DRAFT

Environmental Assessment for Construction and Operation of Solar Photovoltaic Systems at Multiple Installations in California

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U.S. Department of the Navy
Navy Region Southwest
San Diego County, California

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EXECUTIVE SUMMARY

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] § 4321, as amended), Council on Environmental Quality Regulations for Implementing the procedural provisions of NEPA (40 Code of Federal Regulation [CFR] 1500–1508 [1997]), and U.S. Department of the Navy (Navy) procedures implementing NEPA (32 CFR 775 [2004]). The NEPA process ensures that the environmental impacts of proposed major federal actions are considered in the decision-making process.

The Secretary of the Navy has outlined energy goals that include increasing production and consumption from renewable energy sources. Under the Proposed Action, the Navy would help meet these goals by allowing one or more solar power developer (private party) to construct, operate, maintain, and own solar photovoltaic systems on five installations within Navy Region Southwest in California, including:

- Naval Air Facility (NAF) El Centro;
- Naval Support Activity (NSA) Monterey's Main Site and Navy Annex;
- Naval Weapons Station (NAVWPNSTA) Seal Beach;
- NAVWPNSTA Seal Beach Detachment Norco; and,
- Naval Base Ventura County (NBVC) Port Hueneme.

This Proposed Action would include the following:

- Modification to existing infrastructure (e.g., building rooftops) to accommodate solar photovoltaic system installation;
- Site preparation (e.g., grubbing, grading, trenching for underground utility lines);
- Installation of solar photovoltaic array mounting structures (e.g., rooftop mounts, ground-mounted poles, or vertical members/poles for carports);
- Installation of the solar photovoltaic panels;
- Installation and connection of electrical cables to a point of connection that contains electrical equipment (e.g., electrical feed meters, switchgear, inverters, circuit breakers,

transformers, or other small electrical equipment) and connects to the existing installation electrical grid;

- Installation of above-ground electrical poles; and,
- Execution of power purchase agreements (PPAs) to allow the solar power developers to construct, operate, maintain, and own the solar photovoltaic systems on the five installations.

In accordance with NEPA, the Navy performed a focused analysis of the resource areas potentially affected by implementation of the Proposed Action and alternatives. These resource areas include:

- Air Quality;
- Biological Resources;
- Cultural Resources;
- Land Use;
- Socioeconomics and Environmental Justice (only carried forward for detailed analysis at NAF El Centro);
- Utilities;
- Visual Quality; and,
- Water Resources.

Alternatives for development and use of solar photovoltaic systems at the five installations that meet the purpose and need for the project are described below.

ALTERNATIVE 1 (PREFERRED ALTERNATIVE)

The following section provides the type of solar photovoltaic system proposed for each installation with implementation of Alternative 1 and describes the associated site preparations and permanent surface disturbance under this alternative.

- NAF El Centro (10.0 acres [4.0 hectares]):
  - Ground-mounted solar photovoltaic systems would include the following site preparations:
    - Grading to bare mineral soil to remove vegetation at all sites within the project areas;

    - Trenching for electrical conduits between the solar photovoltaic arrays and the point of connection; and,
    - Installation of underground electrical lines (buried 3 feet [0.9 meter] deep, as required by Unified Facilities Criteria codes), and/or overhead electrical lines, to complete the electrical circuits.

- NSA Monterey's Main Site and Navy Annex (3.68 acres [1.49 hectares] and 1.56 acres [0.63 hectare]):
  - Carport-mounted solar photovoltaic systems would include the following site preparations:
    - Saw-cutting through parking lot asphalt and concrete, and excavation to install footings for each vertical member of the carport structure;
    - Trenching for electrical conduits between the solar photovoltaic arrays and the point of connection, and the installation of underground electrical lines to link each carport array to one another; and,
    - In lieu of trenches and electrical lines, installation of overhead connections between carports may be an option.
  - Rooftop-mounted solar photovoltaic systems would include the following site preparations:
    - Trenching for electrical conduits between the solar photovoltaic arrays and the point of connection; and,
    - Installation of underground electrical distribution lines to link each array to one another.

- NAVWPNSTA Seal Beach (6.62 acres [2.67 hectares]):
  - The ground-mounted solar photovoltaic system would include the same site preparations as those listed for NAF El Centro, above.

- NAVWPNSTA Seal Beach Detachment Norco (18.5 acres [7.49 hectares]):
  - The ground-mounted solar photovoltaic systems at Area 1 and/or Area 2 would include the same site preparations as those listed for NAF El Centro, above.

- NBVC Port Hueneme (1.46 acres [0.59 hectare]):
  - The carport-mounted solar photovoltaic system would include the same site preparations as those listed for NSA Monterey's Main Site and Navy Annex, above.

ALTERNATIVE 2

Alternative 2 is similar to Alternative 1 in that both would provide for solar photovoltaic power for Navy Region Southwest; however, Alternative 2 would differ from Alternative 1, as described below.

- NAF El Centro (8.0 acres [3.2 hectares]):
  - The ground-mounted solar photovoltaic system would be constructed and operated on a smaller project site for Alternative 2. The same agricultural outlease area would be used for both alternatives.
- NSA Monterey's Main Site and Navy Annex (3.68 acres [1.49 hectares] and 0.48 acre [0.19 hectare]):
  - One carport-mounted solar photovoltaic system and associated electrical lines included in Alternative 1 at the Navy Annex would be excluded from Alternative 2.
- NAVWPNSTA Seal Beach (6.53 acres [2.64 hectares]):
  - The ground-mounted solar photovoltaic system would be constructed and operated on a smaller project site for Alternative 2; and,
  - Alternative 2 would require a new overhead electrical line, extending west along the north edge of Westminster Boulevard, on approximately 15 wood poles.
- NAVWPNSTA Seal Beach Detachment Norco (18.5 acres [7.49 hectares]):
  - No other sites or configurations were considered viable for this installation. Alternative 2 at NAVWPNSTA Seal Beach Detachment Norco would be the same as Alternative 1.
- NBVC Port Hueneme (1.46 acres [0.59 hectare]):
  - No other sites or configurations were considered viable for this installation. Alternative 2 at NBVC Port Hueneme would be the same as Alternative 1.

NO ACTION ALTERNATIVE

Under the No Action Alternative, the Proposed Action would not be constructed. Therefore, the new solar photovoltaic systems and associated infrastructure would not be constructed and operated at any of the five installations, and the Navy would continue to purchase conventional power from utility providers. The No Action Alternative does not provide

progression towards national and agency energy goals; therefore, the No Action Alternative is not considered a reasonable alternative because it does not meet the purpose and need for the Proposed Action.

SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

Table ES-1 presents a comparison of the potential effects to each resource area that could result from Alternative 1, Alternative 2, and the No Action Alternative. Informed by the analysis presented in this EA, the Navy has identified Alternative 1 as the Preferred Alternative.

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Table ES-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
Air Quality	**NAF El Centro**.....No Significant Impacts **NSA Monterey**.....No Significant Impacts **NAVWPNSTA Seal Beach**.....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme**.....No Significant Impacts	**NAF El Centro**.....No Significant Impacts **NSA Monterey**.....No Significant Impacts **NAVWPNSTA Seal Beach**.....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme**.....No Significant Impacts	**NAF El Centro**.....No Significant Impacts **NSA Monterey**.....No Significant Impacts **NAVWPNSTA Seal Beach**.....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme**.....No Significant Impacts
	The following analysis relates to all installations listed above, unless a specific installation is called out by name. **Construction Emissions** Construction activities would generate minor, short-term emissions, such as fugitive dust emissions from grading activities and exhaust emissions from construction equipment and vehicles used during the installation of the solar photovoltaic panel arrays and electrical lines. Conservation and construction measures (i.e., dust abatement measures), would be followed at all of the installations to further minimize construction emissions, to the extent practicable. **Operation Emissions** Minor amounts of similar types of fugitive dust and exhaust emissions would be generated by the operation of ground vehicles during periodic maintenance of the solar photovoltaic systems. Emission reductions realized by reduced consumption of grid-supplied electricity would more than offset the short-term construction emissions within the first year of operation. Long-term operation of the solar photovoltaic systems would also avoid potential emissions produced from conventional non-renewable energy generating sources in the project areas. Total construction and operation emissions would be below the *de minimis* thresholds and overall, would result in beneficial effects to air quality. Therefore, no significant impacts to air quality would result from construction or operation emissions associated with implementation of Alternative 1.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* **Construction Emissions** Emissions under Alternative 2 would result in the same localized area and timeframe as those described under Alternative 1. Alternative 2 would generate similar amounts of air pollutant emissions during construction and operation of the project as noted for Alternative 1; however, for NAF El Centro, Alternative 2 would have a slightly smaller project footprint and fewer emissions would result at that location with this alternative. As with Alternative 1, Conservation and construction measures (i.e., dust abatement measures), would be followed at all of the installations to further minimize construction emissions, to the extent practicable. **Operation Emissions** As with Alternative 1, emission reductions realized under Alternative 2 by reduced consumption of grid-supplied electricity would offset the short-term construction emissions within the first year of project operation. Long-term operation of the solar photovoltaic systems would also avoid potential emissions produced from conventional non-renewable energy generating sources in the project areas. Total construction and operation emissions would be below the *de minimis* thresholds and overall, would result in beneficial effects to air quality, Therefore, no significant impacts to air quality would result from construction or operation emissions associated with implementation of Alternative 2.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* With the No Action Alternative, no solar photovoltaic systems would be constructed, and consumption of grid-supplied electricity would remain unchanged. Without construction or operation of the systems, there would be no emissions associated with those activities; however, emissions reductions due to reduced consumption of grid-supplied electricity would not be realized. Therefore, no significant impacts to air quality would result from implementation of the No Action Alternative.

Table ES-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
Biological Resources	**NAF El Centro**.....No Significant Impacts **NSA Monterey** .....No Significant Impacts **NAVWPNSTA Seal Beach** .....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme** .....No Significant Impacts	**NAF El Centro** .....No Significant Impacts **NSA Monterey**.....No Significant Impacts **NAVWPNSTA Seal Beach**.....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** .....No Significant Impacts **NBVC Port Hueneme**.....No Significant Impacts	**NAF El Centro**..... No Significant Impacts **NSA Monterey**..... No Significant Impacts **NAVWPNSTA Seal Beach**..... No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** ..... No Significant Impacts **NBVC Port Hueneme**..... No Significant Impacts
	The following analysis relates to all installations listed above, unless a specific installation is called out by name. **Vegetation Communities** Long-term minor impacts from removal of vegetation for construction of ground-mounted solar photovoltaic systems at NAF El Centro and NAVWPNSTA Seal Beach Detachment Norco because the project sites are proposed in previously disturbed areas. No long-term impacts to vegetation at NSA Monterey's Main Site and Navy Annex, and NBVC Port Hueneme because the solar photovoltaic systems would be installed on top of newly constructed carports or on rooftops of existing buildings. Temporary, minor impacts from trenching for electrical conduit and transmission line installation between solar arrays and points of connection to the existing electrical grid at all project sites. Trenched areas would be restored to their original condition following installation. **Federally Listed Species** Alternative 1 would have no effect on federally listed species because there is no suitable habitat available within the project sites for these species; therefore, implementation of Alternative 1 would not result in significant impacts to federally listed wildlife. **State Listed Species** Alternative 1 would have no impacts on state listed species because there is no suitable habitat within the project sites for these species. **Wildlife** Alternative 1 would result in the long-term loss of upland habitat from installation of ground-mounted solar photovoltaic systems at NAF El Centro, NAVWPNSTA Seal Beach, and NAVWPNSTA Seal Beach Detachment Norco. Individuals of less-mobile small mammal, reptile, and amphibian species could be impacted by site preparation. In addition, individuals of burrowing and subterranean species could be impacted by compaction and grading of soils during construction. More mobile species would be expected to move into surrounding areas with suitable habitat. Impacts would be minor due to the relatively small size of the impacted area and amount of habitat in surrounding areas. To minimize potential impacts to wildlife, best available science and appropriate design specifications will be used and implemented	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* **Vegetation Communities** Similar to Alternative 1, long-term minor impacts to vegetation communities would result from implementation of Alternative 2 at NSA Monterey's Main Site, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme. Impacts to vegetation communities at NAF El Centro would be similar to, but slightly less than, impacts associated with Alternative 1 because a smaller area would be impacted with Alternative 2. Impacts to vegetation communities at NSA Monterey's Navy Annex would be similar to Alternative 1 because all sites would be the same, except for Site 1, which would be excluded from Alternative 2. At NAVWPNSTA Seal Beach, a ground-mounted solar photovoltaic system would be installed within an agricultural outlease area. Because this area is regularly disturbed (e.g., plowed) for crop production, no impacts to vegetation would occur at the site. **Federally Listed Species** Alternative 2 would have no effect on federally listed species because there is no suitable habitat available within the project sites for these species; therefore, implementation of Alternative 1 would not result in significant impacts to federally listed wildlife. **State Listed Species** Alternative 2 would have no impacts on state listed species because there is no suitable habitat within the project sites for these species. **Wildlife** Impacts to wildlife under Alternative 2 at NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme would be the same as described for Alternative 1. Less-mobile species could be impacted by site preparation, burrowing and subterranean species could be impacted by compaction and grading, and more mobile species would be expected to relocate to surrounding areas. To minimize potential impacts to wildlife, best available science and appropriate design specifications will be used and implemented during construction.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* Under the No Action Alternative, the Proposed Action would not be implemented. The No Action Alternative would result in no changes to existing conditions; therefore, the No Action Alternative would result in no significant impacts to vegetation communities, threatened and endangered species, wildlife, or wetlands and waters of the United States.

Table ES-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
	during construction. Alternative 1 would result in avian species being impacted or displaced through loss of nests and nest structures, disturbance, and loss of foraging and nesting habitat at NAF El Centro, NAVWPNSTA Seal Beach, and NAVWPNSTA Seal Beach Detachment Norco. Site preparation would be conducted during the non-breeding season, where practicable. If site preparation is conducted during the breeding season, a nest survey would be conducted and buffers would be established to protect nesting birds. Noise and human activity associated with construction during other times of the year have the potential to temporarily displace individuals of avian species locally and interfere with roosting and foraging activities. Birds would be expected to resume use of the surrounding area after construction. Suitable habitat occurs in the surrounding areas therefore, the long-term removal of upland habitat would have a minor impact to birds from habitat loss and displacement. In addition, measures to protect burrowing owls and their burrows would be implemented for these three installations. Although unlikely, ground-mounted solar photovoltaic systems at NAF El Centro, NAVWPNSTA Seal Beach, and NAVWPNSTA Seal Beach Detachment Norco may contribute to lake effect, or the phenomenon whereby birds are injured or killed attempting to land on solar panels they perceive as a body of water. However, due to the small size of the projects, this impact is unlikely to be significant. Impacts to wildlife at NSA Monterey's Main Site and Navy Annex and NBVC Port Hueneme would be minor from temporary displacement of individuals during construction from areas surrounding the proposed sites. Trenching for installation of electrical conduit and transmission lines could result in minor impacts to individuals of less-mobile wildlife species at all project sites. Disturbed areas would be restored to their original condition following construction, resulting in no long-term impacts. **Wetlands and Waters of the United States** Alternative 1 would have no impacts to wetlands or waters of the United States at any project sites because these features do not occur within the sites. A drainage swale within Area 2 at NAVWPNSTA Seal Beach Detachment Norco would be avoided during development of the panel arrays resulting in no impact. A soil erosion and sedimentation plan would be prepared and implemented by the contractor. Therefore, no significant impacts to biological resources would result from implementation of Alternative 1.	With Alternative 2, avian species would be impacted or displaced through loss of nests and nest structures, disturbance, and loss of foraging and nesting habitat at NAF El Centro, NAVWPNSTA Seal Beach, and NAVWPNSTA Seal Beach Detachment Norco. Impacts to wildlife at NAF El Centro would be similar to, but slightly less than, Alternative 1 because a smaller area would be impacted with Alternative 2. Under Alternative 2 at NAVWPNSTA Seal Beach, a ground-mounted solar photovoltaic system would be installed within area previously disturbed area bordered by tall shrubs and low trees; however, impacts to wildlife under Alternative 2 would be similar to those under Alternative 1. **Wetlands and Waters of the United States** Impacts to wetlands or waters of the United States from implementation of Alternative 2 at NAF El Centro, NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme would be the same as those described under Alternative 1. A soil erosion and sedimentation plan would be prepared and implemented by the contractor. Therefore, no significant impacts to biological resources would result from implementation of Alternative 2.	

Table ES-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
Cultural Resources	**NAF El Centro**.....No Significant Impacts **NSA Monterey** .....No Significant Impacts **NAVWPNSTA Seal Beach** .....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme** .....No Significant Impacts	**NAF El Centro** .....No Significant Impacts **NSA Monterey**.....No Significant Impacts **NAVWPNSTA Seal Beach**.....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** .....No Significant Impacts **NBVC Port Hueneme**.....No Significant Impacts	**NAF El Centro**..... No Significant Impacts **NSA Monterey**..... No Significant Impacts **NAVWPNSTA Seal Beach**..... No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** ..... No Significant Impacts **NBVC Port Hueneme**..... No Significant Impacts
	The following analysis relates to all installations listed above, unless a specific installation is called out by name. **Recorded Historic Properties or Other Cultural Resources** No recorded historic properties or other cultural resources are located within the area of potential effect at the Alternative 1 project sites. Two historic districts are located near NSA Monterey's Main Site area of potential effect; however, the proposed project site at this base is outside the boundaries of these historic districts. A historic district is also present at NAVWPNSTA Seal Beach Detachment Norco, but the proposed project site at this installation is outside the boundaries of the historic district. Minor impacts to the viewshed of the district may occur, but these would not be significant. Although no effects on historic properties and no significant impacts to known cultural resources at the installations would occur with implementation of Alternative 1, conservation and construction measures would be employed to further reduce or entirely avoid impacts to any previously unknown, subsurface archaeological deposits that could be disturbed during construction at the installations. These measures would include cultural resources monitoring at NSA Monterey and NBVC Port Hueneme during construction activities. Therefore, no significant impacts to recorded historic properties or other cultural resources would result from implementation of Alternative 1.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* **Recorded Historic Properties or Other Cultural Resources** No recorded historic properties or other cultural resources are located within the area of potential effect at the Alternative 2 project sites. NAF El Centro would have a slightly smaller project footprint for Alternative 2; however, the area of potential effect would remain the same as Alternative 1. Two historic districts are located near NSA Monterey's Main Site area of potential effect; however, the proposed project site at this base is outside the boundaries of these historic districts. For NAVWPNSTA Seal Beach, Alternative 2 would be located in a different area on the installation than for Alternative 1; however, no archeological resources were identified during a survey at the Alternative 2 site. Although no effects on historic properties and no significant impacts to known cultural resources at the installations would occur with implementation of Alternative 1, conservation and construction measures would be employed to further reduce or entirely avoid impacts to any previously unknown, subsurface archaeological deposits that could be disturbed during construction at the installations. These measures would include cultural resources monitoring at NSA Monterey and NBVC Port Hueneme during construction activities. Therefore, no significant impacts to recorded historic properties or other cultural resources would result from implementation of Alternative 2.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* Under the No Action Alternative, the solar photovoltaic systems would not be constructed. As there would be no construction associated with this alternative, recorded historic properties or other cultural resources would not be affected by the No Action Alternative, and currently unknown subsurface cultural resources sites would not be inadvertently disturbed with this alternative. Therefore, no significant impacts to recorded historic properties or other cultural resources would result from implementation of the No Action Alternative.

Table ES-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
Land Use	**NAF El Centro**.....No Significant Impacts **NSA Monterey** .....No Significant Impacts **NAVWPNSTA Seal Beach** .....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme** .....No Significant Impacts	**NAF El Centro** .....No Significant Impacts **NSA Monterey**.....No Significant Impacts **NAVWPNSTA Seal Beach**.....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** .....No Significant Impacts **NBVC Port Hueneme**.....No Significant Impacts	**NAF El Centro**..... No Significant Impacts **NSA Monterey**..... No Significant Impacts **NAVWPNSTA Seal Beach**..... No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** ..... No Significant Impacts **NBVC Port Hueneme**..... No Significant Impacts
	The following analysis relates to all installations listed above, unless a specific installation is called out by name. **Land Use Changes and Incompatible Land Use** At NSA Monterey, NAVWPNSTA Seal Beach, and NBVC Port Hueneme, the project would be in alignment with the land use designations from the applicable installation's Activity Overview Plan for these the sites; therefore, the project would not introduce any incompatible land use activities at these installations. At NAVWPNSTA Seal Beach Detachment Norco, the project would not conflict with a land use designation for the site since there is no applicable Navy land use plan for the installation. At NAF El Centro, a permanent land use change from historic agricultural use to renewable energy development is proposed; however, development of the NAF El Centro site for electrical energy generation would be compatible with the adjacent uses on the installation (e.g., utility, residences, and aircraft operations) and the planned land use for the site (Utilities), as designated by the NAF El Centro Master Plan. Implementation of Alternative 1 would not change any land use patterns or land ownership in the project areas, and all sites would remain under Navy use. Therefore, no significant impacts to land use would result from implementation of Alternative 1.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* **Land Use Changes and Incompatible Land Use** Under Alternative 2, impacts to land use would be similar to those described for Alternative 1. The Navy would discontinue the agricultural outlease at NAF El Centro for a slightly smaller area than would be discontinued under Alternative 1; however, this renewable energy development would still be compatible with the adjacent utility uses on the installation. At NAVWPNSTA Seal Beach, the Alternative 2 project site would be in a different location at the installation; however, the project would still be compatible with the land use designation for this area, as defined in the Seal Beach Activity Overview Plan. Therefore, no significant impacts to land use would result from implementation of Alternative 2.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* Under the No Action Alternative, the solar photovoltaic systems would not be constructed; therefore, no land use changes or incompatible development at the installations would result from implementation of this alternative. Therefore, no significant impacts to land use would result from implementation of the No Action Alternative.

Table ES-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
Socioeconomics	**NAF El Centro**.....No Significant Impacts **NSA Monterey** .....No Significant Impacts **NAVWPNSTA Seal Beach** .....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme** .....No Significant Impacts	**NAF El Centro** .....No Significant Impacts **NSA Monterey**.....No Significant Impacts **NAVWPNSTA Seal Beach**.....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** .....No Significant Impacts **NBVC Port Hueneme**.....No Significant Impacts	**NAF El Centro**..... No Significant Impacts **NSA Monterey**..... No Significant Impacts **NAVWPNSTA Seal Beach**..... No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** ..... No Significant Impacts **NBVC Port Hueneme**..... No Significant Impacts
	The following analysis relates to NAF El Centro only. **Population** With Alternative 1, there would be no increase in military or civilian area populations in the NAF El Centro vicinity. Local contractors would travel to the project site for project construction, and local contractors would also be used for project maintenance during project operation. **Employment and Income** Ten acres (4 hectares) of an agricultural outlease would be discontinued as part of Alternative 1; however, local agricultural workers farm a number of fields in the area and do not solely depend on this site for employment, and no job losses would occur. In addition, 10 to 12 local workers would be employed for the approximately four-month construction period. **Housing** Because there would be no increase in area military or civilian populations in the NAF El Centro vicinity, and because local contractors would travel to the project site for construction and project maintenance activities, there would be no increased housing demands as part of Alternative 1. **Environmental Justice** Alternative 1 would be constructed within the boundary of NAF El Centro, which is designated for military use, and would not be in proximity to minority or low-income housing areas. In addition, Alternative 1 would not result in significant adverse impacts to human health or the environment. An on-installation family housing development and Child Development Center and Youth Center are within 0.2 mile (0.32 kilometer) from Alternative 1; however, Alternative 1 would not result in disproportionately high or significant adverse impacts to environmental health or safety risks to children. Therefore, no significant impacts to socioeconomics, including population, employment and income, housing, and environmental justice, would result from implementation of Alternative 1.	*The following analysis relates to NAF El Centro only.* **Population** Similar to Alternative 1, implementation of Alternative 2 would not increase area populations in the NAF El Centro vicinity because local contractors would travel to the project site for construction and project maintenance activities. **Employment and Income** While the project site for Alternative 2 at NAF El Centro would be slightly smaller in size (8 acres [3.2 hectare] as compared to 10 acres [4 hectares]), the same agricultural outlease area would be discontinued as part of Alternative 1. However, as discussed for Alternative 1, local agricultural workers farm a number of fields in the area, and no job losses would occur. In addition, 10 to 12 local workers would be employed for the approximately four-month construction period. **Housing** There would be no increase in area military or civilian populations in the NAF El Centro vicinity with Alternative 2. Local contractors would travel to the project site for construction and project maintenance activities, therefore, there would be no increased housing demands as part of Alternative 2. **Environmental Justice** Alternative 2 would be constructed on the installation at NAF El Centro at the same location as Alternative 1. Similar to Alternative 1, Alternative 2 would not result in disproportionately high or significant adverse impacts to environmental health or safety risks to children at the on-installation family housing development or Child Development Center and Youth Center. Therefore, no significant impacts to socioeconomics, including population, employment and income, housing, and environmental justice, would result from implementation of Alternative 2.	*The following analysis relates to NAF El Centro only.* Under the No Action Alternative, the solar photovoltaic systems would not be constructed; therefore, there would be no changes to population, employment, housing, or environmental justice resulting from this alternative. Therefore, no significant impacts to socioeconomics, including population, employment and income, housing, and environmental justice, would result from implementation of the No Action Alternative.

Table ES-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
Utilities	**NAF El Centro**.....No Significant Impacts **NSA Monterey** .....No Significant Impacts **NAVWPNSTA Seal Beach** .....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme** .....No Significant Impacts	**NAF El Centro** .....No Significant Impacts **NSA Monterey**.....No Significant Impacts **NAVWPNSTA Seal Beach**.....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** .....No Significant Impacts **NBVC Port Hueneme**.....No Significant Impacts	**NAF El Centro**..... No Significant Impacts **NSA Monterey**..... No Significant Impacts **NAVWPNSTA Seal Beach**..... No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** ..... No Significant Impacts **NBVC Port Hueneme**..... No Significant Impacts
	The following analysis relates to all installations listed above, unless a specific installation is called out by name. **Natural Gas** Under Alternative 1, natural gas services would not be required for project construction or operation. **Water** Alternative 1 would involve the temporary use of water during construction for dust suppression and during operation for panel washing. Water required for these purposes would be supplied to the sites via water trucks by the construction contractor (during construction) and by the solar power developer (during operations). **Wastewater** Alternative 1 would temporarily generate wastewater during construction due to worker use of onsite portable toilets; the wastewater would be removed from each site and disposed of at local treatment facilities having the capacity to receive the waste. **Solid Waste** For Alternative 1, the small volumes of solid waste temporarily generated during project construction and periodically generated during maintenance would be transported offsite to solid waste facilities having adequate capacity to accept the waste. **Electricity Delivery** Alternative 1 would install an approximately 650-kilowatt ground-mounted solar photovoltaic system at NAF El Centro. At NSA Monterey's Main Site and Navy Annex, carport- and rooftop-mounted solar photovoltaic panel arrays and associated infrastructure would be installed. The Main Site system would generate 1 megawatt of electricity and the Navy Annex would generate 500 kilowatts of electricity. In addition, the rooftop-mounted systems at NSA Monterey's Main Site and Navy Annex would provide a reliable source of power to the buildings they service in the event that the local provider experiences an electrical outage. An approximately 500-kilowatt ground-mounted solar photovoltaic system would be installed at NAVWPNSTA Seal Beach. Ground-mounted solar photovoltaic systems in Area 1 and/or Area 2 at NAVWPNSTA Seal Beach Detachment Norco would be installed to produce a combined total of up to 1,500 kilowatts of electricity. For NBVC Port	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* **Natural Gas** Under Alternative 2, natural gas services would not be required for project construction or operation. **Water** Similar to Alternative 1, Alternative 2 would use of water during construction for dust suppression and during operation for panel washing. Water required for these purposes would be supplied to the sites via water trucks by the construction contractor (during construction) and by the solar power developer (during operations). **Wastewater** Under Alternative 2, wastewater would be temporarily generated during construction for onsite portable toilets and removed and disposed of at local treatment facilities having the capacity to receive the waste. **Solid Waste** Similar to Alternative 1, small volumes of solid waste generated during project construction and maintenance for implementation of Alternative 2 would be transported offsite to solid waste facilities having adequate capacity to accept the waste. **Electricity Delivery** Alternative 2 would install an approximately 300-kilowatt ground-mounted solar photovoltaic system at NAF El Centro, which would be smaller than the system installed under Alternative 1. At NSA Monterey's Main Site and Navy Annex, carport- and rooftop-mounted solar photovoltaic panel arrays and associated infrastructure would be installed at the same sites as described for Alternative 1; however, Site 1 at the Navy Annex would be excluded from this alternative and result in a smaller amount of electricity being produced as compared to Alternative 1. For Alternative 2, an approximately 500-kilowatt ground-mounted solar photovoltaic system would be installed at a different location at NAVWPNSTA Seal Beach when compared to Alternative 1; however, both alternatives would generate the same amount of electricity. For NAVWPNSTA Seal Beach Detachment Norco and NBVC Port Hueneme, the solar photovoltaic systems implemented with Alternative 2 would be identical with Alternative 1. These systems would ultimately reduce the electrical	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* Under the No Action Alternative, the solar photovoltaic systems would not be constructed. No natural gas, water, wastewater or solid waste services would be required for implementing this alternative, and the Navy would continue to purchase its power from local utility providers. Therefore, no significant impacts to utilities would result from implementation of the No Action Alternative; however, the Navy would not realize any energy cost savings and this alternative does not provide progression towards the Navy's renewable energy goals.

Table ES-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
	Hueneme, an approximately 300-kilowatt carport-mounted solar photovoltaic system would be installed. These systems would ultimately reduce the electrical demand from the local public utilities, thereby helping the Navy reach its renewable energy goals and reducing the amount of money the installations pay for electricity. Overall, implementation of Alternative 1 would result in long-term beneficial effects to electricity delivery at the five installations, as described above. No significant impacts to natural gas, water, wastewater, solid waste services or electricity availability and delivery would occur at any of the installations under Alternative 1.	demand from the local public utilities, thereby helping the Navy reach its renewable energy goals and reducing the amount of money the installations pay for electricity. Overall, implementation of Alternative 2 would result in long-term beneficial effects to electricity delivery at the five installations, as described above. No significant impacts to natural gas, water, wastewater, solid waste services or electricity availability and delivery would occur at any of the installations under Alternative 2.	
Visual Quality	**NAF El Centro**.....No Significant Impacts **NSA Monterey** .....No Significant Impacts **NAVWPNSTA Seal Beach** .....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme** .....No Significant Impacts	**NAF El Centro** ..... No Significant Impacts **NSA Monterey**..... No Significant Impacts **NAVWPNSTA Seal Beach**..... No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** ..... No Significant Impacts **NBVC Port Hueneme**..... No Significant Impacts	**NAF El Centro**..... No Significant Impacts **NSA Monterey**..... No Significant Impacts **NAVWPNSTA Seal Beach**..... No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** ..... No Significant Impacts **NBVC Port Hueneme**..... No Significant Impacts
	The following analysis relates to all installations listed above, unless a specific installation is called out by name. **Visual Impacts during Construction** For Alternative 1, views of project construction activities at all installations would be temporary in nature. While on-installation military personnel could have views of project construction vehicles and equipment, sensitive and/or off-installation viewers (residents, pedestrians, motorists) could experience partial, intermittent views of construction activities. Project construction at NAF El Centro would take place in a vacant agricultural outlease, and the project would not be easily visible to off-installation sensitive viewers. For NSA Monterey, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme, off-installation sensitive viewers (residents, motorists, and pedestrians) would have only partial and/or intermittent views of construction trucks and equipment at some of the project sites. The Alternative 1 project site at NAVWPSNTA Seal Beach would be visible to off-installation sensitive viewers (motorists) during construction. **Visual Impacts during Operation** Under Alternative 1, the permanent project features (e.g., ground-mounted panels) at NAF El Centro would not be visible to off-installation sensitive viewers, and the rooftop-mounted solar photovoltaic system at NSA Monterey's Navy Annex would not be visible to off-installation sensitive viewers due to the project site's location and elevation on top of existing buildings. Alternative 1's permanent project features at NAVWPNSTA Seal Beach (e.g., ground-mounted panels), NAVWPNSTA Seal Beach Detachment Norco (e.g., ground-mounted panels), NSA Monterey's Main Site (e.g., carport structures and rooftop panels) and Navy Annex (e.g., carport structures), and NBVC Port	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* **Visual Impacts during Construction** Similar to Alternative 1, views of project construction activities for Alternative 2 would be temporary, and sensitive viewers (non-military off-installation viewers) would experience only partial, intermittent views of construction vehicles and associated equipment. Alternative 2 would utilize the same construction sites at NAF El Centro, NSA Monterey, NAVWPNSTA Seal Beach Detachment Norco, and NVBC Port Hueneme; however, NAF El Centro would have a slightly smaller project footprint, and NSA Monterey's Navy Annex would not develop the carport-mounted system constructed for Alternative 1. Under Alternative 2, development of the ground-mounted solar photovoltaic system would occur at a different site at NAVWPNSTA Seal Beach, west of Bolsa Chica Road, and north of Westminster Boulevard, in an area that is partially visible to the public. Construction at the NAVWPNSTA Seal Beach project site for Alternative 2 would be almost completely screened from sensitive viewers (residents) by an existing fabric-covered fence and vegetation to the east; however, motorists could experience partial, intermittent views of construction vehicles and equipment from south of the site, along Westminster Boulevard. **Visual Impacts during Operation** Under Alternative 2, the NAF El Centro, NSA Monterey Main Site and Navy Annex, NAVWPNSTA Seal Beach Detachment Norco and NBVC Port Hueneme project sites, systems, viewers, and impacts related to contrast between the project components and the surrounding landscape, glare,	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* Under the No Action Alternative, the solar photovoltaic panel arrays and associated infrastructure would not be constructed and existing visual resources would not change. Therefore, no significant impacts to visual resources would result from implementation of the No Action Alternative.

Table ES-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
	Hueneme (e.g., carport structures) would be seen by a low number of sensitive viewers; however, the overall visual contrast in height, form, lines, and color between the project components and surrounding elements in the landscape would be weak to moderate, depending on the specific location. Additionally, the project would not be expected to produce substantial glare that would be a nuisance to off-installation receptors near these installations, since viewers would only have brief periods of exposure and other reflective structures (e.g., concrete, chain-link fencing, office buildings) are already present within these viewsheds on the installations. Under Alternative 1, all ground-mounted sites at NAF El Centro, NAVWPNSTA Seal Beach, and NAVWPNSTA Seal Beach Detachment Norco would be enclosed with chain link fencing; however, only NAVWPNSTA Seal Beach and NAVWPNSTA Seal Beach Detachment Norco fences would be covered with fabric, thereby reducing potential glare and largely screening views of the project. In addition, potential glare and other visual impacts that may result from color contrast at NAVWPNSTA Seal Beach Detachment Norco would be substantially reduced by treating metal support structures for the panels with dull finishes consisting of medium to dark earth-tone colors with very low light reflectivity. Consequently, no significant glare-related impacts to off-installation receptors would occur. Under Alternative 1, the carport-mounted systems at NSA Monterey's Main Site and Navy Annex and at NBVC Port Hueneme would require night-time lighting; however, the project would not introduce a new source of substantial light the installations. Overall, there would be no significant impacts to visual resources as a result of implementing Alternative 1 at any of the installations. Although no significant impacts to visual resources would occur, implementation of the applicable conservation and construction measures (e.g., reducing contrast in color between the metal project components and nearby structures, reducing potential glare, and shielding and directing lights downward) would further minimize impacts of color contrast, glare and lighting at these locations.	fencing, and night-time lighting would be the same as those described for Alternative 1. Under Alternative 2, operation of the project's permanent features (ground-mounted panels and above-ground electrical poles) at the NAVWPNSTA Seal Beach site would be visible to a small number of off-installation sensitive viewers (motorists). During operation, the NAVWPNSTA Seal Beach ground-mounted solar photovoltaic system would be almost completely screened from sensitive viewers (residents) by an existing fabric-covered fence and vegetation to the east of the site. In addition, a fabric-covered fence would be installed around the project site to further mitigate viewshed concerns at this location.. Overall, there would be no significant impacts to visual resources as a result of implementing Alternative 2 at any of the installations. Although no significant impacts to visual resources would occur, implementation of conservation and construction measures (e.g., reducing contrast in color between the metal project components and nearby structures, reducing potential glare, and shielding and directing lights downward) would further minimize impacts of color contrast, glare and lighting at the applicable locations.	

Table ES-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
Water Resources	**NAF El Centro**.....No Significant Impacts **NSA Monterey** .....No Significant Impacts **NAVWPNSTA Seal Beach** .....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme** .....No Significant Impacts	**NAF El Centro** .....No Significant Impacts **NSA Monterey**.....No Significant Impacts **NAVWPNSTA Seal Beach**.....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** .....No Significant Impacts **NBVC Port Hueneme**.....No Significant Impacts	**NAF El Centro**..... No Significant Impacts **NSA Monterey**..... No Significant Impacts **NAVWPNSTA Seal Beach**..... No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** ..... No Significant Impacts **NBVC Port Hueneme**..... No Significant Impacts
	The following analysis relates to all installations listed above, unless a specific installation is called out by name. **Hydrology** Under Alternative 1, soil excavation associated with project construction would occur and could result in erosion, surface water runoff, and sedimentation of surface water resources; however, implementation of conservation and construction measures would prevent or minimize impacts to regional hydrology and local water quality. Construction activities associated with Alternative 1 would not degrade the local water quality or adversely affect current uses of local surface water resources. **Floodplains** Alternative 1 would not construct any temporary or permanent structures that would increase the potential for localized flooding at the installations or in local surface water bodies. The Navy would minimize potential impacts to 500-year floodplains at NAVWPNSTA Seal Beach and NBVC Port Hueneme with implementation of conservation and construction measures. **Groundwater** For Alternative 1, project operation would include cleaning the solar photovoltaic panels with water brought in by truck and would not require the use of groundwater resources. Therefore, no significant impacts to water resources would result from implementation of Alternative 1.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* **Hydrology** For Alternative 2, impacts to surface hydrology and water quality would not differ from those discussed under Alternative 1. Soil excavation associated with project construction would result from this alternative, and could result in erosion, surface water runoff, and sedimentation of surface water resources. Also similar to Alternative 1, conservation and construction measures related specifically to surface hydrology and water quality would be implemented with this alternative. **Floodplains** Similar to Alternative 1, Alternative 2 would not construct temporary or permanent structures that would increase the potential for localized flooding. In addition, conservation and construction measures specifically related to 500-year floodplains at NAVWPNSTA Seal Beach and NBVC Port Hueneme. **Groundwater** With Alternative 2, project operation would include cleaning the solar photovoltaic panels with water brought in by truck and would not require the use of groundwater resources. Therefore, no significant impacts to water resources would result from implementation of Alternative 2.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* Under the No Action Alternative, the solar photovoltaic systems would not be constructed; therefore, the existing conditions for regional hydrology, surface water quality and groundwater quality would remain unchanged. Therefore, no significant impacts to water resources would result from implementation of the No Action Alternative.

ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
ARB	Air Resource Board
BLM	Bureau of Land Management
CAAQS	California Ambient Air Quality Standards
Cal/EPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
DOD	U.S. Department of Defense
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FY	Fiscal Year
I	Interstate
NAAQS	National Ambient Air Quality Standards
NAF	Naval Air Facility
NAVFAC SW	Naval Facilities Engineering Command Southwest
NAVWPNSTA	Naval Weapons Station
Navy	U.S. Department of the Navy
NBVC	Naval Base Ventura County
NEPA	National Environmental Policy Act
NO	nitric oxide
NO_2	nitrogen dioxide
NO_X	nitrogen oxide
NRHP	National Register of Historic Places

NSA	Naval Support Activity
O_3	ozone
$PM_{2.5}$	fine particulate matter less than or equal to 2.5 microns in diameter
PM_{10}	suspended particulate matter less than or equal to 10 microns in diameter
PPA	power purchase agreement
RONA	Records of Non-Applicability
SCE	Southern California Edison
SHPO	State Historic Preservation Officer
SO_2	sulfur dioxide
SoCalGas	Southern California Gas Company
SR	State Route
SWPPP	Storm Water Pollution Prevention Plan
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound

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1 INTRODUCTION

1.1 BACKGROUND

The U.S. Department of the Navy (Navy), as the Action Proponent, has prepared this Environmental Assessment (EA) in accordance with the following applicable law and regulations:

- National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] § 4321, as amended);
- Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] 1500–1508 [1997]); and,
- Navy Procedures Implementing NEPA (32 CFR 775 [2004]).

This EA evaluates the potential environmental impacts that could occur from the Navy allowing one or more solar power developer (private party) to construct, operate, maintain, and own solar photovoltaic systems on installations within Navy Region Southwest in California. The Proposed Action would involve the development and use of solar photovoltaic systems at the following five Navy Region Southwest installations:

- Naval Air Facility (NAF) El Centro;
- Naval Support Activity (NSA) Monterey's Main Site and Navy Annex;
- Naval Weapons Station (NAVWPNSTA) Seal Beach;
- NAVWPNSTA Seal Beach Detachment Norco; and,
- Naval Base Ventura County (NBVC) Port Hueneme.

The Navy and the solar power developers would enter into 20-year service agreements permitted under 10 U.S.C. § 2922A, also known as power purchase agreements (PPAs), to allow the solar power developers to construct, operate, maintain, and own the solar photovoltaic systems on the five installations. Once the systems are operational, the solar power developers would sell all power to the Navy and would be responsible for maintenance and operation. Once the PPAs are approved and the solar photovoltaic systems are constructed, all power produced by the project would be used by the Navy. Upon the expiration dates of the PPAs, the Navy would have the opportunity to extend each PPA for a single five-year period (i.e., one time only)

or to terminate the PPAs. Upon termination of the PPAs, per Federal Acquisition Regulations 52.241-5 (d), the solar power developers would be required to remove the systems and return all utilized project sites to their original conditions.

Executive Order 13423 (Strengthening Federal Environmental, Energy and Transportation Management), Executive Order 13514 (Federal Leadership in Environmental, Energy, and Economic Performance), and the National Defense Authorization Act recognize and address the United States' reliance on expensive, non-renewable energy and fuel resources from foreign nations. These mandates require federal agencies to lead the way in energy security and environmental performance by reducing greenhouse gas emissions, and improving energy efficiency and security by implementing renewable energy projects on government lands, and obtaining electricity from renewable energy sources when practicable. Specifically:

- Executive Order 13423 requires federal agencies to acquire at least 50 percent of current renewable energy purchases (i.e., energy purchases made after 2007) from new renewable sources (i.e., sources put into service after January 1, 1999);
- Executive Order 13514 expands upon the energy reduction and environmental performance requirements of Executive Order 13423; and,
- The National Defense Authorization Act codifies the U.S. Department of Defense's (DOD's) voluntary commitment to acquire 25 percent of all consumed energy from renewable sources by 2025.

The DOD's Energy, Environment, and Climate Change programs acknowledge that "energy security is having assured access to reliable supplies of energy and the ability to protect and deliver sufficient energy to meet war fighting and installation needs" (DOD 2011). Additionally, the energy program recognizes environmental stewardship as a means to protect mission capabilities. Investment in environmentally responsible technologies also reduces greenhouse gas emissions. The Secretary of the Navy has outlined energy goals that are based on the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007 and include increasing the production and consumption of renewable energy sources. To help meet these goals, the Navy established renewable energy program offices to award PPAs that will use private sector funds to construct renewable energy plants on Navy land. NAF El Centro, NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme were identified as potential sites for PPAs.

1.2 PROJECT LOCATION

The Proposed Action would be constructed at five installation locations in California, as described below and shown on Figure 1-1.

Path: O:\NAVFAC SW PV Solar EA\GIS Data\Figure1-1_letter_portrait_022714.mxd

0 25 50 75 100 Miles

Base Location

Major City

Figure 1-1
Project Location Map

Source- ESRI (2010)

1.2.1 NAF EL CENTRO

NAF El Centro is located in south-central Imperial County in southern California. The installation is located 7 miles (11.3 kilometers) northwest of the City of El Centro and 109 miles (175 kilometers) (driving) east of San Diego. NAF El Centro is north of Interstate (I-) 8 and due west of Highway 86. Access to the installation is primarily via I-8 (Figure 1-2).

1.2.2 NSA MONTEREY'S MAIN SITE AND NAVY ANNEX

NSA Monterey's Main Site and Navy Annex are located in Monterey County in northern California, within the City of Monterey. Both NSA Monterey's Main Site and Navy Annex are adjacent to major travel routes, including California Highway 1, which abuts the southern boundary of the Main Site, and California Highway 68, which traverses west of the Navy Annex. In addition, the Monterey Peninsula Airport is located south of the Navy Annex (Figure 1-3).

1.2.3 NAVWPNSTA SEAL BEACH

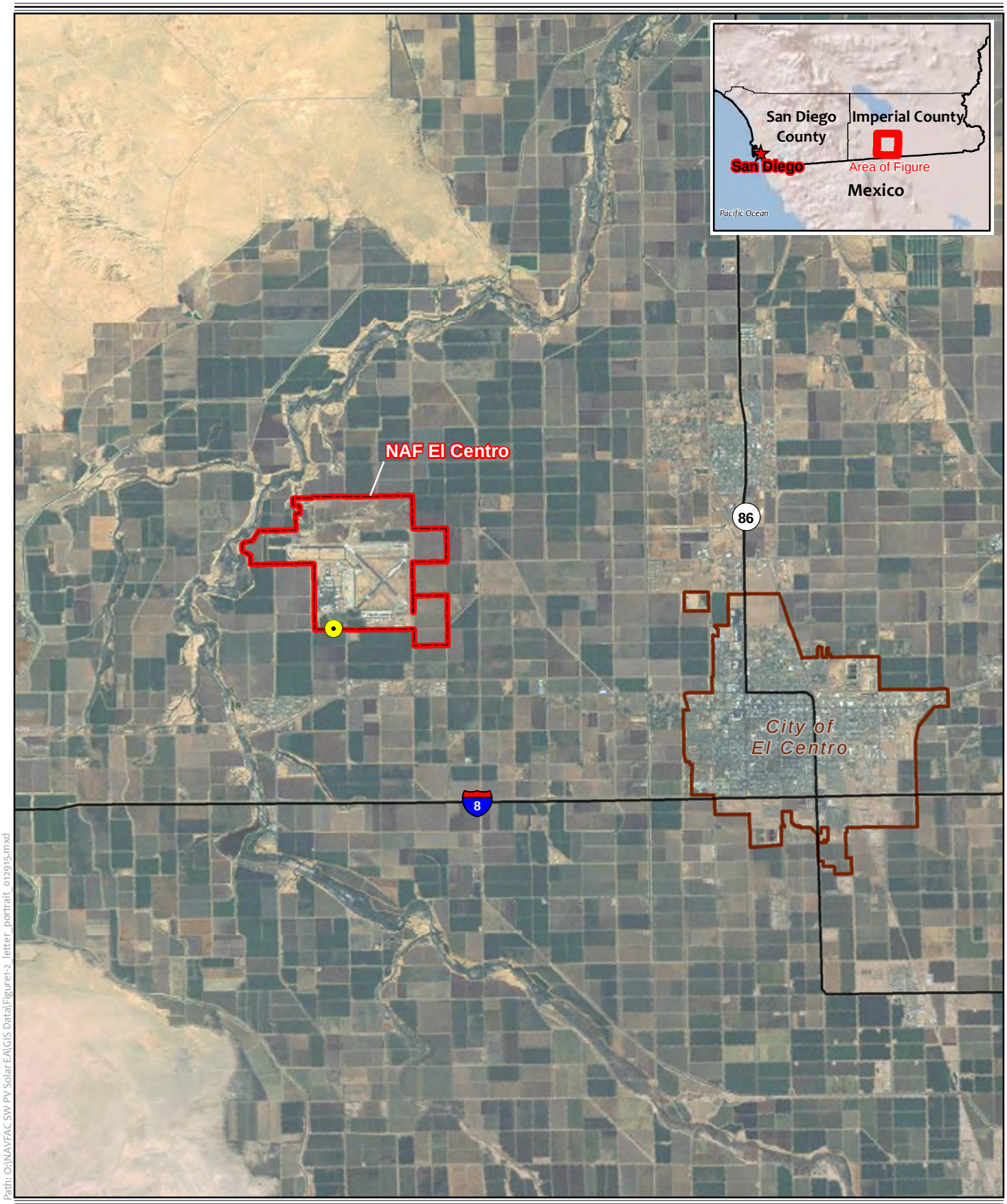
NAVWPNSTA Seal Beach is located in northern Orange County, within the City of Seal Beach, between Huntington Beach and Long Beach, approximately 25 miles (40 kilometers) south of the City of Los Angeles. The City of Westminster borders the station on the northeast, and the City of Huntington Beach borders the station to the south/southeast. I-405 forms the northern boundary of NAVWPNSTA Seal Beach. The Seal Beach National Wildlife Refuge is within installation boundaries (Figure 1-4).

1.2.4 NAVWPNSTA SEAL BEACH DETACHMENT NORCO

NAVWPNSTA Seal Beach Detachment Norco is located in northwest Riverside County in southern California, within the City of Norco. Primary access to the installation is provided by I-15. The installation is situated within 1 mile (1.6 kilometers) of the Santa Ana River. The California Rehabilitation Center, operated by the State Department of Corrections, adjoins the installation at its northern border (Figure 1-5).

1.2.5 NBVC PORT HUENEME

NBVC Port Hueneme is located on the Coast of Ventura County, adjacent to the City of Port Hueneme and the City of Oxnard. NBVC Port Hueneme is located west of California Highway 1 and south of U.S. Highway 101. Channel Islands Harbor, Silver Strand Beach, and Port Hueneme Harbor are located west, southwest, and south of the installation, respectively (Figure 1-6).



Path: O:\NAVFAC SW PV Solar EA\GIS Data\Figure1-2_letter_portrait_012915.mxd

0 1 2 3 4 Miles

Installation Boundary
Solar Photovoltaic System Location
City Boundary
Major Roads

Source- ESRI (2010)

Figure 1-2
NAF El Centro Regional Location Map

Imperial County, California

Path: O:\NAVFAC SW PV Solar EA\GIS Data\Figure1-3_letter_portrait_012915.mxd

0 750 1,500 2,250 3,000 Feet

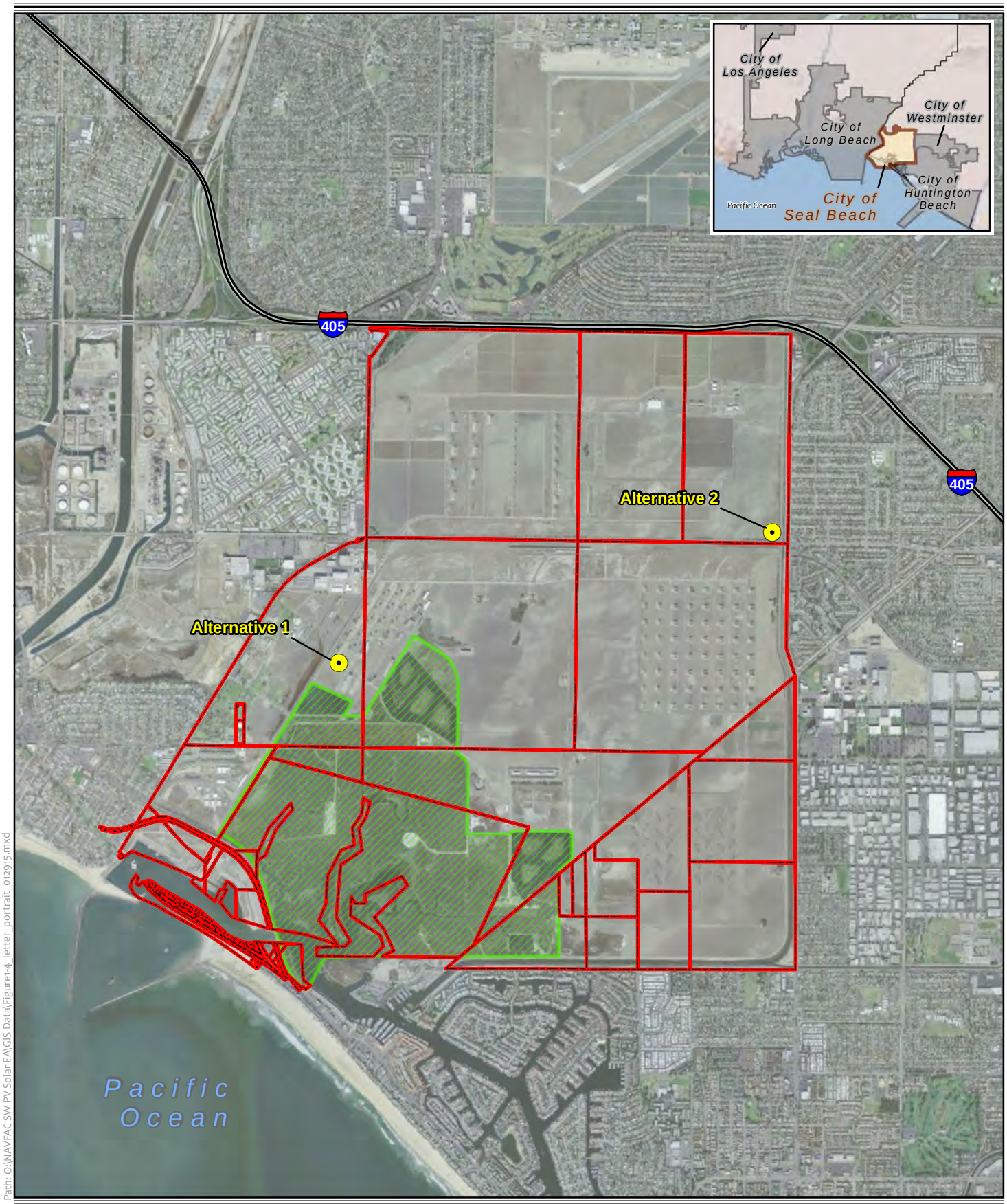
Note: "Solar Photovoltaic System Location" in this figure represents multiple array locations.

Source- ESRI (2010)

Installation Boundary
Solar Photovoltaic System Location
Main Site
Navy Annex (FNMOC)
Highway

Figure 1-3
NSA Monterey Regional Location Map

Monterey County, California



Path: O:\NAVFAC SW PV Solar EA\GIS Data\Figure1-4_letter_portrait_012915.mxd

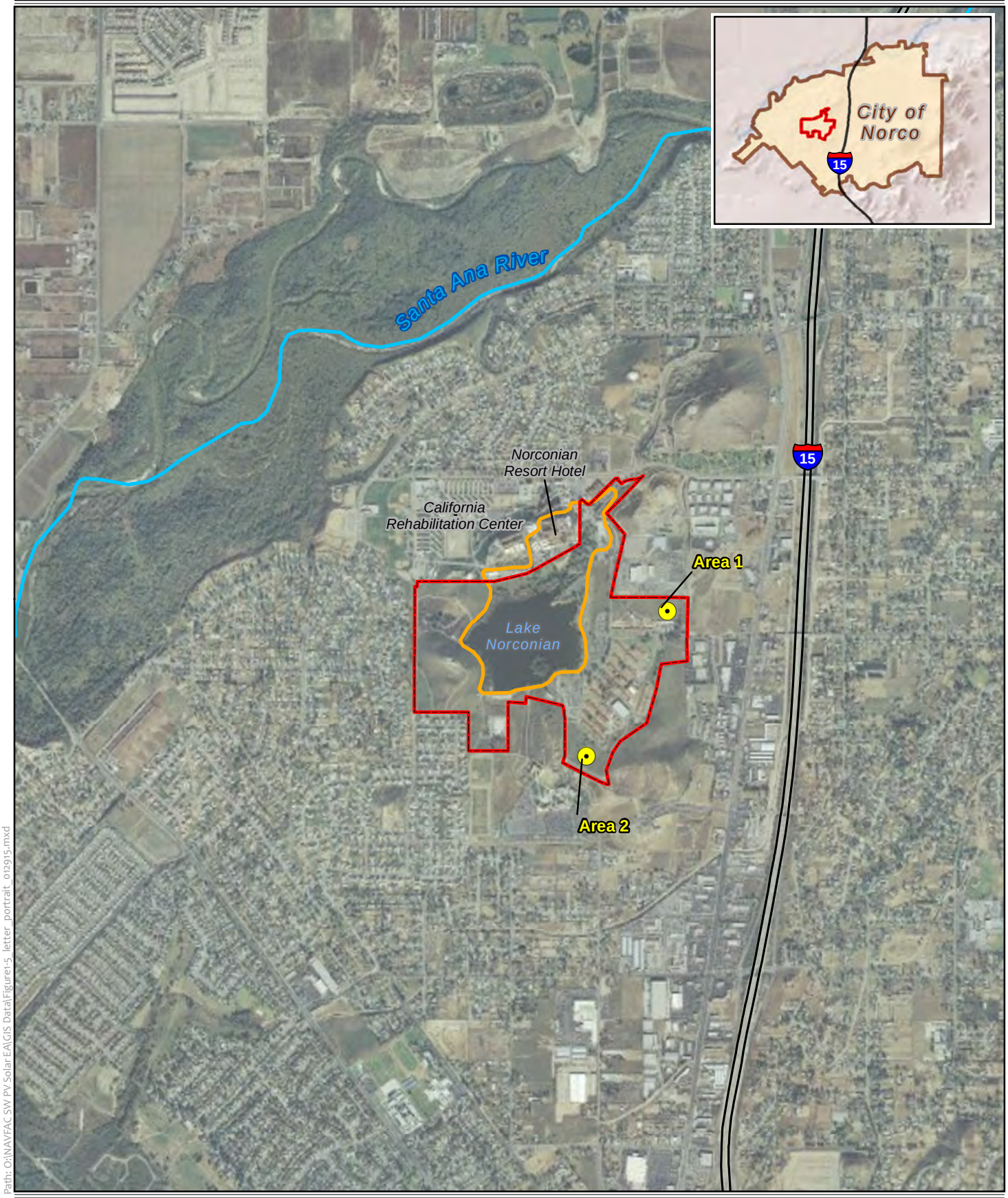
0 0.25 0.5 0.75 1 Miles

Installation Boundary
Solar Photovoltaic System Location
Highway
Seal Beach National Wildlife Refuge

Source- ESRI (2010)

Figure 1-4
NAVWPNSTA Seal Beach
Regional Location Map

Orange County, California



Path: O:\NAVFAC SW PV Solar EA\GIS Data\Figure1-5_letter_portrait_012915.mxd

0 750 1,500 2,250 3,000 Feet

Note: One or both sites may be developed as part of the Proposed Action.

Source- ESRI (2010)

Installation Boundary
Solar Photovoltaic System Location
Highway
River
Lake Norconian Club Historic District

Figure 1-5
NAVWPNSTA Seal Beach Detachment Norco
Regional Location Map

Riverside County, California

Path: O:\NAVFAC SW PV Solar EA\GIS Data\Figure1-6_letter_portrait_012915.mxd

0 0.25 0.5 0.75 1 Miles

Installation Boundary
Solar Photovoltaic System Location
Highway

Source- ESRI (2010)

Figure 1-6
NBVC Port Hueneme Regional Location Map

Ventura County, California

1.3 PURPOSE AND NEED FOR THE PROJECT

The purpose of the Proposed Action is to improve Navy energy security by making the Navy more energy self-sufficient. The project is needed to assist the Navy in meeting the Secretary of the Navy's renewable energy goals, based on the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007, as well as the National Defense Authorization Act's renewable energy goals; specifically:

- The Secretary of the Navy's renewable energy goal is for 50 percent of the Navy's shore-based energy requirements to be acquired from alternative energy sources by the year 2020; and,
- The National Defense Authorization Act applies to the DOD and has a facility energy goal of at least 25 percent of energy requirements to be acquired from renewable energy sources by 2025.

In addition, solar photovoltaic systems provide an alternative source of energy at a reduced cost, fixed rate, and with an overall reduction of carbon dioxide (CO_2) emissions.

The Navy would enter into 20-year PPAs at five Navy installations throughout Navy Region Southwest for the purchase of electricity produced at solar photovoltaic power sources to: (1) obtain energy at the same or less cost than is currently being paid, and (2) reduce overall CO_2 emissions.

1.4 DECISION TO BE MADE

The decision to be made as a result of the analysis in this EA is to decide if an Environmental Impact Statement needs to be prepared. An Environmental Impact Statement will need to be prepared if it is determined that the Proposed Action, or an alternative ultimately selected, would have significant impacts to the human or natural environment. Should an Environmental Impact Statement be deemed unnecessary, the Proposed Action, an alternative action, or the No Action Alternative analyzed in this EA would be selected for implementation. This selection would be documented in a Finding of No Significant Impact, pursuant to 40 CFR 1501.3.

1.5 SCOPE OF THE ANALYSIS

For pre-planning purposes, the energy managers at each installation coordinated with the installations' planning and environmental staff to gather information, conduct site visits, and provide feedback on the project. During 2010, site visits were conducted at NAF El Centro, NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, and NAVWPNSTA Seal Beach Detachment Norco. During 2012, a site visit was conducted at NBVC Port Hueneme. The energy managers then proposed specific sites at their installations for inclusion in the PPA package. These sites are described in Chapter 2.

1.5.1 RESOURCE AREAS ANALYZED IN DETAIL

The 2010 and 2012 pre-planning studies assisted in determining the resource areas that will be analyzed in detail in this EA, and include:

- Air Quality;
- Biological Resources;
- Cultural Resources;
- Land Use;
- Socioeconomics and Environmental Justice (only carried forward for detailed analysis at NAF El Centro);
- Utilities;
- Visual Quality; and,
- Water Resources.

1.5.2 RESOURCE AREAS NOT CARRIED FORWARD FOR DETAILED ANALYSIS

Several other resource areas were considered, but were not carried forward for detailed analysis in this EA because potential impacts from the alternatives would be non-existent or would be considered negligible. Resources not analyzed further in this EA include:

- Coastal Zone Management;
- Noise;
- Public Health and Safety;
- Public Services;
- Recreation;

- Socioeconomics and Environmental Justice (not carried forward for detailed analysis for NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme);
- Topography, Geology, and Soils; and,
- Traffic and Circulation.

1.5.2.1 Coastal Zone Management

None of the proposed alternatives, as described in Chapter 2, would affect coastal zone resources. With the exception of NSA Monterey, NAVWPNSTA Seal Beach, and NBVC Port Hueneme, the action alternatives would not be located in the vicinity of shorelines, and no coastal resources would be affected.

At NSA Monterey, the closest project sites are located approximately 700 feet (213 meters) from the Coastal Zone. This part of the installation is separated from the coastline by Del Monte Avenue and many large trees. Components associated with the proposed alternatives at the Main Site would not block public access to the ocean, nor would they obstruct local residents' views of the ocean.

At NAVWPNSTA Seal Beach, one project site would be located approximately 400 feet (122 meters) from a tidally influenced pond area that is located within the Seal Beach National Wildlife Refuge; however, a levee separates the project site from the pond, and there is no direct connection or flow path between the project site and the pond. Best management practices for runoff and erosion (briefly discussed in Section 1.5.2.7, Topography, Geology, and Soils, and also in Section 3.8, Water Resources) would prevent impacts to ocean resources.

At NBVC Port Hueneme, the port opens to the ocean. Tidally influenced channels run through the western portion of the installation, approximately 500 feet (152 meters) from the project site. The western edge of the installation is separated from the beach by a narrow housing development. NBVC Port Hueneme's project site would be located within 1,000 feet (305 meters) from the shoreline. Housing structures and buildings, which are taller than project components, are already present near the beaches and harbors. Components associated with the proposed alternatives would not block public access to the ocean, nor would they obstruct local residents' views of the ocean.

There would be no reasonably foreseeable impacts to coastal uses and resources from implementation of the proposed alternatives; therefore, Coastal Zone Management does not warrant detailed analysis in the EA. Under these conditions, formal consultation with the California Coastal Commission is not required.

1.5.2.2 Noise

Noise-sensitive receptors include those persons who occupy areas where noise conditions are an important element of the environment. Such areas include residential dwellings, mobile homes, hotels, hospitals, nursing homes, education facilities, and libraries. In addition, noise-sensitive receptors may also include wildlife species (e.g., migratory birds) that rely on vocalizations for communication. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human responses to environmental noise are annoyance and stress. Human noise receptors in the vicinity of the project sites are described below:

- **NAF El Centro:** The project site would be located directly adjacent to (less than 327 feet [100 meters] from) Navy housing;
- **NSA Monterey's Main Site and Navy Annex:** Residential areas are located within 100 feet (30.5 meters) of the project sites at both the Main Site and Navy Annex;
- **NAVWPNSTA Seal Beach:** The Alternative 1 site would be in the center of the installation, near a mixed use industrial Navy facility. The Seal Beach National Wildlife Refuge is immediately adjacent to the Alternative 1 site. The Alternative 2 site would be located 400 feet (122 meters) from a civilian residential area that is east of Bolsa Chica Avenue;
- **NAVWPNSTA Seal Beach Detachment Norco:** The project sites would be less than 0.25 mile (0.4 kilometer) from a commercial/mixed use area that is south of Fourth Street. The project sites would be less than 0.25 mile (0.4 kilometer) from Norco College; and,
- **NBVC Port Hueneme:** The location of the project site is within 100 feet (30.5 meters) of Silver Strand Beach, which is the nearest community.

While there are human noise receptors in the vicinity of the project sites, the noise that would be generated during construction of the proposed alternatives is anticipated to be short-term (an estimated construction duration of approximately four to six months per installation) and would only take place during daylight hours (sunrise to sunset), when higher sound levels are more tolerable. Sound levels that would be generated by the use of heavy-duty equipment and vehicles (trucks, backhoes, forklifts) would be expected to lessen with distance from the source due to ground attenuation, atmospheric absorption, and, at some locations, intervening vegetation and structures. All applicable federal and Navy regulations would be followed during construction. In addition, all construction workers would wear personal protective equipment, if appropriate, and construction-related sound would reach non-workers at attenuated safe levels with the use of safety buffers.

The closest noise receptors at NAF El Centro, NSA Monterey, and NBVC Port Hueneme, besides pedestrians, would be people within residences or other buildings in proximity to the construction activities; however, sound levels would be reduced by transmission loss through residence/building walls, and construction equipment noise would be reduced to levels that are considered permissible by the federal government[1]. No long-term operations noise is expected from the solar photovoltaic systems. Therefore, noise does not warrant detailed analysis in the EA.

1.5.2.3 Public Health and Safety

Installation Restoration Program Sites

The Navy's Installation Restoration Program is responsible for identifying contaminant releases, evaluating risks to human health and the environment, and developing and selecting response actions, as needed. Installation Restoration Program Operable Units or "sites" are areas on Navy property that are associated with past releases of hazardous substances.

There would be limited public access to the project components at the five installations. Although the project would involve ground disturbance for power distribution lines and for ground-mounted systems, the only locations with Installation Restoration Program sites confirmed in the vicinity include Site 70 at NAVWPNSTA Seal Beach (a groundwater plume which does not reach the project site) and Site 19A at NBVC Port Hueneme (located approximately 1,000 feet [305 meters] east of the project site).

Given the nature of the project and the project's distance from Installation Restoration Program sites, there would be no adverse impacts to public health or safety associated with these sites; therefore, this resource does not warrant detailed analysis in the EA.

Explosives Safety Quantity Distance Arcs

Reasonable alternatives must comply with each installation's Activity Overview Plan/Master Plan. For applicable installations, solar photovoltaic panel installation would not be permitted within explosives safety arcs without explosives safety approvals for a waiver of safety regulations. Because there would be no adverse impacts to public health or safety associated with explosives safety quantity distance arcs, this resource does not warrant detailed analysis in the EA.

[1] Noise environments around airports and airfields are typically defined by the Day-Night Average Sound Level (DNL) or the Community Noise Equivalent Level (CNEL). The CNEL is the standard for airports in the state of California and is used in noise studies conducted for Navy facilities in California. DNL and CNEL are often used as the basis for land use compatibility guidelines. Many agencies, including the DOD, have adopted a CNEL of 65 dBA (65 A-weighted decibels) as a criterion that protects those most impacted by noise. Peak construction noise generated by the alternatives is estimated to be reduced by transmission loss through nearby residential/building walls from roughly 90 dBA to 55 dBA or less (assuming a 35 dBA [at minimum] transmission loss through walls), which is lower than the 65 dBA threshold.

Hazardous and Toxic Materials and Waste

Solar photovoltaic panel materials are not considered to be hazardous or toxic. Associated electrical substations, inverters, or other associated hardware at the point of connection also do not contain any hazardous or toxic materials. All project-related equipment installation, repair, and materials disposal work would comply with applicable requirements for working with hazardous materials and waste.

Any accidental spills and leaks from equipment used during construction, maintenance, and removal would be addressed under an Environmental Protection Plan prepared prior to any site work and would indicate corrective procedures.

There would be no adverse impacts to public health or safety associated with human exposure to hazardous materials or waste at the proposed project sites; therefore, this resource does not warrant detailed analysis in the EA.

Electromagnetic Fields

Electromagnetic fields are invisible fields of electric and magnetic force associated with the movement of charged particles. The United States government has not established regulations governing exposure to electromagnetic fields; however, the International Commission on Non-Ionizing Radiation Protection published a rigorous set of guidelines in 2010 titled "International Commission on Non-Ionizing Radiation Protection Guidelines for Limiting Exposure to Time-Varying Electric and Magnetic Fields (1 Hz to 100 kHz)." These guidelines were used for this analysis. For the purposes of this analysis, the generic electromagnetic field has been separated into its component parts: electric and magnetic fields.

Direct electrical current flowing through solar panels and cables creates a very low-frequency electric field. The International Commission on Non-Ionizing Radiation Protection guidelines recommend the public be exposed to not more than 5,000 volts/meter in the 1 to 8 hertz frequency range. Studies show that electric field levels from a rooftop-mounted solar photovoltaic system, measured from the second floor of a two-story building on which such a system is mounted, are not above background levels (less than 5 volts per meter).

Magnetic fields are created by the movement of charged particles. Cables and equipment used in electrical energy distribution, whether it be conventionally generated or photovoltaic, are a known source of magnetic fields. The distribution network portion of this project would generate magnetic fields at the same frequencies and levels as existing systems. The actual solar photovoltaic panels also generate a magnetic field, which is measured through a surface as magnetic flux density (Tech Environmental, Inc. 2012). International Commission on Non-Ionizing Radiation Protection guidelines recommend the public not be exposed to magnetic flux levels exceeding 4×10^{-2} tesla at 1 hertz frequency. Studies show that magnetic

flux density, measured on the top floor of a building with rooftop-mounted solar photovoltaic panels, is significantly below this threshold at 2×10^{-5} to 1.4×10^{-4} tesla.

No adverse impacts to public health or safety would be associated with electromagnetic fields at the proposed project sites; therefore, this resource does not warrant detailed analysis in the EA.

1.5.2.4 Public Services

There would be only temporary contractor support personnel working at each installation to perform the construction and possible removal tasks related to the action alternatives. The Navy would use existing regional labor forces for construction, and the action alternatives would not introduce new or permanent populations to the area during construction or operation; thus, the action alternatives would not impact the performance objectives of local schools, libraries, and other public service facilities, or require the construction of new, or alteration of existing, public facilities. Additionally, the action alternatives would not increase the demand for fire or police protection services.

No adverse impacts to public services would be associated with implementation of the action alternatives; therefore, this resource does not warrant detailed analysis in the EA.

1.5.2.5 Recreation

All of the action alternatives would occur on land that is owned by the U.S. government and that is under the jurisdiction of the Navy for exclusive military use. None of the project sites contain land intended for recreational use, and the action alternatives would not impact recreational resources in the areas.

No adverse impacts to recreation would be associated with implementation of the action alternatives; therefore, this resource does not warrant detailed analysis in the EA.

1.5.2.6 Socioeconomics and Environmental Justice

Construction and operation of the solar photovoltaic panels at NSA Monterey, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme would result in minor and short-term socioeconomic impacts to the surrounding communities. Project construction would not attract long-term worker populations to these regions, nor affect the need for housing in the area. In addition, the project sites for these installations would be located on non-agricultural lands. As there would be only minimal short-term impacts to socioeconomics, this resource area is not analyzed in detail in this EA for these four installations.

At NAF El Centro, the project would remove land from an existing agricultural outlease on the installation. Therefore, Chapter 3 includes an analysis of the socioeconomic impacts that would occur from the change in land use at NAF El Centro.

1.5.2.7 Topography, Geology, and Soils

Given the flat terrain of the ground-mounted project sites and power line corridors, the need for grading and site preparation work is expected to be minimal and largely limited to grubbing and minor excavation associated with foundations for the power stations and mechanical buildings, poles for fencing, electrical poles, and limited underground utility lines (i.e., electrical lines). Potential erosion associated with construction activities would be controlled through the use of storm water best management practices. The California Stormwater Quality Association Best Management Practices Handbook can be used to find applicable best management practices. Low-impact development is discussed in further detail in Section 3.8, Water Quality.

There would be no adverse impacts to topography, geology, and soils from implementation of the proposed alternatives; therefore, these resources do not warrant detailed analysis in the EA.

1.5.2.8 Traffic and Circulation

The action alternatives are not considered a traffic-inducing land use and no new roadways or access gates would be constructed as part of this project; therefore, the project would not impact existing roadways or traffic within the immediate area or on regional roadways.

During the construction period, there would be a temporary increase in construction-related traffic to and from the project sites and action alternative power line corridors. Specific lane closures and access/continued traffic movement along roads during construction would be addressed in a Construction Traffic Management and Detour Plan for each location. Only negligible impacts to roads and traffic are anticipated during the operational period, as the action alternatives are expected to generate approximately two round-trips, twice a year, for panel maintenance activities.

For locations that have Anti-Terrorism/Force Protection requirements and implement carport-mounted systems, the project would require that workable solutions be taken into account during design and planning to re-route traffic.

The action alternatives would have only minor, temporary impacts to local streets during the construction period; therefore, traffic and circulation do not warrant detailed analysis in this EA.

1.6 INTERGOVERNMENTAL COORDINATION

The preparation of this EA is based on requirements including, but not limited to, the applicable guidance, laws, and legal requirements listed in Table 1-1.

Table 1-1 Applicable Guidance, Laws, and Legal Requirements Considered

Legal Requirement	Agency	Finding/Coordination	Regulated Activity
National Environmental Policy Act of 1969 (42 U.S.C. § 4321 et seq.)	U.S. Department of the Navy	Finding of No Significant Impact or preparation of an Environmental Impact Statement	Federal action.
National Historic Preservation Act of 1966, as amended (16 U.S.C. § 470 et seq. and amendments)	Advisory Council on Historic Preservation California State Historic Preservation Officer	Section 106 Consultation	Federal undertakings that may affect properties listed in, or eligible for listing in, the National Register of Historic Places.
Clean Air Act (42 U.S.C. § 7401 et seq.)	U.S. Environmental Protection Agency	Conformity Determination or Record of Non-Applicability	Federal implementation of a proposed action may result in air quality impacts that could exceed the levels noted in 40 CFR 93.153.
Endangered Species Act (1973, as amended)	U.S. Fish and Wildlife Service	Unites States Fish and Wildlife Service Consultation	Federal actions that may affect a threatened or endangered species.

Key:
CFR = Code of Federal Regulations
U.S.C. = United States Code

Of the five installations that are part of the Proposed Action, NAF El Centro is the only installation that has a Programmatic Agreement for Section 106 consultations under the National Historic Preservation Act. For the installations that do not have a Programmatic Agreement (NSA Monterey, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme), the California State Historic Preservation Officer (SHPO) was engaged in consultation, as needed, by the Navy.

In addition, the following cities and other interested parties were notified[2] by the following installations during the planning process:

- **NAF El Centro:** City of El Centro;
- **NSA Monterey:** City of Monterey and Monterey Peninsula Airport;
- **NAVWPNSTA Seal Beach:** Cities of Seal Beach, Westminster, and Huntington Beach, and Seal Beach Historical and Cultural Society;
- **NAVWPNSTA Seal Beach Detachment Norco:** City of Norco and Lake Norconian Club Foundation;
- **Norco College**; and,
- **NBVC Port Hueneme:** Cities of Oxnard and Port Hueneme, County of Ventura, Channel Islands Community Service District, and Channel Islands Harbors District.

1.7 PUBLIC/AGENCY PARTICIPATION

The Navy published a Notice of Availability of the Draft EA in the following newspapers beginning on February 20, 2015, for daily newspapers and on February 19, 2015, for weekly newspapers:

- **NAF El Centro:** three consecutive days in the *Imperial Valley Press*;
- **NSA Monterey:** three consecutive days in the *Monterey Herald* and one day in the *Monterey Weekly*;
- **NAVWPNSTA Seal Beach:** three consecutive days in the *Orange County Register* and one day in the weekly *Seal Beach Sun*;
- **NAVWPNSTA Seal Beach Detachment Norco:** three consecutive days in *The Press-Enterprise* (serving Riverside and San Bernardino counties); and,
- **NBVC Port Hueneme:** three consecutive days in the *Ventura County Star* and one day in the weekly *Vida Newspaper*.

The notice described the Proposed Action, solicited public comments on the Draft EA, provided dates of the 30-day public comment period, and announced that copies of the Draft EA would be available for review on the Commander, Navy Region Southwest website (http://www.cnic.navy.mil/regions/cnrsw/om/environmental_support/Public_Review_of_Navy_Projects/NBVC_NAFEC_NWSSB_Solar_Photovoltaic_EA.html) and at the following 12 libraries:

[2] This notification is not a requirement of NEPA.

- El Centro Public Library, 1140 North Imperial Avenue, El Centro, California 92243;
- Monterey Public Library, 625 Pacific Street, Monterey, California 93940;
- Mary Wilson Public Library,707 Electric Avenue, Seal Beach, California 90740;
- County of Riverside Norco Public Library, 3954 Old Hamner Road, Norco, California 92860;
- Wilfred J. Airey Library - Norco College, 2001 Third Street, Norco, California 92860;
- E.P. Foster Library, 651 East Main Street, Ventura, California 93001;
- Camarillo Public Library, 4101 Las Posas Road, Camarillo, California 93010;
- Oxnard Main Library, 251 South A Street, Oxnard, California 93030;
- South Oxnard Library, 4300 Saviers Road, Oxnard, California 93033;
- City of Port Hueneme (Ray D. Prueter Library), 510 Park Avenue, Port Hueneme, California 93041;
- Huntington Beach Central Library, 7111 Talbert Avenue, Huntington Beach, California 92648; and,
- County of Orange, Westminster Branch Library, 8180 Thirteenth Street, Westminster, California 92683.

In addition, the cities of El Centro, Monterey, Seal Beach, Westminster, Huntington Beach, Norco, Oxnard, and Port Hueneme were notified of the availability of the document. The Riverside County Commissioner of Defense and Military Services was also notified.

A public participation meeting is scheduled for March 7, 2015, at Naval Weapons Station Seal Beach Detachment Norco, 1999 Fourth Street, Norco, California. Comments submitted in writing at the public participation meeting, and all other applicable comments submitted during the Draft EA public comment period, will be considered during preparation of the Final EA.

The Final EA and Finding of No Significant Impact, if applicable, will be available for public review at the libraries listed above and on the Commander, Navy Region Southwest website. The Notice of Availability for the Final EA and Finding of No Significant Impact, if applicable, will appear in the newspapers listed above.

Appendix A of the Final EA will include a summary of the comments received and the Navy’s responses to comments.

2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The Council on Environmental Quality regulations for Implementing the Procedural Provisions of NEPA establish a number of policies for federal agencies, including "using the NEPA process to identify and assess the reasonable alternatives to the Proposed Action that will avoid or minimize adverse effects of these actions on the quality of the human environment" (40 CFR 1500.2 [e]).

This EA provides detailed analysis for the alternatives that could meet the purpose of and need for the project, as defined in Chapter 1, as well as the reasonable alternative screening factors provided below.

2.1 REASONABLE ALTERNATIVE SCREENING FACTORS

The screening factors used to develop the reasonable range of alternatives include:

- Consistency with land use planning provided in each installation's Activity Overview Plan/Master Plan;
- Proximity to a distribution substation, building switchgear, or distribution lines; and,
- A location and/or design capable of providing electricity at or below the current cost of traditional power (e.g., orientation/location/slope relative to the sun for generating higher amounts of power, or a lower system cost relative to output).

2.2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.2.1 DESCRIPTION OF THE PROPOSED ACTION

There are three types of utility-scale solar power technologies in operation today: parabolic trough, concentrated solar power, and solar photovoltaic. Parabolic trough solar technology uses a curved, mirrored trough to focus the sun's energy to heat fluid-filled pipes, which produce steam to power a turbine. Concentrated solar power (or "solar thermal" technology) uses hundreds of thousands of heliostats (i.e., highly reflective mirrors) to concentrate energy from the sun's rays. This solar energy, called "flux," is concentrated at the

top of a tower, where it heats water to produce steam. The steam is first transformed into mechanical energy (by turbines or other engines) and then into electricity (International Energy Agency 2014). The Proposed Action would use solar photovoltaic systems, which are very different from parabolic trough and concentrated solar power systems. Photovoltaic systems convert the sun's rays directly into electricity using photovoltaic cells made of a semiconductor material that generates no heat and reflects[3] only a small amount of sunlight, as compared to other solar technologies.

The Proposed Action includes the installation of three different types of solar photovoltaic systems: ground-mounted, carport-mounted, and rooftop-mounted. Specific installation details would vary slightly based on the project site and the solar power developer's site design. This section of the EA describes the three different solar photovoltaic systems and addresses general scenarios of land/site disturbance for each system proposed for the project. Section 2.2.2 provides specific details on the most likely design scenarios for each of the alternatives.

2.2.1.1 Ground-Mounted Solar Photovoltaic Systems

Ground-mounted solar photovoltaic systems would be built on relatively flat, undeveloped land. In areas with surface vegetation, ground-mounted solar photovoltaic systems may require the site to be cleared and grubbed. Access to ground-mounted systems would be typically restricted by a fence. A ground-mounted system would occupy all of the space contained within its fence line, and the area may include the construction of all-weather gravel roads between the rows of solar panels and around the site perimeter for maintenance access.

Ground-mounted solar photovoltaic systems could include fixed-tilt panel arrays (shown on top) or tracker-mounted panel arrays that rotate on an axis to track the sun (shown on bottom)

[3] Reflectivity is a characteristic of reflective materials relating to or caused by light that reflects off a surface, whereas glare is a harsh, uncomfortable, bright light.

Ground-mounted systems require either an underground or overhead electrical line to provide electrical feedback to the nearest point of connection. A typical configuration for this type of system is to install vertical members into the ground, with the panel mounting hardware, frames, motors, and/or the solar panels themselves affixed atop the constructed mounting structure. Foundations would be built on engineered fill or native soil at a minimum of 24 inches (61 centimeters) below adjacent grade or finished grade (typical for combined footings). If pole footings are to be used, each footing would consist of a 4-inch (10-centimeter) cross-sectional area and would require a depth of 4 feet to 6.5 feet (1.2 meters to 2 meters) below ground surface.

Two types of ground-mounted systems may be constructed at the project sites, depending on the PPA solar power developer's site design: fixed-tilt panel systems or tracker-mounted panel systems. Fixed-tilt solar arrays would remain stationary, whereas tracker-mounted arrays would be mounted on an axis and would be free to move throughout the day to maintain the best sun angle and maximize power output.

The highest point of the solar array for a ground-mounted solar photovoltaic system would not exceed 8 feet (2.4 meters) above the ground surface and would depend on the solar photovoltaic system type (i.e., fixed-tilt or tracker-mounted) and tilt of the arrays. Fixed-tilt panels would maintain a fixed height, whereas the maximum height of tracker-mounted arrays would vary as the arrays move to track the sun[4].

Ground-mounted panels would be approximately 5 feet (1.5 meters) wide and 3 feet (0.9 meter) long. The number of panels in each array, the type of ground-mounted system used, and the array configuration would depend on the PPA solar power developer's site design.

2.2.1.2 Carport-Mounted Solar Photovoltaic Systems

Carport-mounted solar photovoltaic systems are essentially carports with solar panels used as the shading surface material. For the purposes of the Proposed Action, each site containing a carport-mounted solar photovoltaic system (NBVC Port Hueneme and NSA Monterey's Main Site and Navy Annex) would require construction of a new carport in an existing paved parking lot. Each carport would include the installation of vertical members or poles at the site to support the overhanging solar panels. The size, location, and number of pole footings would vary depending on how much load the carport structure would be required to support (i.e., size of the solar photovoltaic system). An individual pole footing would be 6.5 feet (2 meters) deep with a 2.5-foot (0.76-meter) diameter. A combined footing would be approximately 2 feet (0.6 meter) deep by 4 feet (1.2 meters) long by 2 feet (0.6 meter) wide.

[4] The maximum height of the panels on tracker-mounted systems would be approximately 6 feet (1.8 meters) when the panel arrays lay flat and parallel to the ground. When the panels tilt to track the sun, the maximum height (when measured at the highest point) would increase by up to 2 feet (0.6 meter).

Carports are typically single- or double-cantilevered (as shown in the photos below), with space under and around the structures accessed and utilized as shaded parking spots. A single-cantilever design has one vertical member installed into the ground and extends overhanging shade in only one direction. A double-cantilever design has the same vertical member installed into the ground; however, this design extends overhanging shade in two (opposite) directions. The PPA solar power developer would determine whether single- or double-cantilevered carport systems would be developed at each site.

Single-Cantilever

Double-Cantilever

The height of a typical carport-mounted solar photovoltaic system, including the overhanging solar panels, would be 12 to 14 feet (3.7 to 4.3 meters)[5]. Each panel would be approximately 5 feet (1.5 meters) wide and 3 feet (0.9 meter) long, and the number of panels in each array would depend on the PPA solar power developer's site design. The panels would be oriented to optimize the amount of solar exposure received in a day. In the southwestern portion of the country, panel orientation typically faces south or southwest.

2.2.1.3 Rooftop-Mounted Solar Photovoltaic Systems

In rooftop-mounted solar photovoltaic systems, the arrays are most often retrofitted onto existing buildings, and are usually mounted on top of mounting brackets affixed to an existing roof structure. Many rooftop applications are executed at small- and medium-sized installations for consumption

Rooftop-Mounted Solar Photovoltaic System

[5] The Proposed Action includes one 20-foot (6.1-meter) -high carport site (Site 1) at NSA Monterey's Navy Annex (refer to Section 2.2.2.1).

within the buildings that host the arrays. The arrays are typically treated as rooftop equipment placed in limited-access areas; therefore, they are not guarded or protected.

Rooftop-mounted panels would be approximately 5 feet (1.5 meters) wide and 3 feet (0.9 meter) long. The number of panels in each array and array configuration would depend on the PPA solar power developer's site design. The rooftop-mounted panels would be pitched, with a maximum height of 2.5 feet (0.8 meter) relative to the roof's surface and would typically face south or southwest with the arrays "aimed" towards the sky.

2.2.2 DESCRIPTION OF THE ALTERNATIVES

2.2.2.1 Alternative 1 (Preferred Alternative)

Power Purchase Agreements for all Locations

The Navy and one or more private solar power developer would enter into 20-year service agreements, permitted under 10 U.S.C. § 2922A, to allow solar power developers to construct, operate, maintain, and own solar photovoltaic systems on five installations. The solar power developers would sell all power generated by the solar photovoltaic systems to the Navy.

Upon the expiration dates of the PPAs, the Navy would decide whether to extend each PPA for a single five-year period (i.e., one time only) or to terminate the PPAs. Upon termination of the PPAs, per Federal Acquisition Regulations 52.241-5 (d), the solar power developers would be required to remove the systems and return all utilized project sites to their original conditions.

Construction and Operation of the Solar Photovoltaic Systems for all Locations

Construction methods for solar photovoltaic systems can vary, depending on existing site conditions and site design. In general, development of solar photovoltaic systems for the project may include:

- Use of best available science and appropriate design specifications during construction of project and operation of site to minimize potential impacts to wildlife;
- Modification of existing infrastructure (e.g., building rooftops) to accommodate solar photovoltaic system installation;
- Site preparation (e.g., grubbing, grading, trenching for underground electrical lines[6]);
- Installation of solar photovoltaic array mounting structures (i.e., rooftop mounts, ground-mounted poles, or vertical members/poles for carports);

[6] All trenches excavated for the purpose of installing underground electrical lines would be approximately 4 feet (1.2 meters) wide by 3 feet (0.9 meter) deep, and would be located within a 20-foot (6.1-meter) -wide utility corridor.

- Installation of the solar photovoltaic panels; and,
- Installation and connection of electrical cables to a point of connection that contains electrical equipment (i.e., electrical feed meters, switchgear, inverters, circuit breakers, transformers, or other small electrical equipment) and connects to the existing installation electrical grid.

Specific construction details for the Proposed Action's ground-mounted, carport-mounted, and rooftop-mounted solar photovoltaic systems are provided below.

<u>Construction of Ground-Mounted Solar Photovoltaic Systems</u>

NAF El Centro, NAVWPNSTA Seal Beach, and NAVWPNSTA Seal Beach Detachment Norco

Ground-mounted solar photovoltaic systems would include the following site preparations:

- Grading to bare mineral soil to remove vegetation at all sites within the project areas;
- Trenching for electrical conduits between the solar photovoltaic arrays and the point of connection;
- Installation of underground electrical lines (buried 3 feet [0.9 meter] deep, as required by Unified Facilities Criteria codes), and/or overhead electrical lines, to complete the electrical circuits; and,
- Installation of pole footings to a depth of 4 feet to 6.5 feet (1.2 meters to 2 meters) below ground surface.

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

The ground-mounted solar photovoltaic systems (NAF El Centro, NAVWPNSTA Seal Beach, and NAVWPNSTA Seal Beach Detachment Norco) would be enclosed by 8-foot (2.4-meter) -high chain link fences. The fences would be installed by the solar power developers, and these developers would assume the liability for protection of their systems through maintenance activities. Fences at NAVWPNSTA Seal Beach and NAVWPNSTA Seal Beach Detachment Norco would have a fabric covering in order to minimize visual impacts.

Construction of Carport-Mounted Solar Photovoltaic Systems

NSA Monterey's Main Site and Navy Annex and NBVC Port Hueneme

All proposed carport-mounted solar photovoltaic systems would include the construction of new carports in existing parking lots. Carport construction would include:

- Saw-cutting through parking lot asphalt and concrete, and excavation to install footings for each vertical member of the carport structure;
- Trenching for electrical conduits between the solar photovoltaic arrays and the point of connection, and the installation of underground electrical lines to link each carport array to one another; and,
- Installation of overhead connections between carports, in lieu of underground electrical conduits and electrical lines.

Carport-mounted solar photovoltaic systems would also include lighting. Lighting would be installed directly under the carport shade and angled downward. The lighting would utilize sensors and provide illumination from dusk until dawn. The exact type of lighting technology would not be determined until the design phase; however, the lighting would be consistent with installation appearance plan guidelines. After-hour lighting would come from the nearest building connection, and there would be no energy storage/throttling from the carport-mounted solar photovoltaic systems.

Construction of Rooftop-Mounted Solar Photovoltaic Systems

NSA Monterey's Main Site and Navy Annex

In rooftop-mounted solar photovoltaic systems, mounting brackets would be affixed to an existing roof structure, then the arrays would be mounted on top of the brackets. Construction of the rooftop-mounted solar photovoltaic system would include:

- Trenching for electrical conduits between the solar photovoltaic arrays and the point of connection; and,
- Installation of underground electrical distribution lines to link each array to one another.

