliance with applicable state and federal laws and regulations. Similarly, Cheltenham would also contact the Program prior to construction activities to ensure that the treatment, storage or disposal of hazardous wastes and low-level radioactive wastes at the facility will be conducted in compliance with applicable state and federal laws and regulations. As a result, there would be negligible impacts due to management of nonhazardous and hazardous waste generated by construction and operation of the Proposed Action. The interaction of the Proposed Action with other Future Actions is not anticipated to result in any cumulative impacts to the environment due to management of solid and hazardous materials and waste management.

Resource Area	Potential to Contribute to Cumulative Impacts in More Than a Minor Way?	Rationale
Water Resources	**No**	To minimize impacts to surface waters and protect high-quality Tier II streams, Cheltenham would implement all applicable enhanced BMPs, or additional controls, potentially above those minimally required, during and post-construction, to protect high-quality Tier II stream resources. Cheltenham's ESC Plan and Stormwater Management Plan provide detailed BMPs to minimize adverse impacts from stormwater runoff caused by construction and impervious surfaces. These plans received MDE approval on August 17, 2020. Cheltenham met the requirements of the MDE General Permit for Stormwater Discharges from Construction Activity for ground disturbances involving one or more acres on September 4, 2020. FLETC will mitigate the loss of 12.02 acres of forest with the on-site planting of 7.24 acres of trees within the Piscataway Creek 1 watershed and the areas will be protected in accordance with a long-term protection agreement. In a letter dated September 3, 2020, MDE certified that the Proposed Project has adequately addressed avoidance and minimization alternatives analysis, including an acceptable social and economic justification for unavoidable impacts to Tier II resources, as required by COMAR 26.08.02.04-1, and therefore has satisfied the Antidegradation Tier II Review. Since Cheltenham's ESC and Stormwater Management plans are compliant with Section 307 of the CZMA, National Oceanic and Atmospheric Administration regulations (15 CFR Part 930), and Maryland's anti-degradation policy, there would be negligible impacts to surface and groundwater. There would be negligible impacts to floodplains or wetlands as a result of the Proposed Action. The interaction of the Proposed Action with other Future Actions is not anticipated to result in any cumulative impacts to water resources.

Resource Area	Potential to Contribute to Cumulative Impacts in More Than a Minor Way?	Rationale
Biological Resources	**No**	Impacts to vegetative habitat would include the permanent loss of forest resources while impacts to wildlife resources as a result of the Proposed Action would be short-term and minor. Coordination efforts with the MD DNR through the Maryland State Clearinghouse resulted in no project-specific comments concerning state-listed rare, threatened and endangered species (Appendix B). Coordination with MD DNR in 2012 indicated that the forested area on the project site contains FIDS habitat (Appendix B). FLETC has incorporated two FIDS site design guidelines into the site design. Additionally, FLETC incorporated FIDS protection elements into mitigation considerations. The USFWS indicated that no federally proposed or listed endangered or threatened species are known to exist within the Proposed Action Area. Furthermore, USFWS stated there are no critical habitats within the Proposed Action Area under USFWS jurisdiction. Based on these findings and results from a field assessment performed in 2019, there would be no indirect or direct effects on state or federally proposed or listed rare, threatened and endangered species. FLETC will mitigate the loss of 12.02 acres of forest with the on-site planting of 7.24 acres of trees within the Piscataway Creek 1 watershed and the areas will be protected in accordance with a long-term protection agreement. This mitigation serves to satisfy State of Maryland's requirements for the Forest Conservation Act (FCA), COMAR 08.19.04.11. The interaction of the Proposed Action with other Future Actions is not anticipated to result in any cumulative impacts to biological resources.
Cultural Resources	**No**	The Maryland Historic Trust (MHT) "found this project to be consistent with their plans, programs, and objectives." There would be no impacts to cultural resources as a result of the Proposed Action. The interaction of the Proposed Action with other Future Actions is not anticipated to result in cumulative impacts to cultural resources.

