

Sterling Solar 1 Interconnection Project

DRAFT ENVIRONMENTAL ASSESSMENT

DOE/EA-2124



Prepared by

**U.S. Department of Energy
Western Area Power Administration
Desert Southwest Region**

Cooperating Agencies

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Bureau of Land Management
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EXECUTIVE SUMMARY

PROJECT LOCATION

The Sterling Solar 1 Interconnection Project is located in Mohave County, AZ, approximately 2.5 miles east of Golden Shores, 3.5 miles east of Topock, and 2.3 miles north of Interstate 40 (I-40) on 2,077 acres of privately owned land.

PROJECT PARTICIPANTS AND BACKGROUND

Western Area Power Administration (WAPA), a Federal power marketing agency within the U.S. Department of Energy (DOE), is the lead Federal agency for the project under the National Environmental Policy Act (NEPA) review. The Bureau of Land Management (BLM) BLM Lake Havasu Field Office and the U.S. Bureau of Reclamation (Reclamation) Phoenix Area Office are cooperating agencies under NEPA. Sterling Solar 1, LLC (Sterling Solar 1) is a private solar development company and the project proponent.

WAPA is responding to a large generator interconnection request from Sterling Solar 1 to interconnect to its electrical transmission system. The nearest transmission line to the proposed solar facility is Reclamation-owned Topock-Black Mesa 230-kilovolt (kv) transmission line, which runs parallel to, and to the east of, the WAPA-owned North Havasu-Topock 230 kv transmission line. Adjacent to the proposed solar facility, the Topock-Black Mesa 230 kv transmission line runs approximately north–south on land rights owned by Reclamation. Most of the land rights are within rights-of-way (ROWS) under the jurisdiction of the BLM. The proposed solar facility would loop into only the Topock-Black Mesa 230 kv transmission line. Though this line is owned by Reclamation, it is operated and maintained by WAPA, and is part of the Central Arizona Project Power System.

PURPOSE AND NEED

WAPA

WAPA operates and maintains transmission lines and associated facilities in accordance with the Federal Power Act Sections 201 to 213, and its Open Access Transmission Service Tariff (OATT). WAPA's purpose and need is to consider and respond to Sterling Solar 1's large generator interconnection request in accordance with its Large Generator Interconnection Procedures as part of its OATT and the Federal Power Act.

Sterling Solar 1

The primary purpose of the Sterling Solar 1 facility is to provide solar-generated electricity from a site near Golden Shores, Arizona, to meet customer demand for competitively priced energy from renewable resources.

PROPOSED ACTION

WAPA

WAPA's Proposed Action consists of approving a large generator interconnection request, entering into an interconnection agreement, and implementing project-related transmission system upgrades. The transmission system upgrades would consist of new three-pole structures and a switchyard into which Sterling Solar 1 would interconnect. WAPA would also need to perform enhancements at their Topock and Black Mesa substations, to the extent of upgrading the terminals where the transmission line terminates (WAPA 2019). WAPA would build, maintain, and decommission a new switchyard and an interconnection looping in the new switchyard to the existing Topock-Black Mesa 230 kv transmission line. Approximately 38 miles of new overhead optical fiber ground wire would be installed from Topock Substation to Black Mesa Substation, looped through the interconnection switchyard.

Sterling Solar 1

Sterling Solar 1 proposes to build, operate, maintain, and decommission an approximately 225-megawatt (MW) photovoltaic (PV) solar energy generation facility on private land. An additional up-to 225 MW battery energy storage system would be added based on market considerations. Construction of the facility includes installing solar panels, underground collection lines, access roads, on-site collection point substation, up to 225 MW of battery storage, and an onsite aerial connection from the Sterling Solar 1 substation to the WAPA switchyard.

ALTERNATIVES

A No Action Alternative was evaluated to provide a baseline against which the impacts of the Proposed Action can be compared. Under the No Action Alternative, WAPA would not approve an interconnection request, enter into an interconnection agreement, or implement project-related transmission system upgrades, additions, or configurations. BLM would not amend Reclamation's existing ROW authorization, and Sterling Solar 1 would not develop the private property for the PV solar energy generation facility.

