NATIONAL ENVIRONMENTAL POLICY ACT

FINAL ENVIRONMENTAL ASSESSMENT

U.S. ENVIRONMENTAL PROTECTION AGENCY
PROPOSED SOLAR PHOTOVOLTAIC SYSTEM AT THE EPA EDISON FACILITY

EDISON, NEW JERSEY 08837

U.S. Environmental Protection Agency
Facilities Management and Services Division
Architecture, Engineering, and Asset Management Branch
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ACRONYMS AND ABBREVIATIONS

AC	Alternating current
ACHP	Advisory Council on Historic Preservation
AEAMB	[U.S. Environmental Protection Agency] Architecture, Engineering, and Asset Management Branch
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute
AOC	Areas of concern
APE	Area of Potential Effect
AST	Aboveground storage tank
ATSDR	Agency for Toxic Substances and Disease Registry
BERA	Baseline Ecological Risk Assessment
BLM	Bureau of Land Management
BMP	Best management practice
BNL	Brookhaven National Laboratory
CAA	Clean Air Act
CEQ	[U.S.] Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CWA	Clean Water Act
dB	Decibel
dBA	A-weighted Decibel
DC	Direct current
DESC	Defense Energy Support Center
DOE	[U.S.] Department of Energy
DOT	[U.S.] Department of Transportation
EA	Environmental Assessment
ECOS	Environmental Conservation Online System
EDR	Environmental Data Resources, Inc.
EIS	Environmental Impact Statement
EISA	Energy Security and Independence Act
EMS	Environmental Management System
EO	Executive Order
EPA	[U.S.] Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EPAct 2005	Energy Policy Act of 2005
FAQ	Frequently Asked Question
FEMA	Federal Emergency Management Agency
FNSI	Finding of No Significant Impact
FIRM	Flood Insurance Rate Map
FWS	[U.S.] Fish and Wildlife Service
GAO	Government Accountability Office (formerly known as the General Accounting Office)
GHG	Greenhouse gases
GSA	General Service Administration
HABS	Historic American Building Surveys
HAER	Historic American Engineering Record
HUD	Housing and Urban Development
HRMP	Historic Resources Management Plan

IPP	Independent Power Producer
kVA	kilovolt ampere
kW	kilowatt
kWh	kilowatt-hours
MAP	Metropolitan Architects and Planners, Inc.
MNA	Monitored natural attenuation
MOA	Memorandum of Agreement
MSL	Mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFG	Nationwide Facilities Guide
NHP	[New Jersey] Natural Heritage Program
NJ	New Jersey
NJAC	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NJFO	New Jersey Field Office
NO_x	Nitrogen Oxide
NPC	Noise Pollution Clearinghouse
NRCS	Natural Resources Conservation Service
NREL	[U.S. Department of Energy] National Renewable Energy Laboratory
O_3	Ozone
OPA	Oil Pollution Act
ORD	Office of Research and Development
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
Pb	Lead
PCB	Polychlorinated biphenyl
PHS	Public Health Service
PM	Particulate Matter
POL	Petroleum, Oil, Lubricant
PPA	Power Purchase Agreement
PPE	Personal protective equipment
PSE&G	Public Service Electric and Gas Company
PV	Photovoltaic
RCRA	Resource Conservation and Recovery Act
REC	Renewable energy certificate
RFP	Request for Proposal
SHEM	Safety, Health, and Environmental Management
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SWM	Stormwater Management
SPCC	Spill Prevention, Control, and Countermeasures
SPVS	Solar Photovoltaic System
TCE	Trichloroethylene
U.S.	United States
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USCB	United States Census Bureau
USDA	United States Department of Agriculture
USGS	United States Geological Survey

UST	Underground storage tank
UWRF	Urban Watershed Research Facility
UXO	Unexploded ordnance
VOC	Volatile organic compound

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1.0. PURPOSE AND NEED

1.1. THE ENVIRONMENTAL ASSESSMENT

This Environmental Assessment (EA) was prepared in accordance with the National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] §§ 4321, *et seq*.), the Council on Environmental Quality (CEQ) Regulations for NEPA (40 Code of Federal Regulations [CFR] Parts 1500 - 1508), United States (U.S.) Environmental Protection Agency's (EPA) Procedures for Implementing the National Environmental Policy Act and Assessing the Environmental Effects Abroad of U.S. Environmental Protection Agency Actions (40 CFR Part 6), and current EPA and CEQ guidance and policy. The purpose of this EA is to assess whether the Proposed Action would pose a potential significant impact on the environment and to determine whether an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FNSI) is required for the Proposed Action.

1.2. EDISON FACILITY DESCRIPTION AND VICINITY

The EPA's Edison Facility is a campus of laboratories and offices in Edison, New Jersey (hereafter referred to as the Edison Facility), located 30 miles south of New York City in the southeast portion of Edison Township at 2890 Woodbridge Avenue. The Edison Facility is accessible from Woodbridge Avenue (Route 514), which is in close proximity to the New Jersey (NJ) Turnpike, Garden State Parkway, and Routes 1 and 287. The Edison Facility resides on a 205-acre parcel consisting of 20 permanent buildings and numerous temporary trailers, including laboratories, administrative offices, storage buildings, and guard houses. The 205 acres were part of the former U.S. Army Raritan Arsenal.

Middlesex County College on the west, Raritan Center on the south and east, and Woodbridge Avenue on the north surround the site. A residential area lies across Woodbridge Avenue to the North and the Raritan River lies beyond the Raritan Center to the south.

Figure 1.2-1 includes an aerial map showing the Edison Facility and its vicinity, while Figure 1.2-2 shows the layout of the Edison Facility Campus. Photographs of the Edison Facility are included in Appendix A.

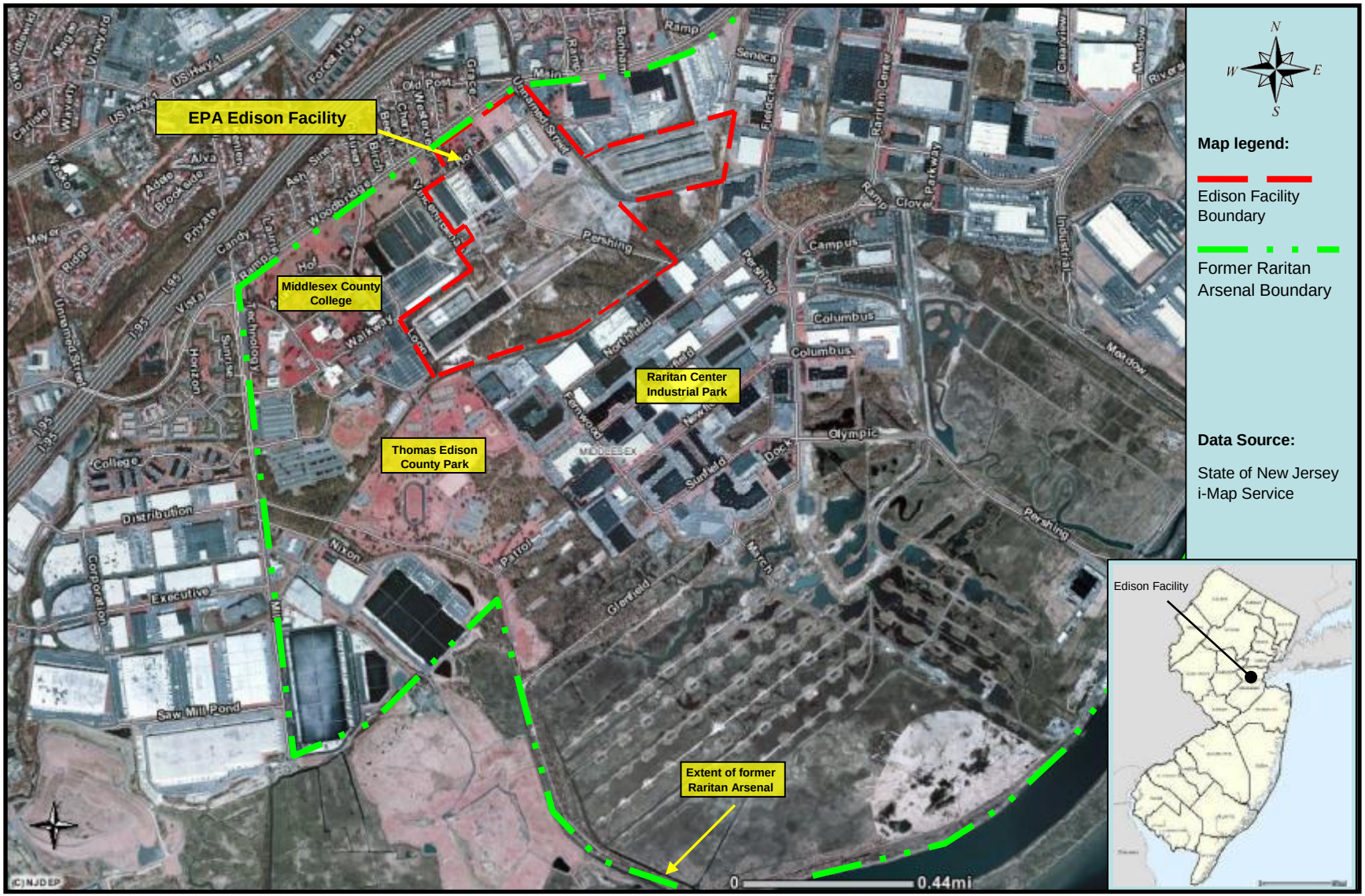

Figure 1.2-1: Edison Facility Vicinity Map

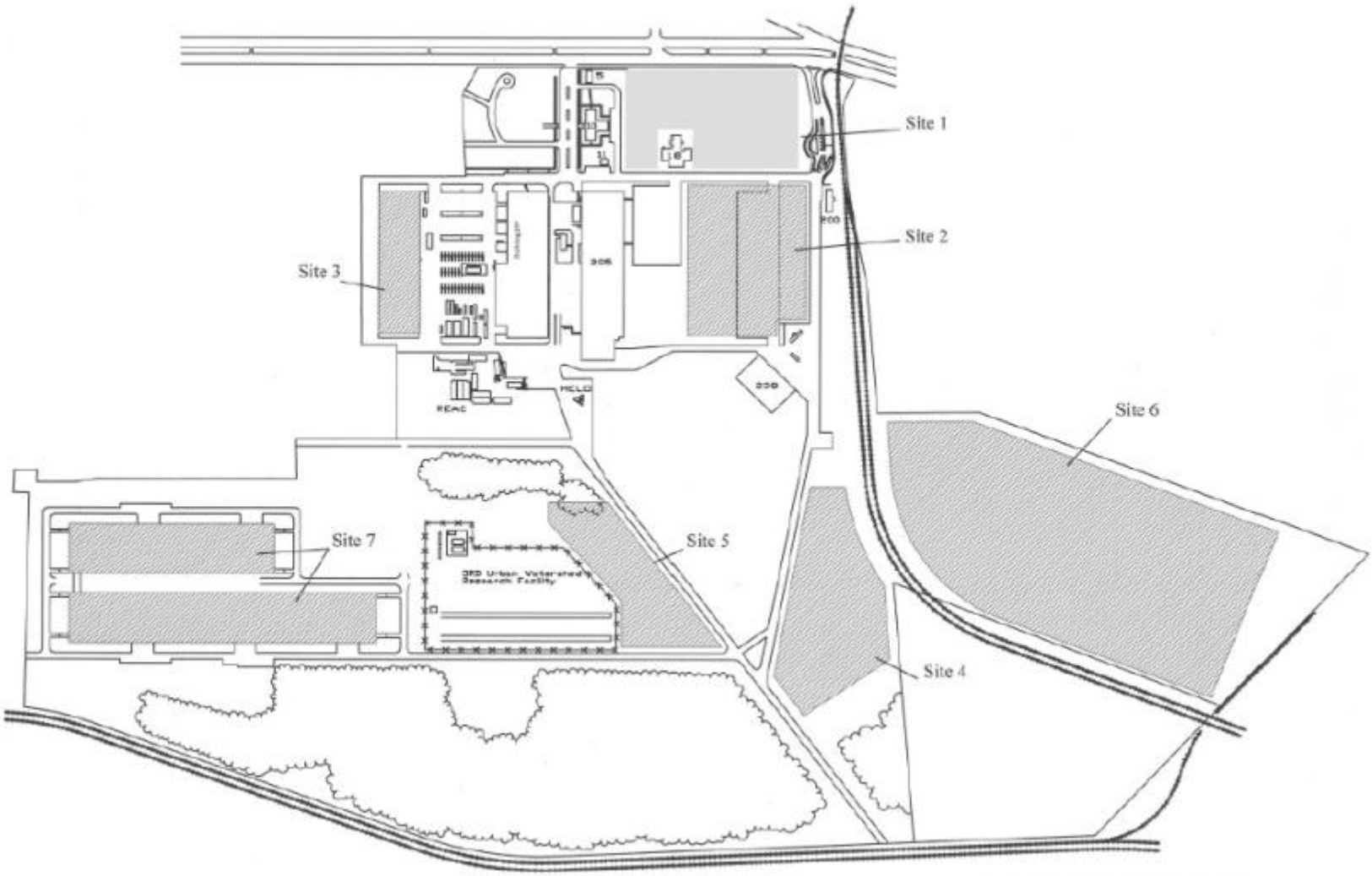

Figure 1.2-2: Edison Facility Campus Map

1.3. THE EDISON FACILITY MISSION

The Edison Facility supports the activities of several national and regional EPA organizations. These organizations include the following:

- Region 2 Division of Environmental Science and Assessment.
- Region 2 Division of Emergency and Remedial Response.
- Region 2 Division of Enforcement and Compliance.
- Region 2 Pesticides and Toxic Substances Program.
- Office of Research and Development (ORD), Urban Watershed Management Branch.
- Office of Solid Waste and Response (OSWER), Environmental Response Team East.

The Edison Facility provides comprehensive analytical support data for enforcement, compliance assistance, and monitoring of Superfund sites, coastal waters, several Brownfield sites, and three nationally recognized estuaries, in New York, New Jersey, Puerto Rico, and the U.S. Virgin Islands. The Edison Facility also supports emergency response operations, Superfund removal actions, pesticide and toxic substances enforcement, laboratory data quality assurance and quality control, field monitoring and sampling, and helicopter operations.

The Edison Facility has been at the forefront of EPA's response to the environmental emergencies in the New York City metropolitan area. EPA deployed its rapid response team to the World Trade Center attack from the Edison Facility. The Edison Facility's location in the New York City metropolitan area and its proximity to several major highways allow it to serve as a critical staging area for collaboration with multiple agencies involved in disaster mitigation efforts. Its location and unique national and regional response expertise and laboratory capability make it a valuable resource in the Agency's Homeland Security and counterterrorism activities. (*EPA Nationwide Facilities Guide* [NFG], 2009).

1.4. THE PROPOSED ACTION

EPA is proposing to lease a portion of their Edison Facility property to an Independent Power Producer (IPP) for a 10-year term to build and operate a solar photovoltaic system (SPVS) or solar panel array. The IPP would be solely responsible for the cost of construction, operations and maintenance, and the dismantling of the SPVS when the lease expires. The IPP and EPA would enter into a Power Purchase Agreement (PPA). The PPA would set a price per kilowatt-hour (kWh) for the electricity generated by the SPVS, and Edison Facility would agree to purchase the energy generated from the SPVS to meet the facility's energy demands. The Edison Facility would benefit by having a set price for the electricity supplied by the SPVS. Power generated by the SPVS that is in excess of the Edison Facility needs could be provided to the common grid and sold to benefit the IPP.

The Edison Facility would purchase the energy generated by the SPVS. The power generated from the system would be directly tied to the Edison Facility downstream of the existing electrical meters. In addition, the local utility, Public Service Electric and Gas Company (PSE&G), would connect the solar array to the utility grid. The electricity generated by the SPVS would offset, in whole or in part, the electrical needs of the Edison Facility for the

foreseeable future. When the lease agreement expires, the dismantling and removal of the SPVS will be required. The IPP selection process and the SPVS technical specifications and details will be determined and fully defined through a competitive bidding process scheduled to begin this calendar year. Additional details are provided in Section 2.1.

1.5. PURPOSE AND NEED

Within the past several years, costs and demand for energy produced through fossil fuel resources, such as crude oil and natural gas, have increased dramatically. In response to this, Congress passed the Energy Policy Act of 2005 (EPAct 2005). Among the many energy conservation measures, EPAct 2005 directs the federal government to use more renewable energy, with a goal of using 7.5% of EPA's total utility usage or more as renewable energy by 2013. Solar power is among the renewable energy sources promoted in EPAct 2005. In addition, the Energy Security and Independence Act (EISA) of 2007 specifies targets for energy efficiency and fossil fuel use reduction by federal facilities. Specifically, new federal buildings should be designed so that they are carbon-neutral by 2030.

In order to offset energy consumption, EPA procures green power in the form of renewable energy certificates (RECs). This green power purchase supplies the Edison Facility with enough RECs to offset 100% of the annual electricity consumption each year. Procured through the Defense Logistics Agency's Defense Energy Support Center (DESC), these contracts support renewable energy generation from wind and biomass resources in nine states. EPA also reduces energy demand at the Edison Facility through the utilization of three solar water-heating systems and relying on electrical systems only for auxiliary water heating, when necessary. (EPA Greening, 2011).

The SPVS would provide the Edison Facility with a cost-efficient renewable energy source that would offset energy requirements for years into the future while meeting federal government renewable energy directives in EPAct 2005 and EISA. It would also allow EPA to support the development of local renewable energy infrastructure, reduce energy costs, and work to prove renewable resource technology. EPA will also continue to support broader green power initiatives through the purchase of non-solar RECs applied towards annual Agency renewable energy goals.

2.0. DESCRIPTION OF THE PROPOSED ACTION

As stated previously in Section 1.4, EPA proposes to lease a portion of the Edison Facility property to an IPP to build and operate an SPVS. This section will describe the components of the Proposed Action including the leasing action, electrical connectivity, construction, operations and maintenance, and dismantling of the SPVS. For the purposes of this analysis, the terms IPP and contractor are interchangeable.