Resource Area	Potential to Contribute to Cumulative Impacts in More Than a Minor Way?	Rationale
Land Use, Aesthetic, and Visual Resources	**No**	The potential for adverse effects to land use of neighboring properties is not significant. The Maryland Department of Planning (MDP) found the Proposed Action to be consistent with their plans, programs, and objectives and Prince George's County did not have comments. The National Capital Planning Commission (NCPC) approved the preliminary site development plans with comments for the Proposed Action. Final approval is anticipated to be obtained in October 2020. The potential for visual impacts due to the Proposed Action's proximity to residential areas and motorists traveling within Cheltenham would be negligible. The interaction of the Proposed Action with other Future Actions is not anticipated to result in cumulative impacts.
Infrastructure	**No**	The Maryland Department of Transportation (MDOT) had no project-specific comments concerning roadways and traffic. Impacts to roadways and traffic during installation, construction, and operation of the Proposed Action would be negligible. No significant impacts to potable water supplies are anticipated. No significant impacts are anticipated to the storm drainage system. There would be a minor, beneficial impact to the electrical system as a result of the Proposed Action. Under the Proposed Action there would be no change in Cheltenham's heating and cooling demands. No cumulative impacts to infrastructure are anticipated.
Socioeconomics and Environmental Justice	**No**	Short-term negligible beneficial economic impacts would occur as a result of a temporary increase in construction workers hired and the local purchasing of construction materials. Long-term negligible economic benefits could occur due to potential contractual support needs for operation and maintenance of new infrastructure. No impacts to public services would occur. There would be no impact on environmental justice populations or children from the Proposed Action. The interaction of the Proposed Action with other Future Actions is not anticipated to result in cumulative impacts to socioeconomics and environmental justice.

Resource Area	Potential to Contribute to Cumulative Impacts in More Than a Minor Way?	Rationale
Sustainability and Resilience	**Yes**	The Proposed Action would have a moderate beneficial impact on sustainability and resilience at Cheltenham because it would lower costs, reduce the greenhouse gas (GHG) footprint of the facility, generate approximately 60 percent of Cheltenham's total annual electricity consumption based on historical utility data, and improve energy security. The interaction of the Proposed Action with other Future Actions is anticipated to result in beneficial cumulative impacts to sustainability and resilience.

4.1.3 Further Assessment of Cumulative Impacts

Sustainability and resilience were determined to have the potential for more than a minor beneficial cumulative impact and was carried forward for further consideration and analysis. The No-Action Alternative would result in a minor negative impact on sustainability and resilience in comparison to existing conditions. Cheltenham would continue to purchase all of their electric energy requirements from PEPCO as a source of non-renewable energy. Therefore, not meeting the renewable energy goals established by DHS nor realizing the direct and indirect benefits associated with solar PV electricity production. Benefits associated with the Proposed Action, including opportunities to be more sustainable and FLETC's ability to meet energy mandates and the future NZE requirements, would not be realized under the No-Action Alternative.

The Proposed Action combined with the Natural Gas-Fired Boilers Conversion and LED Lighting Upgrade could cumulatively have a larger beneficial impact on sustainability and resilience. Other planned projects in Cheltenham's current master plan are mostly renovation projects that would not have a beneficial or detrimental impact to sustainability and resilience.

4.1.3.1 Natural Gas-Fired Boilers Conversion

Currently, Cheltenham receives electrical power from PEPCO and boilers burning #2 Fuel Oil and are used to generate hot water and heating for nine buildings. The #2 Fuel Oil is delivered periodically by truck (Washington Gas 2017). One building, Building 12, has two electric boilers that produce building heat. The conversion to natural gas-fired boilers project would provide a new, non-interruptible, natural gas utility service to the campus and routing to 13 boilers located in buildings 1, 3, 4, 5, 11, 12, 13, 31, 50, and 64. A new four-inch gas line would be installed at Cheltenham, entering from the north end of the campus and following Commo Road through the facility. Depending on site conditions, the gas line would be installed using a direct-bury (open trench) method or by directional drill. A two-inch gas line would be installed up to each building receiving gas service; a new gas meter would also be installed at each of these buildings. The conversion would include removal of existing #2 fuel oil-fired boilers and associated storage tanks, fuel oil piping, fuel pumps, and vent. The new natural gas-fired boilers would be installed in the same location as the old boilers and would utilize the existing footprints, when possible. The gas line would be installed in previously disturbed and maintained roadside or landscaped areas adjacent to existing buildings. Excavation, installation, and stabilization will occur within the same day; therefore, an individual sediment control permit is not required. Preliminary plans indicate that no trees will have to be removed. Washington Gas intends to avoid impacts to

wetlands and buffer areas but will submit any necessary permit applications to Maryland Department of the Environment if impacts to wetlands cannot be avoided.