Construction Equipment and Duration

Standard equipment used to install solar photovoltaic systems with the configurations described in Section 2.2 include, but are not limited to: bulldozers, scrapers, backhoes, pile drivers, water trucks, trenchers, truck-mounted mobile cranes, and other heavy earthwork equipment[7].

The timing of construction would depend on the timing of the PPA execution for each solar photovoltaic system at the individual installations[8]. In general, the duration of construction would last approximately six months for construction activities at NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach Detachment Norco, and NVBC Port Hueneme, and approximately four months for construction activities at NAF El Centro and NAVWPNSTA Seal Beach[9].

Temporary Staging and Equipment Storage Areas

Staging areas would be needed for storing project materials, construction equipment, and vehicles during construction of the solar photovoltaic systems; these areas would be located on the solar generation facility sites or in other approved, previously disturbed areas of the installations. The construction manager would coordinate with the installation to obtain site approval for any proposed staging or material laydown areas prior to project construction. In addition, the solar power developers may require trailers or other temporary onsite facilities for general administrative purposes during construction.

Access for Construction

Access to the sites for construction of the solar photovoltaic systems would proceed from the closest existing road and/or required gate to each location. No new temporary or permanent access roads would be constructed.

Operations and Maintenance

The project facilities would be unmanned and no habitable structures would be constructed on the project sites. Operations activities would include, but would not be limited to, use of all aspects of the project site, including the use of existing access roads and electrical and mechanical systems.

[7] Refer to Appendix B for details on construction equipment estimates.
[8] For the purpose of the Air Quality analysis, construction activities for Alternatives 1 and 2 are assumed to begin between 2015 and 2017.
[9] Days estimate is based on 20 work days per month.

For all locations, electrical maintenance would be conducted on an as-needed basis. Panel washing would occur two times per year, with each site requiring approximately 100 gallons of water each year. The water/vinegar-based solution used for panel washing would be transported to the sites via water trucks and would be supplied by the PPA solar power developer. For systems of these sizes, panel washing would be performed by one to two maintenance workers employed by the PPA solar power developer.

For sites where ground-mounted solar photovoltaic systems are proposed, ongoing vegetation maintenance would be conducted by the contractor to ensure uninterrupted energy production.

Most Likely Design Scenarios for Solar Photovoltaic Systems at the Installations

The following sections describe the most likely design scenarios for the solar photovoltaic systems that would be developed and operated with implementation of Alternative 1 at each of the installations. Final design shall be determined by the PPA solar power developer prior to construction and approved by the Navy.

Table 2-1 (provided at the conclusion of Section 2.2) presents estimates for construction disturbance associated with Alternative 1 for each installation.

NAF El Centro

The Proposed Action is a ground-mounted solar photovoltaic system rated at 650 kilowatts capacity. The solar panel arrays would be located on approximately 10 acres (4 hectares) of disturbed land on NAF El Centro that is part of an agricultural outlease area. This area would be enclosed by an 8-foot (2.4-meter) -high chain link fence. The site would be located west of B Street/Bennett Road, south of First Street, and north of Havens Road (Figure 2-1). In the most likely design scenario, the ground-mounted solar photovoltaic system at NAF El Centro would include a single-axis tracker-mounted system rather than fixed-tilt arrays, and the panels would be oriented upward toward the sun in a south or southwest orientation to maximize electrical energy output[10]. The ground-mounted system may occupy all of the space contained within its fence line, and ground disturbance would occur throughout the 10-acre (4-hectare) solar panel array site (Figure 2-1). Underground electrical conduits and lines would be installed to provide electrical feed from the solar photovoltaic arrays back to the main electrical line; these lines would run north-south within the 10-acre (4-hectare) site.

Some ground disturbance would occur outside of the 10-acre (4-hectare) footprint for the main electrical line[11]. In total, the line would be approximately 1,175 feet (358 meters) long. The 4.16-kilovolt line would proceed approximately 810 feet (247 meters) west from the solar photovoltaic panel array footprint, north of and parallel to the Imperial Irrigation District's Elder Canal and Havens Road, then approximately 280 feet (85 meters) north, and approximately 85 feet (26 meters) west to the point of connection (an existing electrical pole) (Figure 2-1). At the point of connection, the voltage would be stepped up to 12 kilovolts and the electricity would be fed into an existing high-voltage (12-kilovolt) overhead electrical line. From this point, the high-voltage power would be delivered to an existing Imperial Irrigation District substation, which is located south of the point of connection (Figure 2-1). Beyond the point of connection, no new equipment, electrical distribution lines, or substations would be constructed or installed as part of the project.

The estimated total output from the NAF El Centro ground-mounted solar photovoltaic system would be 1,495 megawatt hours per year[12]. The generation system would be interconnected with the utility grid under a Net Energy Meter Tariff agreement between the installation and the utility company (Imperial Irrigation District).

[10] The type of ground-mounted system used, array configuration, number of panels in each array, and orientation of the arrays would be determined by the PPA solar power developer during final site design and approved by the Navy.

[11] A final design from the PPA developer would determine whether the electrical line would be trenched underground or routed overhead on poles. Disturbance estimates assume trenching would occur for a "worst case" scenario.

[12] A megawatt is a unit of power that is equivalent to one million watts. A megawatt describes the rate at which power is being produced or consumed by a circuit at any moment in time. A megawatt hour is a unit of electrical energy. It is a measure of the amount of power produced or consumed by one megawatt expended for a period of one hour.

Path: O:\NAVFAC SW PV Solar EA\GIS Data\Figure2-1_NAF_El_Centro_021114.mxd

0 100 200 300 400 Feet

1:3,000

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

- Ground-Mounted Solar PV Panel Arrays
- Point of Connection
- IID Substation
- Proposed Electrical Line
- Installation Boundary

Figure 2-1
Ground-Mounted Solar Photovoltaic System at NAF El Centro

NSA Monterey's Main Site

The Proposed Action is a combination of carport- and rooftop-mounted solar photovoltaic systems rated at 1,000-kilowatt capacity. The generation facilities would be located at six separate sites on the Main Site (Figure 2-2) within paved areas and on the roofs of existing buildings at the Naval Postgraduate School and in a public works area south of Del Monte Lake. In the most likely design scenario, Sites 1 and 2 would consist of carport-mounted systems located in two adjacent parking lots, south of Del Monte Avenue, near the northwest corner of the Main Site. Site 3 would consist of a carport-mounted system, east of Sloat Avenue, near the southwest corner of the Main Site. Sites 4, 5, and 6 would be located in the southeast corner of the Main Site. Sites 4 and 5 would consist of carport-mounted systems in two adjacent parking lots east of Morse Drive. Site 6 would consist of a rooftop-mounted system, and the solar arrays would be located on the rooftops of two adjacent public works buildings (Buildings 426 and 427) (Figure 2-2).

All carport-mounted solar photovoltaic systems installed at the Main Site would be 12 to 14 feet (3.7 to 4.3 meters) in height, and the PPA solar power developer would determine, on a site-specific basis, whether single- or double-cantilevered carport systems would be developed at the Main Site. All solar photovoltaic arrays mounted on rooftops would be pitched, and the panels would be oriented south or southwest, with the panel fronts "aimed" towards the sky. Underground electrical conduits and lines would be installed between the six solar photovoltaic panel array sites and the points of connection[13] (Figure 2-2).

From the points of connection, the electricity generated by the project would feed into the installation's electrical grid via existing distribution lines, and power would be delivered over an existing line to the nearest existing substation. Beyond the points of connection, no new equipment, electrical distribution lines, or substations would be constructed or installed as part of the project. The rooftop-mounted systems would provide power directly to Buildings 426 and 427 and would reduce the amount of electricity these buildings require from the Pacific Gas and Electric Company grid.

The estimated total output from the Main Site carport- and rooftop-mounted solar photovoltaic systems would be 1,442.6 megawatt hours per year. The generation system would be interconnected with the utility grid under a Net Energy Meter Tariff agreement between the installation and the utility company (Pacific Gas & Electric).

[13] At the Main Site, the installation of overhead connections between carports and the point of connection may be an option in lieu of underground trenches and electrical lines. This would be determined during final site design by the PPA solar power developer and approved by the Navy.

0 150 300 450 600 Feet

1:5,000

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Carport-Mounted Solar PV Panel Arrays
Rooftop-Mounted Solar PV Panel Arrays
Proposed Underground Electrical Line
Point of Connection
Site Boundary
Installation Boundary
Delineated Wetland (2011)

Figure 2-2
Carport- and Rooftop-Mounted Solar Photovoltaic Systems at NSA Monterey's Main Site

Path: O:\NAVFAC SW PV Solar EA\GIS Data\Figure2-2_NSA_Monterey_MainSite_030414.mxd

NSA Monterey's Navy Annex

The Proposed Action is a combination of carport- and rooftop-mounted solar photovoltaic systems rated at 500-kilowatt capacity. The generation facilities would be located at four separate sites at the Navy Annex (Figure 2-3) within paved areas or on top of existing buildings.

In the most likely design scenario, Sites 1 and 3 would consist of carport-mounted systems located near the southern boundary of the Navy Annex, north of a runway for the Monterey Peninsula Airport. Site 2 would consist of rooftop-mounted arrays located on the roofs of Buildings 700, 702, and 704, south of Euclid Avenue and west of Airport Road. Site 4 would consist of a carport-mounted system located along the northern boundary of the Navy Annex, south of Euclid Avenue (Figure 2-3).

All carport-mounted solar photovoltaic systems installed at the Navy Annex would be 12 to 14 feet (3.7 to 4.3 meters) in height, with the exception of Site 1, which would include a 20-foot (6.1-meter) -high carport structure. All rooftop-mounted solar photovoltaic arrays would be pitched, and the panels would be oriented south or southwest, with the panel fronts "aimed" towards the sky.

Underground electrical conduits and lines would be installed to link the solar photovoltaic system arrays to one another[14] (Figure 2-3). The electricity generated by the project would feed into an existing point of connection at Building 708 (a computer data center), and Building 700 would receive direct electrical feed from the project.

The estimated total output from the NSA Monterey Navy Annex carport- and rooftop-mounted solar photovoltaic systems would be 721.3 megawatt hours per year.

[14] At the Navy Annex, the installation of overhead connections between carports and the point of connection may be an option in lieu of underground trenches and electrical lines. This would be determined during final site design by the PPA solar power developer and approved by the Navy.

Path: O:\NAVFAC SW PV Solar EA\GIS Data\Figure2-3_NSA_Monterey_Annex.mxd

0 75 150 225 300 Feet

1:2,000

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

- Carport-Mounted Solar PV Panel Arrays
- Rooftop-Mounted Solar PV Panel Arrays
- Proposed Underground Electrical Line
- Point of Connection
- Site Boundary
- Installation Boundary

Figure 2-3
Carport- and Rooftop-Mounted Solar Photovoltaic Systems at NSA Monterey's Navy Annex

NAVWPNSTA Seal Beach

The Proposed Action is a ground-mounted solar photovoltaic system rated at 500-kilowatt capacity. The generation facility would be located on 6.62 acres (2.67 hectares) in the western portion of the installation. The project site would be bordered by abandoned railroad tracks and Kitts Highway to the west, Third Street to the east, and the Seal Beach National Wildlife Refuge to the south (Figure 2-4); this area would be enclosed by an 8-foot (2.4-meter) – high chain link fence covered with fabric.

In the most likely design scenario, the ground-mounted solar photovoltaic system at NAVWPNSTA Seal Beach would include a single-axis tracker-mounted system rather than fixed-tilt arrays, and the panels would be oriented upward toward the sky in a south or southwest orientation to maximize electrical energy output[15]. The ground-mounted system would occupy all of the space contained within the defined project area, and ground disturbance would occur throughout the 6.62-acre (2.67-hectare) solar panel array site (Figure 2-4). Underground electrical conduits and lines would be installed within the site and would run northeast-southwest to provide electrical feed from the solar photovoltaic arrays back to the point of connection (Figure 2-4).

Additional ground disturbance would occur outside of the 6.62-acre (2.67-hectare) panel array site for electrical connectivity. A 36-foot (11-meter) -long underground electrical conduit and 4.16-kilovolt electrical line would be installed east of Kitts Highway, between the solar photovoltaic panel arrays and the point of connection (Figure 2-4). At the point of connection, a new approximately 100-square-foot (9-square-meter) concrete masonry unit equipment shed would be installed on vacant, disturbed land to house the necessary electrical equipment (e.g., inverters, switches, relays, combiner boxes). A second, 95-foot (29-meter) -long underground conduit and 4.16-kilovolt electrical line would be installed and routed west from the point of connection and beneath the abandoned railroad tracks to tie into an existing electrical pole adjacent to Kitts Highway (Figure 2-4). From this point, the electricity generated by the project would feed into the installation's electrical grid via existing distribution lines, and power would be delivered over an existing line to the nearest existing substation.

The estimated total output from the NAVWPNSTA Seal Beach ground-mounted solar photovoltaic system would be 432.7 megawatt hours per year. The generation system would be interconnected with the utility grid under a Net Energy Meter Tariff agreement between the installation and the utility company (Southern California Edison).

[15] The type of ground-mounted system used, array configuration, number of panels in each array, and orientation of the arrays would be determined during final site design by the PPA solar power developer and approved by the Navy.

Path: O:\NAVFAC SW PV Solar EA\GIS Data\Figure2-4_NAVWPNSTA_Seal_Beach_062514.mxd

0 100 200 300 400 Feet

1:2,500

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Ground-Mounted Solar PV Panel Arrays
Point of Connection
Proposed Underground 4.16kV Electrical Line
Existing Overhead Electrical Line

Delineated Wetland (2006)
Open Water/Intertidal Mudflats
Coastal Salt Marsh
Navigable Waters
CWA 404 Jurisdiction

Figure 2-4
Ground-Mounted Solar Photovoltaic System at NAVWPNSTA Seal Beach - Alternative 1

NAVWPNSTA Seal Beach Detachment Norco

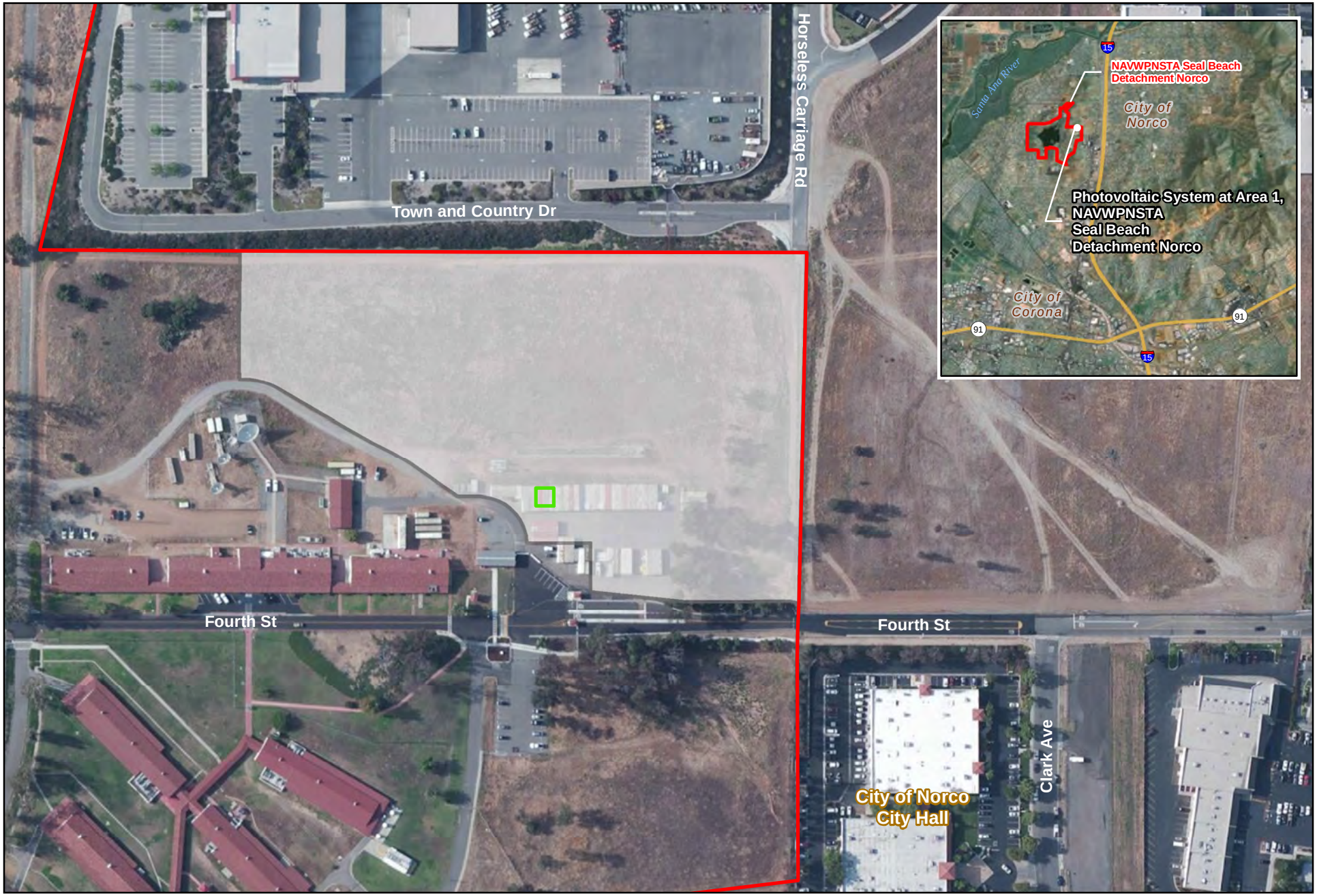
At NAVWPNSTA Seal Beach Detachment Norco, Alternative 1 would include development and operation of solar panel arrays at up to two locations on the installation: Area 1 and/or Area 2. Development of Area 1 and Area 2 would be for ground-mounted solar photovoltaic systems rated at up to 1,500-kilowatt capacity. An 8-foot (2.4-meter) -high chain link fence would enclose the ground-mounted systems and would be covered with fabric to minimize visual impacts to the surrounding community. The estimated total output from the generation facilities at Area 1 and Area 2 would be approximately 2,250 megawatt hours per year. Although only one area may eventually be chosen, this EA will assume the construction of both areas for “worst-case” environmental impact planning.

Area 1

The Proposed Action is a ground-mounted solar photovoltaic system. The generation facility would be located on 8.5 acres (3.4 hectares) on the eastern side of the installation, north of Fourth Street, and south of Town and Country Drive (Figure 2-5). This area would be enclosed by an 8-foot (2.4-meter) -high chain link fence. The fence would be covered with fabric to minimize visual impacts to the surrounding community. The site is mostly vacant and disturbed, but contains several storage bins and mature eucalyptus trees near Fourth Street. The trees would not be removed as part of the project.

In the most likely design scenario, the ground-mounted solar photovoltaic system at Area 1 would include a single-axis tracker-mounted system rather than fixed-tilt arrays, and the panels would be oriented upward toward the sky in a south or southwest direction to maximize electrical energy output[16]. The ground-mounted system would occupy all of the space contained within its fence line, and ground disturbance would occur throughout the 8.5-acre (3.4-hectare) ground-mounted solar panel array site (Figure 2-5). Underground electrical conduits and lines would be installed within the site and would run east to west to provide electrical feed from the solar photovoltaic arrays back to the point of connection (Figure 2-5). The main electrical line and the point of connection would be located within the 8.5-acre (3.4-hectare) site at Area 1. From the point of connection, the electricity generated by the project would feed into the installation’s electrical grid via existing distribution lines, and power would be delivered over an existing line to the nearest existing substation. Beyond the point of connection, no new equipment, electrical distribution lines, or substations would be constructed or installed as part of the project.

[16] The type of ground-mounted system used, array configuration, number of panels in each array, and orientation of the arrays would be determined during final site design by the PPA solar power developer and approved by the Navy.



Path: O:\NAVFAC SW PV Solar EA\GIS Data\Figure2-5_Area1_NAVWPNSTA_Seal_Beach_Detachment_Norco.mxd

0 100 200 300 400 Feet

1:2,500

Ground-Mounted Solar PV Panel Arrays

Point of Connection

Installation Boundary

Figure 2-5

Ground-Mounted Solar Photovoltaic System at NAVWPNSTA Seal Beach Detachment Norco - Area 1

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Area 2

The Proposed Action is a ground-mounted solar photovoltaic system. The generation facility would be located on approximately 10 acres (4 hectares) of unpaved land in the southeastern corner of the installation, north of the Norco College campus (Figure 2-6).

In the most likely design scenario, the ground-mounted solar photovoltaic system at Area 2 would include a single-axis tracker-mounted system rather than fixed-tilt arrays, and the panels would be oriented upward toward the sky in a south or southwest direction to maximize electrical energy output[17]. Ground disturbance would occur throughout the 10-acre (4-hectare) solar panel array site (Figure 2-6), and this area would be enclosed by an 8-foot (2.4-meter) -high chain link fence. Fabric covering would be placed on the fence line to minimize visual impacts to a historic district site located 3,300 feet (1,006 meters) to the north. Underground electrical conduits and lines would run east to west within the 10-acre (4-hectare) solar photovoltaic panel array site to provide electrical feed from the solar photovoltaic arrays back to the main electrical line.

Some ground disturbance would occur outside of the 10-acre (4-hectare) site for the main electrical line. An underground electrical conduit would be installed for the main electrical line, and the 4.16-kilovolt line would be routed underground 280 feet (85 meters) northeast of the solar photovoltaic panel array site to the point of connection (Figure 2-6). From the point of connection, the electricity generated by the project would feed into the installation's electrical grid via existing distribution lines, and power would be delivered over an existing line to the nearest existing substation. Beyond the point of connection, no new equipment, electrical distribution lines, or substations would be constructed or installed as part of the project.

The generation system would be interconnected with the utility by either a Non-Export (Rule-21) Tariff agreement or a Renewable Market Adjusting Tariff, depending on the system size and pricing schedule submitted by the PPA solar power developer. In either case, an Interconnection Agreement would be executed by the solar power developer and the utility company (Southern California Edison).

[17] The type of ground-mounted system used, array configuration, number of panels in each array, and orientation of the arrays would be determined during the final site design by the PPA solar power developer and approved by the Navy.

Path: O:\NAVFAC SW PV Solar EA\GIS Data\Figure2-6_Area2_NAVWPNSTA_Seal_Beach_Detachment_Norco_080614.mxd

0 200 400 Feet

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Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User

Ground-Mounted Solar PV Panel Arrays

Point of Connection

Proposed Underground Electrical Line

Existing Underground Electrical Line

Installation Boundary

Figure 2-6

Ground-Mounted Solar Photovoltaic System at NAVWPNSTA Seal Beach Detachment Norco - Area 2

NBVC Port Hueneme

The Proposed Action is a carport-mounted solar photovoltaic system rated at up to 300-kilowatt capacity. The generation facility would be located on 1.46 acres (0.59 hectare) in a paved parking area south of Highland Drive within in the southwestern portion of the installation (Figure 2-7).

Underground electrical conduits and lines would be installed within the 1.46-acre (0.59-hectare) site to link each carport-mounted solar photovoltaic array to one another[18] (Figure 2-7). All carports installed at NBVC Port Hueneme would be 12 to 14 feet (3.7 to 4.3 meters) in height, including the panels. All solar photovoltaic carport-mounted arrays would be pitched, and the panels would face west or southwest, with the panel fronts “aimed” towards the sky.

Ground disturbance would also occur outside of the 1.46-acre (0.59-hectare) footprint for the main electrical line. In total, the 4.16-kilovolt line would be approximately 340 feet (103.6 meters) long. The line would proceed approximately 80 feet (24.4 meters) northwest from the solar photovoltaic panel array footprint towards Highland Drive, then approximately 260 feet (79.2 meters) west to the point of connection (Figure 2-7). At the point of connection, the electricity generated by the project would feed into an existing switchgear tie point on an electrical pole located north of Building 1388 (Figure 2-7). Building 1388 would be the only building to receive electrical feed from the project.

The estimated total output from the carport-mounted solar photovoltaic system would be 432.8 megawatt hours per year. The generation system would be interconnected with the utility grid under a Non-Export (Rule-21) Tariff agreement between the solar power developer and the utility company (Southern California Edison).

[18] At this site, installation of overhead connections between carports may be an option in lieu of underground conduits and electrical lines.

Path: O:\NAVFAC SW PV Solar EA\GIS Data\Figure2-7 NBVC_Port_Hueneme_050614.mxd

0 50 100 150 200 Feet

1:1,500

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

- Carport-Mounted Solar PV Panel Arrays
- Point of Connection
- Proposed Underground Electrical Line
- Installation Boundary

Figure 2-7
Carport-Mounted Solar Photovoltaic System at NBVC Port Hueneme

2.2.2.2 Alternative 2

For Alternative 2, the same five installations would be included as part of the project, and all five installations would have PPAs. Construction and operation details for Alternative 2 are described in the following sections.

Table 2-1 (provided at the conclusion of Section 2.2) presents estimates for construction disturbance associated with Alternative 2 at each installation.

NAF El Centro

Alternative 2 at NAF El Centro would use the same agricultural outlease area as Alternative 1, but would construct and operate the ground-mounted solar photovoltaic system on only 8 acres (3.2 hectares) of land, as compared to 10 acres (4 hectares) of land with Alternative 1. This alternative would provide enough land space to support project facilities and would be located close enough to existing infrastructure (i.e., substation, distribution lines) to produce approximately 300 kilowatts of electricity at or below the current cost of traditional power.

Under Alternative 2, the generating facility at NAF El Centro would produce 432.7 megawatt hours per year of electricity.

NSA Monterey's Main Site and Navy Annex

At NSA Monterey's Main Site and Navy Annex, Alternative 2 would include the same sites as Alternative 1; however, the 20-foot (6.1-meter) -high carport site (Site 1) and associated electrical lines at the Navy Annex would be excluded from Alternative 2.

Under Alternative 2, the generating facilities in the 1-megawatt system at the Main Site would produce a combined total of 1,442.6 megawatt hours per year of electricity. The generating facilities in the 300-kilowatt system at the Navy Annex would produce a combined total of 432.7 megawatt hours per year of electricity.

Table 2-1 (provided at the conclusion of Section 2.2) presents estimates for construction disturbance associated with Alternative 2 at NSA Monterey's Main Site and Navy Annex.

NAVWPNSTA Seal Beach

Alternative 2 at NAVWPNSTA Seal Beach would be a ground-mounted solar photovoltaic system that would generate 500 kilowatts of renewable energy. For Alternative 2, the ground-mounted solar photovoltaic panel arrays would be located on the northeastern side of the installation, adjacent to the intersection of Westminster Boulevard and Bolsa Chica Road (Figure 2-8).

Path: O:\NAVFAC SW PV Solar EA\GIS Data\Figure2-8 Alternative_2_NAVWPNSTA_Seal_Beach_062514.mxd

0 250 500 750 1,000 Feet

1:7,000

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Ground-Mounted PV Solar Panel Arrays

Point of Connection

Proposed Above-Ground 4.16kV Electrical Line

Existing Underground Electrical Line

Non-Wetland Waters of the U.S. (2006)

Installation Parcel Boundary

Figure 2-8

Ground-Mounted Solar Photovoltaic System at NAVWPNSTA Seal Beach - Alternative 2

As compared to the 6.62-acre (2.67-hectare) project site for Alternative 1, the solar photovoltaic panel array site for Alternative 2 would be slightly smaller, at 6.53 acres (2.64 hectares), including the laydown and equipment staging areas used during construction. Some ground disturbance would also occur outside of the 6.53-acre (2.64-hectare) site for the main electrical line. The project would require installation of a new 4.16-kilovolt overhead electrical line, extending approximately 3,285 feet (1,000 meters) west along the north edge of Westminster Boulevard, from the panel array site to the point of connection (an existing electrical pole) (Figure 2-8).

Approximately 15 wood electrical poles would be installed within the installation fence line along the north side of Westminster Boulevard to support the conducting wires for the overhead electrical line. The project would use wood poles to better blend into the surrounding environment. Each pole would be buried 6 to 8 feet (2 to 2.5 meters) deep and would be 8 to 10 inches (20 to 25 centimeters) in diameter. The height of each electrical pole would be 30 to 40 feet (9.1 to 12.2 meters) in height.

Due to the distance of the Alternative 2 panel array site from the main electrical line, there would be a higher cost associated with connecting Alternative 2 to the installation's electrical system.

The total output from the generation facility would be 432.7 megawatt hours per year.

NAVWPNSTA Seal Beach Detachment Norco

No other sites or configurations were considered viable for this installation (refer to Section 2.3.4). Alternative 2 at NAVWPNSTA Seal Beach Detachment Norco would be the same as Alternative 1.

NBVC Port Hueneme

There are no suitable alternative locations that would meet the purpose and need for the Proposed Action (refer to Section 2.3.5) at NBVC Port Hueneme, and no other sites or configurations were considered viable for this installation. Alternative 2 at NBVC Port Hueneme would be the same as Alternative 1.

Table 2-1 Comparison of Disturbance for Project Alternatives (by Project Component)

Component	Alternative 1 (Preferred Alternative)	Alternative 2
NAF El Centro		
Solar Panel Arrays Footprint	**Permanent Impact** 10.0 acres (4.0 hectares) **Temporary Impact** None	**Permanent Impact** 8.0 acres (3.2 hectares) **Temporary Impact** None
Main Electrical Line from Arrays to the Point of Connection[1]	**Permanent Impact** None **Temporary Impact** 0.1 acre (0.04 hectare)	**Permanent Impact** None **Temporary Impact** 0.1 acre (0.04 hectare)
Point of Connection (Existing Electrical Pole)	**Permanent Impact** None **Temporary Impact** None	**Permanent Impact** None **Temporary Impact** None
TOTAL IMPACTS	**PERMANENT IMPACT** 10.0 acres (4.0 hectares) **TEMPORARY IMPACT** 0.1 acre (0.04 hectare)	**PERMANENT IMPACT** 8.0 acres (3.2 hectares) **TEMPORARY IMPACT** 0.1 acre (0.04 hectare)
NSA Monterey (Main Site)		
Site 1 (Carports)	**Permanent Impact** 1.52 acres (0.62 hectare) **Temporary Impact** None	**Permanent Impact** 1.52 acres (0.62 hectare) **Temporary Impact** None
Site 1 Electrical Line (From Carports to the Point of Connection)	**Permanent Impact** None **Temporary Impact** Less than 0.01 acre (Less than 0.01 hectare)	**Permanent Impact** None **Temporary Impact** Less than 0.01 acre (Less than 0.01 hectare)
Site 2 (Carports[2]**)**	**Permanent Impact** 0.95 acre (0.38 hectare) **Temporary Impact** None	**Permanent Impact** 0.95 acre (0.38 hectare) **Temporary Impact** None

Table 2-1 Comparison of Disturbance for Project Alternatives (by Project Component)

Component	Alternative 1 (Preferred Alternative)	Alternative 2
Site 3 (Carports[2])	**Permanent Impact** 0.58 acre (0.23 hectare) **Temporary Impact** None	**Permanent Impact** 0.58 acre (0.23 hectare) **Temporary Impact** None
Site 4 (Carports[2])	**Permanent Impact** 0.29 acres (0.12 hectare) **Temporary Impact** None	**Permanent Impact** 0.29 acres (0.12 hectare) **Temporary Impact** None
Site 5 (Carports[2])	**Permanent Impact** 0.34 acre (0.14 hectare) **Temporary Impact** None	**Permanent Impact** 0.34 acre (0.14 hectare) **Temporary Impact** None
Site 6 (Rooftops)	**Permanent Impact** None **Temporary Impact** None	**Permanent Impact** None **Temporary Impact** None
Site 6 Electrical Line (From Building 426 to Building 427)	**Permanent Impact** None **Temporary Impact** Less than 0.01 acre (Less than 0.01 hectare)	**Permanent Impact** None **Temporary Impact** Less than 0.01 acre (Less than 0.01 hectare)
Site 6 Electrical Line (From Building 427 to the Point of Connection)	**Permanent Impact** None **Temporary Impact** Less than 0.01 acre (Less than 0.01 hectare)	**Permanent Impact** None **Temporary Impact** Less than 0.01 acre (Less than 0.01 hectare)
Site 6 Point of Connection	**Permanent Impact** None **Temporary Impact** None	**Permanent Impact** None **Temporary Impact** None

Table 2-1 Comparison of Disturbance for Project Alternatives (by Project Component)

Component	Alternative 1 (Preferred Alternative)	Alternative 2
TOTAL IMPACTS	**PERMANENT IMPACT** 3.68 acres (1.49 hectares) **TEMPORARY IMPACT** Less than 0.01 acre (Less than 0.01 hectare)	**PERMANENT IMPACT** 3.68 acres (1.49 hectares) **TEMPORARY IMPACT** Less than 0.01 acre (Less than 0.01 hectare)
NSA Monterey (Navy Annex)		
Site 1 (Carports)	**Permanent Impact** 1.08 acres (0.44 hectare) **Temporary Impact** None	**Permanent Impact** N/A **Temporary Impact** N/A
Site 1 Electrical Line (From Site 1 to Building 708)	**Permanent Impact** None **Temporary Impact** 0.03 acre (0.01 hectare)	**Permanent Impact** N/A **Temporary Impact** N/A
Site 1 Electrical Line (From Site 1 to Point of Connection)	**Permanent Impact** None **Temporary Impact** 0.02 acre (Less than 0.01 hectare)	**Permanent Impact** N/A **Temporary Impact** N/A
Site 2 (Rooftops)	**Permanent Impact** None **Temporary Impact** None	**Permanent Impact** None **Temporary Impact** None
Site 2 Electrical Line (From Building 700 to Building 708)	**Permanent Impact** None **Temporary Impact** Less than 0.01 acre (Less than 0.01 hectare)	**Permanent Impact** None **Temporary Impact** Less than 0.01 acre (Less than 0.01 hectare)
Site 2 Electrical Line (From Building 704 to Site 3)	**Permanent Impact** None **Temporary Impact** Less than 0.01 acre (Less than 0.01 hectare)	**Permanent Impact** None **Temporary Impact** Less than 0.01 acre (Less than 0.01 hectare)

Table 2-1 Comparison of Disturbance for Project Alternatives (by Project Component)

Component	Alternative 1 (Preferred Alternative)	Alternative 2
Site 3 (Carports)	**Permanent Impact** 0.38 acre (0.15 hectare) **Temporary Impact** None	**Permanent Impact** 0.38 acre (0.15 hectare) **Temporary Impact** None
Site 3 Electrical Line (From Site 3 to the Point of Connection)	**Permanent Impact** None **Temporary Impact** Less than 0.01 acre (Less than 0.01 hectare)	**Permanent Impact** None **Temporary Impact** Less than 0.01 acre (Less than 0.01 hectare)
Site 3 Electrical Line (From Site 3 to Site 4)	**Permanent Impact** None **Temporary Impact** 0.03 acre (0.01 hectare)	**Permanent Impact** None **Temporary Impact** 0.03 acre (0.01 hectare)
Site 4 (Carports)	**Permanent Impact** 0.10 acre (0.04 hectare) **Temporary Impact** None	**Permanent Impact** 0.10 acre (0.04 hectare) **Temporary Impact** None
TOTAL IMPACTS	**PERMANENT IMPACT** 1.56 acres (0.63 hectare) **TEMPORARY IMPACT** 0.08 acre (0.03 hectare)	**PERMANENT IMPACT** 0.48 acre (0.19 hectare) **TEMPORARY IMPACT** 0.03 acre (0.01 hectare)
NAVWPNSTA Seal Beach		
Solar Panel Arrays Footprint	**Permanent Impact** 6.62 acres (2.67 hectares) **Temporary Impact** None	**Permanent Impact** 6.53 acres (2.64 hectares) **Temporary Impact** None
Electrical Line from Arrays to Point of Connection	**Permanent Impact** None **Temporary Impact** 0.003 acre (0.001 hectare)	**Permanent Impact** None **Temporary Impact** 0.30 acre (0.12 hectare)

Table 2-1 Comparison of Disturbance for Project Alternatives (by Project Component)

Component	Alternative 1 (Preferred Alternative)	Alternative 2
Electrical Line from Point of Connection to the Existing Electrical Grid	**Permanent Impact** None **Temporary Impact** 0.009 acre (0.004 hectare)	**N/A**
New Aboveground Electrical Distribution Line Wood Poles[3] (x15)	**N/A**	**Permanent Impact** Less than 0.01 acre (less than 0.01 hectare) **Temporary Impact** None
Point of Connection (Proposed Equipment Shed for Alternative 1 and Existing Pole for Alternative 2)	**Permanent Impact** 0.002 acre (less than 0.01 hectare) **Temporary Impact** None	**Permanent Impact** None **Temporary Impact** None
TOTAL IMPACTS	**PERMANENT IMPACT** 6.62 acres (2.67 hectare) **TEMPORARY IMPACT** 0.018 acre (0.007 hectare)	**PERMANENT IMPACT** 6.53 acres (2.64 hectares) **TEMPORARY IMPACT** 0.30 acre (0.12 hectare)
NAVWPNSTA Seal Beach Detachment Norco		
Area 1 – Solar Panel Arrays Footprint	**Permanent Impact** 8.5 acres (3.4 hectares) **Temporary Impact** None	**Permanent Impact** 8.5 acres (3.4 hectares) **Temporary Impact** None
Area 1 – Electrical Line from Arrays to Point of Connection	**Permanent Impact** None **Temporary Impact** None	**Permanent Impact** None **Temporary Impact** None
Area 1- Point of Connection	**Permanent Impact** None **Temporary Impact** None	**Permanent Impact** None **Temporary Impact** None

Table 2-1 Comparison of Disturbance for Project Alternatives (by Project Component)

Component	Alternative 1 (Preferred Alternative)	Alternative 2
Area 2 – Solar Panel Arrays Footprint	**Permanent Impact** 10 acres (4 hectares) **Temporary Impact** None	**Permanent Impact** 10 acres (4 hectares) **Temporary Impact** None
Area 2 – Electrical Line from Arrays to Point of Connection	**Permanent Impact** None **Temporary Impact** 0.26 acre (0.01 hectare)	**Permanent Impact** None **Temporary Impact** 0.26 acre (0.01 hectare)
Area 2 – Point of Connection	**Permanent Impact** None **Temporary Impact** None	**Permanent Impact** None **Temporary Impact** None
TOTAL IMPACTS	**PERMANENT IMPACT** 18.5 acres (7.49 hectares) **TEMPORARY IMPACT** 0.26 acre (0.01 hectare)	**PERMANENT IMPACT** 18.5 acres (7.49 hectares) **TEMPORARY IMPACT** 0.26 acre (0.01 hectare)
NBVC Port Hueneme		
Solar Panel Arrays Footprint (Carports)	**Permanent Impact** 1.46 acres (0.59 hectare) **Temporary Impact** None	**Permanent Impact** 1.46 acres (0.59 hectare) **Temporary Impact** None
Electrical Line from Arrays to Point of Connection	**Permanent Impact** None **Temporary Impact** 0.031 acre (0.013 hectare)	**Permanent Impact** None **Temporary Impact** 0.031 acre (0.013 hectare)
Point of Connection (Existing Structure)	**Permanent Impact** None **Temporary Impact** None	**Permanent Impact** None **Temporary Impact** None

Table 2-1 Comparison of Disturbance for Project Alternatives (by Project Component)

Component	Alternative 1 (Preferred Alternative)	Alternative 2
TOTAL IMPACTS	**PERMANENT IMPACT** 1.46 acres (0.59 hectare) **TEMPORARY IMPACT** 0.031 acre (0.013 hectare)	**PERMANENT IMPACT** 1.46 acres (0.59 hectare) **TEMPORARY IMPACT** 0.031 acre (0.013 hectare)

Notes:
[1] A final design from the PPA solar power developer would determine whether the electrical line would be trenched underground or routed overhead on poles at NAF El Centro. Disturbance estimates assume trenching would occur for a "worst case" scenario. Assumes that all conduits excavated for the purpose of installing underground electrical lines would be approximately 4 feet (1.2 meters) wide by 3 feet (0.9 meter) deep, and would be located within a 20-foot (6.1-meter) -wide utility corridor.
[2] This footprint includes the electrical line from the panels to the point of connection.
[3] Assumes each wood pole would be 8 to 10 inches (20 to 25 centimeters) in diameter.

2.2.2.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be constructed. Therefore, the new solar photovoltaic systems and associated infrastructure would not be constructed and operated at any of the five installations, and the Navy would continue to purchase conventional power from utility providers.

The No Action Alternative does not provide progression towards national and agency energy goals; therefore, the No Action Alternative is not considered a reasonable alternative because it does not meet the purpose and need for the Proposed Action.

The No Action Alternative provides a measure of the baseline/existing conditions against which the impacts of the alternatives can be compared. In this EA, the No Action Alternative is described as the Affected Environment in Chapter 3.

2.3 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD FOR DETAILED ANALYSIS

The following alternatives were considered but not carried forward for detailed analysis in this EA, as they did not meet the purpose and need for the Proposed Action nor satisfy the reasonable alternative screening factors (Section 2.1, Reasonable Alternative Screening Factors):

2.3.1 NAF EL CENTRO

- **East Side of the Main Gate:** This alternative's location is not in proximity to a distribution substation, building switchgear, or distribution lines; therefore, this alternative is cost prohibitive.

  Because this alternative does not meet all reasonable alternative screening factors, it was not carried forward for detailed analysis.

- **Runway:** Open-space sites were examined near the runway on the installation; however, all open-space sites fell within the Clear Zone for the runway (i.e., where structures are prohibited from being built).

  Because this alternative is not consistent with land use planning at the installation, it does not meet all reasonable alternative screening factors; therefore, this alternative was not carried forward for detailed analysis.

2.3.2 NSA MONTEREY'S NAVY ANNEX

- **Ground-Mounted System within Site 1 at the Navy Annex:** This area is one of the only contractor and maintenance laydown areas for NSA Monterey. The ground-mounted system would eliminate these functions.

  Because this alternative is not consistent with land use planning at the installation, it does not meet all reasonable alternative screening factors; therefore, this alternative was not carried forward for detailed analysis.

- **Navy Annex Parking Lot for Carport-Mounted System:** The parking lot directly west of Mitcher Street and the parking lot directly north of Halsey Avenue are planned for gate relocation. The Anti-Terrorism/Force Protection setback requirements for the gate do not allow enough space for the solar photovoltaic system.

  Because this alternative is not consistent with land use planning at the installation, it does not meet all reasonable alternative screening factors; therefore, this alternative was not carried forward for detailed analysis.

2.3.3 NAVWPNSTA SEAL BEACH

- **East of Gate 9:** This location is near the intersection of Kitts Highway and Westminster Boulevard and was considered for a 5.4-acre (2.2-hectare), 4.16-kilovolt ground-mounted system; however, it was found to be located within Unexploded Ordnance Site 6. This site cannot be considered for development until it is remediated or evaluated to have no risk for development.

  Because this alternative is not consistent with land use planning at the installation, it does not meet all reasonable alternative screening factors; therefore, this alternative was not carried forward for detailed analysis.

- **Agricultural Area:** A 6.2-acre (2.5-hectare) area adjacent to Bolsa Chica Road was considered for a ground-mounted system; however, the area was found to be within explosive safety arcs. The site-approval process would also require a high liability on the contractor to be responsible for any damaged equipment due to an explosive incident. This alternative is not economically viable due to the associated risk of liability.

  Because this alternative's benefits would not outweigh its costs, it does not meet all reasonable alternative screening factors; therefore, this alternative was not carried forward for detailed analysis.

2.3.4 NAVWPNSTA SEAL BEACH DETACHMENT NORCO

- **Ground-Mounted System at Hill A (Northwestern Side of Lake Norconian):** The site for this alternative has an adequate size (approximately 6 acres [2.4 hectares]) to accommodate a solar photovoltaic system; however, the site is situated on an uneven slope and is shaded by Hill B located to the south. In addition, the cost of construction would be unfavorable, as there are no existing power lines running to this site.

  This alternative is not in a location capable of providing electricity at or below the current cost of traditional power, its costs would outweigh its benefits, and it is not in proximity to a distribution substation, building switchgear, or distribution lines; therefore, it does not meet all reasonable alternative screening factors and was not carried forward for detailed analysis.

- **Carport-Mounted System at Parking Lot (Southeastern Side of Lake Norconian):** The site for this alternative has an adequate size (7 acres [2.8 hectares]) to accommodate a solar photovoltaic system; however, this alternative would be sited where parking rows would not allow carport-mounted panels to face south (the direction solar photovoltaic panels should face to generate the most electricity). Additionally, there would be logistical challenges for parking during construction since the proposed project site is on the installation's main parking lot. In addition, the "pay-back" to the PPA solar power developer would take an estimated 23 years.

Because this alternative is not in a location capable of providing electricity at or below the current cost of traditional power and its costs would outweigh its benefits, this alternative does not meet all reasonable alternative screening factors; therefore, this alternative was not carried forward for detailed analysis.

- **Recreational Vehicle (RV) Storage Area:** The site for this alternative is within a 10.8-acre (4.4-hectare) area where a patchwork of ground-mounted panels in flat areas could create a 1- to 1.5-megawatt system. This alternative would be within an area already encumbered by the RV Storage Area.

  Because this alternative is not consistent with land use planning at the installation, it does not meet all reasonable alternative screening factors; therefore, this alternative was not carried forward for detailed analysis.

2.3.5 NBVC PORT HUENEME

- **Rooftop-Mounted Solar Photovoltaic System at NAVSEA Buildings 1387 and 1389:** The buildings selected for this alternative are sub-metered (i.e., multiple meters downstream from the Southern California Edison demarcation point) and it would be unfeasible to direct all of the solar photovoltaic system's electricity exclusively to Buildings 1387 and 1389. A demarcation point refers to the substation (or electrical infrastructure) where electricity is transferred between the utility company's distribution lines to the customer's grid. A generation source connected to this type of demarcation point would send electricity to all of its downstream submeters and it would be impossible to differentiate whether the incoming power is from the customer's own generation source or from Southern California Edison. The Navy would be unable to use a PPA since they could not differentiate power supplies to make a fair payment to the solar power developers.

  Because this alternative is not in a location capable of providing electricity at or below the current cost of traditional power, and the system's costs would outweigh its benefits, this alternative does not meet all reasonable alternative screening factors; therefore, this alternative was not carried forward for detailed analysis.

2.4 CONSERVATION AND CONSTRUCTION MEASURES

This section presents proposed conservation and construction measures designed to avoid and/or minimize potential impacts (whether significant or less than significant) to air quality, natural resources (i.e., special-status plants and rare natural communities, common and rare wildlife, and other threatened and endangered species), cultural resources, and visual resources.

Conservation and construction measures would be implemented as part of the selected alternative and would be applied during the design, construction, and operation stages of the selected alternative to avoid and/or minimize the potential for impacts. These measures are presented in this portion of the document and are included as part of the impact analysis in Chapter 3.

2.4.1 ENVIRONMENTAL PROTECTION PLAN

The construction contractor would submit an Environmental Protection Plan for approval by the Navy prior to commencement of construction. Prior to submittal of the plan, the construction contractor would meet with the Navy for the purpose of discussing the implementation of the initial plan, and possible subsequent additions to the plan, including reporting requirements, and methods for administration of the plan.

The plan would discuss measures the contractor would take to prevent or control releases of contaminants into the air, soil, and water during construction. Specifically, the plan would address:

- Weed control;
- Management and removal of trash and rubbish;
- Human waste management;
- Air pollution controls on equipment and operations;
- Dust control;
- Application of paints and coatings;
- Fire prevention precautions;
- Recycling of project waste or demolition debris;
- Contractor parking and laydown;
- Temporary utility services;
- Limits on construction activity due to wildlife or habitat;

- Procedures if site contamination is discovered;
- Historical, archaeological, and paleontological preservation procedures;
- Clearing and grubbing;
- Equipment maintenance and fueling;
- Hazardous materials use by the contractor[19];
- Hazardous waste storage and disposal;
- Smoking plan;
- Asbestos and lead paint mitigation; and,
- Grading plan.

2.4.2 AIR QUALITY CONSERVATION MEASURES

Particulate matter emissions from construction and operations activities would be minimized through dust abatement measures, including:

- Applying soil stabilizers to disturbed, inactive portions of the project site to help bind soil together and make it less susceptible to erosion;
- Replacing ground cover in disturbed areas with tackifier[20] and/or appropriate native plant species, as appropriate;
- Watering exposed soil in disturbed areas with adequate frequency for continued moist soil;
- Suspending excavation and grading activities during periods of high wind activity; and,
- Locating staging areas as far away from sensitive receptors as practicable.

In addition, a Fugitive Dust Control Plan would be followed and would comply with the local air district rules that are in place at the time of project construction.

Vehicle exhaust emissions would be minimized by limiting idling time and scheduling construction truck trips during non-peak hours to the extent practicable to reduce peak-hour emissions.

[19] The contractor would be required to submit a Safety Data Sheet for all hazardous materials used during the project to the applicable installation's Environmental Office for review prior to commencement of work. The Safety Data Sheet would be kept at a designated location at the project site and made available to all workers during normal business hours.

[20] Tackifier is a bonding, or adhesive, agent used in landscaping applications during hydraulic seeding and for anchoring straw mulch to the soil on slopes.

2.4.3 BIOLOGICAL RESOURCES CONSERVATION MEASURES

The following conservation and construction measures would be included in the selected alternative to reduce the potential for significant impacts to sensitive biological resources.

2.4.3.1 General Biological Impact Minimization Measures

1. For sites where ground-mounted solar photovoltaic systems are proposed (i.e., NAF El Centro, NAVWPNSTA Seal Beach, and NAVWPNSTA Seal Beach Detachment Norco) on-going vegetation maintenance would be conducted by the contractor to ensure uninterrupted energy production. Additionally, unapproved vegetation clearing or grading outside and within the vicinity of the approved project footprints would be reported to the Navy Project Manager within 24 hours of discovery. The designated work area flagging and erosion control best management practices would be checked regularly, including within 24 hours of any storm event, and maintained throughout the construction phase. Topsoil would be retained and reused in the revegetation of temporary disturbance areas.

2. To minimize potential impacts to wildlife, best available science and appropriate design specifications will be used and implemented during construction.

3. During site maintenance, the solar photovoltaic system project sites would be monitored for potential impacts to wildlife (birds, small mammals, reptiles/ amphibians).

4. All light posts and permanent nighttime lighting associated with the project would be selected to provide the lowest illumination possible while still allowing for safe operations. To prevent disturbance to sensitive natural resources, the lighting would be set up at the lowest height possible and would be shielded so that it would be directed only toward areas needing illumination.

5. To reduce perching by raptors and other birds, all light posts and tall structures would be designed to prevent perching and/or would be equipped with spike strips. Where there are carports within a project site, spike strips would be installed to prevent birds from perching on these structures.

6. To avoid attracting predators during construction, the project site would be kept clean of debris by the solar panel array developer, as much as feasible.

7. All vehicle traffic would be restricted to construction areas and currently established dirt or paved roads. No off-road vehicle use would be permitted.

8. To minimize impacts to non-avian wildlife, pits and trenches would have wildlife escape ramps or would be covered when not in use.

9. Construction activities at NAVWPNSTA Seal Beach would only take place during daylight hours (sunrise to sunset), and no lighted nighttime work would be permitted in proximity to the Seal Beach Natural Wildlife Refuge.

2.4.3.2 Avoidance of Nesting Birds

The Migratory Bird Treaty Act protects migratory birds and their nests, eggs, young, and parts from possession, sale, purchase, barter, transport, import, export, and take. For purposes of the Migratory Bird Treaty Act, "take" is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect" (50 CFR 10.12). The Migratory Bird Treaty Act applies to migratory birds that are identified in 50 CFR 10.13. The nesting season begins when the first nest or nest start is discovered, and ends when the last nest is confirmed to be inactive. However, the actual nesting season varies depending on regional weather conditions. Generally, the avian breeding season in California is recognized as the interval from February 1 to August 31. To reduce the risk of take of nesting birds protected under the MBTA, mowing, clearing, and grading of vegetated areas would be conducted during the non-breeding season (September through January), when feasible. If mowing, clearing, or grading of vegetated areas must occur during the breeding season (February through September), a nest search survey would be conducted no more than 72 hours prior to these activities. Trees in and within 200 feet (61 meters) of the project sites would be searched for active nests. Any active nests found during the survey would be provided with a buffer (the size of the buffer would be determined based on each situation by the applicable installation wildlife biologist) and avoided until the birds have fledged. No nighttime construction (including the use of lighting) would occur during the aforementioned nesting seasons.

2.4.3.3 Minimize Impacts to Burrowing Owl and its Burrows

The NAF El Centro site is inhabited by the western burrowing owl (*Athene cunicularia hypugaea*), a California species of special concern that is protected under the Migratory Bird Treaty Act. Before commencement of construction, a qualified biologist would survey the site to locate all active burrows.

If burrowing owls and their habitat can be protected in place on or adjacent to the project site, the use of buffer zones, visual screens, or other measures would be utilized to minimize disturbance impacts from project activities. During the burrowing owl breeding season at NAF El Centro (February 1 through August 31), no construction or other disturbance would occur within the buffer distance prescribed in the California Department of Fish and Game (CDFG) 2012 Staff Report on Burrowing Owl Mitigation (CDFG 2012).

At NAVWPNSTA Seal Beach, a maximum of three pairs of burrowing owls were reported in 2013 as residents at the installation (Navy 2014f). In addition, anecdotal reports,

later confirmed by the installation biologist, indicate recent occupation of burrowing owls at NAVWPNSTA Seal Beach Detachment Norco (Navy 2013h). Pre-construction surveys would be conducted at the sites by a qualified biologist within 30 days prior to ground disturbance to avoid direct take of burrowing owls. If burrowing owls or active burrows are found within the project footprints at NAVWPNSTA Seal Beach and/or NAVWPNSTA Seal Beach Detachment Norco before or during construction, similar conservation and construction measures to those described for NAF El Centro would be followed and would be coordinated with the installation's natural resource specialist, as appropriate.

2.4.4 CULTURAL RESOURCES CONSERVATION MEASURES

Cultural resource surveys have been performed in the project sites for NAF El Centro, NAVWPNSTA Seal Beach, and Detachment Norco. The project sites at NSA Monterey occur in areas that are not available for survey (i.e., paved or on existing buildings), and the project site at NBVC Port Hueneme is in an area of fill (refer to Section 3.3). In paved areas at NSA Monterey, where intensive survey efforts are not possible, and at NBVC Port Hueneme, all excavation would be monitored by a qualified archaeologist.

If potential subsurface archaeological deposits are detected during construction, whether by the monitors at NSA Monterey or NBVC Port Hueneme or by construction personnel at the other installations, all work in the discovery area would cease until an archaeologist could provide input regarding the significance of the resource. The Navy Cultural Resources Manager would be contacted immediately to provide direction regarding the potential resource. The potential resource would be evaluated against the eligibility criteria for inclusion on the National Register of Historic Places (NRHP) and, if it is found to be eligible, a treatment plan detailing either preservation in-place or mitigation of impacts through data recovery would be developed and implemented.

2.4.5 VISUAL RESOURCES

The following conservation and construction measures would be included in the selected alternative to avoid and/or minimize potential glare and color contrast, and to minimize and avoid potential glare from carport lighting that could result from implementation of the project.

2.4.5.1 Use and Maintain Color-Treated Solar Collectors and Support Structures

To minimize potential glare, surface finishes of the metal support poles, metal panel housing, and support structures would be treated to have a dull finish consisting of medium to dark earth-tone colors with very low light reflectivity. Selected colors would blend the metal elements with their surroundings by matching or complementing the predominant colors of nearby vegetation, material surfaces, or structures. Additionally, the surfaces of the color-

treated solar collectors and support structures would be maintained, as necessary, by the PPA solar power developer.

2.4.5.2 Lights on Carport Structures

To minimize potential glare and avoid introducing a new substantial source of light into the surrounding landscape, lights installed on the carport structures at NSA Monterey and NBVC Port Hueneme would be shielded and directed downward.

2.4.5.3 Plantings

To fully screen views of Area 2 at NAVWPNSTA Seal Beach Detachment Norco, two rows of plantings (e.g., shrubs and/or small trees) would be installed: one along the northern edge of the project site and one along the southern edge of the parking lot.

2.4.6 GENERAL CONSERVATION MEASURES

2.4.6.1 Storm Water Pollution Prevention Plans and Spill Prevention Plans

Since the project's construction phase would disturb more than 1.0 acre (0.4 hectare) at each of the installations (NAF El Centro, NSA Monterey, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme), coverage under the National Pollution Discharge Elimination System General Permit for Discharges of Storm Water Associated with Construction Activity ("General Permit") would be required prior to project construction. The General Permit is issued by the California Environmental Protection Agency's (Cal/EPA's) State Water Resources Control Board for construction-related discharges as regulated by the State Water Resources Control Board pursuit to Water Quality Order 2009-009-DWQ. As part of the permit, a Storm Water Pollution Prevention Plan (SWPPP) would be developed by the construction contractor for each of the installations. The SWPPPs would incorporate best management practices and would be submitted to the Contracting Officer and made available to state and local agencies, as required. In addition, the project would also meet permit post-construction requirements and Energy Independence and Security Act storm water requirements, as applicable.

For the NAF El Centro, NSA Monterey, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme sites, the construction contractor would be required to prepare the Notice of Intent for the SWPPP and pay appropriate National Pollutant Discharge Elimination System fees and surcharges to the State Regional Water Quality Control Board in order to obtain a waste discharge number for the selected alternative. At the completion of work, the construction contractor would prepare and file a Notice of Termination.

In addition to the SWPPPs, the construction contractor would be required to prepare a spill response plan for each project site. The spill response plans would address basic items, such as contacting the installation dispatcher in the event of a large spill or the environmental department in the event of a small spill. The spill response plans would also address the requirements to incorporate best management practices (e.g., placing drip pans under any diesel tanks, conducting training, and using appropriate personal protective equipment in accordance with material safety data sheets).

2.4.6.2 Erosion Control

As a federal land owner, the Navy is required to control and prevent soil erosion from activities on it properties by implementing conservation measures (Soil Conservation Act, 16 U.S.C. § 5901). A grading plan would be prepared by the contractor for each installation and approved by the installations' Environmental Departments. Erosion control practices, as outlined in the SWPPPs, would be inspected and reviewed frequently and revised as required to accommodate current construction phasing and conditions. The construction contractor for each installation would submit an Erosion and Sediment Control Inspection Report (on a form provided at the preconstruction conference or included within the SWPPP) to the Contracting Officer once every seven days and within 24 hours of a storm event producing 0.5 inch (1.3 centimeters) or more of rain.

For each installation, the construction contractor would prepare and implement a soil erosion and sedimentation control plan prior to commencement of land disturbance activities to ensure project compliance with the Soil Conservation Act. The soil erosion and sedimentation control plan would incorporate structural erosion control measures such as silt fence, erosion control fabric, seed-free certified straw bales and temporary construction entrances. The contractor supervisor would be in charge of overseeing the installation and removal of erosion control measures, unless the device is designed to remain in place post-construction (e.g., erosion control fabric).

Revegetation with native species would occur in areas of cleared vegetation, as appropriate. Revegetation efforts would be coordinated with and approved by the applicable installation Natural Resources staff or by the Navy Region Southwest biologist if the installation does not have a biologist. Top soil would be retained and re-used in revegetation of temporary disturbance areas.

To minimize erosion potential during project construction, parking and driving would be restricted to designated areas, and no off-road vehicular traffic, including parking or driving in undisturbed areas, would be allowed.

2.4.6.3 Solid Waste Management Plan

For each installation, the construction contractor would develop a Solid Waste Management Plan to ensure that the Navy's recycling and solid waste diversion goals are included during construction of the project. Construction contractors would be required to recycle construction materials, to the maximum extent possible. Non-hazardous waste and debris would be disposed of at local Class III landfills. Hazardous wastes would be recycled or managed and disposed of in accordance with the Hazardous Waste Management Plan (Section 2.4.6.4).

2.4.6.4 Hazardous Waste Management Plan

For each installation, the construction contractor would submit a Hazardous Waste Management Plan for approval by the Contracting Officer prior to commencement of construction activities. This plan may be included as part of the overall Environmental Protection Plan. Management and disposal of hazardous waste would comply with applicable federal, state, and local regulations.

Prior to shipment of any material offsite, the construction contractor, in consultation with the Contracting Officer and the installation's Environmental Hazardous Waste Program Manager, would evaluate whether the material is regulated as a hazardous waste in addition to being regulated as a hazardous material; this evaluation would be conducted for the purpose of determining proper shipping descriptions, labeling requirements, etc. by the contractor.

Hazardous wastes would be recycled or managed and properly disposed of in a licensed Class I or II waste disposal facility authorized to accept the waste. Some hazardous wastes would be recycled, including used oils from equipment maintenance and oil-contaminated materials, such as spent oil filters, rags, or other cleanup materials. Used oil would be recycled, and oil- or heavy metal-contaminated materials (e.g., filters) requiring disposal would be disposed of in a Class I waste disposal facility.

The construction contractor would minimize the generation of hazardous waste to the maximum extent practicable. The construction contractor would take all necessary precautions to avoid mixing clean and contaminated wastes. The construction contractor would identify and evaluate recycling and reclamation options as alternatives to land disposal. All transportation-related shipping documents (e.g., draft hazardous waste manifests, draft land disposal restriction notifications, draft asbestos waste shipment records, draft manifests for polychlorinated biphenyls, draft bills of lading for hazardous materials, waste profiles, and supporting waste analysis documents) would be provided to the Contracting Officer for review and signature a minimum of 14 days prior to anticipated pickup.

Packaging assurances would be furnished prior to transporting hazardous materials. “Generator copies” of hazardous waste manifests, land disposal restriction notifications, asbestos waste shipment records, “generator copies” of manifests used for initiating shipments of polychlorinated biphenyls, bills of lading, and supporting waste analysis documents would be furnished when shipments are originated. “Receipt copies” of hazardous waste manifests, polychlorinated biphenyls manifests, and asbestos waste shipment records at the designated disposal facility would be furnished no later than 35 days after acceptance of the shipment.

The construction contractor would be required to coordinate shipments with each installation’s Environmental Department and would properly manage and dispose of hazardous waste per applicable federal, state, and local environmental regulations, including stipulations per the installation’s 90-day hazardous waste accumulation sites as directed under their hazardous waste management program.

2.4.6.5 Health and Safety Plan

The construction contractor would submit a Health and Safety Plan for approval by the Contracting Officer prior to commencement of construction activities. The Health and Safety Plan for the project would address site-specific health and safety issues, including specific emergency response services and procedures and evacuation measures. All project construction activities would be conducted in accordance with the approved Health and Safety Plan.

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3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

RESOURCES ANALYZED IN DETAIL

The environmental setting and potential environmental impacts associated with implementation of the Proposed Action and alternatives are presented and compared in Table 3-1. Detailed descriptions for each resource area and potential environmental consequences are provided in the sections that follow.

TERMINOLOGY USED IN THE ENVIRONMENTAL IMPACT ANALYSIS TO DEFINE IMPACTS

The Council on Environmental Quality NEPA regulations define the impacts and effects that must be addressed and considered by federal agencies in satisfying the requirements of the NEPA process. Impacts can be either permanent or temporary in duration. Terminology used in the environmental impact analysis relative to these impact types are briefly described below.

Permanent Impacts: Permanent impacts result in irreversible actions that modify the affected environment. Permanent impacts may include, but are not limited to, the removal or permanent modification of habitat, such as the replacement of natural habitat with an impervious surface (e.g., paved road), or the grading of an area, which would permanently alter the drainage, slope, and aspect of an area and, therefore, the type of habitat that could be supported.

Temporary Impacts: Temporary impacts have reversible effects to the existing environment. Temporary impacts may include, but are not limited to, the generation of fugitive dust during construction activities, or the temporary damage, modification, or removal of existing habitat where the existing habitat can be replaced or rehabilitated successfully.

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Table 3-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
Air Quality	**NAF El Centro**.....No Significant Impacts **NSA Monterey** .....No Significant Impacts **NAVWPNSTA Seal Beach** .....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme** .....No Significant Impacts	**NAF El Centro** .....No Significant Impacts **NSA Monterey**.....No Significant Impacts **NAVWPNSTA Seal Beach**.....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** .....No Significant Impacts **NBVC Port Hueneme**.....No Significant Impacts	**NAF El Centro**..... No Significant Impacts **NSA Monterey**..... No Significant Impacts **NAVWPNSTA Seal Beach**..... No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** ..... No Significant Impacts **NBVC Port Hueneme**..... No Significant Impacts
	The following analysis relates to all installations listed above, unless a specific installation is called out by name. **Construction Emissions** Construction activities would generate minor, short-term emissions, such as fugitive dust emissions from grading activities and exhaust emissions from construction equipment and vehicles used during the installation of the solar photovoltaic panel arrays and electrical lines. Conservation and construction measures (i.e., dust abatement measures), would be followed at all of the installations to further minimize construction emissions, to the extent practicable. **Operation Emissions** Minor amounts of similar types of fugitive dust and exhaust emissions would be generated by the operation of ground vehicles during periodic maintenance of the solar photovoltaic systems. Emission reductions realized by reduced consumption of grid-supplied electricity would more than offset the short-term construction emissions within the first year of operation. Long-term operation of the solar photovoltaic systems would also avoid potential emissions produced from conventional non-renewable energy generating sources in the project areas. Total construction and operation emissions would be below the *de minimis* thresholds and overall, would result in beneficial effects to air quality. Therefore, no significant impacts to air quality would result from construction or operation emissions associated with implementation of Alternative 1.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* **Construction Emissions** Emissions under Alternative 2 would result in the same localized area and timeframe as those described under Alternative 1. Alternative 2 would generate similar amounts of air pollutant emissions during construction and operation of the project as noted for Alternative 1; however, for NAF El Centro, Alternative 2 would have a slightly smaller project footprint and fewer emissions would result at that location with this alternative. As with Alternative 1, Conservation and construction measures (i.e., dust abatement measures), would be followed at all of the installations to further minimize construction emissions, to the extent practicable. **Operation Emissions** As with Alternative 1, emission reductions realized under Alternative 2 by reduced consumption of grid-supplied electricity would offset the short-term construction emissions within the first year of project operation. Long-term operation of the solar photovoltaic systems would also avoid potential emissions produced from conventional non-renewable energy generating sources in the project areas. Total construction and operation emissions would be below the *de minimis* thresholds and overall, would result in beneficial effects to air quality, Therefore, no significant impacts to air quality would result from construction or operation emissions associated with implementation of Alternative 2.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* With the No Action Alternative, no solar photovoltaic systems would be constructed, and consumption of grid-supplied electricity would remain unchanged. Without construction or operation of the systems, there would be no emissions associated with those activities; however, emissions reductions due to reduced consumption of grid-supplied electricity would not be realized. Therefore, no significant impacts to air quality would result from implementation of the No Action Alternative.

Table 3-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
Biological Resources	**NAF El Centro**.....No Significant Impacts **NSA Monterey** .....No Significant Impacts **NAVWPNSTA Seal Beach** .....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme** .....No Significant Impacts	**NAF El Centro** .....No Significant Impacts **NSA Monterey**.....No Significant Impacts **NAVWPNSTA Seal Beach**.....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** .....No Significant Impacts **NBVC Port Hueneme**.....No Significant Impacts	**NAF El Centro**..... No Significant Impacts **NSA Monterey**..... No Significant Impacts **NAVWPNSTA Seal Beach**..... No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** ..... No Significant Impacts **NBVC Port Hueneme**..... No Significant Impacts
	The following analysis relates to all installations listed above, unless a specific installation is called out by name. **Vegetation Communities** Long-term minor impacts from removal of vegetation for construction of ground-mounted solar photovoltaic systems at NAF El Centro and NAVWPNSTA Seal Beach Detachment Norco because the project sites are proposed in previously disturbed areas. No long-term impacts to vegetation at NSA Monterey's Main Site and Navy Annex, and NBVC Port Hueneme because the solar photovoltaic systems would be installed on top of newly constructed carports or on rooftops of existing buildings. Temporary, minor impacts from trenching for electrical conduit and transmission line installation between solar arrays and points of connection to the existing electrical grid at all project sites. Trenched areas would be restored to their original condition following installation. **Federally Listed Species** Alternative 1 would have no effect on federally listed species because there is no suitable habitat available within the project sites for these species; therefore, implementation of Alternative 1 would not result in significant impacts to federally listed wildlife. **State Listed Species** Alternative 1 would have no impacts on state listed species because there is no suitable habitat within the project sites for these species. **Wildlife** Alternative 1 would result in the long-term loss of upland habitat from installation of ground-mounted solar photovoltaic systems at NAF El Centro, NAVWPNSTA Seal Beach, and NAVWPNSTA Seal Beach Detachment Norco. Individuals of less-mobile small mammal, reptile, and amphibian species could be impacted by site preparation. In addition, individuals of burrowing and subterranean species could be impacted by compaction and grading of soils during construction. More mobile species would be expected to move into surrounding areas with suitable habitat. Impacts would be minor due to the relatively small size of the impacted area and amount of habitat in	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* **Vegetation Communities** Similar to Alternative 1, long-term minor impacts to vegetation communities would result from implementation of Alternative 2 at NSA Monterey's Main Site, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme. Impacts to vegetation communities at NAF El Centro would be similar to, but slightly less than, impacts associated with Alternative 1 because a smaller area would be impacted with Alternative 2. Impacts to vegetation communities at NSA Monterey's Navy Annex would be similar to Alternative 1 because all sites would be the same, except for Site 1, which would be excluded from Alternative 2. At NAVWPNSTA Seal Beach, a ground-mounted solar photovoltaic system would be installed within an agricultural outlease area. Because this area is regularly disturbed (e.g., plowed) for crop production, no impacts to vegetation would occur at the site. **Federally Listed Species** Alternative 2 would have no effect on federally listed species because there is no suitable habitat available within the project sites for these species; therefore, implementation of Alternative 1 would not result in significant impacts to federally listed wildlife. **State Listed Species** Alternative 2 would have no impacts on state listed species because there is no suitable habitat within the project sites for these species. **Wildlife** Impacts to wildlife under Alternative 2 at NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme would be the same as described for Alternative 1. Less-mobile species could be impacted by site preparation, burrowing and subterranean species could be impacted by compaction and grading, and more mobile species would be expected to relocate to surrounding areas. To minimize	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* Under the No Action Alternative, the Proposed Action would not be implemented. The No Action Alternative would result in no changes to existing conditions; therefore, the No Action Alternative would result in no significant impacts to vegetation communities, threatened and endangered species, wildlife, or wetlands and waters of the United States.

Table 3-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
	surrounding areas. To minimize potential impacts to wildlife, best available science and appropriate design specifications will be used and implemented during construction. Alternative 1 would result in avian species being impacted or displaced through loss of nests and nest structures, disturbance, and loss of foraging and nesting habitat at NAF El Centro, NAVWPNSTA Seal Beach, and NAVWPNSTA Seal Beach Detachment Norco. Site preparation would be conducted during the non-breeding season, where practicable. If site preparation is conducted during the breeding season, a nest survey would be conducted and buffers would be established to protect nesting birds. Noise and human activity associated with construction during other times of the year have the potential to temporarily displace individuals of avian species locally and interfere with roosting and foraging activities. Birds would be expected to resume use of the surrounding area after construction. Suitable habitat occurs in the surrounding areas therefore, the long-term removal of upland habitat would have a minor impact to birds from habitat loss and displacement. In addition, measures to protect burrowing owls and their burrows would be implemented for these three installations. Although unlikely, ground-mounted solar photovoltaic systems at NAF El Centro, NAVWPNSTA Seal Beach, and NAVWPNSTA Seal Beach Detachment Norco may contribute to lake effect, or the phenomenon whereby birds are injured or killed attempting to land on solar panels they perceive as a body of water. However, due to the small size of the projects, this impact is unlikely to be significant. Impacts to wildlife at NSA Monterey's Main Site and Navy Annex and NBVC Port Hueneme would be minor from temporary displacement of individuals during construction from areas surrounding the proposed sites. Trenching for installation of electrical conduit and transmission lines could result in minor impacts to individuals of less-mobile wildlife species at all project sites. Disturbed areas would be restored to their original condition following construction, resulting in no long-term impacts. **Wetlands and Waters of the United States** Alternative 1 would have no impacts to wetlands or waters of the United States at any project sites because these features do not occur within the sites. A drainage swale within Area 2 at NAVWPNSTA Seal Beach Detachment Norco would be avoided during development of the panel arrays resulting in no impact. A soil erosion and sedimentation plan would be prepared and implemented by the contractor. Therefore, no significant impacts to biological resources would result from implementation of Alternative 1.	potential impacts to wildlife, best available science and appropriate design specifications will be used and implemented during construction. With Alternative 2, avian species would be impacted or displaced through loss of nests and nest structures, disturbance, and loss of foraging and nesting habitat at NAF El Centro, NAVWPNSTA Seal Beach, and NAVWPNSTA Seal Beach Detachment Norco. Impacts to wildlife at NAF El Centro would be similar to, but slightly less than, Alternative 1 because a smaller area would be impacted with Alternative 2. Under Alternative 2 at NAVWPNSTA Seal Beach, a ground-mounted solar photovoltaic system would be installed within area previously disturbed area bordered by tall shrubs and low trees; however, impacts to wildlife under Alternative 2 would be similar to those under Alternative 1. **Wetlands and Waters of the United States** Impacts to wetlands or waters of the United States from implementation of Alternative 2 at NAF El Centro, NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme would be the same as those described under Alternative 1. A soil erosion and sedimentation plan would be prepared and implemented by the contractor. Therefore, no significant impacts to biological resources would result from implementation of Alternative 2.	

Table 3-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
Cultural Resources	**NAF El Centro**.....No Significant Impacts **NSA Monterey** .....No Significant Impacts **NAVWPNSTA Seal Beach** .....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme** .....No Significant Impacts	**NAF El Centro** .....No Significant Impacts **NSA Monterey**.....No Significant Impacts **NAVWPNSTA Seal Beach**.....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** .....No Significant Impacts **NBVC Port Hueneme**.....No Significant Impacts	**NAF El Centro**..... No Significant Impacts **NSA Monterey**..... No Significant Impacts **NAVWPNSTA Seal Beach**..... No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** ..... No Significant Impacts **NBVC Port Hueneme**..... No Significant Impacts
	The following analysis relates to all installations listed above, unless a specific installation is called out by name. **Recorded Historic Properties or Other Cultural Resources** No recorded historic properties or other cultural resources are located within the area of potential effect at the Alternative 1 project sites. Two historic districts are located near NSA Monterey's Main Site area of potential effect; however, the proposed project site at this base is outside the boundaries of these historic districts. A historic district is also present at NAVWPNSTA Seal Beach Detachment Norco, but the proposed project site at this installation is outside the boundaries of the historic district. Minor impacts to the viewshed of the district may occur, but these would not be significant. Although no effects on historic properties and no significant impacts to known cultural resources at the installations would occur with implementation of Alternative 1, conservation and construction measures would be employed to further reduce or entirely avoid impacts to any previously unknown, subsurface archaeological deposits that could be disturbed during construction at the installations. These measures would include cultural resources monitoring at NSA Monterey and NBVC Port Hueneme during construction activities. Therefore, no significant impacts to recorded historic properties or other cultural resources would result from implementation of Alternative 1.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* **Recorded Historic Properties or Other Cultural Resources** No recorded historic properties or other cultural resources are located within the area of potential effect at the Alternative 2 project sites. NAF El Centro would have a slightly smaller project footprint for Alternative 2; however, the area of potential effect would remain the same as Alternative 1. Two historic districts are located near NSA Monterey's Main Site area of potential effect; however, the proposed project site at this base is outside the boundaries of these historic districts. For NAVWPNSTA Seal Beach, Alternative 2 would be located in a different area on the installation than for Alternative 1; however, no archeological resources were identified during a survey at the Alternative 2 site. Although no effects on historic properties and no significant impacts to known cultural resources at the installations would occur with implementation of Alternative 1, conservation and construction measures would be employed to further reduce or entirely avoid impacts to any previously unknown, subsurface archaeological deposits that could be disturbed during construction at the installations. These measures would include cultural resources monitoring at NSA Monterey and NBVC Port Hueneme during construction activities. Therefore, no significant impacts to recorded historic properties or other cultural resources would result from implementation of Alternative 2.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* Under the No Action Alternative, the solar photovoltaic systems would not be constructed. As there would be no construction associated with this alternative, recorded historic properties or other cultural resources would not be affected by the No Action Alternative, and currently unknown subsurface cultural resources sites would not be inadvertently disturbed with this alternative. Therefore, no significant impacts to recorded historic properties or other cultural resources would result from implementation of the No Action Alternative.

Table 3-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
Land Use	**NAF El Centro**.....No Significant Impacts **NSA Monterey** .....No Significant Impacts **NAVWPNSTA Seal Beach** .....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme** .....No Significant Impacts	**NAF El Centro** .....No Significant Impacts **NSA Monterey**.....No Significant Impacts **NAVWPNSTA Seal Beach**.....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** .....No Significant Impacts **NBVC Port Hueneme**.....No Significant Impacts	**NAF El Centro**..... No Significant Impacts **NSA Monterey**..... No Significant Impacts **NAVWPNSTA Seal Beach**..... No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** ..... No Significant Impacts **NBVC Port Hueneme**..... No Significant Impacts
	The following analysis relates to all installations listed above, unless a specific installation is called out by name. **Land Use Changes and Incompatible Land Use** At NSA Monterey, NAVWPNSTA Seal Beach, and NBVC Port Hueneme, the project would be in alignment with the land use designations from the applicable installation's Activity Overview Plan for these the sites; therefore, the project would not introduce any incompatible land use activities at these installations. At NAVWPNSTA Seal Beach Detachment Norco, the project would not conflict with a land use designation for the site since there is no applicable Navy land use plan for the installation. At NAF El Centro, a permanent land use change from historic agricultural use to renewable energy development is proposed; however, development of the NAF El Centro site for electrical energy generation would be compatible with the adjacent uses on the installation (e.g., utility, residences, and aircraft operations) and the planned land use for the site (Utilities), as designated by the NAF El Centro Master Plan. Implementation of Alternative 1 would not change any land use patterns or land ownership in the project areas, and all sites would remain under Navy use. Therefore, no significant impacts to land use would result from implementation of Alternative 1.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* **Land Use Changes and Incompatible Land Use** Under Alternative 2, impacts to land use would be similar to those described for Alternative 1. The Navy would discontinue the agricultural outlease at NAF El Centro for a slightly smaller area than would be discontinued under Alternative 1; however, this renewable energy development would still be compatible with the adjacent utility uses on the installation. At NAVWPNSTA Seal Beach, the Alternative 2 project site would be in a different location at the installation; however, the project would still be compatible with the land use designation for this area, as defined in the Seal Beach Activity Overview Plan. Therefore, no significant impacts to land use would result from implementation of Alternative 2.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* Under the No Action Alternative, the solar photovoltaic systems would not be constructed; therefore, no land use changes or incompatible development at the installations would result from implementation of this alternative. Therefore, no significant impacts to land use would result from implementation of the No Action Alternative.

Table 3-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
Socioeconomics	**NAF El Centro**.....No Significant Impacts **NSA Monterey** .....No Significant Impacts **NAVWPNSTA Seal Beach** .....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme** .....No Significant Impacts	**NAF El Centro** .....No Significant Impacts **NSA Monterey**.....No Significant Impacts **NAVWPNSTA Seal Beach**.....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** .....No Significant Impacts **NBVC Port Hueneme**.....No Significant Impacts	**NAF El Centro**..... No Significant Impacts **NSA Monterey**..... No Significant Impacts **NAVWPNSTA Seal Beach**..... No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** ..... No Significant Impacts **NBVC Port Hueneme**..... No Significant Impacts
	The following analysis relates to NAF El Centro only. **Population** With Alternative 1, there would be no increase in military or civilian area populations in the NAF El Centro vicinity. Local contractors would travel to the project site for project construction, and local contractors would also be used for project maintenance during project operation. **Employment and Income** Ten acres (4 hectares) of an agricultural outlease would be discontinued as part of Alternative 1; however, local agricultural workers farm a number of fields in the area and do not solely depend on this site for employment, and no job losses would occur. In addition, 10 to 12 local workers would be employed for the approximately four-month construction period. **Housing** Because there would be no increase in area military or civilian populations in the NAF El Centro vicinity, and because local contractors would travel to the project site for construction and project maintenance activities, there would be no increased housing demands as part of Alternative 1. **Environmental Justice** Alternative 1 would be constructed within the boundary of NAF El Centro, which is designated for military use, and would not be in proximity to minority or low-income housing areas. In addition, Alternative 1 would not result in significant adverse impacts to human health or the environment. An on-installation family housing development and Child Development Center and Youth Center are within 0.2 mile (0.32 kilometer) from Alternative 1; however, Alternative 1 would not result in disproportionately high or significant adverse impacts to environmental health or safety risks to children. Therefore, no significant impacts to socioeconomics, including population, employment and income, housing, and environmental justice, would result from implementation of Alternative 1.	*The following analysis relates to NAF El Centro only.* **Population** Similar to Alternative 1, implementation of Alternative 2 would not increase area populations in the NAF El Centro vicinity because local contractors would travel to the project site for construction and project maintenance activities. **Employment and Income** While the project site for Alternative 2 at NAF El Centro would be slightly smaller in size (8 acres [3.2 hectare] as compared to 10 acres [4 hectares]), the same agricultural outlease area would be discontinued as part of Alternative 1. However, as discussed for Alternative 1, local agricultural workers farm a number of fields in the area, and no job losses would occur. In addition, 10 to 12 local workers would be employed for the approximately four-month construction period. **Housing** There would be no increase in area military or civilian populations in the NAF El Centro vicinity with Alternative 2. Local contractors would travel to the project site for construction and project maintenance activities, therefore, there would be no increased housing demands as part of Alternative 2. **Environmental Justice** Alternative 2 would be constructed on the installation at NAF El Centro at the same location as Alternative 1. Similar to Alternative 1, Alternative 2 would not result in disproportionately high or significant adverse impacts to environmental health or safety risks to children at the on-installation family housing development or Child Development Center and Youth Center. Therefore, no significant impacts to socioeconomics, including population, employment and income, housing, and environmental justice, would result from implementation of Alternative 2.	*The following analysis relates to NAF El Centro only.* Under the No Action Alternative, the solar photovoltaic systems would not be constructed; therefore, there would be no changes to population, employment, housing, or environmental justice resulting from this alternative. Therefore, no significant impacts to socioeconomics, including population, employment and income, housing, and environmental justice, would result from implementation of the No Action Alternative.

Table 3-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
Utilities	**NAF El Centro**.....No Significant Impacts **NSA Monterey** .....No Significant Impacts **NAVWPNSTA Seal Beach** .....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme** .....No Significant Impacts	**NAF El Centro** .....No Significant Impacts **NSA Monterey**.....No Significant Impacts **NAVWPNSTA Seal Beach**.....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** .....No Significant Impacts **NBVC Port Hueneme**.....No Significant Impacts	**NAF El Centro**..... No Significant Impacts **NSA Monterey**..... No Significant Impacts **NAVWPNSTA Seal Beach**..... No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** ..... No Significant Impacts **NBVC Port Hueneme**..... No Significant Impacts
	The following analysis relates to all installations listed above, unless a specific installation is called out by name. **Natural Gas** Under Alternative 1, natural gas services would not be required for project construction or operation. **Water** Alternative 1 would involve the temporary use of water during construction for dust suppression and during operation for panel washing. Water required for these purposes would be supplied to the sites via water trucks by the construction contractor (during construction) and by the solar power developer (during operations). **Wastewater** Alternative 1 would temporarily generate wastewater during construction due to worker use of onsite portable toilets; the wastewater would be removed from each site and disposed of at local treatment facilities having the capacity to receive the waste. **Solid Waste** For Alternative 1, the small volumes of solid waste temporarily generated during project construction and periodically generated during maintenance would be transported offsite to solid waste facilities having adequate capacity to accept the waste. **Electricity Delivery** Alternative 1 would install an approximately 650-kilowatt ground-mounted solar photovoltaic system at NAF El Centro. At NSA Monterey's Main Site and Navy Annex, carport- and rooftop-mounted solar photovoltaic panel arrays and associated infrastructure would be installed. The Main Site system would generate 1 megawatt of electricity and the Navy Annex would generate 500 kilowatts of electricity. In addition, the rooftop-mounted systems at NSA Monterey's Main Site and Navy Annex would provide a reliable source of power to the buildings they service in the event that the local provider experiences an electrical outage. An approximately 500-kilowatt ground-mounted solar photovoltaic system would be installed at NAVWPNSTA Seal Beach. Ground-mounted solar photovoltaic systems in Area 1 and/or Area 2	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* **Natural Gas** Under Alternative 2, natural gas services would not be required for project construction or operation. **Water** Similar to Alternative 1, Alternative 2 would use of water during construction for dust suppression and during operation for panel washing. Water required for these purposes would be supplied to the sites via water trucks by the construction contractor (during construction) and by the solar power developer (during operations). **Wastewater** Under Alternative 2, wastewater would be temporarily generated during construction for onsite portable toilets and removed and disposed of at local treatment facilities having the capacity to receive the waste. **Solid Waste** Similar to Alternative 1, small volumes of solid waste generated during project construction and maintenance for implementation of Alternative 2 would be transported offsite to solid waste facilities having adequate capacity to accept the waste. **Electricity Delivery** Alternative 2 would install an approximately 300-kilowatt ground-mounted solar photovoltaic system at NAF El Centro, which would be smaller than the system installed under Alternative 1. At NSA Monterey's Main Site and Navy Annex, carport- and rooftop-mounted solar photovoltaic panel arrays and associated infrastructure would be installed at the same sites as described for Alternative 1; however, Site 1 at the Navy Annex would be excluded from this alternative and result in a smaller amount of electricity being produced as compared to Alternative 1. For Alternative 2, an approximately 500-kilowatt ground-mounted solar photovoltaic system would be installed at a different location at NAVWPNSTA Seal Beach when compared to Alternative 1; however, both alternatives would generate the same amount of electricity. For NAVWPNSTA Seal Beach Detachment Norco and NBVC Port Hueneme, the	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* Under the No Action Alternative, the solar photovoltaic systems would not be constructed. No natural gas, water, wastewater or solid waste services would be required for implementing this alternative, and the Navy would continue to purchase its power from local utility providers. Therefore, no significant impacts to utilities would result from implementation of the No Action Alternative; however, the Navy would not realize any energy cost savings and this alternative does not provide progression towards the Navy's renewable energy goals.

Table 3-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
	at NAVWPNSTA Seal Beach Detachment Norco would be installed to produce a combined total of up to 1,500 kilowatts of electricity. For NBVC Port Hueneme, an approximately 300-kilowatt carport-mounted solar photovoltaic system would be installed. These systems would ultimately reduce the electrical demand from the local public utilities, thereby helping the Navy reach its renewable energy goals and reducing the amount of money the installations pay for electricity. Overall, implementation of Alternative 1 would result in long-term beneficial effects to electricity delivery at the five installations, as described above. No significant impacts to natural gas, water, wastewater, solid waste services or electricity availability and delivery would occur at any of the installations under Alternative 1.	solar photovoltaic systems implemented with Alternative 2 would be identical with Alternative 1. These systems would ultimately reduce the electrical demand from the local public utilities, thereby helping the Navy reach its renewable energy goals and reducing the amount of money the installations pay for electricity. Overall, implementation of Alternative 2 would result in long-term beneficial effects to electricity delivery at the five installations, as described above. No significant impacts to natural gas, water, wastewater, solid waste services or electricity availability and delivery would occur at any of the installations under Alternative 2.	
Visual Quality	**NAF El Centro**.....No Significant Impacts **NSA Monterey** .....No Significant Impacts **NAVWPNSTA Seal Beach** .....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme** .....No Significant Impacts	**NAF El Centro** .....No Significant Impacts **NSA Monterey**.....No Significant Impacts **NAVWPNSTA Seal Beach**.....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** .....No Significant Impacts **NBVC Port Hueneme**.....No Significant Impacts	**NAF El Centro**..... No Significant Impacts **NSA Monterey**..... No Significant Impacts **NAVWPNSTA Seal Beach**..... No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** ..... No Significant Impacts **NBVC Port Hueneme**..... No Significant Impacts
	The following analysis relates to all installations listed above, unless a specific installation is called out by name. **Visual Impacts during Construction** For Alternative 1, views of project construction activities at all installations would be temporary in nature. While on-installation military personnel could have views of project construction vehicles and equipment, sensitive and/or off-installation viewers (residents, pedestrians, motorists) could experience partial, intermittent views of construction activities. Project construction at NAF El Centro would take place in a vacant agricultural outlease, and the project would not be easily visible to off-installation sensitive viewers. For NSA Monterey, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme, off-installation sensitive viewers (residents, motorists, and pedestrians) would have only partial and/or intermittent views of construction trucks and equipment at some of the project sites. The Alternative 1 project site at NAVWPSNTA Seal Beach would be visible to off-installation sensitive viewers (motorists) during construction. **Visual Impacts during Operation** Under Alternative 1, the permanent project features (e.g., ground-mounted panels) at NAF El Centro would not be visible to off-installation sensitive viewers, and the rooftop-mounted solar photovoltaic system at NSA Monterey's Navy Annex would not be visible to off-installation sensitive viewers due to the project site's location and elevation on top of existing buildings.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* **Visual Impacts during Construction** Similar to Alternative 1, views of project construction activities for Alternative 2 would be temporary, and sensitive viewers (non-military off-installation viewers) would experience only partial, intermittent views of construction vehicles and associated equipment. Alternative 2 would utilize the same construction sites at NAF El Centro, NSA Monterey, NAVWPNSTA Seal Beach Detachment Norco, and NVBC Port Hueneme; however, NAF El Centro would have a slightly smaller project footprint, and NSA Monterey's Navy Annex would not develop the carport-mounted system constructed for Alternative 1. Under Alternative 2, development of the ground-mounted solar photovoltaic system would occur at a different site at NAVWPNSTA Seal Beach, west of Bolsa Chica Road, and north of Westminster Boulevard, in an area that is partially visible to the public. Construction at the NAVWPNSTA Seal Beach project site for Alternative 2 would be almost completely screened from sensitive viewers (residents) by an existing fabric-covered fence and vegetation to the east; however, motorists could experience partial, intermittent views of construction vehicles and equipment from south of the site, along Westminster Boulevard.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* Under the No Action Alternative, the solar photovoltaic panel arrays and associated infrastructure would not be constructed and existing visual resources would not change. Therefore, no significant impacts to visual resources would result from implementation of the No Action Alternative.