2.1. PROPOSED ACTION

2.1.1. Leasing Action

EPA enlisted the assistance of the Defense Logistics Agency's DESC for the leasing and contracting process. DESC will publish a Request for Proposal (RFP) that will be circulated publicly. The RFP would request IPPs to develop a proposal for the leasing, construction, maintenance and operation, and dismantling of an SPVS. EPA anticipates, and DESC has concurred, that the construction, operation and maintenance, and dismantling of such an SPVS would be consistent with similar projects around the country. The IPP would be required to obtain all necessary federal, state, and local permits and comply with EPA policy directives, instructions, memoranda, and all applicable Edison Facility environmental plans.

2.1.2. SPVS and Electrical Connections to the Utility Grid

Depending on the utilization of the selected location on the Edison Facility campus and the type of solar arrays chosen (e.g., fixed or tracking arrays) for the development of the SPVS, the SPVS would have a rated capacity of 2,530 kilowatts (kW) per direct current (kW/DC) of solar power. The power produced by the solar panels would be approximately 400 volts direct current (DC). Inverters would be used to transform DC to alternating current (AC) and transformers would be installed to step up voltage to the required 480 volts to tie into the electrical utility grid. (EPA PV Feasibility Assessment, 2008).

Overhead power lines would be utilized for an SPVS located near at Site 1. Section 2.1.3 provides additional information on the power lines running underground. To protect the integrity of the system during electrical failures and lightning strikes, the installation of a 15-kilovolt ampere (kVA) combination fused cutout/lightning arrestor is anticipated at all locations where the SPVS connects to the electrical infrastructure. The purpose of the arrestor would be to shut down the SPVS immediately if there is a main power system failure.

It is anticipated that the power produced from the SPVS would offset most of (and possibly all) the energy needs of the Edison Facility. The SPVS would be connected to Edison Facility buildings downstream of current meters and electric meters would be placed at each location where the SPVS connects to the power grid. The meters would record the total electrical demand on the solar panels and Edison Facility power consumption. There would be potential for the production of excess power, in particular during weekends when electrical power demand of the Edison Facility is less than the amount of energy produced by the solar panels. The IPP would have the right to sell this power. The SPVS would not produce power at night and would not have any storage capabilities.

2.1.3. SPVS Installation

This EA analyzes a single location where an SPVS could be installed, hereafter referred to as Site 1. Figure 2.1-1 shows the general layout of the Edison Facility and the proposed SPVS location at Site 1. Site 1 comprises open, landscaped ground and would require the solar panels to be embedded into the ground with concrete footings (see Section 2.2.1 for more on Site 1). Photographs of Site 1 can be found in Appendix A.

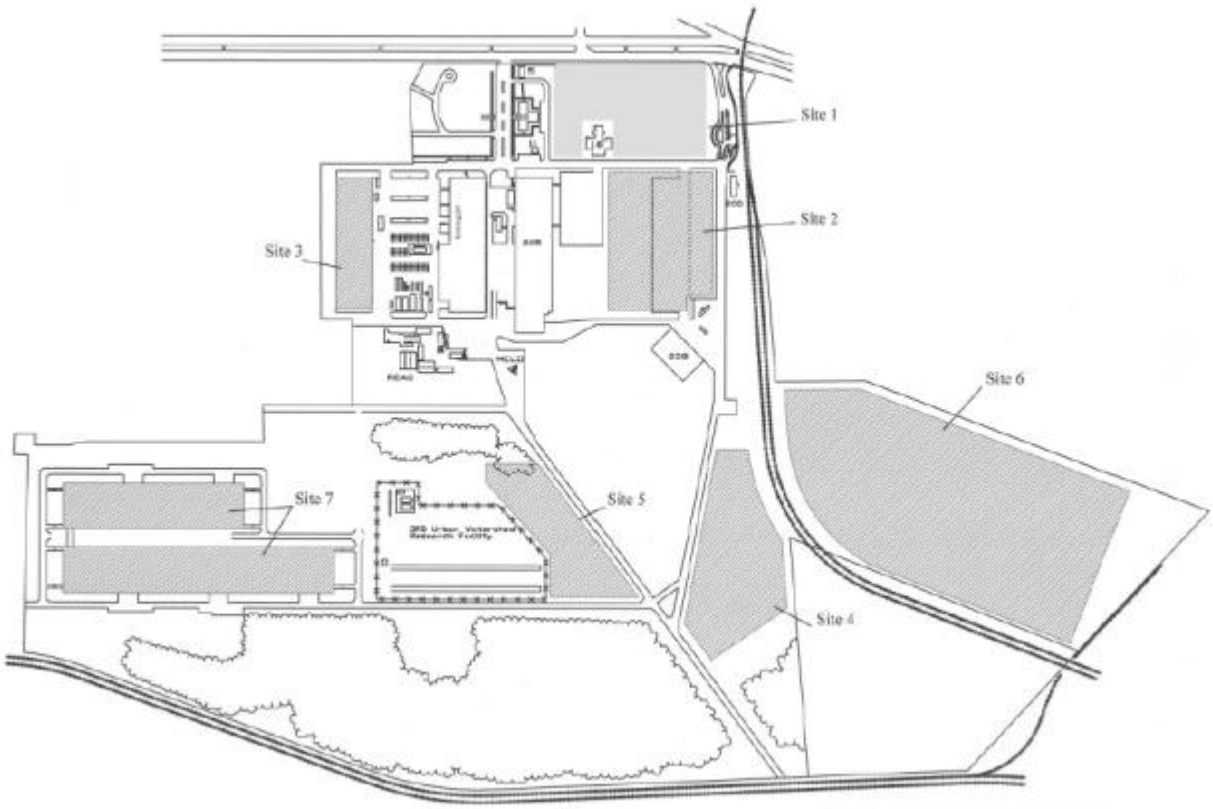

Figure 2.1-1: Edison Facility Campus Map with Proposed SPVS Location

It is anticipated that power lines connecting the SPVS to the main grid circuits would utilize existing overhead lines or be placed underground in trenches that could be as deep as three feet. Where these underground lines run under roadways, trenches might be filled with concrete. Following placement of the line in an underground trench, the line would be covered with earth and the disturbed areas would be graded to maintain current drainage patterns.

The project area would require a staging area for solar panel assembly. Clearing and grading of the land and potential trenching activities would require heavy equipment. It is anticipated that heavy equipment use would not last more than 45 days. Most of the construction process would involve the installation of the solar panels, which could last as long as 60 days.

2.1.4. Operation and Maintenance

A security fence with a secure and locked gate would enclose the entire SPVS. Operation and maintenance of the SPVS would be the responsibility of the IPP. The efficiency of the panels is

dependent upon their cleanliness. As a result, the contractor would conduct regular inspections of the SPVS and would clean as needed via pressure washing with water or blowing compressed air. (VanGeet, 2009). However, cleaning activities would likely be infrequent based upon frequent precipitation events in New Jersey. Additionally, panels that break or malfunction would require repair or replacement. All maintenance activities would occur on an as-needed basis and would not require the use of any heavy equipment.

2.1.5. Dismantling of the SPVS

At the end of the lease, the contractor would dismantle and remove the SPVS. An SPVS installed on an open area would require surface restoration. It is anticipated that the dismantling of the SPVS would take approximately 45 days.

2.2. SITE ALTERNATIVES

The preferred site for the SPVS is Site 1. The Edison Facility has undergone previous evaluations in feasibility studies to determine the potential for cost-effective photovoltaic installations at the Edison Facility Campus. As a result of these analyses and consultation with EPA personnel, Site 1 remains as the only possible location for the construction and operation of the proposed SPVS. The following discussion presents Site 1 as this Proposed Action. Other site alternatives eliminated from further consideration are discussed in Section 2.4.

2.2.1. Site 1

Site 1 is located in an open field along Woodbridge Avenue. There are two rows of recently planted trees between Woodbridge Avenue and Site 1. The site is an open field approximately 6.5 acres in size, of which approximately 275,000 square feet would be available for the SPVS. Since this site is an open grassy area, the construction of the SPVS would require the installation of concrete footings. The solar panel modules would be installed at an approximate 40-degrees tilt, facing due south, away from the road. While the local electrical utility transmission lines are readily available within 25 feet, connection to the grid at 480 volts would require the installation of a step-up transformer. Figure 2.2-1 shows two aerial views of Site 1: the first image, on the left, shows the site highlighted in yellow, relative to the Edison Facility; the second image shows a closer aerial view of the proposed location.

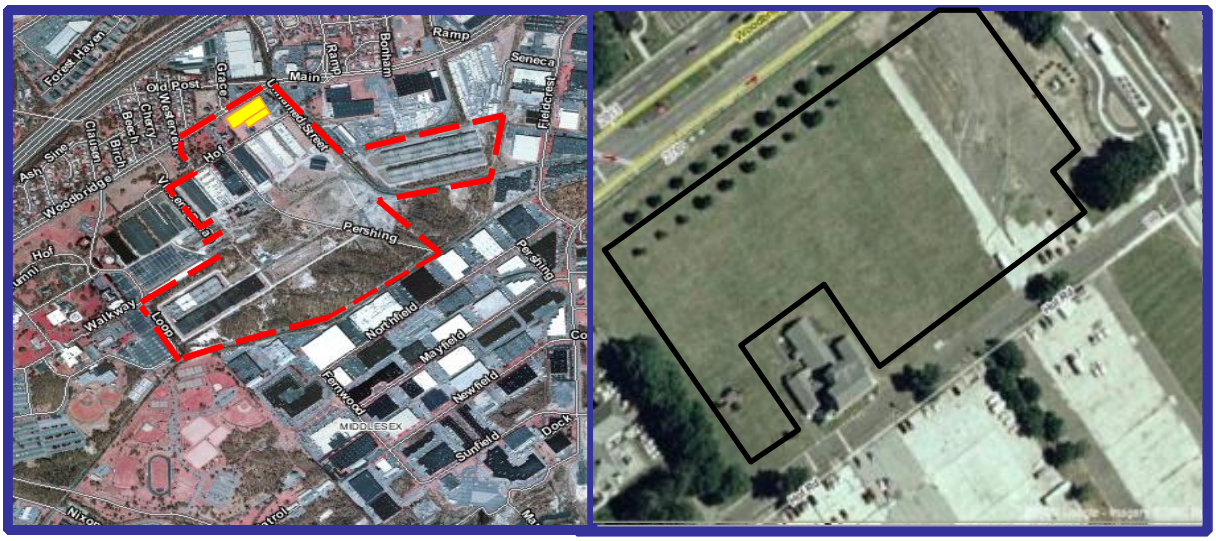

Figure 2.2-1: Aerial View of Site 1

Table 2.2-1 presents the potential power generating capability of the proposed site. A power density of 0.92 kW/100 square feet (ft^2) was used based on a high-efficiency fixed solar array module tilted at 40 degrees and facing due south. The power generation for the site is DC and would be converted to AC to be compatible for the local power grid.

Table 2.2-1: Potential Power Generating Capability

PV System Location	Area Available (sq feet)	Power Density (kW/100 ft^2)	Rated System Capacity (kW/DC)	Rated System Capability (kW/AC)	Annual Production (kWh)
Site 1	275,000	0.92	2,530	1,900	≈ 4,000,000
Notes: kW – Kilowatt. DC = Direct current. AC = Alternating current. kWh = Kilowatt-hour					

(Amon, 2011), (DOE, 2008), (EPA PV Feasibility Assessment, 2008)

In 2007, the Edison Facility was billed for 4,714,656 kWh of electrical use, and in 2008, it was billed for 4,702,067 kWh. (Snyder, 2009).

2.3. NO ACTION ALTERNATIVE

Under the No Action Alternative, the SPVS would not be installed on the Edison Facility grounds nor would there be the creation of a renewable energy source. The current grid supplied energy source would continue to supply power to the Edison Facility. It is likely that power rates would continue to increase, and the Edison Facility would continue to offset the consumption of nonrenewable resources through RECs until implementation of EPA energy conservation goals and alternative methods of meeting the requirements of EPAct 2005.

2.4. ALTERNATIVE SITES ELIMINATED FROM CONSIDERATION

Six other sites were considered as possible SPVS siting locations but due to limiting characteristics and other land use constraints were eliminated from further consideration. The locations of these sites are shown in Figure 2.4-1.

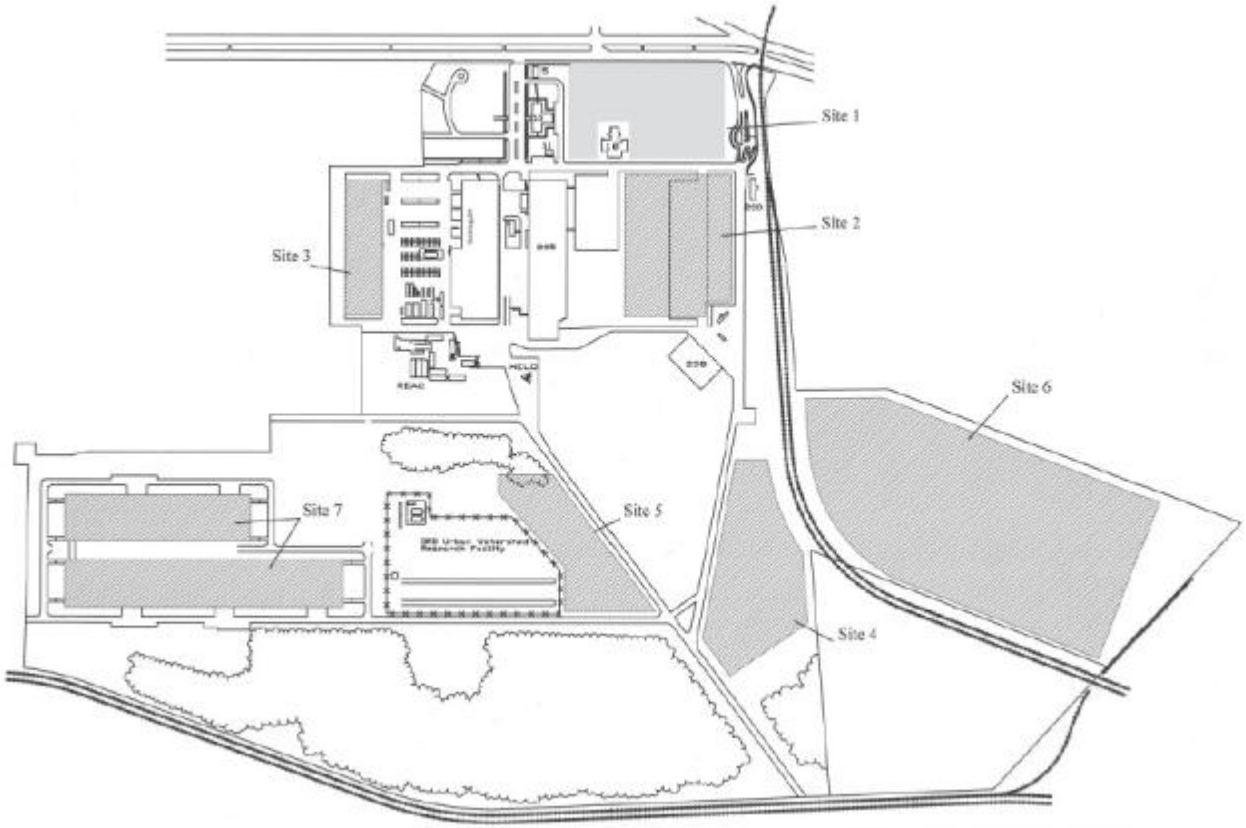

Figure 2.4-1: Edison Facility SPVS Proposed and Alternative Sites

The sites considered but rejected for further study include the following:

- **Site 2**: Site 2 was the site of an experimental green parking lot adjacent to the main roadway, Bonhamtown Road, in the Edison Facility. EPA's Facilities Management and Services Division along with EPA' s Office of Water and EPA's Pollution Prevention Office have sponsored this experiment using a special type of porous asphalt. Utilizing the area for an SPVS at this location would interfere with the experimental site. Upon consultation with the pilot project stakeholders, this site was eliminated from further consideration. (Amon, 2009; Swanhorst, 2009; Pernice, 2009; EPA PV Feasibility Assessment, 2008).
- **Site 3**: Site 3 is the roof of Building 212. The building would need a new roof membrane prior to construction of any solar project development. Installing a new roof on a building of this age would be cost-prohibitive and not in line with the master planning process for the site. Upon consultation with EPA headquarters master planning group, Region 2 facilities management group, and the local facilities management group, this site was eliminated from further consideration. (Amon, 2009; Swanhorst, 2009; Pernice, 2009; EPA PV Feasibility Assessment, 2008).
- **Site 4:** Site 4 is an open field east of Bonhamtown Road. The site is currently being used to store building demolition materials from former buildings at the Edison Facility. This site is also being considered as a location for future new laboratory facilities; therefore,

upon consultation with EPA headquarters master planning group, Region 2 facilities management group, EPA programs site personnel, and the local facilities management group, this site was eliminated from further consideration. (Amon, 2009; Ridge, 2009; Lee, 2009; Swanhorst, 2009; Pernice, 2009).

- **Site 5**: Site 5 is a small field west of Pershing Avenue located in a wooded area with a step-in elevation. This site would require extensive tree and vegetative clearing and is also considered for future new laboratory expansion; therefore upon consultation with EPA headquarters master planning group, Region 2 personnel, EPA programs site personnel, and the local facilities management group, the site was eliminated from further consideration. (Amon, 2009; Ridge, 2009; Lee, 2009; Swanhorst, 2009; Pernice, 2009).
- **Site 6**: Site 6 is located outside the Edison Facility fenced area and consists of old building structures. The site is located across a set of railroad tracks on the west side of the Edison Facility. This site has encumbered access due to the railroad tracks and lacks site security. In addition, a solar program consultant from the Department of Energy (DOE) advised EPA that this site has limited access to existing utility lines and would, therefore, be less economically viable for a PPA. For the foregoing reasons, the site was eliminated from further consideration. (Amon, 2009; Ridge, 2009; Lee, 2009; Swanhorst, 2009; Pernice, 2009).
- **Site 7**: Site 7 is made up of two large, underutilized warehouses, which are in a state of disrepair (Buildings 245 and 256). The site is located on the southern boundary of the Edison Facility grounds and is on level ground surrounded on two sides by rising terrain. The current standing warehouses would have been demolished and the SPVS would have been constructed on the remaining slab foundation. This site would require the installation of new utility lines on existing poles or through an underground utility conduit (i.e., trenches) in order to tie into the grid at the north end of the Edison Facility. For this reason, the site was eliminated from further consideration. (Amon, 2011)
- **Additional sites:** The DOE solar program consultant selected and analyzed the above sites upon conferring with EPA site and headquarters facility management personnel. The sites analyzed are the most viable and economical sites available within the Edison Facility campus based on the recommendation and experience of the DOE consultant. Though the Edison Facility has numerous other open spaces and buildings, DOE recommended and analyzed the above six sites, in addition to Site 1, based on numerous PPA factors .