Natural gas is a more cost-effective fuel alternative for boilers in lieu of #2 fuel oil. Gas-fired boilers have a similar thermal efficiency (approximately 82-85 percent) to the #2 oil-fired boilers. Burning natural gas produces lower air emissions than burning fuel oil (Washington Gas 2017). The need for #2 fuel oil to periodically be trucked to the facility would be eliminated and the risk of fuel oil spills and requirements for fuel oil spill plans would be eliminated. Based on these factors, the natural gas-fired boilers would be more environmentally sustainable and resilient through the provision of a non-interruptible energy supply. Annual electricity savings for the natural gas-fired boilers conversion would be 325,780 kWh. Energy savings were calculated based on FY 2016 Fuel Oil consumption values (Washington Gas 2017).

4.1.3.2 LED Lighting Upgrade (3 Buildings)

The LED Lighting Upgrade project would upgrade a total of 2,377 existing lighting fixtures in buildings 5, 6, and 11, along with the exterior complex lighting which are predominantly compact fluorescent light bulbs and high intensity discharge (HID) to LED technology. Unlike incandescent or fluorescent lamps, LEDs are tiny light bulbs that have no filaments that will burn out and LEDs produce less heat. LED technology has improved to the point that it is a cost-effective light source. Compared to traditional incandescent/fluorescent and other HID fixtures, LED's are more durable, lasting 50,000 hours or more. LED lighting fixtures contain no mercury, which reduces environmental waste. LEDs can provide tremendous energy savings, HVAC savings due to less heat generation, and maintenance savings due to their longer lifespan. Annual electricity savings for the LED lighting upgrade would be 519,203 kWh. This was calculated as a sum of the individual energy savings for each proposed lighting upgrade due to existing kW and proposed kW equipment ratings and existing and proposed operating hours, respectively. Operations and maintenance savings were also considered from not having to purchase material or maintain associated alternate lighting sources (Washington Gas 2017).

The cumulative impact of the Proposed Action combined with the Natural Gas-Fired Boilers Conversion and LED Lighting Upgrade would result in 4,276,800 kWh of electricity savings per year. Cheltenham's FY 2015 grid consumption was 5,777,702 kWh; therefore, the three energy upgrade projects would cumulatively offset 74 percent of grid consumption. This would have a major beneficial cumulative impact to sustainability at Cheltenham.

4.2 Irretrievable Commitment of Resources

NEPA CEQ regulations require environmental analyses to identify "...any irreversible and irretrievable commitments of resources that would be involved in the Proposed Action should it be implemented" (40 CFR §1502.16). Irreversible and irretrievable resource commitments are related to the use of non-renewable resources and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural site).

Implementation of the Proposed Action would result in an irreversible and irretrievable commitment of resources by Cheltenham. The primary irretrievable impacts of the Proposed Action would involve the use of fossil fuels for electricity and for the operation of vehicles and equipment, as well as labor, materials, and fiscal resources that would otherwise be available

for other projects. The use of water for dust control during construction activities would be irreversible. Irretrievable impacts would occur as a result of construction, facility operation, and maintenance activities. Direct losses of biological productivity and the use of natural resources from these impacts would be inconsequential.

5 List of Agencies and Persons Contacted

Name	Affiliation	Location	Topic
Matthew J. Flis, AICP-CUD, LEED-AP	National Capital Planning Commission	Washington, DC	NCPC review of Proposed Action
Diane Sullivan	National Capital Planning Commission	Washington, DC	NCPC review of Proposed Action
Rita Pritchett	Maryland Department of Planning	Baltimore, MD	Maryland State Clearinghouse Review Process
Myra Barnes	Maryland Department of Planning	Baltimore, MD	Maryland State Clearinghouse Review Process
Horace Henry	Maryland Department of Natural Resources	Annapolis, MD	Forest stand delineation/preliminary forest conservation plan
Marian Honeczy	Maryland Department of Natural Resources	Annapolis, MD	Forest stand delineation/preliminary forest conservation plan
Mike Ensor	Ritchie Land Reclamation, L. P.	Upper Marlboro, MD	Prince George's County's construction and demolition (C&D) landfill
Amanda Malcolm, P.E.	Maryland Department of the Environment	Baltimore, MD	Stormwater management and sediment control
Heather Nelson	Maryland Department of the Environment	Baltimore, MD	Coastal Zone Management Act, Consistency Determination
Joseph Abe	Maryland Department of Natural Resources	Annapolis, MD	Coastal Zone Management Act, Consistency Determination
Angel Valdez	Maryland Department of the Environment	Baltimore, MD	Tier II Waters