SUMMARY OF THE PROPOSED ACTION'S ENVIRONMENTAL CONSEQUENCES

Cultural Resources

No historic properties would be impacted by either the WAPA Proposed Action or Sterling Solar 1 Proposed Project; therefore, no impacts to historic properties are anticipated from the construction, operations and maintenance (O&M), interconnection, or decommissioning of the Proposed Project. A 50-foot-wide buffer would be established around the perimeters of known historic properties eligible or unevaluated cultural resources for inclusion in the National Register of Historic Places (NRHP), and for those with indeterminate eligibility, and all project-related ground disturbing activities would avoid these sites. The implementation of design elements and conservation measures would further minimize potential impacts to cultural resources from the construction, O&M, and decommissioning of the WAPA Proposed Action and Sterling Solar 1 Proposed Project.

General Wildlife and Special Status Species

There would be negligible to minor, localized, short- and long-term, direct and indirect adverse impacts to general and special status wildlife species due to the construction, O&M, and decommissioning of the WAPA and Sterling Solar 1 facilities. There would be a temporary loss of approximately 1,669.6 acres and permanent loss of about 1,659.5 acres of wildlife habitat as a result of the WAPA Proposed Action and Sterling Solar 1 Proposed Project.

Direct and indirect adverse impacts to general and special status wildlife species during construction include direct loss of suitable habitat (approximately 1,669.6 acres), potential disturbance from noise and activity, potential disturbance from artificial lighting, and risk for direct mortality from ground disturbance, vehicle strikes, and collision with transmission lines. Activities associated with O&M would be infrequent and would have a negligible impact on general and special status wildlife species. Impacts from decommissioning would be similar to those during construction. The implementation of design elements and conservation measures would minimize potential impacts to general and special status wildlife species from the construction, O&M, and decommissioning of the WAPA Proposed Action and Sterling Solar 1 Proposed Project.

Visual Resources

The WAPA Proposed Action and Sterling Solar 1 Proposed Project would create contrast (i.e., anticipated impact) with the existing landscape features. WAPA's facilities would create moderate contrast and Sterling Solar 1's facilities would create major contrast. Travelers driving on I-40 at posted speeds would see the solar panel array for 4.1 to 5.5 minutes, depending on the direction of travel. The potential magnitude of impacts to the views from the communities of Golden Shores and Topock would vary depending on distance from the project area, time of day, and visibility conditions. The landscape from these viewpoints would appear to be noticeably altered because of the dominance of the solar panel array in scale, color, line, texture, and form. Additionally, the Sterling Solar 1 facility would have a minor visual impact associated with sunlight reflecting off the panels (i.e., glint and glare), which would vary by distance and view point, and would be limited to certain times of day. The use of anti-reflective coating would further reduce impacts from glint and glare. The implementation of design elements and conservation measures would further reduce impacts to visual resources during the construction, O&M, and decommissioning of the WAPA Proposed Action and Sterling Solar 1 Proposed Project.