Table 3-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
	Alternative 1's permanent project features at NAVWPNSTA Seal Beach (e.g., ground-mounted panels), NAVWPNSTA Seal Beach Detachment Norco (e.g., ground-mounted panels), NSA Monterey's Main Site (e.g., carport structures and rooftop panels) and Navy Annex (e.g., carport structures), and NBVC Port Hueneme (e.g., carport structures) would be seen by a low number of sensitive viewers; however, the overall visual contrast in height, form, lines, and color between the project components and surrounding elements in the landscape would be weak to moderate, depending on the specific location. Additionally, the project would not be expected to produce substantial glare that would be a nuisance to off-installation receptors near these installations, since viewers would only have brief periods of exposure and other reflective structures (e.g., concrete, chain-link fencing, office buildings) are already present within these viewsheds on the installations. Under Alternative 1, all ground-mounted sites at NAF El Centro, NAVWPNSTA Seal Beach, and NAVWPNSTA Seal Beach Detachment Norco would be enclosed with chain link fencing; however, only NAVWPNSTA Seal Beach and NAVWPNSTA Seal Beach Detachment Norco fences would be covered with fabric, thereby reducing potential glare and largely screening views of the project. In addition, potential glare and other visual impacts that may result from color contrast at NAVWPNSTA Seal Beach Detachment Norco would be substantially reduced by treating metal support structures for the panels with dull finishes consisting of medium to dark earth-tone colors with very low light reflectivity. Consequently, no significant glare-related impacts to off-installation receptors would occur. Under Alternative 1, the carport-mounted systems at NSA Monterey's Main Site and Navy Annex and at NBVC Port Hueneme would require night-time lighting; however, the project would not introduce a new source of substantial light the installations. Overall, there would be no significant impacts to visual resources as a result of implementing Alternative 1 at any of the installations. Although no significant impacts to visual resources would occur, implementation of the applicable conservation and construction measures (e.g., reducing contrast in color between the metal project components and nearby structures, reducing potential glare, and shielding and directing lights downward) would further minimize impacts of color contrast, glare and lighting at these locations.	**Visual Impacts during Operation** Under Alternative 2, the NAF El Centro, NSA Monterey Main Site and Navy Annex, NAVWPNSTA Seal Beach Detachment Norco and NBVC Port Hueneme project sites, systems, viewers, and impacts related to contrast between the project components and the surrounding landscape, glare, fencing, and night-time lighting would be the same as those described for Alternative 1. Under Alternative 2, operation of the project's permanent features (ground-mounted panels and above-ground electrical poles) at the NAVWPNSTA Seal Beach site would be visible to a small number of off-installation sensitive viewers (motorists). During operation, the NAVWPNSTA Seal Beach ground-mounted solar photovoltaic system would be almost completely screened from sensitive viewers (residents) by an existing fabric-covered fence and vegetation to the east of the site. In addition, a fabric-covered fence would be installed around the project site to further mitigate viewshed concerns at this location.. Overall, there would be no significant impacts to visual resources as a result of implementing Alternative 2 at any of the installations. Although no significant impacts to visual resources would occur, implementation of conservation and construction measures (e.g., reducing contrast in color between the metal project components and nearby structures, reducing potential glare, and shielding and directing lights downward) would further minimize impacts of color contrast, glare and lighting at the applicable locations.	

Table 3-1 Summary of Potential Environmental Impacts

Resource Area	Alternative 1 (Preferred Alternative)	Alternative 2	No Action Alternative
Water Resources	**NAF El Centro**.....No Significant Impacts **NSA Monterey** .....No Significant Impacts **NAVWPNSTA Seal Beach** .....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco**.....No Significant Impacts **NBVC Port Hueneme** .....No Significant Impacts	**NAF El Centro** .....No Significant Impacts **NSA Monterey**.....No Significant Impacts **NAVWPNSTA Seal Beach**.....No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** .....No Significant Impacts **NBVC Port Hueneme**.....No Significant Impacts	**NAF El Centro**..... No Significant Impacts **NSA Monterey**..... No Significant Impacts **NAVWPNSTA Seal Beach**..... No Significant Impacts **NAVWPNSTA Seal Beach Detachment Norco** ..... No Significant Impacts **NBVC Port Hueneme**..... No Significant Impacts
	The following analysis relates to all installations listed above, unless a specific installation is called out by name. **Hydrology** Under Alternative 1, soil excavation associated with project construction would occur and could result in erosion, surface water runoff, and sedimentation of surface water resources; however, implementation of conservation and construction measures would prevent or minimize impacts to regional hydrology and local water quality. Construction activities associated with Alternative 1 would not degrade the local water quality or adversely affect current uses of local surface water resources. **Floodplains** Alternative 1 would not construct any temporary or permanent structures that would increase the potential for localized flooding at the installations or in local surface water bodies. The Navy would minimize potential impacts to 500-year floodplains at NAVWPNSTA Seal Beach and NBVC Port Hueneme with implementation of conservation and construction measures. **Groundwater** For Alternative 1, project operation would include cleaning the solar photovoltaic panels with water brought in by truck and would not require the use of groundwater resources. Therefore, no significant impacts to water resources would result from implementation of Alternative 1.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* **Hydrology** For Alternative 2, impacts to surface hydrology and water quality would not differ from those discussed under Alternative 1. Soil excavation associated with project construction would result from this alternative, and could result in erosion, surface water runoff, and sedimentation of surface water resources. Also similar to Alternative 1, conservation and construction measures related specifically to surface hydrology and water quality would be implemented with this alternative. **Floodplains** Similar to Alternative 1, Alternative 2 would not construct temporary or permanent structures that would increase the potential for localized flooding. In addition, conservation and construction measures specifically related to 500-year floodplains at NAVWPNSTA Seal Beach and NBVC Port Hueneme. **Groundwater** With Alternative 2, project operation would include cleaning the solar photovoltaic panels with water brought in by truck and would not require the use of groundwater resources. Therefore, no significant impacts to water resources would result from implementation of Alternative 2.	*The following analysis relates to all installations listed above, unless a specific installation is called out by name.* Under the No Action Alternative, the solar photovoltaic systems would not be constructed; therefore, the existing conditions for regional hydrology, surface water quality and groundwater quality would remain unchanged. Therefore, no significant impacts to water resources would result from implementation of the No Action Alternative.

3.1 AIR QUALITY

This section describes existing ambient air quality and analyzes potential air quality impacts that may occur at each of the five installations with implementation of the Proposed Action. The following discussion was based on information from the following documents, among others:

- National Ambient Air Quality Standards (NAAQS) (U.S. Environmental Protection Agency [EPA] 2012a);
- California Ambient Air Quality Standards (CAAQS) (Cal/EPA Air Resources Board [ARB] 2013a); and,
- Climate Change 2007: Synthesis Report (Intergovernmental Panel on Climate Change 2007).

DEFINITION OF RESOURCE

Air quality is defined by ambient air concentrations of specific pollutants determined by the EPA to be of concern related to the health and welfare of the general public and the environment and are widespread across the United States. The primary pollutants of concern, called “criteria pollutants,” include carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), suspended particulate matter less than or equal to 10 microns in diameter (PM_{10}), fine particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead. Under the Clean Air Act, the EPA has established NAAQS (40 CFR 50) for these pollutants.

Areas that are and have been historically in compliance with the NAAQS are designated as “attainment” areas. Areas that violate a federal air quality standard are designated as “nonattainment” areas. Areas that have transitioned from nonattainment to attainment are designated as “maintenance” areas and are required to adhere to maintenance plans to ensure continued attainment. The NAAQS represent the maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect public health and welfare. Short-term standards (i.e., 1-, 3-, 8-, and 24-hour periods) are established for pollutants contributing to chronic health effects.

Ambient Air Quality

Ambient air quality is determined by the atmospheric concentrations of regulated air pollutants at specific locations deemed by air quality management agencies to be generally representative of local or regional conditions. The air pollutant concentrations measured at a specific location are determined by local and regional air pollutant emissions rates, local meteorology, and atmospheric chemistry. Emissions source considerations include the types,

rates, and locations of air pollutant emissions into the atmosphere. Wind speed and direction, vertical temperature and pressure gradients, and precipitation patterns affect the dispersal, dilution, and removal from the atmosphere of air pollutants. Lower ambient concentrations of these air pollutants generally indicate higher air quality. Regulatory agencies monitor ambient air quality to document compliance with state and federal air quality standards, and these monitoring data are reported as a mass per unit volume (e.g., micrograms per cubic meter of air) or as a volume fraction (e.g., parts per million by volume). Table 3.1-1 provides a list of NAAQS and CAAQS.

Table 3.1-1 National and California Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS[1]		CAAQS[2]
		Primary[3]	Secondary[4]	Concentration[5]
Ozone (O_3)[6]	1-Hour	---	---	0.09 ppm (180 µg/m^3)
	8-Hour	0.075 ppm (147 µg/m^3)	Same as Primary	0.070 ppm (137 µg/m^3)[9]
Carbon Monoxide (CO)	1-Hour	35 ppm (40 mg/m^3)	---	20 ppm (23 mg/m^3)
	8-Hour	9.0 ppm (10 mg/m^3)	---	9.0 ppm (10 mg/m^3)
Nitrogen Dioxide (NO_2)	1-Hour	0.1 ppm (188 µg/m^3)	---	0.18 ppm (338 µg/m^3)
	Annual Average	0.053 ppm (100 µg/m^3)	Same as Primary	0.03 ppm (56 µg/m^3)
Sulfur Dioxide (SO_2)[7]	1-Hour	0.075 ppm (196 µg/m^3)	---	0.25 ppm (715 µg/m^3)
	3-Hour	---	0.5 ppm (1,300 µg/m^3)	---
	24-Hour	---	---	0.04 ppm (114 µg/m^3)
Suspended Particulate Matter (PM_{10})	24-Hour	150 µg/m^3	Same as Primary	50 µg/m^3
	Annual Arithmetic Mean	---	---	20 µg/m^3[(8)]
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	35 µg/m^3	Same as Primary	---
	Annual Arithmetic Mean	15 µg/m^3	Same as Primary	12 µg/m^3 [(8)]
Lead[9]	Rolling 3-Month Average	0.15 µg/m^3	Same as Primary	1.5 µg/m^3
Hydrogen Sulfide (H_2S)	1-Hour	No Federal Standards		0.03 ppm (42 µg/m^3)
Sulfates (SO_4)	24-Hour			25 µg/m^3
Visibility Reducing Particles	8-Hour (10am-6pm, PST)			Note 11
Vinyl chloride[9]	24-Hour			0.01 ppm (26 µg/m^3)

Table 3.1-1 National and California Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS[1]		CAAQS[2]
		Primary[3]	Secondary[4]	Concentration[5]

Sources: EPA 2012a; Cal/EPA ARB 2013a

Notes:

1. NAAQS (other than O_3, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth-highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is not to be exceeded more than once per year on average over 3 years. The 24-hour standard is attained when the 3-year average of the weighted annual mean at each monitor within an area does not exceed 150 µg/m^3. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, do not exceed 35 µg/m^3. The annual standard is attained when the 3-year average of the weighted annual mean at single or multiple community-oriented monitors does not exceed 15 µg/m^3.
2. CAAQS for O_3, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM_{10} and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded.
3. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
4. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse impacts of a pollutant.
5. Concentration expressed first in units in which it was promulgated. Ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.
6. The federal 1-hour O_3 standard was revoked for most areas of the United States, including all of California on June 15, 2005.
7. Final rule signed June 2, 2010. The 1971 annual and 24-hour SO_2 standards were revoked in that same rulemaking.
8. On June 5, 2003, the Office of Administrative Law approved the amendments to the regulations for the state ambient air quality standards for particulate matter and sulfates. Those amendments established a new annual average standard for $PM_{2.5}$ of 12 µg/m^3 and reduced the level of the annual average standard for PM_{10} to 20 µg/m^3. The approved amendments were filed with the Secretary of State on June 5, 2003. The regulations became effective on July 5, 2003.
9. The Cal/EPA ARB has identified lead and vinyl chloride as “toxic air contaminants” with no threshold level of exposure for adverse health impacts determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants in sufficient amount to produce an extinction coefficient of 0.23 per km due to particles when the relative humidity is less than 70%.

Key:
CAAQS = California Ambient Air Quality Standards
µg/m^3 = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter
NAAQS = National Ambient Air Quality Standards
ppm = parts per million
PST = Pacific Standard Time

Greenhouse Gases

The EPA defines climate change as any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period of time (EPA 2012b). Climate change may result from natural factors (e.g., changes in the sun's intensity or slow changes in the Earth's orbit around the sun), natural processes within the climate system (e.g., changes in ocean circulation), and human activities that change the atmosphere's composition (e.g., through burning fossil fuels) and land surface (e.g., deforestation, reforestation, urbanization, desertification, etc.).

Greenhouse gases are gases that trap heat in the atmosphere, causing a greenhouse effect. According to the Intergovernmental Panel on Climate Change, increased atmospheric levels of carbon dioxide (CO_2) are correlated with rising temperatures, and concentrations of CO_2 have increased by 31 percent above pre-industrial levels since 1750. Climate models show that temperatures will probably increase by 1.4 to 5.8 degrees Celsius (°C) by the year 2100 (Intergovernmental Panel on Climate Change 2007).

The global warming potential of a greenhouse gas indicates the global warming potency of a greenhouse gas relative to CO_2. The global warming potential enables comparison of the warming effects of different gases. Global warming potential uses a relative scale that compares the warming effect of the gas in question with that of the same mass of CO_2. The CO_2 equivalent (CO_2e) is a measure used to sum the effect of emissions of various greenhouse gases based on their global warming potential when projected over a specified time period (generally 100 years). The CO_2e for a gas is obtained by multiplying the mass of the gas (in tons) by its global warming potential.

Climate change, by its nature, is a cumulative impact resulting from multiple greenhouse gas sources. In addition, climate change may have effects on a facility or area. Therefore, the cumulative impacts of climate change are assessed in the cumulative impacts analysis in Section 4.3.1. The direct emissions of greenhouse gases from the existing conditions and the alternatives are presented in Section 3.1.2.

Air Quality Designations

California is divided into 15 air basins defined by generally similar meteorological and geographic conditions. Air basins in which ambient concentrations of a criteria air pollutant exceed the NAAQS are considered to be nonattainment areas for that air pollutant under the federal Clean Air Act. Nonattainment areas for some criteria air pollutants are further classified, depending upon the severity of their air quality problem, to facilitate their management:

- Ozone: marginal, moderate, serious, severe, and extreme;
- CO: moderate and serious; and,
- PM: moderate and serious.

Areas that have attained the NAAQS may be designated as attainment areas or as maintenance areas, subject to maintenance plans showing how the area will continue to meet the NAAQS.

Primary and Secondary Air Pollutants

Air pollutants are classified as either primary or secondary pollutants. Primary air pollutants, such as CO, SO_2, lead, particulates, and hydrogen sulfide, are emitted directly into the atmosphere. Secondary air pollutants, such as ozone, are formed through atmospheric chemical reactions. Such reactions usually involve primary air pollutants and normal constituents of the atmosphere. Sunlight and meteorological conditions, such as temperature and humidity, also can affect atmospheric chemistry. Air pollutants, such as organic gases and particulates, are a combination of primary and secondary pollutants. PM_{10} and $PM_{2.5}$ are generated as primary pollutants by various mechanical processes (e.g., abrasion, erosion, mixing, or atomization) or combustion processes. PM_{10} also may result from agricultural operations, travel on unpaved roads, and wind erosion of bare soils. Compounds that react in the atmosphere to form secondary air pollutants are referred to as precursors. Ozone precursors fall into two broad groups of chemicals: nitrogen oxides (NO_X) and organic compounds. NO_X includes both nitric oxide (NO) and NO_2. Organic compound precursors of ozone are routinely described by a number of different terms, including volatile organic compounds (VOCs), reactive organic compounds, and reactive organic gases. $PM_{2.5}$ also can be formed through chemical reactions or by the condensation of gaseous pollutants into fine aerosols. NO_X and SO_2 are precursors of $PM_{2.5}$. Precursors generally are monitored and regulated to control atmospheric concentrations of the associated criteria pollutants.

General Conformity

The EPA General Conformity Rule applies to federal actions occurring in federal nonattainment or maintenance areas when the total emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emissions thresholds that trigger requirements for a conformity analysis are called *de minimis* levels. *De minimis* levels (in tons per year) vary from pollutant to pollutant and also depend on the severity of the nonattainment status.

A conformity applicability analysis is the first step of a conformity evaluation and assesses if a federal action must be supported by a conformity determination. This is typically accomplished by quantifying applicable emissions that are projected to result due to implementation of the federal action. If the results of the applicability analysis indicate that the total emissions would not exceed the *de minimis* emissions thresholds, then the conformity evaluation process is completed.

3.1.1 AFFECTED ENVIRONMENT

For the purposes of this EA, the affected environment refers to the existing air quality at each of the five installations, as well as the existing air quality of their respective air basins.

3.1.1.1 NAF El Centro

NAF El Centro is located in Imperial County, which is within the Salton Sea Air Basin. The Salton Sea Air Basin is comprised of two air districts: the Imperial County Air Pollution Control District and the South Coast Air Quality Management District.

Imperial County has been characterized by the EPA as marginal nonattainment for ozone, serious nonattainment for PM_{10}, and nonattainment for $PM_{2.5}$ (EPA 2013a). The Cal/EPA ARB has designated Imperial County as nonattainment for ozone and PM_{10}, and unclassified/attainment for all other criteria pollutants (Cal/EPA ARB 2013b).

The most recent emissions inventory for the Salton Sea Air Basin is shown in Table 3.1-2.

Table 3.1-2 Salton Sea Air Basin 2008 Estimated Average Emissions (tons per day)

TOG	ROG	CO	NO_X	SO_X	PM	PM_{10}	$PM_{2.5}$
149.9	48.1	176.2	83.3	0.7	477.1	250.9	43.8

Source: Cal/EPA ARB 2013b
Key:
CO = carbon monoxide
NO_X = oxides of nitrogen
PM = total particulate matter
$PM_{2.5}$ = fine particulate matter less than or equal to 2.5 microns in diameter
PM_{10} = suspended particulate matter less than or equal to 10 microns in diameter
ROG = reactive organic gases
SO_X = oxides of sulfur
TOG = total organic gases

Sensitive Air Quality Receptors near NAF El Centro

Sensitive receptors are those populations that are more susceptible to the effects of air pollution than the population at large. Sensitive receptors are defined as long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, childcare centers, and athletic facilities. For this air quality analysis, sensitive receptors within 0.25 mile (0.4 kilometer) of the NAF El Centro project area have been identified and include Navy family housing and a playground located northeast of the project site along Gila Bend Drive (Figure 2-1).

3.1.1.2 NSA Monterey's Main Site and Navy Annex

NSA Monterey is located in Monterey County, which is within the North Central Coast Air Basin. This air basin is comprised of a single air district, the Monterey Bay Unified Air Pollution Control Air District, and consists of Santa Cruz, San Benito, and Monterey counties.

The North Central Coast Air Basin is currently designated as attainment for all NAAQS (EPA 2013a). The Cal/EPA ARB has designated this air basin as nonattainment for 8-hour

ozone and PM_{10}, and as unclassified/attainment for all other criteria pollutants (Cal/EPA ARB 2013b).

The most recent emissions inventory for the North Central Coast Air Basin is shown in Table 3.1-3. Ozone is generated from reactions of VOCs and NOx, which are precursors to ozone. Therefore, for the purposes of this air quality analysis, VOCs and NOx emissions are used to represent ozone generation. VOCs are characterized in the emission inventories as total organic gases and reactive organic gases.

Table 3.1-3 North Central Coast Air Basin 2008 Estimated Average Emissions (tons per day)

TOG	ROG	CO	NO_X	SO_X	PM	PM_{10}	$PM_{2.5}$
343.1	63.5	450.1	78.4	2.5	135.9	78.7	29.9

Source: Cal/EPA ARB 2013b
Key:
CO = carbon monoxide
NO_X = oxides of nitrogen
PM = total particulate matter
$PM_{2.5}$ = fine particulate matter less than or equal to 2.5 microns in diameter
PM_{10} = suspended particulate matter less than or equal to 10 microns in diameter
ROG = reactive organic gases
SO_X = oxides of sulfur
TOG = total organic gases

Sensitive Air Quality Receptors near NSA Monterey's Main Site and Navy Annex

The closest sensitive receptors to the project area at NSA Monterey's Main Site would include a residential neighborhood along Sloat Avenue, directly to the west of the Main Site near Sites 1, 2, and 3. Additionally, Site 6 would be located on the rooftops of inhabited public works buildings at the Main Site (Figure 2-2).

Sensitive receptors within 0.25 mile (0.4 kilometer) of the project sites at NSA Monterey's Navy Annex would include a residential neighborhood along Euclid Avenue to the north of the Navy Annex (Figure 2-3). Additionally, Site 2 would be located on the rooftops of inhabited research buildings at the Navy Annex (Figure 2-3).

3.1.1.3 NAVWPNSTA Seal Beach

NAVWPNSTA Seal Beach is located in Orange County, which is within the South Coast Air Basin. The South Coast Air Basin is comprised of a single air district, the South Coast Air Quality Management District, and consists of Orange County and the urban portions of Los Angeles, Riverside, and San Bernardino counties.

Due to the combined air pollution sources from over 15 million people, and meteorological and geographical effects that limit the dispersion of these pollutants, the South

Coast Air Basin can experience high air pollutant concentrations. The South Coast Air Basin has been characterized by the EPA as extreme nonattainment for ozone, nonattainment for PM_{10}, nonattainment for $PM_{2.5}$, and attainment for SO_2. The portion of Los Angeles County within the South Coast Air Basin (not including the project site within Orange County) is also a nonattainment area for lead (EPA 2013a). This air basin is also a maintenance area for NO_2 and CO (EPA 2013a). The Cal/EPA ARB has designated the South Coast Air Basin as extreme nonattainment for ozone, nonattainment for PM_{10}, $PM_{2.5}$, NO_2, and lead, and unclassified/attainment for all other criteria pollutants (Cal/EPA ARB 2013b).

The most recent emissions inventory for the South Coast Air Basin is shown in Table 3.1-4.

Table 3.1-4 South Coast Air Basin 2008 Estimated Average Emissions (tons per day)

TOG	ROG	CO	NO_X	SO_X	PM	PM_{10}	$PM_{2.5}$
940.1	697.7	3,413.5	825.0	39.5	521.7	298.9	115.9

Source: Cal/EPA ARB 2013b
Key:
CO = carbon monoxide
NO_X = oxides of nitrogen
PM = total particulate matter
$PM_{2.5}$ = fine particulate matter less than or equal to 2.5 microns in diameter
PM_{10} = suspended particulate matter less than or equal to 10 microns in diameter
ROG = reactive organic gases
SO_X = oxides of sulfur
TOG = total organic gases

Sensitive Air Quality Receptors near NAVWPNSTA Seal Beach

The Alternative 1 site would be located near a mixed-use industrial Navy facility on the installation, about 0.5 mile (0.8 kilometer) from the installation's western boundary. The closest sensitive receptors to the project area would include residences on the west side of Kitts Highway, approximately 0.5 mile (0.8 kilometer) from the site (Figure 2-4).

3.1.1.4 NAVWPNSTA Seal Beach Detachment Norco

NAVWPNSTA Seal Beach Detachment Norco is located in the County of Riverside, which is within the South Coast Air Basin. The South Coast Air Basin's attainment status and most recent emissions inventory are provided in Section 3.1.1.3 and Table 3.1-4.

Sensitive Air Quality Receptors near NAVWPNSTA Seal Beach Detachment Norco

The Area 1 site would be less than 0.25 mile (0.4 kilometer) from off-installation commercial/mixed use and residential areas that are located south of Fourth Street (Figure 2-5). The Area 2 site would be less than 0.25 mile (0.4 kilometer) from Norco College (Figure 2-6).

3.1.1.5 NBVC Port Hueneme

NBVC Port Hueneme is located in Ventura County, which is in the South Central Coast Air Basin. This air basin is comprised of three air districts: the San Luis Obispo County Air Pollution Control District, the Santa Barbara County Air Pollution Control District, and the Ventura County Air Pollution Control District.

The air quality in Ventura County (excluding the Channel Islands of Anacapa and San Nicolas Island) has been characterized by the EPA as a serious nonattainment area for 8-hour ozone. Ventura County is classified by the EPA as unclassified/attainment for all other criteria pollutants (EPA 2013a). Cal/EPA ARB has designated Ventura County as a state nonattainment area for 8-hour ozone and PM_{10}, and as unclassified/attainment for all other criteria pollutants (Cal/EPA ARB 2013b).

The most recent emissions inventory for the South Central Coast Air Basin is shown in Table 3.1-5.

Table 3.1-5 South Central Coast Air Basin 2008 Estimated Average Emissions (tons per day)

TOG	ROG	CO	NO_X	SO_X	PM	PM_{10}	$PM_{2.5}$
217.8	104.4	508.9	103.9	12.7	135.8	76.7	25.4

Source: Cal/EPA ARB 2013b
Key:
CO = carbon monoxide
NO_X = oxides of nitrogen
PM = total particulate matter
$PM_{2.5}$ = fine particulate matter less than or equal to 2.5 microns in diameter
PM_{10} = suspended particulate matter less than or equal to 10 microns in diameter
ROG = reactive organic gases
SO_X = oxides of sulfur
TOG = total organic gases

Sensitive Air Quality Receptors near NBVC Port Hueneme

The project site at NBVC Port Hueneme would be less than 0.25 mile (0.4 kilometer) from residential neighborhoods to the west along Island View Avenue and to the north along Highland Drive (Figure 2-7).

3.1.2 ENVIRONMENTAL CONSEQUENCES

This section discusses the effects to existing ambient air quality that may occur as a result of the implementation of the alternatives using the criteria specified under NEPA Section 1502.16. To compare effects, this analysis defines the temporal scale (time), extent (area), and intensity of effects for each alternative.

Methodology

Potential impacts to air quality were assessed by developing emission estimates associated with proposed construction and operation. As presented in Section 3.1.8, the proposed sites for the solar photovoltaic systems would be located in five different counties within California. EPA evaluates attainment status for each county and criteria pollutant. The General Conformity Rule *de minimis* thresholds may differ between sites, depending on the nonattainment status and the severity of any nonattainment pollutants. Therefore, emissions from each of the proposed solar photovoltaic systems have been analyzed and are presented independently.

Construction

Temporary air emissions from construction of the solar photovoltaic systems at each of the project locations were calculated based on estimates in terms of:

- Number and type of equipment that would be used during construction of the solar photovoltaic systems;
- Acreage of the disturbed sites during construction; and,
- Duration of the construction work.

These data were used as input for air emissions calculations from construction. For construction equipment vehicle exhaust, two sets of emission factors were used to determine construction emissions: (1) non-road equipment emission factors for equipment that is not licensed for on-road travel; and (2) on-road emission factors for vehicles used during the construction phase of the project. For the non-road emission factors, the EPA NONROAD Model was used (EPA 2005); for on-road emission factors, the California EMFAC v2011 emission factor database was used (Cal/EPA ARB 2011).

Greenhouse gas emissions from vehicle exhaust were estimated using the EPA NONROAD Model and the EMFAC v2011 database, and were then converted to CO_2e using the global warming potentials in 40 CFR 98, Subpart A (EPA 2013b).

Fugitive dust emissions from site preparation work, which may include scraping, grading, loading, digging, compacting, light duty vehicle travel, and other operations, were estimated for the three sites that included ground-mounted systems (NAF El Centro, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco). Fugitive dust emissions would not be expected for carport- or rooftop-mounted systems because the systems would be installed in existing parking lots or on existing buildings. For fugitive dust, emission factors from Cal/EPA ARB Section 7.7, Building Construction Dust, were used (Cal/EPA ARB 2002 and EPA 1999).

A Fugitive Dust Control Plan that meets the minimum requirements of each air district would be followed. Specific mitigation measures for fugitive dust are outlined in Section 2.4.2. Per the emissions estimation methodology of Section 7.7 (Cal/EPA ARB 2002), the construction emission factors used are assumed to include the effects of typical control measures, such as those outlined in Section 2.4.2. Construction emissions for installation of the solar photovoltaic systems under Alternatives 1 and 2 would be assumed to occur between 2015 and 2017. Due to external factors, the exact construction date cannot be determined at this time. The duration of project-related construction activities would be six months or less for all five installations; therefore, all construction emissions were considered to occur in one year for the General Conformity analysis.

Operation

Under Alternatives 1 and 2, electricity demand from offsite supplies would be reduced. Estimated annual emission reductions were based on the estimated total electrical output (megawatt-hours per year) of the solar photovoltaic systems and the subsequent reduced demand for offsite electricity from non-renewable sources. The Federal Greenhouse Gas Accounting and Reporting Guidance accompanying Executive Order 13514 recommended using EPA's eGRID non-baseload emission rates to estimate emission reductions from renewable energy (EPA 2012c). Year 2009 eGRID non-baseload output emission rates for the Western Electricity Coordinating Council California subregion (EPA 2012d) were used to estimate emission reductions. Emissions avoided from the use of the renewable energy generating facilities proposed under Alternatives 1 and 2 are assumed to begin between 2016 and 2018. Annual emission reductions would be realized for each year the solar photovoltaic systems would be in operation.

3.1.2.1 Alternative 1 (Preferred Alternative)

Emissions would occur during construction as the result of combustion of fuel in off-road construction equipment and on-road vehicles. Construction-related traffic generation would include equipment delivery, onsite and offsite vehicle and construction equipment, and automobile trips for construction workers in personal vehicles. A Fugitive Dust Control Plan that meets the minimum requirements for the air district in which the construction is occurring would be followed to minimize emissions, to the extent practicable. The conservation and construction measures for dust abatement, as presented in Section 2.4.2, outline the mitigation measures that would be followed in order to comply with local regulations.

Table 3.1-6 shows the estimated construction emissions generated under Alternative 1 and the applicable General Conformity *de minimis* thresholds for each site. Emissions of pollutants subject to General Conformity are below their respective *de minimis* values.

Table 3.1-6 Estimated Construction Emissions at the Five Project Locations under Alternative 1 (Preferred Alternative)

Site	County	Emissions (tons per year)						
		NOx	CO	VOCs	SO_2	PM_{10}	$PM_{2.5}$	CO_2
NAF El Centro Imperial County Air Pollution Control District, and South Coast Air Quality Management District	Imperial	0.23	0.15	0.02	0.01	4.42	0.46	70.02
General Conformity *de minimis* Threshold		100	N/A	50	N/A	70	100	N/A
NSA Monterey's Main Site and Navy Annex Monterey Bay Unified Air Pollution Control Air District	Monterey	0.26	0.17	0.03	0.01	0.03	0.03	80.58
General Conformity *de minimis* Threshold		N/A	N/A	N/A	N/A	N/A	N/A	N/A
NAVWPNSTA Seal Beach South Coast Air Quality Management District	Orange	0.11	0.08	0.01	0.00	2.92	0.30	31.53
General Conformity *de minimis* Threshold		10	N/A	10	N/A	70	100	N/A
NAVWPNSTA Seal Beach Detachment Norco South Coast Air Quality Management District	Riverside	0.24	0.19	0.02	0.01	12.23	1.24	79.85
General Conformity *de minimis* Threshold		10	N/A	10	N/A	70	100	N/A
NBVC Port Hueneme San Luis Obispo County Air Pollution Control District, Santa Barbara County Air Pollution Control District, and Ventura County Air Pollution Control District	Ventura	0.27	0.14	0.02	0.01	0.99	0.12	72.36
General Conformity *de minimis* Threshold		50	N/A	50	N/A	N/A	N/A	N/A

Key:
CO = carbon monoxide
CO_2 = carbon dioxide
N/A = not applicable. Since general conformity analysis is not required when an area is in attainment of National Ambient Air Quality Standards (NAAQS) for a given criteria pollutant, *de minimis* thresholds are not relevant in such situations. Attainment status varies by county or air district/air basin.
NO_X = oxides of nitrogen
$PM_{2.5}$ = fine particulate matter less than or equal to 2.5 microns in diameter
PM_{10} = suspended particulate matter less than or equal to 10 microns in diameter
SO_2 = sulfur dioxide
VOCs = volatile organic compounds

Detailed construction equipment assumptions and emissions calculations are provided in Appendix B. Tables B-1 through B-5 provide the construction equipment and use assumptions, with an individual table provided for each of the five installations. Table B-6 provides the fugitive dust emission calculations for the three sites that include ground-mounted systems (NAF El Centro, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco). Tables B-7 through B-11 provide the mobile equipment emission calculations and total emissions for each installation.

Table 3.1-7 shows the estimated emissions avoided through use of solar photovoltaic systems and reduced consumption of grid-supplied electricity. Detailed emissions calculations are provided in Appendix B, Table B-12.

Table 3.1-7 Estimated Annual Emissions Avoided at the Five Project Locations under Alternative 1 (Preferred Alternative)

Site	County	Emissions Avoided (tons per year)		
		CO_2e	NO_X	SO_2
NAF El Centro	Imperial	2,276	0.24	0.02
NSA Monterey's Main Site and Navy Annex	Monterey	3,294	0.35	0.03
NAVWPNSTA Seal Beach	Orange	1,098	0.12	0.01
NAVWPNSTA Seal Beach Detachment Norco	Riverside	3,294	0.035	0.03
NBVC Port Hueneme	Ventura	659	0.07	0.01

Key:
CO_2e = carbon dioxide equivalents
NO_X = oxides of nitrogen
SO_2 = sulfur dioxide

Construction of Alternative 1 would result in localized, short-term effects on air quality at NAF El Centro, NSA Monterey, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme. As shown in Table 3.1-7, 659 to 3,294 tons of CO_2e emissions would be avoided each year at the five project locations during operation of Alternative 1. In addition, reductions of NO_X, and SO_2 would be realized with implementation of this alternative. The reduced consumption of grid-supplied electricity and subsequent reduction in emissions would more than offset the short-term construction emissions within the first year of operation. Subsequent years of operation would also avoid emissions produced from conventional non-renewable generating sources. Total construction and operation emissions would be below the *de minimis* thresholds and would result in beneficial effects to air quality; therefore, no significant impacts to air quality would occur at any of the proposed five locations under Alternative 1.

Records of Non-Applicability (RONAs) have been completed for project development at the NAF El Centro, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme sites in accordance with the Clean Air Act[21] (refer to Appendix C).

3.1.2.2 Alternative 2

Emissions would be generated during construction as the result of combustion of fuel in off-road construction equipment and on-road vehicles. A Fugitive Dust Control Plan that meets the minimum requirements for the air district in which the construction is occurring would be followed to minimize emissions, to the extent practicable. The conservation and construction measures for dust abatement, as presented in Section 2.4.2, outline the mitigation measures that would be followed in order to comply with local regulations.

Table 3.1-8 shows the estimated construction emissions generated under Alternative 2 and applicable General Conformity *de minimis* thresholds for each location. Emissions of pollutants subject to General Conformity are below their respective *de minimis* values.

Table 3.1-8 Estimated Construction Emissions at the Five Project Locations under Alternative 2

Site	County	Emissions (tons per year)						
		NOx	CO	VOCs	SO_2	PM_{10}	$PM_{2.5}$	CO_2
NAF El Centro	Imperial	0.20	0.13	0.02	0.01	4.42	0.46	60.16
General Conformity *de minimis* Threshold		100	N/A	50	N/A	70	100	N/A
NSA Monterey's Main Site and Navy Annex	Monterey	0.26	0.17	0.03	0.01	0.03	0.03	80.58
General Conformity *de minimis* Threshold		N/A	N/A	N/A	N/A	N/A	N/A	N/A
NAVWPNSTA Seal Beach	Orange	0.11	0.08	0.01	0.00	2.88	0.30	31.53
General Conformity *de minimis* Threshold		10	N/A	10	N/A	70	100	N/A
NAVWPNSTA Seal Beach Detachment Norco	Riverside	0.24	0.19	0.02	0.01	12.23	1.24	79.85
General Conformity *de minimis* Threshold		10	N/A	10	N/A	70	100	N/A

[21] No RONA is required for NSA Monterey (Main Site and Navy Annex), which is located in an Attainment Area.

Table 3.1-8 Estimated Construction Emissions at the Five Project Locations under Alternative 2

Site	County	Emissions (tons per year)						
		NOx	CO	VOCs	SO_2	PM_{10}	$PM_{2.5}$	CO_2
NBVC Port Hueneme	Ventura	0.27	0.14	0.02	0.01	0.99	0.12	72.36
General Conformity *de minimis* Threshold		50	N/A	50	N/A	N/A	N/A	N/A

Key:
CO = carbon monoxide
CO_2 = carbon dioxide
N/A = not applicable. Since general conformity analysis is not required when an area is in attainment of National Ambient Air Quality Standards (NAAQS) for a given criteria pollutant, *de minimis* thresholds are not relevant in such situations. Attainment status varies by county or air district/air basin.
NO_X = oxides of nitrogen
$PM_{2.5}$ = fine particulate matter less than or equal to 2.5 microns in diameter
PM_{10} = suspended particulate matter less than or equal to 10 microns in diameter
SO_2 = sulfur dioxide
tpy = tons per year
VOCs = volatile organic compounds

Detailed construction equipment assumptions and emissions calculations are provided in Appendix B. Tables B-13 through B-17 provide the construction equipment and use assumptions for each of the five installations. Table B-18 provides the fugitive dust emission calculations. Tables B-19 through B-23 provide the mobile equipment emission calculations and total emission for each installation.

Table 3.1-9 shows the estimated emission reductions from the solar photovoltaic systems realized by reduced consumption of grid-supplied electricity for Alternative 2. Detailed emissions calculations are provided in Appendix B, Table B-24.

Table 3.1-9 Estimated Annual Emissions Avoided at the Five Project Locations under Alternative 2

Site	County	Emissions Avoided (tons per year)		
		CO_2e	NO_X	SO_2
NAF El Centro	Imperial	659	0.07	0.01
NSA Monterey's Main Site and Navy Annex	Monterey	2,854	0.30	0.03
NAVWPNSTA Seal Beach	Orange	1,098	0.12	0.01
NAVWPNSTA Seal Beach Detachment Norco	Riverside	3,294	0.35	0.03
NBVC Port Hueneme	Ventura	659	0.07	0.01

Key:
CO_2e = carbon dioxide equivalents
NO_X = oxides of nitrogen
SO_2 = sulfur dioxide

Implementation of Alternative 2 would result in localized, short-term effects on air quality during construction at NAF El Centro, NSA Monterey, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme. As shown in Table 3.1-9, 659 to 3,294 tons of CO_2e emissions would be avoided each year at the five project locations during operation of Alternative 2. In addition, reductions of NO_X, and SO_2 would be realized with implementation of this alternative. The reduced consumption of grid-supplied electricity and subsequent reduction in emissions would more than offset the short-term construction emissions within the first year of operation. Subsequent years of operation would also reduce emissions produced from conventional non-renewable generating sources. Total construction and operation emissions would be below *de minimis* thresholds and would result in beneficial effects to air quality; therefore, no significant impacts to air quality would occur at any of the proposed five locations under Alternative 2.

3.1.2.3 No Action Alternative

Under the No Action Alternative, Alternatives 1 or 2 would not be implemented. No solar photovoltaic sites would be constructed, and consumption of grid-supplied electricity would remain unchanged. Because the project would not be constructed, there would be no short-term air emissions associated with this alternative; however, emissions reductions of CO_2e, NO_x, and SO_2, due to reduced consumption of grid-supplied electricity, would not be realized. Under the No Action Alternative, air emissions would not change from current conditions; therefore, the No Action Alternative would not have significant impacts to air quality.

3.2 BIOLOGICAL RESOURCES

This section describes the biological resources that occur within and adjacent to the project sites, analyzes potential impacts to biological resources that could occur with implementation of the alternatives, and discusses conservation and construction measures to reduce potential impacts, where necessary. Information about biological resources is based on a review of available literature, existing natural resources background data, and the results of project-specific biological surveys. The following discussion was based on information from these documents, among others:

- Final Environmental Impact Statement, U.S. Navy F-35C West Coast Homebasing (Navy 2014g);
- Final Integrated Natural Resources Management Plan, Naval Support Activity Monterey (Navy 2013b);
- Final Integrated Natural Resources Management Plan, Naval Weapons Station Seal Beach Detachment Norco, Norco, California (Navy 2012a);

- Final Integrated Natural Resources Management Plan for Naval Base Ventura County Port Hueneme, Port Hueneme, California (Navy 2012b);
- Final Integrated Natural Resources Management Plan, Naval Weapons Station Seal Beach (Navy 2014f); and,
- Final Integrated Natural Resources Management Plan, Naval Air Facility El Centro and Target Areas (Navy 2001).

3.2.1 AFFECTED ENVIRONMENT

This section describes the existing biological resources that occur within and adjacent to the project site on each installation. For the purposes of biological resources, the project site is defined as portions of each installation where permanent and temporary impacts could occur from implementation of Alternative 1 or Alternative 2.

3.2.1.1 Vegetation Communities

The following sections describe vegetation communities occurring at each installation and those communities having the potential to occur within the project site.

NAF El Centro

Most areas associated with NAF El Centro have been altered through development, landscaping, and pavement and, therefore, contain little native vegetation. The primary types of vegetation that occur within the installation include landscaped/developed areas, agricultural areas, and dispersed shrubs. The majority of the undeveloped land associated with the installation is managed for agricultural purposes through outleases, with alfalfa (*Medicago sativa*) and Bermuda grass (*Cynodon* spp.) being the primary crops grown. The agricultural crops also help control soil erosion and are part of the installation's dust abatement program. A small area of the northwest portion of the installation consists of riparian and desert wetland communities that border the New River found along the northwestern boundary of the installation (Navy 2001).

The proposed project site at NAF El Centro, under both Alternative 1 and Alternative 2, is located within an agricultural outlease area in the southwest portion of the installation. The outlease area was converted to a maintenance area for an anticipated change in land use and is not currently used for crop production. Most recently, Sudan grass (*Sorghum bicolor*) was grown at the site, but alfalfa and Bermuda grass have also been grown in the past (Ecology and Environment, Inc. 2013). The site currently contains patches of vegetation comprised of species capable of growing quickly in disturbed areas and is maintained by the Navy for weed and dust control.

NSA Monterey's Main Site

At NSA Monterey's Main Site, the native coast live oak (*Quercus agrifolia*) is the most abundant tree species, occurring in narrow belts or groves with Monterey pine (*Pinus radiata*) and Monterey cypress (*Cupressus macrocarpa*). Monterey pine and Monterey cypress are both California Native Plant Society (CNPS) List 1B species. The edges of Del Monte Lake, located in the northeast portion of the Main Site, support wetland vegetation, including willows (*Salix* spp.), broadleaf cattails (*Typha latifolia*), and California bulrush (*Scirpus californicus*). The lake's grassy banks are overlain by a discontinuous canopy of native and non-native deciduous and evergreen trees. A catchment basin in the southeastern portion of the installation is lined with bushes and grass, with an overstory of deciduous trees along its east bank (Navy 2013b).

The proposed project sites at NSA Monterey's Main Site are located on top of existing buildings and within paved parking lots where vegetation is absent. The sites are surrounded by a combination of native and non-native trees and other non-native vegetation.

NSA Monterey's Navy Annex

NSA Monterey's Navy Annex is densely developed, but contains some individual, scattered coast live oaks. A remnant central maritime chaparral community is located in a narrow strip along the southern boundary of the Navy Annex, adjacent to the Monterey Peninsula Airport. The maritime chaparral community occurs on sandy substrates in level or rolling terrain near the coast, and generally supports chamise (*Adenostoma fasciculatum*), California lilac (*Ceanothus integerrimus*), and manzanita (*Arctostaphylos* spp.) (Navy 2013b). Two federally listed plant species are known to occur within this community on the Navy Annex (Section 3.2.1.2). This community has also been known to support the sandmat manzanita (*Arctostaphylos pumila*), a CNPS List 1B species; however, this species has not been documented at the Navy Annex since 2009 (Navy 2013b).

The proposed project sites at NSA Monterey's Navy Annex are located on top of existing buildings and within paved parking lots where vegetation is absent. The sites are surrounded by native and non-native trees. Proposed Site 1 and Site 3 border the maritime chaparral community described above. Underground electrical conduits and lines are proposed within areas that are currently paved or contain ornamental vegetation.

NAVWPNSTA Seal Beach

Agricultural fields, mowed grasslands, coastal salt marsh, and developed areas comprise approximately 80 percent of NAVWPNSTA Seal Beach land area. Small areas of coastal freshwater marshes are dominated by southern cattail (*Typha domingensis*), mulefat (*Baccharis salicifolia*), and prairie bulrush (*Scirpus robustus*); beaches and foredunes are dominated by red sand verbena (*Abronia maritima*), pink sand verbena (*Abronia umbellata*),

Watson salt bush (*Atriplex watsonii*), and sea rocket (*Cakile maritima*); riparian forests are dominated by willow (*Salix* spp.) and sycamore (*Platanus racemosa*); and a eucalyptus (*Eucalyptus* spp.) grove also is present at the installation. The primary crops grown in the agricultural areas include barley, lima beans, garbanzo beans, nopales (cactus pads), cucumbers, cauliflower, green beans, celery, lettuce, squash, peppers, watermelons, strawberries, and cabbage. Most of the grasslands at NAVWPNSTA Seal Beach contain non-native species, including bromes (*Bromus* spp.), oats (*Avena* spp.), rat-tail fescue (*Vulpia myuros*), and several other non-native annual grasses and annual forbs; however, patches of native grasslands occur within the non-native grasslands and, in a few areas, mature native grasslands dominated by needlegrass (*Nassella* spp.) with relatively few non-natives occur. A mesic phase of grassland occurs near wetland edges and is dominated by native salt grass (*Distichlis spicata*). Over 1,000 acres (405 hectares) of salt marsh habitat are found on the installation, with the majority found within the Seal Beach National Wildlife Refuge. The marsh is dominated by cordgrass (*Spartina foliosa*) and pickleweed (*Salicornia* spp.). Coastal salt marsh assemblages are subject to regular tidal influence, creating a salt marsh environ that includes salt marsh vegetation. Non-tidal freshwater marshes are generally contiguous with the upland side of the salt marshes. Freshwater marshes and the associated upstream riparian areas have been severely impacted by development and reduced fresh water input from rivers and creeks (Navy 2014f). Two CNPS 1B species have been documented at NAVWPNSTA Seal Beach, Coulter's goldfields (*Lasthenia glabrata* ssp. *Coulteri*) and estuary seablite (*Suaeda esteroa*) (Navy 2014f). Both of these species occur in salt marshes.

The proposed project site at NAVWPNSTA Seal Beach under Alternative 1 is located entirely within an area mapped as annual grassland (mesic) (Navy 2014f). As described above, mesic grasslands on the installation are dominated by native salt grass. The proposed project site under Alternative 2 occurs within a previously disturbed area, with some tall shrubs and low trees bordering the proposed project site to the south and east.

NAVWPNSTA Seal Beach Detachment Norco

NAVWPNSTA Seal Beach Detachment Norco has six distinct vegetation community types: grassland, coastal sage scrub, non-native trees, developed areas, riparian/wetland, and freshwater marsh. Grasslands at the station are comprised of native annuals and many non-native species, and are dominated by several species of grasses that have evolved to persist in concert with human agricultural practices, such as oats, bromes, barley (*Hordeum* spp.), and ryegrass (*Lolium* spp.). A majority of the installation is vegetated by non-native grassland. The coastal sage scrub community is comprised of low, soft-woody subshrubs. It is typically found on dry sites, such as steep, south-facing slopes or clay-rich soils that are slow to release stored water. The tree community is primarily comprised of non-native trees that are not maintained or artificially irrigated. This habitat type has the potential for nesting raptors and other bird species. Developed land is characterized by permanent or semi-permanent structures, pavement, or

hardscape, and landscaped areas that often require irrigation. The riparian/wetland community generally occupies freshwater wetland habitats that are seasonally flooded or saturated, and is typically found in ditches, floodplains, lake edges, low-gradient depositions along rivers, and streams. This habitat is found along the lake margin north of the Lake Norconian Club and on the small island located within the lake. Freshwater marsh dominated by cattail (*Typha* spp.) and bulrush (*Scirpus* sp.) occurs along the margins of Lake Norconian. Two CNPS 1B species have the potential to occur at NAVWPNSTA Seal Beach Detachment Norco, chaparral sand-verbena (*Abronia villosa* var. *aurita*) and smooth tarplant (*Centromadia pungens* ssp. *laevis*) (Navy 2012a).

Proposed Area 1 is mapped as non-native grassland (Navy 2012a). This site is heavily disturbed and consists of barren areas interspersed by small patches of weeds. Mature eucalyptus trees border the fence lines along the entry road (Fourth Street) just south of the site and extend north into the site from the entry road just inside the installation's east boundary. Proposed Area 2 is mapped as non-native grassland (Navy 2012a). This site predominately contains low-growing native and non-native annual grasses and weeds. A narrow swale containing sycamore (*Platanus occidentalis*), non-native trees (e.g., canary island date palm [*Phoenix canariensis*]), and other dense vegetation traverses the site from north to south.

View of the Area 2 site at NAVWPNSTA Seal Beach Detachment Norco, looking east from the ridge located west of the site

NBVC Port Hueneme

NBVC Port Hueneme has four distinct vegetation community types: dune mat, coyote brush (*Baccharis pilularis*) scrub, non-native grassland, and Arroyo willow (*Salix lasiolepis*) thickets. Dune mat habitat occurs in coastal foredunes and is characterized by vegetation that is highly tolerant of wind, sand movement, and an arid climate. At NBVC Port Hueneme, this habitat occurs along the southwest boundary of the installation and is fragmented into two areas that are divided by the Surface Warfare Engineering Facility overflow parking lot. Coyote brush scrub habitat is a diverse vegetation type dominated by coyote brush, and this habitat type typically occurs in upland settings, including stabilized dunes, coastal bluffs, open slopes, or terraces. Within NBVC Port Hueneme, this community occurs in a thin strip between Track 14 Road and the golf course. Non-native annual grasslands are found in the northwest portion of the installation and are comprised of introduced annual grasses and forbs with sparse native perennial species. Historically, these areas may have been occupied by coyote brush scrub

habitat. Arroyo willow thicket habitat occurs under freshwater conditions within drainage channels and freshwater marshes. These areas are dominated by Arroyo willow, bulrush, and cattail species. Arroyo willow thicket habitat has been mapped in the drainage channels and a ponded area north of 23rd Avenue. One CNPS 1B species, Coulter's goldfields, has been documented at NBVC Port Hueneme. While the species has the potential to occur, it has not been documented since 1901. Species-specific surveys are needed to confirm its presence or absence from the installation (Navy 2012b).

The proposed project site at NBVC Port Hueneme is located within paved parking lots that are surrounded by a combination of native and ornamental trees and other ornamental vegetation.

3.2.1.2 Threatened and Endangered Species

The Endangered Species Act of 1973 and its subsequent amendments provide for the conservation of threatened and endangered species of animals and plants and the habitats in which they are found. The Navy ensures that consultations are conducted, as required under Section 7 of the Endangered Species Act, for any action that may affect a federally listed threatened or endangered species. Although the protection of species that are listed at the state level as threatened or endangered is not legally mandated for federal agencies, the Navy encourages cooperation with states to protect such species where such protection is consistent with an installation's mission.

The following sections describe federally and state listed threatened and endangered species that could occur at each of the five installations and, more specifically, within the proposed project sites at each installation.

Federally Listed Species

<u>NAF El Centro</u>

Potential occurrences of federally listed bird species at NAF El Centro were determined through a quadrangle search of the California Natural Diversity Database and a review of the references cited in this section. One federally listed species, the federally endangered Yuma clapper rail (*Rallus longirostris yumanensis*), is listed as occurring within the Seeley Quadrangle, which encompasses NAF El Centro (Table 3.2-1) (California Department of Fish and Wildlife [CDFW] 2014a).

Table 3.2-1 Federally Listed and State Listed Species Occurring in the Seeley Quadrangle (NAF El Centro)

Common Name	Scientific Name	Federal ESA Status	State ESA Status
Birds			
Yuma clapper rail	*Rallus longirostris yumanensis*	Endangered	Threatened
California black rail	*Laterallus jamaicensis coturniculus*	--	Threatened

Sources: CDFW 2014a, 2014b

The Yuma clapper rail is also listed by the State of California as threatened. Habitat for the species includes freshwater marshes dominated by cattail and bulrush with a mix of riparian tree and shrub species along the marsh shoreline (U.S. Fish and Wildlife Service [USFWS] 2009). The Yuma clapper rail has not been documented at NAF El Centro; however, a wetland in the northwest corner of the installation could provide suitable habitat (Navy 2001). This wetland area is located more than 1 mile (1.6 kilometers) from the proposed project site. There is no suitable habitat for the Yuma clapper rail within the proposed project site, as the area is an agricultural outlease maintenance area and does not contain any wetlands.

NSA Monterey's Main Site

Eight federally listed animal species and 12 federally listed plant species have the potential to occur at NSA Monterey, including the Main Site (Table 3.2-2) (Navy 2013b). Of the animal species that have the potential to occur, only the marbled murrelet (*Brachyramphus marmoratus*) has been documented, occasionally occurring in nearshore waters within Monterey Bay, which is located is located 0.2 mile (0.32 kilometer) from NSA Monterey's Main Site. Suitable habitat for this bird species includes nearshore areas, estuaries, and sounds where it can feed on fish and invertebrates (CDFG, n.d.). No suitable habitat for the marbled murrelet occurs within NSA Monterey's Main Site. Of the 12 federally listed plant species with the potential to occur at NSA Monterey, only the Yadon's rein orchid (*Piperia yadonii*), Monterey gilia (*Gilia tenuiflora* ssp. *arenaria*), and Monterey spineflower (*Chorizanthe pungens* var. *pungens*) have been documented (Navy 2013b). However, none of these species have been documented at NSA Monterey's Main Site (Navy 2013b).

Table 3.2-2 Federally Listed and State Listed Species Known to Occur or Potentially Occur at the Navy's Monterey Area Properties, Including the Main Site and Navy Annex

Common Name	Scientific Name	Federal ESA Status	State ESA Status
Amphibians			
California tiger salamander	*Ambystoma californiense*	Threatened	Threatened
California red-legged frog	*Rana draytonii*	Threatened	--
Birds			
Western snowy plover	*Charadrius alexandrinus nivosus*	Threatened	--
Marbled Murrelet	*Brachyramphus marmoratus*	Threatened	Endangered
Fish			
Steelhead – south/central California Coast DPS	*Oncorhynchus mykiss irideus*	Threatened	--
Tidewater goby	*Eucyclogobius newberryi*	Endangered	--
Insects			
Smith's blue butterfly	*Euphilotes enoptes smithi*	Endangered	--
Mammals			
Southern sea otter	*Enhydra lutris nereis*	Threatened	--
Plants			
Beach Layia	*Layia carnosa*	Endangered	Endangered
Menzies' wallflower	*Erysimum menziesii*	Endangered	Endangered
Gowen cypress	*Hesperocyparis goveniana*	Threatened	--
Coastal dunes milk-vetch	*Astragalus tener* var. *titi*	Endangered	Endangered
Tidestrom's lupine	*Lupinus tidestromii*	Endangered	Endangered
Monterey clover	*Trifolium trichocalyx*	Endangered	Endangered
Yadon's rein orchid	*Piperia yadonii*	Endangered	--
Seaside bird's-beak	*Cordylanthus rigidus* ssp. *littoralis*	--	Endangered
Monterey gilia	*Gilia tenuiflora* ssp. *arenaria*	Endangered	Threatened
Monterey spineflower	*Chorizanthe pungens* var. *pungens*	Threatened	--
Robust spineflower	*Chorizanthe robusta* var. *robusta*	Endangered	--
Contra Costa goldfields	*Lasthenia conjugens*	Endangered	--
Hickman's cinquefoil	*Potentilla hickmanii*	Endangered	Endangered

Sources: CDFW 2014b, 2014c; Navy 2013b

Due to the developed nature of the proposed project sites at NSA Monterey's Main Site, and because these species have not been documented on the installation, the remaining federally listed animal and plant species listed in Table 3.2-2 are not considered further in this EA.

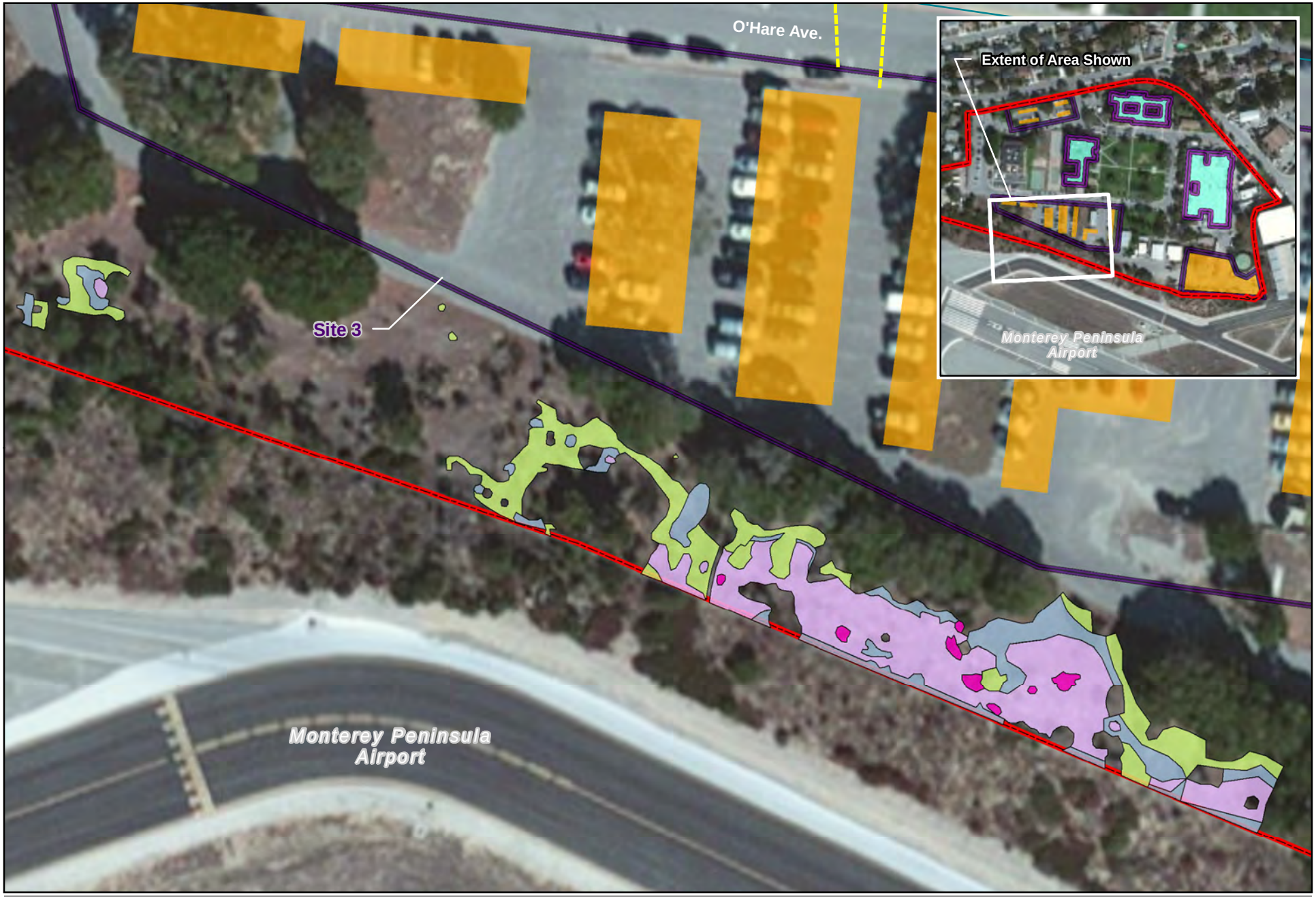
NSA Monterey's Navy Annex

As described above for NSA Monterey's Main Site, eight federally listed animal species and 12 federally listed plant species have the potential to occur at NSA Monterey, including the Navy Annex (Table 3.2-2) (Navy 2013b). The only federally listed animal species that has been documented at NSA Monterey is the marbled murrelet. The Navy Annex is located more than 1 mile (1.6 kilometers) from the Monterey Bay where the marbled murrelet has been documented, and no suitable habitat for the marbled murrelet occurs within NSA Monterey's Navy Annex.

As described above for NSA Monterey's Main Site, three federally listed plant species have been documented at NSA Monterey (Navy 2013b). Of the three species, the Yadon's rein orchid and Monterey spineflower have been documented at NSA Monterey's Navy Annex. Within the Navy Annex, suitable habitat for both species occurs in a thin strip of central maritime chaparral habitat along the southern boundary of the installation adjacent to the Monterey Peninsula Airport (Navy 2013b).

A recent survey mapped locations of the Monterey spineflower in this area (Figure 3.2-1) (Ecological Concerns, Inc. 2013). While the Navy's proposed Site 1 and Site 3 border the central maritime chaparral habitat at the Navy Annex, no suitable habitat for either of these species occurs within the proposed project sites.

Due to the developed nature of the proposed project sites at NSA Monterey's Navy Annex, and because these species have not been documented on the property, the remaining federally listed animal and plant species provided in Table 3.2-2 are not considered further in this EA.



Path: O:\NAVFAC SW\PV Solar EA\GIS Data\Figure3.2-1_NSA_Monterey_Annex_Spineflower.mxd

0 25 50 75 100 Feet

1:600

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Carport-Mounted Solar PV Panel Arrays
Rooftop-Mounted Solar PV Panel Arrays
Proposed Underground Electrical Line
Site Boundary
Installation Boundary

Monterey Spineflower Cover Class

High: 76-100%
Medium: 26-75%
Low: 1-25%
Very Low: <1%

Figure 3.2-1
Monterey Spineflower Cover Classes at NSA Monterey's Navy Annex

NAVWPNSTA Seal Beach

Four federally listed animal species and one federally listed plant species have been documented at NAVWPNSTA Seal Beach (Table 3.2-3) (Navy 2014f).

Table 3.2-3 Federally Listed and State Listed Species Known to Occur or Potentially Occur at NAVWPNSTA Seal Beach

Common Name	Scientific Name	Federal ESA Status	State ESA Status
Birds			
Belding's savannah sparrow	*Passerculus sandwichensis beldingi*	--	Endangered
California least tern	*Sternula antillarum browni*	Endangered	Endangered
Light-footed clapper rail	*Rallus longirostris levipes*	Endangered	Endangered
Swainson's hawk	*Buteo swainsoni*	--	Threatened
Western snowy plover	*Charadrius nivosus*	Threatened	--
Reptiles			
Green sea turtle*	*Chelonia mydas*	Threatened	--
Plants			
Salt marsh bird's beak	*Cordylanthus maritimus* ssp. *maritimus*	Endangered	Endangered

Sources: CDFW 2014b, 2014c; Navy 2014f
Note: Currently, only the breeding colony populations in Florida and on the Pacific Coast of Mexico are listed as Endangered (http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&sid=186cb0f38a1b1b6770e432a7eba20553&rgn=div8&view=text&node=50:2.0.1.1.1.2.1.1&idno=50).

The California least tern (*Sternula antillarum browni*) is a federally and state listed endangered bird species (CDFW 2014b). This species occurs in California from approximately April to August where it will nest in colonies on bare or sparsely vegetated flat substrates near the coast. Nest sites are generally close to the tern's preferred food source (small fish) and are typically found near estuaries, bays, or harbors (CDFG, n.d.). California least terns nest on NASA Island within the Seal Beach National Wildlife Refuge (Navy 2014f). NASA Island is 0.75 and 1.8 miles (1.2 and 2.9 kilometers) from the NAVWPNSTA Seal Beach proposed project sites under Alternative 1 and Alternative 2, respectively. No suitable habitat for the California least tern occurs within the proposed project sites.

The light-footed clapper rail (*Rallus longirostris levipes*) is a federally and state listed endangered bird species (CDFW 2014b). This species occurs year-round in cordgrass-pickleweed salt marshes (CDFG, n.d.). The light-footed clapper rail is known to occur within the coastal salt marshes at NAVWPNSTA Seal Beach (Navy 2014f). While the closest coastal salt marsh habitat to the proposed project site under Alternative 1 is approximately 150 feet (45.7

meters), the wetland is separated from this project site by Kitts Highway and abandoned railroad tracks. The closest coastal salt marsh habitat under Alternative 2 is 1.3 miles (2.1 kilometers) from the proposed project site (Merkel & Associates, Inc. 2006). No suitable habitat for the species occurs within either of the proposed project sites.

The western snowy plover (*Charadrius alexandrinus nivosus*) is a federally listed threatened species, and this bird species is not listed by the State of California (CDFW 2014b). This species nests in colonies on sandy beaches along the west coast of the United States and uses mudflats for foraging (Navy 2014f). The western snowy plover has been documented in low numbers on the beaches at NAVWPNSTA Seal Beach (Navy 2014f); however, no suitable habitat for the species occurs within the proposed project sites at NAVWPNSTA Seal Beach, and the closest suitable habitat is 1.3 and 2.9 miles (2.1 and 4.7 kilometers) from the proposed project sites under Alternative 1 and Alternative 2, respectively.

The green sea turtle (*Chelonia mydas*) is a federally listed threatened species. The green sea turtle returns to its natal beaches to nest and is known to return to the same foraging areas for long periods. While no green sea turtles have been documented to nest on the west coast of the United States, green sea turtles have been sighted offshore of Los Angeles County and Orange County, including offshore NAVWPNSTA Seal Beach. This species has also been sighted in Alamitos Bay (approximately 1.1 miles [1.8 kilometers] northwest) and in the San Gabriel River (approximately 3 miles [4.8 kilometers] northwest) of the installation. These coastal areas are north of the green sea turtle's more common southerly range; however, warmer water temperatures, such as during El Niño events, can make these waters suitable for this species (Navy 2014f). Generally, green turtles are found in fairly shallow waters (except when migrating) inside bays, reefs, and inlets with an abundance of marine grass and algae. Furthermore, the turtle requires open beaches with a sloping platform and minimal disturbance for nesting (USFWS 2014c). Suitable habitat for this species does not occur within the proposed project sites at NAVWPNSTA Seal Beach, and the closest habitat is 1.1 and 3.0 miles (1.8 and 4.8 kilometers) from the proposed project sites under Alternative 1 and Alternative 2, respectively.

The salt marsh bird's beak (*Cordylanthus maritimus* ssp. *maritimus*) is a federally and state listed endangered plant species (CDFW 2014c). This species typically occurs in coastal salt marshes close to the high tide elevation. The salt marsh bird's beak historically occurred at NAVWPNSTA Seal Beach, but has not been documented during recent surveys and may have been extirpated from the installation, and no suitable habitat for this species occurs within the proposed project sites at NAVWPNSTA Seal Beach. While the closest coastal salt marsh habitat is approximately 150 feet (45.7 meters) from the proposed project site under Alternative 1, the wetland is separated from the project site by Kitts Highway and abandoned railroad tracks. The closest coastal salt marsh habitat is 1.3 miles (2.1 kilometers) from the proposed project site under Alternative 2 (Merkel & Associates, Inc. 2006).

NAVWPNSTA Seal Beach Detachment Norco

Four federally listed animal species have the potential to occur at NAVWPNSTA Seal Beach Detachment Norco (Table 3.2-4); however, none of the four species have been documented at the installation.

Table 3.2-4 Federally Listed and State Listed Species Potentially Occurring at NAVWPNSTA Seal Beach Detachment Norco

Common Name	Scientific Name	Federal ESA Status	State ESA Status
Birds			
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered	Endangered
Coastal California gnatcatcher	*Polioptila californica californica*	Threatened	--
Least Bell's vireo	*Vireo bellii pusillus*	Endangered	Endangered
Insects			
Delhi Sands flower-loving fly	*Rhaphiomidas terminatus abdominalis*	Endangered	--

Sources: CDFW 2014b; Navy 2012a

The southwestern willow flycatcher (*Empidonax traillii extimus*) is a federally and state listed endangered bird species (CDFW 2014b). This species breeds in patchy to dense riparian habitats along streams or other wetlands (USFWS 2002). Marginal nesting habitat for the southwestern willow flycatcher occurs at two locations on NAVWPNSTA Seal Beach Detachment Norco: a riparian woodland and scrub near the northwest corner, and a willow woodland mixed with non-native trees along the lake margin north of the Lake Norconian Club (Navy 2012a). Area 1 at NAVWPNSTA Seal Beach Detachment Norco is 0.5 and 0.2 mile (0.8 and 0.3 kilometer) from the potential habitat areas for this species, respectively. Area 2 is 0.5 mile (0.8 kilometer) from both of the potential habitat areas.

The coastal California gnatcatcher (*Polioptila californica californica*) is a federally listed threatened bird species and is not listed by the State of California (CDFW 2014b). The species is non-migratory and occurs almost exclusively within coastal sage scrub habitat (Navy 2012a). Nesting of the species on NAVWPNSTA Seal Beach Detachment Norco is unlikely, due to the relatively poor condition of the coastal sage scrub habitat on the installation; however, dispersing juveniles occasionally could occur on the installation, as this species is known to nest approximately 2 miles (3.2 kilometers) east of the installation (Navy 2012a). The coastal California gnatcatcher would not be expected to occur within the proposed project sites at NAVWPNSTA Seal Beach Detachment Norco, as both sites are mapped as non-native grassland and do not contain the preferred habitat for the species (Navy 2012a).

The least Bell's vireo (*Vireo bellii pusillus*) is a federally and state listed endangered bird species (CDFW 2014b). Breeding habitat for the species is similar to that of the southwestern willow flycatcher. As described above for the southwestern willow flycatcher, the closest habitat, which is considered marginal, occurs 0.2 mile (0.32 kilometer) from Area 1 and 0.5 mile (0.8 kilometer) from Area 2. The closest known breeding population of the least Bell's vireo is 0.75 mile (1.2 kilometers) west of NAVWPNSTA Seal Beach Detachment Norco (Navy 2012a).

The Delhi Sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*) is federally listed as endangered and is not listed by the State of California (CDFW 2014b). This insect species is restricted to open habitats containing sparse cover of perennial shrubs and other vegetation underlain by fine, sandy soils associated with the "Delhi" series (Navy 2012a; USFWS 1997). Optimal vegetative cover for this species is usually in the range of 10 to 20 percent. In addition, three indicator species are usually present where the fly occurs, including common buckwheat (*Eriogonum fasiculatum*), telegraph weed (*Heterotheca grandiflora*), and croton (*Croton californicus*) (USFWS 1997). While 9.3 acres (3.8 hectares) of NAVWPNSTA Seal Beach Detachment Norco is underlain by the Delhi series, it is unlikely that the installation has suitable vegetation to support the species because vegetation in the area containing the appropriate soil is non-native grassland with a much higher percent cover than that in which the fly normally occurs (Navy 2012a). Area 1 at NAVWPNSTA Seal Beach Detachment Norco is not within the mapped Delhi series soils; however, most of Area 2 occurs over the mapped Delhi series soils.

NBVC Port Hueneme

Four federally listed animal species have been documented at NBVC Port Hueneme (Table 3.2-5) (Navy 2012b).

Table 3.2-5 Federally Listed and State Listed Species Known to Occur or Potentially Occur at NBVC Port Hueneme

Common Name	Scientific Name	Federal ESA Status	State ESA Status
Birds			
Western snowy plover	*Charadrius alexandrinus nivosus*	Threatened	--
California least tern	*Sterna antillarum browni*	Endangered	Endangered
Least Bell's vireo	*Vireo bellii pusillus*	Endangered	Endangered
Mammals			
Southern sea otter	*Enhydra lutris nereis*	Threatened	--

Sources: CDFW 2014b; Navy 2012b

The western snowy plover is federally listed as threatened and is not listed by the State of California (CDFW 2014b). Preferred habitat for the species is described above under NAVWPNSTA Seal Beach. The western snowy plover has been observed on the beaches at NBVC Port Hueneme; however, no nesting has been documented at the installation (Navy 2012b) and no suitable habit for the western snowy plover occurs within the proposed project site. The closest beach is 0.15 mile (0.24 kilometer) from the proposed project site.

The California least tern is a federally and state listed endangered species (CDFW 2014b). Preferred habitat for the species is described above under NAVWPNSTA Seal Beach. California least tern nesting has not been documented at NBVC Port Hueneme, but does occur in neighboring areas of coastline. California least terns occasionally may forage in Port Hueneme Harbor and have been documented roosting at the northwest end of the harbor (Navy 2012b); however, no suitable habit for the California least tern occurs within the proposed project site. Port Hueneme Harbor is 0.5 mile (0.8 kilometer) from the proposed project site.

The least Bell's vireo is a federally and state listed endangered species (CDFW 2014b). Preferred habitat for the species is described above under NAVWPNSTA Seal Beach Detachment Norco. The least Bell's vireo has not been documented at NBVC Port Hueneme, but has been regionally documented in Ventura County. Arroyo willow thicket habitat at the installation could support individuals of the species (Navy 2012b); however, no suitable habit for the least Bell's vireo occurs within the proposed project site. Arroyo willow thicket habitat has been mapped in the drainage channels and a ponded area north of 23rd Avenue (Navy 2012b). This area is 0.9 mile (1.4 kilometers) from the proposed project site.

The southern sea otter (*Enhydra lutris nereis*) is federally listed as threatened and is not listed by the State of California (CDFW 2014b). Currently, the southern sea otter's primary range is restricted to the coastal area of central California, from San Mateo County to Santa Barbara County, plus a small translocated population around San Nicolas Island (Navy 2012b). This species prefers rocky shorelines with kelp beds and waters about 66 feet (20 meters) deep. Sea otters have been documented at NBVC Port Hueneme in kelp beds on the west side of the harbor entrance (Navy 2012b). The harbor entrance is 0.8 mile (1.3 kilometer) from the proposed project site.

State Listed Species

<u>NAF El Centro</u>

Potential occurrences of state listed species at NAF El Centro were determined through a quadrangle search of the California Natural Diversity Database and a review of the references cited in this section. One state listed species, the California black rail (*Laterallus jamaicensis coturniculus*), is listed as occurring within the Seeley Quadrangle, which encompasses NAF El Centro (Table 3.2-1) (CDFW 2014a). The California black rail inhabits saltwater, brackish, and

freshwater marshes (CDFG, n.d.). There is no suitable habitat for the California black rail within the proposed project site, as this area is an agricultural outlease maintenance area and does not contain any wetlands. The only potentially suitable habitat for the species occurs in the northwest corner of the installation, located more than 1 mile (1.6 kilometers) from the proposed project site (Navy 2001).

NSA Monterey's Main Site

Aside from those species described above under federally listed species, no state listed threatened or endangered species have been documented at NSA Monterey's Main Site (Navy 2013b). Due to the developed nature of the proposed project sites at NSA Monterey's Main Site, and because these species have not been documented on the property, the remaining state listed animal and plant species listed in Table 3.2-2 are not considered further in this EA.

NSA Monterey's Navy Annex

Aside from those species described above under federally listed species, no state listed threatened or endangered species have been documented at NSA Monterey's Navy Annex (Navy 2013b). Due to the developed nature of the proposed project sites at NSA Monterey's Navy Annex, and because these species have not been documented on the property, the remaining state listed animal and plant species listed in Table 3.2-2 are not considered further in this EA.

NAVWPNSTA Seal Beach

Aside from the species described above under federally listed species, one state endangered species, Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), occurs at NAVWPNSTA Seal Beach. This subspecies of the savannah sparrow (*Passerculus sandwichensis*) is non-migratory and strictly associated with salt marsh habitats. This species is a resident breeder on both NAVWPNSTA Seal Beach and the Seal Beach National Wildlife Refuge (Navy 2014f). Coastal salt marsh habitat occurs 0.1 and 1.2 miles (0.16 and 1.9 kilometers) from the proposed project sites under Alternative 1 and Alternative 2, respectively.

NAVWPNSTA Seal Beach Detachment Norco

Aside from those species described above under federally listed species, no state listed threatened or endangered species have been documented at NAVWPNSTA Seal Beach Detachment Norco (Navy 2012a).

NBVC Port Hueneme

Aside from those species described above under federally listed species, no state listed threatened or endangered species have been documented at NBVC Port Hueneme (Navy 2012b).

3.2.1.3 Wildlife

The following sections describe wildlife occurring at each installation and having the potential to occur within the project site(s) at each installation.

NAF El Centro

Common mammals occurring at NAF El Centro include the coyote (*Canis latrans*), black-tailed jackrabbit (*Lepus californicus*), Audubon's cottontail (*Sylvilagus audubonii*), cactus mouse (*Peromyscus eremicus*), deer mouse (*Peromyscus maniculatus*), and round-tailed ground squirrel (*Spermophilus tereticaudus*). Reptiles and amphibians include the tiger whiptail (*Cnemidophorus tigris*), desert spiny lizard (*Sceloporus magister*), long-tailed brush lizard (*Urosaurus graciosus*), Woodhouse's toad (*Bufo woodhousei*), and bullfrog (*Rana catesbeiana*). Common birds include the European starling (*Sturnus vulgarus*), house sparrow (*Passer domesticus*), black-tailed gnatcatcher (*Polioptila melanura*), white-faced ibis (*Plegadis shihi*), northern mockingbird (*Mimus polyglottos*), Brewer's blackbird (*Euphagus cyanocephalus*), cattle egret (*Bubulcus ibis*), western meadowlark (*Sturnella neglecta*), mountain bluebird (*Sialia currucoides*), American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), and western burrowing owl. The most abundant and diverse populations of birds are found in wetland/riparian areas of the installation. NAF El Centro is located along the Pacific Flyway, one of four main migration flyways in North America that waterfowl, passerines, hawks, and other birds use to make their seasonal migrations (Navy 2014g).

Because the proposed project site at NAF El Centro is within a former agricultural outlease area, wildlife diversity within the project site is likely limited. The mammal and reptile species listed above could occur within the project site; however, the amphibian species would not be expected to occur because the project site does not contain any wetlands. Likewise, bird species commonly found in wetland areas would be absent from the project site, as riparian/wetland areas of the installation are located more than 1 mile (1.6 kilometers) from the project site. Bird species likely to occur within the project site include those adapted to grassland, open, and shrubby habitats. These could include species such as doves (*Columbina* spp. and *Zenaida* spp.), hawks (*Accipter* spp. and *Buteo* spp.), American kestrel, California horned lark (*Eremophila alpestris actia*), sparrows (Emberizidae), loggerhead shrike (*Lanius ludovicianus*), northern mockingbird, and American pipit (*Anthus rubescens*).

The western burrowing owl is a California bird species of special concern. The burrowing owl is a small ground-dwelling owl found in open, dry grasslands, agricultural and range lands, as well as desert habitats with low-growing vegetation. This species resides in burrows primarily created, then abandoned, by species such as ground squirrels and coyotes (Navy 2012a). California has one of the largest populations of resident burrowing owls, with the largest concentrations in the Imperial Valley due to habitat created from agricultural practices (Navy

2001). Throughout their range, western burrowing owls are threatened by habitat loss, predation, vehicle impacts, and control programs for ground squirrels (Navy 2014f). The western burrowing owl has been documented nesting within and in the vicinity of the proposed project site at NAF El Centro (CDFG 2008; NAF El Centro Public Works Department 2013). During surveys in 2013, active burrows were located along the southern boundary of the proposed project site and near the area proposed for trenching for the installation of the electrical conduit and transmission lines (Figure 3.2-2) (NAF El Centro Public Works Department 2013).

The NAF El Centro proposed project site is located just east of New River and is surrounded by agricultural land. A number of birds associated with aquatic habitats (e.g., lakes and ponds) have been identified in the area surrounding the site (USFWS 2014b), and high numbers of water birds are present within the vicinity of the project site. These species include ducks, grebes, mergansers, cormorants, herons, gulls, and terns (eBird 2012).

NSA Monterey's Main Site

Mammals species documented at NSA Monterey's Main Site include the Audubon's cottontail, fox squirrel (*Sciurus niger*), mule deer (*Odocoileus hemionus*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), western gray squirrel (*Sciurus griseus*), western spotted skunk (*Spilogale gracilis*), and bats, including the big brown bat (*Eptesicus fuscus*), hoary bat (*Lasiurus cinereus*), Mexican free-tailed bat (*Tadarida brasiliensis*), and *Myotis* spp. Reptiles and amphibians include the coast garter snake (*Thamnophis elegans terrestris*), California newt (*Taricha torosa torosa*), and Pacific treefrog (*Pseudacris regilla*). Birds occurring at the Main Site include waterfowl, raptors, sparrows, and warblers, and are representative of the wetland, developed, and landscaped habitats that occur there (Navy 2013b).

Because the proposed project sites at NSA Monterey's Main Site are within existing parking lots and on top of existing buildings, occurrences of wildlife in these areas would be limited. With the exception of the bat species, mammals would not be expected to regularly occur within the project sites, but could occur around the periphery of the sites. Bats could roost in anthropogenic structures (e.g., buildings, crevices, and culverts) and could forage over the parking lots and buildings. Similar to mammals, the reptiles and amphibians known to occur at NSA Monterey's Main Site would not be expected to occur within the proposed project sites. Birds adapted to nesting in human-made structures (e.g., the European starling, house finch [*Carpodacus mexicanus*], and house sparrow) could occur within the project sites. Other species know to occur at the installation could occur in vegetated areas around the periphery of the sites, but would not be expected to regularly occur within the proposed sites.

Path: O:\NAVFAC SW PV Solar EA\GIS Data\Figure3_2-2_NAF_El_Centro_BOs_021114.mxd

0 100 200 300 400 Feet

1:3,000

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Ground-Mounted Solar PV Panel Arrays
Point of Connection
IID Substation
Proposed Electrical Line

Burrowing Owl Burrow Location (2013)
Occupied
Unoccupied

Figure 3.2-2
Burrowing Owl Burrow Locations at NAF El Centro

NSA Monterey's Navy Annex

Wildlife occurring at NSA Monterey's Navy Annex have not been specifically identified; however, given the developed nature of the installation and its close proximity to the Main Site, species composition at the Navy Annex is likely similar to the Main Site. As with the Main Site, proposed project sites at the Navy Annex are within existing parking lots and on top of existing buildings. Therefore, occurrences of wildlife in these areas would be limited. With the exception of bats, which could roost in anthropogenic structures and could forage over the parking lots and buildings, mammals would not be expected to regularly occur within the project sites at the Navy Annex but could occur around the periphery of the sites. Reptiles and amphibians would not be expected to occur within the proposed project sites. Birds adapted to nesting in human-made structures could occur within the project sites, and other bird species could occur in vegetated areas around the periphery of the sites, but would not be expected to regularly occur within the proposed sites.

NAVWPNSTA Seal Beach

Nineteen species of mammals, primarily associated with upland habitats, occur or could occur at NAVWPNSTA Seal Beach. These include species such as coyote, red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), raccoon, striped skunk (*Mephitis mephitis*), Audubon's cottontail, black-tailed jackrabbit, and small mammals such as mice, rats, and voles. Five species of reptiles are known to occur on NAVWPNSTA Seal Beach, including the western fence lizard (*Sceloperus occidentalis*), side-blotched lizard (*Uta stansburiana*), southern alligator lizard (*Elgaria multicarinata*), silvery legless lizard (*Anniella pulchra pulchra*), and gopher snake (*Pituophis melanoleucus*). Amphibian species include the California toad and Pacific treefrog. The Seal Beach National Wildlife Refuge is part of the Audubon Society's Orange Coast Wetlands Important Bird Area. There have been 253 bird species recorded at NAVWPNSTA Seal Beach, most of which have been at the refuge. Peak diversity of birds occurs during spring and fall migrations, although several species are year-round residents. Wetland habitats are most frequently used by birds, but the surrounding uplands are also utilized (Navy 2014f).

The proposed project site for Alternative 1 is located within grassland, and the proposed project site for Alternative 2 is within a previously disturbed area bordered by tall shrubs and low trees (Navy 2014f). The mammals, reptiles, and amphibians listed above have the potential to occur within the project sites. Birds known to occur in the grasslands of the station include the western meadowlark (*Sturnella neglecta*), horned lark (*Eremophila alpestris*), mourning dove (*Zenaida macroura*), and loggerhead shrike. The open fields are also used in the winter by savannah sparrows (*Passerculus sandwichensis*) and white-crowned sparrows (*Zonotrichia leucophrys*) (Navy 2014f). Raptors, such as the red-tailed hawk and American kestrel, may also forage in these areas.

The western burrowing owl is known to occur at NAVWPNSTA Seal Beach. As of 2013, a maximum of three pairs of western burrowing owl were residents at the installation. This is the only nesting population of burrowing owl still remaining in Orange County (Navy 2014f).

NAVWPNSTA Seal Beach is adjacent to the Seal Beach National Wildlife Refuge, and a number of birds associated with aquatic habitats (e.g., lakes and ponds) have been identified in the areas surrounding NAVWPNSTA Seal Beach (USFWS 2014b). High numbers of water birds are present within the vicinity of the project sites, including ducks, grebes, mergansers, cormorants, herons, gulls, and terns (eBird 2012). There are numerous water bodies and sources of water available for migrating birds in proximity to the proposed project sites at NAVWPNSTA Seal Beach.

NAVWPNSTA Seal Beach Detachment Norco

Lake Norconian is the primary natural resource feature at NAVWPNSTA Seal Beach Detachment Norco. Waterfowl, herons, hawks, shorebirds, swallows, songbirds, and other types of birds utilize the lake and ponds, or forage or nest in the surrounding wetland and upland habitats. Twelve native mammal species have been documented at the station; however, the most common species are both native and non-native. Native species include the California ground squirrel (*Spermophilus beecheyi*), Audubon's cottontail, Botta's pocket gopher (*Thomomys bottae*), western harvest mouse (*Reithrodontomys megalotis*), coyote, long-tailed weasel (*Mustela frenata*), striped skunk, raccoon, and gray fox. Non-native species occurring at the station include the black rat (*Rattus rattus*), house mouse (*Mus musculus*), and feral cats (*Felis catus*) (Navy 2012a). Reptiles and amphibians documented at the station include the Pacific treefrog, bullfrog, western fence lizard, southern alligator lizard, western blind snake (*Rena humilis*), and gopher snake (*Pituophis catenifer*). There have been 142 bird species documented at the installation (Navy 2012a). The grasslands within the installation also provide foraging habitat for a variety of raptors (Navy 2012a).

The proposed project sites at NAVWPNSTA Seal Beach Detachment Norco are both primarily within non-native grasslands. The mammals, reptiles, and amphibians described above could occur within the project sites. Bird diversity would likely be limited in the project sites due to limited habitat. Species common to open areas, such as northern mockingbird, could occur.

Anecdotal reports from security personnel on the installation, and confirmed by the installation biologist, indicate that there has been recent occupation by burrowing owls in the grassy areas behind Buildings 501, 502, and 503, located south of the Area 1 project site and directly north of Fourth Street. At least two burrows in this area contained rodent bones, indicating somewhat recent occupation. An additional area, near the northwest corner of Lake

Norconian, is commonly occupied by California ground squirrels and the open habitat at this location is suitable for burrowing owls (Navy 2013h).

NAVWPNSTA Seal Beach Detachment Norco encompasses Lake Norconian, an area favored by waterfowl, and a number of birds associated with aquatic habitats (e.g., lakes and ponds) have been identified in the areas surrounding NAVWPNSTA Seal Beach Detachment Norco (USFWS 2014b). High numbers of water birds are present within the vicinity of the project site, including ducks, grebes, mergansers, cormorants, herons, gulls, and terns (eBird 2012) There are numerous water bodies and sources of water available for migrating birds in proximity to the proposed project sites at NAVWPNSTA Seal Beach Detachment Norco.

NBVC Port Hueneme

Mammals documented at NBVC Port Hueneme include coyote, gray fox, raccoon, opossum, Audubon's cottontail, black-tailed jackrabbit, Botta's pocket gopher, California ground squirrel, deer mouse, and fox squirrel. Common reptile and amphibian species include the Pacific treefrog, gopher snake, western fence lizard, side-blotched lizard, and southern alligator lizard. Developed areas provide roosting and nesting habitat for birds within structures and landscaping. The cliff swallow (*Petrochelidon pyrrhonota*), mourning dove, house finch, and other common species have been recorded nesting on various buildings and structures. Herons and egrets nest in eucalyptus trees along the western fence line of the installation. Great horned owls have been documented nesting at the Bard Mansion grounds. Red-tailed hawks may nest on the installation, but none have been confirmed. Waterfowl use the ponded areas at the golf course and Arroyo willow thicket habitat, and occasionally have been recorded nesting or with ducklings (Navy 2012b).

Because the proposed project sites at NBVC Port Hueneme are within existing parking lots, occurrences of wildlife in these areas would be limited. Mammals would not be expected to regularly occur within the parking lots, but could occur around the periphery of the site, and small mammals could occur within the landscaped area proposed for the underground electrical conduits and transmission lines. Occurrences of reptiles and amphibians would be similar to mammals and would be expected to regularly occur within landscaped areas only. Birds would be limited to common species adapted to developed areas. Burrowing owls have been observed at NBVC Port Hueneme, but would not be expected to occur within the project site because there is no suitable habitat.

3.2.1.4 Wetlands and Waters of the United States

Executive Order 11990 of 1977 (Protection of Wetlands) directs the preservation and enhancement of wetlands. Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in

saturated soil conditions. Wetlands generally include swamps, bogs, marshes, and similar areas" (40 CFR 232.2).

Three criteria must be fulfilled in order to consider an area a jurisdictional wetland:

1. The presence of hydrophytic vegetation;
2. The presence of wetland hydrology; and,
3. The presence of hydric soils.

Delineations to identify wetlands and non-wetland jurisdictional waters of the United States, as defined by the U.S. Army Corps of Engineers (USACE), if present, were conducted at NAF El Centro in 2011, NSA Monterey's Main Site in 2011, NAVWPNSTA Seal Beach in 2005, NAVWPNSTA Seal Beach Detachment Norco in 1998, and NBVC Port Hueneme in 2007 and 2011. No wetlands occur at NSA Monterey's Navy Annex.

NAF El Centro

No wetlands occur within the proposed project site at NAF El Centro; however, drainage canals are located just beyond the installation boundary. These canals are located approximately 80 feet (24 meters) south of the proposed project site and approximately 60 feet (18 meters) west of the proposed electrical interconnection site.

NSA Monterey's Main Site

The catchment basin in the southeastern portion of NSA Monterey's Main Site has been classified as an unvegetated waters of the United States. The catchment basin is bordered by a jurisdictional wetland containing willow riparian and freshwater marsh wetlands (Figure 2-2) (Navy 2013b). This wetland borders the eastern boundary of proposed Site 5. No other wetlands occur in proximity to the other proposed sites at NSA Monterey's Main Site.

NSA Monterey's Navy Annex

No wetlands occur at NSA Monterey's Navy Annex.

NAVWPNSTA Seal Beach

No wetlands occur within the proposed project sites at NAVWPNSTA Seal Beach. Wetlands occur to the south and west of the proposed project site under Alternative 1 (Figure 2-4). Both wetlands are composed of coastal salt marsh vegetation communities. The wetland to the south is dominated by Virginia glasswort (*Salicornia virginica*), turtleweed (*Batis maritima*), and marsh jaumea (*Jaumea carnosa*), while the wetland to the west is dominated by Virginia glasswort, turtleweed, and saltgrass (*Distichlis spicata*) (Merkel & Associates, Inc.

2006). The wetland to the south is approximately 400 feet (122 meters) from the proposed project site boundary, while the wetland to the west is approximately 150 feet (46 meters) from the proposed project site boundary but is separated from the project site by Kitts Highway and abandoned railroad tracks.

No wetlands occur within or in the vicinity of the proposed project site under Alternative 2; however, an area of non-wetland waters of the United States has been mapped and is located approximately 700 feet (213 meters) west of the proposed interconnection point (Figure 2-8) (Merkel & Associates, Inc. 2006). The drainage area is 1 foot (0.3 meter) wide and parallels Westminster Boulevard.

NAVWPNSTA Seal Beach Detachment Norco

No wetlands occur within or in the vicinity of proposed Area 1 or Area 2 at NAVWPNSTA Seal Beach Detachment Norco

NBVC Port Hueneme

No wetlands occur within or in the vicinity of the proposed project site at NBVC Port Hueneme.

3.2.2 ENVIRONMENTAL CONSEQUENCES

The following section describes the potential impacts to biological resources that could result from the implementation of the alternatives. Factors relevant to determining whether impacts would be significant include the severity of any impacts to individual species or habitats of threatened and endangered species.