6 List of Preparers

Name/Title	Project Role	Subject Area	Experience
Rebecca Berzinis Senior Project Manager	Project Manager, Author	Air Quality, noise, socioeconomics and environmental justice, cumulative impacts, irreversible and irretrievable commitment of resources	20 years
Cheryl Propst, Senior Scientist	Deputy Project Manager, Author	Earth resources; solid and hazardous waste; water resources; biological resources; cultural resources; land use, aesthetic, and visual resources; infrastructure; sustainability and resilience	18 years
Lisa Mash, Senior Project Manager	Independent Quality Control Reviewer	NEPA specialist	20 years
Bryant Brantley, Senior Planner	Noise Specialist	Noise	12 years
Phil Still, Senior Planner	Noise Technical Reviewer	Noise	17 years
Michelle Empleo, Engineer	Air Quality Specialist	Air Quality	3 years
Ruben Velasquez, Senior Engineer	Air Quality Technical Reviewer	Air Quality	30 years
Jenny Sullivan, Technical Editor	Project Quality Manager	Project Quality	35 years
Amanda Boyd, Technical Coordinator	Document formatting and production	Document formatting and production, 508 compliance	13 years
Rainor Gresham, Senior Scientist	GIS Analyst	GIS analysis and map production	10 years
Shelly Fisher, Senior Scientist	NCPC Coordination and Federal Coastal Management Act Consistency Review	NCPC Coordination and Federal Coastal Management Act Consistency Review	19 years
Gino Pompa, Landscape Designer	Field survey lead for wetlands and biological resources	Wetlands, biological resources, FCA	6 years
Andrea Lake, Senior Associate	Technical reviewer for field survey for wetlands and biological resources	Wetlands, biological resources, FCA	18 years

7 References

BlueSkyModel. 2019. "1-kilowatt-hour." accessed April 13, 2019. http://blueskymodel.org/kilowatt-hour.

Council on Environmental Quality (CEQ). 2019. "Environmental Justice Under the National Environmental Policy Act. December 1997.", Last Modified March 24, 2017, accessed April 13, 2019. https://www.epa.gov/environmentaljustice/ceq-environmental-justice-guidance-under-national-environmental-policy-act.

Ensor, Mike. 2012. "Ritchie Land Reclamation, L.P.", September 10, 2012.

Federal Highway Administration (FHWA). 2019. "Construction Noise Handbook." Last Modified June 28, 2017, accessed January 31, 2019. https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm.

Jones, C., J. McCann, and S. McConville. 2001. A Guide to the Conservation of Forest Interior Dwelling Birds in the Chesapeake Bay Critical Area. Annapolis, Maryland.

Maryland Department of Natural Resources (MD DNR). 2019a. "Digital Data and Products. Potential Habitat for Forest Interior Dwelling Species (FIDS)." accessed December 17, 2019. https://dnr.maryland.gov/wildlife/Pages/plants_wildlife/digitaldata.aspx.

Maryland Department of Natural Resources (MD DNR). 2019b. "Rare, Threatened, and Endangered Species - Plants & Animals." accessed February 1, 2019. https://dnr.maryland.gov/wildlife/Pages/plants_wildlife/rte/espaa.aspx.

Maryland Division of State Documents. 2019. "Title 26 Department of the Environment, Subtitle 02 Occupational, Industrial and Residential Hazards, Chapter 03 Control of Noise from the Annotated Code of Maryland Ordinance (Maryland Noise Ordinance)." accessed March 27, 2019. http://www.dsd.state.md.us/comar/comarhtml/26/26.02.03.02.htm.