1.0 INTRODUCTION

1.1 Project Background

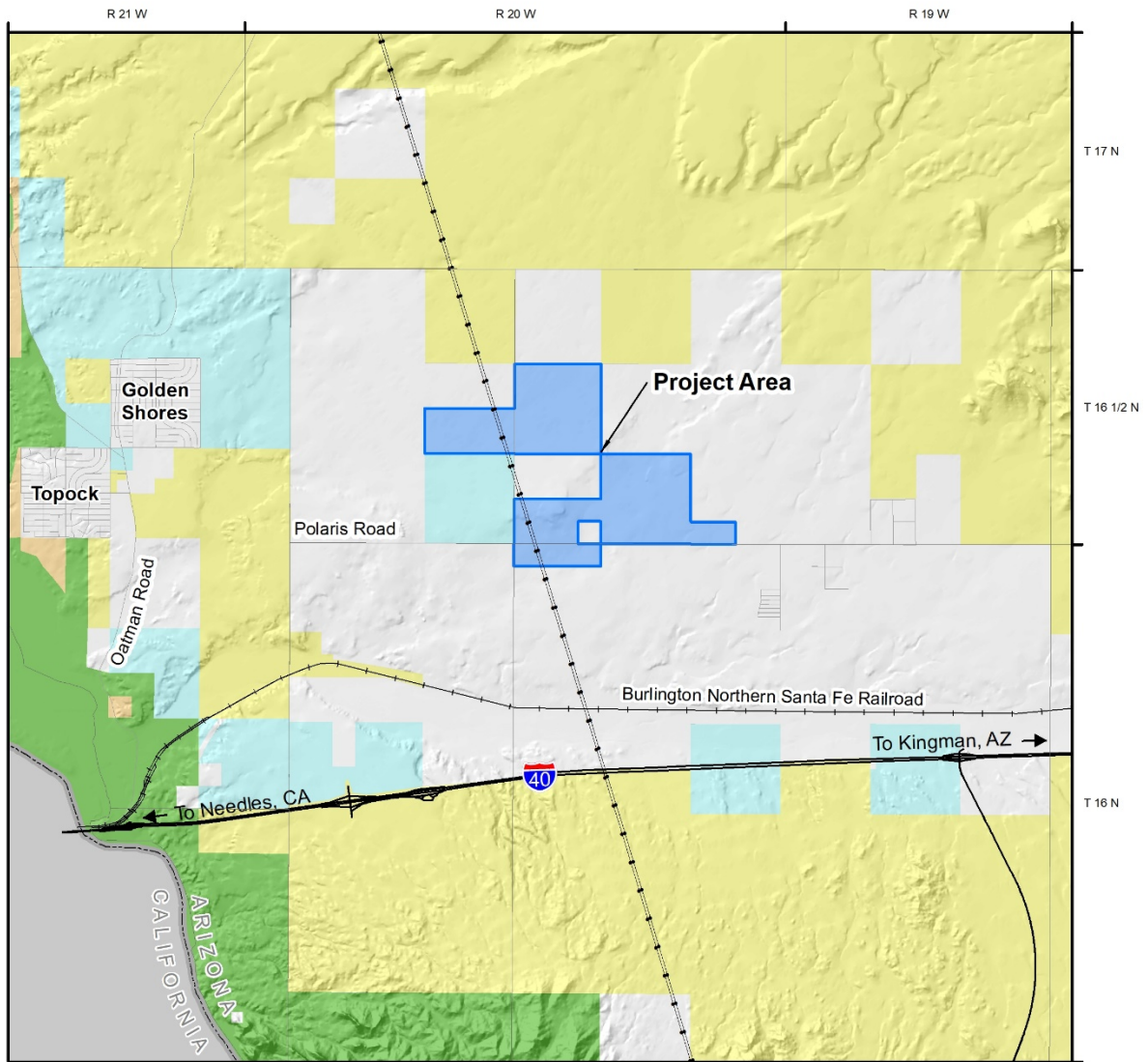
Western Area Power Administration (WAPA) is responding to a large generator interconnection request from Sterling Solar 1, LLC (Sterling Solar 1). Sterling Solar 1 is proposing to interconnect a proposed photovoltaic (PV) solar energy generation facility near Golden Shores/Topock, in Mohave County, Arizona (AZ), to WAPA's electrical transmission system via a new 230-kilovolt (kv) switchyard, looping in the existing Topock-Black Mesa 230 kv transmission line (WAPA 2019) (the project; Figure 1-1). The transmission line was built in 1951 with lattice structures, is 38 miles long, and, adjacent to the proposed solar facility. The line runs generally north-to-south on privately owned lands, State lands, and lands administered by the BLM within an existing right-of-way (ROW) which is owned by the Bureau of Reclamation (Reclamation). However, it is operated and maintained by WAPA and is part of the Central Arizona Project Power System. The line runs parallel to, and to the east of, the WAPA-owned North Havasu-Topock 230 kv transmission line in the project area.

On October 5, 2018, Sterling Solar 1 submitted its large generator interconnection request to WAPA. Sterling Solar 1 proposes to build, operate, maintain, and decommission an approximately 225-megawatt (MW) PV solar energy generation facility on a 2,077-acre parcel of private land. Construction of the facility would include solar panels, access roads, an underground electrical collection system, and an on-site collection point substation. An up-to 225 MW battery energy storage system may be added based on market considerations. The battery storage system would provide energy to the system at times when the solar generation system is offline. To interconnect with the transmission line, pole structures would be installed in the existing transmission line ROW, and a new aerial connection across lands owned by Reclamation would be installed to connect the transmission line to the new structures and into Sterling Solar 1's substation (Figure 1-2). Additionally, a new 48-strand fiber optic grounding wire would be installed, replacing the existing static wire, along the 38-mile length of the Topock-Black Mesa 230 kv transmission line in order to serve as WAPA's primary communications, in addition to its role of grounding the line.