3.0. AFFECTED ENVIRONMENT

The affected environment studied and addressed in this EA focuses on the current environmental resources that could be affected by the Proposed Action at the Edison Facility and its surrounding areas. It was determined that the following areas and resources have the potential to be affected by the Proposed Action and are discussed to determine the presence of significant impacts.

Data sources reviewed for the affected environment include government documents from federal entities, the State of New Jersey, Middlesex County, and Edison Township; communications and interviews with Edison Facility staff and personnel; Environmental Data Resources, Inc. ™ (EDR) reports, and field reconnaissance conducted on April 16 and May 28, 2009 of the Edison Facility campus and surrounding areas.

Additionally, three areas of concern (AOC) that are under investigation by the U.S. Army Corps of Engineers (USACE) are located on the Edison Facility property. Proposed Site 1 is located within an area of concern that extends from the outside northwest boundary of the Edison Facility through to the southeast boundary of the Edison Facility (i.e., AOC 8). (USACE, 2008). Where appropriate, activities and concerns associated with AOC 8 are discussed below and throughout this document.

3.1. GROUND RESOURCES

3.1.1. Geology

EPA's Edison Facility is located in the Coastal Plain physiographic province, approximately 0.25 mile southeast of the fall line, the geographical demarcation between the Coastal Plain and the Piedmont physiographic provinces. Specifically, the Edison Facility is underlain by the Coastal Plan sediments that make up the recently deposited Raritan formation. (NJDEP i-Map, 2009).

The Raritan Formation overlies the Passaic formation of the Newark Basin, representing the beginning of a series of major transgressions and regressions of the seas during Cretaceous time. The Raritan was formed during a period of transgression (sea level rise), which created a progradational alluvial plain, consisting of clay, sand, lignite, and gravels deposited in coastal and near shore marine environments. Subdivided units within the formation include the Raritan Fire Clay, Farrington Sand Member, Woodbridge Clay Member, Sayreville Sand Member, and South Amboy Fire Clay Member (oldest to youngest, respectively). (USGS, 2003).

3.1.2. Topography

The Edison Facility is topographically level. According to the U.S. Geological Survey (USGS) quadrangle map (South Amboy, New Jersey, 1995), Site 1 is located at an elevation of approximately 100 feet above mean sea level (MSL). The prevailing aerial topography of the Edison Facility and surrounding areas slopes gently southeast, toward the Raritan River. (EDR Report, 2009). During original development activities, Site 1 was graded as level. No swales, pits, or other irregular topography is located on the proposed site.

3.1.3. Soils

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) leads the National Cooperative Soil Survey and is responsible for collecting, storing, maintaining, and distributing soil survey information for privately owned lands in the United States. According to NRCS mapping, the proposed site and much of the Edison Facility is mapped as *Urban Land*, which is a designation for areas mostly covered with pavement, concrete, buildings, or otherwise compacted or disturbed soils. In the 1980s several buildings were demolished at Site 1. As a result, portions of these building foundations are known to be located below grade and under fill material. (EPA HRMP, 1992).

Soils mapped in the surrounding site area and most likely the Edison Facility soils are typified by clays, sandy soils, loams, and gravel deposits. The Edison Facility is not in an area considered to be "prime farmland" and mineral resources are not known to exist in the noted soil unit. (USDA NRCS, 2009). Former mining operations in the vicinity of the proposed site have included limited gravel and clay mining operations.

USACE investigations have identified soils contaminated with volatile organic compounds (VOCs) at Site 1. These contaminated soils are associated with the site's former use as a military installation. In addition, the USACE's 1999 supplemental remedial investigation of Area 18E and adjacent buildings has resulted in a planned non-time critical soil removal action at Site 1 (i.e., USACE designated AOC 8; Area 18E). The planned action will begin in July 2011 and will involve the removal of approximately 1,850 cubic yards of soil at a depth of 0-6 feet below grade. Figure 3.1-1 below shows the five planned locations of the non-time critical soil removal actions. The action is anticipated to be completed by the end of calendar year 2011. (USACE, 2011). This action is being conducted independently of the Proposed Action.

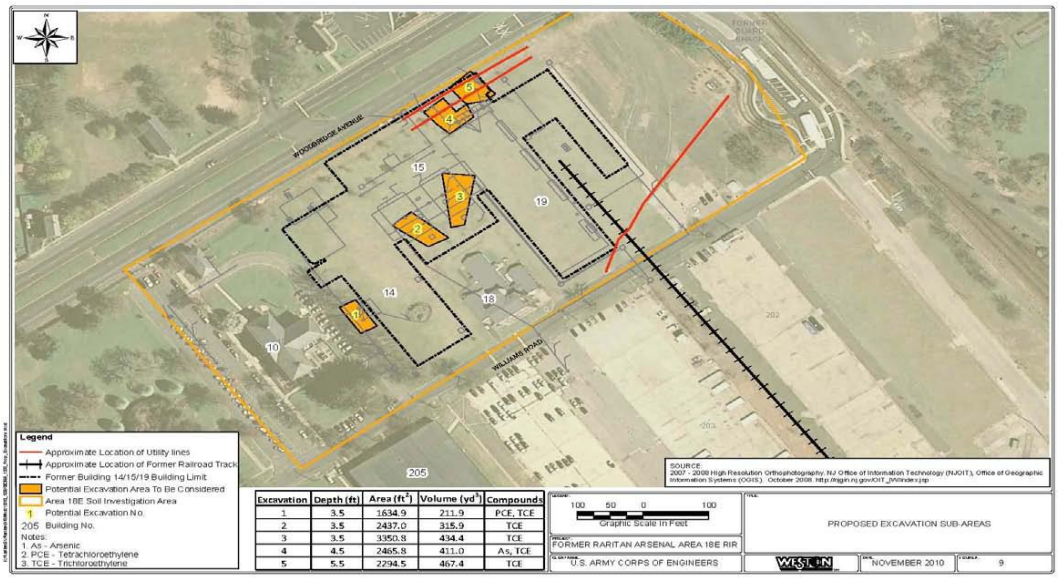

Figure 3.1-1: USACE Proposed Excavation Sub Areas for Non-Time Critical Soil Removal Action
Source: (USACE, 2011)

3.2. WATER RESOURCES

3.2.1. Surface Water

According to USGS mapping, no surface water features are mapped on the Edison Facility property. Wetlands are mapped on the southeastern corner of the Edison Facility, but no wetlands are present at Site 1, the proposed site location. The wetland drains across the southeastern property boundary through a drainage culvert under the railroad line. Wetlands are discussed further in Section 3.2.3 of this report. The culvert runs underground temporarily, emerges, and drains into Red Root Creek located approximately 4,000 feet southeast of the Edison Facility. (NJDEP i-Map, 2009). This creek is a tributary of the Raritan River, which is located approximately 1.5 miles southeast of the Edison Facility. According to the National Park Service's National Wild and Scenic Rivers system, no federally designated wild and scenic rivers are located on, or within two miles of, the Edison Facility, including the Raritan River.

3.2.2. Ground Water

EPA's Edison Facility is located within the Lower Raritan River watershed; no potable wells are located on the property. (NJDEP i-Map, 2009). The Edison Facility uses municipally supplied water for all operational purposes including laboratory, sanitary and drinking water.

Numerous monitoring wells associated with ongoing ground water monitoring are located on the Edison Facility property. The actual number of wells varies as wells are installed, closed, and abandoned as part of the monitoring process. These monitoring wells are associated with soil and ground water contamination identified on the property resultant from past use as the Raritan Arsenal. The former Raritan Arsenal covered approximately 3,200 acres and extended from Woodbridge Avenue (the northern boundary of the Edison Facility) to the Raritan River.

Contaminated ground water has been identified on Site 1 associated with the site's former use as a military installation. Ground water contamination in the area of Site 1 was the result of Trichloroethylene (TCE) degreasing operations that occurred in the vicinity of former buildings that resided on this site. A 2005 sampling event detected TCE concentrations in ground water on Site 1 ranging up to 170 micrograms per liter (µg/l). The remediation strategy chosen for the entire Raritan Arsenal is known as monitored natural attenuation (MNA). This strategy assumes that contaminants will degrade over time through natural biological and chemical processes. This cleanup method is typically selected when receptor pathways are incomplete and the potential impact to human health or the environment is limited. Experts predicted that the MNA strategy would occur for 40 years, beginning in 1999. (USACE, 2008).

Depths-to-ground water measurements in the monitoring wells on the Edison Facility are recorded as part of the ongoing Raritan Arsenal ground water monitoring program. Ground water at Site 1 has been detected at depths of 30 to 40 feet below grade. Ground water flows across the Edison Facility in a southeasterly direction. (USACE, 2008).

3.2.3. Floodplains and Wetlands

No floodplains are mapped on the Edison Facility site. According to the FEMA Flood Insurance Rate Map (FIRM) for Edison, New Jersey (Community Panel number 340261 0006 C), dated June 19, 1985, the entire Edison Facility property area is mapped as Zone C, an area of minimal flooding outside of the 500-year floodplain. The closest mapped floodplain, associated with the Raritan River, is located approximately 4,000 feet southeast of the Edison Facility. (FEMA, 1985).

According to the U.S. Fish and Wildlife Service (FWS), no wetlands are mapped on Site 1 of the Edison Facility; however, wetlands are mapped on the southeastern corner of the facility, approximately 1,700 feet south from Site 1. This wetland area has been identified as a palustrine, forested, broad-leaved deciduous, seasonally flooded wetland system. This system is characterized by impounded, shallow, nontidal freshwater, woody plants and trees, and is seasonally flooded or saturated. This wetland, mapped over approximately 11 acres of an undeveloped portion of the Edison Facility campus, drains across the southeastern boundary through a drainage culvert as discussed above.

3.3. AIR QUALITY

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. EPA established the National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: ozone (O_3), carbon monoxide (CO), nitrogen oxide (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 (Pb).

EPA designates all areas of the United States as having air quality better than (“attainment”) or worse than (“nonattainment”) the NAAQS. EPA designates the Edison area within Middlesex County as being in nonattainment of the NAAQS for ozone (moderate) and PM-2.5. (EPA Green Book, 2011).

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. Edison, New Jersey, is in a nonattainment area for ozone (moderate) and PM-2.5. The applicable *de minimis* thresholds for Middlesex County are shown in Table 3.3-1 below.

Table 3.3-1: Applicable General Conformity *De Minimus* Thresholds

Pollutant	*De Minimis* Threshold (tons)
Ozone (inside an ozone transport region)	
NO_x	100
VOC	50
PM-2.5	
Direct Emissions	100
SO_2	100
NO_x	100
VOC	100

3.3.1 Climate Change/Greenhouse Gas (GHG) Emissions

Climate change refers to major changes in temperature, rainfall, snow, or wind patterns lasting for decades or more. These changes may be the result of natural occurrences (e.g., changes in the Earth's orbit, sun's intensity, or volcanic activity) or manmade activity (e.g., combusting fossil fuels, deforestation and land development). (EPA, 2010). Combustion of fossil fuels results in greenhouse gases (GHG), which trap and convert sunlight into infrared heat. Increased levels of GHGs in the atmosphere have been correlated to a rise in surface temperatures of the Earth, which is thought to contribute to climate change.

The General Conformity Rule (40 CFR Parts 51 and 93) and NEPA provisions do not require an agency to consider GHG emissions and the impact to climate change, nor has any universal standard or regulation for GHG emissions been established. The CEQ issued a draft guidance memorandum in February 2010 for public consideration and comments on how federal agencies should consider GHG emissions from Proposed Actions and the potential impact to climate change. The guidance includes a presumptive threshold of 25,000 metric tons of CO_2, above which a federal agency should perform a more quantitative analysis and assess the effects of climate change on the Proposed Action and their design.

3.4. BIOLOGICAL RESOURCES

Biological resources consist of native or naturalized plants and animals, along with their habitats. The Endangered Species Act of 1973 and the Fish and Wildlife Coordination Act (FWCA) of 1934 provide a framework for conservation of vegetative and wildlife resources and can be supplemented with sound conservation principles to minimize impacts to vegetation and wildlife communities.

3.4.1. Vegetation and Wildlife

There is limited wildlife on and near Site 1 due to urban and residential development in the area. The Edison Facility grounds are largely urban and comprise paved and landscaped areas, including turf/grass, trees, and shrubs. Areas surrounding the Edison Facility are mostly developed and interspersed with small wooded and vegetated areas, which most likely provide habitat for animal species. Wildlife observed during previous field studies included rabbits, crows, mockingbirds, deer, mallards, black ducks, and common egrets. (USACE Baseline

Ecological Risk Assessment [BERA], 2008). Common tree species located on or within the Edison Facility campus include red oak and pitch pine, shrub species such as crab apple, and grass species such as switch grass. (EPA, 1990).

Site 1 comprises an open field with a large grassy area and a few bordering trees. A small landscaped 9-11 Memorial Garden is on the grounds and includes shrubs and small trees. Site 1 is also bordered by paved parking lot areas and roads, administrative buildings, the laboratory gatehouse, and a small landscaped park area located west of Site 1.

3.4.2. Endangered, Threatened and Rare Species

Federally or state-listed endangered, threatened, and rare species are unlikely to exist on or be in the vicinity of the Edison Facility property. Various federal and state government databases and sources were reviewed to determine the presence of endangered, threatened and rare species or their critical habitats. Sources include the EDR Report, New Jersey Department of Environmental Protection (NJDEP) Division of Fish and Wildlife, NJDEP Division of Parks and Forestry, NJDEP i-Map, and FWS. Based on a review of these sources, no federally listed Designated Wilderness Areas, Wilderness Wildlife Preserves, or threatened or endangered species' Critical Habitats reside within a one-mile radius of the Edison Facility, and no state-designated Wildlife Management Areas or state parks reside within Middlesex County. (EDR Report, 2009; NJDEP i-Map, 2009; NJDEP WMAs, 2009).

According to species lists and databases maintained by the FWS Environmental Conservation Online System, the FWS New Jersey Field Office, the NJDEP Division of Fish and Wildlife and the NJDEP Natural Heritage Program (NHP), several federally or state listed threatened and endangered species are potentially located within or near Middlesex County, New Jersey. These species are listed in Table 3.4-1 and Table 3.4-2. (FWS ECOS, 2011; FWS NJFO, 2010; USACE BERA, 2008).

Table 3.4-1: Endangered and Threatened Animal Species for Middlesex County

Group/ Type	Common Name	Scientific Name	Classification	
			State Status	Federal Status
Birds	Piping plover	*Charadrius melodus*	Endangered	Threatened
Mammals	Indiana bat	*Myotis sodalis*	Endangered	Endangered
Reptiles	Bog turtle	*Clemmys muhlenbergii*	Endangered	Threatened

Table 3.4-2: Endangered and Threatened Plant Species for Middlesex County

Group	Common Name	Scientific Name	Classification	
			State Status	Federal Status
Flowering Plants	Seabeach amaranth	*Amaranthus pumilus*	Endangered	Threatened
Flowering Plants	Swamp pink	*Helonias bullata*	Endangered	Threatened
Vascular Plants	Low Rough Aster	*Aster radula*	Endangered	N/A
Vascular Plants	Eaton's Beggar-ticks	*Bidens eatonii*	Endangered	N/A
Vascular Plants	Louisiana Sedge	*Carex Louisianica*	Endangered	N/A
Vascular Plants	Variable Sedge	*Carex polymorpha*	Endangered	N/A
Vascular Plants	Spiny Coontail	*Ceratophyllum echinatum*	Endangered	N/A
Vascular Plants	Pear Hawthorn	*Crataegus calpodendron*	Endangered	N/A
Vascular Plants	Lancaster Flat Sedge	*Cyperus lancastriensis*	Endangered	N/A
Vascular Plants	Trailing Tick-trefoil	*Desmodium humifusum*	Endangered	N/A

Group	Common Name	Scientific Name	Classification	
			State Status	Federal Status
Vascular Plants	Carolina Whitlow-grass	*Draba reptans*	Endangered	N/A
Vascular Plants	Featherfoil	*Hottonia inflata*	Endangered	N/A
Vascular Plants	Floating Marsh-pennywort	*Hydrocotyle ranunculoides*	Endangered	N/A
Vascular Plants	Cream Vetchling	*Lathyrus ochroleucus*	Endangered	N/A
Vascular Plants	Northern Blazing-star	*Liatris scariosa var. novae-angliae*	Endangered	N/A
Vascular Plants	Virginia Bunchflower	*Melanthium virginicum*	Endangered	N/A
Vascular Plants	Nuttall's Mudwort	*Micranthemum micranthemoides*	Endangered	N/A
Vascular Plants	Slender Water-milfoil	*Myriophyllum tenellum*	Endangered	N/A
Vascular Plants	Whorled Water-milfoil	*Myriophyllum verticillatum*	Endangered	N/A
Vascular Plants	Southern Rein Orchid	*Platanthera flava var. flava*	Endangered	N/A
Vascular Plants	Purple Fringeless Orchid	*Platanthera peramoena*	Endangered	N/A
Vascular Plants	Sea-beach Knotweed	*Polygonum glaucum*	Endangered	N/A
Vascular Plants	Torrey's Mountain-mint	*Pycnanthemum torrei*	Endangered	N/A
Vascular Plants	Rhodora	*Rhododendron canadense*	Endangered	N/A
Vascular Plants	Southern Arrowhead	*Sagittaria australis*	Endangered	N/A
Vascular Plants	Saltmarsh Bulrush	*Scirpus maritimus*	Endangered	N/A
Vascular Plants	Small Skullcap	*Scutellaria leonardii*	Endangered	N/A
Vascular Plants	Goldenrod	*Solidago rigida Prairie*	Endangered	N/A
Vascular Plants	Seaside Arrow-grass	*Triglochin maritima*	Endangered	N/A
Vascular Plants	Narrow-leaf Vervain	*Verbena simplex*	Endangered	N/A
Vascular Plants	Death-camus	*Zigadenus leimanthoides*	Endangered	N/A

While the species referenced above could potentially be located in Middlesex County, only one of the federally listed species was identified as possibly extant/present in Edison Township: the Indiana bat. (FWS NJFO, 2010). Previous NEPA reviews and ecological surveys indicated that this species has not been observed on the grounds of or in the vicinity of the Edison Facility and that the site was unlikely to contain suitable habitats for this species or other endangered, threatened, or rare species. Based on this information, and the fact that the Proposed Action's project area has continued to remain developed, it is unlikely that the Edison Facility currently contains federally or state-listed endangered, threatened or rare species.