Impacts to biological resources were evaluated based upon the proposed construction equipment and methods that would be used to build the solar photovoltaic systems, and how the sites would be used after implementation. Conservation and construction measures (Section 2.4) are identified for each location, as appropriate.

3.2.2.1 Alternative 1 (Preferred Alternative)

[*Note. Final acreages of disturbance to specific plant communities are to be determined and will be based on final site design by the PPA solar power developer. Removal of vegetation would be approved by the installation biologist at each installation prior to project construction.*]

Vegetation Communities

NAF El Centro

Under Alternative 1 at NAF El Centro, a ground-mounted solar photovoltaic system would be installed on approximately 10 acres (4 hectares) of previously disturbed land. Site preparation (e.g., grubbing and grading) and installation of the solar photovoltaic system would result in long-term impacts to vegetation at the site. However, because the site has been previously disturbed for agricultural purposes and only contains patches of vegetation, these impacts would be minor. Temporary impacts would also occur as a result of trenching for the installation of electrical conduit between the solar array and point of connection to the existing electrical grid. Following installation of the conduit, the trenched area would be restored to its original condition. Revegetation would be coordinated with and approved by applicable installation personnel, as described in Section 2.4.6; therefore, these impacts would be temporary and minor. Minor, temporary impacts to plant communities adjacent to the site could also occur during construction and maintenance from trampling by vehicles or pedestrians. Overall, no significant impacts to vegetation communities at NAF El Centro would result from implementation of Alternative 1.

NSA Monterey's Main Site

Under Alternative 1 at NSA Monterey's Main Site, a solar photovoltaic system would be installed on top of newly constructed carports in existing paved parking lots and on the rooftops of existing buildings. While there would be no permanent impacts to vegetation communities at the installation, minor, temporary impacts could occur to ornamental vegetation as a result of trenching for electrical conduit installation between the solar arrays and point of connection to the existing electrical grid. Following installation of the conduit, the trenched areas would be restored to their original condition. Revegetation would be coordinated with and approved by applicable installation personnel, as described in Section 2.4.6; therefore, these impacts would be temporary and minor. No trees would be removed from implementation of Alternative 1; therefore, no impacts would occur to the CNPS Listed 1B Monterey pine or Monterey cypress. Overall, no significant impacts to vegetation communities at NSA Monterey's Main Site would result from implementation of Alternative 1.

NSA Monterey's Navy Annex

Under Alternative 1 at NSA Monterey's Navy Annex, a solar photovoltaic system would be installed on top of newly constructed carports in existing paved parking lots and on the rooftops of existing buildings. While there would be no permanent impacts to vegetation communities at the installation, minor, temporary impacts could occur to ornamental vegetation as a result of trenching for electrical conduit installation between the solar arrays and point of connection to the existing electrical grid. Following installation of the conduits, the trenched areas would be restored to their original condition. Revegetation would be coordinated with and approved by applicable installation personnel, as described in Section 2.4.6. The central maritime chaparral community south of proposed Site 1 and Site 3 would not be impacted; therefore, there would be no impacts to the CNPS List 1B sandmat manzanita or its habitat. Overall, no significant impacts to vegetation communities at NSA Monterey's Navy Annex would result from implementation of Alternative 1. (Note. Refer to the Federally Listed Species section for a discussion of potential impacts to federally listed plant species at NSA Monterey's Navy Annex.)

NAVWPNSTA Seal Beach

Under Alternative 1 at NAVWPNSTA Seal Beach, a ground-mounted solar photovoltaic system would be installed on 5.5 acres (2.2 hectares) of mesic grassland. Site preparation (e.g., grubbing and grading) and installation of the solar photovoltaic system would result in long-term impacts to this vegetation community within the proposed site. Temporary impacts would also occur as a result of trenching for electrical conduit installation between the solar array and point of connection to the existing electrical grid. Following installation of the conduit, the trenched area would be restored to its original condition. Revegetation would be coordinated with and approved by applicable installation personnel, as described in Section 2.4.6; therefore, these impacts would be temporary and minor. Minor, temporary impacts could also occur adjacent to the site during construction and maintenance from trampling by vehicles or pedestrians. No impacts to coastal salt marsh communities would occur; therefore, there would be no impacts to the CNPS 1B listed Coulter's goldfields or estuary seablite. Overall, no significant impacts to vegetation communities at NAVWPNSTA Seal Beach would result from implementation of Alternative 1.

NAVWPNSTA Seal Beach Detachment Norco

Under Alternative 1 at NAVWPNSTA Seal Beach Detachment Norco, a ground-mounted solar photovoltaic system would be installed at up to two areas at the installation. Area 1 encompasses approximately 8.5 acres (3.4 hectares) and Area 2 encompasses approximately 10 acres (4 hectares). Both areas have been mapped as non-native grassland. Site preparation (e.g., grubbing and grading) and installation of the solar photovoltaic system would result in long-term impacts to vegetation at the site. Vegetation within the swale that traverses Area 2

would be avoided during development of the panel arrays; no vegetation, including trees within the swale area, would be removed. Because the sites have been previously disturbed and contain large amounts of non-native vegetation, and because the area around the swale within Area 2 would be avoided, impacts would be minor. Temporary impacts outside Area 2 would occur as a result of trenching for electrical conduit installation between the solar array and point of connection to the existing electrical grid. Following installation of the conduit, the trenched area would be restored to its original condition. Revegetation efforts would be coordinated with and approved by applicable installation personnel, as described in Section 2.4.6; therefore, these impacts would be temporary and minor. Minor, temporary impacts to plant communities adjacent to the site could also occur during construction and maintenance from trampling by vehicles or pedestrians. Neither Area 1 nor Area 2 contain habitat to support the chaparral sand verbena (coastal sage scrub) or smooth tarplant (riparian habitat); therefore, Alternative 1 would have no impact on these rare plant species. Overall, no significant impacts to vegetation communities at NAVWPNSTA Seal Beach Detachment Norco would result from implementation of Alternative 1.

NBVC Port Hueneme

Under Alternative 1 at NBVC Port Hueneme, a solar photovoltaic system would be installed on top of newly constructed carports in existing paved parking lots. Therefore, there would be no permanent impacts to vegetation communities at the installation. However, minor, temporary impacts could occur to ornamental vegetation as a result of trenching for electrical conduit installation between the solar array and point of connection to the existing electrical grid. Following installation of the conduit, the trenched area would be restored to its original condition. Revegetation would be coordinated with and approved by applicable installation personnel, as described in Section 2.4.6; therefore, impacts would be temporary and minor. No impacts would occur to the CNPS Listed 1B Coulter's goldfields because there is no suitable habitat for the species in the vicinity of the Proposed Action. Overall, no significant impacts to vegetation communities at NBVC Port Hueneme would result from implementation of Alternative 1.

Federally Listed Species

NAF El Centro

Under Alternative 1 at NAF El Centro, there would be no effect on the federally endangered Yuma clapper rail because there is no suitable habitat for the species within, or in the vicinity of, the proposed project site. As a result, no significant impacts to federally listed species would occur under Alternative 1 at NAF El Centro.

NSA Monterey's Main Site

Under Alternative 1 at NSA Monterey's Main Site, there would be no effect on the federally threatened marbled murrelet because no suitable habitat for the species occurs within or close to the proposed project sites. No other federally listed species have been documented at the Main Site. As a result, no significant impacts to federally listed species would occur under Alternative 1 at NSA Monterey's Main Site.

NSA Monterey's Navy Annex

Under Alternative 1 at NSA Monterey's Navy Annex, there would be no effect on the federally threatened marbled murrelet because no suitable habitat for the species occurs within or close to the proposed project sites. Under Alternative 1, the generation facilities would be located within paved areas or on top of existing buildings. No construction, including trenching for the underground electrical conduit, would be proposed within the central maritime chaparral habitat where the Yadon's rein orchid and Monterey spineflower have been documented. In addition, the Navy has constructed a fence to denote the habitat area for these federally protected plant species. Therefore, Alternative 1 would have no effect on the federally listed Yadon's rein orchid or Monterey spineflower. As a result, no significant impacts to federally listed species would occur under Alternative 1 at NSA Monterey's Navy Annex.

NAVWPNSTA Seal Beach

Under Alternative 1 at NAVWPNSTA Seal Beach, there is no suitable habitat for the California least tern, light-footed clapper rail, western snowy plover, green sea turtle, or salt marsh bird's beak within the proposed project site. The closest habitat to support the California least tern is 0.75 mile (1.2 kilometers) from the proposed project site, while the closest habitat to support the western snowy plover is 1.3 miles (2.1 kilometers) from the proposed project site. The closest habitat for green sea turtle is 1.1 mile (1.8 kilometers) from the Alternative 1 proposed project site. Coastal salt marsh habitat, which could support the light-footed clapper rail and salt marsh bird's beak is approximately 150 feet (46 meters) from the proposed project site on the opposite side of Kitts Highway; however, construction under Alternative 1 would have no impacts to the salt marsh habitat. The wetland area is only approximately 200 feet (61 meters) wide and is bordered to the west by a campground and to the east by Kitts Highway. If the light-footed clapper rail occurs in this wetland, it is likely already exposed to daytime noise from vehicles and pedestrians, and no lighted nighttime work would be permitted in proximity to the Seal Beach Natural Wildlife Refuge. Therefore, noise generated by construction would likely have no impact on the light-footed clapper rail. Because of the distance of the proposed project site to suitable habitat for the California least tern and western snowy plover, Alternative 1 would have no effect on these species. Although suitable habitat for the light-footed clapper rail and salt marsh bird's beak is relatively close to the proposed project site, the two sites are separated by Kitts Highway and railroad tracks. There would be no impacts to the salt marsh habitat, and

noise generated by construction would likely not exceed noise levels already generated by traffic on Kitts Highway and from the nearby campground. Therefore, under Alternative 1, there would be no effect on the light-footed clapper rail or salt marsh bird's beak. As a result, no significant impacts to federally listed species would occur under Alternative 1 at NAVWPNSTA Seal Beach.

NAVWPNSTA Seal Beach Detachment Norco

Under Alternative 1 at NAVWPNSTA Seal Beach Detachment Norco, no suitable habitat for the southwestern willow flycatcher, coastal California gnatcatcher, or least Bell's vireo occurs within the proposed project site. In addition, none of these species has been documented at the installation. Under Alternative 1, the proposed project site occurs over a soil series known to support the Delhi Sands flower-loving fly. However, it is unlikely that the project site would support the fly species because it is covered by a non-native grassland community, and the vegetation is much denser than areas where the fly species is known to occur. Therefore, Alternative 1 would have no effect on these four federally listed species. As a result, no significant impacts to federally listed species would occur under Alternative 1 at NAVWPNSTA Seal Beach Detachment Norco.

NBVC Port Hueneme

Under Alternative 1 at NBVC Port Hueneme, there is no suitable habitat within the proposed project site to support the western snowy plover, California least tern, least Bell's vireo, or southern sea otter. In addition, none of these species would be expected to occur within 0.15 mile (0.24 kilometer) of the proposed project site. Therefore, Alternative 1 would have no effect on these four federally listed species. As a result, no significant impacts to federally listed species would occur under Alternative 1 at NBVC Port Hueneme.

State Listed Species

NAF El Centro

Under Alternative 1 at NAF El Centro, there would be no impact on the state threatened California black rail because there is no suitable habitat for the species within, or in the vicinity of, the proposed project site. As a result, no significant impacts to state listed species would occur under Alternative 1 at NAF El Centro.

NSA Monterey's Main Site

Under Alternative 1 at NSA Monterey's Main Site, there would be no impact on state listed species because none would be expected to occur within, or in the vicinity of, the proposed project sites. As a result, no significant impacts to state listed species would occur under Alternative 1 at NSA Monterey's Main Site.

NSA Monterey's Navy Annex

Under Alternative 1 at NSA Monterey's Navy Annex, there would be no impact on state listed species because none would be expected to occur within, or in the vicinity of, the proposed project sites. As a result, no significant impacts to state listed species would occur under Alternative 1 at NSA Monterey's Navy Annex.

NAVWPNSTA Seal Beach

Under Alternative 1 at NAVWPNSTA Seal Beach, there is no suitable habitat for the Belding's savannah sparrow within the proposed project site. Coastal salt marsh habitat, which could support the sparrow, is located 0.1 mile (0.16 kilometer) from the proposed project site; however, construction under Alternative 1 would not impact the salt marsh habitat. Therefore, Alternative 1 would have no effect on the state endangered Belding's savannah sparrow. As a result, no significant impacts to state listed species would occur under Alternative 1 at NAVWPNSTA Seal Beach.

NAVWPNSTA Seal Beach Detachment Norco

Under Alternative 1 at NAVWPNSTA Seal Beach Detachment Norco, there would be no impact on state listed species because none would be expected to occur within, or in the vicinity of, the proposed project site. As a result, no significant impacts to state listed species would occur under Alternative 1 at NAVWPNSTA Seal Beach Detachment Norco.

NBVC Port Hueneme

Under Alternative 1 at NBVC Port Hueneme, there would be no impact on state listed species because none would be expected to occur within, or in the vicinity of, the proposed project site. As a result, no significant impacts to state listed species would occur under Alternative 1 at NBVC Port Hueneme.

Wildlife

NAF El Centro

Under Alternative 1, the project site at NAF El Centro would be grubbed and graded. This would result in the long-term loss of approximately 10 acres (4 hectares) of upland habitat. Individuals of less-mobile small mammal and reptile species could be impacted by site preparation, as well as trenching for installation of the electrical conduit and transmission lines. In addition, individuals of burrowing and subterranean species could be impacted by compaction and grading of soils during construction. However, because of the relatively small size of the impacted area and the amount of habitat available in the surrounding areas, impacts to individuals of less-mobile species would be minor. More mobile mammal species would be expected to move into surrounding areas with suitable habitat.

Avian species would be impacted or displaced through loss of nests and nest structures, disturbance, and loss of foraging and nesting habitat. If construction were to be conducted during the breeding season, breeding birds, nests, eggs, and/or young could be impacted. As described in Section 2.4.3.2, site preparation would be conducted during the non-breeding season, where practicable. If site preparation is conducted during the breeding season, a nest survey would be conducted and buffers would be established to protect nesting birds. Noise and human activity associated with construction during other times of the year have the potential to temporarily displace individuals of avian species locally and interfere with roosting and foraging activities. Birds would be expected to resume use of the surrounding areas after construction is completed. Ample suitable habitat occurs in the surrounding areas. Therefore, the long-term removal of approximately 10 acres (4 hectares) of upland habitat would have a minor impact on birds from habitat loss and displacement.

Measures to protect burrowing owls and their burrows would be implemented as described in Section 2.4.3.3. These measures include surveys and use of buffer zones, visual screens, or other measures to minimize disturbance if the owls can be protected in place.

Birds could also be injured or killed if they strike project components, such as solar panels. Instances where some species of birds mistakenly land on non-aquatic surfaces such as solar panels are known as “lake effect.” In the context of solar photovoltaic projects, lake effect is the phenomenon whereby birds can be attracted to solar photovoltaic projects because they, like bodies of water, are large, smooth, dark surfaces that reflect horizontally polarized sunlight and skylight. As lake effect has not been attributed to carport- or rooftop-mounted solar photovoltaic projects, the analysis in this EA will be limited to the Navy’s ground-mounted solar photovoltaic systems. It should also be noted that avian fatalities linked to impacts with photovoltaic panels (i.e., fractures of the head and/or neck) have been documented at utility-scale solar photovoltaic projects (USFWS 2014a; KCET 2013; Ironwood Consulting 2012, 2013).

The presence of water on or near a photovoltaic project may also influence the likelihood that birds will confuse the arrays for water. A USFWS study noted that birds were attracted to a water feature at a certain photovoltaic project and habituated to the presence of an accessible aquatic environment and, therefore, may have been more likely to misinterpret the arrays as water (USFWS 2014a). However, unpublished data from some photovoltaic installations in the western United States indicate that birds may be attracted to photovoltaic projects even in the absence of nearby aquatic habitat (Berkeley Energy and Resources Collaborative 2013). While the collective evidence suggests that lake effect contributes to avian mortalities at solar photovoltaic projects, rigorous scientific studies have not been conducted to test the validity of this conclusion.

It is not practical for the Navy to obtain the data needed to draw accurate conclusions about lake effect as it pertains to the Proposed Action because of the large amount of time, money, and effort that would be required. Based on the available data, it is clear that utility-scale solar power projects have the potential to adversely affect birds; however, this effect is not likely to be substantial for the Proposed Action for several reasons. First, lake-effect-related bird deaths are most commonly attributed to solar projects covering hundreds or thousands of acres, and the small size of the Navy's ground-mounted photovoltaic projects make it less likely that birds will mistake them for a large body of water. In addition, solar energy reduces the negative environmental effects of carbon-based energy sources, benefitting far more birds than are killed by solar technology. Solar projects also kill far fewer birds each year than the primary sources of human-caused avian mortality worldwide. For example, plate-glass windows kill an estimated 365 million to 988 million birds each year in the United States alone (Loss et al. 2014).Therefore, the Proposed Action is not expected to significantly affect bird populations through mortalities related to lake effect.

Overall, no significant impacts to wildlife would occur from implementation of Alternative 1 at NAF El Centro.

NSA Monterey's Main Site

Under Alternative 1 at NSA Monterey's Main Site, a solar photovoltaic system would be installed on top of newly constructed carports in existing paved parking lots and on rooftops of existing buildings. Therefore, impacts to wildlife would not be expected. Noise and human activity associated with construction could temporarily displace individuals of wildlife species from the areas surrounding the proposed sites; however; these species would be expected to resume use of the surrounding areas after construction is completed. Given that the Main Site is located in an urban area, most individuals are likely already habituated to noise and human activity. Because lake effect has not been attributed to rooftop- or carport-mounted solar photovoltaic systems, lake effect was not analyzed for Alternative 1 at NSA Monterey's Main Site.

Overall, no significant impacts to wildlife would occur from implementation of Alternative 1 at NSA Monterey's Main Site.

NSA Monterey's Navy Annex

Impacts to wildlife associated with implementation of Alternative 1 at NSA Monterey's Navy Annex would be similar to those described for NSA Monterey's Main Site. However, Alternative 1 at the Navy Annex includes proposed trenching for installation of electrical conduit and transmission lines within landscaped areas, which could result in impacts to individuals of less-mobile wildlife species. However, these impacts would be minor, as the proposed trenches would be relatively narrow. Disturbed landscaped areas would be restored to their original

condition following construction, thereby resulting in no long-term impacts. Because lake effect has not been attributed to rooftop- or carport-mounted solar photovoltaic systems, lake effect-was not analyzed for Alternative 1 at NSA Monterey's Navy Annex.

Overall, no significant impacts to wildlife would occur from implementation of Alternative 1 at NSA Monterey's Navy Annex.

NAVWPNSTA Seal Beach

Under Alternative 1, the project site at NAVWPNSTA Seal Beach would be grubbed and graded. This would result in the long-term loss of 6.62 acres (2.67 hectares) of upland grassland habitat. Individuals of less-mobile small mammal, reptile, and amphibian species could be impacted by the site preparation, as well as trenching for installation of the electrical conduit and transmission lines. In addition, individuals of burrowing and subterranean species could be impacted by compaction and grading of soils during construction. However, because of the relatively small size of the impacted area and the amount of habitat available in the surrounding area, impacts to individuals of less-mobile species would be minor. More mobile mammal species would be expected to move into surrounding areas with suitable habitat.

Avian species would be impacted or displaced through loss of nests and nest structures, disturbance, and loss of foraging and nesting habitat. If construction were to be conducted during the breeding season, breeding birds, nests, eggs, and/or young could be impacted. As described in Section 2.4.3.2, site preparation would be conducted during the non-breeding season, where practicable. If site preparation is conducted during the breeding season, a nest survey would be conducted and buffers would be established to protect nesting birds. Noise and human activity associated with construction during other times of the year have the potential to temporarily displace individuals of avian species locally and interfere with roosting and foraging activities. Birds would be expected to resume use of the surrounding area after construction. Suitable habitat occurs in the surrounding areas. Therefore, the long-term removal of 6.62 acres (2.67 hectares) of upland grassland habitat would have a minor impact to birds from habitat loss and displacement. In addition, measures to protect burrowing owls and their burrows would be implemented, as described in Section 2.4.3.3.

Alternative 1 includes the installation of a ground-mounted solar photovoltaic system at NAVWPNSTA Seal Beach. NAVWPNSTA Seal Beach is adjacent to the Seal Beach National Wildlife Refuge, and a number of birds associated with aquatic habitats have been identified in the areas surrounding the installation (USFWS 2014b). While the presence of water on or near a solar photovoltaic project may increase the likelihood that birds will confuse the arrays for water, birds may be attracted to solar photovoltaic projects even in the absence of nearby aquatic habitat (Berkeley Energy and Resources Collaborative 2013). To minimize potential lake effect impacts to birds from implementation of the Proposed Action, best available science and

appropriate design specifications will be used and implemented during construction of the solar photovoltaic project. Given the small size of the Navy's ground-mounted solar photovoltaic project associated with Alternative 1 at NAVWPNSTA Seal Beach, this alternative is not anticipated to contribute to lake effect to a degree that would significantly impact regional bird populations.

Overall, no significant impacts to wildlife would occur from implementation of Alternative 1 at NAVWPNSTA Seal Beach.

NAVWPNSTA Seal Beach Detachment Norco

Under Alternative 1, the project sites at NAVWPNSTA Seal Beach Detachment Norco would be grubbed and graded. This would result in the long-term loss of approximately 18.5 acres (7.49 hectares) of primarily non-native grassland. Individuals of less-mobile small mammal, reptile, and amphibian species could be impacted by the site preparation, as well as trenching for installation of the electrical conduit and transmission lines north of Area 2. In addition, individuals of burrowing and subterranean species could be impacted by compaction and grading of soils during construction. However, because of the relatively small size of the impacted area and the amount of habitat available in the surrounding areas, impacts to individuals of less-mobile species would be minor. More mobile mammal species would be expected to move into surrounding areas with suitable habitat.

Avian species would be impacted or displaced through loss of nests and nest structures, disturbance, and loss of foraging and nesting habitat. If construction were to be conducted during the breeding season, breeding birds, nests, eggs, and/or young could be impacted. As described in Section 2.4.3.2, site preparation would be conducted during the non-breeding season, where practicable. If site preparation is conducted during the breeding season, a nest survey would be conducted and buffers would be established to protect nesting birds. In addition, vegetation within the swale that traverses Area 2 would be avoided during development of the panel arrays; no vegetation, including trees within the swale area, would be removed. Noise and human activity associated with construction during other times of the year have the potential to temporarily displace individuals of avian species locally and interfere with roosting and foraging activities. Birds would be expected to resume use of the surrounding area after construction. Ample suitable habitat occurs in the surrounding area. Therefore, the long-term removal of approximately 18.5 acres (7.49 hectares) of upland non-native grassland habitat would have a minor impact on birds from habitat loss and displacement. In addition, measures to protect burrowing owls and their burrows would be implemented, as described in Section 2.4.3.3.

Alternative 1 includes the installation of a ground-mounted solar photovoltaic system at NAVWPNSTA Seal Beach Detachment Norco. NAVWPNSTA Seal Beach Detachment Norco

encompasses Lake Norconian, an area favored by waterfowl, and a number of birds associated with aquatic habitats have been identified in the areas surrounding NAVWPNSTA Seal Beach Detachment Norco (USFWS 2014b). While the presence of water on or near a solar photovoltaic project may increase the likelihood that birds will confuse the arrays for water, birds may be attracted to solar photovoltaic projects even in the absence of nearby aquatic habitat (Berkeley Energy and Resources Collaborative 2013). To minimize potential lake effect impacts to birds from implementation of the Proposed Action, best available science and appropriate design specifications will be used and implemented during construction of the solar photovoltaic project. Given the small size of the Navy's ground-mounted solar photovoltaic project associated with Alternative 1 at NAVWPNSTA Seal Beach Detachment Norco, this alternative is not anticipated to contribute to lake effect to a degree that would significantly impact regional bird populations.

Overall, no significant impacts to wildlife would occur from implementation of Alternative 1 at NAVWPNSTA Seal Beach Detachment Norco.

NBVC Port Hueneme

Under Alternative 1 at NBVC Port Hueneme, a solar photovoltaic system would be installed on top of newly constructed carports in existing paved parking lots. Therefore, impacts to wildlife from construction of the carports would not be expected. However, Alternative 1 includes proposed trenching for the installation of electrical conduit and transmission lines within landscaped areas, which could result in impacts to individuals of less-mobile wildlife species. However, these impacts would be minor, as the proposed trenches would be relatively narrow and short (approximately 340 feet [104 meters] long). Disturbed landscaped areas would be restored to their original condition following construction, resulting in no long-term impacts. Noise and human activity associated with construction could temporarily displace individuals of wildlife species from the areas surrounding the proposed site; however, these species would be expected to resume use of the surrounding areas after construction is completed. Given that the proposed project site would be located in a developed area, most individuals are likely already habituated to noise and human activity. Therefore, impacts would be expected to be minor. Because lake effect has not been attributed to rooftop-mounted or carport-mounted solar photovoltaic systems, lake effect was not analyzed for Alternative 1 at NBVC Port Hueneme. Overall, no significant impacts to wildlife would occur from implementation of Alternative 1 at NBVC Port Hueneme.

Wetlands and Waters of the United States

NAF El Centro

No wetlands occur within the proposed project site at NAF El Centro. Therefore, Alternative 1 would have no impacts on wetlands or waters of the United States. Drainage

canals would be located in proximity to the proposed project site; however, as described in Section 2.4.6.2, a soil erosion and sedimentation plan would be prepared and implemented by the contractor. Erosion control measures, such as silt fencing, water breakers, erosion control fabric, or seed-free certified straw bales, would be utilized to prevent sedimentation of the drainage canals. Therefore, implementation of Alternative 1 would not likely impact the drainage canals. Overall, no significant impacts to wetlands or waters of the United States at NAF El Centro would occur under Alternative 1.

NSA Monterey's Main Site

No wetlands occur within the proposed project sites at NSA Monterey's Main Site. Therefore, Alternative 1 would have no impacts on wetlands or waters of the United States. A wetland occurs adjacent to proposed Site 5. As described in Section 2.4.6.2, a soil erosion and sedimentation plan would be prepared and implemented by the contractor. Erosion control measures, such as silt fencing, water breakers, erosion control fabric, or seed-free certified straw bales, would be utilized to prevent sedimentation of the wetland. Therefore, implementation of Alternative 1 would not likely impact the wetland. Overall, no significant impacts to wetlands or waters of the United States at NSA Monterey's Main Site would occur under Alternative 1.

NSA Monterey's Navy Annex

No wetlands occur at NSA Monterey's Navy Annex. Therefore, implementation of Alternative 1 would have no impacts on wetlands. Overall, no significant impacts to wetlands or waters of the United States would occur from implementation of Alternative 1 at NSA Monterey's Navy Annex.

NAVWPNSTA Seal Beach

No wetlands occur within the proposed project site under Alternative 1 at NAVWPNSTA Seal Beach. Therefore implementation of Alternative 1 at NAVWPNSTA Seal Beach would have no impacts on wetlands. Wetlands occur approximately 400 feet (122 meters) to the south and 150 feet (46 meters) to the west of the proposed project site under Alternative 1. As described in Section 2.4.6.2, a soil erosion and sedimentation plan would be prepared and implemented by the contractor. Erosion control measures, such as silt fencing, water breakers, erosion control fabric, or seed-free certified straw bales, would be utilized to prevent sedimentation of wetlands. Because of the distance of the proposed project site from the wetland to the south and with implementation of the erosion control measures, impacts to the wetland would not likely occur. No significant impacts to the wetland located to the west of the proposed project site would occur because the wetland is separated from the proposed project site by Kitts Highway and railroad tracks. Overall, no significant impacts to wetlands or waters of the United States at NAVWPNSTA Seal Beach would occur under Alternative 1.

NAVWPNSTA Seal Beach Detachment Norco

No wetlands occur within or in the vicinity of proposed Area 1 at NAVWPNSTA Seal Beach Detachment Norco. A narrow swale, which has not been classified as a wetland, occurs within proposed Area 2. The swale would be avoided during development of the panel arrays. Therefore, implementation of Alternative 1 would have no impact on wetlands or waters of the United States at NAVWPNSTA Seal Beach Detachment Norco. As described in Section 2.4.6.2, a soil erosion and sedimentation plan would be prepared and implemented by the contractor. Erosion control measures, such as silt fencing, water breakers, erosion control fabric, or seed-free certified straw bales, would be utilized to prevent sedimentation of the swale at Area 2. Therefore, implementation of Alternative 1 would have no impact on wetlands or waters of the United States at NAVWPNSTA Seal Beach Detachment Norco. Overall, no significant impacts to wetlands or waters of the United States at NAVWPNSTA Seal Beach Detachment Norco would occur under Alternative 1.

NBVC Port Hueneme

No wetlands occur within or in the vicinity of the proposed project site at NBVC Port Hueneme. Therefore, implementation of Alternative 1 would have no significant impacts to wetlands or waters of the United States at NBVC Port Hueneme under Alternative 1.

3.2.2.2 Alternative 2

Vegetation Communities

NAF El Centro

Under Alternative 2 at NAF El Centro, the ground-mounted solar photovoltaic system would be installed in the same portion of the installation as Alternative 1, but would impact a smaller area (8 acres [3.2 hectares] under Alternative 2 versus 10 acres [4 hectares] under Alternative 1). Therefore, impacts to vegetation communities under Alternative 2 would be similar to, but slightly less than, those under Alternative 1. Overall, no significant impacts to vegetation communities at NAF El Centro would result from implementation of Alternative 2.

NSA Monterey's Main Site

Alternative 2 at NSA Monterey's Main Site includes the same sites as Alternative 1. Therefore, impacts to vegetation communities from implementation of Alternative 2 would be the same as the impacts under Alternative 1. Overall, no significant impacts to vegetation communities at NSA Monterey's Main Site would result from implementation of Alternative 2.

NSA Monterey's Navy Annex

With the exception of Site 1, which would be excluded from Alternative 2 at NSA Monterey's Navy Annex, Alternative 2 would utilize the same sites as Alternative 1; therefore,

impacts to vegetation communities from implementation of Alternative 2 would be similar to the impacts under Alternative 1. Overall, no significant impacts to vegetation communities at NSA Monterey's Navy Annex would result from implementation of Alternative 2.

NAVWPNSTA Seal Beach

Under Alternative 2 at NAVWPNSTA Seal Beach, a ground-mounted solar photovoltaic system would be installed in a previously disturbed area, and no impacts to vegetation would occur at the site. The trees and shrubs on the periphery of the site would not be impacted. Overall, no significant impacts to vegetation communities at NAVWPNSTA Seal Beach would result from implementation of Alternative 2.

NAVWPNSTA Seal Beach Detachment Norco

Alternative 2 at NAVWPNSTA Seal Beach Detachment Norco would be the same as Alternative 1. Therefore, the impacts to vegetation communities under Alternative 2 would be the same as the impacts under Alternative 1. Overall, no significant impacts to vegetation communities at NAVWPNSTA Seal Beach Detachment Norco would result from implementation of Alternative 2.

NBVC Port Hueneme

Alternative 2 at NBVC Port Hueneme would be the same as Alternative 1. Therefore, the impacts to vegetation communities under Alternative 2 would be the same as the impacts under Alternative 1. Overall, no significant impacts to vegetation communities at NBVC Port Hueneme would result from implementation of Alternative 2.

Federally Listed Species

NAF El Centro

Alternative 2 at NAF El Centro would use the same agricultural outlease area as Alternative 1. Therefore, Alternative 2 would have no effect on federally listed species. As a result, no significant impacts to federally listed species would occur under Alternative 2 at NAF El Centro.

NSA Monterey's Main Site

Alternative 2 at NSA Monterey's Main Site includes the same sites as Alternative 1. Therefore, there would be no effect on federally listed species at NSA Monterey's Main Site under Alternative 2. As a result, no significant impacts to federally listed species would occur under Alternative 2 at NSA Monterey's Main Site.

NSA Monterey's Navy Annex

With the exception of Site 1, which would be excluded from Alternative 2 at NSA Monterey's Navy Annex, Alternative 2 would utilize the same sites as Alternative 1; therefore, under Alternative 2, there would be no effect on federally listed species at NSA Monterey's Navy Annex. As a result, no significant impacts to federally listed species would occur under Alternative 2 at NSA Monterey's Navy Annex.

NAVWPNSTA Seal Beach

There is no suitable habitat for the California least tern, light-footed clapper rail, western snowy plover, green sea turtle, or salt marsh bird's beak within the proposed project site under Alternative 2 at NAVWPNSTA Seal Beach. In addition, the proposed project site under Alternative 2 is located farther away from suitable habitat for these species than the proposed project site under Alternative 1. Because of the distance of the proposed project site to suitable habitat for federally listed species, Alternative 2 would have no effect on these species. As a result, no significant impacts to federally listed species would occur under Alternative 2 at NAVWPNSTA Seal Beach.

NAVWPNSTA Seal Beach Detachment Norco

Alternative 2 at NAVWPNSTA Seal Beach Detachment Norco would utilize the same project site and project configuration as Alternative 1. Therefore, Alternative 2 would have no effect on the southwestern willow flycatcher, coastal California gnatcatcher, least Bell's vireo, or Delhi Sands flower-loving fly and no significant impacts to federally listed species would occur under Alternative 2 at NAVWPNSTA Seal Beach Detachment Norco.

NBVC Port Hueneme

The Proposed Action under Alternative 2 at NBVC Port Hueneme would be the same as the Proposed Action under Alternative 1; therefore, there would be no effect on federally listed species under Alternative 2 at NBVC Port Hueneme. As a result, no significant impacts to federally listed species would occur under Alternative 2 at NBVC Port Hueneme.

State Listed Species

NAF El Centro

Alternative 2 at NAF El Centro would use the same agricultural outlease area as Alternative 1. Therefore, potential impacts to state listed species under Alternative 2 would be the same as under Alternative 1, and no significant impacts to state listed species would occur under Alternative 2 at NAF El Centro.

NSA Monterey's Main Site

Under Alternative 2, impacts to state listed species at NSA Monterey's Main Site would be the same as under Alternative 1 because the same sites proposed under Alternative 1 would be used under Alternative 2, and because no state listed species would be expected to occur within, or in the vicinity of, the proposed project sites. Therefore, no significant impacts to state listed species would occur under Alternative 2 at NSA Monterey's Main Site.

NSA Monterey's Navy Annex

With the exception of Site 1, which would be excluded from Alternative 2 at NSA Monterey's Navy Annex, Alternative 2 would utilize the same sites as Alternative 1; therefore, impacts to state listed species at NSA Monterey's Navy Annex would be the same as those under Alternative 1. No state listed species are expected to occur within, or in the vicinity of, the proposed project sites. Therefore, no significant impacts to state listed species would occur under Alternative 2 at NSA Monterey's Navy Annex.

NAVWPNSTA Seal Beach

There is no suitable habitat for the Belding's savannah sparrow within the proposed project site under Alternative 2 at NAVWPNSTA Seal Beach. Coastal salt marsh habitat, which could support the sparrow, is located 1.2 miles (1.9 kilometers) from the proposed project site. Therefore, Alternative 2 would have no impact on the state endangered Belding's savannah sparrow. Overall, no significant impacts to state listed species would occur under Alternative 2 at NAVWPNSTA Seal Beach.

NAVWPNSTA Seal Beach Detachment Norco

The Proposed Action at NAVWPNSTA Seal Beach Detachment Norco under Alternative 2 would have no impact on state listed species because none are expected to occur within, or in the vicinity of, the proposed project site for this alternative. Therefore, no significant impacts to state listed species would occur under Alternative 2 at NAVWPNSTA Seal Beach Detachment Norco.

NBVC Port Hueneme

The proposed project site under Alternative 2 at NBVC Port Hueneme would be the same as under Alternative 1. Therefore, impacts to state listed species under Alternative 2 would be the same as under Alternative 1, and no significant impacts to state listed species would occur under Alternative 2 at NBVC Port Hueneme.

Wildlife

NAF El Centro

Under Alternative 2 at NAF El Centro, the ground-mounted solar photovoltaic system would be installed in the same portion of the installation as Alternative 1, but would impact a smaller area (8 acres [3.2 hectares] under Alternative 2 versus 10 acres [4 hectares] under Alternative 1). Therefore, impacts to wildlife under Alternative 2 would be similar to, but slightly less than, those listed under Alternative 1. Overall, no significant impacts to wildlife would occur from implementation of Alternative 2 at NAF El Centro.

NSA Monterey's Main Site

Alternative 2 at NSA Monterey's Main Site includes the same sites as Alternative 1. Therefore, impacts to wildlife under Alternative 2 would be the same as the impacts under Alternative 1. Overall, no significant impacts to wildlife would occur from implementation of Alternative 2 at NSA Monterey's Main Site.

NSA Monterey's Navy Annex

With the exception of Site 1, which would be excluded from Alternative 2 at NSA Monterey's Navy Annex, Alternative 2 would utilize the same sites as Alternative 1; therefore, impacts to wildlife under Alternative 2 would be similar to the impacts under Alternative 1. Overall, no significant impacts to wildlife would occur from implementation of Alternative 2 at NSA Monterey's Navy Annex.

NAVWPNSTA Seal Beach

Under Alternative 2 at NAVWPNSTA Seal Beach, a ground-mounted solar photovoltaic system would be installed within a previously disturbed area bordered by low trees and tall shrubs. Impacts to wildlife under Alternative 2 would be similar to those under Alternative 1. Overall, no significant impacts to wildlife would occur from implementation of Alternative 2 at NAVWPNSTA Seal Beach.

NAVWPNSTA Seal Beach Detachment Norco

Alternative 2 at NAVWPNSTA Seal Beach Detachment Norco would be the same as Alternative 1. Therefore, the impacts to wildlife under Alternative 2 would be the same as the impacts under Alternative 1. Overall, no significant impacts to wildlife would occur from implementation of Alternative 2 at NAVWPNSTA Seal Beach Detachment Norco.

NBVC Port Hueneme

Alternative 2 at NBVC Port Hueneme would be the same as Alternative 1. Therefore, the impacts to wildlife under Alternative 2 would be the same as the impacts under Alternative 1.

Overall, no significant impacts to wildlife would occur from implementation of Alternative 2 at NBVC Port Hueneme.

Wetlands and Waters of the United States

NAF El Centro

Under Alternative 2 at NAF El Centro, the ground-mounted solar photovoltaic system would be installed in the same portion of the installation as Alternative 1. Therefore, impacts to wetlands and waters of the United States under Alternative 2 would be the same as under Alternative 1. Overall, no significant impacts to wetlands or waters of the United States at NAF El Centro would occur under Alternative 2.

NSA Monterey's Main Site

Alternative 2 at NSA Monterey's Main Site includes the same sites as Alternative 1. Therefore, impacts to wetlands and waters of the United States under Alternative 2 would be the same as the impacts under Alternative 1. Overall, no significant impacts to wetlands or waters of the United States at NSA Monterey's Main Site would occur under Alternative 2.

NSA Monterey's Navy Annex

No wetlands occur at NSA Monterey's Navy Annex. Therefore, implementation of Alternative 2 would have no impact on wetlands. Overall, no significant impacts to wetlands or waters of the United States at NSA Monterey's Navy Annex would occur under Alternative 2.

NAVWPNSTA Seal Beach

No wetlands occur within the proposed project site under Alternative 2 at NAVWPNSTA Seal Beach. Therefore, implementation of Alternative 2 at NAVWPNSTA Seal Beach would have no impact on wetlands. A non-wetland waters of the United States was mapped approximately 700 feet (213 meters) west of the proposed electrical interconnection point for this alternative. As described in Section 2.4.6.2, a soil erosion and sedimentation plan would be prepared and implemented by the contractor. Erosion control measures, such as silt fencing, water breakers, erosion control fabric, or seed-free certified straw bales, would be utilized to prevent sedimentation of the drainage. Therefore, implementation of Alternative 2 would have no impact on wetlands or waters of the United States. Overall, no significant impacts to wetlands or waters of the United States at NAVWPNSTA Seal Beach would occur under Alternative 2.

NAVWPNSTA Seal Beach Detachment Norco

Alternative 2 at NAVWPNSTA Seal Beach Detachment Norco would be the same as Alternative 1. Therefore, the impacts to wetlands and waters of the United States under

Alternative 2 would be the same as the impacts under Alternative 1. Overall, no significant impacts to wetlands or waters of the United States at NAVWPNSTA Seal Beach Detachment Norco would occur under Alternative 2.

NBVC Port Hueneme

Alternative 2 at NBVC Port Hueneme would be the same as Alternative 1. Therefore, the impacts to wetlands and waters of the United States under Alternative 2 would be the same as the impacts under Alternative 1. No significant impacts to wetlands or waters of the United States at NBVC Port Hueneme would occur under Alternative 2.

3.2.2.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented. The No Action Alternative would result in no changes to existing conditions; therefore, the No Action Alternative would result in no significant impacts to vegetation communities, threatened and endangered species, wildlife, or wetlands and waters of the United States.

3.3 CULTURAL RESOURCES

The following discussion is based on a review of applicable cultural resource documents, available literature, and existing background data, including, but not limited to, the following resources:

- Integrated Cultural Resources Management Plan for Naval Air Facility El Centro, Imperial County, California (Navy 2013f);
- Integrated Cultural Resources Management Plan for Naval Support Activity Monterey, Monterey, Santa Clara, and Santa Cruz Counties California (Navy 2011a);
- Integrated Cultural Resources Management Plan for Naval Weapons Station Seal Beach, Orange County, California (Navy 2011b);
- Integrated Cultural Resources Management Plan for Naval Weapons Station Seal Beach, Detachment Corona, Riverside County, California (Navy 2011c); and,
- Integrated Cultural Resources Management Plan for Point Mugu and Port Hueneme, Naval Base Ventura County, California, and Special Areas (Navy 2013g).

3.3.1 AFFECTED ENVIRONMENT

This section details the cultural resources that have been identified within and/or adjacent to the various undertaking Areas of Potential Effect and analyzes impacts that would occur as a result of project implementation. No cultural resources have been documented at any

of the five installation project areas; therefore, no impacts to cultural resources are anticipated. However, there is the possibility of unanticipated resources being discovered during construction. This section outlines conservation and construction measures that would be included in the selected alternative to reduce potential impacts to cultural resources should unanticipated cultural resources be encountered. The Navy is required to comply with Section 106 of the National Historic Preservation Act and its implementing regulations at 36 CFR 800 for undertakings that have the potential to affect cultural resources. The NEPA process encourages coordination of evaluations under Section 106 with the NEPA evaluation. This section draws on the results of the Section 106 evaluation for its analysis.

In accordance with 36 CFR 800.16(d), an Area of Potential Effect is defined as the geographic areas within which an undertaking may cause alterations in the character or use of historic properties. Historic properties are cultural resources that have been determined eligible for, or are listed in, the NRHP by meeting the following criteria:

- A district, site, building, structure, or object that possesses integrity of location, design, setting, materials, workmanship, feeling, and association and:

  (a) That is associated with events that have made a significant contribution to the broad patterns of our history; or

  (b) That is associated with the lives of significant persons in our past; or

  (c) That embodies distinctive characteristics of a type, period, or method of construction, or that represents the work of a master, or that possesses high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction; or,

  (d) That has yielded, or may be likely to yield, information important in prehistory or history.

Section 106 provides for consultation with the SHPO regarding the effects of an undertaking on historic properties. NAF El Centro has a Programmatic Agreement in place (Appendix D) that specifies how cultural resources issues are to be handled and delegates to the facility the project review authority normally reserved to the SHPO (Navy 2013f). The Section 106 process for project implementation at NAF El Centro falls under the provisions of this Programmatic Agreement so that the Cultural Resources Manager defines the area of potential effect, determines if historic properties are present, and determines the effect of the undertaking on historic properties. The remaining four installations do not have negotiated Programmatic Agreements; therefore, standard Section 106 consultation has been conducted for these facilities.

In accordance with 36 CFR 800.4, each installation has defined an area of potential effect as the geographical area within which the activities associated with the project may cause alterations in the character or use of historic properties. For each installation, the area of potential effect generally encompasses the footprint(s) where solar panel arrays are proposed to be installed, the footprint(s) for associated electrical line routes (i.e., underground conduits or poles), and the point(s) of connection to the electrical grid. Additionally, staging and lay-down areas for construction equipment and materials would be located within the area of potential effect (refer to Appendix E for Section 106 SHPO concurrence letters).

3.3.1.1 Pre-History and History of the Project Area

Archaeologically, California is a very diverse area, and the installations that are part of the project are located in different archaeological regions of the state. Each installation falls within a traditional territory of a different people, as well. The prehistoric archaeology and the ethnography of each installation have been summarized in Appendix F, and Table F-1 provides a list of the prehistoric periods for each installation. In addition, Appendix F also provides a general discussion of the historic period for each installation.

3.3.1.2 Previous Cultural Resources Investigations at the Project Area

Each installation has a unique history of cultural resources investigations, and there are differences in the extent to which these installations have been surveyed for cultural resources:

- **NAF El Centro**: The majority of NAF El Centro has been surveyed;
- **NSA Monterey's Main Site and Navy Annex**: All buildings at NSA Monterey's Main Site have been assessed for NRHP eligibility, but few archaeological surveys have been conducted due to the built-out nature of the installation. An NRHP historic district has been defined for the Hotel Del Monte, and another historic district has been defined for the Naval Postgraduate Engineering School at NSA Monterey's Main Site (JRP Historical Consulting, LLC 2013). A human burial has also been recovered at NSA Monterey's Main Site, but is not located in the area of the project. Other than building assessments, NSA Monterey's Navy Annex has had no cultural resource surveys (Navy 2011a);
- **NAVWPNSTA Seal Beach**: Most of NAVWPNSTA Seal Beach has been covered by archaeological surveys, including the site for the proposed solar panel arrays; this installation has a number of structures covered by World War II and the Cold War Era (1939–1974) Ammunition Storage Facilities Program Comment (Navy 2011b), which provides mechanisms for compliance with Section 106 for these types of structures;

- **NAVWPNSTA Seal Beach Detachment Norco**: Most of NAVWPNSTA Seal Beach Detachment Norco has not been surveyed for archaeological resources, although most of the buildings on the installation have been assessed for NRHP eligibility. Some buildings at NAVWPNSTA Seal Beach Detachment Norco are part of the Lake Norconian Club Historic District (Navy 2011c); and,
- **NBVC Port Hueneme**: NBVC Port Hueneme has not been surveyed for cultural resources due to the history of disturbance and fill of landforms at the installation; however, one archaeological site was recorded in 1933 and has most likely been destroyed by development of the harbor. A number of buildings have been evaluated for NRHP eligibility. One Native American burial was reported at NBVC Port Hueneme before it became a military installation (Navy 2013g).

Appendix F, Table F-2, provides a list of previous cultural resources investigations at the installations.

3.3.1.3 Section 106 Compliance

NAF El Centro

The Programmatic Agreement provides for NAF El Centro Cultural Resource Manager (in conjunction with qualified personnel, as defined in Stipulation II.B of the Programmatic Agreement, from Naval Facilities Engineering Command Southwest [NAVFAC SW] Cultural Resources Management EV52 staff) determinations of an undertaking's area of potential effect, identification of potentially affected historic properties, and determination of "no historic properties affected" and "no adverse effect" without further consultations with the SHPO, as normally required under 36 CFR Part 800.

As noted in Section 3.3.1, above, the NAF El Centro Cultural Resource Manager defined an area of potential effect for the Proposed Action. As also described in Section 3.3.1.2, past archaeological and built environment surveys have been conducted to identify potentially affected historic properties in the area of potential effect, in conformance with Stipulation III.C of the NAF El Centro Programmatic Agreement. No recorded cultural properties are located within the area of potential effect, resulting in a determination of no historic properties affected.

NSA Monterey's Main Site and Navy Annex

Archaeological resources within the area of potential effect on NSA Monterey's Main Site and Navy Annex were identified by conducting archival research, examining historic and geological maps, and reviewing archaeological studies performed both on and adjacent to the installations, as well as the installation's cultural resource management plans. Both the Main Site and Navy Annex are extensively developed, and the soils and sediments have been

disturbed by previous development. The only areas of accessible ground surface are formally designated walkways or parks. The research that has been conducted documents the lack of archaeological sites recorded in the area of potential effect and determines that the potential for NRHP-eligible properties occurring in the area of potential effect is low.

All of the buildings on the Main Site and Navy Annex have been evaluated for NRHP eligibility. Two historic districts have been defined on the Main Site: the Hotel Del Monte Historic District and the Naval Postgraduate School Historic District. The area of potential effect lies outside the boundaries of both districts, and it has been determined that the area of potential effect does not affect the primary character-defining view shed of the Hotel Del Monte. None of the structures on which roof-mounted arrays are proposed to be installed are historic properties.

Information was provided to the SHPO documenting the determination of the area of potential effect. A determination of No Adverse Effect on Historic Properties was made, consistent with 36 CFR 800.5(d). SHPO concurred with these findings on June 19, 2014 (Roland-Nawi 2014a).

NAVWPNSTA Seal Beach

A Class III (Intensive) cultural resource survey was conducted for the Alternative 1 and Alternative 2 sites on October 17, 2013 (Baumann 2014a). No historic properties were encountered in either location. Both Alternative 1 and Alternative 2 are located near ammunition storage facilities covered under World War II and Cold War Era (1939–1974) Ammunition Storage Facilities Program Comment, which addresses measures for Section 106 compliance for these types of structures; however, the project shall not have an adverse effect on these properties (Navy 2014a).

Information was provided to the SHPO documenting the determination of the area of potential effect and a determination of no historic properties affected (Navy 2014a). SHPO concurred with these findings on April 7, 2014 (Roland-Nawi 2014b).

NAVWPNSTA Seal Beach Detachment Norco

A Class III (Intensive) cultural resource survey was conducted for Area 1 and Area 2 on October 18, 2013 (Baumann 2014b). No historic properties were encountered in either location. Neither site is located within the Lake Norconian Club Historic District (Navy 2014c).

Area 1 is not visible from the Norconian Resort's hotel, boat house, gazebo, or other areas in the vicinity of these locations within the Lake Norconian Club Historic District due to intervening terrain blocking these views of the site. Photo 1 shows a view in proximity to the western edge of Area 1 looking in the direction to the historic hotel and boat house. A small portion of the northernmost part of Area 2 may be visible from the boat house, located

approximately 2,000 feet (610 meters) to the north, and from the upper windows of the historic hotel, located approximately 3,300 feet (1,006 meters) to the north. Intervening tall trees screen views of Area 2 from the lower portions of the hotel terraces and grounds surrounding the hotel. Views of the northernmost portion of Area 2 from the historic hotel and boat house are also partially screened by an intervening chain link fence and parking lot with tall metal light poles just north of Area 2. Photos 2 and 3 show views toward the historic hotel and boat house from the northernmost portion of Area 2 with the intervening trees, chain link fence, and parking lot. The majority of Area 2 is not visible from the hotel, boat house, or areas in the vicinity of these locations within the Lake Norconian Club Historic District due to intervening terrain and buildings.

Photo 1. View from the western edge of Area 1 looking toward the Norconian Resort's hotel and boat house.

Photo 2. View from the northernmost portion of Area 2 toward the Norconian Resort's hotel.

Photo 3. View from the northernmost portion of Area 2 toward the Norconian Resort's boat house.

Information was provided to the SHPO documenting the determination of the area of potential effect and a determination of no historic properties affected (Navy 2014b). SHPO concurred with these findings on April 24, 2014 (Roland-Nawi 2014c).

NBVC Port Hueneme

No cultural resource surveys were conducted specifically for the proposed project site because the location of the project is in a previously disturbed area that has been deeply filled and paved or has been covered by non-native vegetation. Building 1388, an administrative, data processing, and laboratory facility built in 1993 and within the area of potential effect, is not considered eligible for the NRHP listing (Navy 2014e).

Information was provided to the SHPO documenting the determination of the area of potential effect and a determination of no historic properties affected (Navy 2014e). SHPO concurred with these findings on April 28, 2014 (Roland-Nawi 2014d).

3.3.2 ENVIRONMENTAL CONSEQUENCES

3.3.2.1 Alternative 1 (Preferred Alternative)

NAF El Centro

As noted in Section 3.3.1, the NAF El Centro Cultural Resource Manager defined an area of potential effect for the Proposed Action. As also described in Section 3.3.1.2, past archaeological and built environment surveys have been conducted to identify potentially affected historic properties in the area of potential effect, in conformance with Stipulation III C of the Programmatic Agreement (Appendix D).

No recorded historic properties or other cultural resources are located within the area of potential effect at NAF El Centro. Further, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction, conservation and construction measures described in Section 2.4.4 would be implemented. Specifically, if potential subsurface archaeological deposits are detected during construction, all work in the discovery area would cease until an archaeologist could provide input regarding the significance of the resource. The Navy Cultural Resources Manager would be immediately contacted to provide direction regarding the potential resource. The potential resource would be evaluated against the eligibility criteria for inclusion on the NRHP and, if it is found to be eligible, a treatment plan detailing either preservation in-place or mitigation of impacts through data recovery would be developed and implemented. Therefore, no effects on historic properties and no significant impacts to cultural resources at NAF El Centro would occur with implementation of Alternative 1.

NSA Monterey's Main Site and Navy Annex

As noted in Section 3.3.1, NSA Monterey environmental personnel defined an area of potential effect for the Proposed Action at NSA Monterey's Main Site and Navy Annex. Also, as described in Section 3.3.1.2, archival research and built environment surveys have been conducted to identify potentially affected historic properties in the area of potential effect.

No recorded historic properties or other cultural resources are located within the area of potential effect at NSA Monterey's Main Site or Navy Annex, although two historic districts are located near the Main Site's area of potential effect. The proposed project site is outside the boundaries of these districts. Further, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction activities, cultural resources monitoring would be conducted and conservation and construction measures described in Section 2.4.4 would be implemented. Specifically, if potential subsurface archaeological deposits are detected during construction by the monitor, all work in the discovery area would cease. The Navy Cultural Resources Manager would be immediately contacted to provide direction regarding the potential resource. The potential resource would be evaluated against the eligibility criteria for inclusion on the NRHP and, if it is found to be eligible, a treatment plan detailing either preservation in-place or mitigation of impacts through data recovery would be developed and implemented. Therefore, no effects on historic properties and no significant impacts to cultural resources at NSA Monterey's Main Site or Navy Annex would occur with implementation of Alternative 1.

NAVWPNSTA Seal Beach

As noted in Section 3.3.1, the NAVWPNSTA Seal Beach Cultural Resources Manager defined an area of potential effect for the Proposed Action. Also, as described in Sections 3.3.1.2 and 3.3.1.3, past archaeological and built environment surveys, along with the cultural resource survey specifically performed for this project (Baumann 2014a), have been conducted to identify any potentially affected historic properties in the area of potential effect.

No recorded historic properties or other cultural resources are located within the area of potential effect at NAVWPNSTA Seal Beach. Further, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction activities, conservation and construction measures described in Section 2.4.4 would be implemented. Specifically, if potential subsurface archaeological deposits are detected during construction, all work in the discovery area would cease until an archaeologist could provide input regarding the significance of the resource. The Navy Cultural Resources Manager would be immediately contacted to provide direction regarding the potential resource. The potential resource would be evaluated against the eligibility criteria for inclusion on the NRHP and, if it is found to be eligible, a treatment plan detailing either preservation in-place or mitigation of impacts through data

recovery would be developed and implemented. Therefore, no effects on historic properties and no significant impacts to cultural resources at NAVWPNSTA Seal Beach would occur with implementation of Alternative 1.

NAVWPNSTA Seal Beach Detachment Norco

As noted in Section 3.3.1, NAVWPNSTA Seal Beach Detachment Norco environmental personnel defined an area of potential effect for the Proposed Action. Also, as described in Sections 3.3.1.2 and 3.3.1.3, past archaeological and built environment surveys, along with the cultural resource survey conducted specifically for this project (Baumann 2014b), have been conducted to identify potentially affected historic properties in the area of potential effect.

As stated in 36 CFR 800.5 (a)(2)(v), Assessment of Adverse Effects, an adverse effect on an historic resource could include the “introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features.” Therefore, in addition to the cultural surveys, visual surveys of Areas 1 and 2 were conducted to determine whether views from the Norconian Resort’s hotel, boat house, and gazebo, or areas within the Lake Norconian Club Historic District may be affected by the project. As described in Section 3.3.1.3, Area 1 is not visible from these locations within the historic district and only the northernmost portion of Area 2 may be visible from these locations, although views of Area 2 are partially screened by intervening tall trees, a chain link fence, and a parking lot. At Area 2, ground-mounted solar photovoltaic panels, not exceeding 8 feet (2.4 meters) above the ground surface, would primarily face south and away from the historic district; therefore, panel surfaces would not be visible from this direction. If the solar photovoltaic arrays are visible from any areas within the Lake Norconian Club Historic District, only the uppermost portions of these would be visible from the rear and they would be viewed in the context of the intervening chain link fence and parking lot with tall metal light poles. The orientation of the solar photovoltaic panels away from the historic district, intervening features partially screening the arrays, the small portions of arrays that may be visible, and their distance from important features within the historic district make it unlikely that the solar photovoltaic arrays would be noticeable to the casual observer from within the historic district. For reasons described above, the project would have no effect on views of Area 1 from the Lake Norconian Club Historic District and effects on views of Area 2 from the historic district, if any, would be minor.

No recorded historic properties or other cultural resources are located within the area of potential effect at NAVWPNSTA Seal Beach Detachment Norco. Further, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction activities, conservation and construction measures described in Section 2.4.4 would be implemented. Specifically, if potential subsurface archaeological deposits are detected during construction, all work in the discovery area would cease until an archaeologist could provide input regarding the significance of the resource. The Navy Cultural Resources Manager

would be immediately contacted to provide direction regarding the potential resource. The potential resource would be evaluated against the eligibility criteria for inclusion on the NRHP and, if it is found to be eligible, a treatment plan detailing either preservation in-place or mitigation of impacts through data recovery would be developed and implemented. Therefore, no effects on historic properties and no significant impacts to cultural resources at NAVWPNSTA Seal Beach Detachment Norco would occur with implementation of Alternative 1.

NBVC Port Hueneme

As noted in Section 3.3.1, NBVC Port Hueneme environmental personnel defined an area of potential effect for the Proposed Action. Also, as described in Section 3.3.1.2, past archaeological and built environment surveys have been conducted to identify potentially affected historic properties in the area of potential effect.

No recorded historic properties or other cultural resources are located within the area of potential effect at NBVC Port Hueneme. Further, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction activities, cultural resources monitoring would be conducted and conservation and construction measures described in Section 2.4.4 would be implemented. Specifically, if potential subsurface archaeological deposits are detected during construction by the monitor, all work in the discovery area would cease until an archaeologist could provide input regarding the significance of the resource. The Navy Cultural Resources Manager would be immediately contacted to provide direction regarding the potential resource. The potential resource would be evaluated against the eligibility criteria for inclusion on the NRHP and, if it is found to be eligible, a treatment plan detailing either preservation in-place or mitigation of impacts through data recovery would be developed and implemented. Therefore, no effects on historic properties and no significant impacts to cultural resources at NBVC Port Hueneme would occur with implementation of Alternative 1.

3.3.2.2 Alternative 2

NAF El Centro

At NAF El Centro, Alternative 2 would include development of a ground-mounted solar photovoltaic system at the same site as described for Alternative 1; however, the solar photovoltaic system would be developed on 8 acres (3.2 hectares) instead of 10 acres (4 hectares). The area of potential effect for Alternative 2 at NAF El Centro would be the same as described under Alternative 1, and there are no known cultural resources or recorded historic properties located within the area of potential effect. Further, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction, conservation and construction measures described in Section 2.4.4 and for Alternative 1 would

be implemented. Therefore, there would be no effects on historic properties, and no significant impacts to cultural resources would result from implementing Alternative 2 at NAF El Centro.

NSA Monterey's Main Site and Navy Annex

At NSA Monterey's Main Site and Navy Annex, Alternative 2 would include development at the same sites as described for Alternative 1, with the exception of Site 1, which would not be developed at the Navy Annex under this alternative. The area of potential effect for Alternative 2 at NSA Monterey's Main Site and Navy Annex would be the same as described under Alternative 1. Two historic districts are located near the Main Site's area of potential effect; however, the proposed project site is outside the boundaries of these districts. Further, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction activities, cultural resources monitoring would be conducted and conservation and construction measures described in Section 2.4.4 and for Alternative 1 would be implemented. Therefore, there would be no effects on historic properties, and no significant impacts to cultural resources would result from implementing Alternative 2 at NSA Monterey.

NAVWPNSTA Seal Beach

At NAVWPNSTA Seal Beach, Alternative 2 would occur in a different area on the installation when compared to Alternative 1. The area of potential effect for Alternative 2 has been surveyed and no archaeological resources were identified. In addition, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction activities, conservation and construction measures described in Section 2.4.4 and for Alternative 1 would be implemented. Therefore, there would be no effects on historic properties, and no significant impacts to cultural resources would result from implementing Alternative 2 at NAVWPNSTA Seal Beach.

NAVWPNSTA Seal Beach Detachment Norco

Under Alternative 2, development at NAVWPNSTA Detachment Norco would be the same as described under Alternative 1. The area of potential effect for Alternative 2 at this installation would be the same as described under Alternative 1. In addition, the project would have no effect on views of Area 1 from the Lake Norconian Club Historic District, and effects on views of Area 2 from the historic district, if any, would be minor. Further, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction activities, conservation and construction measures described in Section 2.4.4 and for Alternative 1 would be implemented. Therefore, there would be no effects on historic properties, and no significant impacts to cultural resources would result from implementing Alternative 2 at NAVWPNSTA Seal Beach Detachment Norco.

NBVC Port Hueneme

Under Alternative 2, development at NBVC Port Hueneme would be the same as described under Alternative 1. The area of potential effect for Alternative 2 at this installation would be the same as described under Alternative 1. Further, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction activities, conservation and construction measures described in Section 2.4.4 and for Alternative 1 would be implemented. Therefore, there would be no effects on historic properties, and no significant impacts to cultural resources would result from implementing Alternative 2 at NBVC Port Hueneme.

3.3.2.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented, and no solar photovoltaic systems would be installed. As there would be no construction associated with this alternative, recorded historic properties or other cultural resources would not be effected by the No Action Alternative, and currently unknown subsurface cultural resources sites would not be inadvertently disturbed with this alternative. Therefore, there would be no effects on historic properties and no significant impacts to historic properties would occur with implementation of the No Action Alternative.

3.4 LAND USE

Land use describes the natural conditions or human-modified conditions that exist at a particular location. This section describes land uses that occur within and adjacent to the project sites at each of the five installations that are included in the Proposed Action.

The following discussion is based on a review of available literature and existing background data, including, but not limited to, the following resources:

- Naval Station Monterey Activity Overview Plan, Existing Conditions Report (Navy 2009a);
- Naval Weapons Station Seal Beach Activity Overview Plan (Navy 2009b);
- Final Integrated Natural Resources Management Plan, Naval Weapons Station Seal Beach Detachment Norco, Norco, California (Navy 2012a);
- Naval Base Ventura County Activity Overview Plan (Navy 2006); and,
- Naval Air Facility El Centro Master Plan (Navy 2014d).

3.4.1 AFFECTED ENVIRONMENT

3.4.1.1 NAF El Centro

Land uses at NAF El Centro are predominantly for military purposes and include operations, mission support, and housing directly related to the Navy; however, approximately 1,105 acres (447.2 hectares) are outleased for agricultural purposes on five-year terms. The installation has no permanently based tactical aircraft, but serves as a support air facility for fleet air squadrons and provides ranges and facilities for tactical air training (Navy 2014).

The NAF El Centro Master Plan designates the existing land use for the project site as Outlease and the planned land use designation for the site is Utilities (Navy 2014d). The site does not contain land classified by the California Department of Conservation as Prime or Unique Farmland or Farmland of Statewide Importance (California Department of Conservation 2010).

The 10-acre (4-hectare) project site is part of a larger agricultural outlease area known as Field K of Lease 4A02 (Figure 3.4-1). The contract for this agricultural outlease area was established on September 1, 2012, and is set to expire on August 31, 2017. No crops are in production, and the site is under maintenance. Sudan grass was grown most recently on the site, and historical use includes the cultivation of alfalfa and Bermuda grass. A delivery ditch remains on the site from previous flood irrigation. Surrounding on-installation land uses include Navy family housing and a playground located northeast of the site along Gila Bend Drive.

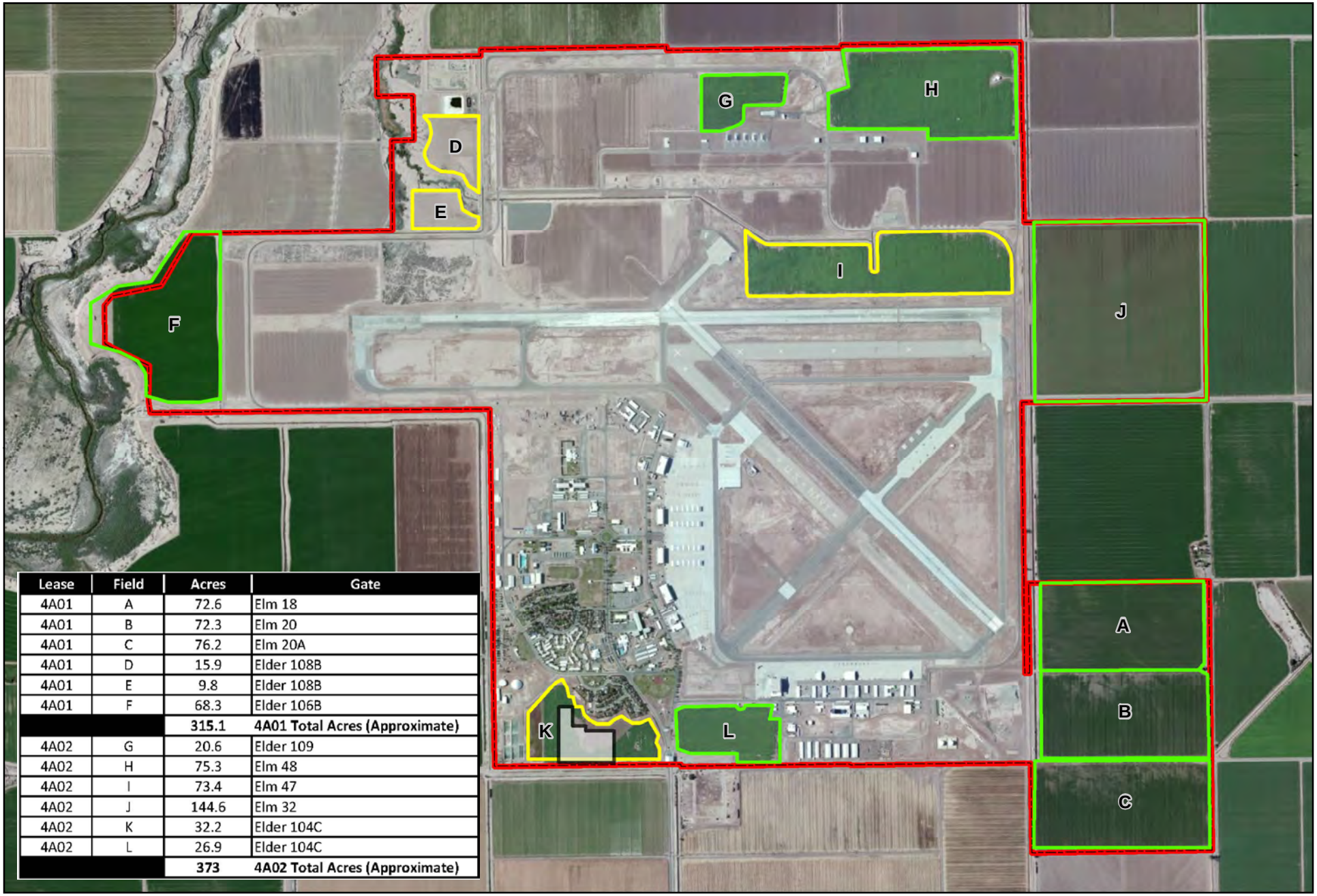
On-installation land uses also include barracks to the north of the site along First Street, the NAF El Centro waste water treatment plant to the northwest at the end of Valley Forge Avenue, and an existing Imperial Irrigation District substation located west of the site and north of Havens Road (Figure 2-1). Private lands to the south of the site are primarily agricultural.

3.4.1.2 NSA Monterey's Main Site and Navy Annex

This project would be located on NSA Monterey's Main Site and Navy Annex. These geographically separate properties are located within the City of Monterey, in Monterey County, California. Both properties house academic and research buildings, computer centers, and personnel support facilities.

Main Site

NSA Monterey's Main Site was once the Hotel Del Monte and includes hotel buildings and historic landscaping dating to 1886 (Navy 2013b). The Main Site is home to the Naval Postgraduate School campus and base administration functions. The Proposed Action would be located at six sites at NSA Monterey's Main Site (Figure 2-2).



Lease	Field	Acres	Gate
4A01	A	72.6	Elm 18
4A01	B	72.3	Elm 20
4A01	C	76.2	Elm 20A
4A01	D	15.9	Elder 108B
4A01	E	9.8	Elder 108B
4A01	F	68.3	Elder 106B
		315.1	**4A01 Total Acres (Approximate)**
4A02	G	20.6	Elder 109
4A02	H	75.3	Elm 48
4A02	I	73.4	Elm 47
4A02	J	144.6	Elm 32
4A02	K	32.2	Elder 104C
4A02	L	26.9	Elder 104C
		373	**4A02 Total Acres (Approximate)**

Path: O:\NAVFAC SW PV Solar EA\GIS Data\Figure3.4-1_NAF_El_Centro_AgLeases.mxd

0 0.25 0.5 Miles

1:23,000

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Ground-Mounted PV Solar Panel Arrays

Agricultural Lease

Maintenance Area

Figure 3.4-1
Agricultural Outlease Map 4A01 and 4A02
NAF El Centro

Sites 1 and 2 would be located in the northwest corner of the Main Site at the Naval Postgraduate School (Figure 2-2). The NSA Monterey Activity Overview Plan designates Sites 1 and 2 at the Main Site as Academic (Navy 2009a). Academic functions support academic instruction, and these facilities occupy almost the entire western portion of the Naval Postgraduate School campus (Navy 2009a). Within the fence line, surrounding land development features include classroom facilities (Glascow Hall) to the south and east, and limited personnel support uses to the southwest. Outside the fence line, adjacent land uses include commercial uses to the northwest and residential uses to the west along Sloat Avenue. Del Monte Avenue, a major thoroughfare for the City of Monterey, abuts the northern boundary of the installation fence line. The Beach Research Area is located north of Del Monte Avenue.

Site 3 would be located in the southwest corner of the Main Site at the Naval Postgraduate School (Figure 2-2). The NSA Monterey Activity Overview Plan designates Site 3 at the Main Site as Academic (Navy 2009a). Within the fence line, classroom facilities (Watkins Hall) and an auditorium border Site 3 to the north and west. The Tenth Street Gate entrance is located south of Site 3. Residential land uses border the Main Site along Sloat Avenue to the west of Site 3, near Seventh and Eighth streets.

Sites 4, 5, and 6 would be located in the southeast corner of the Main Site (Figure 2-2). The NSA Monterey Activity Overview Plan designates Sites 4, 5, and 6 as Public Works (Navy 2009a). Public Works facilities are responsible for utility, maintenance, and engineering infrastructure and facilities at NSA Monterey (Navy 2009a). Surrounding land uses include recreational uses (e.g., baseball field, small picnic area) and Del Monte Lake to the north. California Highway 1 abuts the southern boundary of the Main Site near Site 6, extending southwest towards Carmel and northeast to Seaside and Marina.

Navy Annex

The Navy Annex encompasses an approximately 20-acre (8-hectare) area that is contiguous with the Monterey Peninsula Airport; this area is primarily used for research to support the Navy's meteorological and oceanographic operations and research centers (Navy 2009a).

The project would be located at four sites within the densely developed Navy Annex (Figure 2-3). The NSA Monterey Activity Overview Plan designates Sites 1, 2, 3, and 4 as Research (Navy 2009a). Outside of the fence line, single-family residences are present to the north and west, a small industrial park is located to the east, and an active runway for the Monterey Peninsula Airport is to the south.

3.4.1.3 NAVWPNSTA Seal Beach

NAVWPNSTA Seal Beach encompasses a 5,256-acre (2,127-hectare) area in Seal Beach, California (Navy 2009b). The primary function and activity of NAVWPNSTA Seal Beach is the receipt, segregation, storage, and issuance of ordnance. Land uses at NAVWPNSTA Seal Beach are identified as Ordnance Storage, National Wildlife Refuge, Waterfront, Personnel Support, Industrial, and Administration and Training (Navy 2009b).

Alternative 1 Site

The Alternative 1 project site would be located on flat, undeveloped land east of Kitts Highway, west of Third Street, and south of Missile Road, a restricted usage road approximately 0.5 mile (0.8 kilometer) south of Westminster Boulevard (Figure 2-4). The site is located approximately 0.5 mile (0.8 kilometer) from the installation's western boundary within a 500-year floodplain[22] (refer to Section 3.8.1.1 for more information on floodplains in the project vicinity). The NAVWPNSTA Seal Beach Activity Overview Plan designates the project site as Industrial. Industrial facilities include ordnance handling/storage, storage warehouses, manufacturing facilities, maintenance shops, or other types of support facilities (Navy 2009b). Surrounding on-installation land uses include: ordnance storage warehouses to the north; abandoned railroad tracks, utility uses, and Kitts Highway to the west; administrative buildings, parking areas, and additional utility uses to the east; and a 911-acre (369-hectare) salt marsh (Seal Beach National Wildlife Refuge) located directly adjacent to the south. The nearest off-installation land uses include a residential neighborhood along the west side of Seal Beach Boulevard, also approximately 0.5 mile (0.8 kilometer) from the site.

Alternative 2 Site

The Alternative 2 project site would be located on previously disturbed, vacant land in the northeast portion of the installation, west of Bolsa Chica Road, and north of Westminster Boulevard (Figure 2-8). The NAVWPNSTA Seal Beach Activity Overview Plan designates the site as Industrial (Navy 2009b). Surrounding on-installation land uses include vacant land, utility uses, and some large-scale storage facilities in the operational and maintenance areas to the west and far north of the site. Westminster Boulevard and additional military uses are located to the south. Residential and commercial uses are located outside the installation fence line, east of Bolsa Chica Road. The placement of the aboveground electrical line for Alternative 2 at NAVWPNSTA Seal Beach would occur within the fence line, parallel to an existing transportation corridor (Westminster Boulevard).

[22] A 500-year floodplain is an area that could experience a flood having a 0.2 percent probability of occurring in any given year. It is an area that is not controlled by floodplain regulations and, therefore, construction is permitted, provided that certain building conditions are met.

3.4.1.4 NAVWPNSTA Seal Beach Detachment Norco

NAVWPNSTA Seal Beach Detachment Norco is one of the Navy's scientific and engineering computer operations and analytical complexes. Notable facilities on the installation include the Joint Warfare Assessment Lab, the Daugherty Memorial Assessment Center, and the Measurement Science and Technology Lab. Existing land uses located on the installation primarily include offices, laboratories, and data processing and communications facilities (i.e., a large outdoor satellite and communication towers).

Area 1

The project site at Area 1 has a gentle incline from east to west. The project would be located on disturbed land north of the Main Gate entrance at Fourth Street and south of Town and Country Drive (Figure 2-5). The site is used for targeting, and contains fiber optic cables that are run underground. Large storage facilities occupy the southern portion of Area 1. Surrounding features include a cement wall and other military uses to the north, undeveloped land to the east, communications facilities (i.e., satellite dishes), office buildings, Lake Norconian to the west, and Norco City Hall to the southeast. Mature eucalyptus trees and a netted chain-link fence line the installation's southern boundary.

Area 2

At Area 2, the project would be located on vacant land within a range of small, gently rolling hills in the southeastern portion of the installation (Figure 2-6). The site is traversed by a dirt road and a narrow swale area containing dense vegetation and mature trees. Surrounding land development features include undeveloped land to the east, the Norco College campus and associated parking lots to the south and southeast, and a baseball field and single-family residences to the south and southwest along Third Street. An open space area with trails, benches, and overlooks is located at the hilltop, just north of the Norco College campus, and southwest of Area 2. Vegetation in the area consists of native and non-native annual grasslands.

3.4.1.5 NBVC Port Hueneme

NBVC Port Hueneme occupies 1,615 acres (653 hectares) of land located on the vast Oxnard Plain, northwest of Los Angeles. The installation offers the Navy's only deep water port between San Diego County and the state of Washington.

The project site would be located in an existing parking lot in the southwestern area of the installation, northwest of the Port Hueneme Harbor, southeast of Channel Islands Harbor, and east of Silver Strand Beach (Figure 2-7). The NBVC Activity Overview Plan designates the project site as Logistics and Administrative (Navy 2006). Within the fence line, land uses east

and south of the site include military operations facilities (Navy 2012b) and paved parking lots. Outside the fence line, the surrounding community is characterized by residential and commercial uses. Two- and three-story residences are located along the installation's western boundary at Island View Avenue and Highland Drive, directly adjacent to the project site.

3.4.2 ENVIRONMENTAL CONSEQUENCES

3.4.2.1 Alternative 1 (Preferred Alternative)

NAF El Centro

Under Alternative 1, a ground-mounted solar photovoltaic system would be constructed and operated on a vacant, approximately 10-acre (4-hectare) site at NAF El Centro (Figure 2-1). The solar photovoltaic panel arrays and associated facilities would be located on land that has been previously disturbed and has been historically used for agricultural production. The Alternative 1 site is part of a larger agricultural outlease area (Figure 3.4-1). The NAF El Centro Master Plan designates the existing land use for the project site as Outlease, and the planned land use for the project site is designated as Utilities. While the outleases represent a commitment of the land, they could be modified or allowed to expire if the land were needed for military purposes (Navy 2014d). A permanent land use change would occur at the site, from historic agricultural use to renewable energy development.

Considering the small percentage of acreage discontinued for agricultural use when compared to all outleased property on the installation (4.68 percent of the total 688 acres [278 hectares]), no negative effects would be expected to occur to agricultural uses at NAF El Centro as a result of implementing Alternative 1. No Prime Farmland, Unique Farmland, or Farmland of Statewide Importance would be converted to non-agricultural use by construction or operation of the solar photovoltaic system. Further, the land would remain under Navy use, and development of the site for electrical energy generation would be compatible with the adjacent uses on the installation (e.g., utility, housing, and aircraft operations) and the planned land use for the site (Utilities), as designated by the NAF El Centro Master Plan. The proposed location of the solar photovoltaic power plant would allow for easy maintenance accessibility and preserve other outlying undeveloped areas for future mission-essential uses (Navy 2014d); therefore, there would be no significant impacts to land uses as a result of implementing Alternative 1 at NAF El Centro.

NSA Monterey's Main Site and Navy Annex

The Proposed Action would be compatible with the NSA Monterey Activity Overview Plan land use designations for the sites at the Main Site (Academic [Sites 1, 2, and 3] and Public Works [Sites 4, 5, and 6]), as well as at the Navy Annex (Research [Sites 1, 2, 3, and 4]).

In addition, the panel arrays would be located on existing rooftops and parking lots, thereby allowing for continued operations at these facilities.

Similar to other airports and military airfields in California that have solar panels in proximity to active runways (e.g., San Francisco International Airport, Fresno International Airport, and San Jose International Airport), Alternative 1 at the Navy Annex would require the installation and use of solar photovoltaic panel arrays near an active civilian airport runway. As described in the Federal Aviation Administration's Technical Guidance for Evaluating Selected Solar Technologies on Airports, modern solar photovoltaic panels are constructed of dark, light-absorbing materials and covered with an anti-reflective coating. These panels are designed to maximize solar absorption and reflect as little as 2 percent of the incoming sunlight, depending on the angle of the sun (Federal Aviation Administration 2010).

While there are no Federal Aviation Administration regulations to address reflected sunlight from solar photovoltaic panels located around airports, a study completed by the California Department of Transportation (Caltrans), Division of Aeronautics, located at the Southern California Logistics Airport in Victorville, California, concluded that solar panels would produce a slight potential for an afterimage or flash glare resulting from reflected direct sunlight that would be similar to the potential for glare from water and less than the glare produced by weathered white concrete and snow. Commercial and military pilots typically minimize glare by using glare shields and sunglasses, which reduce radiation by approximately 80 percent and would make any reflected sunlight from solar panels insignificant. Based on the results from the Caltrans study, the Federal Aviation Administration found no objection, based on aircraft operational safety, for a proposed solar photovoltaic system (U.S. Air Force 2011). Further, reflectivity of the metal materials (e.g., carport vertical members) used for the project would be subdued, as necessary, by coating the metals with a paint color that possesses low reflective properties (refer to Section 3.7 for a discussion on visual quality).

For the reasons described above, the operation of the project would not cause a substantial increase in solar radiation reflectivity at NSA Monterey's Navy Annex that could affect aviators approaching or departing the adjacent airfield. Additionally, the project would be compatible with the NSA Monterey Activity Overview Plan land use designations for the sites at the Main Site and the Navy Annex; therefore, there would be no significant impacts to land use as a result of implementing Alternative 1 at NSA Monterey's Main Site and Navy Annex.

NAVWPNSTA Seal Beach

Under Alternative 1, a ground-mounted solar photovoltaic system would be constructed and operated on a vacant, approximately 5-acre (2-hectare) site at NAVWPNSTA Seal Beach (Figure 2-4). The site and adjacent land to the north, east, and west is designated for industrial use. The site is located within a 500-year floodplain (0.2-percent-annual-chance of flooding).

The flood risk at the site is considered low, and flood control infrastructure is currently in place at the installation (refer to Section 3.8.1.1 for information on floodplains in the project area).

The project would not construct any temporary or permanent structures that would increase the potential for flooding in local surface water bodies, restrict or redirect runoff flows, cause localized flooding at the site, or alter or interfere with surrounding land uses. Further, the land would remain under Navy use, and the project would be compatible with the NAVWPNSTA Seal Beach Activity Overview Plan land use designation for the project site (Industrial); therefore, there would be no significant impacts to land use as a result of implementing Alternative 1 at NAVWPNSTA Seal Beach.

NAVWPNSTA Seal Beach Detachment Norco

Under Alternative 1, ground-mounted solar photovoltaic systems would be constructed on up to two sites (Area 1 and/or Area 2) at NAVWPNSTA Seal Beach Detachment Norco (Figures 2-5 and 2-6). At Area 1, several large portable storage units south of the site, near Fourth Avenue, would be removed to accommodate the project. At Area 2, some vegetation would be removed; however, no structures would be removed. The project would not conflict with a land use designation for the site since there is no applicable Navy land use plan for the installation. The land would remain under Navy use, and development of the sites for renewable energy generation would be compatible with the surrounding land uses; therefore, there would be no significant impacts to land use as a result of implementing Alternative 1 at NAVWPNSTA Seal Beach Detachment Norco.

NBVC Port Hueneme

Under Alternative 1, a carport-mounted solar photovoltaic system would be constructed on an existing paved parking lot in the southwestern area of NBVC Port Hueneme (Figure 2-7). The carports developed for Alternative 1 would be compatible with parking uses at this location. Electrical utility lines and point of connection equipment (e.g., switchgears) associated with Alternative 1 would be installed underground or among existing compatible equipment and would be integrated into the installation's electricity distribution system. The project would be compatible with the NBVC Activity Overview Plan land use designation for the project site, which is Logistics and Administrative (Navy 2006). Further, Alternative 1 would not result in any modification to land use outside the installation or conflict with any offsite land uses; therefore, no significant impacts to land use would occur as a result of implementing Alternative 1 at NBVC Port Hueneme.

3.4.2.2 Alternative 2

NAF El Centro

At NAF El Centro, Alternative 2 would include development of a ground-mounted solar photovoltaic system at the same agricultural outlease parcel as described for Alternative 1; however, the electrical generation facility would be developed on 8 acres (3.2 hectares) instead of 10 acres (4 hectares). Impacts to land use under Alternative 2 at NAF El Centro would be the same as those described under Alternative 1. As a result, there would be no significant impacts to land use as a result of implementing Alternative 2 at NAF El Centro.

NSA Monterey's Main Site and Navy Annex

At NSA Monterey's Main Site and Navy Annex, Alternative 2 would include development at the same sites as described for Alternative 1; however, one carport-mounted solar photovoltaic array system (Site 1) would not be developed at the Navy Annex under this alternative. Impacts to land use under Alternative 2 at NSA Monterey would be similar to those described under Alternative 1. As a result, there would be no significant impacts to land use as a result of implementing Alternative 2 at NSA Monterey's Main Site and Navy Annex.

NAVWPNSTA Seal Beach

Under Alternative 2, development of the solar photovoltaic system would occur at a different site at NAVWPNSTA Seal Beach. The NAVWPNSTA Seal Beach Activity Overview Plan land use designation for the Alternative 2 site is Industrial (Navy 2009b) and the project would be compatible with this designation. Additionally, the placement of the aboveground electrical line for Alternative 2 at NAVWPNSTA Seal Beach would occur within the fence line and would not alter or interfere with surrounding land uses. There would be no significant impacts to land use as a result of implementing Alternative 2 at NAVWPNSTA Seal Beach.

NAVWPNSTA Seal Beach Detachment Norco

Under Alternative 2, development at NAVWPNSTA Seal Beach Detachment Norco would be the same as described under Alternative 1. As a result, no significant impacts to land use would occur from implementation of Alternative 2 at NAVWPNSTA Seal Beach Detachment Norco.

NBVC Port Hueneme

Under Alternative 2, development at NBVC Port Hueneme would be the same as described under Alternative 1. As a result, no significant impacts to land use would occur from implementation of Alternative 2 at NBVC Port Hueneme.

3.4.2.3 No Action Alternative

Under the No Action Alternative, no solar photovoltaic array systems would be developed; therefore, existing conditions would remain as described in Section 3.4.1, and there would be no significant impacts to land use. The No Action Alternative would result in maintaining the status quo for land use at the five installations.

3.5 SOCIOECONOMICS

For this EA, socioeconomics is not analyzed for NSA Monterey, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme. Project sites at these installations would not result in a change in land use; therefore, impacts to socioeconomics for these four installations would be minimal and short-term. At NAF El Centro, the project would remove land from an existing agricultural outlease on the installation; therefore, this EA analyzes the socioeconomic impacts that would occur from the change in land use at NAF El Centro.

This section describes existing socioeconomic conditions, including population, housing, employment, income, and demographic characteristics, in the City of El Centro, the City of Imperial, and Imperial County, California. This section also analyzes potential impacts to socioeconomics in these areas that may occur with implementation of the alternatives.

The discussion is based on a review of available literature and existing background data, including the following resources, among others:

- Final Environmental Impact Statement, U.S. Navy F-35C West Coast Homebasing (Navy 2014g);
- Personal Income Summary (U.S. Department of Commerce 2013a-d); and,
- Naval Air Facility El Centro Economic Impact and Community Involvement (NAF El Centro 2011).

3.5.1 AFFECTED ENVIRONMENT

The project site is located in south-central Imperial County in southern California, 7 miles (11.3 kilometers) northwest of the City of El Centro, 14 miles (22.6 kilometers) west of the City of Imperial, and 20 miles (32.2 kilometers) north of the U.S./Mexico border. The affected environment for socioeconomics evaluated for this analysis includes the City of El Centro and Imperial County, the areas with the strongest economic ties to activities at NAF El Centro. The study area for this analysis includes the City of El Centro, the City of Imperial, and Imperial County. Statistics for the State of California are presented for comparison.

3.5.1.1 Population

Table 3.5-1 presents population statistics for the study area, including populations in 2000 and 2010, population projections for 2020, and past and predicted population growth rates. As shown in Table 3.5-1, the 2010 population in Imperial County was 174,528 people. Imperial County's population increased 22.6 percent from 2000 to 2010. Imperial County's population is projected to increase another 37.0 percent by 2020, making the county's growth rate twice the estimated population growth rate for the State of California (18.5 percent) between 2010 and 2020 (Navy 2014g). This rapid growth rate in Imperial County is due, in part, to the area's relatively low land and labor costs and its proximity to Mexico. The City of El Centro grew by 12.6 percent from 2000 to 2010, while the City of Imperial almost doubled in population over the same decade.

Table 3.5-1 Study Area Population Trends

Jurisdiction	2000	2010	Percent Growth Rate 2000-2010	2020 Projection*	Percent Growth Rate 2010-2020
City of El Centro	37,835	42,598	12.6%	---	---
City of Imperial	7,560	14,758	95.2%	---	---
Imperial County	142,361	174,528	22.6%	239,149	37.0%
State of California	33,871,648	37,253,956	10.0%	44,135,923	18.5%

Source: Navy 2014g
Note: *2020 projections only available for county and state.

The Fiscal Year (FY) 2010 population associated with NAF El Centro included 662 federal government personnel (307 military personnel and 355 contractor/civilian employees) and 614 military dependents (Navy 2014g). In addition, 1,273 transient personnel participate in training programs at NAF El Centro each year.

3.5.1.2 Employment and Income

Imperial County's employment (by industry) for 2011 is shown in Table 3.5-2. The industries that employ the greatest number of people in Imperial County include: government (34.5 percent); trade, transportation, and utilities (19.2 percent); agriculture (17.2 percent); educational and health services (7.0 percent); and leisure and hospitality (6.5 percent) (Navy 2014g).

Table 3.5-2 2011 Employment Statistics for Imperial County

Industry	Number Employed*
Government	18,700
Trade, Transportation, and Utilities	10,400
Agriculture	9,300
Educational and Health Services	3,800
Leisure and Hospitality	3,500
Manufacturing	2,400
Professional and Business Services	2,400
Construction, Mining, Logging	1,300
Financial Activities	1,300
Other Services	700
Information	400
Total	**54,200**

Source: Navy 2014g

Note:
*Not seasonally adjusted. April 2011, preliminary.

From 2005 to 2012, total personal income and per capita income grew faster in Imperial County than for the state as a whole, with personal income increasing 43.5 percent and per capita income increasing 26.6 percent (Table 3.5-3). While per capita income in dollars within the study area was less than that for the state, per capita income grew more when compared to the state average (Table 3.5-3).

Table 3.5-3 Study Area Personal and Per Capita Incomes

	Personal Income[1,2]			Per Capita Income[1,3]		
Jurisdiction	2005	2012	Percent Increase 2005-2012	2005	2012	Percent Increase 2005-2012
Imperial County[4]	$3,810,025,000	$5,466,646,000	43.5%	$ 24,406	$30,894	26.6.%
State of California	$1,396,173,422,000	$1,768,039,281,000	26.6%	$38,969	$46,477	19.3%

Sources: U.S. Department of Commerce 2013a-d

Notes:
1 Not adjusted for inflation.
2 Personal income is the income that is received by all persons from all sources.
3 Per capita income is the income per person in an area.
4 Personal income and per capita Income are the same for El Centro Metropolitan Statistical Area.

As shown in Table 3.5-4, unemployment rates in the study area have increased dramatically since 2007, increasing by an average of 57 percent from 2007 to 2011. The 2011 unadjusted unemployment rate in Imperial County was 27.9 percent. The comparable 2011 unadjusted unemployment rates for California and the United States were 11.7 percent and 8.7 percent, respectively (Navy 2014g).