1.2 Purpose and Need

1.2.1 Western Area Power Administration

WAPA will be the lead Federal agency in the National Environmental Policy Act (NEPA) process, and the National Historic Preservation Act (NHPA) Section 106 processes. WAPA is a Federal power-marketing agency within the U.S. Department of Energy (DOE) that operates and maintains transmission lines and associated facilities in accordance with the Federal Power Act sections 210 to 213, and its Open Access Transmission Service Tariff (OATT). WAPA's OATT is filed with the Federal Energy Regulatory Commission (FERC). WAPA's purpose and need is to consider and respond to Sterling Solar 1's large generator interconnection request in accordance with its Large Generator Interconnection Procedures as part of its OATT and the Federal Power Act. These require WAPA to demonstrate that such requests do not degrade system reliability and safety, or adversely affect service to existing customers. WAPA conducts feasibility, system, and facility studies to determine the transmission system upgrades or



Legend

- Sterling Solar 1 Project Area
- Private
- State Trust
- Bureau of Land Management
- Fort Mojave Indian Reservation
- Havasu National Wildlife Refuge
- Existing Transmission Line

Sterling Solar 1
Project Vicinity

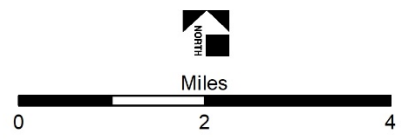
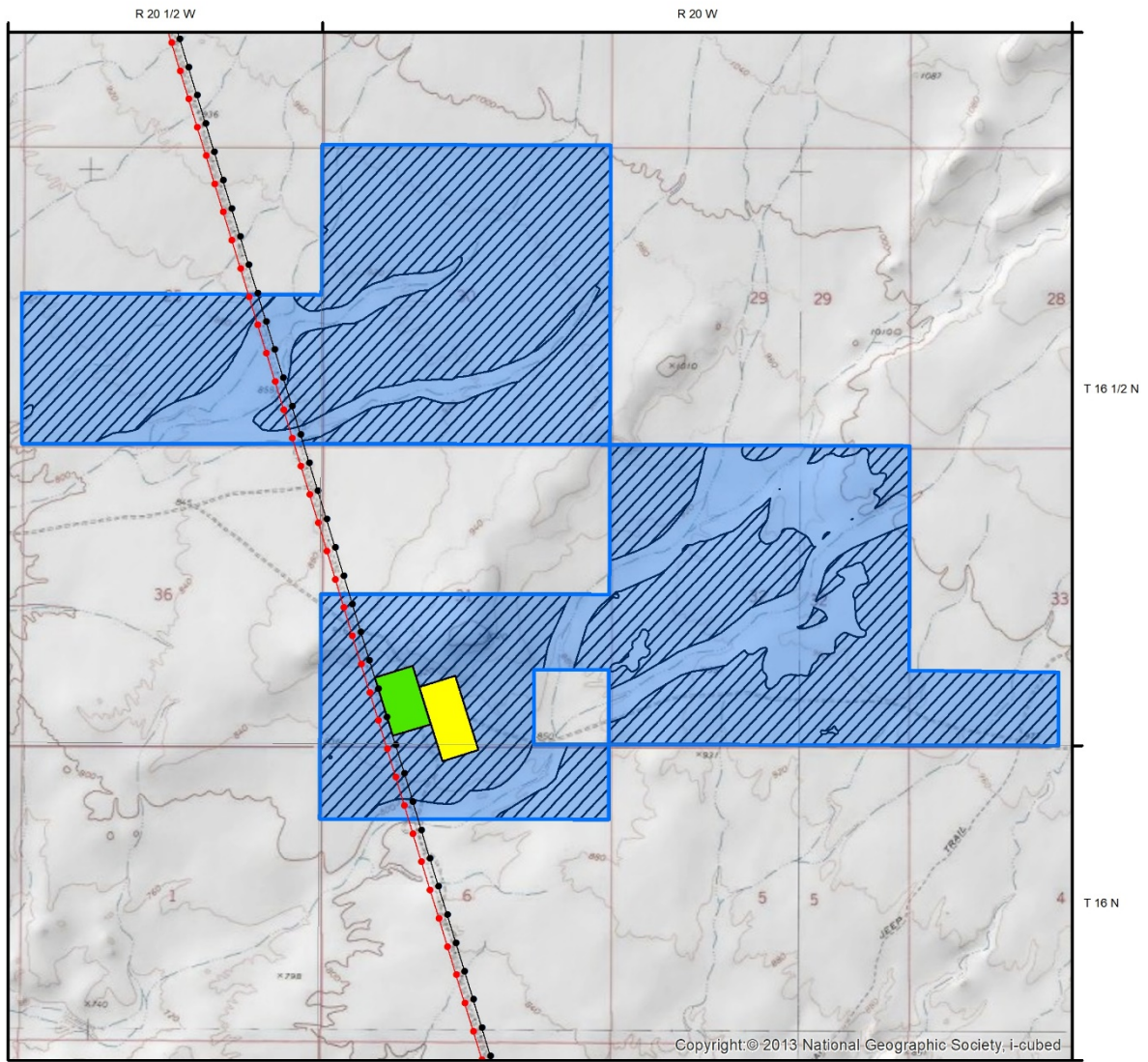