According to previous NEPA reviews for construction projects at the Edison Facility site, federally or state-listed endangered, threatened, and rare species are unlikely to exist on or be in the vicinity of the Edison Facility. These previous NEPA reviews included federal and state database reviews and/or site-specific surveys conducted for the Edison Facility between 1988 and 1998. (EPA, 1990; EPA, 1998b).

In addition, ecological surveys and database reviews were conducted for a USACE 2008 BERA for the former Raritan Arsenal. As a result of this survey, records exist of state-listed endangered species in the vicinity of the former Raritan Arsenal. These observations indicate the possibility of such species existing in the vicinity of the Edison Facility. However, the Edison Facility has continued to remain developed, with little to no vegetation for suitable habitats. In addition, the previously noted observations did not identify any nesting or breeding sites for the state-listed species, nor did the surveys identify anything specifically on the Edison Facility grounds.

Therefore, it is unlikely that the Edison Facility site currently contains habitats for these state-listed endangered species.

3.5. CULTURAL RESOURCES

The proposed project site is located on a portion of the Former Raritan Arsenal Historic District and are managed using the 1992 *Historic Resources Management Plan for the U.S. Environmental Protection Agency's Edison Facility, Former Raritan Arsenal, Edison Township, Middlesex County, New Jersey* (HRMP), and the July 15, 1992, Memorandum of Agreement (MOA) between EPA, the Advisory Council on Historic Preservation (ACHP) and the New Jersey State Historic Preservation Office (SHPO). The HRMP uses zones to identify areas within the Edison Facility property related to the Former Raritan Arsenal. Since the inception of these documents, the Edison Facility property has been subject to the requirements contained in the MOA, which state that all buildings on the property shall be treated as historic. To satisfy the terms of the MOA and maintain mission requirements, EPA completed a Historic American Building Survey/Historic American Engineering Record (HABS/HAER) documentation in January 1997 on eleven buildings as mitigation for demolition. After submission of the completed HABS/HAER documentation, it is available for review at the New Jersey SHPO. Additionally, the MOA states that EPA will consult with the New Jersey SHPO on any significant modifications to the Edison Facility. If EPA and SHPO cannot resolve differences during consultation, then EPA will invite the ACHP's comments.

As detailed in the HRMP, Site 1 is located within historic Zone 4, which is listed as significant solely for the architectural value of the buildings and structures that once existed there. The HRMP notes that this zone is unlikely to yield any archeological resources because of the extensive construction disturbance. In the 1980s, several buildings were demolished at Site 1. As a result, portions of these building foundations are known to be located below grade and under fill material. Buildings associated with the Former Raritan Arsenal Historic District are within the Site 1 viewshed. (EPA HRMP, 1992).

On May 26, 2009, a cultural resources professional meeting the Secretary of the Interior's Professional Qualification Standards conducted SHPO research and a site visit. The SHPO research consisted of file reviews for any built features that would be potentially eligible for listing on the National Register. The New Jersey and National Register listings and the county surveys were reviewed.

During the SHPO file review, six historic buildings located outside of EPA property were identified as located within the area of potential effect (APE), the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of a historic site (36 CFR § 800.16(d)). None of these six historic buildings within the APE are listed in the New Jersey or National Registers. The Heritage Studies of Princeton, New Jersey identified six buildings during the 1978 Middlesex County Survey. Of these six historic buildings, only two historic structures are within the viewshed of Site 1, the Bonhamton School and the Bonhamton Grace Reformed Church. The standards in place for determining eligibility in 1978 dictated that neither was deemed eligible for listing on the National Register, due to the

loss of integrity of the settings. The 1908 Bonhamton School, presently housing a Montessori school, is an excellent example of a neoclassical building with Colonial Revival elements. The Bonhamton Grace Reformed Church, constructed in 1876, is a good example of vernacular Gothic Revival architecture. While these buildings are now considered historic as examples of distinct styles and have maintained integrity of design, modern intrusions surround them, which include the large four-lane Woodbridge Avenue, contemporary architecture, and modern additions to the surrounding houses.

3.6. NOISE

The U.S. has a noise law known as the Noise Control Act of 1972; however, state and local authorities generally address noise enforcements regulations. (Shapiro, 1991). As of this writing, New Jersey is the only state government who must approve local noise ordinances. (Noise Pollution Clearinghouse [NPC], 2001). See Table 3.6-1 for an outline of the Edison Facility noise standards. Consistent with industrial areas, the dominant noise feature of the immediate vicinity is road traffic noise emanating from Woodbridge Avenue, on the Northwestern side of the Edison Facility. The Proposed Action at Site 1 does not present any significant noise issues.

Table 3.6-1: Edison Noise Standards

Sound Source Property Category	Receiving Property Category					
	Another Dwelling Within Multi-dwelling Unit Bldg		Residential		Commercial	Industrial
	7AM–10PM	10PM–7AM	7AM–10PM	10PM–7AM	All Times	All Times
Multi-dwelling unit building	45	40	55	50	65	75
Residential	-	-	55	50	65	75
Commercial or public spaces or rights-of-way	-	-	65	50	65	75
Industrial	-	-	65	50	65	75
The following are exempt from the sound level limits:						
Noise from domestic power tools, lawn mowers, and agricultural equipment when operated with a muffler between the hours of 8AM–8PM on weekdays and 9AM–8PM on weekends and legal holidays, provided that they produce less than 85 A-weighted decibels (dBA) at or within any real property line of a residential property.						
Sound from church bells and church chimes when a part of a religious observance or service.						
Noise from construction activity, provided all motorized equipment used in such activity is equipped with functioning mufflers, except as provided in subsection 12-27.7b.6. of the Code of the Township of Edison.						
Noise from snowblowers/throwers and snow plows when operated with a muffler for snow removal.						
Noise from stationary emergency signaling devices that conforms to the provisions of NJAC 7:29.						
Noise from an exterior burglar alarm of any building or motor vehicle, provided such burglar alarm shall terminate its operation within 15 minutes after it has been activated.						

(Edison, 2010)

3.7. VISUAL RESOURCES

The Edison Facility consists of approximately 20 permanent buildings and numerous temporary trailers on a 205-acre campus, housing laboratory support, office, and storage functions. These permanent buildings were once part of the Raritan Arsenal, a large military installation in Edison Township.

Site 1 is located on the northern portion of the Edison Facility and is visible from Woodbridge Avenue and the residential area north of Woodbridge Avenue. Aerial and surface views are depicted in Figure 3.7-1, Figure 3.7-2 and Figure 3.7-3. Site 1 is adjacent to and fully visible from Buildings 5, 10, 11, and 18. Building 5 is currently occupied by GSA and is comprised of office space. Building 10 is EPA's Administrative Office for the Edison Facility. Building 11 is EPA's maintenance shed. Building 18 currently houses the OSWER Emergency Response Team offices but will become vacant in October 2011. (Beier, 2011).

Along Woodbridge Avenue, Site 1 is visible but the view is partially obscured by metal fencing. In addition to Woodbridge Avenue, portions of Site 1 are visible from the adjacent roads, including Bonhampton Road, Williams Avenue, and the Pershing Avenue parking area. Offsite properties located adjacent to and visible from Site 1 include a Montessori school and a church, which are to the northwest of the Edison Facility, across Woodbridge Avenue.

Site 1 includes two rows of recently planted trees between the proposed Site 1 and Woodbridge Avenue. Additional photographs of Site 1 and the Edison Facility can be found in Appendix A.

Figure 3.7-1: Aerial View and Surface View (to the Northeast) of Site 1

Figure 3.7-2: Angled Aerial View (to the East) of Site 1 (Buildings 10 and 18)
(Bing Maps, 2011)

Figure 3.7-3: Street View (to the Northeast) from Woodbridge Avenue toward Site 1
(Google Maps, 2011)

Site 1 does not have any significant visual impacts. Additional photographs of Site 1 can be found in Appendix A.

3.8. LAND USE

The Edison Facility property is zoned in the Township of Edison's District 5 for civic use. The civic zoning designation is used for municipal and governmental uses. Off-site properties to the northeast and southeast are zoned for Light Industrial uses. The Edison Facility adjoins Thomas Edison County Park at the facility's southwestern corner, which is zoned for Public Parks and Recreation. The grounds of Middlesex Community College are zoned for civic use, and adjoin the Edison Facility at the southwestern boundary. A property that is mapped as vacant adjoins the Edison Facility to the west, but was recently developed with townhouses (this property is shown as residential on the future Land Use Plan). Properties to the northwest of the Edison Facility, across Woodbridge Avenue, are zoned as Institutional/Private School, Places of Worship, and Residential and include a Montessori school and church.

The future Land Use Plan for District 5 shows zoning designations for properties to the north, west, south, and southwest of the Edison Facility that are the same as current zoning. Property to the northeast and southeast of the Edison Facility, which is currently zoned for light industrial use, is part of the future Riverfront and Center Revitalization District. This future revitalization district will revise current zoning designation to encourage mixed-use development with open-space and access to the Raritan River. (NJDEP i-Map, 2009).

3.9. HUMAN HEALTH AND SAFETY

The Edison Facility currently has safety, health, and environmental programs and systems in place to comply with Occupational Safety and Health Administration (OSHA) requirements. This includes policies and procedures to document programmatic safety and health-related goals and performance. Existing policies and protocol at the Edison Facility include EPA Facility Safety, Health and Environmental Management (SHEM) Manual, a multi-facility Environmental Management System (EMS) and an occupational health and safety plan. (SHEM Audit, 2005). In addition, the Edison Facility provides regular training for their personnel, and a Health and Safety Committee meets every six weeks to discuss emerging issues and resolve ongoing problems. Other existing safety and security measures in place include fencing surrounding the Edison Facility campus, a manned entrance guard house with a stationary guard, and a guard who conducts interior and exterior tours of the buildings onsite. (EPA Edison, 2009).

For security measures and safety measures, Site 1 has a fence bordering the field where it is adjacent to Woodbridge Avenue.

3.10. UTILITIES AND INFRASTRUCTURE

The affected environment associated with existing utilities and infrastructure at the Edison Facility include electrical utility management, potable water and wastewater management, stormwater management, and storage tank management.

3.10.1. Electrical Utility Management

In 2007, the Edison Facility was billed for 4.71 million kWh of electrical use, and in 2008, it was billed for 4.70 million kWh. (Snyder, 2009). Currently, electricity is largely provided by PSE&G. The Edison Facility also maintains a 100-kW diesel-powered emergency generator for

use during local power outages. In addition, the Edison Facility has three solar water-heating systems that are the primary source of hot water in their respective areas. All three solar water-heating systems consist of a preheat tank (between 66 and 120 gallons) and various numbers of roof-mounted, single-glazed, liquid evacuated tube collectors. (EPA Greening, 2011). The Edison Facility operates on a standard federal weekday schedule with the building typically occupied Monday through Friday (6:30 AM to 6:00 PM). (EPA WMP, 2006).

In order to offset energy consumption, EPA procures green power in the form RECs. This green power purchase supplies the Edison Facility with enough RECs to offset 100% of the annual electricity consumption each year. Procured through DESC, these contracts support renewable energy generation from wind and biomass resources in nine states. (EPA Greening, 2011).

3.10.2. Potable Water and Wastewater Management

The total annual water consumption by the Edison Facility is estimated to be approximately 4.4 million gallons per year. Approximately 462 employees work in the Edison Facility on a regular basis. (EPA Greening, 2011; EPA NFG, 2009).

Buildings within the Edison Facility receive drinking water supplied by the local municipality, the Middlesex Water Company. (EPA WMP, 2006). Temporary laboratory trailers use water provided by a local distributor. Incoming water supplied by Middlesex Water Company is split and flows through two parallel metered pipes in a metering shed. The locked metering shed is located in a separate fenced area outside of the northeast corner of EPA property, near Site 1. A second set of isolation valves are located to the north-west of the Building 200, also near Site 1. (EPA WMP, 2006). The Edison Facility also maintains an EMS with water conservation goals and developed a Water Management Plan in 2006 that documents and promotes water efficiency and conservation activities.

Wastewaters from the Edison Facility include sanitary wastes and discharges from laboratory sinks. These wastewaters are discharged to the Township of Edison and the Middlesex County Utilities Authority treatment works. (SHEM Audit, 2005). The Edison Facility maintains a policy prohibiting the discharge of chemicals, hazardous wastes, or analytical wastes to the sinks. Based on the Edison Facility's conformance with this policy, no permit or monitoring is required by the local treatment works. In addition, no point sources from the Edison Facility are subject to permitting under the National Pollution Discharge Elimination System (NDPES) for direct discharge of wastewater to state or national waters. (SHEM Audit, 2005).

3.10.3. Stormwater Management

The current stormwater management system at the Edison Facility is designed to collect and direct a portion of stormwater offsite to the municipal stormwater collection system. The direction of stormwater onsite is accomplished through the use of aboveground stormwater diversion mechanisms, belowground stormwater piping systems, and wetlands, which serve as a drainage basin. Aboveground stormwater diversions include the use of sloped paved areas (e.g., sidewalks, parking lots and roadway areas), curbing, open culverts, storm drain inlets and sloped grassy areas and embankments. Underground stormwater diversions include piping systems that collect stormwater and direct it to specific outfalls.

The majority of stormwater runoff from the Edison Facility site eventually flows offsite through a drainage outfall culvert on the east side of Edison property, near the intersection of Pershing Avenue and the railroad track. Stormwater runoff originating from Site 1 flows into a drainage pipe collection system and is directed towards this outfall.

Lastly, the Edison Facility currently has two stormwater-related research activities:

- Construction of a one-acre experimental porous parking lot and rain garden was completed in 2009. This project is part of on-going and long-term research efforts to quantify the effects of different permeable surfaces on stormwater runoff. This area is located to the south of Site 1. (EPA Stormwater Management [SWM], 2008; EPA Greening, 2011).
- The Edison Facility's Urban Watershed Management Branch participates in research in 20-acre open space at the Edison Facility to evaluate the performance of stormwater management practices under controlled conditions. Onsite storage tanks, mixing, transfer, and distribution equipment provide collected stormwater to the practice under evaluation. Outdoor facilities include pilot-scale swales, wet ponds, and wetlands allowing for controlled-condition evaluations. This research facility is located to the north of the warehouse buildings (Buildings 245 and 256). (EPA MAP, 2003; EPA UWRF, 2009).

3.10.4. Storage Tank Management

The Edison Facility does store sufficient quantities (greater than 10,000 pounds) of petroleum products and laboratory samples to warrant community right-to-know reporting pursuant to Executive Order (EO) 13148, *Greening the Government through Leadership in Environmental Management*, and the Emergency Planning and Community Right-to-Know Act (EPCRA). A review of the recent facility SHEM audits indicated the following: (SHEM Audit, 2005)

- Fuel oil is stored in a 10,000-gallon underground storage tank (UST) (located near Buildings 205 and 209, south of Site 1).
- Diesel fuel is stored in a 500-gallon aboveground storage tank (AST) (associated with the Edison Facility emergency power generator, located near the guard shack, east of Site 1).
- There are no known leaking USTs located on the grounds of the Edison Facility.

The Edison Facility does not maintain a Spill Prevention, Control, and Countermeasures (SPCC) plan, per Clean Water Act (CWA) and Oil Pollution Act (OPA) regulations (codified in 40 CFR Part 112), because the facility does not meet the threshold requirements. While an SPCC plan is not required, the Edison Facility maintains a combined *Oil and Hazardous Substance Contingency Plan* to address concerns regarding potential releases. In addition, the Edison Facility maintains relevant UST registrations and conducts periodic inventory monitoring in accordance with New Jersey regulations. (SHEM Audit, 2005).

3.11. WASTE MANAGEMENT

This section describes the affected environment associated with solid, hazardous, and sanitary waste management.

3.11.1. Solid Waste Management

The nonhazardous solid waste stream produced by the Edison Facility includes standard office waste and nonhazardous laboratory wastes. Based on previous EPA SHEM audit reports, the Edison Facility has implemented a recycling program for several nonhazardous solid wastes. Based on site personnel interviews, the Edison Facility's solid waste and recycling is removed by Midco Waste Systems and then transported to the appropriate recycling and disposal facilities.

The solid waste management practices at Site 1 currently falls under the same environmental management program at the Edison Facility.

3.11.2. Hazardous Waste Management

Based on previous SHEM audit reports, the Edison Facility has implemented hazardous waste management programs as a part of their environmental management system. (SHEM Audit, 2005). The Edison Facility is subject to hazardous waste management regulations for the handling, storage, and disposal of laboratory-related hazardous wastes.

The Edison Facility operates as a large quantity generator under New Jersey Resource Conservation and Recovery Act (RCRA) regulations, since it routinely generates quantities of hazardous waste in excess of the 1,000 kg/month threshold for non-acute hazardous waste and occasionally generates more than 1 kg of acutely hazardous waste. The majority of these waste streams generated by the Edison Facility consist of spent organic solvents, corrosive liquids from various analytical processes, toxic metals and pesticides, and solid laboratory waste. (SHEM Audit, 2005).