Table 3.5-4 Study Area Unemployment Rates

Jurisdiction	2007[1]	2008[1]	2009[1]	2010[1]	2011[1,2]	Percent Increase 2007-2011
City of El Centro	17.0	21.1	26.5	28.2	26.4	55.3%
City of Imperial	12.1	15.3	19.5	20.9	19.5	61.2%
Imperial County	18.0	22.3	27.9	29.7	27.9	55.0%
State of California	5.3	7.2	11.3	12.4	11.7	120.8%

Source: Navy 2014g

Notes:
[1] Not seasonally adjusted.
[2] April 2011, preliminary.

NAF El Centro's strong presence in the study area plays an important role in Imperial County's economy. For FY 2010, there were 662 federal government personnel (307 military personnel and 355 civilians) employed at NAF El Centro (Navy 2014g). Total payroll to support this workforce was approximately $24 million. In addition, 13,406 guest-nights at local hotels were associated with air show visitors and transient military and civilian personnel training at NAF El Centro during FY 2010. An economic impact assessment for FY 2010 determined that NAF El Centro's total economic impact in Imperial County was 800 jobs and $105 million (including $4 million in state and local tax revenues) (NAF El Centro 2011).

3.5.1.3 Housing

In 2010, there were approximately 56,000 housing units in Imperial County, with a vacancy rate of 12.4 percent (Table 3.5-5). The vacancy rates in the City of El Centro and the City of Imperial were lower than the county, at 9.5 percent and 7.3 percent, respectively. While both cities' vacancy rates were less than Imperial County's rate, only the City of Imperial had a lower vacancy rate than the state (8.1 percent) (Navy 2014g).

Table 3.5-5 Study Area Housing Units, 2010

Jurisdiction	Housing Units	Percent Vacant	Occupied Housing Units		
			Total	Percent Owner	Percent Renter
City of El Centro	14,476	9.5%	13,108	49.5%	50.5%
City of Imperial	4,751	7.3%	4,405	71.1%	28.9%
Imperial County	56,067	12.4%	49,126	55.9%	44.1%
State of California	13,608,081	8.1%	12,557,498	55.9%	44.1%

Source: Navy 2014g

In 2009, NAF El Centro prepared an update of the 2006 Housing Requirement Market Analysis. The analysis assessed the housing market within a 60-minute commute of NAF El Centro. At the time of the 2009 analysis, there were 19,515 rental housing units, of which 8,128 units (42 percent) were considered suitable for military families in terms of physical conditions, health and safety concerns, and availability. A manpower update to the 2009 Housing Requirement Market Analysis was completed in 2011. The 2011 update predicted a shortfall of 564 military family community housing units and a shortfall of 216 community housing units for unaccompanied personnel by 2014 (Navy 2014g).

NAF El Centro has 101 military family housing units (31 officer units and 70 enlisted units). On average, less than 10 percent of the units are vacant (Navy 2014g).

3.5.1.4 Environmental Justice

On February 11, 1994, President Clinton signed Executive Order 12898, Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations, into effect. The intent of Executive Order 12898 is to prevent low-income and minority populations from being subjected to disproportionately adverse environmental effects. More specifically, the Executive Order directs federal agencies "…to make achieving environmental justice part of its mission by identifying and addressing…disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority population and low-income population in the [U.S.]."

The following provides information on minority and low-income populations in the study area. Imperial County serves as the community of comparison since it is the largest geographic area that encompasses the study area.

Minority and Low-Income Population Trends

The total minority population is calculated as the percent of the population that is categorized in one of six racial categories and those of Hispanic or Latino origin (without double counting those who report two or more races/origins). The low-income population is calculated using data from the 2010 American Community Survey for individuals whose income has been below the poverty level during the previous 12-month reporting period. Table 3.5-6 presents the data for total minority and low-income populations within the study area. All three jurisdictions within the study area have a higher percentage of minority populations as compared to the state, and both the City of El Centro and Imperial County have a greater percentage of low-income populations as compared to the state.

Table 3.5-6 Minority and Low-Income Populations within the Study Area

Jurisdiction	Total Population	Minority Population	% Minority	% Low-Income*
City of El Centro	42,598	36,840	86.5%	20.9%
City of Imperial	14,758	11,776	79.8%	12.6%
Imperial County	174,528	150,601	86.3%	21.4%
State of California	37,253,956	22,297,703	59.9%	13.7%

Source: Navy 2014g
Note: *Includes all individuals for whom poverty status is determined.

Environmental Health and Safety Risks to Children

In April 1997, President Clinton signed Executive Order 13045, Environmental Health and Safety Risks to Children (62 Fed. Reg. 1988 [1997]), into effect. The intent of Executive Order 13045 is to prevent children from being subjected to disproportionately adverse environmental health and safety risks from federal actions. The policy of the Executive Order states that each federal agency:

(a) Shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and,

(b) Ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

To comply with the Executive Order, this EA addresses child-specific environmental health risk and safety risk issues associated with the project.

Table 3.5-7 presents 2010 census data on the percentage of the study area's population that is less than 18 years of age.

Table 3.5-7 Percent of Population Under the Age of 18 within the Study Area, 2010

Jurisdiction	< Age 18
City of El Centro	29.7%
City of Imperial	33.4%
Imperial County	29.3%
State of California	25.0%

Source: Navy 2014g

An on-installation family housing development, located adjacent to and northeast of the project site, and the NAF El Centro Child Development Center and Youth Center, located along B Street, are within 0.2 mile (0.32 kilometer) of the project site.

3.5.2 ENVIRONMENTAL CONSEQUENCES

3.5.2.1 Alternative 1 (Preferred Alternative)

Population

Alternative 1 would not increase in the number of permanent military and civilian personnel moving to areas in the NAF El Centro vicinity. Local contractors already living in the area would travel to NAF El Centro to work at the project site. Private contractors hired by the PPA solar power developer and living in the region would construct and maintain the solar photovoltaic system, as needed. Alternative 1 would have no long-term or short-term effects to area populations because military and civilian personnel and their families and project contractors would not move to the City of El Centro or surrounding areas. Therefore, there would be no significant impacts to area populations as a result of implementing Alternative 1.

Employment and Income

Land uses within the installation are predominantly for military purposes and include operations, mission support, and housing directly related to the Navy; however, 688 acres (278 hectares) of the installation are outleased for agricultural purposes on five-year terms. Under Alternative 1, the solar photovoltaic system would be located on a 10-acre (4-hectare) site that has been historically used for agricultural production. The 10-acre (4-hectare) site is part of a larger agricultural outlease area known as Field K of Lease 4A02 (Figure 3.4-1). While part or all of the outlease at Field K would be discontinued for agricultural use as part of this alternative, local agricultural workers farm a number of fields in the area on a regular basis and do not

solely depend on the 10-acre (4–hectare) site for employment. Given the small percentage of acreage discontinued for agricultural use when compared to all outleased property on the installation (4.68 percent of the total 688 acres [278 hectares]), and no anticipated job loss, no significant long-term or short-term effects related to local employment or area incomes would be expected to occur as a result of implementing Alternative 1.

During construction of Alternative 1, a single 10- to 12-person crew, hired by the PPA solar power developer and living in the area, would access the project site for the installation of the solar photovoltaic system at NAF El Centro. During construction of the system, 10 to 12 workers would be present at NAF El Centro each day, for an estimated four-month construction period. The workers would purchase local goods and services, thereby providing a short-term, beneficial economic effect for the local economy.

Considering the relatively small amount of agricultural land impacted by Alternative 1, and the short-term, beneficial effects due to use of area facilities and the purchase of local goods and services, no significant impacts to local employment or area incomes would be expected to occur as a result of implementing Alternative 1.

Housing

Alternative 1 would not increase the number of military and civilian personnel and their families or project contractors requiring housing in the vicinity of NAF El Centro. Therefore, there would be no long-term or short-term significant impacts to area housing as a result of implementing this alternative.

Environmental Justice

As evaluated in accordance with Executive Order 12898, a project would have disproportionately high and adverse human health or environmental effects on low-income or minority populations if the project would result in any environmental impacts (e.g., air quality, water, socioeconomics) that would disproportionately affect minority or low-income populations in the project study area. The implementation of Alternative 1 would be conducted within the boundary of NAF El Centro, which is designated for military use, and would not be in proximity to minority or low-income housing areas. In addition, based on the analysis of impacts presented in Sections 3.1 through 3.8, Alternative 1 would not result in adverse effects to human health or the environment. Therefore, Alternative 1 would not cause disproportionately high or adverse human health or environmental effects to low-income or minority populations. No significant impacts to minority or low-income populations in the study area would result from implementation of Alternative 1.

In accordance with Executive Order 13045, a project would have significant environmental health and safety risks on children if the project generates environmental effects

that would disproportionately affect populations of children (i.e., local residences or schools) within the study area. An on-installation family housing development and Child Development Center and Youth Center are within 0.2 mile (0.32 kilometer) from Alternative 1; however, based on the analysis of impacts presented in Sections 3.1 through 3.8, Alternative 1 would not result in disproportionately high or adverse effects to environmental health or safety risks to children. Therefore, no significant impacts to environmental health or safety risks to children would result from implementation of Alternative 1.

3.5.2.2 Alternative 2

Population

Similar to Alternative 1, implementation of Alternative 2 would not increase area populations in the NAF El Centro vicinity because local contractors would travel to the project site for construction and project maintenance activities. Therefore, no significant impacts to area populations would result from implementation of Alternative 2.

Employment and Income

Alternative 2 would be constructed within the same area as Alternative 1, but the solar photovoltaic system would encompass 8 acres (3.2 hectares) of land, as compared to 10 acres (4 hectares) of land with the implementation of Alternative 1. If Alternative 2 were implemented, the Navy would discontinue the agricultural outlease for the same acreage discontinued under Alternative 1. Therefore, no significant impacts to area employment would result from implementation of Alternative 2.

Housing

There would be no increase in area military or civilian populations in the NAF El Centro vicinity with Alternative 2. Local contractors would travel to the project site for construction and project maintenance activities, and there would be no increased housing demands as part of Alternative 2. Therefore, no significant impacts to area housing would result from implementation of Alternative 2.

Environmental Justice

Alternative 2 would be constructed within the boundary of NAF El Centro, which is designated for military use. This alternative would not be in proximity to minority or low-income housing areas or result in significant adverse impacts to human health or the environment. Similar to Alternative 1, Alternative 2 would not result in disproportionately high or significant adverse impacts to environmental health or safety risks to children at the on-installation family housing development or Child Development Center and Youth Center. Therefore, no significant impacts to environmental justice would result from implementation of Alternative 2.

3.5.2.3 No Action Alternative

Under the No Action Alternative, the solar photovoltaic systems would not be constructed or operated, and the Navy would continue to purchase conventional power from utility providers; therefore, there would be no significant impacts to population, employment, housing, environmental justice, and risks to children with implementation of the No Action Alternative.

3.6 UTILITIES

This section discusses the utilities used at the five installation project sites, including natural gas, water, wastewater, solid waste, and electrical services. This section also analyzes potential impacts to these services with implementation of the alternatives. The following discussion was primarily based on information from these resources:

- Final Naval Air Facility El Centro Activity Overview Plan (Navy 2005);
- Final Integrated Natural Resources Management Plan, Naval Air Facility El Centro and Target Areas (Navy 2001);
- Final Integrated Natural Resources Management Plan, Naval Support Activity Monterey (Navy 2013b);
- Final Naval Weapons Station Seal Beach Activity Overview Plan (Navy 2009b);
- Final Environmental Assessment, Construction and Operation of a New Laboratory and Demolition of Structures at Naval Weapons Station Seal Beach, City of Seal Beach, California (Navy 2013d);
- Final Environmental Assessment for Implementation of the Updated Integrated Natural Resources Management Plan, Naval Weapons Station Seal Beach Detachment Norco, Norco, California (Navy 2013e);
- Final Integrated Natural Resources Management Plan, Naval Weapons Station Seal Beach Detachment Norco, Norco, California (Navy 2012a); and,
- Naval Base Ventura County Activity Overview Plan, Final Report (Navy 2006).

3.6.1 AFFECTED ENVIRONMENT

3.6.1.1 Natural Gas Delivery

NAF El Centro

Southern California Gas Company (SoCalGas) supplies natural gas to NAF El Centro via a 3-inch (7.6-centimeter) -diameter gas main that runs along Bennett Road and enters the installation at the Main Gate. The main line forks into feeder lines to serve the east and west portions of the installation (Navy 2005).

NSA Monterey's Main Site and Navy Annex

Pacific Gas and Electric provides natural gas service to NSA Monterey. The natural gas distribution system is owned and maintained by NSA Monterey (Navy 2013b).

NAVWPNSTA Seal Beach

Natural gas is purchased from SoCalGas at NAVWPNSTA Seal Beach, and the natural gas system, along with other utility systems, is maintained by NAVFAC SW Public Works. Natural gas is primarily used to provide space heating to offices, operations, and residential buildings. The installation uses four separately metered independent branch-type distribution systems that service Public Works, the Administrative and Training Functional District, the Research, Technology, and Evaluation complex, and the missile assembly area. The closest natural gas line to the project site is approximately 1,000 feet (304 meters) to the north (Navy 2009b).

NAVWPNSTA Seal Beach Detachment Norco

SoCalGas provides natural gas service at NAVWPNSTA Seal Beach Detachment Norco. The natural gas system is maintained by NAVFAC SW Public Works.

NBVC Port Hueneme

SoCalGas provides natural gas service at NBVC Port Hueneme. The natural gas system is maintained by NAVFAC SW Public Works.

3.6.1.2 Water

NAF El Centro

NAF El Centro receives all of its water from the Imperial Irrigation District; there is no use of wells or other groundwater. Drinking water arrives by way of the Elder Canal, and has a primary and secondary treatment facility that includes a settling basin with flocculation and

sedimentation chambers. Effluent is released into the New River since it is not suitable for irrigation. Water is chlorinated, and basic testing is conducted under 40 CFR 22 of the federal Clean Water Act (Navy 2001).

The water distribution system at NAF El Centro consists of a network of closed-loop pipelines that service lateral lines within the network. The network pipelines range in size from 6 to 12 inches (15.2 to 30.5 centimeters) in diameter, and service laterals are 3 to 8 inches (7.6 to 20.3 centimeters) in diameter. The polyvinyl chloride main distribution lines were upgraded in 1996 and 1997 (Navy 2005).

NSA Monterey's Main Site and Navy Annex

Potable water is provided to NSA Monterey's Main Site and Navy Annex by California-American Water Company and is supplied to every building via an underground network installed under major streets. Landscape irrigation water is provided by Lake Del Monte, on-installation wells, and a small amount of California-American Water Company potable water. The distribution system is owned and maintained by NSA Monterey (Navy 2013b).

NAVWPNSTA Seal Beach

Water is supplied to NAVWPNSTA Seal Beach by the City of Seal Beach. This water has an onsite storage and distribution system that serves all major operation areas of the site, other than the northeast ordnance magazine area. Water is used for domestic purposes in administrative and personnel support areas, for industrial consumption in assembly and operations areas, and for fire protection in all areas. Extensive portions of the water delivery system are devoted to the fire protection service for widespread ordnance handling and production activities conducted at the installation. Twenty-one percent of the water lines are devoted to non-potable uses. The northeast magazine area is supplied with water by the City of Seal Beach (Navy 2009b).

NAVWPNSTA Seal Beach Detachment Norco

The City of Norco provides a metered water connection that delivers potable water to NAVWPNSTA Seal Beach Detachment Norco. The City of Norco also manages a water well field that provides non potable water to fill Lake Norconian. Future plans include the City of Norco to provide a metered reclaimed waterline connection that will bring high-quality reclaimed water to the installation to supply for landscape irrigation needs. Since the evaporation rate is very high in this arid environment, the lake would dry up without the supplemental water from the well water system. Annual total flow depends on the amount of rainfall and the water system's capability (Navy 2012a).

NBVC Port Hueneme

NBVC Port Hueneme receives potable water from the Port Hueneme Water Agency, which is the wholesale provider for the City of Port Hueneme, the Channel Islands Community Services District, and NBVC Point Mugu. Irrigation water for landscaping is provided from the on-installation water well and the United Water Conservation District (Navy 2006).

3.6.1.3 Wastewater

NAF El Centro

The sanitary sewer system at NAF El Centro is located at the far northwestern portion of the installation. Sewage is treated by a "Modified Activated Sludge" system in which bacteria are grown to organically break down the waste materials without chemicals. The sewage is pumped to a clarifier where the heavy solids settle. The sludge is then buried in one of three sludge drying ponds near the facility. This process is able to treat approximately 5 million gallons (18,927 cubic meters) of sewage per month. Effluent from the NAF El Centro wastewater treatment plant is released into the New River because it is not suitable for irrigation. In 2004, a project for the sewer conveyance system replaced old, deteriorated, vitrified clay pipe throughout the installation, and upgraded the wastewater treatment plant (Navy 2005).

NSA Monterey's Main Site and Navy Annex

The Monterey Regional Water Pollution Control Agency provides sewage services from NSA Monterey's Main Site and Navy Annex to the regional treatment plant (Navy 2013b).

NAVWPNSTA Seal Beach

NAVWPNSTA Seal Beach is predominantly served by a gravity branching configuration sewer line system supplemented in remote site areas with several small independent leach fields. Several onsite lift stations overcome local grade obstacles. The main gravity system flows to the southwestern portion of the installation, at which point the City of Seal Beach pumping facilities, located near the intersection of Seal Beach Boulevard and Electric Avenue, deliver the flows into the Orange County Sanitation District system for eventual treatment (Navy 2009b).

NAVWPNSTA Seal Beach Detachment Norco

The current sewer system at NAVWPNSTA Seal Beach Detachment Norco includes an outdated lift station that has spilled in the past. Under a Memorandum of Agreement between the City of Norco and the Navy, a new sewer connection will be installed to provide a gravity feed to a different municipal sewer line, thus eliminating the need for the current lift station (Navy 2012a).

NBVC Port Hueneme

All wastewater generated at NBVC Port Hueneme is pumped through the City of Port Hueneme sewer system to the City of Oxnard sewer system, where it is conveyed to the City of Oxnard Wastewater Treatment Plant for secondary treatment and discharge (Navy 2006).

3.6.1.4 Solid Waste

NAF El Centro

Installation Operating and Service contractors provide solid waste removal for NAF El Centro (Navy 2005). The waste is conveyed to the Allied Imperial Landfill for disposal.

NSA Monterey's Main Site and Navy Annex

City of Monterey contractors collect solid waste at NSA Monterey's Main Site and Navy Annex (Navy 2013b). The waste is then conveyed to the Marina Landfill for disposal (Yamashita 2014a).

NAVWPNSTA Seal Beach

Solid waste produced on NAVWPNSTA Seal Beach is collected by a private company and disposed of at one of three approved Class III landfills in the area. All materials are disposed of in compliance with the Navy's Sustainability and Environmental Management Policy Statement and sustainability goals (e.g., recycling approximately 50 percent of municipal trash and 40 percent of construction and demolition waste), ensuring that eligible items are recycled. NAVWPNSTA Seal Beach currently participates in a Sustainable Solid Waste Program, which is a Qualified Recycling Program that has an overall goal of diverting solid waste from going to landfills, reducing waste streams, preventing pollution, decreasing solid waste disposal costs, and conserving resources (Navy 2013d).

NAVWPNSTA Seal Beach Detachment Norco

Municipal solid waste generated at NAVWPNSTA Seal Beach Detachment Norco is collected by Waste Management, a third-party refuse contractor. Municipal solid waste is currently being taken to an area landfill. The installation participates in the Sustainable Solid Waste Program. Recyclables are collected by the Site-Specific Work Plan staff on a weekly basis. The Site-Specific Work Plan has a site coordinator that collects and reports data for waste diversion (Bosalet 2014).

NBVC Port Hueneme

Solid waste from NBVC Port Hueneme is conveyed by a private contractor to an approved transfer station in Oxnard, California, and then transferred to a landfill for disposal (Navy 2006).

3.6.1.5 Electricity Delivery

NAF El Centro

The Imperial Irrigation District provides electricity to NAF El Centro and maintains the substation that is proposed for interconnection with the Proposed Action (Figure 2-1). Underground power lines are used in the vicinity of the airfield, but overhead power lines are used in much of the housing and administrative areas. During power outages, which may result from high winds and storms, back-up generators are used at some facilities, such as the sewage plant, water treatment plant, control tower, medical/dental clinic, and fire department (Navy 2005). Currently, NAF El Centro receives approximately 300 kilowatts of electricity from renewable resources (e.g., carport solar). Installation activities conducted at NAF El Centro[23] consumed 16,023 megawatt hours of electricity in FY 2013 (Yamashita 2014b).

NSA Monterey's Main Site and Navy Annex

NSA Monterey's Main Site and Navy Annex purchase electricity from the Western Area Power Administration, and Pacific Gas delivers the electricity to the installations. The on-installation distribution system consists of underground and overhead lines, and is owned and maintained by NSA Monterey (Navy 2013b). In FY 2013, the Main Site consumed 15,048 megawatt hours of electricity, and 10,276 megawatt hours of electricity were consumed at the Navy Annex during the same year (Yamashita 2014b).

NAVWPNSTA Seal Beach

NAVWPNSTA Seal Beach purchases power from Southern California Edison (SCE), and the electrical distribution system for the installation consists of overhead lines that interconnect all of the major site operations. The site also possesses portable generators capable of providing 4.16 kilovolts of back-up power to various facilities (Navy 2009b). NAVWPNSTA Seal Beach consumed 7,796 megawatt hours of electricity in FY 2013 (Yamashita 2014c).

NAVWPNSTA Seal Beach Detachment Norco

NAVWPNSTA Seal Beach Detachment Norco purchases power from SCE, and the electrical distribution system for the installation consists of overhead and below ground lines

[23] This does not include electricity consumed at the ranges or outlying areas of NAF El Centro.

that interconnect all major site operations. NAVWPNSTA Seal Beach Detachment Norco consumed 11,835 megawatt hours of electricity in FY 2013 (Yamashita 2014c).

NBVC Port Hueneme

Electricity for NBVC Port Hueneme is purchased from SCE and Strategic Energy and is distributed via both overhead and underground distribution electrical systems (Navy 2006). Installation activities conducted at NBVC Port Hueneme consumed 44,263 megawatt hours of electricity in FY 2013 (Yamashita 2014b).

3.6.2 ENVIRONMENTAL CONSEQUENCES

3.6.2.1 Alternative 1 (Preferred Alternative)

Natural Gas

Actions under Alternative 1 would not involve any use of, or changes to, natural gas infrastructure at NAF El Centro, NSA Monterey's Main Site or Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, or NBVC Port Hueneme. Therefore, no significant impacts to natural gas delivery systems would occur with implementation of Alternative 1.

Water

Alternative 1 would involve the temporary use of water during project construction and operation. Water used during construction of Alternative 1 for dust suppression would be transported to each project site via water trucks by the construction contractor. During operation, panel washing would occur two times per year, with each solar photovoltaic system requiring approximately 100 gallons of water annually. The water/vinegar-based solution used for panel washing would be transported to the sites via water trucks and would be supplied by the PPA solar power developer. Therefore, no significant impacts to potable or non-potable water systems would occur with implementation of Alternative 1.

Wastewater

Alternative 1 would generate small volumes of wastewater during project construction due to workers' use of onsite portable toilets at each installation; this waste would be removed from each site and disposed of at local wastewater treatment facilities that are available and have the capacity to receive such waste. During operation, the majority of the water/vinegar-based solution used for panel washing would evaporate off of the solar panel surfaces into the air and small amounts may drip into the soil. The operation of Alternative 1 would not involve increased use of wastewater systems at any installation. Therefore, no significant impacts to wastewater infrastructure would occur with implementation of Alternative 1.

Solid Waste

Alternative 1 would generate small volumes of non-hazardous solid waste on a temporary basis during construction of the solar photovoltaic systems at each project site. As discussed in Section 2.4.6.3, the construction contractors would store this waste onsite in approved containers (e.g., covered dumpsters) that would be removed and replaced at regular intervals. During operations and maintenance, equipment may fail and need to be replaced, at which time contractors would transport the resulting waste materials to an approved recycling or disposal facility. Overall, the increased amount of solid waste conveyed to local facilities would be negligible, and the local facilities would have availability and adequate capacity to accept project waste; therefore, no significant impacts related to solid waste disposal would occur with implementation of Alternative 1.

Electricity Delivery

Installation of solar photovoltaic systems at each installation under Alternative 1 signifies the Navy's shift towards more technologically-advanced methods of delivering electricity and less reliance upon more conventional energy sources. Ground-, carport-, and rooftop-mounted solar photovoltaic panels and associated electrical equipment (e.g., electrical feed meters, switchgear, inverters, circuit breakers, and transformers) would connect to the existing electrical grid. As discussed in Section 2.2.2.1, the Navy and one or more private solar power developer would enter into 20-year PPAs, with the opportunity to extend each PPA for a single five-year period (i.e., one time only), allowing the solar power developers to construct, operate, maintain, and own solar photovoltaic systems at each installation, providing added long-term energy security. During construction, all equipment requiring sources of electricity would be operated using gas- or diesel-powered generators provided by construction contractors, and no temporary adverse effects related to disruption of the existing electrical services would occur with implementation of Alternative 1.

<u>NAF El Centro</u>

For NAF El Centro, Alternative 1 would install an approximately 650-kilowatt ground-mounted solar photovoltaic system. This system, coupled with the 300 kilowatts from renewable resources already installed, would maximize the amount of electricity NAF El Centro can generate, as allowed by the Imperial Irrigation District. The total output from the NAF El Centro ground-mounted solar photovoltaic system would be 1,495 megawatt hours per year. This system would ultimately reduce the electrical demand from Imperial Irrigation District and reduce the amount of money the installation pays for electricity.

<u>NSA Monterey's Main Site and Navy Annex</u>

Alternative 1 would install carport- and rooftop-mounted solar photovoltaic panel arrays and associated infrastructure at NSA Monterey's Main Site; in total, this system would generate

1 megawatt of electricity at NSA Monterey's Main Site. The carport-mounted systems would be connected directly into the Pacific Gas and Electric grid and would reduce the amount of power being purchased from Pacific Gas and Electric. The rooftop-mounted systems would provide power directly to Buildings 426 and 427 at the Main Site and would reduce the amount of electricity these buildings require from the electrical grid. The solar photovoltaic systems would also provide power to these buildings in the event the Pacific Gas and Electric grid is disabled. The total output from the solar photovoltaic systems at NSA Monterey's Main Site would be 1,442.6 megawatt hours per year.

Alternative 1 would install carport- and rooftop-mounted solar photovoltaic panel arrays and associated infrastructure at NSA Monterey's Navy Annex; in total, this system would generate 500 kilowatts of electricity at the Navy Annex. The carport-mounted systems would be connected directly into the existing electrical grid and would reduce the amount of power purchased from Pacific Gas and Electric. The rooftop-mounted systems would provide power directly to Building 700 at the Navy Annex and would reduce the amount of electricity the building requires from the Pacific Gas and Electric grid. The solar photovoltaic systems would also provide power to the building in the event the Pacific Gas and Electric grid is disabled. The output from the solar photovoltaic systems at NSA Monterey's Navy Annex would be 721.3 megawatt hours per year.

The solar photovoltaic systems at both NSA Monterey's Main Site and Navy Annex would ultimately reduce the electrical demand from Pacific Gas and Electric and reduce the amount of money the installation pays for electricity.

NAVWPNSTA Seal Beach

Alternative 1 would install an approximately 500-kilowatt ground-mounted solar photovoltaic system at NAVWPNSTA Seal Beach. The total output from the facility would be 432.7 megawatt hours per year. This system would ultimately reduce the electrical demand from SCE and reduce the amount of money the installation pays for electricity.

NAVWPNSTA Seal Beach Detachment Norco

Alternative 1 would install ground-mounted solar photovoltaic systems at up to two locations (Area 1 and/or Area 2) at NAVWPNSTA Seal Beach Detachment Norco for a solar photovoltaic system rated at up to 1,500-kilowatt capacity. The total output from the generating facilities at Areas 1 and 2 would be approximately 2,250 megawatt hours per year. This system would ultimately reduce the electrical demand from SCE and reduce the amount of money the installation pays for electricity.

NBVC Port Hueneme

Alternative 1 would install an approximately 300-kilowatt carport-mounted solar photovoltaic system at NBVC Port Hueneme. The total output from the facility would be 432.7 megawatt hours per year. This system would ultimately reduce the electrical demand from SCE and Strategic Energy and reduce the amount of money the installation pays for electricity.

In summary, implementation of Alternative 1 would result in long-term beneficial effects to electricity delivery at the five installations, as described above. No significant impacts to electricity availability and delivery would occur at any of the five installations under Alternative 1.

3.6.2.2 Alternative 2

Natural Gas

Under Alternative 2, natural gas would not be utilized by the project; therefore no significant impacts to natural gas would occur with implementation of this alternative.

Water

Under Alternative 2, water would be used, managed, and disposed of in the same manner as described under Alternative 1; therefore no significant impacts to water delivery would occur with implementation of Alternative 2.

Wastewater

Under Alternative 2, wastewater would be generated, managed, and disposed of in the same manner as described under Alternative 1; therefore no significant impacts to wastewater systems would occur with implementation of Alternative 2.

Solid Waste

Under Alternative 2, solid waste generation and disposal methods would be the same as those described under Alternative 1; therefore no significant impacts related to solid waste disposal would occur with implementation of Alternative 2.

Electricity Delivery

During construction of the Alternative 2 sites, all equipment requiring sources of electricity would be operated using gas- or diesel-powered generators provided by construction contractors, and no disruption to the existing electrical services would occur at any of the installations.

NAF El Centro

At NAF El Centro, the 300-kilowatt system would result in a smaller footprint than the footprint for Alternative 1 (8 acres [3.2 hectares], as compared to 10 acres [4 hectares]) and would generate less electricity than the 650-kilowatt system for Alternative 1 (432.7 megawatt hours of electricity per year versus 1,495 megawatt hours of electricity per year); however, development of the solar photovoltaic system under Alternative 2 would still result in the long-term, beneficial effect on electricity delivery at NAF El Centro, as described under Alternative 1.

NSA Monterey's Main Site and Navy Annex

At NSA Monterey's Main Site and Navy Annex, Alternative 2 would install carport- and rooftop-mounted solar photovoltaic systems at the same sites on the Main Site and Navy Annex; however, a carport site (Site 1) at the Navy Annex would be excluded from Alternative 2. This would result in a smaller amount of electricity produced relative to Alternative 1 (432.7 megawatt hours per year versus 721.3 megawatt hours per year), but would ultimately result in a long-term, beneficial effect on the electricity supply and delivery system at NSA Monterey.

NAVWPNSTA Seal Beach

At NAVWPNSTA Seal Beach, Alternative 2 would install an approximately 500-kilowatt ground-mounted solar photovoltaic system at a different location on the installation. The distance from the solar photovoltaic panel array footprint to the existing electrical point of connection would be longer under this alternative; however, the lack of effect to the overall electrical infrastructure would be the same as discussed under Alternative 1. Additionally, Alternative 2 would result in the same amount of electricity produced relative to Alternative 1 (432.7 megawatt hours per year), and would result in a long-term, beneficial effect on the electricity supply and delivery system at NAVWPNSTA Seal Beach.

NAVWPNSTA Seal Beach Detachment Norco

At NAVWPNSTA Seal Beach Detachment Norco, the solar photovoltaic system developed under Alternative 2 would be the same as discussed under Alternative 1; therefore, impacts would be the same as described under Alternative 1.

NBVC Port Hueneme

At NBVC Port Hueneme, the solar photovoltaic system developed under Alternative 2 would be the same as discussed under Alternative 1; therefore, impacts would be the same as described under Alternative 1.

In summary, no significant impacts related to electricity delivery would occur at any of the five installations with implementation of Alternative 2.

3.6.2.3 No Action Alternative

Under the No Action Alternative, no new solar photovoltaic systems and associated infrastructure would be constructed. No natural gas, water, wastewater, or solid waste services would be required for implementing this alternative, and the Navy would continue to purchase conventional electrical power from local utility providers. While no significant impacts to utilities would occur with implementation of the No Action Alternative, the Navy would not realize any energy cost savings through PPAs with solar power developers, and this alternative does not provide progression towards the nation's or the Navy's energy goals.

3.7 VISUAL QUALITY

This section describes the visual resources that occur within and near the project areas at NAF El Centro, NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme. This section also analyzes potential impacts to visual resources that would occur with implementation of the alternatives.

For the purposes of the analysis in this section, the project area is defined as the solar panel array sites and surrounding areas at the installations. The project site(s) refers to the location(s) where disturbance would occur at each installation.

The following discussion is based on a review of available literature and existing background data, including, but not limited to, the following resources:

- Final Integrated Natural Resources Management Plan, Naval Support Activity Monterey (Navy 2013b);
- Final Integrated Natural Resources Management Plan, Naval Weapons Station Seal Beach Detachment Norco, Norco, California (Navy 2012a); and,
- Final Integrated Natural Resources Management Plan for Naval Base Ventura County Port Hueneme, Port Hueneme (Navy 2012b).

3.7.1 AFFECTED ENVIRONMENT

3.7.1.1 Visual Character and Quality

Visual resources are generally defined as the natural and built features of a landscape that may be viewed by the public and contribute to the visual quality and character of an area. Visual resources form the overall impression that an observer has of an area or its landscape character. Distinctive landforms, water bodies, vegetation, and man-made features that contribute to an area's aesthetic qualities are elements that contribute to an area's visual

character. Visual quality is generally defined as the visual significance or appeal of a landscape based on cultural values and the landscape's intrinsic physical elements (USACE 1988).

The visual character and quality of the project areas are described using terminology and criteria commonly applied as part of established processes for visual resource management and assessment by federal agencies (Bureau of Land Management [BLM] 1984, U.S. Forest Service 1995, Federal Highway Administration 1981, USACE 1988). The appearance of the landscape is described using the dominance elements of form, line, color, and texture, as appropriate. These dominance elements are the basic components used to describe visual character and quality for most visual assessments.

3.7.1.2 Visual Sensitivity, Viewer Sensitivity, and Exposure

Visual sensitivity is a measure of viewer interest and concern for the visual quality of the landscape and potential changes to it. Visual sensitivity is determined based on a combination of viewer sensitivity and viewer exposure. Viewer sensitivity is determined based on the types of viewers, activities they may be engaged in, and the expressed or anticipated level of public interest and concern for visual resources and quality. Viewer exposure considers the numbers of viewers and the frequency and duration of views.

Viewer sensitivity varies for individuals and groups, depending on the activities viewers are engaged in, their values and expectations related to the appearance and character of the landscape, and their potential level of concern for changes to the landscape. High viewer sensitivity is typically assigned to viewer groups engaged in recreational or leisure activities, those traveling on scenic routes for pleasure or to or from recreational or scenic areas, viewers experiencing or traveling to or from protected, natural, cultural, or historical areas, or viewers experiencing views from resort areas or their residences. Low viewer sensitivity is typically assigned to viewer groups engaged in work activities or commuting to or from work.

Viewer exposure varies for any particular view location or travel route depending on the number or volume of viewers, the frequency of views (i.e., how often the view is experienced), and the duration of the views (i.e., the length of time the view is experienced). Viewer exposure would typically be highest for views frequently experienced by large numbers of people for long periods. Other factors, such as viewing angle and viewer position relative to a feature or area, can also be contributing factors to viewer exposure.

The sections below summarize the affected environment for the project sites and surrounding areas at each of the five installations.

NAF El Centro

The project site is located in south-central Imperial County, within the southwest corner of NAF El Centro (Figure 2-1). On-installation land uses surrounding the project site at NAF El Centro are primarily military residential to the north and northeast and public works/utility uses to the west and northwest. Off-installation land uses include agricultural uses to the south. The site and its surroundings are generally characterized by flat agricultural land, tall structures associated with electricity distribution (i.e., power poles, substations), and military facilities. Most areas associated with NAF El Centro have been developed and, therefore, contain little native vegetation. Access to the project area is from unimproved dirt roads along the western and southern boundaries of the site.

The most visually prominent landmark in the area is a large red and white water tank, located northwest of the site at the end of Valley Forge Avenue (Photo 4). Portions of the water tank are visible for many miles outside of the project area due to its height and strong contrast in color, form, and texture relative to the surrounding landscape and blue sky. Other land development features within the project area include an Imperial Irrigation District electrical substation, a chain link fence, and irrigation ponds to the west, several electrical distribution lines to the west and northwest, barracks to the north, and military family housing to the northeast (Photo 4).

Photo 4. View looking north/northwest towards the NAF El Centro project site from the dirt access road, near the installation's southern boundary. Visible in this view are the large water tower, the NAF El Centro wastewater treatment plant, and several overhead electrical lines in the distance.

The project site is not visible from established communities that would have high viewer sensitivity, such as the town of Seeley, located 2 miles (3.2 kilometers) to the southwest, and the City of El Centro, located 6 miles (9.65 kilometers) to the southeast. Views of the project site are from buildings and grounds within NAF El Centro. Viewers living and/or working at the installation are considered to have a moderate concern for changes to the landscape on the installation and, thus, have moderate viewer sensitivity. Direct views from nearby military residences northeast of the site on the installation are screened by 6-foot (1.8-meter) -high concrete walls and intervening structures (Photo 4).

NSA Monterey's Main Site and Navy Annex

Main Site

NSA Monterey's Main Site is located within a heavily urbanized area of the city of Monterey. The Main Site is bounded by Sloat Avenue to the west, Del Monte Avenue to the north, Palo Verde Avenue to the east, and California Highway 1 to the south. Residential areas are located immediately west and east of the installation (Figure 2-2). Overall, the visual character of the Main Site is a complex of natural elements and historical and modern built elements condensed in a small area. For this reason, the architecture, landscaping, and overall aesthetics of the Main Site varies widely depending on the location. The extensive mature trees and landscaping throughout provide a strong cohesion to the varied structures and built elements. Expansive open parking lots in some areas tend to break up the otherwise cohesive open spaces and create a somewhat cluttered appearance and character. Viewer sensitivity is considered high for residential viewers with views of the installation living in the adjacent community. Viewer sensitivity is considered low to moderate for passersby (i.e., motorists and pedestrians) traveling along adjacent roads, such as Sloat Avenue and Del Monte Avenue, and for people living and/or working on the installation.

The project area for the Main Site consists of six geographically distinct sites in the northwest, southwest, and southeast corners of the Main Site (Figure 2-2). The four project sites located in the northwest (Sites 1 and 2), southwest (Site 3), and southeast (Site 6) corners of the installation would be partially visible to the public. Sites 4 and 5, located in the southeast corner of the installation, would not be visible from outside the installation.

Sites 1 and 2 are located in the northwest corner of the Main Site within adjacent paved parking lots. Del Monte Avenue, a major thoroughfare for the City of Monterey, defines the northern boundary of these sites. Sloat Avenue, which defines the Main Site's western boundary, flanks the western side of Site 1 (Figure 2-2). Within the fence line, the predominantly flat landscape near Sites 1 and 2 is occupied by multiple-story buildings and parking lots that are interspersed by mature coast live oaks and cypress trees. Land uses outside the fence line consist of open space and a recreation trail to the north along Del Monte Avenue, single-family residences to the west and east, and Highway 1 to the south.

Views of Sites 1 and 2 from outside the installation are mostly screened by dense, mature trees and other vegetation and fencing along the perimeter of the installation bordering both Sloat Avenue and Del Monte Avenue. Site 1 would be slightly visible from single-family residences with high viewer sensitivity and a commercial business with low viewer sensitivity located west of the site, near the intersection of Sloat Avenue and First Street. Views looking east from First Street currently include Sloat Road, the metal rails of the installation fence line, tall trees (primarily Monterey cypress and coast live oaks) that preside in the foreground, and minor views of the Naval Postgraduate School and associated paved parking lots beyond. Motorists with low to moderate viewer sensitivity traveling north along Sloat Avenue have partial views of Site 1 from near the intersection of Sloat Avenue and Del Monte Avenue (Photo 5).

Photo 5. Site 1 at NSA Monterey's Main Site is visible to motorists traveling north along Sloat Avenue. View looking east from Sloat Avenue towards Site 1.

Site 1 is visible from a residential area with high viewer sensitivity located at the intersection of First Street and Sloat Avenue (Photo 6). Motorists traveling north and south along Sloat Avenue, between Del Monte Avenue and Second Street, may view portions of Site 1, where the road parallels the western boundary of the Main Site (Photo 6). Additionally, motorists traveling east and west along Del Monte Avenue, between Sloat Avenue and Palo Verde Avenue, experience similar views of Site 1 and Site 2 where the road parallels the northern boundary of the Main Site.

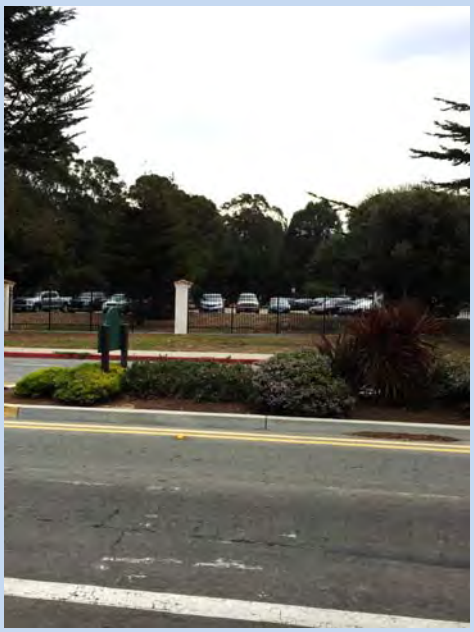


Photo 6. View from a residential area located at the intersection of First Street and Sloat Avenue, looking east at Site 1.

Site 3 is located in the southwest corner of the Main Site in a paved parking lot just east of Sloat Avenue and north of the Sloat Avenue installation entrance (Figure 2-2). Two- and three-story academic buildings located adjacent to the site are the most visually prominent features in this area (Photo 7). These buildings tower above the pavement, perimeter fence, and small trees in the parking lot, and contrast strongly with these features in color and form. Views of Site 3 from outside the installation are partially screened by dense vegetation and fencing. Site 3 would be visible from two-story residences with

high viewer sensitivity near the intersection of Sloat Avenue and Seventh Avenue (Photo 7). While Site 3 is visible in foreground views from this vantage point, the views are partially screened by the installation's metal vertical rail fence and scattered trees (coast live oaks and Monterey cypress) within the installation's western fence line.

Photo 7. Site 3 at the Main Site is partially visible when looking southeast from two-story residences located at the intersection of Seventh Street and Sloat Avenue.

Sites 4, 5, and 6 are located in the southeast corner of the installation. Sites 4 and 5 are within paved parking lots, and Site 6 is on the rooftops of two public works buildings (Figure 2-2). Surrounding land uses include a baseball field, a small picnic area, and Del Monte Lake to the north. Del Monte Lake is surrounded by dense vegetation, and the entire area surrounding Sites 4 and 5 have dense landscaping consisting of a combination of native and non-native trees, shrubs, and other vegetation.

Views of Sites 4 and 5 from outside the installation are mostly screened by dense, mature trees and other vegetation and structures. Site 6, located on Building 426, would be partially visible from residences with high viewer sensitivity along the eastern fence line, since the building is built into a slope and its location is lower than the nearby residences.

Navy Annex

NSA Monterey's Navy Annex is bounded by Euclid Avenue to the north, Airport Road to the east, the Monterey Peninsula Airport to the south, and a laboratory/recreation area to the west. California Highway 68 is west of the Navy Annex (Figure 2-3).

At the densely developed Navy Annex, the project area includes four sites encompassing several paved parking lots and the rooftops of three multiple-story buildings (Figure 2-3). Vegetation at the Navy Annex includes scattered individual and groupings of coast live oaks, planted shrubs, and manicured lawns. Most trees and shrubs border the Navy Annex's fence line along its perimeter. This Navy Annex also contains Monterey spineflower, which grows on a small sandy slope just south of Site 3 (Figure 3.2-1). Within the fence line, land development features include single- and two-story buildings, various other structures, light poles, tennis courts, access roads, and several parking lots. Outside the Navy's fence line, surrounding land development includes single- and two-story residences with high viewer sensitivity to the north along Euclid Avenue and immediately west of the Navy Annex, industrial

buildings to the east, and the Monterey Peninsula Airport runways and taxiways to the south (Figure 2-3).

Views of Sites 1 and 3 from outside the installation are screened by dense mature trees and other vegetation and structures. Located adjacent to the Monterey Peninsula Airport, these sites are not visible to residences with high viewer sensitivity. Site 4 is partially visible from Euclid Avenue and residences to the north; however, these views are mostly screened by the dense trees and shrubs bordering the northern boundary of the Navy Annex (Photo 8). The rooftops of the three buildings constituting Site 2 are elevated well above residences north and northeast of the Navy Annex and along Airport Road.

Photo 8. View looking southwest toward Site 4 at the Navy Annex from Euclid Avenue.

NAVWPNSTA Seal Beach

NAVWPNSTA Seal Beach is located within the City of Seal Beach in north Orange County (Figure 1-4). I-405 runs along the installation's northern border. California Highway 1 and the Pacific Ocean border the installation to the southwest, the City of Westminster borders the installation to the northeast, and the City of Huntington Beach borders the installation to the south/southeast (Figure 1-4).

Alternative 1 Site

The Alternative 1 project site is located on flat, undeveloped land east of and bordering Kitts Highway, west of Third Street, and south of Westminster Boulevard (Figure 2-4). Surrounding on-installation land uses include undeveloped land and tall concrete storage warehouses to the north, wetlands, an RV park, several buildings, abandoned railroad tracks, and wood utility poles along Kitts Highway to the west (Photo 9), paved parking lots, administrative buildings, and wood utility poles to the east. The Seal Beach National Wildlife Refuge occupies 911 acres (369 hectares) of mostly salt marsh habitat in the southwest

Photo 9. View of the Alternative 1 site at NAVWPNSTA Seal Beach, looking west from the parking lot bordering the east side of the site. The railroad tracks, a portion of the RV park, and several base buildings and other facilities are visible beyond the site.

portion of the installation and borders the Alternative 1 project site to the south. Most of the Alternative 1 project site is covered by low-growing non-native grasses and sparse patches of weeds.

The Alternative 1 project site is not visible to viewers from outside the installation to the north, east, and west because of intervening structures, vegetation, and terrain that screen these views. From a distance of 3,200 feet (975 meters), travelers with high viewer sensitivity traveling along the Pacific Coast Highway may have brief, intermittent views of the Alternative 1 project site; however, the site would not be noticeable to casual observers given the distance, nearly perpendicular view angle from the highway, and intervening vegetation and structures.

Alternative 2 Site

The Alternative 2 project site is located in the northeastern portion of the installation, immediately west of Bolsa Chica Road, and north of Westminster Boulevard (Figure 2-8). Adjacent land uses include flat, mostly vacant land to the north, west, and south that is used for military (i.e., ordnance storage) and some utility purposes. Residential and commercial uses are east of Bolsa Chica Road outside the installation fence line. A canal and a fabric-covered fence separate Bolsa Chica Road from the installation and the Alternative 2 project site. Westminster Boulevard is a public road running east-west through the installation and borders the Alternative 2 project site along its southern edge; a chain link fence is present on both sides of this road. Vegetation in the area primarily consists of non-native grasslands, and the site is covered by bare dirt and sparse patches of weeds. Tall shrubs and low trees line the southern edge of the site, just inside the fence, along the northern edge of Westminster Boulevard. Some tall shrubs also line the site along its eastern edge.

Motorists and pedestrians with low to moderate viewer sensitivity traveling along Westminster Boulevard have intermittent views of the Alternative 2 project site through small openings between the tall vegetation lining the north side of the road. Views of the site by motorists and pedestrians traveling along Bolsa Chica Road are almost completely screened by the fabric-covered fence and vegetation. Residences with high viewer sensitivity along the east side of Bolsa Chica Road are a mixture of single- and two-story structures (Photo 10), and very few have windows facing west toward the project site. The Alternative 2 project site is partially visible from the commercial area at the intersection of Westminster Boulevard and Bolsa Chica Road (Photo 11); however, views of the site are almost completely screened by the fabric-covered fence and tall vegetation lining the south and east sides of the site.

Photo 10. View from the Alternative 2 site at NAVWPNSTA Seal Beach, looking east toward residences along the east side of Bolsa Chica Road.

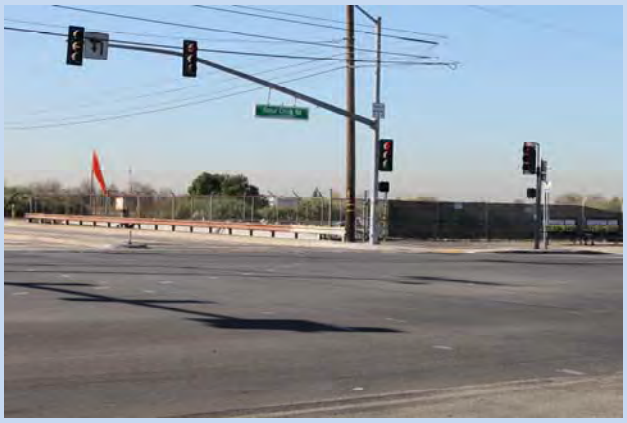


Photo 11. View of the Alternative 2 site at NAVWPNSTA Seal Beach, looking northwest from the commercial area at the intersection of Westminster Avenue and Bolsa Chica Road.

NAVWPNSTA Seal Beach Detachment Norco

NAVWPNSTA Seal Beach Detachment Norco is located in northwest Riverside County within the City of Norco. The installation is situated within a large intermediate valley bordered by the Santa Ana Mountain Range to the west, the San Gabriel and San Bernardino mountain ranges to the north, and the San Jacinto Mountains to the east (Navy 2012a). The terrain on the installation is somewhat rolling and variable, with elevations ranging from 604 feet (184 meters) to 720 feet (220 meters) (Navy 2012a). The installation is situated a little less than 1 mile (1.6 kilometers) southeast of the Santa Ana River. The California Rehabilitation Center, operated by the State Department of Corrections, adjoins the installation to the northwest. The Lake Norconian Club Historic District's hotel, located on state property and closed to the public, sits atop a high hill to the north of the installation. Lake Norconian, an historic man-made lake built as part of the resort, is located south of the historic hotel on the Navy's property (Figure 1-5).

Area 1

Area 1 is located on 8.5 acres (3.4 hectares) of predominantly flat disturbed land within a fenced area that is north of the east Main Gate on Fourth Street and south of Town and Country Drive (Figure 2-5). The project site's overall appearance is disturbed, consisting mostly of low-growing non-native annual grasses, weeds, and barren areas. Mature eucalyptus trees line the fence along the entry road (Fourth Street) just south of the site and extend north and into the site from the entry road just inside the installation's east boundary and fence line. Several mature trees are located along and just west of the far western edge of the site. Large metal storage containers occupy the southern portion of the site (Figure 2-5). Land development features adjacent to the project site include communications facilities (i.e., large satellite dishes),

buildings, and parking areas on the installation to the west and south, a two-story building, concrete wall, and an area with restricted public access to the north, and open disturbed land with non-native annual grasses and barren areas just beyond the installation boundary to the east (Figure 2-5). Norco City Hall is located approximately 300 feet (91 meters) southeast of the site, just east of and outside the east Main Gate on Fourth Street (Figure 2-5).

Views of the project site from outside the installation are limited. Views of the project site from the two-story building to the north are limited by the building's setback from the site and the steep embankment between the two locations. Additionally, the building has few windows oriented toward the site, and public access to this building is restricted. Viewer sensitivity for views from this building and its surroundings is considered low because these views are restricted to people engaged in work activities who generally have a low concern for changes to the landscape. As described in Section 3.3.1.3, the project site is not visible from Lake Norconian or the historic resort hotel's contributing features because intervening terrain blocks these views (Figure 1-5). Photo 12, which shows a view from near the western edge of Area 1 looking toward the Norconian Resort's hotel, indicates the project site is not visible from Lake Norconian or the historic hotel's contributing features. Although located near the project site, Norco City Hall is lower in elevation, and views toward the site from Norco City Hall are blocked by intervening terrain and tall vegetation. The project site is partially visible from Fourth Street, just east of the east Main Gate, for motorists and pedestrians with moderate to low viewer sensitivity approaching the entry gate or travelling to or from Norco City Hall; however, tall trees and shrubs obscure views of most of the site, and the installation security fence partially screens these views (Photo 13). The project site is partially visible to viewers with moderate to low viewer sensitivity from the business and retail commercial area and Hamner Avenue east of the site; however, the site is higher in elevation than these areas and is only partially visible (Photo 14). Views from the commercial area and road are partially screened by some intervening vegetation and fencing. Also, views of the project site from these areas are dominated by several large, white communication discs, tall wood power poles, and metal light poles (Photo 14).

Photo 12. View from the western edge of Area 1, looking toward the Norconian Resort's hotel and boat house.

Photo 13. View looking northwest toward the Area 1 project site from the pedestrian path on Fourth Street near the top of the stairs leading down to Norco City Hall.

Photo 14. View toward the Area 1 project site at NAVWPNSTA Seal Beach Detachment Norco, looking west-southwest from just south of the commercial area on Hamner Avenue.

Area 2

At Area 2, the project would be located on vacant land within a gently sloping area in the southeastern portion of the installation (Figure 2-6). The project site is traversed by a narrow swale containing some trees and other dense vegetation. The site abuts land outside the installation boundary to the east, south, and west. Installation buildings and a parking lot are located adjacent to the project site to the north. Surrounding off-installation land uses include the Norco College campus buildings and associated parking lots to the south and JFK Middle College to the southeast (Figure 2-6), undeveloped open fields and a low hill to the east, and a

fairly steep hill and ridge to the west that extends north from the campus and consists of open space with trails, an overlook, several trees and shrubs, two former military bunkers built into the hillside, and a small communications structure at the high point of the ridge. Vegetation on the site and on adjacent open land to the east and west is predominately low-growing native and non-native annual grasses and weeds (Navy 2012a).

From outside the installation fence line, the Area 2 project site is visible to viewers with high viewer sensitivity from the hill and ridge open space areas to the west (Photo 15). This hill protrudes north from the Norco College campus, abutting the southern portion of the installation. Trails running from the campus to and around the top of the hill provide access to panoramic views of the surrounding area, including much of the installation (Photo 15). The site is not visible to viewers with moderate to low viewer sensitivity from the buildings or other parts of the JFK Middle College campus. Views of the Area 2 project site from the Norco College campus are limited to a small area at the north edge of the campus behind the maintenance area. Views from this area are not considered sensitive because they are primarily viewed by maintenance workers and staff at the college. As described in Section 3.3.1.3, a small portion of the northernmost portion of the Area 2 project site may be visible from the Norconian Resort's boat house, located approximately 2,000 feet (610 meters) to the north, and from the upper windows of the historic hotel, located approximately 3,300 feet (1,006 meters) to the north. Intervening tall trees screen views of the Area 2 project site from the lower portions of the hotel terraces and grounds surrounding the hotel. Views of the northernmost portion of the project site from the Norconian Resort's hotel and boat house are also partially screened by an intervening chain link fence and parking lot with tall metal light poles just north of the Area 2 site. Photo 16 and Photo 17 show views toward the hotel and boat house from the northernmost portion of the project site with the intervening trees, chain link fence, and parking lot. The majority of the project site is not visible from the Norconian Resort's hotel and boat house or areas in the vicinity of these locations within the Lake Norconian Club Historic District, due to intervening terrain and buildings.

Photo 18 shows the dense vegetation that runs along the swale that traverses the Area 2 project site, a communication structure (gated and not accessible to the public) on the ridge top, and a former military bunker set into the hillside. Views of the Area 2 project site from the western open space area would be experienced by sensitive viewers using the open space area for recreation or leisure activities and as an overlook of the surrounding region. The ridge and trails in this area provide panoramic views of distant mountains, Lake Norconian, the Norconian Resort's hotel, the Santa Ana River, and the buildings and grounds on the installation. Views of the site from the east open space area are limited to the upper part of the hill.

Photo 15. View of the Area 2 project site at NAVWPNSTA Seal Beach Detachment Norco, looking east from the top of the ridge in the open space area west of the site.

Photo 16. View from the northernmost portion of Area 2 toward the Norconian Resort's hotel.

Photo 17. View from the northernmost portion of Area 2 toward the Norconian Resort's boat house.

Photo 18. View from the Area 2 project site at NAVWPNSTA Seal Beach Detachment Norco, looking west toward the ridge in the west open space area. The low hill in the open space area east of the site and the upper portion of the John F. Kennedy Middle College building are captured at the far right in this photo.

NBVC Port Hueneme

NBVC Port Hueneme is located in a heavily urbanized area near the coast of Ventura County, west of California Highway 1, and south of U.S. Highway 101 (Figure 1-6). The project site is located in the southwestern area of the installation within an existing paved parking lot east of Island View Avenue, west of Talos Road, and south of Highland Drive (Figure 2-7).

Vertical elements in and adjacent to the site include tall white light poles and several wood power poles along Talos Road. Beyond the installation boundary, the surrounding community is characterized by flat land that has been built out by predominantly residential and commercial development (Figure 2-7). The area immediately surrounding the site is predominately one- and two-story military buildings, parking lots, and other military facilities on the installation, and residences adjacent to the installation boundary on the south, west, and north (Navy 2012b). Residences to the south and west of the site are a mix of one-, two-, and three-story structures, and residences to the north are primarily two stories with roof decks on some. Most of NBVC Port Hueneme has been developed or paved, with portions of the installation landscaped with non-native eucalyptus and other ornamental trees, various shrubs, lawns, and low-growing iceplant. A tall (12-foot [3.6-meter] -high) chain link fence runs along the installation boundary at Island View Avenue. A chain link fence of similar height installed on a low concrete block wall runs along the north boundary separating the rear areas of the residences on Highland Drive from the installation.

Views of the project site from outside the installation are primarily experienced by local residents with high viewer sensitivity; however, most residences are oriented to face the side streets that intersect with Island View Avenue, though some residences have upper- or lower-story windows facing the site (Photo 19). The project site is also visible from off-installation at the corner of Moorpark Avenue and Island View Avenue (Photo 20), and along portions of Island View Avenue (Photo 21). Although views of the project site from the street are through the chain link fence, views from upper-story windows of residences look over the top of the fence toward the site. Several residences along the south side of Highland Drive have views from their rear windows or roof decks toward the project site; however, many of these views are partially or mostly screened by dense evergreen trees and shrubs (Photo 22).

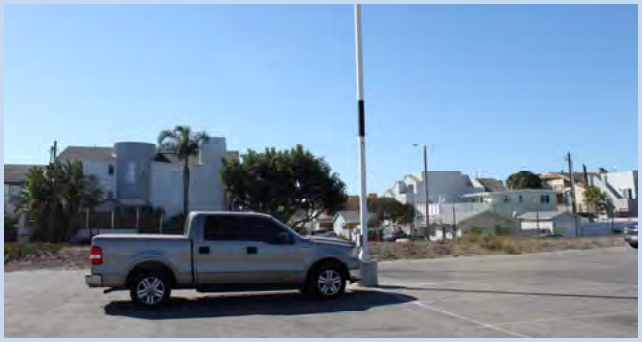


Photo 19. View looking west from the NBVC Port Hueneme project site towards residences in the neighborhood southwest of Island View Avenue.

Photo 20. View looking northeast towards the NBVC Port Hueneme project site from the corner of Moorpark Avenue and Island View Avenue.

Photo 21. View looking east towards the NBVC Port Hueneme project site from the corner of Glendale Avenue and Island View Avenue.

Photo 22. View from the north edge of the project site at NBVC Port Hueneme, looking north toward the rear of residences on Highland Drive that abut the installation boundary. This view shows roof decks and windows that have partially screened views of a portion of the site through dense vegetation along the installation's northern fence line.

3.7.2 ENVIRONMENTAL CONSEQUENCES

The existing visual character and quality and viewer sensitivity in the project areas provide the baseline for determining impacts to visual resources from implementation of the alternatives. Visual impacts are assessed based on the level of contrast of these actions with existing conditions (i.e., landscape character and quality) and their visibility and proximity to sensitive viewers. For the purposes of impact analysis, visual contrast is assessed based on a project's contrast in form, line, color, and texture with landscape features of topography, water, vegetation, and structures.

The degree of contrast that would be introduced by the project is assessed using the following ratings:

- Strong: the element contrast demands attention, will not be overlooked, and is dominant in the landscape;
- Moderate: The element contrast begins to attract attention and begins to dominate the characteristic landscape;
- Weak: the element contrast can be seen but does not attract attention; and,
- None: the element contrast is not visible or perceived (BLM 1986).

Impacts resulting from introducing new sources of substantial light or glare into the landscape are also assessed. Glare is reflective light that can be visually unpleasant or possibly unsafe due to the potential for temporary "blindness." Glare may be caused by light from artificial sources or the sun reflecting off of light colored or smooth surfaces such as metal, glass, water, or polished stone. Glare intensity varies depending on the source and intensity of the light, time of day, time of year, angle of reflectance, weather, atmospheric conditions, color and texture of material surface finish, length of exposure, nature and sensitivity of receptors, and other factors. According to the BLM's "Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands," the potential for solar photovoltaic panel glare varies "…depending on panel orientation, sun angle, viewing angle, viewer distance, and other visibility factors (BLM 2013)." Because of the high number of variables, glare is not measured quantitatively, but rather is assessed qualitatively in this visual assessment.

3.7.2.1 Alternative 1 (Preferred Alternative)

Reflectivity of Solar Photovoltaic Panels and Other Project Structures

Under Alternative 1, the solar panel surfaces would be dark bluish in color and have very low reflectivity due to the use of an anti-reflective coating, dimpling of the panel glass surface, and the overall light absorption character of the low-iron glass that is proposed for use in the solar photovoltaic systems. As described in Section 3.4, Land Use, modern solar photovoltaic panels are designed to reflect as little as two percent of the incoming sunlight, depending on the angle of the sun (Federal Aviation Administration 2010), and a recent study completed by Caltrans, Division of Aeronautics, concluded that a solar photovoltaic panel's minimal potential for glare is similar to the glare potential produced by water and less than the glare produced by weathered white concrete and snow. This glare potential is so low that, under a worst case scenario, pilots are typically able to mitigate effects by using glare shields and sunglasses, which reduce the radiation by approximately 80 percent and would make any reflected sunlight from solar panels insignificant (U.S. Air Force 2011).

In addition to the potential for glare from the panel surfaces, other metal components that are part of solar photovoltaic facilities, such as the support poles, panel housing, and inverter boxes that house the electrical equipment, may reflect sunlight in the form of glare. Depending on their color, they may contrast with the array or result in a striking pattern of color contrasts (BLM 2013); however, as described in Section 2.4.5, the project design would include standard best management practices, including the use and maintenance of color-treated solar collectors and support structures, to minimize glare from metal project components to the maximum extent feasible.

The potential for glare impacts to off-installation sensitive receptors resulting from implementation of Alternative 1 at the five installations is described in further detail below.

Visual Attributes Common to all Ground-Mounted Solar Photovoltaic Systems

Under Alternative 1, the ground-mounted systems (NAF El Centro, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco), would include single-axis ground-mounted panels that would be 6 to 8 feet (1.8 to 2.4 meters) tall, including the panels. The visible form of the ground-mounted solar panel array structures would consist of rows of tilted rectilinear solar photovoltaic panels mounted on vertical, thin, metal support poles. Lines would be mostly horizontal, with repeated angular elements due to the tilt of the panels. Under Alternative 1, all associated electrical lines and point of connection equipment would be installed underground or aboveground among existing compatible equipment to blend in with the surrounding environment.

Visual Attributes Common to all Carport-Mounted Systems

Under Alternative 1, the carport-mounted systems (NSA Monterey's Main Site and Navy Annex and NBVC Port Hueneme) would be installed within existing, paved parking lots, and the structures would typically be a maximum of 14 feet (4.3 meters) in height (lower than that of nearby buildings), including the solar panel shade structures. All associated electrical lines and point of connection equipment would be installed underground, obscured from view, or aboveground among existing compatible equipment. Similar to the ground-mounted systems, the overall form of the carport structures would be mostly rectilinear and their lines would be mostly horizontal with some repeated angular elements due to the tilt of the panels. Carport-mounted systems would include lighting underneath the roofs of the carports, and the lighting would operate on light sensors to provide lighting from dusk until dawn.

Visual Attributes Common to all Rooftop-Mounted Systems

Under Alternative 1, the solar panels on rooftop-mounted systems (NSA Monterey's Main Site and Navy Annex) would be pitched, with a maximum height of 2.5 feet (0.8 meter) relative to the roof's surface, and would be set back from the rooftop edges. No buildings of greater height with windows facing the proposed rooftop-mounted system sites and containing sensitive viewers would be located nearby. During construction, a low number of sensitive viewers, including adjacent residences, motorists and other passersby, may have brief glimpses of trucks and equipment; however, the construction period would only last six months at NSA Monterey and no related permanent or significant impacts would occur. During operation, rooftop-mounted systems, with the exception of Site 6 at NSA Monterey's Main Site (refer to discussion below), would be obscured from view by nearby sensitive viewers and no long-term alteration of visual resources in the area would occur.

Visual impacts resulting from implementation of Alternative 1 at the five installations are described in further detail below.

NAF El Centro

Under Alternative 1, a ground-mounted solar photovoltaic system would be constructed and operated on an approximately 10-acre (4-hectare) site at NAF El Centro (Figure 2-1). The solar photovoltaic panel arrays and ancillary facilities would be located on vacant, disturbed land that has been historically used for agricultural production.

The project would not be easily visible to sensitive viewers outside or on the installation during project construction or operation. Viewers at residences northeast of the project site live on the installation and would be considered to have a moderate concern for changes to the landscape on the installation. However, a 6-foot (1.8-meter) -high concrete wall separates the residences from the project and would effectively block direct views of the project from the single-story residences. During operation, the ground-mounted system's height, form, lines, and color would result in weak contrast (i.e., the element contrast can be seen but does not attract attention) with the existing landscape.

During operation, the solar panel surfaces would be oriented to the south or southwest, away from nearby residences, and would not be expected to produce substantial glare that would be a nuisance to the nearest residents. For reasons described above, there would be no significant impacts to pilots flying to and from the airfield at NAF El Centro.

Overall, no significant impacts to visual resources would result from implementation of Alternative 1 at NAF El Centro. Although no significant impacts to visual resources would occur, implementation of the applicable conservation and construction measures described in Section 2.4.5 (e.g., reducing contrast in color between the metal project components and nearby structures and reducing potential glare) would further minimize impacts of color contrast and glare at this location.

NSA Monterey's Main Site and Navy Annex

<u>Main Site</u>

Under Alternative 1, both carport- and rooftop-mounted solar photovoltaic systems would be constructed and operated within NSA Monterey's Main Site (Figure 2-2).

During the temporary construction period, off-installation viewers with high viewer sensitivity (residents) and low to moderate viewer sensitivity (motorists, and pedestrians) along Sloat Avenue could have partial views of trucks and other equipment at Sites 1, 2, 3, and viewers (residences) near the eastern boundary of the Main Site could have similar views during

construction at Site 6; however, no related permanent or significant impacts to visual resources would occur.

During project operation, the rooftop-mounted solar photovoltaic system at Site 6 on the Main Site would be partially visible from residences with high viewer sensitivity along the eastern fence line; however, the system would be similar in line, form, and texture relative to the surrounding built environment and no related impacts to visual resources would occur.

During project operation, the carport-mounted solar photovoltaic systems at Sites 1, 2, 3, 4, and 5 would be lower in height but similar in line, form, and texture relative to surrounding buildings and utility poles at the Main Site. In addition, mature vegetation and fences would screen the carport-mounted systems at Sites 1, 2, and 3 from residential viewers with high viewer sensitivity living in the adjacent community, west of Sloat Avenue, and passersby (i.e., motorists and pedestrians) with low to moderate sensitivity traveling along Sloat Avenue and Del Monte Avenue. During operation, the carport-mounted systems' height, form, lines, and color would result in weak contrast (i.e., the element contrast can be seen but does not attract attention) with the existing landscape at the Main Site.

During project operation, the carport and rooftop-mounted panels at the Main Site would be oriented to the south or southwest. Considering the heights of the panel surfaces on top of the proposed carports (Sites 1, 2, and 3) and rooftops (Sites 4, 5, and 6), viewer distances, and viewing angles from the nearest residences and roadways (looking upwards at the non-reflective underside of the panels), no significant panel glare impacts to residents or motorists would occur. Further, for reasons described above, there would be no significant impacts to pilots navigating to and from the Monterey Peninsula Airport.

Overall, there would be no significant impacts to visual resources as a result of implementing Alternative 1 at NSA Monterey's Main Site. Although no significant impacts to visual resources would occur, implementation of the applicable conservation and construction measures described in Section 2.4.5 (e.g., reducing contrast in color between the metal project components and nearby structures and reducing potential glare, and shielding and directing lights downward) would further minimize impacts of color contrast, glare, and lighting at this location.

Navy Annex

Under Alternative 1, both rooftop- and carport-mounted solar photovoltaic systems would be constructed and operated within NSA Monterey's Navy Annex (Figure 2-3). These systems would be similar in size, placement, and construction as those described above, with the exception of the large 20-foot (6.1-meter) -tall carport site (Site 1) that would be constructed at the southeastern corner.

During the temporary construction period, off-installation viewers (residents, motorists, and pedestrians) along Euclid Avenue could have partial views of trucks and other equipment at Site 4; however, no related permanent or significant impacts would occur.

During project operation, the rooftop-mounted panels would not be visible to sensitive viewers due to their elevation. The carport-mounted panels at Site 4 would be mostly screened from views by residential viewers with high viewer sensitivity along Euclid Avenue by the mature vegetation along the northern fence of the Navy Annex. Due to this screening, viewers with low to moderate sensitivity (e.g., motorists and pedestrians) traveling along Euclid Avenue would only experience intermittent views of the proposed carports. Similarly, the carport-mounted systems at Sites 1 and 3 would be largely screened from off-installation views by intervening terrain, mature vegetation, and structures that exist along the Navy Annex's southern and eastern boundaries. The height, form, lines, and color of the carport-mounted system would result in weak contrast (i.e., the element contrast can be seen but does not attract attention) with the existing landscape.

During project operation, the carport- and rooftop-mounted panels at the Main Site would be oriented to the south or southwest. Considering the heights of the panel surfaces on top of the proposed carports (Sites 1, 3, and 4) and rooftops (Site 2), viewer distances, and viewing angles from the nearest residences and roadways (looking upwards at the non-reflective underside of the panels), no significant panel glare impacts to residents or motorists would occur. Further, for reasons described above, there would be no significant impacts to pilots navigating to and from the Monterey Peninsula Airport.

Overall, there would be no significant impacts to visual resources as a result of implementing Alternative 1 at NSA Monterey's Navy Annex. Although no significant impacts to visual resources would occur, implementation of the applicable conservation and construction measures described in Section 2.4.5 (e.g., reducing contrast in color between the metal project components and nearby structures and reducing potential glare, and shielding and directing lights downward) would further minimize impacts of color contrast, glare, and lighting at this location.

NAVWPNSTA Seal Beach

Under Alternative 1, a ground-mounted solar photovoltaic system would be constructed and operated on a vacant, 6.62-acre (2.67-hectare) site at NAVWPNSTA Seal Beach (Figure 2-4).

During the temporary construction period, intervening structures, vegetation, and terrain would screen the Alternative 1 site from off-installation viewers to the north, east and west. Off-installation viewers (motorists) with high viewer sensitivity traveling along elevated sections of

Pacific Coast Highway, south of the site, could have partial views of trucks and other construction equipment at the site; however, these elements are unlikely to be noticeable to the casual observer traveling on the highway, and no related permanent or significant impacts would occur.

During operations, the project may be partially visible to travelers on the elevated sections of Pacific Coast Highway; however, the ground-mounted panels' height, form, lines, and color would result in weak contrast (i.e., the element contrast can be seen but does not attract attention) with the existing landscape on the base. In addition, an 8-foot (2.4-meter) -high chain link fence covered with fabric would enclose the ground-mounted system at this location. Project-related structures, including the ground-mounted solar panel arrays and the proposed equipment shed at the point of connection, would be visible to on-installation military personnel during construction and operation; however, these observers would have a low to moderate concern for changes to the landscape on the installation and would not be considered sensitive viewers.

During operation, the panel surfaces would be oriented to the south or southwest. High sensitivity viewers (motorists) driving on Pacific Coast Highway may notice minor panel glare during daylight hours; however the 8-foot (2.4-meter) -high, fabric-covered fence would substantially screen any glare and the exposure to any potential glare for these distant and mobile viewers would be brief. Therefore, the project would not be expected to produce substantial glare that would be a nuisance to off-installation viewers; there would be no significant glare-related impacts.

Overall, there would be no significant impacts to visual resources as a result of implementing Alternative 1 at the NAVWPNSTA Seal Beach. Although no significant impacts to visual resources would occur, implementation of the applicable conservation and construction measures described in Section 2.4.5 (e.g., reducing contrast in color between the metal project components and nearby structures and reducing potential glare) would further minimize impacts of color contrast and glare at this location.

NAVWPNSTA Seal Beach Detachment Norco

Under Alternative 1, ground-mounted solar photovoltaic systems would be constructed on up to two sites (Area 1 and/or Area 2) at NAVWPNSTA Seal Beach Detachment Norco (Figures 2-5 and 2-6). As part of the project, 8-foot (2.4-meter) -high chain link fences covered with fabric would be installed at Areas 1 and 2 to further mitigate viewshed concerns at these locations.

Area 1

At Area 1, ground-mounted solar photovoltaic panels would be constructed and operated on a mostly vacant and disturbed site at NAVWPNSTA Seal Beach Detachment Norco (Figure 2-5). Built elements adjacent to the west side of the site include several large, white, oval-appearing communication discs, tall vertical wood power poles, and vertical metal light poles; therefore, panel height would be substantially lower than the nearby structures.

During the temporary construction period, off-installation viewers along Fourth Street just east of the Main Gate, in a two-story office building to the north, and in a business and commercial area on Hamner Avenue would have intermittent views of vehicles and equipment used for construction of the ground-mounted system at Area 1.

During project operation, the ground-mounted panels would be partially visible from the same off-installation locations described above. These views would be partially to mostly screened by intervening terrain, the fabric-covered installation security fence, and tall vegetation, including mature eucalyptus trees. Additionally, a new fabric-covered chain link fence would be installed within the installation's perimeter fence at Area 1 to further minimize the potential for viewshed impacts to the surrounding community. Viewer sensitivity for these partial views would be considered low because viewers would be primarily engaged in professional or personal business activities and as such, would likely have low concern for changes to the landscape on the installation. Similarly, on-installation viewers (military personnel) would have low sensitivity of the solar panel views. During operation, the height, form, and color of the ground-mounted solar photovoltaic panels would result in weak contrast (i.e., the element contrast can be seen but does not attract attention) with the existing landscape and would be partially to largely screened from view.

During operation, the panel surfaces would be oriented to the south or southwest, towards Fourth Street and the interior of the installation. Due to the intervening fabric-covered installation security fence and mature trees along the perimeter and the project site's fabric-covered fence, the project would not be expected to produce substantial glare that would be a nuisance to the nearest off-installation receptors along Fourth Street. Additionally, the panel surfaces would be oriented away from receptors with views from two-story windows north of the site, near Town and Country Drive; therefore, due to their viewing angle, which would face the backside of the panels, no significant glare-related impacts to these receptors would occur.

Overall, there would be no significant impacts to visual resources as a result of implementing Alternative 1 (Area 1) at NAVWPNSTA Seal Beach Detachment Norco. Although no significant impacts to visual resources would occur, implementation of the applicable conservation and construction measure described in Section 2.4.5 (e.g., reducing contrast in

color between the metal project components and nearby structures and reducing potential glare) would further minimize impacts of color contrast and glare at this location.

Area 2

At Area 2, ground-mounted solar photovoltaic panels would be constructed and operated on a mostly vacant and disturbed site at NAVWPNSTA Seal Beach Detachment Norco (Figure 2-6). This area would be enclosed by a new fabric-covered chain link fence within the installation's existing perimeter fence. Dense vegetation along a swale running through the site would be retained, and the panel arrays would be placed in other adjacent areas on the site. As stated in Section 2.4.3.2, project construction at Area 2 would be avoided during the avian nesting/breeding season. Built elements in the immediate vicinity of the site include long, linear, one-story installation buildings, narrow paved and unpaved roads through and around the perimeter of the site, and chain link fences along the installation boundary on three sides of the site. The new ground-mounted panels would be lower in height than the nearby installation buildings.

During the temporary construction period, a low number of off-installation viewers (e.g., visitors to the west open space area and workers engaged in maintenance activities behind Norco College campus) would be able to see the trucks and equipment; however, no related permanent or significant impacts would occur.

During project operation, the solar panel arrays would be visible to off-installation viewers from three areas: the hill and ridge in the open space area to the west (high visibility), the open space area to the east (partial visibility), and the maintenance area on the Norco College campus (partial visibility). In addition, the northernmost portion of the site may be visible from some features within the Lake Norconian Club Historic District, including the Norconian Resort's boat house, approximately 2,000 feet (610 meters) to the north, and the upper windows of the historic hotel, approximately 3,300 feet (1,006 meters) to the north. However, as described in Section 3.7.1.2, these views of the site are partially screened by intervening tall trees, a chain link fence, and a parking lot, and the addition of a new fabric-covered chain link fence within the installation's existing perimeter fence would further screen any potential views of the solar panel arrays from the Lake Norconian Club Historic District. Viewer sensitivity for the views from the west open space area would be considered high because viewers are primarily engaged in recreational and leisure activities and the area provides opportunities for panoramic views of the surrounding landscape, including the installation and the proposed solar panel array site. Viewer sensitivity for the views from the east open space area would be considered low because the area is restricted to public access. Viewer sensitivity for views from the Norco College campus maintenance area would be considered low, as these viewers are primarily engaged in work activities and would likely have low concern for changes to the landscape on the installation. During project operation, the solar panel arrays would also be

visible to on-installation viewers (e.g., military personnel), but the sensitivity of on-installation viewers would be low to moderate, as workers would likely have low to moderate concern for changes to the landscape on the installation.

When viewed from close to the ground, the overall contrast of the panels would be weak in form and line relative to other elements in the landscape. When viewed from the superior position of the ridge and hill in the west open space area, the rows of panels in the arrays would appear darker in color and coarser in texture than the surrounding light-colored and smoother-textured grasslands and the large forms of the arrays and angular lines would create moderate contrast with the existing forms and lines in the landscape. Overall, the new panels in Area 2 would introduce moderate contrast in the landscape for views from the west open space area.

Because the solar photovoltaic panel arrays would be highly visible by a low number of sensitive viewers from the west open space area and the contrast created by the panels would be moderate, the visual impacts to off-installation viewers as a result of implementing Alternative 1 (Area 2) at NAVWPNSTA Seal Beach Detachment Norco would be moderate.

During operation, the faces of panel arrays would be oriented to the south or southwest, towards the maintenance area behind Norco College campus. Low sensitivity viewers (maintenance workers) using the area behind the college may notice minor panel glare during daylight hours, but these viewers would be engaged in work activities with brief periods of exposure, and would likely have low concern for changes to the landscape on the installation. In addition, a low number of high sensitivity viewers (hikers) using the west open space area would have views of the panels and may notice minor glare from the panel surfaces if they visit the hill area during daylight hours; however, the project would not be expected to produce substantial glare that would be a nuisance to these off-installation receptors, since they would only have brief periods of exposure and other reflective structures (e.g., concrete, chain-link fencing, office buildings) are already present within this viewshed on the installation. Consequently, no significant glare-related impacts to off-installation receptors would occur.

Overall, there would be no significant impacts to visual resources as a result of implementing Alternative 1 (Area 2) at NAVWPNSTA Seal Beach Detachment Norco. Although no significant impacts to visual resources would occur, implementation of the applicable conservation and construction measure described in Section 2.4.5 (i.e., reducing contrast in color between the metal project components and nearby structures and reducing potential glare, and placing a row of plantings, such as shrubs and/or small trees, along the northern edge of the project site and southern edge of the parking lot) would further minimize impacts of color contrast and glare at this location. Additionally, the use of a fabric-covered chain link fence at Area 2 would further minimize the potential for viewshed impacts to the surrounding community and the Lake Norconian Club Historic District site to the north (refer to Section 3.3, Cultural

Resources, for additional discussion of the historic viewshed at NAVWPNSTA Seal Beach Detachment Norco).

NBVC Port Hueneme

Under Alternative 1, a carport-mounted solar photovoltaic system would be constructed on an existing paved parking lot in the southwestern area of NBVC Port Hueneme (Figure 2-7). The carport-mounted systems at NBVC Port Hueneme would be lower in height (14 feet [4.3 meters]) than the existing 24-foot (7.3-meter) poles in the parking lot. These taller light poles are mostly white and contrast somewhat in form, line, and color with other nearby elements in the landscape. All associated electrical lines would be routed underground, and the point of connection equipment would be obscured from view within an existing utility shed directly north of Building 1388.

During the temporary construction period, off-installation viewers along Highland Drive (residents) and Island View Avenue (residents, motorists, and pedestrians) may experience partial views of construction vehicles and equipment; however, no related permanent or significant impacts would occur.

During project operation, portions of the carport-mounted solar arrays would be visible by residential viewers with high viewer sensitivity from some two-story residences located along the installation's northern boundary at Highland Drive; however, mature trees and other evergreen vegetation would fully or partially screen views of all but a small portion of the site from these residences. Portions of the carport-mounted solar arrays would also be visible by residential viewers with high viewer sensitivity from the upper stories of two-story residences located along the installation's western boundary at Island View Avenue. However, the panels would be set back approximately 180 feet (55 meters) from the installation boundary, thus blending somewhat with surrounding elements in the landscape. Street level views of the carport-mounted panels would be partially to mostly screened by the intervening terrain and tall fence near the installation's southwest boundary.

During operation, the carport-mounted panels' height, form, and lines would result in weak contrast (i.e., the element contrast can be seen but does not attract attention) with the existing landscape. Since the solar photovoltaic panel surfaces are designed to absorb, rather than reflect, light, and the carport-mounted panels would face west or southwest with the panel fronts aimed towards the sky, only minimal glare would be noticeable from the two-story windows of residences along Island View Avenue during daylight hours, and no significant glare impacts would occur.

Overall, there would be no significant impacts to visual resources as a result of implementing Alternative 1 at the NBVC Port Hueneme. Although no significant impacts to

visual resources would occur, implementation of the applicable conservation and construction measures described in Section 2.4.5 (e.g., reducing contrast in color between the metal project components and nearby structures and reducing potential glare, and shielding and directing lights downward) would further minimize impacts of color contrast, glare, and lighting at this location.

3.7.2.2 Alternative 2

NAF El Centro

At NAF El Centro, Alternative 2 would include development of a ground-mounted solar photovoltaic system at the same site as described for Alternative 1; however, the electrical generation facility would be developed on 8 acres (3.2 hectares) instead of 10 acres (4 hectares). Visual impacts under Alternative 2 at NAF El Centro would be similar to those described under Alternative 1. In addition, the conservation and construction measures described in Section 2.4.5 and under Alternative 1 would be implemented for this alternative. Therefore, there would be no significant visual impacts as a result of implementing Alternative 2 at NAF El Centro.

NSA Monterey's Main Site and Navy Annex

Main Site

At NSA Monterey, Alternative 2 would include development at the same sites as described for Alternative 1. Visual impacts under Alternative 2 at NSA Monterey's Main Site would be the same as those described under Alternative 1. In addition, the conservation and construction measures described in Section 2.4.5 and under Alternative 1 would be implemented for this alternative. Therefore, there would be no significant impacts to visual resources as a result of implementing Alternative 2 at NSA Monterey's Main Site.

Navy Annex

At NSA Monterey's Navy Annex, Alternative 2 would include development at the same sites as described for Alternative 1; however, the 20-foot (6.1-meter) -tall carport-mounted solar photovoltaic array system (Site 1) would not be developed under this alternative. Visual impacts under Alternative 2 at NSA Monterey's Navy Annex would be the same as those described under Alternative 1. In addition, the conservation and construction measures described in Section 2.4.5 and under Alternative 1 would be implemented for this alternative. Therefore, there would be no significant impacts to visual resources as a result of implementing Alternative 2 at NSA Monterey's Navy Annex.

NAVWPNSTA Seal Beach

Under Alternative 2, development of the ground-mounted solar photovoltaic system would occur at a different site at NAVWPNSTA Seal Beach. The Alternative 2 project site would be located on previously disturbed, vacant land in the northeast portion of the installation, west of Bolsa Chica Road, and north of Westminster Boulevard (Figure 2-8). Surrounding on-installation land uses include vacant land, utility uses, and some large-scale storage facilities in the operational and maintenance areas to the west and far north of the site. Westminster Boulevard and additional military uses are located to the south. Residential and commercial uses are located outside the installation fence line, east of Bolsa Chica Road. The placement of the aboveground electrical line for Alternative 2 at NAVWPNSTA Seal Beach would occur within the installation fence line, parallel to Westminster Boulevard and an existing transmission line.

During the temporary construction period, the existing fabric-covered fence and vegetation along the installation's eastern boundary would almost completely screen views of the construction site from residents who live along the east side of Bolsa Chica Road (high sensitivity viewers) and from people traveling along Bolsa Chica Road and from the commercial area east of the site (low sensitivity viewers). Off-installation viewers traveling along Westminster Boulevard (motorists and pedestrians with low to moderate viewer sensitivity) may experience partial and intermittent views of construction vehicles and equipment; however, no related permanent or significant impacts would occur.

Once in operation, an 8-foot (2.4-meter) -high chain link fence covered with fabric would be installed around the project site to further mitigate viewshed concerns at this location. During project operation, the overall form, lines, and texture of the ground-mounted solar panel array structures would be the same as those described for the ground-mounted systems under Alternative 1. The height, form, and color of the ground-mounted panels would result in weak contrast (i.e., the element contrast can be seen but does not attract attention) with the existing landscape.

The new wooden electrical poles that would be placed along the north side of Westminster Boulevard would be 30 to 40 feet (9.1 to 12.2 meters) in height. These poles would be visible from the roads and commercial and residential areas in the vicinity. However, existing wood power poles of similar height and appearance line Bolsa Chica Road, and taller wood poles, approximately 80 feet (24.4 meters) -high, line the north side of Westminster Boulevard. Because the existing poles along Westminster Boulevard would be taller than the new poles, and because there would be other existing and similar poles nearby, introduction of the new poles would not substantially increase contrast in the landscape.

The existing fabric-covered fence and vegetation along the installation's eastern boundary would almost completely screen views of the panels from residents who live along the

east side of Bolsa Chica Road (high sensitivity viewers) and from people traveling along Bolsa Chica Road and from the commercial area east of the site (low sensitivity viewers). Views of the panels by viewers traveling along Westminster Boulevard (low to moderate viewer sensitivity viewers) would be intermittent, and mostly screened by existing vegetation along the fence line to the south of the site. During operation, the faces of panel arrays would be oriented to the south or southwest, towards Westminster Boulevard. Low to moderate sensitivity viewers (motorists) traveling along Westminster Boulevard may notice minor panel glare during daylight hours, but these viewers would be engaged in driving with brief periods of exposure, and would likely have low concern for changes to the landscape on the installation. Consequently, no significant glare-related impacts to off-installation receptors would occur.

Overall, there would be no significant impacts to visual resources as a result of implementing Alternative 2 at NAVWPNSTA Seal Beach. Although no significant impacts to visual resources would occur, implementation of the applicable conservation and construction measure described in Section 2.4.5 (e.g., reducing contrast in color between the metal project components and nearby structures and reducing potential glare) would further minimize impacts of color contrast and glare at this location.

NAVWPNSTA Seal Beach Detachment Norco

Under Alternative 2, development at NAVWPNSTA Detachment Norco would be the same as described under Alternative 1. Visual impacts under Alternative 2 at NAVWPNSTA Seal Beach Detachment Norco would be the same as those described under Alternative 1. In addition, the conservation and construction measures described in Section 2.4.5 and under Alternative 1 would be implemented for this alternative. Therefore, there would be no significant impacts to visual resources as a result of implementing Alternative 2 at NAVWPNSTA Seal Beach Detachment Norco.

NBVC Port Hueneme

Under Alternative 2, development at NBVC Port Hueneme would be the same as described under Alternative 1. Visual impacts under Alternative 2 at NBVC Port Hueneme would be the same as those described under Alternative 1. In addition, the conservation and construction measures described in Section 2.4.5 and under Alternative 1 would be implemented for this alternative. Therefore, there would be no significant impacts to visual resources as a result of implementing Alternative 2 at NBVC Port Hueneme.

3.7.2.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and development of solar photovoltaic panel arrays and associated infrastructure would not take

place at the five installations. The existing visual resources would not change; therefore, the No Action Alternative would have no significant impacts to visual resources.

3.8 WATER RESOURCES

This section describes the existing hydrology and water quality conditions that occur within and adjacent to the project sites at the five installations. For the purposes of evaluating hydrology and water quality, the project sites are defined as the areas proposed to be used for construction and operation under the alternatives.

The following discussion is based on a review of available literature and existing background data, including, but not limited to, the following resources:

- Best Available Floodplain Maps webviewer (California Department of Water Resources 2013);
- California's Groundwater Bulletin 118 (California Department of Water Resources 2004);
- Federal Emergency Management Agency (FEMA) Stay Dry v. 3.0 (FEMA 2013);
- Final Integrated Natural Resources Management Plan, Naval Air Facility El Centro and Target Areas (Navy 2001);
- Final Integrated Natural Resources Management Plan, Naval Support Activity Monterey (Navy 2013b);
- Final Integrated Natural Resources Management Plan, Naval Weapons Station Seal Beach (Navy 2014d);
- Final Integrated Natural Resources Management Plan, Naval Weapons Station Seal Beach Detachment Norco, Norco, California (Navy 2012a); and,
- Final Integrated Natural Resources Management Plan for Naval Base Ventura County, Port Hueneme, Port Hueneme, California (Navy 2012b).

3.8.1 AFFECTED ENVIRONMENT

3.8.1.1 Regional Hydrology and Floodplains

Regional hydrology and floodplains encompassing the project sites and surrounding areas are described below.

NAF El Centro

Hydrology

NAF El Centro is located within the Upper New River and Middle New River hydrologic sub-units of the Colorado River Hydrologic Region. The dominant waterbody in the Imperial Valley is the Salton Sea, located 19 miles (30.6 kilometers) north of the installation. Surface water flow to the Salton Sea is provided by a network of rivers and canals that bring irrigation runoff from nearby agricultural fields.

The closest river to the NAF El Centro project site is the New River, located approximately 1.5 miles (2.4 kilometers) west. The New River carries urban runoff, untreated and partially treated municipal wastes, untreated and partially treated industrial wastes, and agricultural runoff across the International Boundary at Calexico, California, and is fed by agricultural runoff from Imperial County. This river is listed as impaired under the Clean Water Act Section 303(d) for bacteria, dissolved oxygen, nutrients, pesticides, sedimentation and siltation, trash, and VOCs (Navy 2013c). The New River is considered unsuitable for any public use.

The closest canal to the NAF El Centro project is the Elder Canal, located less than 0.1 mile (0.16 kilometer) south. The New River originates in the City of Mexicali, Mexico, and flows north until it discharges into Salton Sea. The Elder Canal, from which NAF El Centro draws water, is part of the larger All-American Canal system that connects to the Colorado River (Navy 2001). Further discussion on water withdrawals by NAF El Centro is provided in Section 3.6.1.2.