Figure 1-1. Sterling Solar 1 Project Vicinity



Sterling Solar 1
Project Layout

- Legend**
- Sterling Solar 1 Project Area
 - Photovoltaic Solar Panel Array Area
 - Sterling Solar Substation
 - WAPA Switchyard
 - Bureau of Reclamation Transmission Line
 - Western Area Power Administration Transmission Line

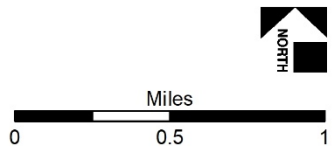


Figure 1-2. Sterling Solar 1 Proposed Layout

additions necessary to meet these requirements and accommodate the proposed interconnection. Under WAPA's OATT, interconnections are offered to all eligible customers on a first-come, first-served basis, with a final decision on whether or not to make this offer subject to an environmental review under NEPA.

1.2.2 Sterling Solar 1's Underlying Purpose and Need

The purpose and need for the project is to construct, operate, and maintain a 225 MW PV solar energy generation facility to meet customer demand for clean, cost effective, renewable energy. The State of Arizona is promoting investments in renewable energy production using low- and zero-emission electricity generation technologies (Arizona Revised Statute [A.R.S]. §§ 43-1083.02 and 43-1164.03). Sterling Solar 1 would help meet Arizona's Renewable Energy Standard and Tariff which requires that regulated electric utilities must generate 15 percent of their energy from renewable resources by 2025 (Arizona Administrative Code §14-2-1801 et seq).

1.3 Resource Management Plan Conformance

The proposed interconnection is subject to and would be reviewed for conformance with the BLM Lake Havasu Field Office's Record of Decision and Approved Resource Management Plan (RMP), which was approved on May 10, 2007 (BLM 2007). The Lake Havasu Field Office may issue ROWs for uses pursuant to Title V of FLPMA that include "access roads, power lines, telephone lines, fiber optic systems, communications facilities, and so forth" (BLM 2007, p. 37). The Proposed Action would be located in an existing designated utility corridor (Davis-Parker "A" [UC-2A]) and would be consistent with the following RMP objectives, terms, and conditions:

- WF-20: Construction sites for wind turbines, power lines, telecommunication, towers, solar power sites, and any other new technology, etc., will conform with guidelines developed by USFWS [U.S. Fish and Wildlife Service] to minimize impacts to wildlife species, particularly migratory birds and bats (BLM 2007, p. 19).
- LR-11: New utility facilities will be located in designated corridors unless an evaluation of the project shows that location outside of a designated area is the only practicable alternative (BLM 2007, p. 39).
- LR-14: In utility corridors, uses including but not limited to transportation, pipelines, and electrical transmission lines will be allowed when the uses are compatible. These designated corridors apply only to BLM-administered lands (BLM 2007, p. 40).
- TE-14: Include monitoring provisions specific to decisions affecting the desert tortoise. Maintain a log of Environmental Assessments containing stipulations pertaining to the desert tortoise, for express purpose of tracking compliance and effectiveness of the stipulations. The monitoring of these stipulations and recommendations for improvement will be documented in the log (BLM 2007, p. 23).