Wastes generated by the Edison Facility's analytical activities are initially placed in labeled satellite accumulation containers (as appropriate for the type of waste) in each laboratory where hazardous wastes are generated. Wastes from all laboratory operations are subsequently moved to the Edison Facility 90-day central accumulation area, located behind Building 209, when the satellite containers become full and prior to offsite shipment for treatment, storage, or disposal. The accumulated hazardous materials and wastes are picked up and managed by Veolia and then transported to the appropriate disposal or treatment facilities.

In addition, medical wastes at the Edison Facility are generated in the Occupational Health Resource Center in Building 200. The Edison Facility is registered with the NJDEP as a medical waste generator, and medical wastes are managed by appropriately licensed biomedical waste disposal vendors that maintain permits to operate in New Jersey and New York. (SHEM Audit, 2005).

At Site 1, there is an existing ground water contamination plume, for which the monitoring and remediation activities are being conducted by the USACE. An upcoming soil removal action at Site 1 by USACE will generate contaminated soils. Although regulated, these soils are not considered hazardous based on contamination concentrations. Remediation actions on Site 1 are being conducted independently of the Proposed Action. No known hazardous substances are known to exist at Site 1.

3.11.3. Sanitary Waste

Currently, sanitary waste generated at the Edison Facility in the restrooms, sinks and wastewater drains in the buildings is treated by the local wastewater treatment works, the Middlesex County Utilities Authority. (SHEM Audit, 2005). Sanitary wastes are not currently collected on Site 1.

3.12. TRANSPORTATION AND PARKING

The Edison Facility is located 30 miles south of New York City and is accessible from Woodbridge Avenue (Route 514), proximally located to the New Jersey Turnpike, Garden State Parkway, and Routes 1 and 287.

There are six primary roads on the Edison Facility:

- Bonhamtown Road runs generally northwest/southeast through the main part of the Edison Facility and provides the main entry point.
- Williams Avenue runs roughly east to west and ends at Bonhamtown Road.
- Industrial Road runs roughly east to west and ends at Bonhamtown Road.
- Casad Road runs roughly east to west, south of the main complex, and ends at Pershing Avenue.
- Pershing Avenue runs northwest to southeast and provides access to the section of the Edison Facility across the railroad tracks to the west.

The Township of Edison does not provide mass transit to or on the Edison Facility campus, although there are nearby bus stops. There are two nearby train stations with service by New Jersey Transit and/or Amtrak. The closest train station is Metuchen, located approximately two miles north, and it is served by New Jersey Transit while Amtrak serves the Metropark station, located approximately four miles north. The nearest commercial airport, located approximately 19 miles north, is Newark Liberty International Airport, for transportation to and from the region. A helicopter pad onsite is utilized by EPA researchers for transport. The helicopter pad is also made available for other local and regional contingency operations. Parking capacity is more than adequate at the Edison Facility.

3.13. SOCIOECONOMICS

The Edison Facility employs approximately 462 personnel, including scientists, professional staff, technical support contractors, and visiting scientists and students. This workforce represents a relatively minor portion of the 2008 Middlesex County estimated population of 809,858 and 2005-2009 average estimated labor force of 412,727. (U.S. Census Bureau [USCB], 2011a and 2011b). According to the 2000 census, the Middlesex County workforce comprises 40.6% of persons employed in management, professional, and related occupations; 28.4% in sales and office occupations; 12.8% in production, transportation, and material moving occupations; 11% in service occupations; 7.1% in construction, extraction, and maintenance occupations; and 0.1% in farming, fishing, and forestry occupations.

3.14. ENVIRONMENTAL JUSTICE AND PROTECTION OF THE CHILDREN

3.14.1. Environmental Justice

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. Data for Middlesex County presents a 2009 median household income of $74,959 with 7.9% of persons living below the poverty level. The Middlesex County median income is higher than the state of New Jersey and U.S. levels, and poverty rates are lower than the state of New Jersey and the U.S. rates. Data for the state of New Jersey presents a 2009 median household income of $68,444 with 9.4% of persons living below the poverty level, while 2009 Census data presents U.S. median income of $50,221 with 14.3% of persons living below the poverty level. (USCB, 2011a and 2011c). Middlesex County 2010 racial demographics include 58.6% White (18.4% Hispanic or Latino), 9.7% African American, 0.3% American Indian or Alaskan Native, 21.4% Asian, 0.0% Native Hawaiian or other Pacific Islander, and 3.0% two or more races. (USCB, 2011a)

3.14.2. Protection of Children

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 located in the vicinity of, or could come in contact with, a proposed project. There are no facilities within the Edison Facility grounds to which children would have access.

4.0. ENVIRONMENTAL CONSEQUENCES

This section addresses the impacts to the environment anticipated during the construction, operation and maintenance, and dismantling of the proposed SPVS on the Edison Facility. The following subsections outline potential impacts to environmental resources as a result of construction, operation and maintenance, and dismantling of the SPVS. This section analyzes construction and dismantling impacts collectively, because dismantling impacts are generally similar in scope to construction impacts. Where differences in construction and dismantling impacts exist, the text will provide appropriate discussion of the different impacts. The No Action Alternative is not individually analyzed throughout this section since the analysis is generally the same for each resource area.

No Action Alternative

Under the No Action Alternative, the SPVS would not be constructed at Site 1 and therefore, all the resources discussed below would experience no impacts.

4.1. GROUND RESOURCES

4.1.1. Construction and Dismantling

Geology

The Edison Facility is located within the Coastal Plain physiographic province and is underlain by thick terrace sediment deposits. Excavation during construction activities is not expected to exceed 6 feet below grade, significantly shallower than the underlying geologic formation. Because geologic features would not be encountered during construction or dismantling of the SPVS, potential impacts caused by encountering geologic formations and/or impacts to geologic formations themselves are unlikely.

Topography

The ground disturbance for the Proposed Action would include excavation for the installation of concrete footers for the individual solar panel supports, potential trenching for installation of power line conduit, installation of security fencing, and installation of a water-permeable aggregate layer (such as gravel) to control vegetation and prevent runoff. Site 1 is level and significant excavation to change topography would not be required during construction of the Proposed Action. Therefore, there is no potential for impact to topography on the site or surrounding properties during construction. Similarly, dismantling of the SPVS would not include significant excavation or other topography altering activities; therefore, dismantling of the SPVS would not impact topography.

Soils –Erosion Concerns

Site 1 is currently undeveloped and consists of an open grassy field occupying approximately 275,000 square feet (6.5 acres). Construction of the SPVS at Site 1 would entail the disturbance or removal of grasses and some topsoil over more than one acre. Since ground disturbance exceeds the one-acre disturbance threshold, construction activities would require permitting for

compliance with local land disturbance regulations. Upon dismantling of the SPVS at Site 1, the footings would be removed and the surface regarded and restored.

Vehicular access to the site is available via existing paved roads, negating the need for temporary construction roads; therefore, sediment control measures would not be required or necessary along the existing roadways.

Soils –Contamination and Unexploded Ordnance (UXO) Concerns

Solar panels may contain trace levels of heavy metals within their components, depending on the manufacturer. It is unlikely that these components would leach heavy metals during installation or dismantling; however, potential soil contamination could result during construction and dismantling of the SPVS from leakage of petroleum from construction equipment and dielectric fluid from transformers installed to support the SPVS. Quantities of dielectric fluid stored in transformers would be minimal and modern dielectric fluid does not contain polychlorinated biphenyls (PCBs). Best management practices (BMPs) and equipment maintenance significantly reduce the potential of a release from equipment or transformers. Therefore, the risk of soil contamination during construction, operation, or dismantling of the Proposed Action is not significant.

As discussed in Section 3.1.3, USACE investigations have identified VOC contaminated soils at Site 1. These contaminated soils are associated with the site's former use as a military installation, the Raritan Arsenal. To address these contaminated soils, the USACE will conduct a non-time critical removal action at Site 1 (i.e., AOC 8; Area 18E) in July 2011. Specifically, USACE will remove approximately 1,850 cubic yards of soil at a depth of 0-6 feet below grade. The action is anticipated to be completed by the end of calendar year 2011. Areas of excavation will be backfilled with certified clean fill material suitable for construction. (USACE, 2011).

As a result of the USACE non-time critical removal action to remove known contamination, it is unlikely that additional significantly contaminated soils would be encountered during the Proposed Action. In addition, any excavations during SPVS installation are not expected to reach the contaminated ground water table. Finally, the Proposed Action itself does not have a potential to cause any further negative impact to the condition of the soil at Site 1.

Unexploded ordinance (UXO) has been previously identified on the former Raritan Arsenal property, the northern portion of which is currently occupied by the Edison Facility. Identification and abatement of UXO has been completed by the Army at the former Raritan Arsenal. (Cho, 2009). UXO was not identified at Site 1, the proposed solar array location. (GAO, 1992). Although no UXO were identified in this area, the presence of UXO cannot be completely discounted. Note that previously discovered UXO at the former Raritan Arsenal were deemed inert and did not detonate. Prior to environmental investigation activities at Site 1, a UXO screening was conducted in accordance with the Accident Prevention Plan. No evidence or UXO was discovered during the screening. (USACE, 2006). Based on previous UXO investigations, it is unlikely that any UXO would be encountered during construction activities associated with the Proposed Action; hence, the Proposed Action is not likely to have a significant impact on UXO.

4.1.2. Operation and Maintenance

Geology

No geologic features would be encountered during operation and maintenance of the proposed SPVS and impacts from or to geologic features would not occur.

Topography

Operation and maintenance to the SPVS would not include significant excavation or other topography altering activities. Operation and maintenance of the SPVS would not impact topography.

Soils

The long-term operation of the SPVS is not anticipated to result in significant environmental impacts to the quality of soils at the Edison Facility or in the surrounding area. Localized soil heating may occur in the vicinity of the array due to the absorption of heat by the solar panels from the sun, but the impact would be minimal and is unlikely to affect soil conditions.

Ongoing environmental investigation/remediation in the area of Site 1 in connection with the USACE investigation of the Raritan Arsenal could include the installation of additional soil borings in order to collect soil and ground water samples. These anticipated and potential future borings represent temporary sampling features that would not require ongoing monitoring. Based on the passive nature of the proposed SPVS, unplanned future investigation/remediation is not likely to be affected by the operation of the SPVS. (USACE, 2011).

4.1.3. Conclusion

Impacts from the Proposed Action to ground resources, including geology, topography, and soils, are expected to be minimal at the proposed site due to the existing improved and graded surface at the proposed site. Additionally, the existing soil contamination located at the Edison Facility is unlikely to be encountered or otherwise affect the construction or operation of the SPVS, and the discovery of UXO is not expected.

4.2. WATER RESOURCES

4.2.1. Construction and Dismantling

Surface Water

Since there are no surface water resources or wetlands located on proposed Site 1, no direct impacts are anticipated.

Potential indirect impacts to nearby surface waters include siltation caused by soil erosion primarily from Site 1, which includes ground disturbing activities for construction and dismantling of the SPVS. Use of BMPs to comply with state and local sediment control laws would control any siltation or erosion from this site during the construction and dismantling phases.

Other potential indirect impacts to nearby surface waters could result from the release and subsequent runoff of dielectric fluids used in the transformers or any fuel or oil from

construction and/or dismantling equipment. The potential for leaks or releases of dielectric fluids, fuels, and oils is minimal due to use of BMPs and implementation of spill prevention plans; therefore surface water contamination caused as a result of the construction and dismantling of the SPVS is not significant.

Ground Water

Excavation at Site 1 would include the installation of concrete footer bases for the solar panels, security fencing, and potential trenching for electrical utility conduit. These excavation activities are not expected to exceed a depth of six feet below grade. Similarly, dismantling activities are not expected to exceed a depth of six feet below grade. Based on the ongoing ground water-monitoring program on the Edison Facility, the depth-to-ground water at Site 1 is approximately 30 to 40 feet below grade, well below the expected maximum depth of excavation.

Potential ground water contamination sources that may exist during construction and dismantling of the SPVS are limited to leakage of petroleum from construction equipment and dielectric fluid from transformers. In the unlikely event of leakage, impacts to ground water would be localized and limited. Therefore, the potential for contamination impacts to ground water during construction of the proposed SPVS is not significant.

An ongoing ground water-monitoring program by the USACE on the Edison Facility (associated with the Raritan Arsenal) has identified ground water contamination at Site 1. Based on the depth-to-contaminated ground water measurement on this site (approximately 30 to 40 feet), dissolved- and vapor-phase VOC contamination is unlikely to be encountered during construction excavation or dismantling of the SPVS. Numerous ground water monitoring wells are located at Site 1, however, the actual number varies as sampling wells are installed, closed, and abandoned as part of the monitoring process. If the SPVS were to be constructed at Site 1, solar panels will not be placed in a manner that would damage or limit access to the monitoring wells.

Floodplains and Wetlands

The Raritan River floodplain resides approximately 4,000 feet southeast of the Edison Facility; no floodplains are mapped on the Edison Facility or closer than 4,000 feet. Based on the distance between the Edison Facility and the floodplain, the Proposed Action does not have a potential to impact floodplain resources.

No wetlands are mapped on Site 1 of the Edison Facility; however, wetlands are mapped on the southeastern corner of the facility, approximately 1,700 feet south from Site 1. The greatest potential for impact to the wetland is siltation from runoff during construction and dismantling activities. Use of erosion control BMPs would prevent soil erosion at the proposed site. State and local regulations require that sediment control measures be in place prior to the start of construction. Therefore, the likelihood that wetlands on the Edison Facility would be impacted by soil erosion is not significant.

As established earlier, the risk of a fuel spill due to construction and dismantling equipment failure or spill from a transformer is considered minimal. If a spill from equipment or a

transformer were to occur, it would likely be localized to a small area near the equipment and could easily be abated. Therefore, the risk of contamination from spills to wetlands from construction of the proposed SPVS is not significant.

4.2.2. Operation and Maintenance

Surface Water

To ensure soil erosion concerns do not extend during the operation and maintenance phase, permanent erosion control measures at Site 1 would include a permeable layer of aggregate and vegetation that stabilizes soils and allows water to permeate into the soil. Aboveground runoff during a heavy rain event would be supplemented by stormwater inlets located south of the site that drain to a culvert that exists on the Edison Facility property across the southeastern boundary.

The potential for leaks or releases of dielectric fluids, fuels, and oils during operation and maintenance is minimal due to use of BMPs and implementation of spill prevention plans. Additionally, transformers are sealed for operation, and no removal or refilling of fluids occurs as part of operation and maintenance. Therefore, the lack of fluid handling negates the risk of spillage from routine maintenance.

Ground Water

Potential ground water contamination sources that may exist during operation and maintenance of the SPVS are limited to leakage of dielectric fluid from transformers. In the unlikely event of leakage, impacts to ground water would be localized and minimal based on the limited quantities of dielectric fluid stored in transformers.

Operation and maintenance of the proposed SPVS is not expected to affect the ongoing ground water-monitoring program by the USACE on the Edison Facility. If requested by the USACE, SPVS equipment should be taken out of service to accommodate the ongoing remediation effort at Site 1.

Floodplains and Wetlands

The environmental consequences to floodplains and wetlands as part of operation and maintenance of the proposed SPVS are similar to those expected for surface waters. Significant or any impact to wetlands or floodplains is unlikely.

4.2.3. Conclusion

Impacts from soil erosion and accidental spills to water resources, including surface water, ground water, floodplains, and wetlands, are expected to be minimal at the proposed site and do not present a potential for significant impact to the environment.

4.3. AIR QUALITY

Edison, New Jersey, is in a nonattainment area for PM-2.5 and ozone (moderate). Since ozone is not a pollutant that is emitted directly into the atmosphere, ozone precursor pollutants, such as NO_x and VOCs, must be analyzed to determine the potential for ozone impacts. To determine if the Proposed Action would contribute to air pollution above the thresholds listed in Table 3.41, a

General Conformity applicability determination was conducted. Air quality impacts associated with the construction, operations and maintenance, and dismantling of the SPVS are primarily related to increases in vehicle emissions associated with the heavy equipment in the construction and dismantling and the delivery of construction materials via truck to and from the workplace.

The U.S. EPA NONROAD Model 2008a was used to calculate emissions of criteria pollutants and CO_2. (EPA, 2008). A sample set of equipment was set up for construction, operation, and dismantling the proposed SPVS. Table 4.3-1 depicts the equipment used in the model.

Table 4.3-1: Equipment Modeled for Air Quality Analysis

Phase	Equipment
Construction	Bulldozer, Crane, Welder, Front End Loader, Flatbed Truck, Concrete Truck, Backhoe, Scraper, Dump Truck, Grader, Trencher
Operation	Pressure Washer, Air Compressor
Dismantling	Bulldozer, Crane, Front End Loader, Flatbed Truck, Backhoe, Scraper, Grader, Dump Truck

Appendix B presents details on the air emission calculations used in this analysis. All emissions calculations were completed using the worst case scenario and included no natural mitigation measures.

4.3.1. Construction and Dismantling

Construction and dismantling activities that have the potential to result in air emissions impacts include fugitive dust impacts from surface disturbance and ground excavation activities (primarily at Site 1), use of construction equipment (during the construction phase), equipment removal (during dismantling), and an increase in vehicle access to the site (during the construction and dismantling phases). Any impact to ambient air quality associated with construction and dismantling the SPVS 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 prohibiting the idling of trucks.

Construction activities from the equipment listed in Table 4.3-1 would cause a temporary increase in all NAAQS criteria pollutants. The emissions associated with construction are shown in Table 4.3-2. As shown in the table, emissions would be well below *de minimis* standards. As a result, there would be a minor adverse, but less than significant, air quality impact associated with construction emissions.

Table 4.3-2: Construction Air Quality Emissions (tons)

	VOC	NO_x	SO_2	PM-10	PM-2.5
Site 1	0.04	0.65	0.02	0.05	0.05
***De minimis* Standard**	50	100	100	100	100
% De minimis	0.08%	0.65%	0.02%	0.05%	0.05%

As shown in the table, emissions would be below *de minimis* standards. As with construction, activities involving dismantling would create fugitive dust impacts; however, these impacts would be temporary in nature and easily mitigated by applying BMPs, such as watering the

ground on a regular basis during construction. As a result, there would be a minor adverse, but less than significant, air quality impact associated with the dismantling of the SPVS.