Floodplains

Potential flooding is limited to an area along the westernmost boundary of the installation, extending approximately 1,200 feet (366 meters) onto NAF El Centro, which does not include the project site. The FEMA Flood Zone for the project site is undetermined (FEMA 2013) and is not within a 500-year floodplain (California Department of Water Resources 2013).

NSA Monterey's Main Site and Navy Annex

Hydrology

NSA Monterey's Main Site is located within the Seal Rock Creek-Frontal Monterey Bay hydrologic sub-unit, and NSA Monterey's Navy Annex is located within the Canyon Del Rey hydrologic sub-unit of the Central Coast Hydrologic Region. Both project sites lie within 1.5 miles (2.4 kilometers) of the coastline along Monterey Bay, which is situated to the north. Other waterbodies near the Main Site are Del Monte Lake and El Estero Lake, which are located 0.3 mile (0.48 kilometers) to the east and west, respectively.

Storm water runoff from the Main Site flows into Del Monte Lake via storm drains, bioswales, and a small intermittent creek and into El Estero Lake via the Sloat Avenue storm drain system. In addition, a storm drainage culvert comes onto the installation from the south and runs into a catchment basin before flowing into Del Monte Lake. Discharges from the Navy Annex Site are transported into Roberts Lake in Seaside via the Monterey storm drain system. Del Monte Lake shows sediment buildup, eutrophication (i.e., nutrient material build-up), water quality concerns, and vegetative encroachment; however, water quality issues are not noted for El Estero Lake or Roberts Lake (Navy 2013b).

Floodplains

Portions of Del Monte Lake and its source stream are within 100-year and 500-year floodplains (Navy 2013b); however, the FEMA Flood Zone for both project sites at NSA Monterey's Main Site and the Navy Annex is low to moderate (FEMA 2013) and the project sites, themselves, are not in 100-year or 500-year floodplains (California Department of Water Resources 2013).

NAVWPNSTA Seal Beach

Hydrology

NAVWPNSTA Seal Beach is located within the Bolsa Chica Channel-Frontal Huntington Harbor hydrologic sub-unit of the South Coast Hydrologic Region. The Bolsa Chica Channel-Frontal Huntington Harbor sub-unit is at the mouth of the Santa Ana River Watershed, where it meets Anaheim Bay. Bolsa Chica Channel, itself, is indicative of the flood control armoring of the former Santa Ana River channel, beginning with the completion of the Prado Dam in 1941. Since that time, sediment flow has been blocked and has prevented the river from seasonally flooding the marshes, replenishing sediment, and filtering the outflows to the sea.

Runoff from precipitation at NAVWPNSTA Seal Beach varies throughout the installation. The majority of the installation has runoff into open areas where the water percolates into the ground or evaporates. On the east side of Kitts Highway and for some areas west of Kitts Highway, including the project area, the installation storm water system includes man-made channels, natural ditches, and detention basins, as well as tidal sloughs through flat-lying clay deposits. With the exception of the tidal sloughs, flow in channels and ditches is intermittent and is dependent on rainfall and excess landscape irrigation runoff. In the Installation Industrial Storm Water Pollution Prevention Plan, discharge locations for runoff have been identified to discharge into the Seal Beach National Wildlife Refuge and Anaheim Bay. Anaheim Bay has been identified as a Category 5 California 303(d) listed waterbody. Pollutants in Anaheim Bay have been identified; however, the source of the pollutants is unknown. Anaheim Bay is a known "Toxic Hot Spot" for certain metals (cadmium, copper, lead, and chromium), and a "Potential Toxic Hot Spot" for certain pesticides/herbicides (aldrin, chlordane, lindane

chlorbenside, polychlorinated biphenyls, dichloro-diphenyl-trichloroethane, or "DDT," chlorpyrifos, endosulfan, heptachlorepoxide, and hexachlorbenzene) (Navy 2014d). The installation has an active National Pollutant Discharge Elimination System Industrial General Permit that was issued through the State Water Resources Control Board. The proposed project site is adjacent to one of the industrial operation facilities that is regularly inspected as part of the SWPPP. Drainage for the proposed project site is within an area that is considered a stormwater detention area and does not have a designated discharge path out of the detention area.

Floodplains

The FEMA Flood Zone for the project site at NAVWPNSTA Seal Beach is undetermined (FEMA 2013); however, it is also considered to be within a 500-year floodplain by some reference sources (Navy 2009b) and outside of that area by others (California Department of Water Resources 2013). Regardless, the flood risk is considered low, primarily because of the aforementioned flood control infrastructure currently in place.

NAVWPNSTA Seal Beach Detachment Norco

Hydrology

NAVWPNSTA Seal Beach Detachment Norco lies within the Oak Avenue Draw-Temescal Wash hydrologic sub-unit of the South Coast Hydrologic Region. The primary surface water features in the vicinity of the project sites are Lake Norconian and associated ponds, located 0.1 mile (0.16 kilometer) west of Area 1 and 0.15 mile (0.24 kilometer) north of Area 2. The Santa Ana River is approximately 1 mile (1.6 kilometers) to the northwest of Areas 1 and 2. The lake and ponds are artificial and are primarily fed by groundwater imported from a well field near the Santa Ana River.

Lake Norconian also receives water from runoff, precipitation, groundwater seepage, and the seepage recharge system. Urban runoff causes Lake Norconian to be a eutrophic lake. This condition is qualitatively indicated by the greenish water color, the low clarity, large beds of aquatic vegetation, and the emission of hydrogen sulfide when sediments are disturbed (Navy 2012a).

Floodplains

The FEMA Flood Zone for the project site at NAVWPNSTA Seal Beach Detachment Norco, including Areas 1 and 2, is low to moderate (FEMA 2013) and not within a 500-year floodplain (California Department of Water Resources 2013).

NBVC Port Hueneme

Hydrology

NBVC Port Hueneme lies within the McGrath Lake-Frontal Pacific Ocean hydrologic sub-unit of the South Coast Hydrologic Region. The primary surface water features at NBVC Port Hueneme include four drainage channels, a tidal channel, wetlands at the northwestern corner of the installation, and Port Hueneme Harbor. There are no natural streams on the installation.

Impermeable building and pavement surfaces cover most of the installation, resulting in a high amount of surface runoff during storms. Surface water flow at the installation is in response to intermittent seasonal precipitation. With the exception of the northernmost portion of the installation, storm water runoff ultimately discharges into the Port of Hueneme Harbor, conveyed through a network of drainage channels that parallel roadways and intercept overland flows. NBVC Port Hueneme drainage channels carry surface water through the installation from surrounding urban and agricultural land use discharges. The surface waters draining into NBVC Port Hueneme are highly mineralized (Navy 2012b).

Floodplains

The FEMA Flood Zone for the project site at NBVC Port Hueneme is moderate (FEMA 2013), and the project site is within a 500-year floodplain (California Department of Water Resources 2013).

3.8.1.2 Groundwater

Groundwater (i.e., the water beneath the earth's surface) is an integral part of the biological and physical ecosystem that relies on precipitation as its water source. Together with surface water, groundwater defines the water balance within a watershed. The right to use groundwater belongs to the overlying landowner, subject to the right of other landowner to use the same groundwater aquifer. Groundwater resources encompassing the project sites and surrounding areas are described below.

NAF El Centro

The Imperial Valley Groundwater Basin is the major source of groundwater for the NAF El Centro project site and the surrounding valley. Total storage capacity of the basin is estimated at 14 million acre-feet (California Department of Water Resources 2004).

The Imperial Valley Groundwater Basin is primarily recharged by irrigation, with some input from surface waters and groundwater underflow and seepage from unlined canals. Natural recharge from precipitation is estimated at 2,600 acre-feet per year (Navy 2013c). Recharge

from New River is estimated at 7,000 acre-feet per year (California Department of Water Resources 2004).

NSA Monterey's Main Site and Navy Annex

NSA Monterey's Main Site and Navy Annex are within the Salinas Valley Groundwater Basin Seaside Area Sub-Basin in which surface drainage is primarily internal to small depressions between the sand dunes along Monterey Bay, north of both project sites.

Groundwater recharge primarily comes from deep percolation of local precipitation and subsurface inflow from the Corral de Tierra Sub-Basin to the east, along with minor seepage from creeks and has generally shown declines in the period from the 1960s to the present due to municipal use (California Department of Water Resources 2004). Groundwater pumping within the Seaside basin is supported by annual natural recharge of about 4,600 acre-feet (RBF Consulting 2007).

NAVWPNSTA Seal Beach

NAVWPNSTA Seal Beach lies toward the northern edge of the Coastal Plain of the Orange County Groundwater Basin. Upper, middle, and lower aquifer systems are recognized in the basin, with the middle aquifer being responsible for 90 to 95 percent of the groundwater utilized.

Recharge to the Orange County Groundwater Basin is derived from percolation of Santa Ana River flow, infiltration of precipitation, and injection into wells. The Santa Ana River flow contains natural flow, reclaimed water, and imported water that is spread in the basin forebay. Historical groundwater flow was generally toward the ocean in the southwest, but modern pumping has caused water levels to drop below sea level and has encouraged seawater to migrate inland, contaminating the groundwater supply (California Department of Water Resources 2004). The Orange County Water District monitors the intrusion of salt water into groundwater. To prevent intrusion, treated water is injected into wells maintained along the coast. The water district also monitors aquifer levels approximately quarterly in test wells, one of which is owned and operated by the Navy (Navy 2014d).

The California Regional Water Quality Control Board further divides the groundwater under NAVWPNSTA Seal Beach into the Santa Ana Pressure Sub-Basin. Fuel plumes and landfills have been identified as water quality issues in this sub-basin. Groundwater underlies NAVWPNSTA Seal Beach at levels from 5 to 15 feet (1.5 to 4.6 meters) below the surface, rising to even shallower depths during heavy rain years (Navy 2014d).

NAVWPNSTA Seal Beach Detachment Norco

NAVWPNSTA Seal Beach Detachment Norco lies in the northern portion of the Upper Santa Ana Valley Groundwater Basin Temescal Sub-Basin.

Dominant recharge to the groundwater reservoir is from percolation of precipitation on the valley floor and infiltration of stream flow within tributaries exiting the surrounding mountains and hills (California Department of Water Resources 2004). As previously discussed, Lake Norconian and associated ponds are primarily supported by groundwater from the Santa Ana River, thus representing a source of local groundwater drawdown; however, no serious groundwater deficits are evident.

NBVC Port Hueneme

NBVC Port Hueneme is in the Oxnard Plain Sub-Basin of the Santa Clara River Valley Basin. Underlying the Oxnard Plain is a substantial aquifer system that is the primary source of water for the region's population and is used for urban and agricultural purposes. The major freshwater resources of NBVC Port Hueneme and its surroundings include the Oxnard Plain Sub-Basin aquifers, an unnamed stream, an overflow pond, and artificial drainages. The groundwater aquifers beneath the Oxnard Plain are contained in late Pleistocene to Holocene age sand and gravel deposits associated with the development of the Santa Clara River, its floodplain, delta, and estuary. In order of increasing depth, these aquifers are the Semi-Perched, Oxnard, Mugu, Hueneme, and Fox Canyon aquifers. A sixth aquifer, the Grimes Canyon, is beneath the Fox Canyon in the southern and eastern portions of the Oxnard Plain. This aquifer is not beneath NBVC Port Hueneme, due to a change in lithology (rock type). The Oxnard and the Fox Canyon aquifers are considered the two primary freshwater-bearing units. Depth to groundwater at the project site is approximately 5 feet (1.5 meters).

Freshwater recharge to the aquifers beneath the Oxnard Plain and NBVC Port Hueneme occurs naturally from precipitation during above-average rainfall periods, infiltration through the Santa Clara Riverbed, and artificial seepage areas in Saticoy and El Rio operated by the United Water Conservation District northwest of the installation (Navy 2012b).

3.8.2 ENVIRONMENTAL CONSEQUENCES

The following section describes the potential impacts to water resources that could result from the implementation of the alternatives at the NAF El Centro, NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme project sites.

Impacts to water resources have been evaluated based upon an understanding of the project components, as described under the Most Likely Design Scenario (refer to Section 2.2),

construction equipment and methods that would be used to build the solar photovoltaic systems, and how the sites would be used at each installation after the project is developed. All impacts resulting from the alternatives are described as they would occur with implementation of the conservation and construction measures presented in Section 2.4.

3.8.2.1 Alternative 1 (Preferred Alternative)

Hydrology

Surface disturbance (e.g., grading, localized excavation) would occur during construction of the solar photovoltaic panels and trenching for underground electrical conduits. During construction, storm water runoff from the project sites could result in a slight increase in turbidity. In addition, the minor and temporary impacts to vegetation (i.e., removal and crushing) could temporarily increase soil erosion and turbidity. All vegetated areas impacted by construction would be reseeded or replanted after construction. There would be no increase in impermeable surfaces with the development of Alternative 1. Potential impacts from an increase in turbidity would be avoided or minimized with implementation of best management practices (e.g., watering soils, silt fencing), development of grading plans, and adherence to erosion and storm water management practices, as described in Section 2.4.6, to contain soil and runoff on the project sites. Construction associated with Alternative 1 would not likely degrade the local water quality or adversely affect current uses of local surface waters.

As discussed in Section 2.4.6, the Navy would be required to obtain a Construction General Permit for discharges from construction activities for each of the five installations from the California State Water Resources Control Board prior to construction of Alternative 1. The Navy would install and maintain effective erosion- and sediment-control measures as necessary to comply with the Construction General Permit. The Navy would also develop SWPPPs for the proposed construction prior to implementation of Alternative 1. The SWPPPs would describe and ensure implementation of practices that would minimize pollutants in storm water discharges associated with construction at the applicable project site and ensure compliance with the terms of the Construction General Permit. The SWPPPs would prevent sedimentation and the introduction of pollutants to local water bodies within the vicinity of the installations (e.g., New River, Anaheim Bay, Lake Norconian) and would prevent violations of applicable regulations and standards.

Additionally, the Navy would be subject to the Construction General Permit post-construction requirements. Upon completion of Alternative 1, hydrologic conditions of the areas not developed with impermeable surfaces would be restored (e.g., revegetated) to reflect pre-project conditions.

The construction contractor would implement best management practices to prevent, control, and mitigate potential spills of oils, fuels, or lubricants from construction equipment

(e.g., bulldozers, dump trucks, backhoes) that may be temporarily stored onsite during construction of the project. If a spill or leak were to occur onsite, procedures identified in best management practices described in the applicable installation's spill prevention plan and SWPPP would be implemented (refer to Section 2.4.6) to contain the spill and minimize the potential for, and extent of, any associated contamination.

With implementation of the conservation and construction measures described in Section 2.4.6, including obtaining the necessary permits, complying with permit conditions, and following procedures in the SWPPP and spill prevention plan, implementation of Alternative 1 would have no significant impacts to local water quality, surface water bodies, or hydrology.

Floodplains

Under Alternative 1, construction of the solar photovoltaic systems at NAVWPNSTA Seal Beach and NBVC Port Hueneme would occur within 500-year floodplain. The Navy would minimize potential impacts to the floodplains with implementation of conservation and construction measures described in Section 2.4.6 and under regional hydrology. Alternative 1 would be consistent with the regulations described in Executive Order 11988, Floodplain Management.

Therefore, project structures would not increase the potential for flooding in local surface water bodies, restrict or redirect runoff flows, or cause localized flooding at the NAVWPNSTA Seal Beach or NBVC Port Hueneme project sites, and no significant impacts to floodplains would occur with implementation of Alternative 1.

Groundwater

Under Alternative 1, water required for dust suppression during construction would be supplied to the sites via water trucks by the construction contractor; therefore, construction of the Alternative 1 would not require the use of installation-supplied groundwater.

During project operation, water required for panel washing would be supplied by the PPA solar power developer, and Alternative 1 would not require the use of installation-supplied groundwater. The ground-mounted (NAF El Centro, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco) and carport-mounted (NSA Monterey's Main Site and Navy Annex, NBVC Port Hueneme) solar photovoltaic panels would be cleaned two times per year by one to two local workers employed by the PPA solar power developer. The crew would use a nonhazardous water/vinegar-based solution (maximum application rate of 7 ounces/square-foot/day/site) transported via water truck. Solar photovoltaic panels on the rooftop-mounted systems at NSA Monterey's Main Site and Navy Annex would be hand-washed two times per year by local workers employed by the PPA solar power developer. The majority of the spent solution would evaporate on the surface of the solar photovoltaic panels, due to the high

evaporation rate at each project site. At the sites with ground-mounted panels (NAF El Centro, NAVWPNSTA Seal Beach, and NAVWPNSTA Seal Beach Detachment Norco), small amounts of the solution may drip off of the panels and would be absorbed into the soil.

Overall, the Navy would continue to manage groundwater resources in a manner consistent with federal and state laws and regulations. Therefore, with implementation of the recommended conservation and construction measures described in Section 2.4.6, including obtaining the necessary permits, complying with permit conditions, and following procedures in the SWPPP, spill prevention plan, and erosion control plan, Alternative 1 would not result in significant impacts to groundwater.

3.8.2.2 Alternative 2

Hydrology

Under Alternative 2, impacts to surface hydrology would not differ from those discussed under Alternative 1. The conservation and construction measures described in Section 2.4.6 and listed under Alternative 1 would be implemented. Therefore, no significant impacts to hydrology would occur with implementation of Alternative 2 at the proposed project sites.

Floodplains

Under Alternative 2, impacts to floodplains would not differ from those discussed under Alternative 1, and the conservation and construction measures described in Section 2.4.6 and listed under Alternative 1 would be implemented. Therefore, project structures would not increase the potential for flooding local surface water bodies, restrict or redirect runoff flows, or cause localized flooding at the NAVWPNSTA Seal Beach or NBVC Port Hueneme project sites, and no significant impacts to floodplains would occur with implementation of Alternative 2.

Groundwater

Under Alternative 2, impacts to groundwater would not differ from those discussed under Alternative 1, and conservation and construction measures described in Section 2.4.6 and listed under Alternative 1 would be implemented. Therefore, no significant impacts to groundwater would occur with implementation of Alternative 2.

3.8.2.3 No Action Alternative

Under the No Action Alternative, no new solar photovoltaic systems and associated infrastructure would be constructed, and the Navy would continue to purchase conventional power from utility providers. Therefore, the No Action Alternative would not result in significant impacts to water resources.

4 CUMULATIVE IMPACTS ANALYSIS

4.1 INTRODUCTION

4.1.1 DEFINITION OF CUMULATIVE IMPACTS

The approach taken for this cumulative impacts analysis follows the objectives of NEPA and the Council on Environmental Quality regulations for implementing NEPA. The regulations require that the analysis of cumulative impacts in an EA consider the potential environmental impacts resulting from “the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions” (40 CFR 1508.7).

Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Cumulative impacts may occur when there is a relationship between a proposed action and other actions expected to occur in a similar geographic area or during a similar time period. Actions overlapping, or in proximity to, a proposed action can have more potential for cumulative impacts on “shared resources” than actions that are geographically separated. Similarly, actions that coincide temporally would tend to offer a higher potential for cumulative impacts. To the extent that details regarding such actions exist and the actions have a potential to interact with the Proposed Action outlined in this EA, these actions are included in the cumulative analysis.

4.1.2 GEOGRAPHIC BOUNDARIES FOR CUMULATIVE IMPACTS ANALYSIS

Geographic boundaries for analysis of cumulative impacts in this EA vary for different environmental resources. For example, the affected air basin may be the appropriate geographic extent for cumulative impacts to air quality, whereas the project area may be the appropriate boundary for other resources. This cumulative impacts analysis focuses on projects that directly overlap with the alternatives (i.e., occur in similar locations and potentially impact similar resources).

4.2 PROJECTS WITH POTENTIAL FOR CUMULATIVE IMPACTS

The Navy identified past, present, and reasonably foreseeable actions in the vicinity of each alternative analyzed in this EA. Projects within or near the project vicinity that could interact with each alternative are described in the subsections below. These actions, which are in proximity to NAF El Centro, NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme, are neither part of the alternatives described in this EA, nor are they dependent on them. Where applicable, environmental analyses of the other actions addressed in this section have been, or would be, conducted separately, with the results of the analyses incorporated into documents prepared specifically for those actions.

Table 4-1, presented at the end of this section, provides a summary of the past, present, and reasonably foreseeable projects that occur in the cumulative analysis area.

4.2.1 OCOTILLO SOL SOLAR PHOTOVOLTAIC ENERGY PROJECT

San Diego Gas & Electric has filed an application with the BLM for a right-of-way grant to construct, operate, maintain, and decommission a 100-acre (40-hectare) solar photovoltaic facility on BLM-managed lands located 9 miles (14.5 kilometers) southwest of the City of El Centro. The solar photovoltaic facility would interconnect with the existing Imperial Valley Substation via a buried 12.47-kilovolt transmission line and is expected to generate between 15 to 18 megawatts of electricity. An Environmental Impact Statement was prepared to analyze environmental impacts related to the project, and an amendment to the California Desert Conservation Area Plan was proposed. A Record of Decision was signed in April 2014 to approve the project, selecting the preferred alternative analyzed as Alternative 3, and amending the California Desert Conservation Area Plan to identify the 102 acres (41.3 hectares) of public land within the solar facility footprint and laydown area as suitable for solar energy development (BLM 2014a). Construction of the project was scheduled to begin during 2014/2015, and the plant would be brought online in 2015 (BLM 2014b).

The project would be located 7 miles (11 kilometers) south of the Alternative 1 and Alternative 2 sites at NAF El Centro.

4.2.2 IMPERIAL SOLAR ENERGY CENTER WEST

CSOLAR Development, LLC filed an application with the BLM for a right-of-way grant to construct, operate, maintain, and decommission an electrical transmission line and associated access on public lands. The project consists of three primary components: (1) the construction and operation of a 250-megawatt solar energy facility; (2) the construction and operation of an approximately 5-mile (8-kilometer) electrical transmission line that would connect from the solar facility to the existing Imperial Valley substation; and (3) proposed construction of an access road that traverses the proposed transmission line right-of-way on BLM lands. The solar energy facility would be located on approximately 1,130 acres (457 hectares) of fallow agricultural land

in the unincorporated area of Imperial County. The proposed transmission line and access road would be located within the Yuha Desert and within BLM's Utility Corridor "N" of the California Desert Conservation Area Plan. A Final Environmental Impact Report/EA for project compliance with the California Environmental Quality Act and NEPA was prepared in July 2011. The project was approved in August 2011, and the BLM issued a right-of-way grant for the project in September 2011 (BLM 2012). Construction began in December 2014, with commercial operation expected to begin in 2016 (Tenaska, Inc. 2014).

The project would be located approximately 5.5 miles (9 kilometers) southwest of the Alternative 1 and Alternative 2 sites at NAF El Centro.

4.2.3 RENEWABLE ENERGY PROGRAM OFFICE PROPOSED CONSTRUCTION AND OPERATION OF A PHOTOVOLTAIC SYSTEM

The Navy is preparing an EA to construct, operate, maintain, and decommission a solar photovoltaic facility at NAF El Centro. The proposed system at NAF El Centro would be constructed to contribute to the Secretary of the Navy's overall goal to obtain one gigawatt of renewable energy for the Navy. This project would produce up to 25 megawatts of power. Four sites have been identified as potential locations for this photovoltaic system. The EA will evaluate each of these alternative locations. Parcel 1 is a 15-acre (6-hectare) site on vacant land in the west-central portion of NAF El Centro. Parcel 2 is a 30-acre (12-hectare) site on vacant (formerly agricultural) land in the southwest portion of NAF El Centro near the main entrance. Parcel 3 is a 26-acre (10.5-hectare) site (currently leased for agriculture) located in the southern portion of NAF El Centro. Parcel 4 is a 55-acre (22-hectare) site (currently leased for agriculture) located west of Silsbee Road and outside of the NAF El Centro fence line. Construction is scheduled to begin in 2016 and is expected to take two years to complete.

The closest parcel to the Alternative 1 and Alternative 2 project sites at NAF El Central would be Parcel 3, which is located within the same parcel as the Alternative 1 and Alternative 2 sites.

4.2.4 WEST COUNTY CONNECTORS PROJECT

The West County Connectors Project was initiated by the Orange County Transportation Authority and Caltrans to link high-occupancy vehicle lanes/carpool lanes on the San Diego Freeway (I-405) with those on the Garden Grove Freeway (State Route [SR]-22) and the San Gabriel River Freeway (I-605). The project would create a seamless high-occupancy vehicle connection between the three freeways. The project traverses the cities of Garden Grove, Westminster, Seal Beach, Los Alamitos, and Long Beach, and the community of Rossmoor. Construction of the project began in 2011 and completed in February 2015 (Orange County Transportation Authority 2014a).

The project would be located 2 miles (3.2 kilometers) north of the Alternative 1 site and 1.25 miles (2 kilometers) north of the Alternative 2 site at NAVWPNSTA Seal Beach.

4.2.5 SAN DIEGO FREEWAY (I-405) IMPROVEMENT PROJECT

Caltrans, in cooperation with the Orange County Transportation Authority, has proposed a project to widen the San Diego Freeway (I-405) between SR-73 and I-605. The purpose of the Proposed Action is to improve travel conditions by increasing freeway capacity, improving traffic and interchange operations, and enhancing road safety to meet state and federal standards. A Draft Environmental Impact Report/Environmental Impact Statement was released for public review from May 18 through July 17, 2012. In June 2013, the Orange County Transportation Authority, in partnership with the Caltrans, released a Supplemental Draft Environmental Impact Report/Environmental Impact Statement that contained additional traffic information, largely in the Long Beach area, not previously contained in the original report. Caltrans selected the preferred alternative for the project in late 2013, and a Final Environmental Impact Report/Environmental Impact Statement is expected in February 2015. Construction of the project would occur from 2016 to 2020 (Orange County Transportation Authority 2014b).

The project would be located approximately 2 miles (3.2 kilometers) north of the Alternative 1 site and 1.25 miles (2 kilometers) north of the Alternative 2 site at NAVWPNSTA Seal Beach.

4.2.6 AMMUNITION PIER AND TURNING BASIN PROJECT

At NAVWPNSTA Seal Beach, the Navy would construct and operate a one-sided ammunition pier (1,100 feet [335 meters]) with pre-stressed concrete pile supports, an ordnance support facility (2,500 square feet [232 square meters]), and port security barrier (1,000 feet [305 meters]). In addition, the Navy would construct a fill causeway (800 feet [244 meters]) and breakwater (525 feet [160 meters]) to provide access to the pier. The project would dredge a public boat channel (750 by 400 feet [229 by 122 meters]) to a depth of -20 feet (-6.1 meters) to separate private boat traffic from Navy operations. The existing turning basin would be dredged to a navigation depth of -38 feet (-11.6 meters) with a 2-foot (0.6-meter) overdraft allowance. While this project is not currently funded and the scope of this action has not been fully developed, it is included for consideration under cumulative impacts as this project is a long-term goal for the Navy at NAVWPNSTA Seal Beach. As required, the Navy would prepare an EA or Environmental Impact Statement for this project if funding becomes available for this project. Project construction would not begin before 2017, following completion of environmental and design documentation.

The project would be located 1.3 miles (2 kilometers) southwest of the Alternative 1 site and 3.4 miles (5.5 kilometers) southwest of the Alternative 2 site at NAVWPNSTA Seal Beach.

4.2.7 CONSTRUCTION AND OPERATION OF A NEW LABORATORY AND DEMOLITION OF STRUCTURES

The Navy completed an EA in August 2013 for the demolition of buildings in the Research, Testing, and Evaluation area of NAVWPNSTA Seal Beach and the construction of a new weapons systems surveillance test and calibration laboratory in the same general area. In 2014, the Navy began construction of a new one-story, 62,000-square-foot (5,760-square-meter) building at a location southwest of the existing laboratory buildings (Buildings 112 and 126). New utilities (including natural gas, water, and sewer) will be installed within the project site and connect directly to existing infrastructure and systems. Construction for the new building includes paving and site improvements, such as sidewalks, vehicle parking, road improvements, and storm water infrastructure. The new facility has been designed to meet Leadership in Energy and Environmental Design (LEED®) silver ratings, as well as comply with the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007.

The project will demolish a total of 20 buildings and structures in the Research, Testing, and Evaluation area, and will include the removal and disposal of associated structures and equipment, foundations, cranes, plumbing, electrical, heating, ventilation, and air conditioning systems, miscellaneous exterior equipment, and fencing. Nineteen of these structures are contributing elements of the National Aeronautics and Space Administration Saturn Stage-II Historic District. Construction will occur over an approximately 12-month period. Demolition activities will follow and occur over a 10- to 15-year period.

The project will be located 450 feet (137 meters) northwest of the Alternative 1 site, and 1.1 miles (1.8 kilometers) west of the Alternative 2 site at NAVWPNSTA Seal Beach.

4.2.8 RENEWABLE ENERGY PROGRAM OFFICE PROPOSED CONSTRUCTION AND OPERATION OF A PHOTOVOLTAIC SYSTEM

The Navy is preparing an EA to construct, operate, maintain, and decommission a solar photovoltaic facility at NAVWPNSTA Seal Beach. The proposed system at NAVWPNSTA Seal Beach would be constructed to contribute to the Secretary of the Navy's overall goal to obtain one gigawatt of renewable energy for the Navy. This project would produce up to 25 megawatts of power for NAVWPNSTA Seal Beach. Two sites have been identified as potential locations for this solar photovoltaic system. Both sites are currently used for agricultural purposes. Site A is an 86-acre (35-hectare) parcel located adjacent to off-station Bolsa Chica and Edinger roads and directly adjacent to Perimeter Road, which runs parallel to the station's security fence. Site B is a 74-acre (30-hectare) area bounded by Bolsa Chica Road to the east and Westminster Boulevard to the south. The EA will evaluate each of these alternative locations. Construction is scheduled to begin in 2016 and is expected to take two years to complete.

Area A is approximately 1.3 miles (2.1 kilometers) south of Alternative 1. Area B covers the area included in Alternative 1. Area A is approximately 2.3 miles (3.7 kilometers) southeast

of Alternative 2. Area B is approximately 2.1 miles (3.4 kilometers) west-northwest of Alternative 2.

4.2.9 HOMEPORTING OF THE LITTORAL COMBAT SHIPS ON THE WEST COAST OF THE UNITED STATES

The Navy completed an EA in May 2012 to homeport up to 16 Littoral Combat Ships at Naval Base San Diego and use a combination of existing military assets in the Southern California area (e.g., Naval Base San Diego, NBVC Point Mugu, NBVC Port Hueneme, Naval Station North Island) to provide berthing space, ship hotel services (e.g., utilities), tug service, maintenance support, drydocking facilities, fueling services, ordnance handling and storage, cargo and mission module handling and storage, support facilities, and aviation asset support. Existing facilities, Buildings 362 and 364 at NBVC Point Mugu; and Building 1392 at NBVC Port Hueneme are being used, with minor improvements (i.e., interior renovations and minor exterior site improvements) required for some of the existing facilities used. The homeporting is occurring between FY 2013 and 2020.

The project is within 1 mile (1.6 kilometers) of the proposed Alternative 1 and Alternative 2 sites at NBVC Port Hueneme.

4.2.10 BIODIESEL FUEL PROCESSING FACILITY EXPANSION PROJECT

The Navy has proposed to expand the biodiesel fuel processing test facility at NBVC Port Hueneme. The Biodiesel Expansion Project would include expansion of the 0.46-acre (0.19-hectare) facility to allow for the production rate of up to 27,400 gallons (104 cubic meters) of biodiesel per day. Major new project components would include expanded use of solar technology and the installation of algae ponds, anaerobic digesters, and gasifiers. If implemented, the facility's total footprint would be expanded by 0.56 acre (0.23 hectare), to a total of 1.02 acres (0.41 hectare). An EA is currently being prepared to analyze the environmental impacts of the project.

The project would be located approximately 1 mile (1.6 kilometers) northeast of the Alternative 1 and Alternative 2 sites at NBVC Port Hueneme.

4.2.11 RENEWABLE ENERGY PROGRAM OFFICE PROPOSED CONSTRUCTION AND OPERATION OF A PHOTOVOLTAIC SYSTEM

The Navy is preparing an EA to construct, operate, maintain, and decommission a solar photovoltaic facility at NBVC Port Hueneme. The proposed system at NBVC Port Hueneme would be constructed to contribute to the Secretary of the Navy’s overall goal to obtain one gigawatt of renewable energy for the Navy. This project would produce up to 6 megawatts of power on up to 42.5 acres (17 hectares) of land. Five locations are being considered for the photovoltaic system: Parcel 9, a 28-acre (11-hectare) site located on a closed landfill south of 23rd Avenue and east of West Road; Parcel 13, a 12.5-acre (5-hectare) site located on a vacant

lot south of 23rd Avenue, east of West Road, and adjacent to Parcel 9 on a tracked vehicle road; Parcel 16, a 2.5-acre (1-hectare) vacant lot located south of Mill Road, north of 23rd Avenue, west of Patterson Road, and east of Track 13; Parcel 17, a 0.75-acre (0.3-hectare) vacant lot located north of 23rd Avenue between Tracks 13 and 14; and Parcel 18, a 1.5-acre (0.6-hectare) vacant lot located North of 23rd Avenue and east of Parcel 17. Construction is scheduled to begin in 2016 and is expected to take 2 years to complete.

The closest parcel to the Alternative 1 and Alternative 2 project sites at NBVC Port Hueneme would be Parcel 13, located approximately 0.5 mile (0.8 kilometer) north of the Alternative 1 and Alternative 2 sites.

4.2.12 FLEET LOGISTICS CENTER WAREHOUSE CONSTRUCTION PROJECT

The Navy has proposed to construct a new approximately 8,500-square-foot (790-square-meter) metal storage building at NAVWPNSTA Seal Beach Detachment Norco. The new building would have a truck loading/unloading dock attached. This building is proposed for storage to support fleet logistics operations. The project design process is currently underway. Construction is planned for FY 2016. The Navy would prepare appropriate NEPA documentation to analyze the environmental impacts of the project pending completion of the design process. The project location has not yet been determined.

4.2.13 NAVAL SURFACE WARFARE CENTER WAREHOUSE CONSTRUCTION PROJECT

The Navy has proposed to construct a new approximately 13,500-square-foot (1,255-square-meter) metal storage building at NAVWPNSTA Seal Beach Detachment Norco. This building is proposed for storage to support Naval Surface Warfare Center operations material and supply storage. The project design process is currently underway. Construction is planned for FY 2016. The Navy would prepare appropriate NEPA documentation to analyze the environmental impacts of the project pending completion of the design process. The project location has not yet been determined

Table 4-1 Projects Evaluated for Potential Cumulative Impacts

Project Name	Location	Project Description and Status	Approximate Distance & Direction from Nearest Project Component
Projects near NAF El Centro			
1. Ocotillo Sol Solar Photovoltaic Energy	BLM land, southwest of El Centro, California	A 15- to18-megawatt solar photovoltaic energy project on 115 acres (46 hectares) of BLM public lands. Status: A Record of Decision was signed in April 2014 for the Final Environmental Impact Statement and California Desert Conservation Area Plan Amendment. Construction scheduled for 2014/2015.	7 miles (11 kilometers) south of Alternative 1 Alternative and 2
2. Imperial Solar Energy Center West	West of El Centro, California	A 250-megawatt solar photovoltaic energy project on approximately 1,130 acres (457 hectares) of BLM and private lands. Status: Project was approved in August 2011. The BLM issued a right-of-way grant for the project in September 2011. Construction began in December 2014.	5.5 miles (9 kilometers) southwest of Alternative 1 and Alternative 2
3. Renewable Energy Program Office Proposed Construction and Operation of a Photovoltaic System	NAF El Centro, California	The proposed system would produce up to 25 megawatts of power. Four sites have been identified as potential locations for a photovoltaic system. Status: An EA is underway with construction expected to begin in 2016; the project will take two years to complete.	Parcel 3 would be located within the same parcel as Alternative 1 and Alternative 2.
Projects near NAVWPNSTA Seal Beach			
4. West County Connectors Project	Garden Grove, Westminster, Seal Beach, Los Alamitos, Long Beach and the community of Rossmoor	A project to link high-occupancy vehicle lanes/carpool lanes on the I-405 with those on SR-22 and I-605 to create a seamless high-occupancy vehicle connection for the three freeways. Status: Construction began in 2011 and will be complete in February 2015.	2 miles (3.2 kilometers) north of Alternative 1; 1.25 miles (2 kilometers) north of Alternative 2

Table 4-1 Projects Evaluated for Potential Cumulative Impacts

Project Name	Location	Project Description and Status	Approximate Distance & Direction from Nearest Project Component
5. San Diego Freeway (I-405) Improvement Project	Orange County	A project to widen I-405 between SR-73 and I-605. Status: Construction to occur from 2016-2020.	2 miles (3.2 kilometers) north of Alternative 1; 1.25 miles (2 kilometers) north of Alternative 2
6. Ammunition Pier and Turning Basin	NAVWPNSTA Seal Beach	A project to construct a one-sided ammunition pier, a fill causeway and breakwater to provide access to the pier. Status: If approved and funded, the Navy will prepare a NEPA EA or Environmental Impact Statement.	1.3 miles (2 kilometers) southwest of Alternative 1; 3.4 miles (5.5 kilometers) southwest of Alternative 2
7. Construction and Operation of a New Laboratory and Demolition of Structures	NAVWPNSTA Seal Beach	Demolition of buildings in the Research, Testing, and Evaluation area of NAVWPNSTA Seal Beach and the construction of a new weapons systems surveillance test and calibration laboratory. Status: EA completed in 2013. Construction began in 2014.	450 feet (137 meters) northwest of Alternative 1; 1.1 miles (1.8 kilometers) west of Alternative 2
8. Renewable Energy Program Office Proposed Construction and Operation of a Photovoltaic System	NAVWPNSTA Seal Beach	The proposed system would produce up to 25 megawatts of power on up to 86 acres (35 hectares) of land. Two sites have been identified as potential locations for a photovoltaic system. Status: An EA is underway with construction expected to begin in 2016 and take 2 years to complete.	Area A: 1.3 miles (2.1 kilometers) south of Alternative 1; Area B: covers the area included in Alternative 1. Area A: 2.3 miles 3.7 kilometers) southeast of Alternative 2; Area B: 2.1 miles (3.4 kilometers) west-northwest of Alternative 2.

Table 4-1 Projects Evaluated for Potential Cumulative Impacts

Project Name	Location	Project Description and Status	Approximate Distance & Direction from Nearest Project Component
Projects near NBVC Port Hueneme			
9. Homeporting of the Littoral Combat Ships on the West Coast of the United States	NBVC Port Hueneme	A project to homeport up to 16 Littoral Combat Ships at Naval Base San Diego and use a combination of existing military assets in the Southern California area (e.g., NBVC Port Hueneme). Status: EA completed in 2012. The homeporting is occurring between FY 2013 and 2020.	Within 1 mile (1.6 kilometers) of Alternative 1 and Alternative 2
10. Biodiesel Fuel Expansion Project at NBVC Port Hueneme	NBVC Port Hueneme	A project to expand the biodiesel fuel processing test facility at NBVC Port Hueneme. Status: EA is currently in progress.	1 mile (1.6 kilometers) northeast of Alternative 1 and Alternative 2
11. Renewable Energy Program Office Proposed Construction and Operation of a Photovoltaic System	NBVC Port Hueneme	The proposed system would produce up to 6 megawatts of power on up to 42.5 acres (17 hectares) of land. Five sites have been identified as potential locations for a photovoltaic system. Status: An EA is underway with construction expected to begin in 2016 and take 2 years to complete.	Parcel 13 (the closest parcel to the Proposed Action) would be located 0.5 mile (0.8 kilometer) north of Alternative 1 and Alternative 2.
Projects near NAVWPNSTA Seal Beach Detachment Norco			
12. Fleet Logistics Center Warehouse Construction	NAVWPNSTA Seal Beach Detachment Norco	A project to construct a new approximately 8,500-square-foot (790-square-meter) metal storage building with accompanying loading dock. Status: The Navy will prepare appropriate NEPA documentation; design process underway; construction expected in FY 2016.	Project location to be determined.
13. Naval Surface Warfare Center Warehouse Construction	NAVWPNSTA Seal Beach Detachment Norco	A project to construct a new approximately 13,500-square-foot (1,255-square-meter) metal storage building. Status: The Navy will prepare appropriate NEPA documentation; design process underway; construction expected in FY 2016.	Project location to be determined.

Table 4-1 Projects Evaluated for Potential Cumulative Impacts

Project Name	Location	Project Description and Status	Approximate Distance & Direction from Nearest Project Component

Notes:
The information provided in this table represents the extent of data available for present and reasonably foreseeable future projects in the cumulative region of influence. Navy projects without given durations are expected to be completed within the year that they begin. Some of the cumulative projects are conceptual and have not been approved or funded for construction.

No current or reasonably foreseeable future projects have been identified near NSA Monterey's Main Site and Navy Annex alternative locations for consideration in this cumulative analysis.

4.3 CUMULATIVE IMPACTS ANALYSIS

This section addresses the potential effects of implementing the alternatives in combination with other past, present, and reasonably foreseeable actions. The No Action Alternative would leave the project sites largely unchanged at NAF El Centro, NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme; therefore, the No Action Alternative does not require further evaluation of possible cumulative impacts.

4.3.1 AIR QUALITY AND CLIMATE CHANGE

The geographic extent for cumulative effects on air quality is defined as areas within the air basin for each installation:

- NAF El Centro: Salton Sea Air Basin;
- NSA Monterey's Main Site and Navy Annex: North Central Coast Air Basin;
- NAVWPNSTA Seal Beach and NAVWPNSTA Seal Beach Detachment Norco: South Coast Air Basin; and,
- NBVC Port Hueneme: South Central Coast Air Basin.

As described in Section 3.1, construction of either Alternative 1 or Alternative 2 would result in negligible localized, short-term effects on air quality during construction. Implementation of standard conservation and construction measures described in Section 2.4.2 would be used to minimize fugitive dust and air emissions generated during construction. Emissions from other projects that may be constructed concurrently within the same air basin (e.g., projects in Table 4-1) would contribute to regional air quality impacts during proposed construction. However, operation of the solar photovoltaic systems proposed under this action would avoid long-term emissions generated from conventional non-renewable generating sources, thereby resulting in beneficial effects to air quality throughout the air basins. Therefore, proposed construction and operation, in combination with air emissions from cumulative projects, would not contribute to any significant, cumulative impact on air quality in the regions.

Greenhouse Gases

Impacts related to greenhouse gas emissions are, by nature, global and cumulative, since individual sources of greenhouse gas emissions are not large enough to have an appreciable effect on climate change. Therefore, an appreciable impact to global climate change would only occur when greenhouse gas emissions associated with the alternatives combine with greenhouse gas emissions from other man-made activities on a global scale.

Implementation of projects identified in Table 4-1 would result in greenhouse gas emissions as a consequence of constructing and operating those projects. Due to the temporary nature of construction emissions from Alternative 1 or Alternative 2 at the installations (refer to Section 3.1, Tables 3.1-6 and 3.1-8), regional construction emissions from Alternative 1 or Alternative 2 would not result in a significant cumulative impact related to climate change.

In addition, emissions of NO_X, SO_2, and CO_2e would be avoided (refer to Section 3.1, Tables 3.1-7 and 3.1-9) at the five installations by reduced consumptions of grid-supplied electricity, and would more than offset the short-term construction emissions within the first year of operation. Subsequent years of operation would also avoid emissions produced from conventional non-renewable generating sources.

Overall, Alternative 1 and Alternative 2 and identified cumulative projects are relatively small in scale and would produce small amounts greenhouse gases during a short timeframe. Therefore, when added to the impacts from the identified alternatives and past and reasonably foreseeable future projects, no significant cumulative impacts related to greenhouse gas emissions or climate change would result from implementation of Alternative 1 or Alternative 2.

4.3.2 BIOLOGICAL RESOURCES

The geographic extent for cumulative effects on biological resources is defined as the ecological region (ecoregion) surrounding each installation analyzed in this EA, including NAF El Centro, NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme. Potentially impacted biological resources include resident wildlife, migratory wildlife, and vegetative resources.

Projects with potential impacts to biological resources that could contribute to a cumulative effect to biological resources, when added to the similar effects of other past, present, and reasonably foreseeable future projects, include those that would result in the permanent loss vegetation or wildlife communities, permanent loss of sensitive plant or wildlife populations, habitat fragmentation, or the permanent loss of wetlands or wildlife migration corridors.

Vegetation Communities

At NAF El Centro, up to 10 acres (4 hectares) of vegetation would be permanently removed under the Proposed Action. Three additional solar energy projects have been identified in the surrounding area, which would remove up to 1,300 acres (526 hectares) of vegetation, combined. Collectively, these projects could have a cumulative impact on vegetation communities. However, given the relatively small area impacted at NAF El Centro, and the large amounts of undeveloped land surrounding the installation, particularly to the west, the potential cumulative impacts would be minor.

No projects were identified in the vicinity of NAVWPNSTA Seal Beach and NAVWPNSTA Seal Beach Detachment Norco that would remove vegetation communities. Therefore, no cumulative impacts would occur with the Proposed Action at these two installations. Because no vegetation would be permanently removed at NSA Monterey's Main Site and Navy Annex or at NBVC Port Hueneme, the Proposed Action at these installations would have no cumulative impacts to vegetation when combined with the other identified projects.

Federally and State Listed Threatened and Endangered Species

The Proposed Action analyzed in this EA would have no effect on federally listed threatened and endangered species and no impact on state listed threatened and endangered species. Therefore, the alternatives, combined with other cumulative projects, would not result in significant cumulative impacts to threatened and endangered species.

Wildlife

Potential effects to resident wildlife (e.g., less-mobile small mammals, reptile, and amphibian species) are assessed by habitat and ecosystem requirements, whereas migratory wildlife (birds) are assessed based on breeding grounds, migration routes, wintering areas, or total range of affected population units. In addition, impacts to vegetative resources are assessed at the watershed, forest, range, and ecosystem level. Another way to evaluate geographic boundaries is to consider the distance an effect can travel. For instance, an appropriate regional boundary may be a river basin or parts; however, to assess impacts on a migratory fish, a watershed boundary is useful because the fish may travel up and down the river system throughout its lifecycle. Therefore, the distance that a potential effect can travel is an important determination in analyzing cumulative impacts to biological resources.

Potential impacts associated with the Proposed Action would be minor due to the relatively small size of the impacted area and the amount of habitat in the surrounding areas; however, the Proposed Action at NAF El Centro could impact resident individuals of less-mobile small mammal, reptile, and amphibian species, and could disturb and displace more mobile mammal species. Impacts from the proposed solar projects in the vicinity of NAF El Centro would likely be similar. However, given the localized effects of the Proposed Action, cumulative impacts to mammals, reptiles, and amphibians would be unlikely. The Proposed Action and the solar projects in the vicinity of El Centro could have a cumulative impact on birds through habitat loss, particularly for migratory species and those species with large territories. However, because the amount of habitat to be removed is relatively small given the larger regional context, cumulative impacts to birds would be minor.

The Proposed Action could have a cumulative effect on local and migratory waterfowl populations because all project sites are located within the vicinity of areas that provide potential nesting and foraging habitat for migratory and special status bird species. Other projects in the vicinity of the Proposed Action could result in temporary cumulative impacts to wildlife through disturbance from noise and human activity; however, potential cumulative impacts to resident and migratory wildlife would be expected to be minor and not significant.

The Proposed Action at NAF El Centro would permanently remove up to 10 acres (4 hectares), a portion of which would be utilized for the ground-mounted solar photovoltaic system. The additional solar energy projects that have been identified in the surrounding area would remove up to 1,300 acres (526 hectares) of vegetation, combined. Thus, when taken together, the Proposed Action would increase the panel area potentially contributing to lake-effect-related bird mortality by less than one percent. Therefore, impacts resulting from lake effect would remain insignificant.

Therefore, in conjunction with other past, present, or reasonably foreseeable projects, there would be no significant cumulative impacts to wildlife from implementation of Alternative 1 or Alternative 2.

Wetlands and Waters of the United States

The Proposed Action analyzed in this EA would have no impacts to wetlands or waters of the United States. Therefore, the alternatives, combined with other cumulative projects, would not result in significant cumulative impacts to wetlands or waters of the United States.

4.3.3 CULTURAL RESOURCES

The geographic extent for cumulative effects on cultural resources is defined as the installation boundaries at NAF El Centro, NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme.

As discussed in Sections 3.3.1 and 3.3.2, historic properties are found within the geographic extent for cumulative effects on cultural resources at NSA Monterey and NAVWPNSTA Seal Beach Detachment Norco. However, no recorded historic properties or other cultural resources are located within the area of potential effect at any of the installations under Alternative 1 or Alternative 2; therefore, no effects on historic properties and no significant impacts to cultural resources would occur. Further, to ensure that any unevaluated, subsurface cultural resource sites are not inadvertently disturbed during construction activities, conservation and construction measures described in Section 2.4.4 regarding unanticipated discoveries would be implemented.

Projects 7, 9, 12, and 13, listed in Table 4-1, have recently undergone or will undergo separate environmental reviews under NEPA and as needed, and consultation under the National Historic Preservation Act. Consultation ensures that any adverse effects to cultural resources associated with those actions would be avoided, minimized, and/or compensated to the extent practicable. When combined and analyzed alongside other past, present, or reasonably foreseeable projects identified in Table 4-1, there would be no significant cumulative adverse effects to cultural resources from implementation of either Alternative 1 or Alternative 2.

4.3.4 LAND USE

The geographic extent for cumulative effects on land use is defined as the installation boundaries at NAF El Centro, NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme.

Under Alternative 1 and Alternative 2, a ground-mounted solar photovoltaic system would be constructed and operated in an agricultural outlease area at NAF El Centro; consequently, a permanent land use change would occur at the site from historic agricultural use to renewable energy development. Depending on the parcel chosen, Project 3 may convert agricultural use to another land use at the installation (Table 4-1). However, considering the small percentage of acreage that could be discontinued from agricultural use (depending on the parcel chosen for Project 3) when compared to all outleased property on the installation (12.6 percent of the total 688 acres [278 hectares]), no significant cumulative impacts to land use would be expected to occur to agricultural uses at NAF El Centro as a result of implementing Alternative 1 or Alternative 2.

Under Alternative 1 and Alternative 2, installation of the proposed solar photovoltaic array systems would not introduce any incompatible land use activities at NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, or NBVC Port Hueneme. While a permanent land use change is proposed at NAF El Centro, development of the El Centro site for electrical energy generation would be compatible with the adjacent utility uses on the installation. Implementation of Alternative 1 or Alternative 2 would not change any land use patterns or land ownership in the areas, and all sites would remain under Navy use. Therefore, there would be no significant cumulative impacts to land use as a result of implementing Alternative 1 or Alternative 2 at the installations that are part of this project.

Projects 7 and 9, listed in Table 4-1, are estimated to occur within the geographic extent but would not pose a significant cumulative impact to land use. While changes to land use would be expected under this Proposed Action and the combined projects, only negligible to minor impacts would occur; therefore, when analyzed in conjunction with these projects, there

would be no significant cumulative impacts to land use from implementation of Alternative 1 or Alternative 2.

4.3.5 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

The geographic extent for cumulative effects on socioeconomics and environmental justice at NAF El Centro is defined as Imperial County.

Area population and housing would not be affected by implementation of Alternative 1 or Alternative 2 because no new military or civilian personnel requiring housing in the NAF El Centro vicinity would occur during construction or operation of these alternatives. No job loss would be anticipated as a result of discontinuing agricultural use at the project site, since local agricultural workers farm a number of fields in the area on a regular basis, and do not depend solely on the 10-acre (4–hectare) site for employment. Additionally, construction would likely boost the purchase of local goods and services, resulting in short-term, beneficial socioeconomic effects for the regional economy.

Based on the analysis of impacts presented in Sections 3.1 through 3.8, the alternatives would not result in disproportionately high or adverse human health or environmental effects on children, or disproportionately high or adverse effects on minority or low-income populations.

Projects 1, 2, and 3, listed in Table 4-1, are estimated to occur within the geographic extent of cumulative effects for socioeconomics and environmental justice. Projects 1 and 2 have recently undergone separate environmental review under NEPA and the California Environmental Quality Act, which concluded that the projects could result in short-term, beneficial, cumulative effects to the local economy due to job creation during construction, and minimal, if any, changes in socioeconomics in Imperial County during operations, given the minimal staffing levels required for solar plant operations. Additionally, these projects would not result in disproportionately high or adverse human health or environmental effects on children, or disproportionately high or adverse effects on minority or low-income populations. Projects 1, 2, and 3, along with the Proposed Action, could result in beneficial effects to environmental justice communities and children due to the net reduction in air emissions associated with power generation. Overall, Alternative 1 or Alternative 2, in combination with Projects 1, 2, and 3, listed in Table 4-1, would not contribute to cumulative impacts related to socioeconomics within Imperial County or near the project site at NAF El Centro.

4.3.6 UTILITIES

The geographic region of analysis for potential cumulative impacts to utilities is centered on the utility supply areas at NAF El Centro, NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme.

As discussed in Sections 3.6.2.1 and 3.6.2.2, availability and delivery of electricity would be improved at each installation under Alternative 1 and Alternative 2. Additionally, the project would lessen the overall electricity usage dependent on more-traditional utility systems. Therefore, Alternative 1 and Alternative 2 would result in a beneficial effect to the availability and delivery of electricity at the installations. Sufficient capacity exists within the regional landfills to accommodate the solid waste generation from construction of Alternative 1 or Alternative 2, and there would be an inconsequential change in the level of operational activities associated with the alternatives. Further, Alternative 1 and Alternative 2 would not involve any impacts to natural gas delivery or wastewater system during construction and operation, and the minimal quantities of water required by the project and supplied by the contractor during construction and operation, when compared against the current baseline conditions, would not be significant.

Projects 7 and 9, listed in Table 4-1, are estimated to occur within the geographic extent of cumulative impacts for utilities. The demands on electricity, solid waste disposal, natural gas, water, and wastewater systems from implementation of these projects, in combination with the utilities demands from either Alternative 1 or Alternative 2, would be expected to be accommodated by existing utility system supplies and capacities. Therefore, in conjunction with other past, present, or reasonably foreseeable projects, there would be no significant cumulative impacts to utilities from implementation of Alternative 1 or Alternative 2.

4.3.7 VISUAL QUALITY

The geographic extent for cumulative impacts to visual resources is defined as the project sites at NAF El Centro, NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme, as well as the surrounding viewsheds.

No long-term individual or cumulative impacts to the viewsheds in the Alternative 1 or Alternative 2 sites at NAF El Centro would result from the presence of permanent project features (e.g., ground-mounted panels, electrical lines) since these sites would not be viewed by sensitive viewers from outside the installation.

Long-term impacts to the viewsheds in the project sites at NSA Monterey's Main Site and Navy Annex, in the Alternative 1 or Alternative 2 project sites at NAVWPNSTA Seal Beach,

in the Alternative 1 or Alternative 2 project sites at NAVWPNSTA Seal Beach Detachment Norco, and in the Alternative 1 or Alternative 2 project sites at NBVC Port Hueneme would result from the presence of permanent project features (e.g., ground-mounted panels, carports, and/or electrical lines) that would be seen by sensitive viewers from outside the installation. However, the overall visual contrast from project features would be weak to moderate. Although no significant impacts to visual resources would occur, implementation of the applicable conservation and construction measures described in Section 2.4.5 (e.g., reducing contrast in color between the metal project components and nearby structures and reducing potential glare and shielding and directing lights downward) would further minimize impacts of color contrast, glare and lighting at these locations.

Impacts resulting from construction and operation could result in a cumulative effect on visual resources when combined with the incremental effects of past, present, or reasonably foreseeable future actions, as identified in Table 4-1. For visual resources, impacts could include line, form, color, and/or texture contrast with the landscape, including contrasts from glare and lighting. These, projects could result in visual impacts for motorists and pedestrians, as well as visual impacts to residents in the surrounding areas. However, impacts would be localized to residents and recreational users and of short duration for motorists and bicyclists. Impacts would be expected to be minimal to moderate; therefore, when analyzed in conjunction with the Proposed Action, there would be no significant cumulative impacts to visual resources from implementation of Alternative 1 or Alternative 2.

No current or reasonably foreseeable future projects have been identified near NSA Monterey's Main Site and Navy Annex alternative locations or for NAVWPNSTA Seal Beach Detachment Norco locations for consideration in this cumulative analysis. For NAVWPNSTA Seal Beach, three of the projects listed in Table 4-1 are greater than 1.25 miles (2.0 kilometers) from the Alternative 1 and Alternative 2 project sites. At these distances, these projects would not be visible in conjunction with the Proposed Action, and there would be no cumulative visual impacts. The construction and operation of a new laboratory and demolition of structures, currently underway, is located approximately 450 feet (137 meters) from the NAVWPNSTA Seal Beach Alternative 1 project site at its closest point. Views of this project, in conjunction with the Proposed Action, would only occur for on-base viewers who are not considered sensitive viewers. This project is more than 1.1 miles (1.8 kilometers) from the Alternative 2 project site and would not be visible in conjunction with the Proposed Action. For these reasons, there would be no cumulative visual impacts for the Alternative 1 or Alternative 2 project sites at NAVWPNSTA Seal Beach. For NBVC Port Hueneme, the projects listed in Table 4-1 are approximately 1 mile (1.6 kilometer) or greater from the Alternative 1 and Alternative 2 project sites and would not be visible in conjunction with the Proposed Action. For this reason, there would be no cumulative visual impacts for the Alternative 1 or Alternative 2 project sites at NBVC Port Hueneme.

When analyzed in conjunction with the projects listed in Table 4-1, there would be no significant cumulative impacts to visual resources from implementation of Alternative 1 or Alternative 2.

4.3.8 WATER RESOURCES

The geographic extent for cumulative effects on water resources is defined as the project sites at NAF El Centro, NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme and the water bodies that may receive surface water flows from the project sites (e.g., New River, Elder Canal, El Estero Lake, Anaheim Bay, Port Hueneme Harbor).

Potential impacts to water resources may include increases in sedimentation into local water bodies, the increase in impermeable surfaces that would alter volumes or patterns of surface flows or increase flooding potential, and the discharge of construction-related waste materials that could impact downstream water quality.

Alternative 1 and Alternative 2 would cause surface disturbance (e.g., grading, localized excavation) during the construction of the solar photovoltaic systems at the installations, which could result in storm water runoff. Best management practices (e.g., silt fencing) would be followed, including development of grading plans, development of spill prevention plans, and adherence to erosion and storm water management practices outlined in each installation's SWPPP for the project, as described in Sections 2.4.6, to contain soil, construction-related contaminants (e.g., oils) and runoff on the project sites. Therefore, implementation of Alternative 1 or Alternative 2 would not result in significant impacts to water resources including construction-induced erosion, surface water and groundwater quality, offsite discharge of construction-related contaminants, groundwater contamination, or increased flooding potential onsite or offsite.

Projects 7 and 9, listed in Table 4-1, could result in temporary and localized effects to water resources that would be similar to those associated with Alternative 1 and Alternative 2. Although Projects 7 and 9 would have similar effects, these projects would comply with applicable federal, state, and local regulations, would implement best management practices to reduce potential impacts, and any anticipated impacts from the above-listed projects would not be considered significant because of geographic separation and the types of waters impacted. Therefore, when analyzed in conjunction with other past, present, or reasonably foreseeable projects identified in Table 4-1, there would be no significant cumulative impacts to water resources from implementation of Alternative 1 or Alternative 2.

4.4 CONCLUSION

The Navy reviewed the potential cumulative impacts resulting from implementation of Alternative 1 and Alternative 2 and other past, present, and reasonably foreseeable future projects. The Navy has determined that the projects identified in Table 4-1 and Alternative 1 and Alternative 2 would not result in significant cumulative impacts to the environment.

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5 OTHER NEPA CONSIDERATIONS

This chapter addresses additional considerations required by NEPA, including:

- Possible conflicts between the alternatives and the objectives of federal, regional, state, and local plans, policies, and controls;
- Energy requirements and the conservation potential of alternatives;
- Irreversible and irretrievable commitment of natural or depletable resources;
- Short-term versus long-term productivity; and,
- Any probable significant environmental impacts that cannot be avoided and are not amenable to mitigation.

5.1 POSSIBLE CONFLICTS BETWEEN THE ACTION AND THE OBJECTIVES OF FEDERAL, REGIONAL, STATE AND LOCAL PLANS, POLICIES, AND CONTROLS

Implementation of the alternatives would comply with existing federal regulations and state, regional, and local policies and programs, while maintaining the Navy's mission. The project would be completed in accordance with the Migratory Bird Treaty Act, the Endangered Species Act, the Clean Air Act, and the National Historic Preservation Act. Records of Non-Applicability (RONAs) have been completed for project development at the NAF El Centro, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme sites in accordance with the Clean Air Act[24] (refer to Appendix C). Additionally, the Navy completed Section 106 consultation on the proposed development at NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme sites with the California SHPO for compliance with the National Historic Preservation Act (refer to Appendix E, Section 106 Consultation Letters).

[24] No RONA is required for NSA Monterey (Main Site and Navy Annex), which is located in an Attainment Area.

5.2 ENERGY REQUIREMENTS, CONSERVATION POTENTIAL OF ALTERNATIVES

Energy required to successfully implement the project would include fuel and electricity to power vehicles and equipment during construction and periodic maintenance activities. Fuel for construction and maintenance vehicles and equipment is currently available and in adequate supply. Required electricity demands during project construction would be supplied by the existing electrical services on the installations. Energy use between the alternatives would not differ substantially, and the No Action Alternative would not result in an increase of energy usage over existing usage.

Direct energy requirements under Alternatives 1 and 2 would be limited to those necessary to operate vehicles and equipment. No superfluous use of energy related to the alternatives has been identified, and proposed energy uses would be minimized to the greatest extent possible without compromising the integrity of the proposed facilities to be constructed. Proposed new construction would comply with applicable local, state, and federal codes that are designed to promote energy efficiency and the use of renewable energy resources. Further, operation of Alternative 1 or Alternative 2 would produce a renewable energy source that would be used to supply electricity to the installations, thereby conserving fossil fuels and reducing the Navy's dependence on non-renewable energy sources.

5.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF NATURAL OR DEPLETABLE RESOURCES

Resources that are irreversibly or irretrievably committed to a project are those that are used on a long-term or permanent basis. These include non-renewable resources, such as metal and fuel, and other natural or cultural resources. These resources are irretrievable in that they would be used for a project when they could have been used for other purposes or conserved. Human labor is also considered an irretrievable resource. Another impact that falls under this category is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.

Implementation of the alternatives would involve an irreversible or irretrievable commitment of materials and environmental resources. Non-renewable resources, such as fuel, oil, and lubricants, would be consumed by construction and maintenance vehicles and equipment and would be irreversibly lost. A small amount of building materials, such as concrete, metals (i.e., steel) and wood, would be irretrievably committed to construct the alternatives. Human labor would be required for project construction and engineering purposes. When considered at the regional level, the quantities of the resources expended at each site for construction and operation of the alternatives would be relatively inconsequential. Additionally,

operation of Alternative 1 or Alternative 2 would produce a renewable energy source that would counterbalance the minimal demands on non-renewable energy resources (i.e., fossil fuels) required to construct the solar photovoltaic systems. Therefore, implementation of the alternatives would not result in a significant commitment of irreversible or irretrievable resources.

5.4 RELATIONSHIP BETWEEN SHORT-TERM ENVIRONMENTAL IMPACTS AND LONG-TERM PRODUCTIVITY

NEPA requires an EA to address the relationship between short-term uses of the environment and the impact that such uses may have on the maintenance and enhancement of the long-term productivity of the environment. Impacts that would narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing one development option would lessen future flexibility in pursuing other options or that committing a parcel of land or other resource to a certain use would eliminate the possibility of other uses being implemented at that site.

The alternatives would include construction and operation of solar photovoltaic systems at NAF El Centro, NSA Monterey's Main Site and Navy Annex, NAVWPNSTA Seal Beach, NAVWPNSTA Seal Beach Detachment Norco, and NBVC Port Hueneme. Permanent land uses at the installations would be within areas already dedicated to exclusive use by the Navy. As part of Alternatives 1 and 2, land at NAF El Centro would be permanently removed from agricultural production for development of the proposed ground-mounted solar photovoltaic system. The short-term effects of the proposed improvements at the installations would include minor impacts to common vegetation. Therefore, the alternatives would not result in any impacts that would permanently narrow the range of beneficial uses of the environment. Further, the alternatives would not affect the long-term productivity of these resources at a regional level.

5.5 PROBABLE SIGNIFICANT ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED AND ARE NOT AMENABLE TO MITIGATION

This EA has determined that the alternatives would not result in any significant impacts; therefore, there are no probable significant environmental effects that cannot be avoided or reduced by mitigation.

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6 LIST OF AGENCIES AND PERSONS CONSULTED

6.1 UNITED STATES GOVERNMENT

UNITED STATES DEPARTMENT OF THE NAVY

- Gene Beale, NAVFAC SW, Project Manager
- Jimmie Collins, NAF El Centro, Environmental Protection Specialist
- Robert Powell, NAF El Centro. Natural Resources Specialist
- Victoria Taber, NSA Monterey, Natural Resources Specialist/NEPA Planner
- Johanna Turner, NSA Monterey, Installation Environmental Program Director
- Lisa Ellen Bosalet, NAVWPNSTA Seal Beach/NAVWPNSTA Seal Beach Detachment Norco, NEPA/Cultural Resources Manager
- Chad Lousen, NBVC, Environmental Planner
- Catherine Girod, NBVC, Cultural Resources Program Manager

6.2 STATE AGENCIES

CALIFORNIA OFFICE OF HISTORIC PRESERVATION

- Tristan Tozer, California Office of Historic Preservation, State Historian
- Jessica Tudor, California Office of Historic Preservation, State Archaeologist

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7 LIST OF NAMES, EXPERTISE, AND EXPERIENCE OF EA PREPARERS

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Key Navy personnel who contributed to the preparation of this EA include:

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- Robert Powell, NAF El Centro. Natural Resources Specialist
- Victoria Taber, NSA Monterey, Natural Resources Specialist/NEPA Planner
- Johanna Turner, NSA Monterey, Installation Environmental Program Director
- Lisa Ellen Bosalet, NAVWPNSTA Seal Beach/NAVWPNSTA Seal Beach Detachment Norco, NEPA/Cultural Resources Manager
- Chad Lousen, NBVC Port Hueneme, Environmental Planner
- Catherine Girod, NBVC Port Hueneme, Cultural Resources Program Manager

7.2 PRIME CONTRACTOR RESPONSIBLE FOR PREPARATION OF EA

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Cindy Shurling Contract Manager Cumulative Impacts Analysis	M.E.M., Environmental Management B.S., Laboratory Animal Science B.A., Biology	9
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Roya Compani-Tabrizi Project Manager (Preliminary Draft) Land Use Visual Quality	B.S., Environmental Systems	9
Nick Czarnecki, P.E. Air Quality	B.S., Mechanical Engineering	13
Janine Whitken Air Quality	B.E., Civil Engineering/Environmental Concentration	29
Stephen Czapka Biological Resources	M.S., Biology	15
Katie Duffield Biological Resources	B.S., Biology	3
Dave Plumpton, Ph.D. Lake Effect	Ph.D., Wildlife Conservation M.S., Wildlife Science B.S., Wildlife Science	21
Tyler Barns Lake Effect	M.S., Environmental Sciences B.S., Environmental Sciences	7
Caitlin Barns Lake Effect	M.S., Forest Resources B.S., Natural Resources	5
Tim Gross Cultural Resources	Ph.D., Anthropology M.A., Anthropology B.A., Anthropology	34

Team Member and Contribution	Professional Discipline	Years Exp.
Joseph Donaldson Visual Quality	M.L.A., Masters of Landscape Architecture B.A, Architecture	30
Travis Whitney Utilities Water Resources GIS	B.A., Geography	7
Peggy Farrell Quality Assurance NEPA Specialist	M.S., Natural Sciences/Environmental Studies B.A., Environmental Studies/Biology	30

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A PUBLIC PARTICIPATION

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B AIR EMISSIONS CALCULATIONS

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Table B1: Alternative 1 - Construction Equipment Activity Assumptions NAF El Centro

Equipment Use Assumptions - Construction

NAF El Centro - Alternative 1 (2015, 2016, or 2017) - Imperial County

Equipment	Purpose	NAF El Centro			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 4 months. Days estimate based on 20 work days per month.
F-150 pickup	general use (personnel transport)	3	3	75	135	30375	na	Assumed 135miles per day (3 hrs @ 45 mph). Pickups are used only to transport personnel to and from site.
forklift	lift haul place materials	1	3	60	na	na	180	
Bobcat or small dozer	grading, stone/soil fill	1	8	30	na	na	240	
trenching machine	4 ft x 3 ft deep trench	1	8	15	na	na	120	2km of trenching for electrical lines
dump truck	brings in stone/soil fill, hauls away demo'd material	1	8	7	100	700	na	Estimate that trucks will bring in fill and place at strategic spots. Bobcat will distribute.
scraper	grading at site	1	8	7	na	na	56	Scraper hp assumed to be between 600 hp and 750 hp
pile driver	driving posts into ground	1	8	15	na	na	120	Pile driver hp assumed to be between 100 hp and 175 hp
Truck mounted mobile crane	installing parts	1	8	30	na	na	240	Crane hp assumed to be between 175 hp and 300 hp
Delivery truck	delivers panels/parts	10	3	1	135	1350	na	Assumed 135 miles per day (3hrs @ 45 mph). One delivery truck = 300 panels.
welding machine	small, for installing support fixtures	2	8	15	na	na	240	
backhoe	dig excavate foundation for new sites	2	8	30	na	na	480	
Water Truck	dust suppression	1	8	15	100	1500	na	

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Bulldozer	Paving Machine	Roller	Scraper	Other Const. Equip	Cranes
Total Hrs Used (year?)	180	480	240	120	240	0	0	0	56	120	240

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	30375	3550

Table B2: Alternative 1 - Construction Equipment Activity Assumptions NSA Monterey

Equipment Use Assumptions - Construction

NSA Monterey Alternative 1 (2015, 2016, or 2017) - Monterey County

Equipment		NSA Monterey			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 6 months. Days estimate based on 20 work days per month.
Delivery truck	delivers panels/parts	15	3	1	135	2025	na	Assumed 135 miles per day (3 hrs @45 mph). One delivery truck = 300 panels.
F-150 pickup	general use	3	3	80	135	32400	na	Assumed 135 miles per day (3 hrs @45 mph) Pickups are used only to transport personnel to and from site.
forklift	lift/haul/place materials	2	3	60	na	na	360	
backhoe	dig/excavate foundation for new sites	3	8	30	na	na	720	
trenching machine	4 ft wide x 3 ft deep trench?	1	8	15	na	na	120	3km of trenching for electrical lines
welding machine	small, for installing support fixtures	2	8	30	na	na	480	
crane	erect vertical support members	2	8	40	na	na	640	Crane hp assumed to be between 175 hp and 300 hp
paving machine	paving	1	8	5	na	na	40	
roller	finish paving to match surrounding	1	8	5	na	na	40	
pneumatic jack hammer	remove concrete for the electrical trench	2	8	4	na	na	64	Emissions from Air Compressor used to drive pneumatic jack hammer

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Bulldozer	Paving Machine	Roller	Scraper	Jack Hammer	Cranes
Total Hrs Used (year?)	360	720	480	120	0	0	40	40	0	64	640

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	32400	2025

Table B3: Alternative 1 - Construction Equipment Activity Assumptions NAVWPNSTA Seal Beach

Equipment Use Assumptions - Construction

NAVWPNSTA Seal Beach - Alternative 1 (2015, 2016, or 2017) - Orange County

Equipment		NAVWPNSTA Seal Beach			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 4 months. Days estimate based on 20 work days per month.
Delivery truck	delivers panels/parts	5	3	1	135	675	na	Assumed 135 miles per day (3 hrs @45 mph). One delivery truck = 300 panels.
F-150 pick up	general use	3	3	30	135	12150	na	Assumed 135 miles per day (3 hrs @45 mph) Pickups are used only to transport personnel to and from site.
forklift	lift/haul/place materials	1	3	40	na	na	120	
backhoe	dig/excavate foundation for new sites	2	8	15	na	na	240	
bobcat or small dozer	grading, stone/soil fill	1	8	15	na	na	120	
trenching machine	4 ft wide x 3 ft deep trench	1	8	10	na	na	80	1 km of trenching for electrical lines
dump truck	brings in stone/soil fill, hauls away demo'd	1	8	5	100	500	na	Estimate that trucks will bring in fill and place at strategic spots. Bobcat will distribute.
welding machine	small, for installing support fixtures	2	8	10	na	na	160	
scraper	grading at site	1	8	5	na	na	40	Scraper hp assumed to be between 600 hp and 750 hp
pile driver	moving dirt	1	8	10	na	na	80	Pile driver hp assumed to be between 100 hp and 175 hp
water truck	dust suppression	1	8	10	100	1000	na	

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Bulldozer	Paving Machine	Roller	Scraper	Other Const. Equip	Cranes
Total Hrs Used (year?)	120	240	160	80	120	0	0	0	40	80	0

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	12150	2175

Table B4: Alternative 1 - Construction Equipment Activity Assumptions Detachment Norco

Equipment Use Assumptions - Construction

Detachment Norco - Alternative 1 (2015, 2016, or2017) - Riverside County

Equipment		Detachment Norco			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 6 months. Days estimate based on 20 work days per month.
Delivery truck	delivers panels/parts	15	3	1	135	2025	na	Assumed 135 miles per day (3 hrs @45 mph). One delivery truck = 300 panels.
F-150 pick up	general use	5	3	80	135	54000	na	Assumed 135 miles per day (3 hrs @45 mph) Pickups are used only to transport personnel to and from site.
forklift	lift/haul/place materials	2	3	60	na	na	360	
backhoe	dig/excavate foundation for new sites	3	8	30	na	na	720	
bobcat or small dozer	grading, stone/soil fill	1	8	30	na	na	240	
trenching machine	4 ft x 3 ft deep trench	1	8	15	na	na	120	2 km of trenching electrical lines
dump truck	brings in stone/soil fill, hauls away demo'd material	1	6	80	100	8000	na	Estimate that trucks will bring in fill and place at strategic spots. Bobcat will distribute.
welding machine	small, for installing support fixtures?	2	8	30	na	na	480	
scraper	grading at site	1	8	5	na	na	40	Scraper hp assumed to be between 600 hp and 750 hp
pile driver	moving dirt	1	8	10	na	na	80	Pile driver hp assumed to be between 100 hp and 175 hp
water truck	dust suppression	1	8	10	100	1000	na	

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Bulldozer	Paving Machine	Roller	Scraper	Other Const. Equip	Cranes
Total Hrs Used (year?)	360	720	480	120	240	0	0	0	40	80	0

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	54000	11025

Table B5: Alternative 1 - Construction Equipment Activity Assumptions NBVC Port Hueneme

Equipment Use Assumptions - Construction

NBVC Port Hueneme - Alternative 1 (2015,2016,or 2017) - Carport-mounted Panels - Ventura County

Equipment		NBVC Port Hueneme			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 6 months. Days estimate based on 20 work days per month.
Delivery truck	delivers panels/parts	10	3	1	135	1350	na	Assumed 135 miles per day (3 hrs @45 mph). One delivery truck = 300 panels.
F-150 pick up	general use	3	3	30	135	12150	na	Assumed 135 miles per day (3 hrs @45 mph) Pickups are used only to transport personnel to and from site.
forklift	lift/haul/place materials	1	3	40	na	na	120	
backhoe	dig/excavate foundation for new sites	2	8	15	na	na	240	
bobcat or small dozer	grading, stone/soil fill	1	8	15	na	na	120	
trenching machine	4 ft x 3 ft deep trench	1	8	10	na	na	80	1 km of trenching electrical lines
dump truck	brings in stone/soil fill, hauls away demo'd material	1	6	40	100	4000	na	Estimate that trucks will bring in fill and place at strategic spots. Bobcat will distribute.
welding machine	small, for installing support fixtures?	2	8	10	na	na	160	
scraper	grading at site	1	8	15	na	na	120	Scraper hp assumed to be between 600 hp and 750 hp
pile driver	moving dirt	1	8	15	na	na	120	Pile driver hp assumed to be between 100 hp and 175 hp
water truck	dust suppression	1	8	15	100	1500	na	
paving machine	paving	1	8	10	na	na	80	
roller	finish paving to match surrounding	1	8	10	na	na	80	
crane	erect vertical support members	1	8	20	na	na	160	Crane hp assumed to be between 175 hp and 300 hp
pneumatic jack hammer	remove concrete for the electrical trench	1	8	2	na	na	16	Emissions from Air Compressor used to drive pneumatic jack hammer

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Jack Hammer	Paving Machine	Roller	Scraper	Other Const. Equip	Cranes
Total Hrs Used (year?)	120	240	160	80	120	16	80	80	120	120	160

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	12150	6850

Table B6: Alternative 1 - Fugitive Dust from Construction Activity

Site	County	Variables for Fugitive Dust from Construction Activity					
		D months	A acres	EF ton PM_{10}/acre month	$SF_{2.5}$ na	PM_{10} tons	$PM_{2.5}$ tons
NAF El Centro (2015, 2016, or 2017)	Imperial	4	10.0	0.11	0.100	4.4	0.4
NSA Monterey (2015, 2016, or 2017)	Monterey	na					
NAVWPNSTA Seal Beach (2015, 2016, or 2017)	Orange	4	6.6	0.11	0.100	2.9	0.3
Detachment Norco (2015, 2016, or 2017)	Riverside	6	18.5	0.11	0.100	12.2	1.2
NBVC Port Hueneme (2015, 2016, or 2017)	Ventura	6	1.5	0.11	0.100	1.0	0.1

Variables:

$D = Duration\ of\ soil\ disturbance$

$A = area\ disturbed\ during\ construction$

$SF_{2.5} = scaling\ factor\ to\ predict\ PM_{2.5}\ emissions\ from\ PM_{10}\ emissions\ (Ref.2)$

$EF\ = PM_{10}\ Emission\ factor\ for\ construction\ fugitives\ (Ref.1)$

Equations:

$$PM_{10}(tons) = D(months) \times A(acres) \times EF\left(\frac{ton\ PM_{10}}{acre - month}\right) \quad (Ref.1)$$

$$PM_{2.5}(tons) = PM_{10}(tons) \times SF_{2.5}$$

References:

[1] California Air Resource Board. *ARB Miscellaneous Processes Methodologies - Construction and Demolition, Section 7.7, Building Construction Dust.* September 2002.

[2] MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Table B7: Alternative 1 - Construction Emissions

NAF El Centro - Alternative 1 (2015, 2016, or 2017) - Imperial County

Nonroad Equipment	Hours Of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	180	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.017	0.001	0.001	0.001	0.001	0.001	3.279
Backhoe	480	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.038	0.047	0.008	0.001	0.007	0.007	6.718
Welding machine	240	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.006	0.006	0.001	0.000	0.001	0.001	0.819
Trenching machine	120	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.010	0.002	0.001	0.000	0.001	0.001	1.585
Bobcat or small dozer	240	Diesel	69.074	12.032	3.565	2.026	3.815	3.700	12081.777	0.018	0.003	0.001	0.001	0.001	0.001	3.196
Scraper	56	Diesel	806.506	476.535	65.789	39.660	78.329	75.979	217584.423	0.050	0.029	0.004	0.002	0.005	0.005	13.431
Pile driver	120	Diesel	178.507	72.298	17.886	8.136	21.289	20.650	43559.575	0.024	0.010	0.002	0.001	0.003	0.003	5.762
Truck-mounted mobile crane	240	Diesel	170.885	37.891	17.834	9.630	15.536	15.070	54224.422	0.045	0.010	0.005	0.003	0.004	0.004	14.345

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
F-150 Pickup Truck	30375	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.005	0.040	0.001	0.000	0.000	0.000	16.199
Dump/Delivery/Water Truck	3550	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.017	0.001	0.000	0.000	0.000	0.000	4.688

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	10		Refer to Table C2					4.40	0.44	

Total NAF El Centro - Alternative 1 (2015, 2016, or 2017)	**0.230**	**0.151**	**0.024**	**0.009**	**4.423**	**0.462**	**70.022**

Table B8: Alternative 1 - Construction Emissions

NSA Monterey Alternative 1 (2015, 2016, or 2017) - Monterey County

Nonroad Equipment	Hours of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	360	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.033	0.003	0.002	0.001	0.002	0.002	6.558
Backhoe	720	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.057	0.071	0.012	0.002	0.011	0.011	10.077
Trenching machine	120	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.010	0.002	0.001	0.000	0.001	0.001	1.585
Paving machine	40	Diesel	120.379	61.963	7.484	4.077	9.269	8.991	22122.426	0.005	0.003	0.000	0.000	0.000	0.000	0.975
Welding machine	480	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.013	0.012	0.003	0.000	0.002	0.002	1.638
Crane	640	Diesel	170.885	37.891	17.834	9.630	15.536	15.070	54224.422	0.121	0.027	0.013	0.007	0.011	0.011	38.254
Paving roller	40	Diesel	119.154	64.458	7.765	3.975	9.471	9.187	21340.727	0.005	0.003	0.000	0.000	0.000	0.000	0.941
Pneumatic Jack Hammer	64	Diesel	52.537	10.578	2.861	1.496	3.019	2.928	8495.603	0.004	0.001	0.000	0.000	0.000	0.000	0.599

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
Pickup Truck	32400	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.005	0.043	0.001	0.000	0.000	0.000	17.279
Dump Truck/Delivery Truck	2025	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.010	0.001	0.000	0.000	0.000	0.000	2.674

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	N/A		Refer to Table C2					0.00	0.00	

Total - NSA Monterey - Alternative 1 (2015, 2016, or 2017)	**0.263**	**0.165**	**0.031**	**0.011**	**0.027**	**0.026**	**80.580**

Table B9: Alternative 1 - Construction Emissions

NAVWPNSTA Seal Beach - Alternative 1 (2015, 2016, or 2017) - Orange County

Nonroad Equipment	Hours of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	120	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.011	0.001	0.001	0.000	0.001	0.001	2.186
Backhoe	240	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.019	0.024	0.004	0.001	0.004	0.004	3.359
Bobcat or small dozer	120	Diesel	69.074	12.032	3.565	2.026	3.815	3.700	12081.777	0.009	0.002	0.000	0.000	0.001	0.000	1.598
Trenching machine	80	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.006	0.001	0.000	0.000	0.000	0.000	1.057
Welding machine	160	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.004	0.004	0.001	0.000	0.001	0.001	0.546
Scraper	40	Diesel	806.506	476.535	65.789	39.660	78.329	75.979	217584.423	0.036	0.021	0.003	0.002	0.003	0.003	9.594
Pile driver	80	Diesel	178.507	72.298	17.886	8.136	21.289	20.650	43559.575	0.016	0.006	0.002	0.001	0.002	0.002	3.841

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
Pickup Truck	12150	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.002	0.016	0.000	0.000	0.000	0.000	6.479
Dump/Delivery/Water Truck	2175	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.010	0.001	0.000	0.000	0.000	0.000	2.872

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	6.6		Refer to Table C2					2.91	0.29	

Total - NAVWPNSTA Seal Beach - Alternative 1 (2015, 2016, or 2017)	**0.114**	**0.076**	**0.011**	**0.004**	**2.924**	**0.302**	**31.532**

Table B10: Alternative 1 - Construction Emissions

Detachment Norco - Alternative 1 (2015, 2016, or2017) - Riverside County

Nonroad Equipment	Hours of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	360	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.033	0.003	0.002	0.001	0.002	0.002	6.558
Backhoe	720	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.057	0.071	0.012	0.002	0.011	0.011	10.077
Bobcat or small dozer	240	Diesel	69.074	12.032	3.565	2.026	3.815	3.700	12081.777	0.018	0.003	0.001	0.001	0.001	0.001	3.196
Trenching machine	120	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.010	0.002	0.001	0.000	0.001	0.001	1.585
Welding machine	480	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.013	0.012	0.003	0.000	0.002	0.002	1.638
Scraper	40	Diesel	806.506	476.535	65.789	39.660	78.329	75.979	217584.423	0.036	0.021	0.003	0.002	0.003	0.003	9.594
Pile driver	80	Diesel	178.507	72.298	17.886	8.136	21.289	20.650	43559.575	0.016	0.006	0.002	0.001	0.002	0.002	3.841

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
Pickup Truck	54000	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.009	0.072	0.002	0.000	0.000	0.000	28.798
Dump/Delivery/Water Truck	11025	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.052	0.004	0.001	0.000	0.000	0.000	14.559

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	18.5		Refer to Table C2					12.21	1.22	

Total - Detachment Norco - Alternative 1 (2015, 2016, or 2017)	**0.244**	**0.194**	**0.025**	**0.007**	**12.232**	**1.242**	**79.845**

Table B11: Alternative 1 - Construction Emissions

NBVC Port Hueneme - Alternative 1 (2015,2016,or 2017) - Carport-mounted Panels - Ventura County

Nonroad Equipment	Hours of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	120	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.011	0.001	0.001	0.000	0.001	0.001	2.186
Backhoe	240	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.019	0.024	0.004	0.001	0.004	0.004	3.359
Bobcat or small dozer	120	Diesel	69.074	12.032	3.565	2.026	3.815	3.700	12081.777	0.009	0.002	0.000	0.000	0.001	0.000	1.598
Trenching machine	80	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.006	0.001	0.000	0.000	0.000	0.000	1.057
Welding machine	160	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.004	0.004	0.001	0.000	0.001	0.001	0.546
Scraper	120	Diesel	806.506	476.535	65.789	39.660	78.329	75.979	217584.423	0.107	0.063	0.009	0.005	0.010	0.010	28.781
Pile driver	120	Diesel	178.507	72.298	17.886	8.136	21.289	20.650	43559.575	0.024	0.010	0.002	0.001	0.003	0.003	5.762
Paving machine	80	Diesel	120.379	61.963	7.484	4.077	9.269	8.991	22122.426	0.011	0.005	0.001	0.000	0.001	0.001	1.951
Paving roller	80	Diesel	119.154	64.458	7.765	3.975	9.471	9.187	21340.727	0.011	0.006	0.001	0.000	0.001	0.001	1.882
Crane	160	Diesel	170.885	37.891	17.834	9.630	15.536	15.070	54224.422	0.030	0.007	0.003	0.002	0.003	0.003	9.563
Pneumatic jack hammer	16	Diesel	52.537	10.578	2.861	1.496	3.019	2.928	8495.603	0.001	0.000	0.000	0.000	0.000	0.000	0.150

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
Pickup Truck	12150	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.002	0.016	0.000	0.000	0.000	0.000	6.479
Dump/Delivery/Water Truck	6850	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.032	0.002	0.001	0.000	0.000	0.000	9.046

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	1.5		Refer to Table C2					0.96	0.10	

Total - NBVC Port Hueneme - Alternative 1 (2015, 2016, or 2017)	**0.267**	**0.141**	**0.023**	**0.010**	**0.987**	**0.119**	**72.360**

Table B12: Alternative 1 - Emission Reductions from Renewable Energy

Site	County	Year Reductions Begin	Output	WECC California Year 2009 Subregion Non-Baseload Output Emission Rates (lb/MWh)					Emissions Reductions (tons per year)					
			MWh/yr	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2e
NAF El Centro	Imperial	2016, 2017,or 2018	1495	993.890	33.520	4.070	0.321	0.032	742.93	25.06	3.04	0.24	0.02	2276
NSA Monterey	Monterey	2016, 2017,or 2018	2164						1075.39	36.27	4.40	0.35	0.03	3294
NAVWPNSTA Seal Beach	Orange	2016, 2017,or 2018	721						358.30	12.08	1.47	0.12	0.01	1098
Detachment Norco	Riverside	2016, 2017,or 2018	2164						1075.39	36.27	4.40	0.35	0.03	3294
NBVC Port Hueneme	Ventura	2016, 2017,or 2018	433						215.18	7.26	0.88	0.07	0.01	659

	CO_2	CH_4	N_2O
GWP	1	25	298

Variables:

$EO = Total\ output\ in\ megawat\ hours\ per\ year\ (MWh/yr)$

$EF = WECC\ California\ year\ 2009\ subregion\ non-baseload\ output\ emission\ rate\ in\ pounds\ per\ megawatt\ hours\ (lb/MWh)\quad (Ref.1)$

$ER = Emission\ Reductions\ in\ tons\ per\ year\ (tpy)$

$CO_2e = Carbon\ dioxide\ equivalent$

$GHG_i = Mass\ emissions\ of\ each\ greenhouse\ gas$

$GWP_i = Global\ warming\ potentail\ for\ each\ greenhouse\ gas\quad (Ref.2)$

Equations:

$$ER(tpy) = EO\left({}^{MWh}/_{yr}\right) \times EF\left({}^{lb}/_{MWh}\right) \times \left(\frac{1\ ton}{2000\ lb}\right)$$

$$CO_2e = \sum_{i=1}^{n} GHG_i \times GWP_i \quad (Ref.2)$$

References:

[1]US EPA. The Emissions & Generation Resource Integrated Database for 2012 (eGRID 2012). April 2012

[2]40 CFR Part 98, Mandatory Greenhouse Gas Reporting, Subpart A

Table B13: Alternative 2 - Construction Equipment Activity Assumptions NAF El Centro

Equipment Use Assumptions - Construction

NAF El Centro - Alternative 2 (2015, 2016, or 2017) - Imperial County

Equipment	Purpose	NAF El Centro			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 4 months. Days estimate based on 20 work days per month.
F-150 pickup	general use (personnel transport)	3	3	60	135	24300	na	Assumed 135miles per day (3 hrs @ 45 mph). Pickups are used only to transport personnel to and from site.
forklift	lift haul place materials	1	3	50	na	na	150	
Bobcat or small dozer	grading, stone/soil fill	1	8	25	na	na	200	
trenching machine	4 ft x 3 ft deep trench	1	8	12	na	na	96	2km of trenching for electrical lines
dump truck	brings in stone/soil fill, hauls away demo'd material	1	8	7	100	700	na	Estimate that trucks will bring in fill and place at strategic spots. Bobcat will distribute.
scraper	grading at site	1	8	7	na	na	56	Scraper hp assumed to be between 600 hp and 750 hp
pile driver	driving posts into ground	1	8	12	na	na	96	Pile driver hp assumed to be between 100 hp and 175 hp
Truck mounted mobile crane	installing parts	1	8	25	na	na	200	Crane hp assumed to be between 175 hp and 300 hp
Delivery truck	delivers panels/parts	10	3	1	135	1350	na	Assumed 135 miles per day (3hrs @ 45 mph). One delivery truck = 300 panels.
welding machine	small, for installing support fixtures	2	8	12	na	na	192	
backhoe	dig excavate foundation for new sites	2	8	25	na	na	400	
Water Truck	dust suppression	1	8	12	100	1200	na	

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Bulldozer	Paving Machine	Roller	Scraper	Other Const. Equip	Cranes
Total Hrs Used (year?)	150	400	192	96	200	0	0	0	56	96	200

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	24300	3250

Table B14: Alternative 2 - Construction Equipment Activity Assumptions NSA Monterey

Equipment Use Assumptions - Construction

NSA Monterey Alternative 2 (2015, 2016, or 2017) - Monterey County

Equipment		NSA Monterey			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 6 months. Days estimate based on 20 work days per month.
Delivery truck	delivers panels/parts	15	3	1	135	2025	na	Assumed 135 miles per day (3 hrs @45 mph). One delivery truck = 300 panels.
F-150 pickup	general use	3	3	80	135	32400	na	Assumed 135 miles per day (3 hrs @45 mph) Pickups are used only to transport personnel to and from site.
forklift	lift/haul/place materials	2	3	60	na	na	360	
backhoe	dig/excavate foundation for new sites	3	8	30	na	na	720	
trenching machine	4 ft wide x 3 ft deep trench?	1	8	15	na	na	120	3km of trenching for electrical lines
welding machine	small, for installing support fixtures	2	8	30	na	na	480	
crane	erect vertical support members	2	8	40	na	na	640	Crane hp assumed to be between 175 hp and 300 hp
paving machine	paving	1	8	5	na	na	40	
roller	finish paving to match surrounding	1	8	5	na	na	40	
pneumatic jack hammer	remove concrete for the electrical trench	2	8	4	na	na	64	Emissions from Air Compressor used to drive pneumatic jack hammer

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Bulldozer	Paving Machine	Roller	Scraper	Jack Hammer	Cranes
Total Hrs Used (year?)	360	720	480	120	0	0	40	40	0	64	640

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	32400	2025

Table B15: Alternative 2 - Construction Equipment Activity Assumptions NAVWPNSTA Seal Beach

Equipment Use Assumptions - Construction

NAVWPNSTA Seal Beach - Alternative 2 (2015, 2016, or 2017) - Orange County

Equipment		NAVWPNSTA Seal Beach			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 4 months. Days estimate based on 20 work days per month.
Delivery truck	delivers panels/parts	5	3	1	135	675	na	Assumed 135 miles per day (3 hrs @45 mph). One delivery truck = 300 panels.
F-150 pick up	general use	3	3	30	135	12150	na	Assumed 135 miles per day (3 hrs @45 mph) Pickups are used only to transport personnel to and from site.
forklift	lift/haul/place materials	1	3	40	na	na	120	
backhoe	dig/excavate foundation for new sites	2	8	15	na	na	240	
bobcat or small dozer	grading, stone/soil fill	1	8	15	na	na	120	
trenching machine	4 ft wide x 3 ft deep trench	1	8	10	na	na	80	1 km of trenching for electrical lines
dump truck	brings in stone/soil fill, hauls away demo'd	1	8	5	100	500	na	Estimate that trucks will bring in fill and place at strategic spots. Bobcat will distribute.
welding machine	small, for installing support fixtures	2	8	10	na	na	160	
scraper	grading at site	1	8	5	na	na	40	Scraper hp assumed to be between 600 hp and 750 hp
pile driver	moving dirt	1	8	10	na	na	80	Pile driver hp assumed to be between 100 hp and 175 hp
water truck	dust suppression	1	8	10	100	1000	na	

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Bulldozer	Paving Machine	Roller	Scraper	Other Const. Equip	Cranes
Total Hrs Used (year?)	120	240	160	80	120	0	0	0	40	80	0

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	12150	2175

Table B16: Alternative 2 - Construction Equipment Activity Assumptions Detachment Norco

Equipment Use Assumptions - Construction

Detachment Norco - Alternative 2 (2015, 2016, or2017) - Riverside County

Equipment		Detachment Norco			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 6 months. Days estimate based on 20 work days per month.
Delivery truck	delivers panels/parts	15	3	1	135	2025	na	Assumed 135 miles per day (3 hrs @45 mph). One delivery truck = 300 panels.
F-150 pick up	general use	5	3	80	135	54000	na	Assumed 135 miles per day (3 hrs @45 mph) Pickups are used only to transport personnel to and from site.
forklift	lift/haul/place materials	2	3	60	na	na	360	
backhoe	dig/excavate foundation for new sites	3	8	30	na	na	720	
bobcat or small dozer	grading, stone/soil fill	1	8	30	na	na	240	
trenching machine	4 ft x 3 ft deep trench	1	8	15	na	na	120	2 km of trenching electrical lines
dump truck	brings in stone/soil fill, hauls away demo'd material	1	6	80	100	8000	na	Estimate that trucks will bring in fill and place at strategic spots. Bobcat will distribute.
welding machine	small, for installing support fixtures?	2	8	30	na	na	480	
scraper	grading at site	1	8	5	na	na	40	Scraper hp assumed to be between 600 hp and 750 hp
pile driver	moving dirt	1	8	10	na	na	80	Pile driver hp assumed to be between 100 hp and 175 hp
water truck	dust suppression	1	8	10	100	1000	na	

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Bulldozer	Paving Machine	Roller	Scraper	Other Const. Equip	Cranes
Total Hrs Used (year?)	360	720	480	120	240	0	0	0	40	80	0

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	54000	11025

Table B17: Alternative 2 - Construction Equipment Activity Assumptions NBVC Port Hueneme

Equipment Use Assumptions - Construction

NBVC Port Hueneme - Alternative 2 (2015,2016,or 2017) - Carport-mounted Panels - Ventura County

Equipment		NBVC Port Hueneme			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 6 months. Days estimate based on 20 work days per month.
Delivery truck	delivers panels/parts	10	3	1	135	1350	na	Assumed 135 miles per day (3 hrs @45 mph). One delivery truck = 300 panels.
F-150 pick up	general use	3	3	30	135	12150	na	Assumed 135 miles per day (3 hrs @45 mph) Pickups are used only to transport personnel to and from site.
forklift	lift/haul/place materials	1	3	40	na	na	120	
backhoe	dig/excavate foundation for new sites	2	8	15	na	na	240	
bobcat or small dozer	grading, stone/soil fill	1	8	15	na	na	120	
trenching machine	4 ft x 3 ft deep trench	1	8	10	na	na	80	1 km of trenching electrical lines
dump truck	brings in stone/soil fill, hauls away demo'd material	1	6	40	100	4000	na	Estimate that trucks will bring in fill and place at strategic spots. Bobcat will distribute.
welding machine	small, for installing support fixtures?	2	8	10	na	na	160	
scraper	grading at site	1	8	15	na	na	120	Scraper hp assumed to be between 600 hp and 750 hp
pile driver	moving dirt	1	8	15	na	na	120	Pile driver hp assumed to be between 100 hp and 175 hp
water truck	dust suppression	1	8	15	100	1500	na	
paving machine	paving	1	8	10	na	na	80	
roller	finish paving to match surrounding	1	8	10	na	na	80	
crane	erect vertical support members	1	8	20	na	na	160	Crane hp assumed to be between 175 hp and 300 hp
pneumatic jack hammer	remove concrete for the electrical trench	1	8	2	na	na	16	Emissions from Air Compressor used to drive pneumatic jack hammer

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Jack Hammer	Paving Machine	Roller	Scraper	Other Const. Equip	Cranes
Total Hrs Used (year?)	120	240	160	80	120	16	80	80	120	120	160

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	12150	6850

Table B18: Alternative 2 - Fugitive Dust from Construction Activity

Site	County	Variables for Fugitive Dust from Construction Activity					
		D months	A acres	EF ton PM_{10}/acre month	$SF_{2.5}$ na	PM_{10} tons	$PM_{2.5}$ tons
NAF El Centro (2015, 2016, or 2017)	Imperial	4	10.0	0.11	0.100	4.4	0.4
NSA Monterey (2015, 2016, or 2017)	Monterey	na					
NAVWPNSTA Seal Beach (2015, 2016, or 2017)	Orange	4	6.5	0.11	0.100	2.9	0.3
Detachment Norco (2015, 2016, or 2017)	Riverside	6	18.5	0.11	0.100	12.2	1.2
NBVC Port Hueneme (2015, 2016, or 2017)	Ventura	6	1.5	0.11	0.100	1.0	0.1

Variables:

$D = Duration\ of\ soil\ disturbance$

$A = area\ disturbed\ during\ construction$

$SF_{2.5} = scaling\ factor\ to\ predict\ PM_{2.5}\ emissions\ from\ PM_{10}\ emissions\ (Ref.2)$

$EF\ = PM_{10}\ Emission\ factor\ for\ construction\ fugitives\ (Ref.1)$

Equations:

$$PM_{10}(tons) = D(months) \times A(acres) \times EF\left(\frac{ton\ PM_{10}}{acre - month}\right) \quad (Ref.1)$$

$$PM_{2.5}(tons) = PM_{10}(tons) \times SF_{2.5}$$

References:

[1] California Air Resource Board. *ARB Miscellaneous Processes Methodologies - Construction and Demolition, Section 7.7, Building Construction Dust.* September 2002.