1.4 Public Participation and Tribal Consultation

1.4.1 Public Scoping

Public scoping for Sterling Solar 1 was initiated on September 5, 2019. WAPA held a 25-day public scoping period for the project that ended on September 30, 2019. Scoping letters were mailed to

organizations, interested parties, and approximately 2,500 landowners in the Golden Shores and Topock areas to inform them of the project and scoping period, and to request input on the Federal action. WAPA accepted scoping comments via telephone, email, and U.S. mail and received a total of 34 submittals from 32 individuals, 1 business, and 1 State agency (some individuals sent more than one submission, and some submissions were signed by more than one individual). The issues that were raised most frequently during the public scoping period were health and safety, recreation, water resources, floodplains, air quality, visual quality, wildlife, and construction impacts.

1.4.2 Tribal Consultation

As the Federal lead agency under NEPA and the NHPA Section 106 review, WAPA formally initiated government-to-government consultation with Native American Tribes on September 11, 2019 to identify locations of traditional or cultural importance within the vicinity of the proposed solar facility. Consultation was initiated by mailing the Tribes a notice of proposed project letter. The contacted Tribes are as follows:

- Chemehuevi Indian Tribe
- Colorado River Indian Tribes
- Fort McDowell Indian Reservation
- Fort Mohave Indian Tribe
- Hopi Tribe
- Hualapai Tribe
- Moapa Band of Paiutes
- Navajo Nation
- Pueblo of Zuni
- Salt River Pima-Maricopa Indian Community
- Yavapai-Apache Nation
- Yavapai-Prescott Tribe

The Hopi Tribe has responded and stated that they are interested in consulting on any proposal in Arizona that has the potential to adversely affect prehistoric sites. They are requesting copies of cultural reports and the Draft EA for review/comment. The Colorado River Indian Tribes also responded to request additional information and maps of the project area. Their Tribal Historic Preservation Officer (THPO) expressed interest in visiting the project site and indicated interest in participating in cultural surveys for future projects.

1.5 Decisions Needed

1.5.1 WAPA's Decision

Based on the analysis in this EA, the WAPA Desert Southwest (DSW) Regional Manager would approve, approve with modifications, or deny Sterling Solar 1's application for interconnection. WAPA's decision is limited to whether the Sterling Solar 1 facility can be interconnected with the Federal transmission system.

1.5.2 Other Decisions Needed

Sterling Solar 1 would also need to apply for and obtain a building permit from Mohave County Development Services. Design and construction of the solar facility would be required to follow the Mohave County Building Code, which regulates the use, occupancy, location, and quality of materials used in construction.

2.0 PROPOSED ACTION AND ALTERNATIVES

This chapter describes and compares the WAPA Proposed Action, the Sterling Solar 1 Proposed Project, and the No Action Alternative.

2.1 WAPA's Proposed Action

WAPA's Proposed Action consists of approving a large generator interconnection request, entering into an interconnection agreement, and implementing project-related transmission system upgrades. The transmission system upgrades would consist of new three-pole structures and a switchyard into which Sterling Solar 1 would interconnect. WAPA would also need to perform enhancements at their Topock and Black Mesa substations, to the extent of upgrading the terminals where the transmission line terminates (WAPA 2019). WAPA would build, maintain, and decommission a new switchyard and an interconnection looping in the new switchyard to the existing Topock-Black Mesa 230 kv transmission line (Figure 1-2). The interconnection would consist of four new three-pole structures (12 new poles in total) in the vicinity of existing poles 30/4 and 31/2, located directly adjacent to the west of Sterling Solar 1's proposed substation. The four new three-pole structures would be up to 100 feet tall and made of galvanized steel. Two of the three-pole structures would be constructed within the existing Reclamation ROW. The remaining two three-pole structures would be constructed within in the new switchyard. Please see Section 2.2 for details on the interconnection from Sterling Solar 1's substation to the WAPA switchyard.

Additionally, approximately 38 miles of new 48-strand overhead fiber optic grounding wire would be installed, replacing the existing static wire, on the Topock-Black Mesa 230 kv transmission line between the Topock and Black Mesa substations, looped through the WAPA interconnection switchyard. The fiber optic wire would serve as primary and temporary secondary communication until permanent secondary communication facilities are in place, in addition to its role as shielding for the energized conductors from lightning strikes. When lightning strikes, the energy from the lightning strike will travel along the overhead ground wire to a location where the energy from the lightning strike can go to ground and safely dissipate, allowing for the transmission line conductors to remain energized.

The communication link along a transmission line is used to gather information about the system such as the status of the line's service and equipment at the stations, the amount of power being transmitted along the line, and for sending signals to operate a station's equipment remotely. Additionally, the communication link allows for voice communication between the utility's dispatch center and its workers at the station. Typically, this communication link utilizes fiber optics placed inside of the overhead ground wire. The use of a fiber optic cable allows for near instantaneous communication between the stations.