Table 4.3-3: Dismantling Air Quality Emissions (tons)

	VOC	NO_x	SO_2	PM-10	PM-2.5
Site 1	0.02	0.35	0.01	0.02	0.02
***De minimis* Standard**	50	100	100	100	100
% De minimis	0.04%	0.35%	0.01%	0.02%	0.02%

4.3.2. Operations and Maintenance

The primary contributors to air emission in the operation and maintenance phase of the project are from the use of air compressors and the pressure washers. For the purposes of this analysis, weekly washing and blowing with compressed air was assumed as a worse case. The emissions associated with operations and maintenance are shown in Table 4.3-4. Unlike construction and dismantling, there would be no ground disturbance and therefore no fugitive dust impacts associated with operations and maintenance. As a result, there would be little to no air quality impact associated with operations and maintenance emissions.

Table 4.3-4: Operations and Maintenance Emissions (tons)

	VOC	NO_x	SO_2	PM-10	PM-2.5
Site 1	0.003	0.003	0.0002	0.0001	0.0001
***De minimis* Standard**	50	100	100	100	100
% De minimis	0.06%	0.003%	<0.001%	<0.001%	<0.001%

4.3.3. Greenhouse Gas Emissions

GHG emissions (CO_2) were also estimated for the construction, demolition, and operations and maintenance activities using EPA's NONROAD Model 2008a. (EPA, 2008). The GHG emissions generated from the Proposed Action are shown in Table 4.3-5. These emissions are well below the 25,000 metric ton threshold suggested by the White House CEQ, therefore, were not considered further in this analysis.

Table 4.3-5: Greenhouse Gas Emissions (metric tons)

Site 1	CO_2
Construction	98.2
Maintenance and Operations	0.9
Dismantling	48.9
Total	148.0

4.3.4. Conclusion

The emissions associated with the Proposed Action would increase emissions by less than 2.0% annually and would not hinder maintenance of the NAAQS within the region of influence. Temporary fugitive dust impacts would be temporary in nature and easily mitigated with regular wetting of the affected ground; vehicle emissions impacts would be mitigated as much as possible by prohibiting truck idling. Based on these findings, there would be an adverse, but

insignificant, impact associated with air quality emissions due to the Proposed Action. Additionally, the use of renewable energy creates a positive impact by reducing the greenhouse gas footprint of the Edison Facility.

The energy generated by the solar panel array would create no emissions and would result in a net savings of emissions by eliminating the demand for electricity generated by conventional means of fossil fuel combustion. Table 4.3-6 depicts the annual savings generated by the use of the SPVS creating the energy from a renewable source.

Table 4.3-6: Annual Emissions Saved Using Renewable Energy Source (tons)

	NO_x	CO_2	SO_2
Site 1 Savings	2.76	1,370.0	3.27
No Action	0	0	0

(Watts, 2009)

4.4. BIOLOGICAL RESOURCES

4.4.1. Construction and Dismantling

Vegetation and Wildlife

Under the Proposed Action the majority of Site 1 would be disturbed for SPVS construction and dismantling activities, including the open field of landscaped turf and trees. The removal or displacement of some of the recently planted trees may be necessary, and to comply with Edison Township Codes, tree replacements or permits may be required, based on the size and type of tree being removed. (Edison, 2011). In addition, the 9-11 Memorial Garden is expected to be moved to another location at the Edison Facility.

Construction and dismantling impacts are expected to be minimal and insignificant because the site is already currently developed, construction BMPs would be utilized, trees requiring displacement would be moved or replaced (rather than being removed completely), and no long-term changes in biological habitat are likely or anticipated.

Endangered, Threatened and Rare Species

Based on the previous ecological surveys, referenced in Section 3.4, it is unlikely that there are any federally or state listed endangered, threatened, or rare species in the immediate area of the Proposed Action. However, state-listed endangered or threatened bird species were previously observed to be present in the vicinity of Edison Facility. It is unlikely such species would be adversely impacted by construction or dismantling activities at the site. Site 1 is currently developed with little vegetation and would not be expected to have suitable habitats for breeding or nesting. Therefore, it is unlikely any endangered, threatened or rare species would be significantly impacted by construction or dismantling activities associated with the Proposed Action.

In addition, the FWS Northeast Regional Office was consulted in May 2009 regarding federally listed endangered, threatened, and rare species within the Proposed Action's project area, and this office deferred to the FWS New Jersey Field Office (NJFO). The FWS New Jersey Field Office currently maintains a policy (effective March 2009) that does not require federal agencies

such as the EPA to seek consultation with the FWS if existing information and field surveys demonstrate that no potentially suitable habitat is located within the project's action area (i.e., the affected environment). (FWS NJFO, 2009). The FWS New Jersey Field Office provides a template for federal agencies to document the FWS's policy not to provide concurrence with a "no effect" determination. This letter is included in Appendix C.

4.4.2. Operation and Maintenance

Vegetation and Wildlife

Possible impacts from the operation and maintenance of the proposed SPVS may result from typical anticipated maintenance activities. Maintenance activities include removing and trimming of any trees or vegetative that would potentially shade the SPVS panels. In addition, the SPVS array may create perching opportunities for birds. This would not be anticipated to harm the wildlife, but may require more frequent cleaning and washing of the solar panels to remove possible bird droppings. (DOE, 2009). EPA has included language in the SPVS scope of work that requires the contractor to use environmentally preferable products for any cleaning that will take place during the operation and maintenance phase. Thus, this would not be expected to significantly impact the surrounding wildlife and vegetation.

Lastly, the SPVS site design is expected to incorporate measures such as fencing to prevent predators and other animals from entering the site. None of the above-mentioned potential impacts on vegetation and wildlife are expected to be significant or adverse.

Endangered, Threatened and Rare Species

Based on previous ecological surveys, referenced in Section 3.4, it is unlikely any federally or state listed endangered, threatened and rare species would have habitats in the immediate vicinity of the SPVS. However, state-listed bird species were previously observed to be present in the vicinity of Edison Facility. It is unlikely such species would be adversely impacted by operation and maintenance activities at the site. Any impacts resulting from operation and maintenance of the SPVS are expected to be negligible. For example, the SPVS may create perching opportunities for birds, but the panels would not likely be suitable nesting or breeding. It is unlikely any endangered, threatened, or rare species would be impacted by operation and maintenance activities associated with the SPVS.

4.4.3. Conclusion

The Proposed Action is not expected to impose significant impacts on local vegetation and wildlife or any endangered, threatened, and rare species. There would be no anticipated significant impacts on biological resources resulting from the construction, operation and maintenance, or dismantling of the proposed SPVS.

4.5. CULTURAL RESOURCES

The Proposed Action would not have an impact on either the buildings associated with the Former Raritan Arsenal Historic District or the two historic properties located offsite (i.e., Bonhamton School and the Bonhamton Grace Reformed Church).

Mitigation has been completed for EPA-owned buildings located on Site 1, HRMP Zone 4, through HABS/HAER documentation as required in the MOA.

As previously stated, the area surrounding the non-EPA owned historic properties has not retained integrity of setting. The Proposed Action would not introduce viewshed concerns that could produce adverse effects to cultural resources. Additionally, the Proposed Action is temporary as the SPVS would be leased for 10 years to a contractor. Therefore, the introduction of the SPVS to the viewshed of these buildings would not be permanent. The Edison Facility property is currently fenced and additional fences that may be constructed for the Proposed Action are not anticipated to create viewshed concerns.

Due to the degraded setting of the historic properties within the viewshed and the temporary nature of the Proposed Action, none of the actions associated with the Proposed Action, including construction, operation and maintenance or dismantling, would affect cultural and/or historic resources within and near the project site.

4.6. NOISE

4.6.1. Construction and Dismantling

Vehicles and equipment involved in the SPVS construction and dismantling would generate the primary noise from the Proposed Action. The typical noise levels generated by these activities range from 74 to 84 A-weighted decibels (dBA) at approximately 50 feet from the source. Table 4.6-1 illustrates the anticipated sound pressure levels at a distance of 50 feet for the miscellaneous heavy equipment.

Table 4.6-1: Heavy Equipment Noise Levels

Equipment Type	Number Used	Noise Levels (dBA)
Bulldozer	1	83
Backhoe (rubber tire)	1	74
Front Loader (rubber tire)	1	80
Dump Truck	1	78
Concrete Truck	1	82
Concrete Finisher	1	79
Crane	1	82
Flat-bed Truck (18 Wheel)	1	78
Scraper	1	84
Grader	1	83
Trenching Machine	1	77
Estimate based on typical construction scenario		

(DOT, 1981)

There would be a temporary increase in noise during construction and dismantling activities associated with the Proposed Action. Construction noise would be comparable to noise generated from trucks and heavy equipment used in the surrounding commercial industries.

In the unlikely event that all of the equipment would be active at once, the noise level generated by at Site 1 could reach 68.27 decibels (dB) at 500 feet from the site, well within the Edison criteria for an industrial site (see Table 3.6-1). For the two sensitive receptors (Bonhamton School and Bonhamton Grace Reformed Church), which are located on the north side of

Woodbridge avenue approximately 1,200 feet (i.e., just under ¼ mile) from the center of Site 1, the noise emanating from the construction at Site 1 would be indistinguishable from the traffic noise emanating from the nearby and intervening Woodbridge Avenue.

4.6.2. Operation and Maintenance

The operation of the solar panels would be virtually silent for a fixed array. An array that is tracked to align itself with the relative position of the sun would have very minimal noise emanating from the small electrical motors powering the tracks as they align the surface to face the sun. Maintenance of the solar panels would include washdown of the solar panels with water or using air blowers to remove any dust or debris, but this activity would be infrequent. (VanGeet, 2009). Pressure washers, air blowers and compressors would result in temporary and minimal noise impacts.

4.6.3. Conclusion

The noise associated with the Proposed Action would be greatest during construction and dismantling of the SPVS. Although impacts are anticipated to be adverse at times during the construction and dismantling phases, they would be for short periods of time and only occur during work hours to minimize the impact to any nearby receptors. They are not anticipated to be significant due to significant levels of street traffic and other industrial noises currently present surrounding the site and the presence of thick foliage and other natural noise barriers. The noise associated with the operation and maintenance of the solar panels would be virtually nonexistent; and therefore not be significant.

4.7. VISUAL RESOURCES

The area around the Edison Facility is fully developed with a combination of industrial, housing and commercial uses. The relatively low profile of the proposed SPVS means that there would be little visual impact to the areas directly surrounding the proposed project site. Due to the temporary nature of the Proposed Action, the SPVS would not negatively impact existing buildings or spaces within the APE. The placement of the SPVS on Site 1 would allow it to be partially visible from non-EPA owned properties, predominantly from the area north of and along Woodbridge Avenue. The solar panels would stand approximately 10-12 feet tall at the highest point.

The SPVS at Site 1 would create changes to the landscaped grounds and the Edison Facility viewscape. Figure 4.7-1 provides an artist's rendering of how the SPVS would appear from directly overhead and from the west side of the array looking to the north.

Note it is possible that the estimated placement of the panels may extend past what is depicted in the rendering; for example, panels may also be placed closer to the tree lines. In addition, while unlikely, it is possible the rows of recently planted trees would need to be moved to provide space for the panels in the SPVS.

Figure 4.7-1: Aerial and Surface Rendering of the Proposed Site 1

While the change in viewscape would be visible from Woodbridge Avenue, the SPVS would be aligned to face away from the avenue and toward the sun. This would prevent any possible problems with sun glint, reflection, or glare from the panels. In addition, Site 1 would also be enclosed within a security fence that would limit public access but would still provide passing traffic with a view of the solar panels. This fencing would also provide a partial sight barrier to the panels. Based on existing fencing/sight barriers being employed and the planned system design preventing light glare, visual impacts resulting from SPVS are expected to be minimal and insignificant.

4.8. LAND USE

The SPVS would be installed under a land lease agreement with the IPP. The term of the lease is expected to be 10 years. Based on the terms of the lease, the SPVS would be dismantled at that time and the site would be returned to its previous use. In the case of the proposed Site 1, the land is currently vacant and unused. Based on the lease terms, the Proposed Action would only have a temporary impact on the land use of the proposed site, but no significant impact to the long-term land use is expected.

Operation of the SPVS appears to be consistent with current zoning designations for EPA property; however, according to local code, project authorization through the Edison Township Zoning Board would be required. (Edison, 2011). Based the Proposed Action's alignment with current zoning and the passive nature of the Proposed Action, the potential for adverse effects to land use of neighboring properties is not significant.

4.9. HUMAN HEALTH AND SAFETY

4.9.1. Construction and Dismantling

Implementation of the Proposed Action would involve activities typical of construction projects. The contractor would be expected to ensure that construction and dismantling activities comply with OSHA standards and other applicable engineering and construction standards and codes, such as the National Electrical Safety Code. The contractor is expected to plan for potential site-specific risks (e.g., possible UXOs) and potential risks specific to solar array panel installation

(e.g., danger of electric shock). Construction workers are expected to receive appropriate safety training, hold the proper certifications, and be knowledgeable in solar panel installation and its applicable hazards and precautions. For example, prior to installation, solar panels would be expected to remain in a shaded staging area and not in direct sunlight, to prevent possible burns from handling the panels. In addition, the contractor is expected to develop a worker health and safety plan, which would need to be in accordance with any existing health and safety plans at the Edison Facility.

At Site 1, where there is an existing ground water contamination plume, construction and dismantling activities may require additional personal protective equipment (PPE) for workers, such as protective clothing and gear. However, this is unlikely, given that the ground water is not expected to be disturbed. The contractor is expected to coordinate with EPA and the USACE to ensure that proper precautions are taken and BMPs are implemented.

4.9.2. Operation and Maintenance

The Proposed Action would involve operation and maintenance activities that may expose on-site personnel to health and safety risks. The SPVS site design is expected to be protected on all sides; safety and security measures would likely include enhanced fencing, locked entrances, and signage to prevent unauthorized entrance onto the site, and to protect against danger of electric shock. Because the contractor would be responsible for all aspects of operating and maintaining the SPVS, they would also be responsible for training their personnel on related health and safety precautions related to the SPVS. The contractor would be expected to ensure that operation and maintenance activities comply with all applicable health and safety standards (e.g., OSHA). While EPA and other Edison Facility personnel are not expected to participate in the operation and maintenance of the SPVS, the Edison Facility would likely train their personnel on basic safety protocol, such as whom to notify if they observe an issue at the SPVS site.

4.9.3. Conclusion

Health and safety risks are expected to be minimal and temporary, and the contractor is expected to effectively manage these risks with measures such as developing a worker health and safety plan, providing PPE for workers, implementing protocols during SPVS operations, and installing secure fencing. Therefore, the potential health and safety impacts resulting from construction, operation and maintenance, and dismantling of the SPVS are expected to be minimal and insignificant.

4.10. UTILITIES AND INFRASTRUCTURE

4.10.1. Construction and Dismantling

Electrical Utility Management

Construction and dismantling of the proposed SPVS would be expected to temporarily require additional electrical demand to serve construction equipment and other typical activities. Construction and dismantling of the SPVS may also require temporary electrical utility service interruptions for the Edison Facility. For Site 1, connection to the utility transmission line would

be readily available within 25 feet, so land disturbances due to utility connections would be minimal.

After the SPVS is dismantled, the Edison Facility 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, reverting back to providing the previous electrical power demand prior to the construction and operation of the SPVS. Although the Edison Facility would no longer purchase the majority of electrical power through a contract involving the SPVS, the Edison Facility would continue with normal operations and would continue to obtain service from a local electrical utility company.

None of the abovementioned impacts are expected to be significant.

Potable Water and Wastewater

There would likely be a temporary increased use of the potable water and wastewater infrastructure due to an increase in site personnel during construction and dismantling activities. In addition, because of ground disturbance and digging activities, some of the existing potable water and wastewater lines at Site 1 may require relocation or removal. Temporary water service interruptions at the Edison Facility are unlikely, but may be necessary during construction activities.

Stormwater Management

Stormwater runoff originating from the site would likely have an increase in sediment due to expected ground disturbance during construction activities associated with the Proposed Action. Disturbed areas are expected to be graded and designed appropriately so that stormwater flow is still directed to the existing stormwater collection network and toward the drainage outfall culvert. EPA has inserted sustainable development requirements into the project scope of work to require the contractor to ensure the stormwater profile of the site meets all federal requirements (e.g., EISA stormwater management requirements). The contractor would be expected to implement BMPs for erosion/sediment control and stormwater management during these activities to minimize impacts on the existing stormwater collection system, wetlands, and other environmental resources. Specifically, the contractor would be expected to implement precautions to prevent polluted runoff from affecting the porous parking lot south of Site 1. In fact, the stormwater projects near Site 1 may help mitigate any potential stormwater management issues originating from Site 1 independent of the Proposed Action.

It is possible that there may be a temporary increase in stormwater runoff from Site 1 because of the removal of the landscaped turf and increase in impervious paved area. However, site designs are expected to incorporate BMPs and the contractor will be required to ensure the design meets all federal stormwater requirements. In addition, at Site 1, new drainage structures or other stormwater management facilities may need to be constructed to connect to the existing stormwater drainage network.

After dismantling the SPVS at Site 1, the contractor is expected to remove the concrete footings and return the grounds to their previous condition (i.e., landscaped turf). This would likely reduce the stormwater runoff back to its predevelopment conditions.

Storage Tank Management

The Proposed Action would not include changes or improvements to any existing fuel storage tanks, nor is the Proposed Action expected to include construction of any new fuel storage tanks. Because the existing storage tanks (and any associated pipes or connections) are not located on or adjacent to Site 1, the storage tanks are not expected to be disturbed by construction or dismantling activities. In addition, the tanks are not located in the anticipated pathways of heavy equipment or delivery trucks. Thus, no expected impacts on storage tank management would result from the construction and dismantling activities associated with the Proposed Action.

4.10.2. Operation and Maintenance

Electrical Utility Management

The Edison Facility would continue to operate on a standard federal weekday. No significant increase in worker population is expected in the near future and thus, there would be no significant electrical power demand increase or reduction resulting from this.