Maryland Geological Survey. 2019a. "Index to Online Geologic Maps (1968)." Last Modified January 14, 2013, accessed April 15, 2019. http://www.mgs.md.gov/esic/geo/index.html.

Maryland Geological Survey. 2019b. "Maryland Geology." Maryland Department of Natural Resources, accessed April 12, 2019. http://www.mgs.md.gov/geology/.

Meister Consultants Group, Inc. 2014. "Solar and Glare." accessed April 8, 2019. http://solaroutreach.org/wp-content/uploads/2014/06/Solar-PV-and-Glare-_Final.pdf.

National Capital Planning Commission (NCPC). 2016. The Comprehensive Plan for the National Capital: Federal Elements, Introduction.

National Capital Planning Commission (NCPC). 2019. "About NCPC." accessed April 8, 2019. www.ncpc.gov/about/.

National Renewable Energy Laboratory (NREL). 2016. Getting to Net Zero. edited by Department of Homeland Security (DHS).

Natural Resources Conservation Service (NRCS) United States Department of Agriculture (USDA). 2012. Prime and other Important Farmlands - Prince George's County, Maryland. FLETC Cheltenham.

Natural Resources Conservation Service (NRCS) United States Department of Agriculture (USDA). 2019. Prince George's County, Maryland Soil Survey.

Nexsen, Clark. 2001. Environmental Assessment for the Development of a Federal Law Enforcement Training Center, Cheltenham, Maryland.

Ozone Transport Commission. 2019. "What is the Ozone Transport Commission?", accessed March 28, 2019. otcair.org/about.asp.

Siebein Associates Inc. 2001. Environmental Acoustic Assessment for the Proposed Federal Law Enforcement Training Center Cheltenham, Maryland.

The Maryland-National Capital Park and Planning Commission (M-NCPPC). 2010. Guide to Zoning Categories Prince George's County, Maryland.

The Maryland-National Capital Park and Planning Commission (M-NCPPC). 2013a. Approved Subregion 5 Master Plan and Sectional Map Amendment. Upper Marlboro, Maryland.
The Maryland-National Capital Park and Planning Commission (M-NCPPC). 2013b. Subregion 5 Approved Master Plan and Sectional Map Amendment.
The Maryland-National Capital Park and Planning Commission (M-NCPPC). 2019. "GIS Open Data Portal." accessed March 25, 2019.
Trapp, Henry, Jr., and Marilee A. Horn. 1997. Ground Water Atlas of the United States, Segment 11, Delaware, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia, West Virgina. Reston, Virginia: U.S. Geological Survey.
U.S. Census Bureau. 2019. "American Fact Finder ACS Demographic and Housing Estimates." accessed April 13, 2019. https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml.
U.S. Department of Homeland Security (DHS). 2010. FY 2010 FLETC Comprehensive Master Plan Update, Section 4 - Cheltenham.
U.S. Department of Homeland Security (DHS). 2011. Department of Homeland Security Strategic Sustainability Performance Plan.
U.S. Department of Homeland Security (DHS). 2017a. 2015 Update to the 2010 FLETC Comprehensive Master Plan. Fiscal Year 2015 Report to Congress.
U.S. Department of Homeland Security (DHS). 2017b. Department of Homeland Security 2017 Strategic Sustainability Performance Plan. edited by Department of Homeland Security.
U.S. Department of Homeland Security (DHS). 2019. "Federal Law Enforcement Training Centers Strategic Plan Fiscal Years 2016-2018." accessed March 21, 2019.
U.S. Environmental Protection Agency (EPA). 2019a. "*De Minimis* Tables." Last Modified August 4, 2017, accessed April 10, 2019. www.epa.gov/general-conformity/de-minimis-tables.
U.S. Environmental Protection Agency (EPA). 2019b. "Nonattainment Areas for Criteria Pollutants (Green Book)." Last Modified March 31, 2019, accessed April 11, 2019. www.epa.gov/green-book.
U.S. Fish and Wildlife Service (USFWS). 2011. Birds of Management Concern and Focal Species. edited by Migratory Bird Program.
Washington Gas. 2017. Proprietary and Confidential-UESC Energy Conservation Project Detailed Feasibility Study Prepared for Federal Law Enforcement Training Center, Cheltenham, Maryland. Federal Law Enforcement Training Center Cheltenham, Maryland.