[2] MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Table B19: Alternative 2 - Construction Emissions

NAF El Centro - Alternative 2 (2015, 2016, or 2017) - Imperial County

Nonroad Equipment	Hours Of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	150	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.014	0.001	0.001	0.000	0.001	0.001	2.733
Backhoe	400	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.032	0.040	0.006	0.001	0.006	0.006	5.598
Welding machine	192	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.005	0.005	0.001	0.000	0.001	0.001	0.655
Trenching machine	96	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.008	0.002	0.000	0.000	0.000	0.000	1.268
Bobcat or small dozer	200	Diesel	69.074	12.032	3.565	2.026	3.815	3.700	12081.777	0.015	0.003	0.001	0.000	0.001	0.001	2.664
Scraper	56	Diesel	806.506	476.535	65.789	39.660	78.329	75.979	217584.423	0.050	0.029	0.004	0.002	0.005	0.005	13.431
Pile driver	96	Diesel	178.507	72.298	17.886	8.136	21.289	20.650	43559.575	0.019	0.008	0.002	0.001	0.002	0.002	4.609
Truck-mounted mobile crane	200	Diesel	170.885	37.891	17.834	9.630	15.536	15.070	54224.422	0.038	0.008	0.004	0.002	0.003	0.003	11.954

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
F-150 Pickup Truck	24300	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.004	0.032	0.001	0.000	0.000	0.000	12.959
Dump/Delivery/Water Truck	3250	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.015	0.001	0.000	0.000	0.000	0.000	4.292

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	10		Refer to Table C2					4.40	0.44	

Total NAF El Centro - Alternative 1 (2015, 2016, or 2017)	**0.199**	**0.129**	**0.020**	**0.008**	**4.420**	**0.459**	**60.163**

Table B20: Alternative 2 - Construction Emissions

NSA Monterey Alternative 2 (2015, 2016, or 2017) - Monterey County

Nonroad Equipment	Hours of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	360	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.033	0.003	0.002	0.001	0.002	0.002	6.558
Backhoe	720	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.057	0.071	0.012	0.002	0.011	0.011	10.077
Trenching machine	120	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.010	0.002	0.001	0.000	0.001	0.001	1.585
Paving machine	40	Diesel	120.379	61.963	7.484	4.077	9.269	8.991	22122.426	0.005	0.003	0.000	0.000	0.000	0.000	0.975
Welding machine	480	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.013	0.012	0.003	0.000	0.002	0.002	1.638
Crane	640	Diesel	170.885	37.891	17.834	9.630	15.536	15.070	54224.422	0.121	0.027	0.013	0.007	0.011	0.011	38.254
Paving roller	40	Diesel	119.154	64.458	7.765	3.975	9.471	9.187	21340.727	0.005	0.003	0.000	0.000	0.000	0.000	0.941
Pneumatic Jack Hammer	64	Diesel	52.537	10.578	2.861	1.496	3.019	2.928	8495.603	0.004	0.001	0.000	0.000	0.000	0.000	0.599

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
Pickup Truck	32400	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.005	0.043	0.001	0.000	0.000	0.000	17.279
Dump Truck/Delivery Truck	2025	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.010	0.001	0.000	0.000	0.000	0.000	2.674

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	N/A		Refer to Table C2					0.00	0.00	

Total - NSA Monterey - Alternative 1 (2015, 2016, or 2017)	**0.263**	**0.165**	**0.031**	**0.011**	**0.027**	**0.026**	**80.580**

Table B21: Alternative 2 - Construction Emissions

NAVWPNSTA Seal Beach - Alternative 2 (2015, 2016, or 2017) - Orange County

Nonroad Equipment	Hours of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	120	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.011	0.001	0.001	0.000	0.001	0.001	2.186
Backhoe	240	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.019	0.024	0.004	0.001	0.004	0.004	3.359
Bobcat or small dozer	120	Diesel	69.074	12.032	3.565	2.026	3.815	3.700	12081.777	0.009	0.002	0.000	0.000	0.001	0.000	1.598
Trenching machine	80	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.006	0.001	0.000	0.000	0.000	0.000	1.057
Welding machine	160	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.004	0.004	0.001	0.000	0.001	0.001	0.546
Scraper	40	Diesel	806.506	476.535	65.789	39.660	78.329	75.979	217584.423	0.036	0.021	0.003	0.002	0.003	0.003	9.594
Pile driver	80	Diesel	178.507	72.298	17.886	8.136	21.289	20.650	43559.575	0.016	0.006	0.002	0.001	0.002	0.002	3.841

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
Pickup Truck	12150	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.002	0.016	0.000	0.000	0.000	0.000	6.479
Dump/Delivery/Water Truck	2175	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.010	0.001	0.000	0.000	0.000	0.000	2.872

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	6.5		Refer to Table C2					2.87	0.29	

Total - NAVWPNSTA Seal Beach - Alternative 1 (2015, 2016, or 2017)	**0.114**	**0.076**	**0.011**	**0.004**	**2.884**	**0.298**	**31.532**

Table B22: Alternative 2 - Construction Emissions

Detachment Norco - Alternative 2 (2015, 2016, or2017) - Riverside County

Nonroad Equipment	Hours of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	360	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.033	0.003	0.002	0.001	0.002	0.002	6.558
Backhoe	720	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.057	0.071	0.012	0.002	0.011	0.011	10.077
Bobcat or small dozer	240	Diesel	69.074	12.032	3.565	2.026	3.815	3.700	12081.777	0.018	0.003	0.001	0.001	0.001	0.001	3.196
Trenching machine	120	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.010	0.002	0.001	0.000	0.001	0.001	1.585
Welding machine	480	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.013	0.012	0.003	0.000	0.002	0.002	1.638
Scraper	40	Diesel	806.506	476.535	65.789	39.660	78.329	75.979	217584.423	0.036	0.021	0.003	0.002	0.003	0.003	9.594
Pile driver	80	Diesel	178.507	72.298	17.886	8.136	21.289	20.650	43559.575	0.016	0.006	0.002	0.001	0.002	0.002	3.841

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
Pickup Truck	54000	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.009	0.072	0.002	0.000	0.000	0.000	28.798
Dump/Delivery/Water Truck	11025	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.052	0.004	0.001	0.000	0.000	0.000	14.559

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	18.5		Refer to Table C2					12.21	1.22	

Total - Detachment Norco - Alternative 1 (2015, 2016, or 2017)	**0.244**	**0.194**	**0.025**	**0.007**	**12.232**	**1.242**	**79.845**

Table B23: Alternative 2 - Construction Emissions

NBVC Port Hueneme - Alternative 2 (2015,2016,or 2017) - Carport-mounted Panels - Ventura County

Nonroad Equipment	Hours of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	120	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.011	0.001	0.001	0.000	0.001	0.001	2.186
Backhoe	240	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.019	0.024	0.004	0.001	0.004	0.004	3.359
Bobcat or small dozer	120	Diesel	69.074	12.032	3.565	2.026	3.815	3.700	12081.777	0.009	0.002	0.000	0.000	0.001	0.000	1.598
Trenching machine	80	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.006	0.001	0.000	0.000	0.000	0.000	1.057
Welding machine	160	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.004	0.004	0.001	0.000	0.001	0.001	0.546
Scraper	120	Diesel	806.506	476.535	65.789	39.660	78.329	75.979	217584.423	0.107	0.063	0.009	0.005	0.010	0.010	28.781
Pile driver	120	Diesel	178.507	72.298	17.886	8.136	21.289	20.650	43559.575	0.024	0.010	0.002	0.001	0.003	0.003	5.762
Paving machine	80	Diesel	120.379	61.963	7.484	4.077	9.269	8.991	22122.426	0.011	0.005	0.001	0.000	0.001	0.001	1.951
Paving roller	80	Diesel	119.154	64.458	7.765	3.975	9.471	9.187	21340.727	0.011	0.006	0.001	0.000	0.001	0.001	1.882
Crane	160	Diesel	170.885	37.891	17.834	9.630	15.536	15.070	54224.422	0.030	0.007	0.003	0.002	0.003	0.003	9.563
Pneumatic jack hammer	16	Diesel	52.537	10.578	2.861	1.496	3.019	2.928	8495.603	0.001	0.000	0.000	0.000	0.000	0.000	0.150

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
Pickup Truck	12150	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.002	0.016	0.000	0.000	0.000	0.000	6.479
Dump/Delivery/Water Truck	6850	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.032	0.002	0.001	0.000	0.000	0.000	9.046

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	1.5		Refer to Table C2					0.96	0.10	

Total - NBVC Port Hueneme - Alternative 1 (2015, 2016, or 2017)	**0.267**	**0.141**	**0.023**	**0.010**	**0.987**	**0.119**	**72.360**

Table B24: Alternative 2 - Emission Reductions from Renewable Energy

Site	County	Year Reductions Begin	Output	WECC California Year 2009 Subregion Non-Baseload Output Emission Rates (lb/MWh)					Emissions Reductions (tons per year)					
			MWh/yr	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2e
NAF El Centro	Imperial	2016, 2017,or 2018	433	993.890	33.520	4.070	0.321	0.032	215.18	7.26	0.88	0.07	0.01	659
NSA Monterey	Monterey	2016, 2017,or 2018	1875						931.77	31.43	3.82	0.30	0.03	2854
NAVWPNSTA Seal Beach	Orange	2016, 2017,or 2018	721						358.30	12.08	1.47	0.12	0.01	1098
Detachment Norco	Riverside	2016, 2017,or 2018	2164						1075.39	36.27	4.40	0.35	0.03	3294
NBVC Port Hueneme	Ventura	2016, 2017,or 2018	433						215.18	7.26	0.88	0.07	0.01	659

	CO_2	CH_4	N_2O
GWP	1	25	298

Variables:

$EO = Total\ output\ in\ megawat\ hours\ per\ year\ (MWh/yr)$

$EF = WECC\ California\ year\ 2009\ subregion\ non-baseload\ output\ emission\ rate\ in\ pounds\ per\ megawatt\ hours\ (lb/MWh)\quad (Ref.1)$

$ER = Emission\ Reductions\ in\ tons\ per\ year\ (tpy)$

$CO_2e = Carbon\ dioxide\ equivalent$

$GHG_i = Mass\ emissions\ of\ each\ greenhouse\ gas$

$GWP_i = Global\ warming\ potentail\ for\ each\ greenhouse\ gas\quad (Ref.2)$

Equations:

$$ER(tpy) = EO\left({}^{MWh}/_{yr}\right) \times EF\left({}^{lb}/_{MWh}\right) \times \left(\frac{1\ ton}{2000\ lb}\right)$$

$$CO_2e = \sum_{i=1}^{n} GHG_i \times GWP_i \quad (Ref.2)$$

References:

[1]US EPA. The Emissions & Generation Resource Integrated Database for 2012 (eGRID 2012). April 2012

[2]40 CFR Part 98, Mandatory Greenhouse Gas Reporting, Subpart A

C RECORDS OF NON-APPLICABILITY

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CLEAN AIR ACT - GENERAL CONFORMITY RULE
RECORD OF NON-APPLICABILITY (RONA)

FOR
CONSTRUCTION AND OPERATION OF A
SOLAR PHOTOVOLTAIC SYSTEM AT
NAF EL CENTRO

NAF EL CENTRO
EL CENTRO, CALIFORNIA

JULY 2014

PREPARED FOR

U.S. Department of the Navy
Navy Region Southwest
San Diego County, California

PREPARED BY

Ecology and Environment, Inc.
401 West A Street, Suite 775
San Diego, California 92101

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PROPOSED ACTION

The proposed action falls under the Record of Non-Applicability (RONA) category and is documented with this RONA.

Action Proponent: Commanding Officer, NAF El Centro, El Centro, California

Location: South-Central Imperial County, California

Proposed Action Name: Construction and operation of a solar photovoltaic system at NAF El Centro, Imperial County, California

PROPOSED ACTION AND EMISSIONS SUMMARY

PROPOSED ACTION

Under the Proposed Action, the Navy would install a ground-mounted solar photovoltaic system that would generate 650 kilowatts of alternating current renewable energy at NAF El Centro. The generation facilities would be located in an area of approximately 10 acres (4 hectares) at the installation. The project is needed to contribute towards the Navy's overall compliance with the Secretary of the Navy's renewable energy goals and the National Defense Authorization Act.

Alternative 1 (Preferred Alternative)

- Construct and operate a ground-mounted solar photovoltaic system that would generate 650 kilowatts of alternating current renewable energy. The total output from the generation facility would be approximately 1,495 megawatt hours per year;
- The ground-mounted systems would occupy all of the space contained within its fence line, and ground disturbance would occur throughout the 10-acre (4-hectare) solar panel array site; and,
- Construction of the ground-mounted solar photovoltaic system is expected to occur between 2015 and 2017. Due to external factors, the exact construction date cannot be determined at this time.

EMISSIONS SUMMARY

Air quality impacts associated with the Proposed Action are related to emissions that would occur during construction of the ground-mounted solar photovoltaic system at NAF El Centro. The principal sources of pollutants during construction would be the construction equipment, construction crew commuting vehicles, and earth-moving activities.

Construction

Construction for the installation of ground-mounted solar photovoltaic systems associated with Alternative 1 facilities at NAF El Centro is estimated to take place over a four-month period; therefore, all construction emissions will be considered to occur in one year for the General Conformity analysis. While construction emissions are assumed to occur between 2015 and 2017, due to external factors, the exact construction date cannot be determined at this time.

Table 1 compares the maximum estimated emissions for the Proposed Action at NAF El Centro with the *de minimis* annual emissions thresholds set forth for the Salton Sea Air Basin (per EPA General Conformity Rule and OPNAVINST 5090.1B Change-3, Appendix F, Clean Air Act General Conformity Guidance). Based on the air quality analysis, the maximum estimated emissions for the Proposed Action at NAF El Centro would be below general conformity *de minimis* levels for all criteria pollutants for the Salton Sea Air Basin. Therefore, implementation of Alternative 1 at NAF El Centro would result in minor, localized, short-term effects on air quality during construction, and impacts from Alternative 1 during construction would not be significant.

Table 1 Estimated Construction Emissions at NAF El Centro Compared to *de minimis* Emissions for Nonattainment and Attainment/Maintenance Criteria Pollutants in the Salton Sea Air Basin[1]

Site	County	Emissions (tons per year)						
		NOx	CO	VOCs	SO_2	PM_{10}	$PM_{2.5}$	CO_2
NAF El Centro	Imperial	0.23	0.15	0.02	0.01	4.42	0.46	70.02
General Conformity *de minimis* Threshold		100	N/A	50	N/A	70	100	N/A

Key:
CO = carbon monoxide
CO_2 = carbon dioxide
N/A = not applicable
NO_X = oxides of nitrogen
$PM_{2.5}$ = fine particulate matter less than or equal to 2.5 microns in diameter
PM_{10} = suspended particulate matter less than or equal to 10 microns in diameter
SO_2 = sulfur dioxide
VOCs = volatile organic compounds

Note:
[1] 40 CFR 93. The Salton Sea Air Basin is classified as marginal nonattainment for O_3, serious nonattainment for PM_{10} and nonattainment for $PM_{2.5}$.

Detailed construction and demolition equipment assumptions, fugitive dust emission calculations, and emissions calculations for NAF El Centro are provided in Appendix B, Tables B1, B6, and B7, respectively.

Operations

Long-term operation of Alternative 1 at NAF El Centro would result in avoided emissions of CO_2e, NO_X, and SO_2 by reducing the consumption of grid-supplied electricity. Subsequent years of operation would also avoid emissions produced from conventional non-renewable generating sources. Table 2 shows the estimated emissions avoided from the ground-mounted solar photovoltaic system at NAF El Centro that would be realized by reduced consumption of grid-supplied electricity. Detailed emissions calculations are provided in Appendix B, Table B12.

Table 2 Estimated Annual Emissions Avoided at NAF El Centro with Implementation of Alternative 1 (Preferred Alternative)

Site	County	Emissions Avoided (tons per year)		
		CO_2e	NO_X	SO_2
NAF El Centro	Imperial	2,276	0.24	0.02

Key:
CO_2e = carbon dioxide equivalents
NO_X = oxides of nitrogen
SO_2 = sulfur dioxide

Affected Air Basin: Salton Sea Air Basin, California

Date RONA Prepared: July 2014

RONA Prepared by: Environment and Ecology, Inc.

Proposed Action Exemptions: The Proposed Action is exempt because the calculated total emissions are below the *de minimis* levels set forth in the Clean Air Act General Conformity Rule.

ATTAINMENT AREA STATUS AND EMISSIONS EVALUATION CONCLUSION

The project area at NAF El Centro is located within the Salton Sea Air Basin, which is a federal nonattainment area for 8-hour ozone, PM_{10}, and for $PM_{2.5}$ (based on the EPA Green Book as of January 20, 2014). Based on the data in Table 1, it is concluded that the Clean Air Act General Conformity Rule *de minimis* thresholds for applicable criteria pollutants would not be exceeded as a result of implementation of the Proposed Action at NAF El Centro. Therefore, further formal Conformity Determination procedures are not required, resulting in this RONA.

RONA APPROVAL:

Date: July 24, 2014 Signature: Robert Fischer

Table B1: Alternative 1 - Construction Equipment Activity Assumptions NAF El Centro

Equipment Use Assumptions - Construction

NAF El Centro - Alternative 1 (2015, 2016, or 2017) - Imperial County

Equipment	Purpose	NAF El Centro			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 4 months. Days estimate based on 20 work days per month.
F-150 pickup	general use (personnel transport)	3	3	75	135	30375	na	Assumed 135miles per day (3 hrs @ 45 mph). Pickups are used only to transport personnel to and from site.
forklift	lift haul place materials	1	3	60	na	na	180	
Bobcat or small dozer	grading, stone/soil fill	1	8	30	na	na	240	
trenching machine	4 ft x 3 ft deep trench	1	8	15	na	na	120	2km of trenching for electrical lines
dump truck	brings in stone/soil fill, hauls away demo'd material	1	8	7	100	700	na	Estimate that trucks will bring in fill and place at strategic spots. Bobcat will distribute.
scraper	grading at site	1	8	7	na	na	56	Scraper hp assumed to be between 600 hp and 750 hp
pile driver	driving posts into ground	1	8	15	na	na	120	Pile driver hp assumed to be between 100 hp and 175 hp
Truck mounted mobile crane	installing parts	1	8	30	na	na	240	Crane hp assumed to be between 175 hp and 300 hp
Delivery truck	delivers panels/parts	10	3	1	135	1350	na	Assumed 135 miles per day (3hrs @ 45 mph). One delivery truck = 300 panels.
welding machine	small, for installing support fixtures	2	8	15	na	na	240	
backhoe	dig excavate foundation for new sites	2	8	30	na	na	480	
Water Truck	dust suppression	1	8	15	100	1500	na	

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Bulldozer	Paving Machine	Roller	Scraper	Other Const. Equip	Cranes
Total Hrs Used (year?)	180	480	240	120	240	0	0	0	56	120	240

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	30375	3550

Table B6: Alternative 1 - Fugitive Dust from Construction Activity

Site	County	Variables for Fugitive Dust from Construction Activity					
		D months	A acres	EF ton PM_{10}/acre month	$SF_{2.5}$ na	PM_{10} tons	$PM_{2.5}$ tons
NAF El Centro (2015, 2016, or 2017)	Imperial	4	10.0	0.11	0.100	4.4	0.4
NSA Monterey (2015, 2016, or 2017)	Monterey	na					
NAVWPNSTA Seal Beach (2015, 2016, or 2017)	Orange	4	6.6	0.11	0.100	2.9	0.3
Detachment Norco (2015, 2016, or 2017)	Riverside	6	18.5	0.11	0.100	12.2	1.2
NBVC Port Hueneme (2015, 2016, or 2017)	Ventura	6	1.5	0.11	0.100	1.0	0.1

Variables:

$D = Duration\ of\ soil\ disturbance$

$A = area\ disturbed\ during\ construction$

$SF_{2.5} = scaling\ factor\ to\ predict\ PM_{2.5}\ emissions\ from\ PM_{10}\ emissions\ (Ref.2)$

$EF\ = PM_{10}\ Emission\ factor\ for\ construction\ fugitives\ (Ref.1)$

Equations:

$$PM_{10}(tons) = D(months) \times A(acres) \times EF\left(\frac{ton\ PM_{10}}{acre - month}\right) \quad (Ref.1)$$

$$PM_{2.5}(tons) = PM_{10}(tons) \times SF_{2.5}$$

References:

[1] California Air Resource Board. *ARB Miscellaneous Processes Methodologies - Construction and Demolition, Section 7.7, Building Construction Dust.* September 2002.

[2] MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Table B7: Alternative 1 - Construction Emissions

NAF El Centro - Alternative 1 (2015, 2016, or 2017) - Imperial County

Nonroad Equipment	Hours Of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	180	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.017	0.001	0.001	0.001	0.001	0.001	3.279
Backhoe	480	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.038	0.047	0.008	0.001	0.007	0.007	6.718
Welding machine	240	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.006	0.006	0.001	0.000	0.001	0.001	0.819
Trenching machine	120	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.010	0.002	0.001	0.000	0.001	0.001	1.585
Bobcat or small dozer	240	Diesel	69.074	12.032	3.565	2.026	3.815	3.700	12081.777	0.018	0.003	0.001	0.001	0.001	0.001	3.196
Scraper	56	Diesel	806.506	476.535	65.789	39.660	78.329	75.979	217584.423	0.050	0.029	0.004	0.002	0.005	0.005	13.431
Pile driver	120	Diesel	178.507	72.298	17.886	8.136	21.289	20.650	43559.575	0.024	0.010	0.002	0.001	0.003	0.003	5.762
Truck-mounted mobile crane	240	Diesel	170.885	37.891	17.834	9.630	15.536	15.070	54224.422	0.045	0.010	0.005	0.003	0.004	0.004	14.345

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
F-150 Pickup Truck	30375	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.005	0.040	0.001	0.000	0.000	0.000	16.199
Dump/Delivery/Water Truck	3550	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.017	0.001	0.000	0.000	0.000	0.000	4.688

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	10		Refer to Table C2					4.40	0.44	

Total NAF El Centro - Alternative 1 (2015, 2016, or 2017)	**0.230**	**0.151**	**0.024**	**0.009**	**4.423**	**0.462**	**70.022**

Table B12: Alternative 1 - Emission Reductions from Renewable Energy

Site	County	Year Reductions Begin	Output	WECC California Year 2009 Subregion Non-Baseload Output Emission Rates (lb/MWh)					Emissions Reductions (tons per year)					
			MWh/yr	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2e
NAF El Centro	Imperial	2016, 2017,or 2018	1495	993.890	33.520	4.070	0.321	0.032	742.93	25.06	3.04	0.24	0.02	2276
NSA Monterey	Monterey	2016, 2017,or 2018	2164						1075.39	36.27	4.40	0.35	0.03	3294
NAVWPNSTA Seal Beach	Orange	2016, 2017,or 2018	721						358.30	12.08	1.47	0.12	0.01	1098
Detachment Norco	Riverside	2016, 2017,or 2018	2164						1075.39	36.27	4.40	0.35	0.03	3294
NBVC Port Hueneme	Ventura	2016, 2017,or 2018	433						215.18	7.26	0.88	0.07	0.01	659

	CO_2	CH_4	N_2O
GWP	1	25	298

Variables:

$EO = Total\ output\ in\ megawat\ hours\ per\ year\ (MWh/yr)$

$EF = WECC\ California\ year\ 2009\ subregion\ non-baseload\ output\ emission\ rate\ in\ pounds\ per\ megawatt\ hours\ (lb/MWh)\quad (Ref.1)$

$ER = Emission\ Reductions\ in\ tons\ per\ year\ (tpy)$

$CO_2e = Carbon\ dioxide\ equivalent$

$GHG_i = Mass\ emissions\ of\ each\ greenhouse\ gas$

$GWP_i = Global\ warming\ potentail\ for\ each\ greenhouse\ gas\quad (Ref.2)$

Equations:

$$ER(tpy) = EO\left({}^{MWh}/_{yr}\right) \times EF\left({}^{lb}/_{MWh}\right) \times \left(\frac{1\ ton}{2000\ lb}\right)$$

$$CO_2e = \sum_{i=1}^{n} GHG_i \times GWP_i \quad (Ref.2)$$

References:

[1]US EPA. The Emissions & Generation Resource Integrated Database for 2012 (eGRID 2012). April 2012

[2]40 CFR Part 98, Mandatory Greenhouse Gas Reporting, Subpart A

Table B13: Alternative 2 - Construction Equipment Activity Assumptions NAF El Centro

Equipment Use Assumptions - Construction

NAF El Centro - Alternative 2 (2015, 2016, or 2017) - Imperial County

Equipment	Purpose	NAF El Centro			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 4 months. Days estimate based on 20 work days per month.
F-150 pickup	general use (personnel transport)	3	3	60	135	24300	na	Assumed 135miles per day (3 hrs @ 45 mph). Pickups are used only to transport personnel to and from site.
forklift	lift haul place materials	1	3	50	na	na	150	
Bobcat or small dozer	grading, stone/soil fill	1	8	25	na	na	200	
trenching machine	4 ft x 3 ft deep trench	1	8	12	na	na	96	2km of trenching for electrical lines
dump truck	brings in stone/soil fill, hauls away demo'd material	1	8	7	100	700	na	Estimate that trucks will bring in fill and place at strategic spots. Bobcat will distribute.
scraper	grading at site	1	8	7	na	na	56	Scraper hp assumed to be between 600 hp and 750 hp
pile driver	driving posts into ground	1	8	12	na	na	96	Pile driver hp assumed to be between 100 hp and 175 hp
Truck mounted mobile crane	installing parts	1	8	25	na	na	200	Crane hp assumed to be between 175 hp and 300 hp
Delivery truck	delivers panels/parts	10	3	1	135	1350	na	Assumed 135 miles per day (3hrs @ 45 mph). One delivery truck = 300 panels.
welding machine	small, for installing support fixtures	2	8	12	na	na	192	
backhoe	dig excavate foundation for new sites	2	8	25	na	na	400	
Water Truck	dust suppression	1	8	12	100	1200	na	

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Bulldozer	Paving Machine	Roller	Scraper	Other Const. Equip	Cranes
Total Hrs Used (year?)	150	400	192	96	200	0	0	0	56	96	200

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	24300	3250

Table B18: Alternative 2 - Fugitive Dust from Construction Activity

Site	County	Variables for Fugitive Dust from Construction Activity					
		D months	A acres	EF ton PM_{10}/acre month	$SF_{2.5}$ na	PM_{10} tons	$PM_{2.5}$ tons
NAF El Centro (2015, 2016, or 2017)	Imperial	4	10.0	0.11	0.100	4.4	0.4
NSA Monterey (2015, 2016, or 2017)	Monterey	na					
NAVWPNSTA Seal Beach (2015, 2016, or 2017)	Orange	4	6.5	0.11	0.100	2.9	0.3
Detachment Norco (2015, 2016, or 2017)	Riverside	6	18.5	0.11	0.100	12.2	1.2
NBVC Port Hueneme (2015, 2016, or 2017)	Ventura	6	1.5	0.11	0.100	1.0	0.1

Variables:

$D = Duration\ of\ soil\ disturbance$

$A = area\ disturbed\ during\ construction$

$SF_{2.5} = scaling\ factor\ to\ predict\ PM_{2.5}\ emissions\ from\ PM_{10}\ emissions\ (Ref.2)$

$EF\ = PM_{10}\ Emission\ factor\ for\ construction\ fugitives\ (Ref.1)$

Equations:

$$PM_{10}(tons) = D(months) \times A(acres) \times EF\left(\frac{ton\ PM_{10}}{acre - month}\right) \quad (Ref.1)$$

$$PM_{2.5}(tons) = PM_{10}(tons) \times SF_{2.5}$$

References:

[1] California Air Resource Board. *ARB Miscellaneous Processes Methodologies - Construction and Demolition, Section 7.7, Building Construction Dust.* September 2002.

[2] MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Table B19: Alternative 2 - Construction Emissions

NAF El Centro - Alternative 2 (2015, 2016, or 2017) - Imperial County

Nonroad Equipment	Hours Of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	150	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.014	0.001	0.001	0.000	0.001	0.001	2.733
Backhoe	400	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.032	0.040	0.006	0.001	0.006	0.006	5.598
Welding machine	192	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.005	0.005	0.001	0.000	0.001	0.001	0.655
Trenching machine	96	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.008	0.002	0.000	0.000	0.000	0.000	1.268
Bobcat or small dozer	200	Diesel	69.074	12.032	3.565	2.026	3.815	3.700	12081.777	0.015	0.003	0.001	0.000	0.001	0.001	2.664
Scraper	56	Diesel	806.506	476.535	65.789	39.660	78.329	75.979	217584.423	0.050	0.029	0.004	0.002	0.005	0.005	13.431
Pile driver	96	Diesel	178.507	72.298	17.886	8.136	21.289	20.650	43559.575	0.019	0.008	0.002	0.001	0.002	0.002	4.609
Truck-mounted mobile crane	200	Diesel	170.885	37.891	17.834	9.630	15.536	15.070	54224.422	0.038	0.008	0.004	0.002	0.003	0.003	11.954

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
F-150 Pickup Truck	24300	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.004	0.032	0.001	0.000	0.000	0.000	12.959
Dump/Delivery/Water Truck	3250	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.015	0.001	0.000	0.000	0.000	0.000	4.292

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	10		Refer to Table C2					4.40	0.44	

Total NAF El Centro - Alternative 1 (2015, 2016, or 2017)	**0.199**	**0.129**	**0.020**	**0.008**	**4.420**	**0.459**	**60.163**

Table B24: Alternative 2 - Emission Reductions from Renewable Energy

Site	County	Year Reductions Begin	Output	WECC California Year 2009 Subregion Non-Baseload Output Emission Rates (lb/MWh)					Emissions Reductions (tons per year)					
			MWh/yr	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2e
NAF El Centro	Imperial	2016, 2017,or 2018	433	993.890	33.520	4.070	0.321	0.032	215.18	7.26	0.88	0.07	0.01	659
NSA Monterey	Monterey	2016, 2017,or 2018	1875						931.77	31.43	3.82	0.30	0.03	2854
NAVWPNSTA Seal Beach	Orange	2016, 2017,or 2018	721						358.30	12.08	1.47	0.12	0.01	1098
Detachment Norco	Riverside	2016, 2017,or 2018	2164						1075.39	36.27	4.40	0.35	0.03	3294
NBVC Port Hueneme	Ventura	2016, 2017,or 2018	433						215.18	7.26	0.88	0.07	0.01	659

	CO_2	CH_4	N_2O
GWP	1	25	298

Variables:

$EO = Total\ output\ in\ megawat\ hours\ per\ year\ (MWh/yr)$

$EF = WECC\ California\ year\ 2009\ subregion\ non-baseload\ output\ emission\ rate\ in\ pounds\ per\ megawatt\ hours\ (lb/MWh)\quad (Ref.1)$

$ER = Emission\ Reductions\ in\ tons\ per\ year\ (tpy)$

$CO_2e = Carbon\ dioxide\ equivalent$

$GHG_i = Mass\ emissions\ of\ each\ greenhouse\ gas$

$GWP_i = Global\ warming\ potentail\ for\ each\ greenhouse\ gas\quad (Ref.2)$

Equations:

$$ER(tpy) = EO\left({}^{MWh}/_{yr}\right) \times EF\left({}^{lb}/_{MWh}\right) \times \left(\frac{1\ ton}{2000\ lb}\right)$$

$$CO_2e = \sum_{i=1}^{n} GHG_i \times GWP_i \quad (Ref.2)$$

References:

[1]US EPA. The Emissions & Generation Resource Integrated Database for 2012 (eGRID 2012). April 2012

[2]40 CFR Part 98, Mandatory Greenhouse Gas Reporting, Subpart A

CLEAN AIR ACT - GENERAL CONFORMITY RULE
RECORD OF NON-APPLICABILITY (RONA)

FOR
CONSTRUCTION AND OPERATION OF A SOLAR PHOTOVOLTAIC SYSTEM AT NAVWPNSTA SEAL BEACH

NAVWPNSTA SEAL BEACH
SEAL BEACH, CALIFORNIA

JANUARY 2015

PREPARED FOR

U.S. Department of the Navy
Navy Region Southwest
San Diego County, California

PREPARED BY

Ecology and Environment, Inc.
401 West A Street, Suite 775
San Diego, California 92101

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PROPOSED ACTION

The proposed action falls under the Record of Non-Applicability (RONA) category and is documented with this RONA.

Action Proponent: Commanding Officer, NAVWPNSTA Seal Beach, Seal Beach, California

Location: Seal Beach, Orange County, California

Proposed Action Name: Construction and operation of a solar photovoltaic system at NAVWPNSTA Seal Beach, Seal Beach, California

PROPOSED ACTION AND EMISSIONS SUMMARY

PROPOSED ACTION

Under the Proposed Action, the Navy would install a ground-mounted solar photovoltaic system that would generate 500 kilowatts of alternating current renewable energy at NAVWPNSTA Seal Beach. The generation facility would be located on 6.62 acres (2.67 hectares). The project is needed to contribute towards the Navy's overall compliance with the Secretary of the Navy's renewable energy goals and the National Defense Authorization Act.

Alternative 1 (Preferred Alternative):

- Construct and operate a ground-mounted solar photovoltaic system that would generate 500 kilowatts of alternating current renewable energy. The total output from the generation facility would be 432.7 megawatt hours per year;
- The ground-mounted system would occupy all of the space contained within its fence line, and ground disturbance would occur throughout the 6.62-acre (2.67-hectare) solar panel array site; and,
- Construction of the ground-mounted solar photovoltaic system is expected to occur between 2015 and 2017. Due to external factors, the exact construction date cannot be determined at this time.

EMISSIONS SUMMARY

Air quality impacts associated with the Proposed Action are related to emissions that would occur during construction of the ground-mounted solar photovoltaic system at NAVWPNSTA Seal Beach. The principal sources of pollutants during construction would be the construction equipment, construction crew commuting vehicles, and earth-moving activities.

Construction

Construction for the installation of ground-mounted solar photovoltaic systems associated with Alternative 1 at NAVWPNSTA Seal Beach is estimated to take place over a four-month period; therefore, all construction emissions will be considered to occur in one year for the General Conformity analysis. While construction emissions are assumed to occur between 2015 and 2017, due to external factors, the exact construction date cannot be determined at this time.

Table 1 compares the maximum estimated emissions for the Proposed Action at NAVWPNSTA Seal Beach with the *de minimis* annual emissions thresholds set forth for the South Coast Air Basin (per EPA General Conformity Rule and OPNAVINST 5090.1B Change-3, Appendix F, Clean Air Act General Conformity Guidance). Based on the air quality analysis, the maximum estimated emissions for the Proposed Action at NAVWPNSTA Seal Beach would be below general conformity *de minimis* levels for all criteria pollutants for the South Coast Air Basin. Therefore, implementation of Alternative 1 at NAVWPNSTA Seal Beach would result in negligible, localized, short-term effects on air quality during construction, and impacts from Alternative 1 during construction would not be significant.

Table 1 Estimated Construction Emissions at NAVWPNSTA Seal Beach Compared to *de minimis* Emissions for Nonattainment and Attainment/Maintenance Criteria Pollutants in the South Coast Air Basin[1]

Site	County	Emissions (tons per year)						
		NOx	CO	VOCs	SO_2	PM_{10}	$PM_{2.5}$	CO_2
NAVWPNSTA Seal Beach	Orange	0.11	0.08	0.01	0.00	2.92	0.30	31.53
General Conformity *de minimis* Threshold		10	N/A	10	N/A	70	100	N/A

Key:
CO = carbon monoxide
CO_2 = carbon dioxide
N/A = not applicable
NO_X = oxides of nitrogen
$PM_{2.5}$ = fine particulate matter less than or equal to 2.5 microns in diameter
PM_{10} = suspended particulate matter less than or equal to 10 microns in diameter
SO_2 = sulfur dioxide
VOCs = volatile organic compounds

Note:
[1] 40 CFR 93. The South Coast Air Basin is classified as extreme nonattainment for O_3, nonattainment for PM_{10} and nonattainment for $PM_{2.5}$.

Detailed construction and demolition equipment assumptions, fugitive dust emission calculations, and emissions calculations are provided in Appendix B, Tables B3, B6, and B9, respectively.

Operations

Long-term operation of Alternative 1 at NAVWPNSTA Seal Beach would result in avoided emissions of CO_2e, NO_X, and SO_2 by reducing consumption of grid-supplied electricity. Subsequent years of operation would also avoid emissions produced from conventional non-renewable generating sources. Table 2 shows the estimated emissions avoided from the ground-mounted solar photovoltaic system at NAVWPNSTA Seal Beach that would be realized by reduced consumption of grid-supplied electricity. Detailed emissions calculations are provided in Appendix B, Table B12.

Table 2 Estimated Annual Emissions Avoided at NAVWPNSTA Seal Beach with Implementation of Alternative 1 (Preferred Alternative)

Site	County	Emissions Avoided (tons per year)		
		CO_2e	NO_X	SO_2
NAVWPNSTA Seal Beach	Orange	1,098	0.12	0.01

Key:
CO_2e = carbon dioxide equivalents
NO_X = oxides of nitrogen
SO_2 = sulfur dioxide

Affected Air Basin: South Coast Air Basin, California

Date RONA Prepared: July 2014

RONA Prepared by: Environment and Ecology, Inc.

Proposed Action Exemptions: The Proposed Action is exempt because the calculated total emissions are below the *de minimis* levels set forth in the Clean Air Act General Conformity Rule.

ATTAINMENT AREA STATUS AND EMISSIONS EVALUATION CONCLUSION

The project area at NAVWPNSTA Seal Beach is located within the South Coast Air Basin, which is a federal nonattainment area for 8-hour ozone, PM_{10}, and for $PM_{2.5}$ and a maintenance area for NO_2 and CO (based on the EPA Green Book as of January 20, 2014). Based on the data in Table 1, it is concluded that the Clean Air Act General Conformity Rule *de minimis* thresholds for applicable criteria pollutants would not be exceeded as a result of implementation of the Proposed Action at NAVWPNSTA Seal Beach. Therefore, further formal Conformity Determination procedures are not required, resulting in this RONA.

RONA APPROVAL:

Date: _20 January 2015_____ Signature: _____

Julian Ibarra
Naval Weapons Station Seal Beach
Air Program Manager
By direction of the Commanding Officer

Table B3: Alternative 1 - Construction Equipment Activity Assumptions NAVWPNSTA Seal Beach

Equipment Use Assumptions - Construction

NAVWPNSTA Seal Beach - Alternative 1 (2015, 2016, or 2017) - Orange County

Equipment		NAVWPNSTA Seal Beach			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 4 months. Days estimate based on 20 work days per month.
Delivery truck	delivers panels/parts	5	3	1	135	675	na	Assumed 135 miles per day (3 hrs @45 mph). One delivery truck = 300 panels.
F-150 pick up	general use	3	3	30	135	12150	na	Assumed 135 miles per day (3 hrs @45 mph) Pickups are used only to transport personnel to and from site.
forklift	lift/haul/place materials	1	3	40	na	na	120	
backhoe	dig/excavate foundation for new sites	2	8	15	na	na	240	
bobcat or small dozer	grading, stone/soil fill	1	8	15	na	na	120	
trenching machine	4 ft wide x 3 ft deep trench	1	8	10	na	na	80	1 km of trenching for electrical lines
dump truck	brings in stone/soil fill, hauls away demo'd	1	8	5	100	500	na	Estimate that trucks will bring in fill and place at strategic spots. Bobcat will distribute.
welding machine	small, for installing support fixtures	2	8	10	na	na	160	
scraper	grading at site	1	8	5	na	na	40	Scraper hp assumed to be between 600 hp and 750 hp
pile driver	moving dirt	1	8	10	na	na	80	Pile driver hp assumed to be between 100 hp and 175 hp
water truck	dust suppression	1	8	10	100	1000	na	

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Bulldozer	Paving Machine	Roller	Scraper	Other Const. Equip	Cranes
Total Hrs Used (year?)	120	240	160	80	120	0	0	0	40	80	0

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	12150	2175

Table B6: Alternative 1 - Fugitive Dust from Construction Activity

Site	County	Variables for Fugitive Dust from Construction Activity					
		D months	A acres	EF ton PM_{10}/acre month	$SF_{2.5}$ na	PM_{10} tons	$PM_{2.5}$ tons
NAF El Centro (2015, 2016, or 2017)	Imperial	4	10.0	0.11	0.100	4.4	0.4
NSA Monterey (2015, 2016, or 2017)	Monterey	na					
NAVWPNSTA Seal Beach (2015, 2016, or 2017)	Orange	4	6.6	0.11	0.100	2.9	0.3
Detachment Norco (2015, 2016, or 2017)	Riverside	6	18.5	0.11	0.100	12.2	1.2
NBVC Port Hueneme (2015, 2016, or 2017)	Ventura	6	1.5	0.11	0.100	1.0	0.1

Variables:

$D = Duration\ of\ soil\ disturbance$

$A = area\ disturbed\ during\ construction$

$SF_{2.5} = scaling\ factor\ to\ predict\ PM_{2.5}\ emissions\ from\ PM_{10}\ emissions\ (Ref.2)$

$EF\ = PM_{10}\ Emission\ factor\ for\ construction\ fugitives\ (Ref.1)$

Equations:

$$PM_{10}(tons) = D(months) \times A(acres) \times EF\left(\frac{ton\ PM_{10}}{acre - month}\right) \quad (Ref.1)$$

$$PM_{2.5}(tons) = PM_{10}(tons) \times SF_{2.5}$$

References:

[1] California Air Resource Board. *ARB Miscellaneous Processes Methodologies - Construction and Demolition, Section 7.7, Building Construction Dust.* September 2002.

[2] MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Table B9: Alternative 1 - Construction Emissions

NAVWPNSTA Seal Beach - Alternative 1 (2015, 2016, or 2017) - Orange County

Nonroad Equipment	Hours of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	120	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.011	0.001	0.001	0.000	0.001	0.001	2.186
Backhoe	240	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.019	0.024	0.004	0.001	0.004	0.004	3.359
Bobcat or small dozer	120	Diesel	69.074	12.032	3.565	2.026	3.815	3.700	12081.777	0.009	0.002	0.000	0.000	0.001	0.000	1.598
Trenching machine	80	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.006	0.001	0.000	0.000	0.000	0.000	1.057
Welding machine	160	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.004	0.004	0.001	0.000	0.001	0.001	0.546
Scraper	40	Diesel	806.506	476.535	65.789	39.660	78.329	75.979	217584.423	0.036	0.021	0.003	0.002	0.003	0.003	9.594
Pile driver	80	Diesel	178.507	72.298	17.886	8.136	21.289	20.650	43559.575	0.016	0.006	0.002	0.001	0.002	0.002	3.841

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
Pickup Truck	12150	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.002	0.016	0.000	0.000	0.000	0.000	6.479
Dump/Delivery/Water Truck	2175	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.010	0.001	0.000	0.000	0.000	0.000	2.872

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	6.6		Refer to Table C2					2.91	0.29	

Total - NAVWPNSTA Seal Beach - Alternative 1 (2015, 2016, or 2017)	**0.114**	**0.076**	**0.011**	**0.004**	**2.924**	**0.302**	**31.532**

Table B12: Alternative 1 - Emission Reductions from Renewable Energy

Site	County	Year Reductions Begin	Output	WECC California Year 2009 Subregion Non-Baseload Output Emission Rates (lb/MWh)					Emissions Reductions (tons per year)					
			MWh/yr	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2e
NAF El Centro	Imperial	2016, 2017,or 2018	1495	993.890	33.520	4.070	0.321	0.032	742.93	25.06	3.04	0.24	0.02	2276
NSA Monterey	Monterey	2016, 2017,or 2018	2164						1075.39	36.27	4.40	0.35	0.03	3294
NAVWPNSTA Seal Beach	Orange	2016, 2017,or 2018	721						358.30	12.08	1.47	0.12	0.01	1098
Detachment Norco	Riverside	2016, 2017,or 2018	2164						1075.39	36.27	4.40	0.35	0.03	3294
NBVC Port Hueneme	Ventura	2016, 2017,or 2018	433						215.18	7.26	0.88	0.07	0.01	659

	CO_2	CH_4	N_2O
GWP	1	25	298

Variables:

$EO = Total\ output\ in\ megawat\ hours\ per\ year\ (MWh/yr)$

$EF = WECC\ California\ year\ 2009\ subregion\ non-baseload\ output\ emission\ rate\ in\ pounds\ per\ megawatt\ hours\ (lb/MWh)\quad (Ref.1)$

$ER = Emission\ Reductions\ in\ tons\ per\ year\ (tpy)$

$CO_2e = Carbon\ dioxide\ equivalent$

$GHG_i = Mass\ emissions\ of\ each\ greenhouse\ gas$

$GWP_i = Global\ warming\ potentail\ for\ each\ greenhouse\ gas\quad (Ref.2)$

Equations:

$$ER(tpy) = EO\left({}^{MWh}/_{yr}\right) \times EF\left({}^{lb}/_{MWh}\right) \times \left(\frac{1\ ton}{2000\ lb}\right)$$

$$CO_2e = \sum_{i=1}^{n} GHG_i \times GWP_i \quad (Ref.2)$$

References:

[1]US EPA. The Emissions & Generation Resource Integrated Database for 2012 (eGRID 2012). April 2012

[2]40 CFR Part 98, Mandatory Greenhouse Gas Reporting, Subpart A

Table B15: Alternative 2 - Construction Equipment Activity Assumptions NAVWPNSTA Seal Beach

Equipment Use Assumptions - Construction

NAVWPNSTA Seal Beach - Alternative 2 (2015, 2016, or 2017) - Orange County

Equipment		NAVWPNSTA Seal Beach			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 4 months. Days estimate based on 20 work days per month.
Delivery truck	delivers panels/parts	5	3	1	135	675	na	Assumed 135 miles per day (3 hrs @45 mph). One delivery truck = 300 panels.
F-150 pick up	general use	3	3	30	135	12150	na	Assumed 135 miles per day (3 hrs @45 mph) Pickups are used only to transport personnel to and from site.
forklift	lift/haul/place materials	1	3	40	na	na	120	
backhoe	dig/excavate foundation for new sites	2	8	15	na	na	240	
bobcat or small dozer	grading, stone/soil fill	1	8	15	na	na	120	
trenching machine	4 ft wide x 3 ft deep trench	1	8	10	na	na	80	1 km of trenching for electrical lines
dump truck	brings in stone/soil fill, hauls away demo'd	1	8	5	100	500	na	Estimate that trucks will bring in fill and place at strategic spots. Bobcat will distribute.
welding machine	small, for installing support fixtures	2	8	10	na	na	160	
scraper	grading at site	1	8	5	na	na	40	Scraper hp assumed to be between 600 hp and 750 hp
pile driver	moving dirt	1	8	10	na	na	80	Pile driver hp assumed to be between 100 hp and 175 hp
water truck	dust suppression	1	8	10	100	1000	na	

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Bulldozer	Paving Machine	Roller	Scraper	Other Const. Equip	Cranes
Total Hrs Used (year?)	120	240	160	80	120	0	0	0	40	80	0

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	12150	2175

Table B18: Alternative 2 - Fugitive Dust from Construction Activity

Site	County	Variables for Fugitive Dust from Construction Activity					
		D months	A acres	EF ton PM_{10}/acre month	$SF_{2.5}$ na	PM_{10} tons	$PM_{2.5}$ tons
NAF El Centro (2015, 2016, or 2017)	Imperial	4	10.0	0.11	0.100	4.4	0.4
NSA Monterey (2015, 2016, or 2017)	Monterey	na					
NAVWPNSTA Seal Beach (2015, 2016, or 2017)	Orange	4	6.5	0.11	0.100	2.9	0.3
Detachment Norco (2015, 2016, or 2017)	Riverside	6	18.5	0.11	0.100	12.2	1.2
NBVC Port Hueneme (2015, 2016, or 2017)	Ventura	6	1.5	0.11	0.100	1.0	0.1

Variables:

$D = Duration\ of\ soil\ disturbance$

$A = area\ disturbed\ during\ construction$

$SF_{2.5} = scaling\ factor\ to\ predict\ PM_{2.5}\ emissions\ from\ PM_{10}\ emissions\ (Ref.2)$

$EF\ = PM_{10}\ Emission\ factor\ for\ construction\ fugitives\ (Ref.1)$

Equations:

$$PM_{10}(tons) = D(months) \times A(acres) \times EF\left(\frac{ton\ PM_{10}}{acre - month}\right) \quad (Ref.1)$$

$$PM_{2.5}(tons) = PM_{10}(tons) \times SF_{2.5}$$

References:

[1] California Air Resource Board. *ARB Miscellaneous Processes Methodologies - Construction and Demolition, Section 7.7, Building Construction Dust.* September 2002.

[2] MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Table B21: Alternative 2 - Construction Emissions

NAVWPNSTA Seal Beach - Alternative 2 (2015, 2016, or 2017) - Orange County

Nonroad Equipment	Hours of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	120	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.011	0.001	0.001	0.000	0.001	0.001	2.186
Backhoe	240	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.019	0.024	0.004	0.001	0.004	0.004	3.359
Bobcat or small dozer	120	Diesel	69.074	12.032	3.565	2.026	3.815	3.700	12081.777	0.009	0.002	0.000	0.000	0.001	0.000	1.598
Trenching machine	80	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.006	0.001	0.000	0.000	0.000	0.000	1.057
Welding machine	160	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.004	0.004	0.001	0.000	0.001	0.001	0.546
Scraper	40	Diesel	806.506	476.535	65.789	39.660	78.329	75.979	217584.423	0.036	0.021	0.003	0.002	0.003	0.003	9.594
Pile driver	80	Diesel	178.507	72.298	17.886	8.136	21.289	20.650	43559.575	0.016	0.006	0.002	0.001	0.002	0.002	3.841

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
Pickup Truck	12150	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.002	0.016	0.000	0.000	0.000	0.000	6.479
Dump/Delivery/Water Truck	2175	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.010	0.001	0.000	0.000	0.000	0.000	2.872

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	6.5		Refer to Table C2					2.87	0.29	

Total - NAVWPNSTA Seal Beach - Alternative 1 (2015, 2016, or 2017)	**0.114**	**0.076**	**0.011**	**0.004**	**2.884**	**0.298**	**31.532**

Table B24: Alternative 2 - Emission Reductions from Renewable Energy

Site	County	Year Reductions Begin	Output	WECC California Year 2009 Subregion Non-Baseload Output Emission Rates (lb/MWh)					Emissions Reductions (tons per year)					
			MWh/yr	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2e
NAF El Centro	Imperial	2016, 2017,or 2018	433	993.890	33.520	4.070	0.321	0.032	215.18	7.26	0.88	0.07	0.01	659
NSA Monterey	Monterey	2016, 2017,or 2018	1875						931.77	31.43	3.82	0.30	0.03	2854
NAVWPNSTA Seal Beach	Orange	2016, 2017,or 2018	721						358.30	12.08	1.47	0.12	0.01	1098
Detachment Norco	Riverside	2016, 2017,or 2018	2164						1075.39	36.27	4.40	0.35	0.03	3294
NBVC Port Hueneme	Ventura	2016, 2017,or 2018	433						215.18	7.26	0.88	0.07	0.01	659

	CO_2	CH_4	N_2O
GWP	1	25	298

Variables:

$EO = Total\ output\ in\ megawat\ hours\ per\ year\ (MWh/yr)$

$EF = WECC\ California\ year\ 2009\ subregion\ non-baseload\ output\ emission\ rate\ in\ pounds\ per\ megawatt\ hours\ (lb/MWh)\quad (Ref.1)$

$ER = Emission\ Reductions\ in\ tons\ per\ year\ (tpy)$

$CO_2e = Carbon\ dioxide\ equivalent$

$GHG_i = Mass\ emissions\ of\ each\ greenhouse\ gas$

$GWP_i = Global\ warming\ potentail\ for\ each\ greenhouse\ gas\quad (Ref.2)$

Equations:

$$ER(tpy) = EO\left({}^{MWh}/_{yr}\right) \times EF\left({}^{lb}/_{MWh}\right) \times \left(\frac{1\ ton}{2000\ lb}\right)$$

$$CO_2e = \sum_{i=1}^{n} GHG_i \times GWP_i \quad (Ref.2)$$

References:

[1]US EPA. The Emissions & Generation Resource Integrated Database for 2012 (eGRID 2012). April 2012

[2]40 CFR Part 98, Mandatory Greenhouse Gas Reporting, Subpart A

CLEAN AIR ACT - GENERAL CONFORMITY RULE
RECORD OF NON-APPLICABILITY (RONA)

FOR
CONSTRUCTION AND OPERATION OF
SOLAR PHOTOVOLTAIC SYSTEMS AT
NAVWPNSTA SEAL BEACH DETACHMENT NORCO

NAVWPNSTA SEAL BEACH DETACHMENT NORCO
NORCO, CALIFORNIA

JANUARY 2015

PREPARED FOR

U.S. Department of the Navy
Navy Region Southwest
San Diego County, California

PREPARED BY

Ecology and Environment, Inc.
401 West A Street, Suite 775
San Diego, California 92101

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PROPOSED ACTION

The proposed action falls under the Record of Non-Applicability (RONA) category and is documented with this RONA.

Action Proponent: Commanding Officer, NAVWPNSTA Seal Beach Detachment Norco, Norco, California

Location: Norco, Riverside County, California

Proposed Action Name: Construction and operation of solar photovoltaic systems at NAVWPNSTA Seal Beach Detachment Norco, Norco, California

PROPOSED ACTION AND EMISSIONS SUMMARY

PROPOSED ACTION

Under the Proposed Action, the Navy would install up to two ground-mounted solar photovoltaic systems rated at 1,500-kilowatt capacity at NAVWPNSTA Seal Beach Detachment Norco. The generation facilities would be located in two separate areas of approximately 8.5 and 10 acres (3.4 and 4 hectares). The project is needed to contribute towards the Navy's overall compliance with the Secretary of the Navy's renewable energy goals and the National Defense Authorization Act.

Alternative 1 (Preferred Alternative):

- Construct and operate up to two ground-mounted solar photovoltaic systems that would generate 1,500 kilowatts of alternating current renewable energy. The total output from the generation facilities would be approximately 2,250 megawatt hours per year;
- The ground-mounted systems would occupy all of the space contained within its fence lines, and ground disturbance would occur throughout the approximately 8.5- and 10-acre (3.4- and 4-hectare) solar panel array sites; and,
- Construction of the ground-mounted solar photovoltaic system is expected to occur between 2015 and 2017. Due to external factors, the exact construction date cannot be determined at this time.

EMISSIONS SUMMARY

Air quality impacts associated with the Proposed Action are related to emissions that would occur during construction of the ground-mounted solar photovoltaic systems at NAVWPNSTA Seal Beach Detachment Norco. The principal sources of pollutants during construction would be the construction equipment, construction crew commuting vehicles, and earth-moving activities.

Construction

Construction for the installation of ground-mounted solar photovoltaic systems associated with Alternative 1 at NAVWPNSTA Seal Beach Detachment Norco is estimated to take place over a six-month period; therefore, all construction emissions will be considered to occur in one year for the General Conformity analysis. While construction emissions are assumed to occur between 2015 and 2017, due to external factors, the exact construction date cannot be determined at this time.

Table 1 compares the maximum estimated emissions for the Proposed Action at NAVWPNSTA Seal Beach Detachment Norco with the *de minimis* annual emissions thresholds set forth for the South Coast Air Basin (per EPA General Conformity Rule and OPNAVINST 5090.1B Change-3, Appendix F, Clean Air Act General Conformity Guidance). Based on the air quality analysis, the maximum estimated emissions for the Proposed Action at NAVWPNSTA Seal Beach Detachment Norco would be below general conformity *de minimis* levels for all criteria pollutants for the South Coast Air Basin. Therefore, implementation of Alternative 1 at NAVWPNSTA Seal Beach Detachment Norco would result in minor, localized, short-term effects on air quality during construction, and impacts from Alternative 1 during construction would not be significant.

Table 1 Estimated Construction Emissions at NAVWPNSTA Seal Beach Detachment Norco Compared to *de minimis* Emissions for Nonattainment and Attainment/ Maintenance Criteria Pollutants in the South Coast Air Basin[1]

Site	County	Emissions (tons per year)						
		NOx	CO	VOCs	SO_2	PM_{10}	$PM_{2.5}$	CO_2
NAVWPNSTA Seal Beach Detachment Norco	Riverside	0.24	0.19	0.02	0.01	12.23	1.24	79.85
General Conformity *de minimis* Threshold		10	N/A	10	N/A	70	100	N/A

Key:
CO = carbon monoxide
CO_2 = carbon dioxide
N/A = not applicable
NO_X = oxides of nitrogen
$PM_{2.5}$ = fine particulate matter less than or equal to 2.5 microns in diameter
PM_{10} = suspended particulate matter less than or equal to 10 microns in diameter
SO_2 = sulfur dioxide
VOCs = volatile organic compounds

[1] 40 CFR 93. The South Coast Air Basin is classified as extreme nonattainment for O_3, nonattainment for PM_{10} and nonattainment for $PM_{2.5}$.

Detailed construction and demolition equipment assumptions, fugitive dust emission calculations, and emissions calculations for NAVWPNSTA Seal Beach Detachment Norco are provided in Appendix B, Tables B4, B6, and B10, respectively.

Operations

Long-term operation of Alternative 1 at NAVWPNSTA Seal Beach Detachment Norco would result in avoided emissions of CO_2e, NO_X, and SO_2 by reducing consumption of grid-supplied electricity. Subsequent years of operation would also avoid emissions produced from conventional non-renewable generating sources. Table 2 shows the estimated emissions avoided from the ground-mounted solar photovoltaic system at NAVWPNSTA Seal Beach Detachment Norco that would be realized by reduced consumption of grid-supplied electricity. Detailed emissions calculations are provided in Appendix B, Table B12.

Table 2 Estimated Annual Emissions Avoided at NAVWPNSTA Seal Beach Detachment Norco with Implementation of Alternative 1 (Preferred Alternative)

Site	County	Emissions Avoided (tons per year)		
		CO_2e	NO_X	SO_2
NAVWPNSTA Seal Beach Detachment Norco	Riverside	3,294	0.035	0.03

Key:
CO_2e = carbon dioxide equivalents
NO_X = oxides of nitrogen
SO_2 = sulfur dioxide

Affected Air Basin: South Coast Air Basin, California

Date RONA Prepared: July 2014

RONA Prepared by: Environment and Ecology, Inc.

Proposed Action Exemptions: The Proposed Action is exempt because the calculated total emissions are below the *de minimis* levels set forth in the Clean Air Act General Conformity Rule.

ATTAINMENT AREA STATUS AND EMISSIONS EVALUATION CONCLUSION

The project area at NAVWPNSTA Seal Beach Detachment Norco is located within the South Coast Air Basin, which is a federal nonattainment area for 8-hour ozone, PM_{10}, and $PM_{2.5}$ and a maintenance area for NO_2 and CO (based on the EPA Green Book as of January 20, 2014). Based on the data in Table 1, it is concluded that the Clean Air Act General Conformity Rule *de minimis* thresholds for applicable criteria pollutants would not be exceeded as a result of implementation of the Proposed Action at NAVWPNSTA Seal Beach Detachment Norco. Therefore, further formal Conformity Determination procedures are not required, resulting in this RONA.

RONA APPROVAL:

Date: _20 January 2015 _____ Signature: _____

Julian Ibarra
Naval Weapons Station Seal Beach
Air Program Manager
By direction of the Commanding Officer

Table B4: Alternative 1 - Construction Equipment Activity Assumptions Detachment Norco

Equipment Use Assumptions - Construction

Detachment Norco - Alternative 1 (2015, 2016, or2017) - Riverside County

Equipment		Detachment Norco			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 6 months. Days estimate based on 20 work days per month.
Delivery truck	delivers panels/parts	15	3	1	135	2025	na	Assumed 135 miles per day (3 hrs @45 mph). One delivery truck = 300 panels.
F-150 pick up	general use	5	3	80	135	54000	na	Assumed 135 miles per day (3 hrs @45 mph) Pickups are used only to transport personnel to and from site.
forklift	lift/haul/place materials	2	3	60	na	na	360	
backhoe	dig/excavate foundation for new sites	3	8	30	na	na	720	
bobcat or small dozer	grading, stone/soil fill	1	8	30	na	na	240	
trenching machine	4 ft x 3 ft deep trench	1	8	15	na	na	120	2 km of trenching electrical lines
dump truck	brings in stone/soil fill, hauls away demo'd material	1	6	80	100	8000	na	Estimate that trucks will bring in fill and place at strategic spots. Bobcat will distribute.
welding machine	small, for installing support fixtures?	2	8	30	na	na	480	
scraper	grading at site	1	8	5	na	na	40	Scraper hp assumed to be between 600 hp and 750 hp
pile driver	moving dirt	1	8	10	na	na	80	Pile driver hp assumed to be between 100 hp and 175 hp
water truck	dust suppression	1	8	10	100	1000	na	

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Bulldozer	Paving Machine	Roller	Scraper	Other Const. Equip	Cranes
Total Hrs Used (year?)	360	720	480	120	240	0	0	0	40	80	0

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	54000	11025

Table B6: Alternative 1 - Fugitive Dust from Construction Activity

Site	County	Variables for Fugitive Dust from Construction Activity					
		D months	A acres	EF ton PM_{10}/acre month	$SF_{2.5}$ na	PM_{10} tons	$PM_{2.5}$ tons
NAF El Centro (2015, 2016, or 2017)	Imperial	4	10.0	0.11	0.100	4.4	0.4
NSA Monterey (2015, 2016, or 2017)	Monterey	na					
NAVWPNSTA Seal Beach (2015, 2016, or 2017)	Orange	4	6.6	0.11	0.100	2.9	0.3
Detachment Norco (2015, 2016, or 2017)	Riverside	6	18.5	0.11	0.100	12.2	1.2
NBVC Port Hueneme (2015, 2016, or 2017)	Ventura	6	1.5	0.11	0.100	1.0	0.1

Variables:

$D = Duration\ of\ soil\ disturbance$

$A = area\ disturbed\ during\ construction$

$SF_{2.5} = scaling\ factor\ to\ predict\ PM_{2.5}\ emissions\ from\ PM_{10}\ emissions\ (Ref.2)$

$EF\ = PM_{10}\ Emission\ factor\ for\ construction\ fugitives\ (Ref.1)$

Equations:

$$PM_{10}(tons) = D(months) \times A(acres) \times EF\left(\frac{ton\ PM_{10}}{acre - month}\right) \quad (Ref.1)$$

$$PM_{2.5}(tons) = PM_{10}(tons) \times SF_{2.5}$$

References:

[1] California Air Resource Board. *ARB Miscellaneous Processes Methodologies - Construction and Demolition, Section 7.7, Building Construction Dust.* September 2002.

[2] MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Table B10: Alternative 1 - Construction Emissions

Detachment Norco - Alternative 1 (2015, 2016, or2017) - Riverside County

Nonroad Equipment	Hours of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	360	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.033	0.003	0.002	0.001	0.002	0.002	6.558
Backhoe	720	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.057	0.071	0.012	0.002	0.011	0.011	10.077
Bobcat or small dozer	240	Diesel	69.074	12.032	3.565	2.026	3.815	3.700	12081.777	0.018	0.003	0.001	0.001	0.001	0.001	3.196
Trenching machine	120	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.010	0.002	0.001	0.000	0.001	0.001	1.585
Welding machine	480	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.013	0.012	0.003	0.000	0.002	0.002	1.638
Scraper	40	Diesel	806.506	476.535	65.789	39.660	78.329	75.979	217584.423	0.036	0.021	0.003	0.002	0.003	0.003	9.594
Pile driver	80	Diesel	178.507	72.298	17.886	8.136	21.289	20.650	43559.575	0.016	0.006	0.002	0.001	0.002	0.002	3.841

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
Pickup Truck	54000	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.009	0.072	0.002	0.000	0.000	0.000	28.798
Dump/Delivery/Water Truck	11025	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.052	0.004	0.001	0.000	0.000	0.000	14.559

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	18.5		Refer to Table C2					12.21	1.22	

Total - Detachment Norco - Alternative 1 (2015, 2016, or 2017)	**0.244**	**0.194**	**0.025**	**0.007**	**12.232**	**1.242**	**79.845**

Table B12: Alternative 1 - Emission Reductions from Renewable Energy

Site	County	Year Reductions Begin	Output	WECC California Year 2009 Subregion Non-Baseload Output Emission Rates (lb/MWh)					Emissions Reductions (tons per year)					
			MWh/yr	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2e
NAF El Centro	Imperial	2016, 2017,or 2018	1495	993.890	33.520	4.070	0.321	0.032	742.93	25.06	3.04	0.24	0.02	2276
NSA Monterey	Monterey	2016, 2017,or 2018	2164						1075.39	36.27	4.40	0.35	0.03	3294
NAVWPNSTA Seal Beach	Orange	2016, 2017,or 2018	721						358.30	12.08	1.47	0.12	0.01	1098
Detachment Norco	Riverside	2016, 2017,or 2018	2164						1075.39	36.27	4.40	0.35	0.03	3294
NBVC Port Hueneme	Ventura	2016, 2017,or 2018	433						215.18	7.26	0.88	0.07	0.01	659

	CO_2	CH_4	N_2O
GWP	1	25	298

Variables:

$EO = Total\ output\ in\ megawat\ hours\ per\ year\ (MWh/yr)$

$EF = WECC\ California\ year\ 2009\ subregion\ non-baseload\ output\ emission\ rate\ in\ pounds\ per\ megawatt\ hours\ (lb/MWh)\quad (Ref.1)$

$ER = Emission\ Reductions\ in\ tons\ per\ year\ (tpy)$

$CO_2e = Carbon\ dioxide\ equivalent$

$GHG_i = Mass\ emissions\ of\ each\ greenhouse\ gas$

$GWP_i = Global\ warming\ potentail\ for\ each\ greenhouse\ gas\quad (Ref.2)$

Equations:

$$ER(tpy) = EO\left({}^{MWh}/_{yr}\right) \times EF\left({}^{lb}/_{MWh}\right) \times \left(\frac{1\ ton}{2000\ lb}\right)$$

$$CO_2e = \sum_{i=1}^{n} GHG_i \times GWP_i \quad (Ref.2)$$

References:

[1]US EPA. The Emissions & Generation Resource Integrated Database for 2012 (eGRID 2012). April 2012

[2]40 CFR Part 98, Mandatory Greenhouse Gas Reporting, Subpart A

Table B16: Alternative 2 - Construction Equipment Activity Assumptions Detachment Norco

Equipment Use Assumptions - Construction

Detachment Norco - Alternative 2 (2015, 2016, or2017) - Riverside County

Equipment		Detachment Norco			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 6 months. Days estimate based on 20 work days per month.
Delivery truck	delivers panels/parts	15	3	1	135	2025	na	Assumed 135 miles per day (3 hrs @45 mph). One delivery truck = 300 panels.
F-150 pick up	general use	5	3	80	135	54000	na	Assumed 135 miles per day (3 hrs @45 mph) Pickups are used only to transport personnel to and from site.
forklift	lift/haul/place materials	2	3	60	na	na	360	
backhoe	dig/excavate foundation for new sites	3	8	30	na	na	720	
bobcat or small dozer	grading, stone/soil fill	1	8	30	na	na	240	
trenching machine	4 ft x 3 ft deep trench	1	8	15	na	na	120	2 km of trenching electrical lines
dump truck	brings in stone/soil fill, hauls away demo'd material	1	6	80	100	8000	na	Estimate that trucks will bring in fill and place at strategic spots. Bobcat will distribute.
welding machine	small, for installing support fixtures?	2	8	30	na	na	480	
scraper	grading at site	1	8	5	na	na	40	Scraper hp assumed to be between 600 hp and 750 hp
pile driver	moving dirt	1	8	10	na	na	80	Pile driver hp assumed to be between 100 hp and 175 hp
water truck	dust suppression	1	8	10	100	1000	na	

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Bulldozer	Paving Machine	Roller	Scraper	Other Const. Equip	Cranes
Total Hrs Used (year?)	360	720	480	120	240	0	0	0	40	80	0

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	54000	11025

Table B18: Alternative 2 - Fugitive Dust from Construction Activity

Site	County	Variables for Fugitive Dust from Construction Activity					
		D months	A acres	EF ton PM_{10}/acre month	$SF_{2.5}$ na	PM_{10} tons	$PM_{2.5}$ tons
NAF El Centro (2015, 2016, or 2017)	Imperial	4	10.0	0.11	0.100	4.4	0.4
NSA Monterey (2015, 2016, or 2017)	Monterey	na					
NAVWPNSTA Seal Beach (2015, 2016, or 2017)	Orange	4	6.5	0.11	0.100	2.9	0.3
Detachment Norco (2015, 2016, or 2017)	Riverside	6	18.5	0.11	0.100	12.2	1.2
NBVC Port Hueneme (2015, 2016, or 2017)	Ventura	6	1.5	0.11	0.100	1.0	0.1

Variables:

$D = Duration\ of\ soil\ disturbance$

$A = area\ disturbed\ during\ construction$

$SF_{2.5} = scaling\ factor\ to\ predict\ PM_{2.5}\ emissions\ from\ PM_{10}\ emissions\ (Ref.2)$

$EF\ = PM_{10}\ Emission\ factor\ for\ construction\ fugitives\ (Ref.1)$

Equations:

$$PM_{10}(tons) = D(months) \times A(acres) \times EF\left(\frac{ton\ PM_{10}}{acre - month}\right) \quad (Ref.1)$$

$$PM_{2.5}(tons) = PM_{10}(tons) \times SF_{2.5}$$

References:

[1] California Air Resource Board. *ARB Miscellaneous Processes Methodologies - Construction and Demolition, Section 7.7, Building Construction Dust.* September 2002.

[2] MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Table B22: Alternative 2 - Construction Emissions

Detachment Norco - Alternative 2 (2015, 2016, or2017) - Riverside County

Nonroad Equipment	Hours of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	360	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.033	0.003	0.002	0.001	0.002	0.002	6.558
Backhoe	720	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.057	0.071	0.012	0.002	0.011	0.011	10.077
Bobcat or small dozer	240	Diesel	69.074	12.032	3.565	2.026	3.815	3.700	12081.777	0.018	0.003	0.001	0.001	0.001	0.001	3.196
Trenching machine	120	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.010	0.002	0.001	0.000	0.001	0.001	1.585
Welding machine	480	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.013	0.012	0.003	0.000	0.002	0.002	1.638
Scraper	40	Diesel	806.506	476.535	65.789	39.660	78.329	75.979	217584.423	0.036	0.021	0.003	0.002	0.003	0.003	9.594
Pile driver	80	Diesel	178.507	72.298	17.886	8.136	21.289	20.650	43559.575	0.016	0.006	0.002	0.001	0.002	0.002	3.841

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
Pickup Truck	54000	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.009	0.072	0.002	0.000	0.000	0.000	28.798
Dump/Delivery/Water Truck	11025	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.052	0.004	0.001	0.000	0.000	0.000	14.559

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	18.5		Refer to Table C2					12.21	1.22	

Total - Detachment Norco - Alternative 1 (2015, 2016, or 2017)	**0.244**	**0.194**	**0.025**	**0.007**	**12.232**	**1.242**	**79.845**

Table B24: Alternative 2 - Emission Reductions from Renewable Energy

Site	County	Year Reductions Begin	Output	WECC California Year 2009 Subregion Non-Baseload Output Emission Rates (lb/MWh)					Emissions Reductions (tons per year)					
			MWh/yr	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2e
NAF El Centro	Imperial	2016, 2017,or 2018	433	993.890	33.520	4.070	0.321	0.032	215.18	7.26	0.88	0.07	0.01	659
NSA Monterey	Monterey	2016, 2017,or 2018	1875						931.77	31.43	3.82	0.30	0.03	2854
NAVWPNSTA Seal Beach	Orange	2016, 2017,or 2018	721						358.30	12.08	1.47	0.12	0.01	1098
Detachment Norco	Riverside	2016, 2017,or 2018	2164						1075.39	36.27	4.40	0.35	0.03	3294
NBVC Port Hueneme	Ventura	2016, 2017,or 2018	433						215.18	7.26	0.88	0.07	0.01	659

	CO_2	CH_4	N_2O
GWP	1	25	298

Variables:

$EO = Total\ output\ in\ megawat\ hours\ per\ year\ (MWh/yr)$

$EF = WECC\ California\ year\ 2009\ subregion\ non-baseload\ output\ emission\ rate\ in\ pounds\ per\ megawatt\ hours\ (lb/MWh)\quad (Ref.1)$

$ER = Emission\ Reductions\ in\ tons\ per\ year\ (tpy)$

$CO_2e = Carbon\ dioxide\ equivalent$

$GHG_i = Mass\ emissions\ of\ each\ greenhouse\ gas$

$GWP_i = Global\ warming\ potentail\ for\ each\ greenhouse\ gas\quad (Ref.2)$

Equations:

$$ER(tpy) = EO\left({}^{MWh}/_{yr}\right) \times EF\left({}^{lb}/_{MWh}\right) \times \left(\frac{1\ ton}{2000\ lb}\right)$$

$$CO_2e = \sum_{i=1}^{n} GHG_i \times GWP_i \quad (Ref.2)$$

References:

[1]US EPA. The Emissions & Generation Resource Integrated Database for 2012 (eGRID 2012). April 2012

[2]40 CFR Part 98, Mandatory Greenhouse Gas Reporting, Subpart A

CLEAN AIR ACT - GENERAL CONFORMITY RULE
RECORD OF NON-APPLICABILITY (RONA)

FOR
CONSTRUCTION AND OPERATION OF A
SOLAR PHOTOVOLTAIC SYSTEM AT
NBVC PORT HUENEME

NBVC PORT HUENEME
PORT HUENEME, CALIFORNIA

JULY 2014

PREPARED FOR

U.S. Department of the Navy
Navy Region Southwest
San Diego County, California

PREPARED BY

Ecology and Environment, Inc.
401 West A Street, Suite 775
San Diego, California 92101

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PROPOSED ACTION

The proposed action falls under the Record of Non-Applicability (RONA) category and is documented with this RONA.

Action Proponent: Commanding Officer, NBVC Port Hueneme, Port Hueneme, California

Location: Ventura County, California

Proposed Action Name: Construction and operation of a solar photovoltaic system at NBVC Port Hueneme, Ventura County, California

PROPOSED ACTION AND EMISSIONS SUMMARY

PROPOSED ACTION

Under the Proposed Action, the Navy would install a carport-mounted solar photovoltaic system that would generate 300 kilowatts of alternating current renewable energy at NBVC Port Hueneme. The generation facilities would be located on 1.46 acres (0.59 hectare) in a paved parking area at the installation. The project is needed to contribute towards the Navy's overall compliance with the Secretary of the Navy's renewable energy goals and the National Defense Authorization Act.

Alternative 1 (Preferred Alternative):

- Construct and operate a carport-mounted solar photovoltaic system that would generate 300 kilowatts of alternating current renewable energy. The total output from the generation facility would be approximately 432.8 megawatt hours per year;
- Construction of the carport-mounted solar photovoltaic system is expected to occur between 2015 and 2017. Due to external factors, the exact construction date cannot be determined at this time.

EMISSIONS SUMMARY

Air quality impacts associated with the Proposed Action are related to emissions that would occur during construction of the carport-mounted solar photovoltaic system at NBVC Port Hueneme. The principal sources of pollutants during construction would be the construction equipment, construction crew commuting vehicles, and earth-moving activities.

Construction

Construction for the installation of ground-mounted solar photovoltaic systems associated with Alternative 1 facilities at NBVC Port Hueneme is estimated to take place over a six-month period; therefore, all construction emissions will be considered to occur in one year for the General Conformity analysis. While construction emissions are assumed to occur between 2015 and 2017, due to external factors, the exact construction date cannot be determined at this time.

Table 1 compares the maximum estimated emissions for the Proposed Action at NBVC Port Hueneme with the *de minimis* annual emissions thresholds set forth for the South Central Coast Air Basin (per EPA General Conformity Rule and OPNAVINST 5090.1B Change-3, Appendix F, Clean Air Act General Conformity Guidance). Based on the air quality analysis, the maximum estimated emissions for the Proposed Action at NBVC Port Hueneme would be below general conformity *de minimis* levels for all criteria pollutants for the South Central Coast Air Basin. Therefore, implementation of Alternative 1 at NBVC Port Hueneme would result in negligible, localized, short-term effects on air quality during construction, and impacts from Alternative 1 during construction would not be significant.

Table 1 Estimated Construction Emissions at NBVC Port Hueneme Compared to *de minimis* Emissions for Nonattainment and Attainment/ Maintenance Criteria Pollutants in the South Central Coast Air Basin [1]

Site	County	Emissions (tons per year)						
		NOx	CO	VOCs	SO_2	PM_{10}	$PM_{2.5}$	CO_2
NBVC Port Hueneme	Ventura	0.27	0.14	0.02	0.01	0.99	0.12	72.36
General Conformity *de minimis* Threshold		50	N/A	50	N/A	N/A	N/A	N/A

Key:
CO = carbon monoxide
CO_2 = carbon dioxide
N/A = not applicable
NO_X = oxides of nitrogen
$PM_{2.5}$ = fine particulate matter less than or equal to 2.5 microns in diameter
PM_{10} = suspended particulate matter less than or equal to 10 microns in diameter
SO_2 = sulfur dioxide
VOCs = volatile organic compounds

Note:
[1] 40 CFR 93. The South Central Coast Air Basin is classified as serious nonattainment for O_3.

Detailed construction and demolition equipment assumptions, fugitive dust emission calculations, and emissions calculations are provided in Appendix B, Tables B5, B6, and B11, respectively.

Operations

Long-term operation of Alternative 1 at NAF El Centro would result in avoided emissions of CO_2e, NO_X, and SO_2 by reducing the consumption of grid-supplied electricity. Subsequent years of operation would also avoid emissions produced from conventional non-renewable generating sources. Table 2 shows the estimated emissions avoided from the carport-mounted solar photovoltaic system at NBVC Port Hueneme that would be realized by reduced consumption of grid-supplied electricity. Detailed emissions calculations are provided in Appendix B, Table B12.

Table 2 Estimated Annual Emissions Avoided at NBVC Port Hueneme with Implementation of Alternative 1 (Preferred Alternative)

Site	County	Emissions Avoided (tons per year)		
		CO_2e	NO_X	SO_2
NBVC Port Hueneme	Ventura	659	0.07	0.01

Key:
CO_2e = carbon dioxide equivalents
NO_X = oxides of nitrogen
SO_2 = sulfur dioxide

Affected Air Basin: South Central Coast Air Basin, California

Date RONA Prepared: July 2014

RONA Prepared by: Environment and Ecology, Inc.

Proposed Action Exemptions: The Proposed Action is exempt because the calculated total emissions are below the *de minimis* levels set forth in the Clean Air Act General Conformity Rule.

ATTAINMENT AREA STATUS AND EMISSIONS EVALUATION CONCLUSION

The project area at NBVC Port Hueneme is located within the South Central Coast Air Basin, which is a federal nonattainment area for 8-hour ozone (based on the EPA Green Book as of January 20, 2014). Based on the data in Table 1, it is concluded that the Clean Air Act General Conformity Rule *de minimis* thresholds for applicable criteria pollutants would not be exceeded as a result of implementation of the Proposed Action at NBVC Port Hueneme. Therefore, further formal Conformity Determination procedures are not required, resulting in this RONA.

RONA APPROVAL:

Date: 8/5/14 Signature: Daniel T. Shide

Dan Shide, NBVC Installation
Environmental Program Director

Table B5: Alternative 1 - Construction Equipment Activity Assumptions NBVC Port Hueneme

Equipment Use Assumptions - Construction

NBVC Port Hueneme - Alternative 1 (2015,2016,or 2017) - Carport-mounted Panels - Ventura County

Equipment		NBVC Port Hueneme			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 6 months. Days estimate based on 20 work days per month.
Delivery truck	delivers panels/parts	10	3	1	135	1350	na	Assumed 135 miles per day (3 hrs @45 mph). One delivery truck = 300 panels.
F-150 pick up	general use	3	3	30	135	12150	na	Assumed 135 miles per day (3 hrs @45 mph) Pickups are used only to transport personnel to and from site.
forklift	lift/haul/place materials	1	3	40	na	na	120	
backhoe	dig/excavate foundation for new sites	2	8	15	na	na	240	
bobcat or small dozer	grading, stone/soil fill	1	8	15	na	na	120	
trenching machine	4 ft x 3 ft deep trench	1	8	10	na	na	80	1 km of trenching electrical lines
dump truck	brings in stone/soil fill, hauls away demo'd material	1	6	40	100	4000	na	Estimate that trucks will bring in fill and place at strategic spots. Bobcat will distribute.
welding machine	small, for installing support fixtures?	2	8	10	na	na	160	
scraper	grading at site	1	8	15	na	na	120	Scraper hp assumed to be between 600 hp and 750 hp
pile driver	moving dirt	1	8	15	na	na	120	Pile driver hp assumed to be between 100 hp and 175 hp
water truck	dust suppression	1	8	15	100	1500	na	
paving machine	paving	1	8	10	na	na	80	
roller	finish paving to match surrounding	1	8	10	na	na	80	
crane	erect vertical support members	1	8	20	na	na	160	Crane hp assumed to be between 175 hp and 300 hp
pneumatic jack hammer	remove concrete for the electrical trench	1	8	2	na	na	16	Emissions from Air Compressor used to drive pneumatic jack hammer

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Jack Hammer	Paving Machine	Roller	Scraper	Other Const. Equip	Cranes
Total Hrs Used (year?)	120	240	160	80	120	16	80	80	120	120	160

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	12150	6850

Table B6: Alternative 1 - Fugitive Dust from Construction Activity

Site	County	Variables for Fugitive Dust from Construction Activity					
		D months	A acres	EF ton PM_{10}/acre month	$SF_{2.5}$ na	PM_{10} tons	$PM_{2.5}$ tons
NAF El Centro (2015, 2016, or 2017)	Imperial	4	10.0	0.11	0.100	4.4	0.4
NSA Monterey (2015, 2016, or 2017)	Monterey	na					
NAVWPNSTA Seal Beach (2015, 2016, or 2017)	Orange	4	6.6	0.11	0.100	2.9	0.3
Detachment Norco (2015, 2016, or 2017)	Riverside	6	18.5	0.11	0.100	12.2	1.2
NBVC Port Hueneme (2015, 2016, or 2017)	Ventura	6	1.5	0.11	0.100	1.0	0.1

Variables:

$D = Duration\ of\ soil\ disturbance$

$A = area\ disturbed\ during\ construction$

$SF_{2.5} = scaling\ factor\ to\ predict\ PM_{2.5}\ emissions\ from\ PM_{10}\ emissions\ (Ref.2)$

$EF\ = PM_{10}\ Emission\ factor\ for\ construction\ fugitives\ (Ref.1)$

Equations:

$$PM_{10}(tons) = D(months) \times A(acres) \times EF\left(\frac{ton\ PM_{10}}{acre - month}\right) \quad (Ref.1)$$

$$PM_{2.5}(tons) = PM_{10}(tons) \times SF_{2.5}$$

References:

[1] California Air Resource Board. *ARB Miscellaneous Processes Methodologies - Construction and Demolition, Section 7.7, Building Construction Dust.* September 2002.