The Edison Facility would obtain energy directly from the SPVS as well as continue to obtain electric service from an electrical utility company, which is currently PSE&G. If excess power is generated by the SPVS, the utility would obtain the solar-derived photovoltaic electricity from the SPVS. The SPVS electrical production would be metered and measured, as the Edison Facility's consumption is metered and measured. The SPVS would not produce electrical power when the sun is not present and would not have any energy storage capabilities. It is expected that the Edison Facility will use all electricity generated by the SPVS, but that the SPVS would not meet 100% of the Edison Facility electrical power demands. Thus, it is expected that the Edison Facility's electrical usage would be charged an additional flat rate if the usage exceeds the SPVS production. However, the electrical power delivery to the Edison Facility would not be based upon the SPVS' collection and production (i.e., the utility would continue to provide electricity to the Edison Facility, even when the Edison Facility's demand exceeds the SPVS production). This includes emergency and other situations as well; if the SPVS temporarily undergoes maintenance, operates at a lower efficiency, or is shut down due to damage or system failure, the Edison Facility would continue to obtain electrical service from the local utility. During power outages where the local utility and/or power grid are unable to provide electrical service to the Edison Facility, the existing onsite emergency generator would be used temporarily.

While normal operations would continue, the SPVS would provide a potential additional electrical power source for the local electric grid. It is expected that the SPVS would reduce the electricity demand on the local electrical utility providers. In addition, EPA may still procure green power RECs for the Edison Facility as a swap for the solar RECs developed under this project.

Potable Water and Wastewater

There would likely be a minor increase in the potable water use at the Edison Facility (e.g., outdoor water faucets fed by the Edison Facility's potable water infrastructure) due to cleaning and washing of the proposed SPVS; however, this maintenance is likely to be infrequent, as the contractor is expected to rely on precipitation as much as possible to wash the solar panels. Washdown from these cleaning activities would be expected to drain into the wastewater or stormwater collection system and may contribute to a minor increase in the use of the Edison Facility's wastewater infrastructure. None of the above mentioned impacts are expected to be significant.

Stormwater Management

It is possible there would be a minor increase in the stormwater runoff water use due to cleaning/washing of the proposed SPVS, although this would likely be infrequent and only when local temperatures were above freezing. Washdown from these activities would be expected to drain into the wastewater or stormwater collection system, but it is possible that the washdown would infiltrate into the ground or surrounding vegetated areas. However, the water would not be expected to contain toxic or hazardous substances or a significant increase in sediment. Therefore, there would be no anticipated adverse impacts on the stormwater runoff. In addition, site development designs are expected to implement BMPs for managing stormwater runoff.

Storage Tank Management

No significant impacts to storage tank management are expected to occur due to the operation and maintenance of the proposed SPVS. It is unlikely the SPVS would contribute to the occurrence of power outages and therefore impact emergency generator operations. Operation and maintenance activities associated with the Proposed Action would likely result in no impacts on the storage tank management.

4.10.3. Conclusion

Construction activities associated with the Proposed Action would have negligible impacts on the existing utilities and infrastructure management.

After construction is completed, the operation and maintenance of the SPVS would reduce demand on the local electric utility and would create additional electrical power for the local grid. The anticipated impact on the electrical utility management would be potentially beneficial but not significant. Other operation and maintenance activities associated with the Proposed Action would likely result in minimal impacts on the existing potable water, wastewater and stormwater infrastructure.

Dismantling activities would likely result in similar impacts from construction of the SPVS. In addition, the SPVS would no longer provide solar-derived electrical power to the local electrical utility, but the Edison Facility would continue its normal operations and receive electrical power from the local utility company.

No significant impacts are expected to result from construction, operation and maintenance, or dismantling of the SPVS.

4.11. WASTE MANAGEMENT

4.11.1. Construction and Dismantling

Solid Waste

Construction of the proposed SPVS would be expected to temporarily generate solid wastes. Solid wastes that would be generated may include concrete, scrap wire, masonry, packing materials, and debris. EPA is inserting recycling and reuse requirements that meet all federal requirements into the project scope of work, the contractor will be required to ensure the design meets all federal pollution prevention requirements. The contractor would be directed to recycle materials, where feasible, thereby reducing the amount of debris disposed in landfills. Solid waste not recycled by the contractor would likely be directed to an approved landfill, and it is possible that some solid waste (e.g., concrete rubble) would be left onsite per EPA's direction.

At Site 1, demolition of existing buildings would not occur and the solid waste generation at this site is anticipated to be minimal. Because Site 1 previously included building facilities, some concrete, rubble and other aggregates (i.e., beneath the topsoil and sod) may be removed during construction activities. The amount of waste generated by the Proposed Action at Site 1 would likely not have a significant impact on the operating life of the landfill.

Solid wastes would be generated when dismantling the SPVS components; these wastes would be disposed of or recycled. PV panels are generally accepted at and safe for landfills, because the panel and solar cell materials are usually encased in glass or plastic, and most of the materials are insoluble. (DOE, 2009; DOE National Renewable Energy Laboratory [NREL] EA, 2007). However, as stated previously, some constituents could be classified as toxic or hazardous substances, a situation that is prompting the PV industry to develop recycling processes for modules. Because solar panel disposal is in its infancy, it is not possible to specify if the dismantled SPVS panels would ultimately be able to be recycled. (DOE NREL EA, 2007). Thus, the dismantling of the SPVS would likely create solid waste and would create an adverse, but insignificant, impact on the local receiving landfill with respect to solid waste management. It is expected that the solid wastes generated from the dismantling activities would be the responsibility of the utility/operating contractor.

Hazardous Waste

At Site 1, there is an existing ground water contamination plume. However, no hazardous waste management impacts are expected to result from activities associated with this contamination, given that the construction activities are not expected to disrupt the ground water table. The contractor is expected to coordinate with EPA and the USACE to ensure that proper precautions are taken and BMPs are implemented. At a minimum, the contractor should coordinate with EPA and the USACE to ensure that construction activities take place after the planned soil removal activities at Site 1.

In addition, the following potential impacts may occur:

- It is likely the construction and dismantling activities would require the use of potentially hazardous materials, such as petroleum, oils and lubricants (POLs). All hazardous

materials and construction debris used during construction and dismantling activities would be handled, stored, and disposed of in accordance with federal, state, and local regulations and laws.

- The SPVS would require components which may contain hazardous substances, such as electrical connections to the power grid (e.g., lead soldering). Some models of solar photovoltaic panels may also contain trace amounts of hazardous materials and heavy metals, such as arsenic or cadmium. While solar panels are sealed under normal operating conditions, there is the potential for minimal risks if they are damaged during construction and dismantling activities. (DOE, 2009). However, the potentially hazardous constituents in the solar panels are solid (i.e., they are not liquid or gaseous and thus would not be prone to leaking or dispersing), and these materials would not expected to cause any contamination in soils or ground water if the panels were de-commissioned properly upon being damaged (Fthenakis, 2009).

While potential impacts listed above may occur during construction and dismantling, the likelihood of such events is very small, and BMPs are expected to be implemented to ensure proper management and control of these events. Therefore, potential impacts associated with hazardous waste from construction activities are expected to be minimal and insignificant.

Sanitary Waste

The volume of sanitary waste generated is likely to increase during construction and dismantling activities due to the increase of site personnel at the construction site. It is expected that portable toilets would be provided by an external contractor. This contractor would be expected to properly manage and dispose of the sanitary wastes through the proper wastewater treatment authority.

4.11.2. Operation and Maintenance

Solid Waste

Solar photovoltaic panels are encased and sealed in glass or plastic and typically have useful lives of up to 30 years. (DOE NREL EA, 2007; Brookhaven National Laboratory [BNL], 2003). While there is a potential over the life of the SPVS for a panel to break or require replacement, under normal operating conditions, the solar panels would not require frequent replacement or disposal. Infrequent, isolated replacement of solar panels or other equipment over the course of the operation and maintenance of the SPVS may occur; this would not cause a significant increase in solid waste.

Hazardous Waste

As mentioned previously, some models of solar photovoltaic panels may also contain trace amounts of hazardous materials, such as lead, arsenic or cadmium. It is highly unlikely that these substances would lead to environmental contamination during operation and maintenance (Fthenakis, 2009). In addition, while other components of the SPVS, such as the transformers, are not expected to contain hazardous wastes (e.g., PCBs), but they may contain POLs and other

fluids. Potential leaks from these transformers would be very unlikely and insignificant. The utility company would be expected to implement proper maintenance and inspection practices to prevent such leaks.

Sanitary Waste

No increase in sanitary wastes is anticipated to result from the operation and maintenance of the SPVS.

4.11.3. Conclusion

Potential impacts resulting from construction, operation and maintenance, or dismantling activities associated with the Proposed Action are not expected to have any significant impacts on solid, hazardous and sanitary waste management.

4.12. TRANSPORTATION AND PARKING

4.12.1. Construction and Dismantling

There would be a temporary increase in traffic accessing the Edison Facility while a staging area is set up for the construction and dismantling activities. Heavy equipment, as shown in Sections 4.3 and 4.6, would access the Edison Facility grounds during these project phases and could potentially hamper the traffic flow in and out of the facility during peak times. However, once the staging area is established, this traffic surge created by large delivery trucks and heavy equipment would then be limited to only construction workers accessing the Edison Facility. Edison Facility has adequate roads and parking to accommodate utility vehicles, negating the need for road alterations or offsite parking. This would be true for all phases.

4.12.2. Maintenance and Operation

The contractor would be completely responsible for the operation, maintenance and upkeep of the SPVS. It is anticipated there would be equipment housed at the Edison Facility for the purpose of maintaining the solar panels. Minimal traffic and parking would be required on a periodic basis for personnel to access the site for maintenance and upkeep duties.

4.12.3. Conclusion

There would be a minor and temporary increase in traffic accessing the Edison Facility during the construction and dismantling phases. There would be little traffic activity associated with the operations and maintenance of the SPVS. With all vehicles operating from a staging area, there would be only a temporary impact on parking. As a result, the Proposed Action would not result in a significant impact to transportation or parking.

4.13. SOCIOECONOMICS

This section addresses the socioeconomic impacts anticipated from the Proposed Action. The impacts associated with the Proposed Action are not differentiated between the three phases of the project. Socioeconomic impacts from the Proposed Action are expected to be minimal because of the temporary nature of the proposed activities and substantial changes in the labor force at the Edison Facility or surrounding community is not expected.

The construction and operation of the Proposed Action is not anticipated to impact employment at the Edison Facility or in the surrounding community. The Proposed Action would neither create nor eliminate any jobs at the Edison Facility. The construction activities at the Edison Facility would not be expected to require additional EPA or construction contract employees to be brought in from outside the local area. Therefore, the Proposed Action is not expected to cause significant change or stress on local employment, community social services (i.e., fire, police or health services) or community demographics.

4.14. ENVIRONMENTAL JUSTICE AND PROTECTION OF THE CHILDREN

4.14.1. Environmental Justice

The Proposed Action would not be expected to cause adverse or disproportionately high impacts to minority or low-income communities. Although the Edison Facility resides within the proximity of residential areas, Middlesex County has median income rates 9.5% higher than the State of New Jersey and 49.2% higher than the U.S., and poverty rates 19.0% lower than the State of New Jersey and 81.0% lower than the U.S., and the Proposed Action's potential impacts would be contained to the Edison Facility grounds. Therefore there would be no significant impact on environmental justice from the Proposed Action.

4.14.2. Protection of Children

The Proposed Action would not produce any environmental impacts that could disproportionately affect infants or children. There would be no potential for releases of gasses, particulate matter, or noise that is outside the scope of a similar construction project. The Proposed Action would not produce excessive noise, and noise is expected to occur during working business hours. Additionally, any increases in truck or large vehicle traffic would take place during working business hours and travel to the site should take into account any vehicular restrictions imposed by the nearby school (e.g., crosswalks and loading/unloading zones). Furthermore, some schools such as the Mosier Community School in Mosier, Oregon and the Satori Elementary School in Galveston, Texas, have installed SPVSs on campus to harness energy and serve as teaching tools. 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.

5.0. CUMULATIVE IMPACTS

The CEQ Regulations (40 CFR Parts 1500-1508) implementing the procedural provisions of NEPA defines cumulative effects as:

> *The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other action.* (40 CFR § 1508.7).

Determination of cumulative impacts involves the consideration of both the affected environment and environmental consequences of the connected actions. The environmental consequences in all resource areas of this Proposed Action were of insignificant to minimal levels of impact and are not expected to contribute to cumulative impacts over time.

Direct and indirect impact analysis focuses only on those resources that may be impacted by the Proposed Action. Cumulative impacts analysis addresses these same resources from activities reasonably foreseeable in the future, with the potential to interact with the Proposed Action, together with past and present activities.

At this time, there are no reasonably foreseeable major projects outside Edison Facility grounds that would significantly impact the facility. The Edison Facility has numerous projects completed in the past few years and several more being contemplated. Table 5.0-1 shows many of the recent and future projects of the Edison Facility grounds.

Table 5.0-1: Edison Facility Projects

Action	Start	Current Milestone	Status
Building 209 Boiler Replacement	2007	Complete	Project Complete
Permeable Parking Experiment	2008	Complete	Project Complete
Renovate Parking Area	2008	Complete	Project Complete
Renovate Building 238	2008	Complete	Project Complete
Building 205 Lab Improvements	2008	Complete	Project Complete
USACE Site Investigation	2009	Complete	Investigation Complete
OSWER Modular Laboratories	2010	Complete	Project Complete
USACE Non-time Critical Soil Removal	2011	Contract Awarded	Construction Start July 2011
Building 209 Bays E and F Roof Replacement	2011	Awaiting Construction Contract Award	Construction Complete November 2011
Building 209 Engine Generator and Uninterruptible Power Supply System Installation	2011	Awaiting Construction Contract Award	Construction Complete December 2011
Building 209 Interior Renovation into Office Space	2011	50% Design Complete	Construction Complete Fall 2012

(Pernice, 2011), (Swanhorst, 2011), (USACE, 2011)

Parking Projects

Two projects involved parking within Edison Facility grounds. One was an expansion of the existing parking area and the other was to install an experimental permeable asphalt parking lot. The purpose of the experiment is to determine various impacts associated with stormwater,

runoff, and permeability with differing types of soils. The permeable parking experiment concluded in 2009.

Building Improvement Projects

Six of the projects involved building improvements including updating the buildings per code requirements (Building 238 and 205), installing a new boiler and the proposed installation of a new engine generator and uninterrupted power supply (Building 209), interior renovations to office space (Building 209), and the a planned roof replacement (Building 209). Each of these projects was subject to the review of environmental impacts pursuant NEPA and its implementation regulations. The engine generator project is awaiting award and planned to be complete in December 2011. The office renovations are currently in the design phase and scheduled to be complete in Fall 2012 pending funding. The roof replacement project is awaiting award and planned to be complete in November 2011.

USACE Site Investigation and Non-time Critical Removal Action

The USACE completed a site investigation at Site 1 in December 2009. This investigation included soil sampling activities, shallow ground water sampling, soil borings, and installing monitoring wells. Results from the investigation were made available for review in November 2010. As a result of the investigation, USACE will be conducting a non-time critical removal action at Site 1 (designated as AOC 8: Area 18E and adjacent EPA buildings) in July 2011, which will involve the removal of approximately 1,850 cubic yards of soil at a depth of 1-6 feet below grade. The action is anticipated to be completed by December 2011. (USACE, 2011). This action is being conducted independently of the Proposed Action.

OSWER Modular Laboratories

A project to install six replacement trailers in support of OSWER operations was completed in December 2010. Altogether there would be approximately 5600 square feet of lab space added and the trailers were installed on Building 211 pad. Minor construction was conducted to remove the existing pad and replace it with a gravel base to allow for underground vents and electrical connections. (Beier, 2009). This project was also subject to the review of environmental impacts pursuant NEPA and its implementation regulations. This action did not incur significant impacts to the SPVS or the Edison Facility.

The addition of the SPVS would not add any significant impacts nor is it anticipated that the cumulative impacts of all of these actions would add up to significance in any resource area.

6.0. FINDINGS AND CONCLUSION

6.1. FINDINGS: IMPACT ANALYSIS

Using the No Action Alternative as the baseline for assessing potential impacts from the Proposed Action, the following potential issues and concerns have been identified:

- Temporary and localized, but not significant, impacts to ground resources are expected in the land disturbance areas, such as soil erosion and sedimentation during construction.
- Temporary adverse, but not significant, impacts to air quality are expected from heavy equipment emissions and increases in fugitive dust and airborne particulates from construction and dismantling related activities.
- Adverse, but not significant, impacts to biological resources (vegetation) are expected as a result of the Proposed Action.
- Temporary impacts, but not significant, to ambient noise are expected from construction and dismantling related activities.
- Adverse, but not significant, impacts to visual resources are expected as a result of the Proposed Action.
- Utilities services would not be expected to increase significantly as a result of the Proposed Action.
- Adverse, but not significant, impacts to waste management are expected from construction and dismantling activities.
- Local roadways and parking are adequate to support movement of construction equipment and materials to the project area and there would be a minor and temporary impact to traffic accessing the Edison Facility grounds during the construction and dismantling phases.

Using the No Action Alternative as the baseline for assessing potential impacts, the following findings have been identified and are not expected to be affected by the Proposed Action:

- Water resources, including wetlands and floodplains are not expected to be affected by the Proposed Action because proper utilization of BMPs would protect against erosion impacts and leaks and spills.
- Threatened and endangered species are not expected to be affected by the Proposed Action due to the lack of species and species habitat within or near the vicinity of the Proposed Action.
- Land use impacts would be expected to be consistent with existing and future land use planning.
- No impacts to cultural resources are expected because any impacts to the buildings associated with the Former Raritan Arsenal Historic District would be managed through an existing Memorandum of Agreement between the Edison Facility and the SHPO.
- Socioeconomics are not expected to be affected by the Proposed Action.

- The goals of EO 12898 related to environmental justice for minorities and the goals of EO 13045 related to the protection of children are expected to be maintained.

Potential benefits of the Proposed Action include:

- Reduction in greenhouse gas emissions from the utilization of renewable energy source.
- Provide Edison Facility with a cost-efficient renewable energy source that would offset energy requirements for years into the future while meeting government renewable energy directives.

6.2. CONCLUSIONS: MITIGATION ACTION SUMMARY

Although no significant impacts to the environment are anticipated, EPA would ensure the following mitigation measures are implemented to minimize potential impacts. These measures would be implemented through provisions stipulated in design and construction contracts and lease agreements. The potentially adverse environmental impacts related to the construction, operation, and dismantling of the Proposed Action could be minimized, mitigated and controlled to acceptable levels by implementation of the following measures:

- EPA would require the contractor to use dust abatement measures, such as wetting, mulching, or seeding exposed areas, where appropriate, to address any air quality concerns.
- EPA would require the contractor to mitigate vehicle emissions impacts as much as possible by prohibiting truck idling.
- EPA would require the contractor to provide lay down (i.e., temporary material storage) areas for construction equipment and materials within existing cleared and paved areas to minimize disturbance to existing land and vegetation.
- EPA would require contractor compliance with erosion and sediment control measures related to stabilization of disturbed areas.
- EPA would require the contractor to provide silt fencing, or other suitable control device, to be placed around the construction area to mitigate erosion and sediment runoff.
- EPA would require the contractor to implement BMPs for erosion/sediment control and stormwater management to minimize impacts to the existing stormwater collection system, wetlands, and other environmental resources.
- EPA would require all necessary measures be taken by the contractor to prevent, control, and mitigate the release of oils, trash, debris, and other pollutants to air, water and land.
- EPA would require contractors to safely handle and dispose of solid and hazardous waste in accordance with applicable local, state and federal regulations.
- EPA would require contractors to provide appropriate health and safety training, precautions and other protection for their workers.
- EPA would require contractors to recycle or reuse materials to the greatest extent possible, and to dispose of construction debris in accordance with federal, state and local waste disposal regulations.

- EPA would require that the Proposed Action not commence without the concurrence of the New Jersey SHPO regarding any National Register-eligible historic structure.
- EPA would require, in the event that unexpected cultural resources were found during construction activities, the contractor to stop work and consult with the New Jersey SHPO be initiated.
- EPA would require that the transportation of construction equipment and materials over local roads be scheduled to occur after peak traffic periods, whenever possible.
- EPA would require contractors to minimize construction-related noise impacts by limiting construction-related activities to the hours between 7:00 a.m. and 5:00 p.m. on weekdays.
- EPA would require that, upon commencement, the construction phase be executed expeditiously to minimize the period of disturbance to the affected environment.

Consideration of the activities involved in the construction, operations and maintenance, and dismantling of an SPVS at the Edison Facility would have no significant impacts on the quality of the human environment or on local natural resources. As a result of this EA, it is determined that an EIS is not required for the Proposed Action. In conclusion, a FNSI is recommended to be published for the Proposed Action.

7.0. REFERENCES

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APPENDIX A: PHOTOGRAPHS OF THE EDISON FACILITY

Photograph 1. View toward the northeast showing Site 1.

Photograph 2. View toward the east showing Building 18, located to the south of Site 1.

Photograph 3. View toward the northwest showing Building 5, located to the west of Site 1.

Photograph 4. View toward the south showing Building 10, located to the southwest of Site 1.

APPENDIX B: AIR QUALITY COMPUTATIONS

Assumptions:

Equipment List and daily (8-hour) emissions came from EPA's NONROAD Model 2008a. (EPA, 2008).

Assumes all equipment operating at the same time at the same point.

Construction

								g/day			
	SCC	**Type Equipment**	**Fuel**	**HP**	**VOC**	**CO**	**NOx**	**CO2**	**SOx**	**PM10**	**PM2.5**
Dozer	2270002069	Crawler Tractor/Dozers	Diesel	750	215.5	2266.3	4,122.0	573,585.2	120.3	265.5	257.5
Front End Loader	2270002060	Rubber Tire Loaders	Diesel	175	51.8	252.8	641.3	89,850.4	19.3	57.5	55.8
Backhoe	2270002066	ractors/Loaders/Backho	Diesel	175	77.1	303.6	468.8	49,149.9	10.6	54.5	52.8
Grader	2270002048	Graders	Diesel	300	89.0	393.6	1,135.9	192,731.4	40.0	85.2	82.6
Cranes	2270002045	Off-Highway Tractors	Diesel	300	73.9	218.8	1,028.6	146,997.2	30.7	52.5	50.9
Scrapers	2270002075	Off-Highway Tractors	Diesel	600	133.0	976.8	2,285.8	304,011.0	63.9	143.7	139.3
Trenchers	2265002030	Trenchers	Gas	100	131.1	4668.2	296.0	43,935.0	9.1	4.0	3.7
Dump Truck	2270002051	Off-highway Trucks	Diesel	600	199.5	1418.4	3,313.2	597,326.9	123.4	246.6	239.2
Flatbed Truck	2270002051	Off-highway Trucks	Diesel	600	199.5	1418.4	3,313.2	597,326.9	123.4	246.6	239.2
Concrete Truck	2270002051	Off-highway Trucks	Diesel	600	199.5	1418.4	3,313.2	597,326.9	123.4	246.6	239.2
Welders	2270006025	Welders	Diesel	25	16.4	64.4	51.2	5,432.1	1.2	9.2	8.9
								lb/day			
	SCC	**Type Equipment**	**Fuel**	**HP**	**VOC**	**CO**	**NOx**	**CO2**	**SOx**	**PM10**	**PM2.5**
Dozer	2270002051	Off-highway Trucks	Diesel	750	0.48	5.00	9.09	1,264.54	0.27	0.59	0.57
Front End Loader	2270002051	Off-highway Trucks	Diesel	175	0.11	0.56	1.41	198.09	0.04	0.13	0.12
Backhoe	2265006030	Pressure Washers	Diesel	175	0.17	0.67	1.03	108.36	0.02	0.12	0.12
Grader	2265006030	Pressure Washers	Diesel	300	0.20	0.87	2.50	424.90	0.09	0.19	0.18
Cranes	2265006030	Scrapers	Diesel	300	0.16	0.48	2.27	324.07	0.07	0.12	0.11
Scrapers	2270002018	Scrapers	Diesel	600	0.29	2.15	5.04	670.23	0.14	0.32	0.31
Trenchers	2270002018	Scrapers	Gas	100	0.29	10.29	0.65	96.86	0.02	0.01	0.01
Dump Truck	2270002036	Excavators	Diesel	600	0.44	3.13	7.30	1,316.88	0.27	0.54	0.53
Flatbed Truck	2270002036	Excavators	Diesel	600	0.44	3.13	7.30	1,316.88	0.27	0.54	0.53
Concrete Truck	2270002036	Excavators	Diesel	600	0.44	3.13	7.30	1,316.88	0.27	0.54	0.53
Welders	2265006015	Air Compressors	Diesel	25	0.04	0.14	0.11	11.98	0.00	0.02	0.02
								tons			
Site 1		Proposed Hours of Use 2009 EA	Proposed Hours of Use 2011 EA[1]	Proposed Days of Use 2011 EA[2]	**VOC**	**CO**	**NOx**	**CO2**	**SOx**	**PM10**	**PM2.5**
Dozer		48	126	16	0.004	0.039	0.071	9.9	0.002	0.005	0.004
Front End Loader		48	126	16	0.001	0.004	0.011	1.6	0.000	0.001	0.001
Backhoe		48	126	16	0.001	0.005	0.008	0.9	0.000	0.001	0.001
Grader		48	126	16	0.002	0.007	0.020	3.3	0.001	0.001	0.001
Cranes		80	210	26	0.002	0.006	0.030	4.2	0.001	0.002	0.001
Scrapers		96	251	31	0.005	0.034	0.079	10.5	0.002	0.005	0.005
Trenchers		0	0	0	0	0	0	0	0	0	0
Dump Truck		120	314	39	0.009	0.061	0.143	25.9	0.005	0.011	0.010
Flatbed Truck		120	314	39	0.009	0.061	0.143	25.9	0.005	0.011	0.010
Concrete Truck		120	314	39	0.009	0.061	0.143	25.9	0.005	0.011	0.010
Welders		96	251	31	0.001	0.002	0.002	0.2	0.0000	0.000	0.000
				Totals (tons)	**0.04**	**0.28**	**0.65**	**108.2**	**0.02**	**0.05**	**0.05**

Notes:

1. Assumed proposed operating hours of equipment increased by the ratio of original square footage to the new square footage of the solar array.

2. Assuming 8 hours per day.

Maintenance and Operations

					g/day						
	SCC	Type Equipment	Fuel	HP	VOC	CO	NOx	CO2	SOx	PM10	PM2.5
Pressure Washers	2265006030	Pressure Washers	Gas	25	33.4	1702.8	17.4	5321.3	1.1	0.6	0.5
Air Compressors	2265006015	Air Compressors	Gas	40	12.1	466.2	35.8	16560.5	3.4	1.6	1.5
					lb/day						
	SCC	Type Equipment	Fuel	HP	VOC	CO	NOx	CO2	SOx	PM10	PM2.5
Pressure Washers	2265006030	Pressure Washers	Gas	25	0.074	3.754	0.038	11.7	0.002	0.001	0.001
Air Compressors	2265006015	Air Compressors	Gas	40	0.027	1.028	0.079	36.5	0.008	0.004	0.003
					tons						
Site 1		Proposed Hours of Use 2009 EA	Proposed Hours of Use 2011 EA[1]	Proposed Days of Use 2011 EA[2]	VOC	CO	NOx	CO2	SOx	PM10	PM2.5
Pressure Washers		208	545	68	0.0025	0.128	0.001	0.4	0.0001	0.00004	0.00004
Air Compressors		104	272	34	0.0005	0.017	0.001	0.6	0.0001	0.00006	0.00006
				Totals (tons)	**0.003**	**0.15**	**0.003**	**1.0**	**0.0002**	**0.0001**	**0.0001**
Notes:											
1. Assumed proposed operating hours of equipment increased by the ratio of original square footage to the new square footage of the solar array.											
2. Assuming 8 hours per day.											
3. Assuming the emissions from trimming or relocating the ornamental trees along the NW border of Site 1 is negligible.											

Dismantling

					g/day						
	SCC	Type Equipment	Fuel	HP	VOC	CO	NOx	CO2	SOx	PM10	PM2.5
Dozer	2270002069	Crawler Tractor/Dozers	Diesel	750	215.5	2266.3	4,122.0	573,585.2	120.3	265.5	257.5
Front End Loader	2270002060	Rubber Tire Loaders	Diesel	175	51.8	252.8	641.3	89,850.4	19.3	57.5	55.8
Backhoe	2270002066	ractors/Loaders/Backho	Diesel	175	77.1	303.6	468.8	49,149.9	10.6	54.5	52.8
Grader	2270002048	Graders	Diesel	300	89.0	393.6	1,135.9	192,731.4	40.0	85.2	82.6
Cranes	2270002045	Off-Highway Tractors	Diesel	300	73.9	218.8	1,028.6	146,997.2	30.7	52.5	50.9
Scrapers	2270002075	Off-Highway Tractors	Diesel	600	133.0	976.8	2,285.8	304,011.0	63.9	143.7	139.3
Dump Truck	2270002051	Off-highway Trucks	Diesel	600	199.5	1418.4	3,313.2	597,326.9	123.4	246.6	239.2
Flatbed Truck	2270002051	Off-highway Trucks	Diesel	600	199.5	1418.4	3,313.2	597,326.9	123.4	246.6	239.2
					lb/day						
	SCC	Type Equipment	Fuel	HP	VOC	CO	NOx	CO2	SOx	PM10	PM2.5
Dozer	2270002051	Off-highway Trucks	Diesel	750	0.48	5.00	9.09	1,264.5	0.27	0.59	0.57
Front End Loader	2270002051	Off-highway Trucks	Diesel	175	0.11	0.56	1.41	198.1	0.04	0.13	0.12
Backhoe	2265006030	Pressure Washers	Diesel	175	0.17	0.67	1.03	108.4	0.02	0.12	0.12
Grader	2265006030	Pressure Washers	Diesel	300	0.20	0.87	2.50	424.9	0.09	0.19	0.18
Cranes	2265006030	Scrapers	Diesel	300	0.16	0.48	2.27	324.1	0.07	0.12	0.11
Scrapers	2270002018	Scrapers	Diesel	600	0.29	2.15	5.04	670.2	0.14	0.32	0.31
Dump Truck	2270002036	Excavators	Diesel	600	0.44	3.13	7.30	1,316.9	0.27	0.54	0.53
Flatbed Truck	2270002036	Excavators	Diesel	600	0.44	3.13	7.30	1,316.9	0.27	0.54	0.53
					tons						
Site 1		Proposed Hours of Use 2009 EA	Proposed Hours of Use 2011 EA[1]	Proposed Days of Use 2011 EA[2]	VOC	CO	NOx	CO2	SOx	PM10	PM2.5
Dozer		48	126	16	0.004	0.039	0.071	9.9	0.002	0.005	0.004
Front End Loader		96	251	31	0.002	0.009	0.022	3.1	0.001	0.002	0.002
Backhoe		48	126	16	0.001	0.005	0.008	0.9	0.000	0.001	0.001
Grader		96	251	31	0.003	0.014	0.039	6.7	0.001	0.003	0.003
Cranes		40	105	13	0.001	0.003	0.015	2.1	0.000	0.001	0.001
Scrapers		96	251	31	0.005	0.034	0.079	10.5	0.002	0.005	0.005
Dump Truck		48	126	16	0.003	0.025	0.057	10.3	0.002	0.004	0.004
Flatbed Truck		48	126	16	0.003	0.025	0.057	10.3	0.002	0.004	0.004
				Totals (tons)	**0.02**	**0.15**	**0.35**	**53.9**	**0.01**	**0.02**	**0.02**
Notes:											
1. Assumed proposed operating hours of equipment increased by the ratio of original square footage to the new square footage of the solar array.											
2. Assuming 8 hours per day.											

APPENDIX C: PUBLIC AGENCY COORDINATION AND CONSULTATION

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March 10, 2009

To Whom It May Concern:

Section 7(a)(2) of the Endangered Species Act (ESA) requires Federal agencies to consult with the U.S. Fish and Wildlife Service (Service) to ensure that actions they fund, authorize, permit or otherwise carry out will not jeopardize the continued existence of any listed species or adversely modify designated critical habitats. Federal agencies must initiate consultation with the Service if a proposed action *may affect* one or more listed species. In addition, the Service provides review of non-Federal actions that *may affect* federally listed species or their habitats as technical assistance to help non-Federal project proponents ensure compliance with the ESA and with New Jersey land use regulations. Staffing constraints currently limit the Service's New Jersey Field Office to reviewing only those projects that *may affect* federally listed species. The *may affect* determination is made by the Federal action agency or non-Federal project proponent using the information and instructions on our web site.

http://www.fws.gov/northeast/njfieldoffice/Endangered/consultation.html

Federal agencies are not required to contact the Service if a proposed action will have *no effect* on listed species, or if no listed species are present in the action area. No further ESA consultation or coordination is necessary for projects where the Federal action agency or non-Federal project proponent has followed the procedures on our web site and determined that proposed project activities will have *no effect* on federally listed species. Service concurrence with a *no effect* determination is not required under the ESA and will not be provided by the New Jersey Field Office. In addition to this letter, the Federal action agency or non-Federal project proponent should retain in their paper files documentation from our web site at the time of their review, including the relevant portion(s) of the *Federally Listed and Candidate Species Occurrences in New Jersey by County and Municipality*. Note that under the ESA, a species list is valid for only 90 days; the Service recommends consulting our web site regularly during project planning and implementation for updated species lists and information.

Thank you for your cooperation. Please contact Wendy Walsh at (609) 383-3938, extension 48, if you have any questions or require further assistance regarding federally listed threatened or endangered species.

Sincerely,

J Eric Davis Jr.
Supervisor

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

AUG 5 2009

Daniel D. Saunders
Deputy State Historic Preservation Officer
Historic Preservation Office
501 East State Street
PO Box 404
Trenton, NJ 08625

Subject: Section 106 Consultation on EPA's Solar Array Project at EPA's Region 2 Edison Facility

Dear Mr. Saunders:

The U.S. Environmental Protection Agency (EPA) is considering a lease of a portion of EPA's Edison Facility to a utility company to build and operate an array of electricity-producing solar panels. A portion of the electricity produced by the solar panels would serve the electrical needs of the Edison Laboratory for the foreseeable future; the remainder of electricity produced by the panels would be made available by the utility company to the public. The panels would be dismantled and removed when the lease agreement expires; the term of the proposed lease is 10 years with a 10-year renewal option. The utility company selection process and the solar panel technical specifications and details will be determined and fully defined through a competitive bidding process scheduled to begin later this summer. The enclosed map details the project area.

This lease constitutes an "undertaking" pursuant to Section 106 of the National Historic Preservation Act. With this in mind, and in accordance with the June 1992 Memorandum of Agreement between your office and EPA, as well as the July 1992 Historic Resources Management Plan (HRMP) for the Edison Facility, EPA has examined this undertaking for its effects upon the Raritan Arsenal Historic District.

EPA has identified two potential areas where the solar array may be located: Site 1 (located within historic Zone 4) and Site 7 (contained within historic Zone 7). Site 1 within Zone 4 is located on the southern boundary of Woodbridge Avenue. Zone 4 is listed as significant solely for the architectural value of the buildings and structures that once existed there. (As noted in the HRMP, this zone is unlikely to yield any archeological resources because of the extensive construction disturbance.) However, those buildings and structures have since been removed, and recorded as required by the HRMP.

Site 7 within Zone 7 is located at the southwestern portion of the Edison Laboratory property and is bounded by berms and mature woods to the south and by Middlesex Community College to the northwest. Zone 7 contains two large warehouses (Buildings 245 and 246), which are listed as contributing elements to the Raritan Arsenal Historic District. If Site 7 is chosen as the location for the solar array, it would be necessary to remove the two warehouses. EPA believes that the warehouses could be removed and the adverse effect mitigated through a Level One HABS/HAER recordation.

Per the MOA, we are requesting your concurrence on our assessment of Site 1, and the level of recordation for the contributing historic elements in Site 7 should it be necessary to remove them.

Thank you in advance for your expeditious evaluation of this request. In the interim, please feel free to contact me at (202) 564-7157, or have your staff contact Jaime Loichinger at (202) 564-0276.

Sincerely,

Robert W. Hargrove
Deputy Federal Preservation Officer

Enclosure