[2] MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Table B11: Alternative 1 - Construction Emissions

NBVC Port Hueneme - Alternative 1 (2015,2016,or 2017) - Carport-mounted Panels - Ventura County

Nonroad Equipment	Hours of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	120	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.011	0.001	0.001	0.000	0.001	0.001	2.186
Backhoe	240	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.019	0.024	0.004	0.001	0.004	0.004	3.359
Bobcat or small dozer	120	Diesel	69.074	12.032	3.565	2.026	3.815	3.700	12081.777	0.009	0.002	0.000	0.000	0.001	0.000	1.598
Trenching machine	80	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.006	0.001	0.000	0.000	0.000	0.000	1.057
Welding machine	160	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.004	0.004	0.001	0.000	0.001	0.001	0.546
Scraper	120	Diesel	806.506	476.535	65.789	39.660	78.329	75.979	217584.423	0.107	0.063	0.009	0.005	0.010	0.010	28.781
Pile driver	120	Diesel	178.507	72.298	17.886	8.136	21.289	20.650	43559.575	0.024	0.010	0.002	0.001	0.003	0.003	5.762
Paving machine	80	Diesel	120.379	61.963	7.484	4.077	9.269	8.991	22122.426	0.011	0.005	0.001	0.000	0.001	0.001	1.951
Paving roller	80	Diesel	119.154	64.458	7.765	3.975	9.471	9.187	21340.727	0.011	0.006	0.001	0.000	0.001	0.001	1.882
Crane	160	Diesel	170.885	37.891	17.834	9.630	15.536	15.070	54224.422	0.030	0.007	0.003	0.002	0.003	0.003	9.563
Pneumatic jack hammer	16	Diesel	52.537	10.578	2.861	1.496	3.019	2.928	8495.603	0.001	0.000	0.000	0.000	0.000	0.000	0.150

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
Pickup Truck	12150	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.002	0.016	0.000	0.000	0.000	0.000	6.479
Dump/Delivery/Water Truck	6850	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.032	0.002	0.001	0.000	0.000	0.000	9.046

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	1.5		Refer to Table C2					0.96	0.10	

Total - NBVC Port Hueneme - Alternative 1 (2015, 2016, or 2017)	**0.267**	**0.141**	**0.023**	**0.010**	**0.987**	**0.119**	**72.360**

Table B12: Alternative 1 - Emission Reductions from Renewable Energy

Site	County	Year Reductions Begin	Output	WECC California Year 2009 Subregion Non-Baseload Output Emission Rates (lb/MWh)					Emissions Reductions (tons per year)					
			MWh/yr	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2e
NAF El Centro	Imperial	2016, 2017,or 2018	1495	993.890	33.520	4.070	0.321	0.032	742.93	25.06	3.04	0.24	0.02	2276
NSA Monterey	Monterey	2016, 2017,or 2018	2164						1075.39	36.27	4.40	0.35	0.03	3294
NAVWPNSTA Seal Beach	Orange	2016, 2017,or 2018	721						358.30	12.08	1.47	0.12	0.01	1098
Detachment Norco	Riverside	2016, 2017,or 2018	2164						1075.39	36.27	4.40	0.35	0.03	3294
NBVC Port Hueneme	Ventura	2016, 2017,or 2018	433						215.18	7.26	0.88	0.07	0.01	659

	CO_2	CH_4	N_2O
GWP	1	25	298

Variables:

$EO = Total\ output\ in\ megawat\ hours\ per\ year\ (MWh/yr)$

$EF = WECC\ California\ year\ 2009\ subregion\ non-baseload\ output\ emission\ rate\ in\ pounds\ per\ megawatt\ hours\ (lb/MWh)\quad (Ref.1)$

$ER = Emission\ Reductions\ in\ tons\ per\ year\ (tpy)$

$CO_2e = Carbon\ dioxide\ equivalent$

$GHG_i = Mass\ emissions\ of\ each\ greenhouse\ gas$

$GWP_i = Global\ warming\ potentail\ for\ each\ greenhouse\ gas\quad (Ref.2)$

Equations:

$$ER(tpy) = EO\left({}^{MWh}/_{yr}\right) \times EF\left({}^{lb}/_{MWh}\right) \times \left(\frac{1\ ton}{2000\ lb}\right)$$

$$CO_2e = \sum_{i=1}^{n} GHG_i \times GWP_i \quad (Ref.2)$$

References:

[1]US EPA. The Emissions & Generation Resource Integrated Database for 2012 (eGRID 2012). April 2012

[2]40 CFR Part 98, Mandatory Greenhouse Gas Reporting, Subpart A

Table B17: Alternative 2 - Construction Equipment Activity Assumptions NBVC Port Hueneme

Equipment Use Assumptions - Construction

NBVC Port Hueneme - Alternative 2 (2015,2016,or 2017) - Carport-mounted Panels - Ventura County

Equipment		NBVC Port Hueneme			Miles per day	Total miles	Total Hrs	Additional Assumptions
		Quantity	Hr/day	Days				
								Construction duration is 6 months. Days estimate based on 20 work days per month.
Delivery truck	delivers panels/parts	10	3	1	135	1350	na	Assumed 135 miles per day (3 hrs @45 mph). One delivery truck = 300 panels.
F-150 pick up	general use	3	3	30	135	12150	na	Assumed 135 miles per day (3 hrs @45 mph) Pickups are used only to transport personnel to and from site.
forklift	lift/haul/place materials	1	3	40	na	na	120	
backhoe	dig/excavate foundation for new sites	2	8	15	na	na	240	
bobcat or small dozer	grading, stone/soil fill	1	8	15	na	na	120	
trenching machine	4 ft x 3 ft deep trench	1	8	10	na	na	80	1 km of trenching electrical lines
dump truck	brings in stone/soil fill, hauls away demo'd material	1	6	40	100	4000	na	Estimate that trucks will bring in fill and place at strategic spots. Bobcat will distribute.
welding machine	small, for installing support fixtures?	2	8	10	na	na	160	
scraper	grading at site	1	8	15	na	na	120	Scraper hp assumed to be between 600 hp and 750 hp
pile driver	moving dirt	1	8	15	na	na	120	Pile driver hp assumed to be between 100 hp and 175 hp
water truck	dust suppression	1	8	15	100	1500	na	
paving machine	paving	1	8	10	na	na	80	
roller	finish paving to match surrounding	1	8	10	na	na	80	
crane	erect vertical support members	1	8	20	na	na	160	Crane hp assumed to be between 175 hp and 300 hp
pneumatic jack hammer	remove concrete for the electrical trench	1	8	2	na	na	16	Emissions from Air Compressor used to drive pneumatic jack hammer

(Nonroad Equipment)	Forklift	Backhoe	Welder	Trencher	Bobcat	Jack Hammer	Paving Machine	Roller	Scraper	Other Const. Equip	Cranes
Total Hrs Used (year?)	120	240	160	80	120	16	80	80	120	120	160

(Onroad Equipment)	Pickup	Dump/Deliv Truck
Total Miles Driven (year?)	12150	6850

Table B18: Alternative 2 - Fugitive Dust from Construction Activity

Site	County	Variables for Fugitive Dust from Construction Activity					
		D months	A acres	EF ton PM_{10}/acre month	$SF_{2.5}$ na	PM_{10} tons	$PM_{2.5}$ tons
NAF El Centro (2015, 2016, or 2017)	Imperial	4	10.0	0.11	0.100	4.4	0.4
NSA Monterey (2015, 2016, or 2017)	Monterey	na					
NAVWPNSTA Seal Beach (2015, 2016, or 2017)	Orange	4	6.5	0.11	0.100	2.9	0.3
Detachment Norco (2015, 2016, or 2017)	Riverside	6	18.5	0.11	0.100	12.2	1.2
NBVC Port Hueneme (2015, 2016, or 2017)	Ventura	6	1.5	0.11	0.100	1.0	0.1

Variables:

$D = Duration\ of\ soil\ disturbance$

$A = area\ disturbed\ during\ construction$

$SF_{2.5} = scaling\ factor\ to\ predict\ PM_{2.5}\ emissions\ from\ PM_{10}\ emissions\ (Ref.2)$

$EF\ = PM_{10}\ Emission\ factor\ for\ construction\ fugitives\ (Ref.1)$

Equations:

$$PM_{10}(tons) = D(months) \times A(acres) \times EF\left(\frac{ton\ PM_{10}}{acre - month}\right) \quad (Ref.1)$$

$$PM_{2.5}(tons) = PM_{10}(tons) \times SF_{2.5}$$

References:

[1] California Air Resource Board. *ARB Miscellaneous Processes Methodologies - Construction and Demolition, Section 7.7, Building Construction Dust.* September 2002.

[2] MRI 1996. *Improvement of Specific Emission Factors (BACM Project No. 1).* Midwest Research Institute (MRI). Prepared for the California South Coast Air Quality Management District, March 29, 1996.

Table B23: Alternative 2 - Construction Emissions

NBVC Port Hueneme - Alternative 2 (2015,2016,or 2017) - Carport-mounted Panels - Ventura County

Nonroad Equipment	Hours of Operation	Fuel Type	Nonroad Emission Factor (gm/hour)							Emissions (tons per year)						
			NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2	NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Forklift	120	Diesel	83.715	7.089	3.873	2.545	4.346	4.216	16526.743	0.011	0.001	0.001	0.000	0.001	0.001	2.186
Backhoe	240	Diesel	72.133	89.600	14.625	2.467	14.033	13.612	12696.448	0.019	0.024	0.004	0.001	0.004	0.004	3.359
Bobcat or small dozer	120	Diesel	69.074	12.032	3.565	2.026	3.815	3.700	12081.777	0.009	0.002	0.000	0.000	0.001	0.000	1.598
Trenching machine	80	Diesel	73.383	16.729	4.025	2.114	4.346	4.215	11981.895	0.006	0.001	0.000	0.000	0.000	0.000	1.057
Welding machine	160	Diesel	23.809	23.019	5.293	0.666	3.239	3.142	3095.707	0.004	0.004	0.001	0.000	0.001	0.001	0.546
Scraper	120	Diesel	806.506	476.535	65.789	39.660	78.329	75.979	217584.423	0.107	0.063	0.009	0.005	0.010	0.010	28.781
Pile driver	120	Diesel	178.507	72.298	17.886	8.136	21.289	20.650	43559.575	0.024	0.010	0.002	0.001	0.003	0.003	5.762
Paving machine	80	Diesel	120.379	61.963	7.484	4.077	9.269	8.991	22122.426	0.011	0.005	0.001	0.000	0.001	0.001	1.951
Paving roller	80	Diesel	119.154	64.458	7.765	3.975	9.471	9.187	21340.727	0.011	0.006	0.001	0.000	0.001	0.001	1.882
Crane	160	Diesel	170.885	37.891	17.834	9.630	15.536	15.070	54224.422	0.030	0.007	0.003	0.002	0.003	0.003	9.563
Pneumatic jack hammer	16	Diesel	52.537	10.578	2.861	1.496	3.019	2.928	8495.603	0.001	0.000	0.000	0.000	0.000	0.000	0.150

Onroad Equipment	Miles Driven	Fuel Type	EMFAC v2011 Emission Factor (gm/mile)							Emissions (tons per year)						
Pickup Truck	12150	Gasoline	0.151	1.209	0.027	0.005	0.002	0.002	483.800	0.002	0.016	0.000	0.000	0.000	0.000	6.479
Dump/Delivery/Water Truck	6850	Diesel	4.300	0.288	0.085	0.011	0.034	0.031	1198.000	0.032	0.002	0.001	0.000	0.000	0.000	9.046

Construction Fugitives	Acres Graded		Emission Factors	Emissions (tons per year)						
	1.5		Refer to Table C2					0.96	0.10	

Total - NBVC Port Hueneme - Alternative 1 (2015, 2016, or 2017)	**0.267**	**0.141**	**0.023**	**0.010**	**0.987**	**0.119**	**72.360**

Table B24: Alternative 2 - Emission Reductions from Renewable Energy

Site	County	Year Reductions Begin	Output	WECC California Year 2009 Subregion Non-Baseload Output Emission Rates (lb/MWh)					Emissions Reductions (tons per year)					
			MWh/yr	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2	CH_4	N_2O	NO_X	SO_2	CO_2e
NAF El Centro	Imperial	2016, 2017,or 2018	433	993.890	33.520	4.070	0.321	0.032	215.18	7.26	0.88	0.07	0.01	659
NSA Monterey	Monterey	2016, 2017,or 2018	1875						931.77	31.43	3.82	0.30	0.03	2854
NAVWPNSTA Seal Beach	Orange	2016, 2017,or 2018	721						358.30	12.08	1.47	0.12	0.01	1098
Detachment Norco	Riverside	2016, 2017,or 2018	2164						1075.39	36.27	4.40	0.35	0.03	3294
NBVC Port Hueneme	Ventura	2016, 2017,or 2018	433						215.18	7.26	0.88	0.07	0.01	659

	CO_2	CH_4	N_2O
GWP	1	25	298

Variables:

$EO = Total\ output\ in\ megawat\ hours\ per\ year\ (MWh/yr)$

$EF = WECC\ California\ year\ 2009\ subregion\ non-baseload\ output\ emission\ rate\ in\ pounds\ per\ megawatt\ hours\ (lb/MWh)\quad (Ref.1)$

$ER = Emission\ Reductions\ in\ tons\ per\ year\ (tpy)$

$CO_2e = Carbon\ dioxide\ equivalent$

$GHG_i = Mass\ emissions\ of\ each\ greenhouse\ gas$

$GWP_i = Global\ warming\ potentail\ for\ each\ greenhouse\ gas\quad (Ref.2)$

Equations:

$$ER(tpy) = EO\left({}^{MWh}/_{yr}\right) \times EF\left({}^{lb}/_{MWh}\right) \times \left(\frac{1\ ton}{2000\ lb}\right)$$

$$CO_2e = \sum_{i=1}^{n} GHG_i \times GWP_i \quad (Ref.2)$$

References:

[1]US EPA. The Emissions & Generation Resource Integrated Database for 2012 (eGRID 2012). April 2012

[2]40 CFR Part 98, Mandatory Greenhouse Gas Reporting, Subpart A

D NAF EL CENTRO AND RANGES PROGRAMMATIC AGREEMENT

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PROGRAMMATIC AGREEMENT
AMONG THE
COMMANDING OFFICER, NAVAL AIR FACILITY EL CENTRO
AND THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER
REGARDING OPERATIONAL TRAINING AND MAINTENANCE UNDERTAKINGS
ON THE NAVAL AIR FACILITY EL CENTRO AND ITS ADMINISTERED RANGES,
IMPERIAL COUNTY, CALIFORNIA

WHEREAS, the U.S. Navy's mission is to organize, train, equip, and maintain combat-ready naval forces capable of winning wars, deterring aggression, and maintaining the freedom of the seas; and

WHEREAS, the Naval Air Facility El Centro (NAFEC) conducts airfield operations and administers operational training activities on NAFEC and its administered training ranges (the El Centro Ranges) in Imperial County, California, that have been ongoing for over 60 years and continue to play a vital part in the Navy national defense mission as a critical aviation and desert training area; and

WHEREAS, to meet requirements of the Department of Defense and Department of the Navy national defense mission, Commanding Officer NAFEC (CONAFEC), a subordinate command under the Commander Navy Region Southwest (CNRSW), administers, authorizes, carries out, or causes to be carried out a broad range of operational, testing and maintenance activities, and related support programs (undertakings) on NAFEC and the El Centro Ranges. These undertakings fall within two categories of actions: (1) operational flight training and support activities by aircraft and ground personnel (Attachment A); and (2) air facility and range sustainability activities, including construction, maintenance, repair, demolition of buildings, structures, roads and other infrastructure assets, and the management of biological and cultural resources (Attachment B); and

WHEREAS, the scope of this programmatic agreement (PA) covers NAFEC proper and all the El Centro Ranges within the larger CONAFEC area of responsibility (AOR) (Figures 1 through 4 of Attachment A); and

WHEREAS, NAFEC and portions of the El Centro Ranges lands are owned by the U.S. Navy, while other portions are withdrawn by the Bureau of Land Management (BLM) to the Navy for use as ranges; and

WHEREAS, CONAFEC oversees cultural resource management for NAFEC and the El Centro Ranges to ensure compliance with Section 106 of the National Historic Preservation Act (NHPA; 16 U.S.C. 470f) and conformance with the procedural requirements of its implementing regulations, 36 CFR 800 (as amended August 5, 2004), for undertakings within the El Centro Ranges, where CONAFEC has determined that undertakings on NAFEC and the El Centro Ranges may affect properties listed or eligible for listing in the National Register of Historic Places (NRHP; hereinafter referred to as "historic properties); and

WHEREAS, aircraft-flight-only operations within restricted Special Use Area (SUA) airspace components of the El Centro Ranges are understood to have no potential to adversely affect historic properties on the underlying landscapes encompassed in and out of discrete El Centro Ranges land components (Attachment A); and

WHEREAS, while CONAFEC has not yet fully determined the effects of ongoing or future undertakings on historic properties within the land components of NAFEC and the El Centro Ranges (36 CFR 800.14(b) (1)(ii)), CONAFEC will comply with Section 106 for the subject undertakings through the execution of this PA; and

WHEREAS, CONAFEC has prepared a NAFEC Integrated Cultural Resources Management Plan (ICRMP), with management protocols for the implementation of Section 106 compliance authorities and protocols stipulated under this PA; and

WHEREAS, existing archaeological inventories have recorded nearly 380 archaeological sites over 43,301 acres (77 percent) of the and NAFEC and El Centro Ranges collective 56,245 acres, with a remaining 12, 944 acres still to be surveyed; and

WHEREAS, existing, adequate archaeological inventories have indentified no archaeological properties on NAFEC proper, and past comprehensive built property inventories have indentified, and past consultations with CASHPO have confirmed, no built historic properties are present on either NAFEC or the El Centro Ranges; and

WHEREAS, ongoing archaeological inventories are being conducted utilizing standardized National Register of Historic Places eligibility evaluations on selected archaeological sites within the El Centro Ranges to identify individual sites or classes of sites that may meet criteria for being historic properties under 36 CFR 60.6; CONAFEC will continue programming such evaluations on the El Centro Ranges on a schedule defined within the ICRMP and by funding availability; and

WHEREAS, CONAFEC will ensure coordination of Section 106 compliance with requirements of other statutes, where applicable, including the National Environmental Policy Act (NEPA), the Archaeological Resources Protection Act (ARPA), the American Indian Religious Freedom Act (AIRFA), and the Native American Graves Protection and Repatriation Act (NAGPRA); and

WHEREAS, in compliance with NEPA, the Navy is preparing an Environmental Assessment (EA) addressing the operational training and support activities within the El Centro Ranges that fall under the scope of this PA; and for which this PA will serve as evidence of compliance with Section 106 for finalization of the EA; and

WHEREAS, CONAFEC has consulted with Advisory Council on Historic Preservation (ACHP), which has made the determination not to participate in the development of this PA, in accordance with 36 CFR 800.6(a)(1)(iii); and

WHEREAS, CONAFEC has consulted with the California State Historic Preservation Officer (CASHPO) in the development of this PA; and

WHEREAS, portions of the El Centro Ranges are withdrawn by the BLM to the Navy for use as ranges, CONAFEC has consulted with the BLM Desert District in the development of this PA and invited to its concurrence on this PA; and

WHEREAS, the El Centro Ranges lie within the local government jurisdiction of Imperial County, with which CONAFEC has consulted and invited to concur on this PA; and

WHEREAS, CONAFEC has identified and consulted with federally-recognized Indian tribes that may attach religious and cultural significance to historic properties within the El Centro Ranges, and has invited these tribes to concur on this PA, including: Quechan Tribe of the Fort Yuma Indian Reservation; Cocopah Tribe of Arizona; Barona Group of Capitan Grande Band of Mission Indians of the Barona Reservation; Campo Band of Diegueno Mission Indians of the Campo Reservation; Ewiiaapaayp Band of Kumeyaay Indians; La Posta Band of Diegueno Mission of the La Posta Reservation; Jamul Indian Village of California; Inaja Band of Diegueno Mission Indians of the Inaja and Cosmit Reservation of California; Manzanita Band of Mission Indians of the Manzanita Reservation; Mesa Grande band of Diegueno Mission Indians of the Mesa Grande Reservation; Sycuan Band of the Kumeyaay Nation; Santa Ysabel Band of Diegueno Mission Indians of the Santa Ysabel Reservation; San Pasqual Band of Diegueno Mission Indians; Viejas Group of Capitan Grande Band of Mission Indians of the Viejas Reservation; Augustine Band of Mission Indians of the Augustine Reservation; Torres-Martinez Desert Cahuilla Indians; and, Cabazon Band of Mission Indians; and

WHEREAS, CONAFEC has identified and consulted with Imperial Valley College, as a regional academic institution with a demonstrated interest in historic preservation on the El Centro Ranges, and has sought to consult with other institutions and nongovernmental organizations, or with individuals associated with these institutions and organizations, which have a like interest in historic preservation on NAFEC and the El Centro Ranges, and has invited them to concur on this PA; and

NOW, THEREFORE, CONAFEC and CASHPO agree that CONAFEC will undertake its operational training and support activities, and range sustainability activities, on NAFEC and within the El Centro Ranges in accordance with the following stipulations for management of historic properties.

STIPULATIONS

In cooperation with CASHPO and other consulting parties to this PA, CONAFEC shall undertake its operational training and support activities and range sustainability activities within the El Centro Ranges and ensure compliance with the following stipulated measures.

I. Applicability

A. This PA applies to all undertakings initiated on NAFEC and within the two primary components of El Centro Ranges, the operational airspace and range lands that underlie the airspace, as listed below. CONAFEC will notify the parties to this PA if the NAFEC installation or

these operational airspace and range lands components are added to or deleted from coverage under this PA through the Annual Report developed in accordance with Stipulation VII. The addition or deletion of such installation or range components does not require an amendment to the PA.

1. NAFEC includes the air facility and supporting infrastructure on a contiguous 2,600 acres.

2. Range components include:

a. Airspace Components: R-2510 and R-2512

b. Land Components: Within R-2510:
Target 101 "Shade Tree" (18,550 acres)
Target 103 "Loom Lobby" (10,260 acres)
Parachute Drop Target (7,312 acres)
Additional Navy-Owned Land (4,770 acres)

Within R-2512:
Target 68 "Inkey Barley" (8,325 acres)
Target 95 "Kitty Baggage" (6,207 acres)

B This PA applies to all undertakings initiated on NAFEC and within the El Centro Ranges, to include:

1. Operational training and support activities as identified and described in Attachment A.

2. Range sustainability activities as identified in Attachment B.

C. Should CONAFEC determine that modification of the use or infrastructure of NAFEC or the El Centro Ranges is required, or that substantive changes are proposed to the types of activities described in Attachments A and B, it will notify the Signatories to this PA and initiate consultation to determine whether an amendment to this PA is needed prior to implementation of the modification and associated undertakings.

II. General Provisions

A. Roles and Responsibilities

1. The terms of this PA are binding on the Signatories and their respective successors and assigns.

2. CONAFEC, the "agency official" as defined under 36 CFR 800.2(a) for undertakings subject to Section 106, shall ensure Navy compliance with this PA.

3. NAFEC Cultural Resources Manager

a. CONAFEC shall designate and authorize a NAFEC Cultural Resources Manager (CRM) to oversee implementation of this PA. The NAFEC CRM is a collateral-duty position, not staffed by a person meeting the professional qualifications standards defined under 36 CFR 61.

b. The CRM shall coordinate and ensure that all training and operational activities undertakings and all facilities-related undertakings on NAFEC and within the El Centro Ranges are reviewed by NAVFACSW EV52 personnel with professional qualifications as defined in part B.1 of this Stipulation prior to approval.

c. The CRM shall ensure timely reviews of facilities-related and training/operational undertakings consistent with the Stipulations of this PA.

4. CASHPO shall provide timely reviews of undertakings submitted for consultation on findings of adverse effect to historic properties, and shall participate in review of undertakings when requested by CONAFEC.

5. ACHP and CASHPO shall participate in dispute resolution consistent with Stipulation X of this PA, and may monitor the effectiveness of this PA consistent with Stipulation VIII.A of this PA.

6. CONAFEC shall consult with any federally-recognized Indian tribe that attaches religious and cultural significance to historic properties that may be affected by an undertaking within the scope of this PA.

B. Qualified Personnel

1. All work pursuant to this PA regarding prehistoric and historic archaeological resources, and any historic properties to which Indian tribes may attach religious and cultural significance, will be carried out, reviewed by, or conducted under the supervision of a person or persons meeting the professional qualifications for Archeologist, as defined under 36 CFR 61.

2. All work pursuant to this PA regarding historic buildings and structures will be carried out, reviewed by, or conducted under the supervision of a person or persons meeting the professional qualifications for Architectural Historian, Historic Architect, or Historian, as defined under 36 CFR 61.

3. Since the NAFEC CRM is a collateral-duty position not staffed by a person meeting the professional qualifications standards defined under 36 CFR 61, qualified professional support for implementation of this PA is provided through reach back from the Naval Facilities Engineering Command Southwest (NAVFACSW) Cultural Resources Management EV52 staff in San Diego.

4. As non-professionally-qualified staff who may be responsible for decisions and actions supporting implementation of this PA, the NAFEC CRM will receive suitable training, orientation, guidance, and/or supervision by qualified NAVFACSW EV52 personnel regarding the requirements and implementation of this PA, the ICRMP, and project specific conditions, as appropriate, to help ensure the preservation of historic properties.

C. Additional Cultural Resources Management Information

1. In support of the Navy's national defense mission, CONAFEC is preparing an ICRMP to support and facilitate the implementation of this PA. The ICRMP provides background cultural resources information resulting from decades of investigation, management, and consultation for cultural resources on NAFEC and within the El Centro Ranges. The ICRMP also provides more detailed guidance for planning, review, and documentation of undertakings consistent with the procedures defined in this PA.

D. Notifications and Time Periods

1. Notifications required pursuant to this PA shall be in writing.

2. All notices, submissions, consents, demands, requests, or other communications which may or are required pursuant to this PA to be given hereunder to the Signatories and Concurring Parties shall be sent by (a) hand delivery (which will be deemed to have been received when the sender receives a signed receipt), (b) reputable overnight courier (which will be deemed to have been received one business day after the date sent), (c) United States mail (which will be deemed to have been received upon date stamp of the receiver), or (d) facsimile, with a copy sent by reputable overnight courier (which will be deemed to have been received when the sender receives a confirmation of successful transmission of the facsimile), or by other means available as technology changes that may be agreed to by the parties to this PA.

3. All time periods shall be counted in calendar days unless specifically stated otherwise.

III. Processes for Review of Undertakings

A. All undertakings

1. For purposes of implementing this PA, undertakings will be defined consistent with 36 CFR 800.16(y).

2. Consistent with roles and responsibilities defined in Stipulation II. A., all undertakings on NAFEC and within the El Centro Ranges will be reviewed by the CRM. When necessary, assistance or supervision by qualified NAVFACSW EV52 personnel will be provided for defining area of potential effects (APE), identifying the presence of historic properties within an APE, and the determining effect, prior to approval and/or implementation.

a. The CRM reviews NAFEC and El Centro Ranges construction, maintenance and sustainability undertakings in accordance with CNRSW instruction for Project Approvals for Construction, Repair, Maintenance and/or Modification of Facilities (Attachment C).

b. The CRM shall review operational training and support activities on the El Centro Ranges in accordance with the El Centro Ranges Procedures for Operational Training Requests (Attachment D).

B. APE Determinations

1. Consistent with 36 CFR 800.16(d), and with the assistance of qualified NRSW CRMP personnel, the CRM shall define an APE as the geographical area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties. CONAFEC will not consult further with CASHPO or other parties to this PA in determining the APEs for undertakings, except where provided for under Stipulation III.B.2, below. Definitions of APE will be influenced by the scale and nature of the undertaking and may be different for different kinds of effects caused by an undertaking. The extent of an APE is further defined by the following provisions:

a. For undertakings where an APE occurs more than 25 m from the established boundaries of historic properties, these are considered to lie outside the APE.

b. For undertakings where an APE occurs within 25 m of an established boundary of an historic property, the APE will be considered and defined to include the whole of the historic property.

c. For undertakings involving ground disturbing activities, the APE will be defined to include all areas of surface and subsurface disturbance, any associated lay down or staging areas, and a 25-m buffer surrounding each area of ground disturbance and associated activities. If any part of an archaeological site falls within the defined APE, the entire extent of the archaeological site will be included in the APE.

2. CONAFEC shall consult with Indian tribes in defining an APE for any undertaking that has the potential to cause visual or acoustic effects to archaeological properties to which in future Indian tribes may attach religious and cultural significance.

C. Identification of Historic Properties

1. Consistent with 36 CFR 800.4, qualified personnel under the direction or supervision of the CRM, shall identify or supervise the identification of historic properties within the APE for all proposed undertakings subject to this PA.

2. Where existing information regarding the presence or absence of historic properties within an APE is absent or inadequate, personnel with professional qualifications will conduct, supervise or direct to be conducted historic property surveys sufficient to identify any historic properties within the APE.

3. Existing information on the locations of historic and other archaeological properties has been collected, and shall continue to be collected, using established standards and protocols for archaeological survey on the El Centro Ranges.

4. CONAFEC will document these survey standards and protocols, existing inventory coverage, and a synthesis of currently identified historic and other archaeological properties in the ICRMP, pursuant to Stipulation IV.

5. National Register Eligibility Evaluations.

a. Programmatic National Register Eligibility Evaluations. CONAFEC conducts, and will continue to conduct, proactive testing of selected archaeological sites to determine their National Register eligibility.

b. CONAFEC will document the existing standards and protocols for this eligibility evaluation process, and precedents from past consultations for concurrence on CONAFEC eligibility determinations, will be documented in the ICRMP pursuant to Stipulation IV.

c. Testing shall not exceed 4 cubic meters or 5% of the overall area of a site, whichever represents the lesser percentage volume of a site's overall cultural deposit. If required, additional testing volume may be undertaken in consultation with SHPO staff.

d. In instances where proposed undertakings have the potential to adversely affect prehistoric archaeological properties, CONAFEC will consult with Indian tribes, and non-federally-recognized Indian claimant groups to assist in affirming the eligibility recommendation, and to determine if they attach religious and cultural significance to the historic properties.

e. If a cultural resource in the APE has not previously been evaluated and concurred in for National Register eligibility, but is evaluated as eligible through actions under this PA, CONAFEC shall treat the property as eligible for purposes of this PA. Such determination will require no CASHPO review and will be included in the Annual Report described in Stipulation VI. CONAFEC may at its discretion request CASHPO review of its determination.

f. If a cultural resource on NAFEC and within the El Centro Ranges has not previously been evaluated and concurred in as not eligible for the National Register, but is evaluated as not eligible through actions under this PA, CONAFEC shall request CASHPO review of the associated documentation and concurrence in this determination. To the extent possible, CASHPO will provide comments or concurrence within 30 days of receipt.

g. Consistent with 36 CFR 800.4, when the condition of cultural resources changes or where new information is forthcoming that affects past eligibility determinations, CONAFEC may, in consultation with the CASHPO and other consulting parties to this PA, reevaluate the eligibility of selected properties previously determined eligible or ineligible for listing in the National Register. CONAFEC shall include the results of any such updated determinations in the Annual Report pursuant to Stipulation VII, and in future updates of the ICRMP.

D. Findings of Effect

1. When eligible or potentially eligible properties are identified within the APE for an undertaking, the CRM and qualified NRSW CRMP personnel will review, analyze, and document the undertaking's potential for effect, including:

a. Assess the Undertaking's consistency with Avoidance Measures outlined under Stipulation V.A, below.

b. Make available the documentation of findings made hereunder to the ACHP, CASHPO, and other parties in accordance with Stipulation VII of this PA, or upon written request to CONAFEC.

2. Findings of No Historic Properties Affected: When qualified personnel determine, consistent with 36 CFR 800.4(d) (1), that a proposed undertaking has no potential to affect historic properties, the finding shall be documented and no further review will be required. Should the undertaking change, it will be subject to additional review for scope and effect.

3. Findings of No Adverse Effect: When qualified personnel determine, consistent with 36 CFR 800.5(b), that a proposed undertaking will have no adverse effect on historic properties, further review and/or consultation will be required only if the undertaking changes or unanticipated effects are discovered. Should the undertaking change it will be subject to additional review for scope and effect.

4. Findings of Adverse Effect: When qualified personnel find, consistent with 36 CFR 800.5(a), that an undertaking may adversely affect a historic property, CONAFEC will consider other alternatives to the undertaking that meet mission requirements and avoid the potential adverse effects to historic properties.

a. If, as a result of such efforts, the potential adverse effect can be avoided, an alternate finding shall be documented, consistent with this Stipulation of the PA. Should the undertaking later change, it will be subject to additional review for scope and effect.

b. If CONAFEC cannot identify an alternative or otherwise modify an undertaking so as to avoid the potential adverse effects, qualified personnel will document a finding of adverse effect and CONAFEC will initiate consultation with CASHPO, ACHP, and other parties as appropriate to resolve the adverse effect, pursuant to 36 CFR 800.6.

IV. Integrated Cultural Resources Management Plan

A. In accordance with Navy guidelines, the Navy has prepared an ICRMP to codify management protocols for the implementation of the Section 106 compliance authorities and protocols stipulated for NAFEC under this PA, some of which may constitute departures from the normal Section 106 process (36 CFR §800.14(b)(1)(v)). The ICRMP also defines and facilitates review processes for undertakings on NAFEC in support of the Navy's national defense mission.

B. The ICRMP includes procedures and consultation protocols for coordination of Section 106 review and compliance with historic preservation statutes and implementing regulations, as applicable, including ARPA, AIRFA, and NAGPRA.

C. Development of the ICRMP was concurrent with consultation on this PA, during which CONAFEC consulted with CASHPO and other interested consulting parties. CONAFEC has provided the final version of the ICRMP to CASHPO for review and comment.

D. As necessary following execution of this PA, the ICRMP will, during the normal annual update process, include an executive revision to:

1. Incorporate all attachments to this PA into the ICRMP, where required, to substitute all other attachments and become the only attachment to this PA; and

2. Reflect incidental grammar changes and attachment reference corrections as needed, consistent with the attached PA.

E. With the annual updating the NAFEC ICRMP required under Navy policy, CONAFEC will determine whether any recommended changes to the ICRMP may need consultation pursuant to Stipulation XI to determine whether an amendment to this PA is required.

V. Treatment of Archaeological Historic Properties

A. **Avoidance Measures.** CONAFEC will ensure that the authorization of ground disturbing activities implements, as necessary and appropriate, measures to protect archaeological resources from inadvertent effects. The following measures are currently and will remain in place on the El Centro Ranges for avoidance of adverse effect to archaeological historic properties:

1. Unless otherwise authorized following review for effect, all vehicles are required to stay on established roads or within cleared range targets; and

2. Unauthorized collection of archaeological materials is prohibited; and

3. Unauthorized digging is prohibited; and

4. Large-scale land exercises, including associated foot traffic, are restricted to designated areas where there is a paucity or absence of historic properties.

B. **Monitoring**. Where historic properties are or may be at risk of inadvertent effect by an undertaking, CONAFEC will provide for archaeological monitoring of ground disturbing activities.

1. CONAFEC has developed, or will further develop under follow-on ICRMP update and implementation actions, maps identifying areas on the El Centro Ranges which may, or may not, require monitoring by the qualified archaeologist.

2. In the ICRMP, or within follow-on ICRMP update and implementation actions, CONAFEC will also explicitly map areas where existing conditions, including previous disturbance, preclude the potential for eligible archaeological deposits and where, at the discretion of the qualified Navy personnel, archaeological monitoring would not be required.

3. CONAFEC shall implement any required archaeological testing or monitoring in accordance with the archaeological research design framework already developed for the El Centro Ranges, which is , or will be, incorporated in the ICRMP, for compliance with requirements of the NHPA, ARPA, NAGPRA and their implementing regulations, including 36 CFR 79.

VI. Inadvertent Discoveries and Emergencies

A. CONAFEC will manage its response to discoveries, unanticipated effects, and emergencies where feasible to avoid or minimize harm to historic properties.

1. If during the performance of an undertaking, historic properties are discovered or unanticipated effects are found, the activity will be immediately stopped in the vicinity of the discovery and CONAFEC and the CRM will be immediately notified. Review consistent with Stipulation III will be initiated, as appropriate.

2. CONAFEC will establish working procedures with appropriate contracting authorities to ensure that:

a. Contractors and other authorized agents engaged in ground disturbing activities will be required to stop work in the vicinity of any discovered archaeological deposit upon direction from a ICRM-authorized archaeological monitor and/or contracting officer upon encountering any such deposit; and

b. Construction or other activity in the vicinity of the discovery will not be resumed until CONAFEC has completed review in accordance with this Stipulation.

3. If, in the process of reviewing any discovery, unanticipated effect or emergency, CONAFEC identifies the potential for an adverse effect to historic properties, CONAFEC will notify CASHPO by telephone or email to resolve the adverse effect. When appropriate, CONAFEC will consult with CASHPO regarding which additional parties should be notified and consulted. The consultation process shall not exceed ten working days. CONAFEC will provide CASHPO and other involved parties with written recommendations reflecting the outcome of the consultation. If the parties do not object to CONAFEC's recommendations within ten working days of receipt, CONAFEC will modify the scope of work as necessary to implement the recommendations.

4. In the event that natural disasters, fires, chemical spill events or other emergency events occur, CONAFEC may take actions that affect historic properties without consultation to protect life safety, stabilize any involved historic properties, and prevent further damage to property, consistent with 36 CFR 800.12. Emergency response work shall be undertaken in a manner to avoid or minimize effects on historic properties to the extent possible.

a. As early as possible, given the nature of the emergency, CONAFEC will provide telephonic or email notification of the emergency to the CASHPO. Notification will include the steps being taken to address the emergency, the affected property and its historic significance, and a description of the emergency work and potential effects of that work on the discovered property.

b. Within 30 calendar days following this notification, CONAFEC will provide CASHPO and other parties as appropriate a written report documenting the actions taken to minimize effects, the present condition of the historic property, and the planned treatment of the property. CASHPO and the other parties will have 30 days to provide comments on the report and planned treatment. This action will also be included in the report developed in accordance with Stipulation VII.

VII. Annual Reports

A. CONAFEC shall, beginning 60 days after the end of the 2013 federal fiscal year, provide an Annual Report to the CASHPO and ACHP for each of the first five years following execution of this agreement, and biennially thereafter. Electronic reporting will be utilized as the preferred method to transmit this information.

1. The reports will include the following information; subject to the confidentiality requirements of 36 CFR 800.11(c) and other applicable laws:

a. Summary of actions taken under Stipulations III.B, III.C.5.d, III.D.3, V.B.2, and VI.A.4.b of this PA, including:

1) Archaeological site or building number/name, location and eligibility categorization;

2) Project name and designation with a brief description of proposed action;

3) List of agencies or parties consulted;

4. Date of project completion;

5) List of any reports that present the findings of archaeological work; and

6) Any problems encountered

b. Name of the reviewer with applicable date.

c. Reports of any training given pursuant to Stipulation II.B.3.

d. Identification of current CONAFEC points of contact and notification of any changes in key historic preservation personnel and/or functional organization of review.

e. Reports of any modifications and/or updates to the ICRMP.

f. Any recommendations to amend this PA or improve communications among the parties.

2. The format for this Annual Report will be developed in the ICRMP per Stipulation IV.

B. CASHPO and ACHP may review each report and may provide CONAFEC with comments within 30 days of receipt. CASHPO and ACHP may request additional documentation or explanations from CONAFEC. CONAFEC will provide timely responses to all comments and requests.

VIII. Review of PA

A. The ACHP and the CASHPO may review activities carried out pursuant to this PA on their own initiative or if so requested by participants to this PA. CONAFEC will cooperate with ACHP and CASHPO in carrying out their review responsibilities.

IX. Definitions

A. Definitions under 36 CFR 800.16 apply throughout this PA. These definitions are supplemented by the following:

1. The term "cultural resource" shall refer to any property or location that was created, modified, or used by people at least 50 years in the past. This term shall include but not be limited to historic properties and traditional cultural properties, as defined in 36 CFR 60. For the purpose of this PA, objects of military range residue (shrapnel, spent rounds, etc.) shall not be documented as cultural resources or determined to be historic properties.

2. The term "historic preservation" shall refer to any activity carried out per this PA to identify, manage, evaluate, protect or treat historic properties.

X. Dispute Resolution

A. Objections to the conduct of actions under this PA will be managed through consultation.

1. Should a Signatory to this PA object in writing to CONAFEC regarding any action carried out or proposed with respect to the implementation of this PA, CONAFEC shall consult with the objecting party. If after initiating such consultation CONAFEC determines that the objection cannot be resolved through consultation, it shall forward all documentation relevant to the objection to ACHP, including CONAFEC's proposed response to the objection. Within 30 calendar days after receipt of all pertinent documentation, ACHP shall exercise one of the following options:

a. Advise CONAFEC that ACHP concurs in CONAFEC's proposed response to the objection, whereupon CONAFEC will respond to the objection accordingly;

b. Provide CONAFEC with recommendations, which CONAFEC shall take into account in reaching a final decision regarding its response to the objection; or

c. Notify CONAFEC that the objection will be referred to ACHP membership for formal comment and proceed to comment pursuant to 36 CFR 800.7(c). The resulting comment shall be taken into account by CONAFEC in accordance with 36 CFR 800.7(c)(4).

B. Should ACHP not exercise one of the above options within 30 calendar days after receipt of the pertinent documentation, CONAFEC may move forward with its proposed resolution.

C. CONAFEC shall take into account any ACHP recommendation or comment provided in accordance with this stipulation with reference only to the subject of the objection; CONAFEC's responsibility to carry out all actions under this PA that are not the subjects of such objection shall remain unchanged.

D. Should an objection be raised by a member of the public to any stipulation under this PA or the manner of its implementation, CONAFEC shall take the objection into account and consult as needed with the objecting party, ACHP, and CASHPO, to attempt to resolve the objection.

XI. Amendment

A. If any of the Signatories to this PA believe that the terms of the agreement cannot be carried out, or that an amendment to the terms of the agreement is required, that Signatory shall immediately notify the other Signatories and request consultation to amend the PA. This PA may be amended when such an amendment is agreed to in writing by all Signatories. The amendment will be effective on the date a copy signed by all of the Signatories is filed with the ACHP.

XII. Termination

A. Any Signatory may terminate this PA by providing 30 calendar days written notice to the other Signatories, explaining the reasons for the termination. The Signatories shall consult during this 30-calendar-day period to seek agreement on amendments or other actions that would avoid termination. In the event of termination, CONAFEC will comply with 36 CFR 800.3 through 800.7 with regard to the undertaking, or initiate consultation to develop a new PA pursuant to 36 CFR 800.14(b) prior to beginning any undertaking previously included in the scope of this PA. CONAFEC shall notify the parties to this PA as to the course of action it will pursue.

XIII. Anti-Deficiency Act

A. CONAFEC's obligations under this PA are subject to the availability of appropriated funds, and the stipulations of this PA are subject to the provisions of the Anti-Deficiency Act. CONAFEC will make reasonable and good faith efforts to secure the necessary funds to implement its obligations under this PA. If compliance with the Anti-Deficiency Act alters or impairs CONAFEC's ability to implement its obligations under this PA, CONAFEC will consult in accordance with the amendment and termination procedures found at Stipulations XI and XII.

XIV. Duration

A. This PA shall take effect on the date that it has been signed by the last remaining Signatory.

B. This PA shall expire ten years after the date of execution. Six months prior to the expiration date, CONAFEC shall initiate consultation with the Signatories to review the PA for renewal and/or possible amendment and extension.

EXECUTION

Execution of this PA by CONAFEC and CASHPO and the implementation of its terms evidence that CONAFEC has taken, and will take, into account the effects of Navy undertakings on historic properties on the El Centro Ranges and afforded the ACHP an opportunity to comment. Each of the undersigned certifies that they have full authority to bind the party that they represent for purposes of entering into this agreement.

SIGNATORIES

NAVY REGION SOUTHWEST

By: _____ Date: 7 MAY 2013
Devon Jones, CAPT, USN
Commanding Officer, Naval Air Facility El Centro

STATE HISTORIC PRESERVATION OFFICER

By: _____ Date: 10 May 2013
Carol Rowland-Nawi
California State Historic Preservation Officer

CONCURRING PARTIES:

BUREAU OF LAND MANAGEMENT

By: _____ Date: _____
Greg Thompson
Program Manager, BLM Desert District

A. Synopsis of Selected Background Content from the El Centro Ranges EA

B. El Centro Ranges Infrastructure Management Actions

C. CNRSWINST for Project Approvals for Construction, Repair, Maintenance and/or Modification of Facilities

D. El Centro Ranges Procedure for Reviewing Operational Training Requests

E SECTION 106 SHPO CONCURRENCE LETTERS

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OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
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SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov

June 19, 2013

Reply in Reference To: USN_2014_0422_001

Captain T.C. Faller
Department of the Navy
Naval Support Activity Monterey
271 Stone Road
Monterey, CA 93943-5189

RE: Installation of Photovoltaic Systems at Naval Support Activity Monterey, Monterey, CA

Dear Captain Fuller:

Thank you for consulting with me on the above-referenced undertaking. Pursuant to Section 106 of the National Historic Preservation Act (16 USC 470f), as amended, and its implementing regulation outlined at 36 CFR Part 800, the United States Navy (Navy) is requesting I concur with a finding of No Adverse Effect to Historic Properties.

The Navy proposes to install and operate roof-mounted and carport-mounted photovoltaic systems in six different locations at Naval Support Activity Monterey Main Base and the Navy Annex. The undertaking is being developed as a design/build project. The specifications of the final design will be developed by the winning bidder. As I understand it, the final design will loosely conform to the artist renderings included with your submittal.

Project components include the installation of vertical support poles or combined footings. The amount of supports and the depth to which they will be driven has yet to be determined and will ultimately load to support. The typical support will be approximately six and a half feet-deep with a two and a half foot-diameter, while combined footings will be driven to an approximate depth of two feet, with a four foot-long by 2 foot-wide diameter. The Navy anticipates that the number of footings will not exceed 500 at Main Base and 150 at Navy Annex.

The height of a typical carport-mounted system will be approximately twelve to fourteen feet. Each panel will be approximately 5 feet wide and 3 feet long, and the number of panels in each array will depend on the solar power developer's site design. Rooftop-mounted panels will be approximately five feet wide by three feet long. The number of panels in each array will depend on the site design. The rooftop panels will be pitched with a maximum height of two and a half feet relative to the roof's surface. The rooftop panels will be mounted on Buildings 426, 427, 700, 702, 704, and 708.

The Navy defines the Area of Potential Effects (APE) all areas of proposed development, including ground disturbance, within the Main Base and Annex. At the Main Base the APE at the Main Base does not intersect the boundaries of the Hotel Del Monte Historic District or the Naval Postgraduate engineering School Historic District.

In an effort to identify historic resources that this undertaking might impact, Navy cultural resources staff conducted records searches and archival research, as well as reviewing previous cultural resources studies conducted at Naval Support Activity Monterey. Buildings 426, 427, 700, 702, 704, and 708 are less than fifty years old and do not exhibit an exceptional degree that might otherwise qualify them for inclusion on the National Register of Historic Places. Because both Main Base and the Annex were developed prior to the ability to conduct intensive surface surveys, the only accessible ground surface consists of public parks and walkways. Therefore, the effort to identify archaeological resources with the APE focused on archives, historic and geological maps, a review of previous archaeological studies, and a review of the installations Integrated Cultural Resources Management Plan. Based on a review of these materials, the Navy has determined that there is a low potential to encounter archaeological sites within the APE. However, the Navy will provided an archeological monitor to observe all ground disturbance associated with this project.

Naval Support Activity Monterey is located within the traditional ethnographic territory of the Rumsen band of Costanoan/Ohlone. The Coastanoan/Ohlone is not a federally recognized body and does not meet the definition of an Indian tribe as defined in 36 CFR Part 800.16. As no prehistoric archaeological sites or sacred lands have been identified within the undertaking area, Main Base, or the Annex, the Navy has elected not to request the participation on non-federally recognized individuals or groups as interested parties as defined under 36 CFR Part 800.3 (f).

Having reviewed your project description and the accompanying supporting documentation, I have the following comments:

1) I concur with your Finding of Effect.

2) While the Coastanoan/Ohlone is not a federally recognized tribe, the Navy cannot exclude a non-federally recognized tribe from consultation under 800.3 (f) as participants in the process should to be determined in consultation with the State Historic Preservation Officer (SHPO), and the SHPO is of the opinion that all tribal groups, entities, or individuals who may have an interest or ties to the project area should be notified of projects and consulted with. In the future, please consult with tribes early in the project planning process.

3) I support the Navy's proposal to provide for an archaeological monitor.

4) Please be reminded that in the event in a change in the scale or scope of the project, or in the event of an inadvertent discovery, the Navy may have additional responsibilities under 36 CFR Part 800.

Thank you for considering historic properties as part of the project planning process. If you have any questions or comments, please contact Tristan Tozer of my staff at (916) 445-7027 or at Tristan.Tozer@parks.ca.gov.

Sincerely,

Carol Roland-Nawi, Ph.D.

Carol Roland-Nawi, Ph. D.
State Historic Preservation Officer

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April 7, 2013

Reply in Reference To: USN_2014_0207_001

David Baillie
Environmental Program Director
Naval Weapons Station Seal Beach
800 Seal Beach Boulevard
Seal Beach, CA 90740-5000

RE: Photovoltaic System Construction, Naval Weapons Station Seal Beach, Seal Beach, CA

Dear Mr. Baillie:

Thank you for consulting with me on the above-referenced undertaking. Pursuant to Section 106 of the National Historic Preservation Act (16 USC 470f), as amended, and its implementing regulation outlined at 36 CFR Part 800, the United States Navy (Navy) is requesting I concur with a finding of No Historic Properties Affected.

The Navy proposes to install a photovoltaic system at Naval Weapons Station Seal Beach. Two locations have been proposed, identified as Alternatives 1 and 2. You define the Area of Potential Effects (APE) as the alternatives, as described and depicted in your letter and supporting documentation.

Frames, motors, and solar panels will be installed. Project components include grading the project site to remove vegetation, installation of underground electrical lines, and trenching between panels. An eight foot-high chain link fence will be installed around the site. Either combined footings or pole footings will be used. If the former are used, approximately 24 inches of vertical ground disturbance will be required; between four-to-six and a half feet of excavation will be required to install the pole footings.

A cultural resources records search carried out in 2007 indicated that 39 cultural resources studies have been conducted at the station. The records search also indicates that eight archaeological sites have been recorded within the boundaries of the station. Two of these sites have been determined eligible for listing on the National Register of Historic Places. None of the sites are located within the APE for this undertaking.

A Navy archaeologist performed pedestrian surveys of each alternative. Five meter transects were used in each survey. Each of the alternatives appears to have been graded at some point in the past. Rodent burrows were examined for indications of archaeological deposits. No historic properties were identified. Both alternatives are in the vicinity of ammunition storage bunkers and other support facilities covered under the

Program Comment for World War II and Cold War Era (1939-1974) Ammunition Storage Facilities. The undertaking will not affect these structures.

Native American tribal groups who might have an interest in or knowledge of the project area were notified of the proposed undertaking by letter. No responses have been received to date.

Having reviewed your project, I concur with your Finding of Effect. I also have no objections to the delineation of your APE. Please be reminded that in the event of further changes in the scale or scope of the project, you may have additional responsibilities under 36 CFR Part 800.

Thank you for considering historic properties as part of the project planning process. If you have any questions or comments, please contact Tristan Tozer of my staff at (916) 445-7027 or at Tristan.Tozer@parks.ca.gov.

Sincerely,

Carol Roland-Nawi, Ph.D.

Carol Roland-Nawi, Ph. D.
State Historic Preservation Officer

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov

April 22, 2013 14 B
Error in year.

Reply in Reference To: USN_2014_0206_001

David Baillie
Environmental Program Director
Naval Weapons Station Seal Beach
800 Seal Beach Boulevard
Seal Beach, CA 90740-5000

RE: Photovoltaic System Construction, Naval Weapons Station Seal Beach, Detachment Corona, Norco, CA

Dear Mr. Baillie:

Thank you for consulting with me on the above-referenced undertaking. Pursuant to Section 106 of the National Historic Preservation Act (16 USC 470f), as amended, and its implementing regulation outlined at 36 CFR Part 800, the United States Navy (Navy) is requesting I concur with a finding of No Historic Properties Affected.

The Navy proposes to install a photovoltaic system at Naval Weapons Station Seal Beach, Detachment Corona consisting of frames, motors, and solar panels. Project components include grading the project site to remove vegetation, installation of underground electrical lines, and trenching between panels. An eight foot-high chain link fence will be installed around the site. Either combined footings or pole footings will be used. If the former are used, approximately 24 inches of vertical ground disturbance will be required; between four and six and a half feet of excavation will be required to install pole footings.

Two locations have been proposed, identified as Alternatives 1 and 2. One or both of these locations may be selected for development. Alternative 1 is identified as eight and a half acres on the eastern side of the installation. Alternative 2 is comprised of approximately ten acres of unpaved land in the southeastern corner of the installation.

You define the Area of Potential Effects (APE) as the alternatives, as described and depicted in your letter and supporting documentation.

A cultural resources records search carried out in 2007 indicated that eleven cultural resources studies have been conducted at the station. The records search also indicates that one archaeological site, first identified in 1977, has been recorded within the boundaries of the station. Subsequent surveys failed to locate the site. Regardless, the site is not located within the APE.

A Navy archaeologist performed pedestrian surveys of each alternative. Five meter transects were used in each survey. Each of the alternatives appears to have been graded at some point in the past. Rodent burrows were examined for indications of archaeological deposits. No historic properties were identified.

The Navy considered visual effects to the National Register-listed Lake Norconian Club Historic District. The view shed has been evaluated and determined not to be an issue due to the topography.

Native American tribal groups who might have an interest in or knowledge of the project area were notified of the proposed undertaking by letter. No responses have been received to date.

Having reviewed your project, I concur with your Finding of Effect. I also have no objections to the delineation of your APE. Please be reminded that in the event of further changes in the scale or scope of the project, you may have additional responsibilities under 36 CFR Part 800.

Thank you for considering historic properties as part of the project planning process. If you have any questions or comments, please contact Tristan Tozer of my staff at (916) 445-7027 or at Tristan.Tozer@parks.ca.gov.

Sincerely,

Carol Roland-Nawi, Ph.D.

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April 28, 2013

Reply in Reference To: USN_2014_0204_001

Captain L.R. Vasquez
Department of the Navy
Naval Base Ventura County
311 Main Road, Suite 1
Point Mugu, CA 93042-5033

RE: Photovoltaic System Construction, Building PH 1388, Naval Base Ventura County, Port Hueneme, CA

Dear Captain Vasquez:

Thank you for consulting with me on the above-referenced undertaking. Pursuant to Section 106 of the National Historic Preservation Act (16 USC 470f), as amended, and its implementing regulation outlined at 36 CFR Part 800, the United States Navy (Navy) is requesting I concur with a finding of No Historic Properties Affected.

The Navy proposes to install a double cantilever carport photovoltaic system and associated infrastructure at Building PH 1388, a tilt-up concrete structure constructed in 1993. Project components include partial pavement removal, grading, and trenching for installation of electrical conduit.

You define the Area of Potential Effects (APE) as Building PH 1388, the parking lot, and a fifty-foot buffer area around the area. No historic properties are located within the APE.

The Navy is of the opinion that the development history of NBVC Port Hueneme precludes the potential for ground-disturbing activities to affect archaeological resources. More than half of the area comprising Port Hueneme is made up of reclaimed coastal wetlands subject to extensive modification beginning in the early1900s via agricultural development through the 1940s and 1950s during the primary periods of development as a military facility. These activities deeply buried or significantly modified some or all of the original terrains. However, all trenching or grading activities will be monitored by a qualified archaeologist.

The Navy consulted with the Santa Ynez Band of Chumash Indians Elders Council by email. The Council's Cultural Preservation Consultant Freddie Romero noted in an email dated April 23, 2014 that the Council "see no impacts to any cultural sites or sacred areas and have no further comments."

Having reviewed your project, I concur with your Finding of Effect. I also have no objections to the delineation of your APE. Please be reminded that in the event of further changes in the scale or scope of the project, you may have additional responsibilities under 36 CFR Part 800.

Thank you for considering historic properties as part of the project planning process. If you have any questions or comments, please contact Tristan Tozer of my staff at (916) 445-7027 or at Tristan.Tozer@parks.ca.gov.

Sincerely,

Carol Roland-Nawi, Ph.D.

Carol Roland-Nawi, Ph. D.
State Historic Preservation Officer

F PREHISTORY AND HISTORY OF THE INSTALLATIONS

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APPENDIX F

PRE-HISTORY AND HISTORY OF THE INSTALLATIONS

Archaeologically, California is a very diverse area, and the installations that are part of the project are located in different archaeological regions of the state. Each installation falls in the traditional territory of different people, as well. Native American communities fall into one of two categories—those that are federally recognized and those that are not. Federally recognized tribes have a special relationship with the federal government, while unrecognized tribes do not. Tribes affiliated with the area of each installation are:

- NAF El Centro: Cocopah and Quechan;
- NSA Monterey's Main Site and Navy Annex: Esselen and Costanoan/Ohlone;
- NAVWPNSTA Seal Beach: Gabrielino (Tongva);
- NAVWPNSTA Seal Beach Detachment Norco: Gabrielino (Tongva); and,
- NBVC Port Hueneme: Chumash.

The prehistoric archaeology and the ethnography of each installation will be summarized below, followed by a general discussion of the historic period. Table F-1, presented at the conclusion of this summary, provides a list of the prehistoric periods for each installation, and Table F-2 lists the previous cultural resource investigations conducted at the installations. Unless otherwise noted, the following is summarized from the installation Integrated Cultural Resources Management Plans (ICRMPs) (Navy 2011b, 2011c, 2011d, 2013f, 2013g).

PRE-HISTORY

NAF EL CENTRO

NAF El Centro is located in the Colorado Desert, an area where stratified sites and secure dates are scarce. Four periods are recognized for the area: Malpais, Paleoindian, Archaic, and Late Prehistoric.

Malpais. Several authors have identified what they believe are archaeological assemblages that they believe predate the Paleoindian period, making them older than about 12,000 Before Present (BP). Found on desert pavements in the area, these assemblages refer

to core-based tools, including scrapers and choppers, which are weathered and covered with desert varnish. Rock alignments and circles cleared in the desert pavement are often attributed to this period; however, because they are restricted to surface contexts and have no datable material associated with them, it is difficult to determine the age of either the features or the artifacts. The Yuha burial, found near NAF El Centro, was dated to over 20,000 B.P. based on the radiocarbon age of caliche (calcium carbonate) associated with it; however, subsequent accelerator mass spectrometry dating of the bone itself indicated the burial is only 5000 years old. Many scholars question the antiquity of this material.

Paleoindian Period (12,000 to 7,000 B.P.). The archaeological complexes known as San Dieguito and Lake Mojave are the representatives of the Paleoindian period in the Colorado Desert. Primarily known from surface sites, the C.W. Harris site on the San Diego coast has San Dieguito materials in a buried context. San Dieguito (and the related Lake Mohave) complex are characterized by percussion-flaked tools made on both cores and flakes, particularly unifacial tools known as scrapers, along with choppers, and scraper planes. Crescents are a distinctive part of the assemblage, and stemmed points (including those called Lake Mojave and Silver Lake points), leaf-shaped points, and spokeshaves are also found.

In the desert, the sites are generally surface finds which often occur on desert pavement surfaces with associated weathered trails and cleared circles known popularly as “sleeping circles.” The subsistence during the Paleoindian period is generally thought to have focused on large game, in part because seed-milling implements are rare to absent on San Dieguito sites, but faunal remains are also generally lacking. Small game may have contributed a substantial portion of the diet during these times. More precise dating and nature of the association of these artifacts with the trails and cleared circles are important research questions for this period, as are questions about subsistence.

Archaic Period (7,000 to 1,500 B.P.). During the Archaic period, there are two complexes recognized in the Colorado Desert: the Pinto complex and the Amargosa-Gypsum complex.

The Pinto complex dates from 7,000 to 4,000 B.P. and appears to have been a time of shifting subsistence emphasis away from big game to a broader pattern of exploitation of the environment with more plant resources being exploited. Distinctive projectile points, called Pinto points, are a hallmark of this period, but milling equipment in the form of manos and metates also become more common. Other artifacts found on Pinto period sites include knives, scrapers, scraper-planes, and chopping tools. This change in subsistence is seen as an adaptation to climate change in which the deserts became warmer and drier.

The Gypsum-Amargosa complex has dates of 4,000 to 1,500 B.P. associated with it. Projectile points, including types called Elko, Humboldt, and Gypsum, are more finely made. Leaf-shaped points, knives with rectangular bases, flake scrapers, and T-shaped drills are also found, and a few large scraper-planes, choppers, and hammerstones round out the

assemblage. Seed processing is indicated by the continued presence of manos and basin metates, and the mortar and pestle used for pulverizing seeds was introduced late in this time interval.

Few Archaic period sites are currently known from the Colorado Desert. Sites of this period are important for filling out the details of the archeological record in the area, and sites that can provide information on past environments are important in helping to flesh out the context of this adaptation.

Late Prehistoric (Patayan) Period (1,500 to 700 B.P.). Major cultural changes take place during this period, which is referred to as the Patayan period. Ceramic manufacture is introduced into the area, possibly due to influences to the Hohokam of Arizona. Although few burials are known for the Archaic period, during the Patayan period bodies were cremated. The larger atlatl points of the Archaic period are replaced by arrowheads of two basic times: the Cottonwood Triangular point and the Desert Side-Notched point. During this period, there is a change from hunting and gathering and exploitation of riverine resources in the Patayan I period (A.D. 700 to 1000) to floodplain horticulture in the Patayan II period (A.D. 1000 to 1500). Agriculture was well developed along the Colorado River, but was practiced along the Alamo and New rivers, as well. An extensive system of well-developed trails is also dated to this period indicating travel. Travel appears to have been both for trade and as part of religious activities.

Patayan I groups appear to have been small, mobile bands deriving their living from wild resources. Patayan II people grew maize, tepari beans, squash, pumpkins, and gourds in the floodplains, although wild plants were probably also important.

During the Late Prehistoric period the Salton Trough was filled repeatedly by flooding from the Colorado River to form Lake Cahuilla. When it was present, the lake drew populations to its shores, as evidenced by numerous sites found along the terraces that mark its former stands. Sites appear to represent a range from small fishing camps to more permanent settlements. A portion of the ancient Lake Cahuilla shoreline is found within NAF El Centro, and questions about the nature of lacustrine adaptations are important areas of potential research.

Ethnographic Period. This is the period when historic Native American occupants of the area can be identified. The installation is included in the traditional territories of several of the river and delta Yuman peoples, including the Quechan, Mojave, Cocopah, and several others. The desert Tiapi or Kamia also used the area. Tribal boundaries appear to have been fluid. These groups subsisted on a combination of wild resources and floodplain horticulture, and maintained an extensive trail system throughout the area. The installation maintains a relationship with the Quechan and the Cocopah, both of which are federally recognized tribes.

NSA MONTEREY'S MAIN SITE AND NAVY ANNEX

NSA Monterey is located on California's central coast. The archaeological record in this area is summarized below.

Paleoindian Period (before 10,000 B.P.). On the California' central coast, there is sporadic evidence for early occupation, mostly in the form of isolated fluted points (the hallmarks of Paleoindian occupation in other parts of the country). Recent research in the western United States, particularly at Paisley Cave in Oregon and on California's Channel Islands, suggests that there are occupations that predated the fluted point-making groups that made stemmed points and crescentics (Erlandson and Braje 2011). While no evidence of these materials has been found in the area of NSA Monterey, the possibility of a widespread early coastal occupation is relevant to consideration of the earliest occupations of the area.

Millingstone Period (10,000 to 5,500 B.P.). The Millingstone period is found throughout Central and Southern California. It is marked by the appearance of manos or hands stones and milling slabs. The flaked stone portion of Millingstone assemblages includes large side-notched points thought to have been used on altalt darts and cobble-core tools. The sites are often marked by quantities of marine shell, but the bones of fish, birds, and mammals are also found. The bulk of the diet appears to have been acquired from the sea, and Millingstone sites are generally found in the vicinity of the coast.

Early Period (5,500 to 2,600 B.P.). Sites of this period contain a number of large projectile points and bifaces. Side-notched points found in the earlier Millingstone period are present, along with narrow contracting-stemmed points and Rossi square-stemmed points. Lower frequencies of cobble-core tools are found in sites of this period, and portable mortars and pestles appear in the archaeological record. Fish bones are more abundant in sites of the Early period, and pinpointed bone gorges that could have been used for line fishing are found. Land mammal remains include deer, rabbits, and sea otter. Some archeologists would separate this period into two phases, with sites dating prior to 4,000 B.P. in the earlier phase and those dating after that time in the later phase.

Middle Period (2,600 to 1,000 B.P.) Both square-stemmed and large side-notched points disappear from the record at this time, but contracting-stem points continue. Ground stone includes both manos and milling slabs and mortars and pestles. Circular shell fishhooks make their appearance during this time, although bone gorges continue to be found, and fish bone is more common than in earlier times. Grooved stone net weights are found during this period, as well. Mammal remains vary from site to site. At the end of this period, small leaf-shaped projectile points indicate the replacement of the atlatl by the bow and arrow.

Middle-Late Transition (1,000 to 750 B.P.). The Middle-Late Transition is marked by sites with an abundance of projectile points, and fewer stemmed points are found. Fishing

appears to have increased, as does the harvesting of vertebrates, but shellfish use decreased, although shells are found in all coastal sites during this time.

Late Period (750 B.P to A.D. 1769). Sites of the Late period are quite different from those of earlier periods. Arrow points of this period are primarily desert side-notched and cottonwood types. Bedrock milling is associated with sites of this period, as are hopper mortars and small bifacial bead drills. Sites are found in inland locations more often than on the coast, and some sites on the Monterey Peninsula in which whole abalone shells are found have been interpreted as places where people from the interior collected and processed these meaty shellfish. Bedrock mortars and extensive midden deposits suggest extensive seed harvesting, including the use of the acorn. The end of this period is the date of beginning of sustained contact between Native Americans and the Europeans in the area.

Ethnographic period. NSA Monterey's Main Site and Navy Annex are in the territory of the Costanoan/Ohlone, and the Esselen territory was to the south. Both groups were hunter/gatherers who also participated in trade with their neighbors. They used a number of plants for food, with acorns and pine nuts being important. Marine fish and shellfish also contributed to their diet. Neither the Costanoan/Ohlone nor the Esselen are federally recognized tribes.

NAVWPNSTA SEAL BEACH AND NAVWPNSTA SEAL BEACH DETACHMENT NORCO

Both NAVWPNSTA Seal Beach and NAVWPNSTA Seal Beach Detachment Norco are in Southern California where a series of four horizons is used to describe the prehistory of the area. Although there are some differences in the details between the two installations, based on the fact that Seal Beach is on the coast and Detachment Norco is inland, these horizons will be summarized below for both installations.

Horizon I – Early Man (ca. 12,000 to 8,000 B.P.). As was discussed for NSA Monterey, above, the potential for very early material along the California coast, pre-dating the fluted point complexes, should be considered, although no evidence for these occupations has been found in the immediate vicinity of either NAVWPNSTA Seal Beach or NAVWPNSTA Seal Beach Detachment Norco. It is also recognized that a few isolated fluted points have been found in Southern California, but Horizon I generally refers to the San Dieguito Complex discussed above for NAF El Centro. This complex is characterized by large leaf-shaped bifaces, stemmed points, scrapers, and crescentics. As previously noted, milling stones are rare in San Dieguito assemblages.

Horizon II – Milling Stone (8,000 to 5,000 B.P.). The Milling Stone horizon is characterized by the presence of milling stones (manos or hand stones, and grinding slabs or basins), as well as by stone choppers, scrapers, and cutting tools, generally made from locally

available raw material. Projectile points are large and often leaf-shaped and are of appropriate size for spears or atlatl darts. Although rare, bone tools are found, including awls, and a few sites have evidence of weaving or basketry. Mortars and pestles were introduced during this period, as well. Mortuary practices consisted of inhumation (burial of the body) either in a flexed or extended position. Cairns of cobbles or milling stones are often placed over burials, and millings stones that have a hole broken through the bottom are sometimes associated with the burials. Caches of cogstones and discoidals are sometimes associated with Milling Stone sites.

On the coast, subsistence focused on marine resources, as evidenced by extensive shell middens. At inland sites, the subsistence seems to have been based on a broad variety of resources.

Horizon III – Intermediate (5,000 to 1,500 B.P.). Projectile points of the Intermediate period include large side-notched points, stemmed, and leaf-shaped points, including both Gypsum and Elko points. Other tools include knives, flake scrapers, and drill-like implements. Mortars and pestles generally replace the mano and metate, and hopper mortars and stone bowls are also found. Burials were generally flexed and sometimes accompanied by red ochre and abalone shell dishes. Cairns were sometimes present.

Subsistence during this period appears to have included marine resources and hunting, with a wide range of plant resources being harvested. There is considerable regional variation in subsistence strategy. Exchange was also important at this time, with traded items including objects of steatite and obsidian.

Horizon IV – Late Prehistoric (1,500 B.P. to Historic Contact). The Late Prehistoric Horizon is marked by an increase in both the complexity and diversity of material culture. This is seen in the presence of a greater number of artifact classes. The number of small projectile points increases, and steatite arrow shaft straighteners are found. Steatite was also used for the manufacture of containers and cooking vessels. Bone and circular shell fishhooks occur in larger numbers than in previous horizons, and a variety of bone tools and personal ornaments of shell, bone, and stone are found. Natural asphalt was used as mastic and for waterproofing items. Fired clay smoking pipes and ceramic vessels have been recovered at some sites and date to 1,000 B.P. or later, but these were probably received in trade, as they are relatively rare, at least in coastal areas.

In the area of subsistence, there appears to have been an increased use of plants in the diet, and an increase in both marine and terrestrial hunting. Burial patterns became more elaborate, with both inhumations and cremations occurring. Burials were often accompanied by abundant grave goods.

Ethnographic Period. NAVWPNSTA Seal Beach is located in Gabrielino/Tongva territory, and NAVWPNSTA Seal Beach Detachment Norco is located at the intersection of Gabrielino/Tongva territory with that of the Cahuilla and the Juaneño/Acjachemen. The name

"Gabrielino" refers to the association with Mission San Gabriel, but descendent populations refer to themselves as Tongva. The Tongva occupied the Los Angeles Basin and San Clemente, Santa Catalina, and San Nicolas Islands, living in large permanent villages.

Tongva subsistence included both hunting and gathering, and along the coast they used ocean-going plank canoes for fishing and trade. The Tongva are not a federally recognized tribe.

NBVC PORT HUENEME

NBVC Port Hueneme is located in the Santa Barbara subregion of the Southern Coastal region of California. The four horizons described above for NAVWPNSTA Seal Beach and NAVWPNSTA Seal Beach Detachment Norco are also sometimes applied to this area, although a more common scheme is division into Early, Middle, and Late periods. That is succinctly summarized in the following text taken directly from the ICRMP for this installation (Navy 2013g:32-33).

The Early Period (pre-5,000 to 1,000 B.C.). contained three phases characterized by a gradual shift from an egalitarian to a ranked society based on achieved status; an absence of centralized leadership; subsistence emphases on plant gathering, hunting, and marine resource exploitation; permanent settlements with associated cemeteries; and trade between coastal and island dwellers.

The Middle Period (1,000 B.C. to A.D. 1100). included five phases marked by numerous types of beads and ornaments, with a shift from rectangular to circular Haliotis and Olivella shell beads; inherited leadership and status differences; coastal villages; use of the plank canoe in the Late Middle period; subsistence increasingly focused on acorns and maritime resources; and centralized ports and trading centers established in conjunction with a more extensive exchange system.

The Late Period (A.D. 1100 to 1804). was divided into three phases and characterized by the use of shell money in the form of Olivella callus beads; the appearance of special-usesites, including seasonal villages, rock shelters, and processing sites; a complex hunting and gathering economy; and various lithic quarrying activities.

Ethnographic Period. The Native Americans whose territory encompassed NBVC Port Hueneme are the Chumash. The Chumash were complex hunters and gatherers who lived on the coast in the Santa Barbara and Ventura areas and on the four northernmost Channel Islands: Santa Cruz, Santa Rosa, San Miguel, and Anacapa.

They lived in large, permanent villages, and subsisted on a combination of terrestrial foods, most notably the acorn, and marine resources, including sea mammals, fish, and

shellfish. Like the Tongva, they made ocean-going plank canoes used for trade and for obtaining fish and sea mammals. The Chumash are a federally recognized tribe.

HISTORY

Written history in California began with European exploration of the area. Historic times can be divided into four periods: Exploration, Spanish, Mexican, and American. :

Exploration Period (A.D. 1540 to 1769). Beginning with Hernando de Alarcón's exploration of the lower Colorado River in 1540, California was infrequently visited during this period. Juan Rodríguez Cabrillo sailed the coast of California in 1542, and Sebastián Vizcaino followed in 1602 to 1603. These explorations provided the first documentation of the Native Americans of the region, but they had little effect on the indigenous peoples and left little trace in the archaeological record.

Spanish or Mission Period (A.D. 1769-1821). Sustained contact between native peoples in California and Europeans really began in 1769 when Franciscan missionaries working under the direction of the Spanish Crown established the first mission in Alta California at San Diego. These missions were intended to bring in the local Indians and convert them to Christianity.

Ultimately, 21 missions were established in Alta California. NAF El Centro is east of Mission San Diego de Alcala and this area was not heavily affected by the mission. Mission San Carlos Borromeo was founded in 1770 and NSA Monterey was within its territory. Both NAVWPNSTA Seal Beach and NAVWPNSTA Seal Beach Detachment Norco are located in what was the territory of Mission San Gabriel Arcangel, established in 1771. The area covered by Mission San Buenaventura, founded in 1782, included NBVC Port Hueneme. The Spanish also established presidios, including one at Monterey, and pueblos.

Mexican Period (A.D.1821 to 1850). Mexico won its independence from Spain in 1821. Following Mexican independence, the missions were secularized in 1834 and their lands were confiscated and allocated to individuals as large land grants. The Mexican war in 1846 and the discovery of gold in 1848 led to the end of this period.

American period (A.D. 1850-present). Following the Mexican War and the Gold Rush of 1849, California became a state on September 9, 1850. The Gold Rush brought a large influx of people into California. The American period saw the growth of agriculture and the linking of California to the east by railroads. Towns were established and cities grew from the pueblos established by the Spanish.

One interesting trend of the American period was the development of resort hotels. NSA Monterey's Main Site was the site of the development of the Hotel Del Monte in the 1870s. A later incarnation of the hotel has been incorporated into the base and is now a National Register of Historic Places (NRHP) historic district. In the 1920 the Lake Norconian Resort was

developed at NAVWPNSTA Seal Beach Detachment Norco, also today an NRHP historic district.

Military History. Each of the installations was established as result of the United States' involvement in World War II. NAF El Centro began its operation in 1942 as Marine Corps Air Station El Centro for training air crews; NSA Monterey was originally a preflight school, beginning in 1943; in late 1944, NAVWPNSTA Seal Beach was established as an ammunition depot and a facility for repairing steel submarine nets; NAVWPNSTA Seal Beach Detachment Norco started out as a hospital in 1941; and NBVC Port Hueneme operated as an Advanced Base Depot for training and staging of Seabees in 1942. Each of the installations has seen its mission and activities change over the intervening years. In terms of evaluating military structures, two periods are particularly important: World War II and the Cold War. The Naval Postgraduate School at NSA Monterey is now an NRHP historic district.

REFERENCES

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U.S. Department of the Navy (Navy). 2013f. Integrated Cultural Resources Management Plan for Naval Air Facility El Centro, Imperial County, California. Prepared for NAVFAC Southwest. March 2013.

_____. 2013g. Integrated Cultural Resources Management Plan for Point Mugu and Port Hueneme, Naval Base Ventura County, California, and Special Areas. Prepared for NAVFAC Southwest. May 2013.

_____. 2011b. Integrated Cultural Resources Management Plan for Naval Weapons Station Seal Beach, Orange County, California. Prepared for NAVFAC Southwest. September 2011.

_____. 2011c. Integrated Cultural Resources Management Plan for Naval Weapons Station Seal Beach, Detachment Corona Riverside County, California. Prepared for NAVFAC Southwest. September 2011.

_____. 2011d. Integrated Cultural Resources Management Plan for Naval Support Activity Monterey, Monterey, Santa Clara, and Santa Cruz Counties California. Prepared for NAVFAC Southwest. September 2011.

Table F-1 Prehistoric Periods, by Installation

Periods	Dates	Characteristics	Reference
NAF El Centro			
Malpais	Prior to 12,000 B.P.	Controversial period represented by heavily weathered and patinated stone tools, rock alignments, and cleared circles.	Navy 2013f
Paleoindian (San Dieguito/ Lake Mojave	12.000-7,000 B.P.	Scrapers, flake-based tools, stemmed points, and crescentics.	Navy 2013f
Archaic—Pinto complex	7,000-4,000 B.P.	Pinto atlatl points, scrapers, knives, scraper-planes, manos, and mutates.	Navy 2013f
Archaic—Amargosa-Gypsum complex	4,000-1500 B.P.	Elko and Gypsum points, leaf-shaped points, scrapers, and choppers. Millingstones become more common.	Navy 2013f
Late Prehistoric (Patayan)	1,150-450 B.P.	Small arrow points and ceramics. Cremations. Some agriculture.	Navy 2013f
NSA Monterey's Main Site and Navy Annex			
Palaeoindian	Prior to 10,000 B.P.	Sparse fluted points.	Navy 2011d
Millingstone	10,000-5,500 B.P.	Millingstones, large side-notched points, coble tools.	Navy 2011d
Early	5,500-2,600 B.P.	Large points and bifaces, cobble tools, portable mortars and pestles (rare). Bone fish gorges.	Navy 2011d
Middle	2,600-1,000 B.P.	Changes in point and bead styles, milling stones and mortar and pestle, circular shell fishhooks. Arrow points appear at the end of the period.	Navy 2011d
Middle-Late Transition	1,000-750 B.P.	Increase in arrow points, changes in bead styles.	Navy 2011d
Late	750 B.P.-Contact*	Desert side-notched and cottonwood triangular points, bedrock mortars, hopper mortars.	Navy 2011d
NAVWPNSTA Seal Beach			
Early Man (Horizon I)	12,000-8000 B.P.	Few fluted points. San Dieguito complex – leaf-shaped points and knives, stemmed scrapers, engraving tools, and crescents.	Navy 2011b
Millingstone (Horizon II)	8,000-5,000 B.P.	Millingstones. Chopping, scraping, and cutting tools, leaf-shaped points, bone tools.	Navy 2011b
Intermediate (Horizon III)	5,000-1,500 B.P.	Large points (including Elko and Gypsum), mortar and pestle, hopper mortars, and stone bowls.	Navy 2011b
Late Prehistoric (Horizon IV)	1,500-Contact*	Small points (arrowheads), steatite vessels, increase in shell fishhooks, fired clay smoking pipes.	Navy 2011b

Table F-1 Prehistoric Periods, by Installation

Periods	Dates	Characteristics	Reference
NAVWPNSTA Seal Beach Detachment Norco			
Early Man (Horizon I)	12,000-8000 B.P.	Few fluted points. San Dieguito complex – leaf-shaped points and knives, stemmed scrapers, engraving tools, and crescents.	Navy 2011c
Millingstone (Horizon II)	8,000-5-000 B.P.	Millingstones. Chopping, scraping, and cutting tools, leaf-shaped points, cogged stones, and discoidals.	Navy 2011c
Intermediate (Horizon III)	5,000-1,500 B.P.	Large points (including Elko and Gypsum), mortar and pestle, hopper mortars, and stone bowls.	Navy 2011c
Late Prehistoric (Horizon IV)	1,500-Contact*	Small points (arrowheads), steatite vessels, increase in shell fishhooks, fired clay smoking pipes.	Navy 2011c
NBVC Port Hueneme			
Early Period	pre-5000 to 1000 B.C.	A gradual shift from an egalitarian to a ranked society; absence of centralized leadership; gathering, hunting, and marine resource exploitation; permanent settlements with associated cemeteries, and trade between coastal and island dwellers.	Navy 2013g
Middle Period	1000 B.C. to A.D. 1100	Inherited leadership and status differences; coastal villages; plank canoe; increasing focus on acorns and maritime resources; and centralized ports and trading centers; more extensive exchange system.	Navy 2013g
Late Period	A.D. 1100 to 1804	*Olivella* callus beads used as money, special-use sites, including seasonal villages, rock shelters, and processing sites; complex hunting and gathering economy.	Navy 2013g

Note:
* "Contact" indicates the period in which Native Americans began to interact with Europeans.

Table F-2 Previous Cultural Resources Investigations, by Installation

Author	Description of Project	Type of Project	Year
NAF El Centro[1]			
von Werlhof, J.	Archaeological Examinations of Petty Ray Geophysical Transects on West Mesa	Survey	1983
Apple, R., et al	Historic and Archaeological Resources Protection Plan	Historic and Archaeological Resources Protection Plan	1994
Ogden Environmental and Energy Services	Cultural Site Survey	Archaeological Survey, built environment survey, evaluation of 10 structures	1997
JRP Historical Consulting, Inc.	Inventory and Evaluation of National Register of Historic Places Eligibility, Cold War Era Buildings and Structures	Architectural inventory and evaluation	2004
RECON	Archaeological Survey of Lake Cahuilla Shoreline	Archaeological survey	2007
AECOM	Archaeological Survey for Proposed Geothermal Test Well	Archaeological survey	2010
ASM Affiliates	Subsurface Testing of Four Prehistoric Sites	Test excavation	2010
ASM Affiliates	Archaeological Survey Target 68	Archaeological survey	2011
ASM Affiliates	Archaeological Survey Targets 101 and 103	Archaeological survey	2011
ASM Affiliates	Historic Context Investigation (Hearths and Earth Ovens)	Investigation of historic context	2012
Far Western Anthropological Research Group, Inc.	Cultural Resource Inventory Target 101 and Superstition Hills	Inventory of cultural resources in the Target 101 and Superstition Hills area	2013
NSA Monterey's Main Site[2]			
Haversat, T. and G.S. Breschini	Archaeological and Osteological Analyses of a Prehistoric Burial Recovered from the Naval Postgraduate School	Archaeological and osteological burial analysis	1989
Blosser, A.	Historic American Buildings Survey: Hotel Del Monte, East Annex (Naval Postgraduate School, Herrmann Hall, Building 221)	Historic American Buildings Survey	2004
Blosser, A.	Historic American Buildings Survey: Hotel Del Monte, West Annex (Naval Postgraduate School, Herrmann Hall Building 222)	Historic American Buildings Survey	2004
Manley, W.R.	The Naval Postgraduate Engineering School Historic District	NRHP evaluation with Department of Parks and Recreation 523 series forms	2005
Thompson, S.A.	Archaeological Survey and Subsurface Investigation/Excavation of the Hotel Del Monte/Resort's Stanley Grove	Archaeological survey and subsurface testing	2006

Table F-2 Previous Cultural Resources Investigations, by Installation

Author	Description of Project	Type of Project	Year
NSA Monterey's Navy Annex[2]			
Chavez, D.	Archaeological Resources Review for the Naval Postgraduate School	Records search only and minimal archaeological reconnaissance	1981
Uribe and Associates	Historic and Archaeological Resource Protection Plan for Naval Postgraduate School	Historic and archaeological resource protection plan (cultural resources overview)	1997
NAVWPNSTA Seal Beach[3]			
U.S. Navy	Historic Context of NAVWPNSTA Seal Beach, Det. Fallbrook, and Fleet Missile System Analysis and Evaluation Group Annexes 1941–1971	Historic Context	1972
Clevenger, J.	Archaeological Survey	Archaeological survey	1997
Cottrell, M. and T. Cooley	Archaeological Survey at SBNWR	Archaeological survey	1980
Van Horn, D.	Archaeological Survey	Archaeological survey	1981
Brock, J.	Archaeological Survey at SBNWR	Archaeological survey	1985
Bissell, R.	Archaeological Survey at NAVWPNSTA Seal Beach, Det. Corona, and Det. Fallbrook	Archaeological survey	1988
Bissell, R.	Archaeological Survey	Archaeological survey	1992
Ogden Environmental and Energy Services	Historic Properties Inventory and site NRHP eligibility evaluation	Historic buildings and archaeological evaluation	1993
Clevenger, J. and K. Crawford	Archaeological survey and site NRHP eligibility evaluation	Historic buildings and archaeological evaluation	1995
Bissell, R.	Archaeological Survey	Archaeological survey	1996
Clevenger, J.	Archaeological Survey	Archaeological survey	1996
Clevenger, J. and K. Crawford	Evaluation of NRHP eligibility for CA-ORA-298 and CA-ORA-322/1188	Historic buildings evaluation and archaeological survey/ evaluation	1997
Davy, D.	Archaeological Survey	Archaeological survey	1997
Crawford, K.	Archaeological, Historical, and Architectural Survey and site NRHP eligibility evaluation	Historic buildings evaluation and archaeological survey/evaluation	1997
Lewis, K.	Evaluation of NRHP eligibility of Historic Buildings	Historic buildings evaluation	1998
JRP Historical Consulting, Inc.	Evaluation of NRHP eligibility of Cold War-Era Buildings and Structures	Historic buildings evaluation	1999

Table F-2 Previous Cultural Resources Investigations, by Installation

Author	Description of Project	Type of Project	Year
Carrico, R. and R. Case	Archaeological Survey	Archaeological survey	2000
JRP Historical Consulting, Inc.	Evaluation of NRHP eligibility of Historic Buildings and Structures	Historic buildings evaluation	2000
U.S. Army Corps of Engineers, Sacramento District	Preparation of a Draft Integrated Cultural Resources Management Plan	Management plan	2001
Underwood, J. and J. Cleland	Evaluation of NRHP eligibility for CA-ORA-1502, CA-ORA-1503, and CAORA-1504 of Historic Buildings	Archaeological evaluation	2002
RECON	Evaluation of NRHP eligibility for Historic WWII Buildings	Historic buildings evaluation	2002
Willey, L. and J. Underwood	Evaluation of NRHP eligibility for CA-ORA-322/1188	Archaeological evaluation	2003
Chatters, J.	Archaeological Data Recovery for CAORA-322/1118	Archaeological data recovery	2003
Foster Wheeler Environmental Corporation	Archaeological Data Recovery	Archaeological data recovery	2003
Manley, W.	Reevaluation of WWII munitions depots for NRHP eligibility	Historic building evaluation	2003
EDAW	Site NRHP eligibility evaluation	Archaeological evaluation	2006
Cassidy	P-063 survey of 29 acres	Archaeological survey	2011
Whitaker, A.	Test excavations at CA-ORA-1711 for NRHP-eligibility	Archaeological evaluation	2011
York, A.	Testing and evaluation of site CA-ORA-1503	Archaeological evaluation	2011
Baumann, J.	Cultural Resources Investigations for the Photovoltaic System, Naval Weapons Station Seal Beach, Orange County, California	Cultural Resources Survey	2013
NAVWPNSTA Seal Beach Detachment Norco[4]			
Feickert, J.	Archaeological survey of 65 acres of the 1941 U.S. Navy land acquisition and the southern portion of present-day Det. Corona	Archaeological Survey	1980
Drover, C.	Archaeological survey of 20 acres of land at Det. Corona	Archaeological Survey	1984
McCarthy, D.	Archaeological survey along a 3.3-km interceptor sewer pipeline at Det. Corona	Archaeological Survey	1985
Drover, C.	Archaeological survey of 285 acres that included only small portions of Det. Corona	Archaeological Survey	1987

Table F-2 Previous Cultural Resources Investigations, by Installation

Author	Description of Project	Type of Project	Year
Archiplan	Preparation of the Final Master Plan Update for NAVWPSTA Seal Beach and detachments Fallbrook and Corona	Planning Document	1988
Clevenger J. and K. Crawford	Historic properties overview that included a Phase I cultural resources overview survey and Phase II NRHP eligibility evaluations for an archaeological site and 61 buildings at Naval Warfare Assessment Center Det. Corona	Historic Buildings and Archaeological Evaluation	1995
Mellon & Associates	NRHP nomination form for the Lake Norconian Club Historic District	Historic Property Evaluation	1998
RECON	Final integrated cultural resources management plan for Naval Surface Warfare Center, Corona Division	Integrated Cultural Resources Management Plan	2005
Shaver, N. and A. Bethke	Class III archaeological survey and evaluation of proposed Hill 501 project area	Archaeological Survey and Evaluation	2011
Pumphrey, M., S. Stringer-Bowsher, and S. Davis	Survey, evaluation, and update of NRHP eligibility	Historic Property Evaluation	2011
Smith, E., NAVFAC SW	Addendum to the survey, evaluation, and update of NRHP eligibility completed by Pumphrey, Stringer-Bowsher, and Davis in 2011	Historic Property Evaluation	2013
Baumann, J.	Cultural Resources Investigations for the Photovoltaic System, Naval Weapons Station Seal Beach, Detachment Norco, Riverside County, California	Cultural Resources Survey	2013
NBVC Port Hueneme[5]			
William Self Associates	Preparation of data in anticipation of the preparation of the Historic and Archaeological Resources Protection Plan; SHPO concurrence was not sought on this document	Cultural Resources Overview	1995
Uribe & Associates with William Self Associates	Historic and Archaeological Resources Protection Plan to guide identification and management of historic and archaeological resources at NBVC Port Hueneme; SHPO comments were received but never incorporated into the document and SHPO concurrence was never sought	Historic and Archaeological Resources Protection Plan	1998
Tetra Tech	Integrated (Natural and Cultural) Resources Management Plan to document natural and cultural resources found at NBVC Port Hueneme, and develop preliminary recommendations for the management of natural resources at NBVC Port Hueneme	Final Integrated (Natural and Cultural) Resources Management Plan	1999

Table F-2 Previous Cultural Resources Investigations, by Installation

Author	Description of Project	Type of Project	Year
Guerra, S.	Documented the current conditions of the National Register-listed Berylwood Historic District and updated National Register information; this document was prepared in draft; not submitted for SHPO review.	National Register of Historic Places Update	2002
RECON	Archaeological monitoring in support of Anti-Terrorism/Force Protection construction and other activities on the installation	Archaeological Monitoring	2004
EDAW	Evaluation of 37 structures including buildings 5, 6, 7, 8, 10, 11, 115, 251-267, 274, 322, 323, 462, 488, 808, 927, 1146, 1321, 1358, 1370, 1371, and the Marshalling Yard in advance of the demolition of buildings 251-258 and railroad tracks	National Register of Historic Places Evaluation	2004
EDAW	Evaluation of buildings/structures 19, 99, 103, 842, 1150, 1156, 1283, 1284, and 1361 along with four objects related to Building 99 (museum) including a container with shrapnel holes, a statue of a Seabee, a totem pole, and artwork embedded in concrete (none of the buildings were found to be eligible); SHPO concurrence was obtained	National Register of Historic Places Evaluation	2005

Sources:
[1] Navy 2013f
[2] Navy 2011d
[3] Navy 2011b
[4] Navy 2011c
[5] Navy 2013g

Key:
GIS = Geographic Information System
NAVFAC SW = Naval Facilities Engineering Command Southwest
NRHP = National Register of Historic Places
SBNWR = Seal Beach National Wildlife Refuge
SHPO = State Historic Preservation Officer
WWII = World War II

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