WAPA would also work with the BLM in the processing of the ROW application to support these connections, as needed (see Sections 2.2 and 2.3 below). WAPA's Proposed Action is further described in Section 2.5 Project Implementation.

2.2 Sterling Solar 1's Proposed Project

While Sterling Solar 1 facilities are not part of the Federal actions, they are described alongside the Federal actions to aid the analysis. Sterling Solar 1 proposes to build, operate, maintain, and decommission an approximately 225 MW PV solar energy generation facility on private land. An additional up-to 225 MW battery energy storage system would be added based on market considerations. The Sterling Solar 1 facility is shown at full build-out in Figure 1-2. Construction of the facility includes the following components.

- Installing solar panels
- Installing underground collection lines from each panel to a collection point switchyard
- Constructing access roads within the facility for construction and maintenance
- Constructing an on-site collection point substation covering up to 20 acres
- Installing and maintaining an onsite aerial connection from the Sterling Solar 1 substation to the WAPA switchyard via a single structure
- Installation of up to 225 MW of battery storage

2.3 Project Location

The project is located within Mohave County, AZ, approximately 2.5 miles east of Golden Shores and 3.5 miles east of Topock (Figure 1-1). The project area covers 2,077 acres located approximately 2.3 miles north of Interstate 40 (I-40). The average elevation of the project area is approximately 250 feet above mean sea level. WAPA's proposed interconnection would be located within the Sterling Solar Proposed Project area which is adjacent to the existing Black Mesa–Topock and North Havasu–Topock 230 kv transmission line ROWs, in Sections 6, Township 16 North, Range 20 West, Section 25, Township 16.5 North, Range 20.5 West, and Sections 30, 31, 32, and 33, of Township 16.5 North, Range 20 West, all within the Gila and Salt River Baseline and Meridian, Mohave County, Arizona.

2.4 Schedule

Sterling Solar 1 anticipates a commercial operation date of March 2021. To meet this operation date, construction would begin no later than August of 2020 and is expected to take seven to eight months to complete, with an additional one to two months for testing. All construction would occur during daylight hours, no additional lighting would be required.

2.5 Project Implementation

The following sections describe the construction, operations and maintenance (O&M), and decommissioning activities for the WAPA interconnection and Sterling Solar 1 PV facility. Table 2-1 and Table 2-2 provide a detailed account of all temporary and permanent disturbances related to project implementation for WAPA's Proposed Action and Sterling Solar 1's Proposed Project, respectively. WAPA's Proposed Action would result in 50.6 acres of total disturbance, of which 18.5 acres would be permanent disturbance. Sterling Solar 1's Proposed Project would result in approximately 1,651 acres of disturbance, of which approximately 1,641 acres would be permanent disturbance.

Table 2-1. WAPA's Proposed Action Disturbance Estimates

Component	Temporary Disturbance (acres)¹	Permanent Disturbance (acres)
Access road ²	0.1	–
Transmission System Upgrades	1.5	1.5
Switchyard	17.0	17.0
Pulling Sites	12.0 (within ROW)	–
Staging Areas	20.0 (5 acres per 10 miles of line)	–
Total WAPA Disturbance Area:	50.6	18.5

¹With the exception of less than 0.01 acre of temporary wash disturbance for collection/road crossings, the majority of Sterling Solar 1's construction disturbance would be permanent disturbance. For the purposes of this EA, it is assumed that all construction disturbance would be permanent.

²Access roads are existing; no new permanent disturbance would result from this action.

Table 2-2. Sterling Solar 1's Proposed Project Disturbance Estimates

Component	Temporary Disturbance (acres)¹	Permanent Disturbance (acres)
PV solar panel array	1,604.0	1,604.0
Staging areas	10.0	–
Access roads	17.0	17.0
Underground collection ¹	–	–
Substation	20.0	20.0
Communications utility	< 1.0	< 1.0
Aerial connection to WAPA switchyard ²	< 1.0	< 1.0
Solar facility and battery energy storage system total disturbance area³:	1,651.0	1,641.0

¹Underground collection is co-located with the panel development area and access roads; therefore, no additional disturbance is associated with this project component.

²The aerial connection would be extended by hand, by workers walking across the less than 100-foot-long area between the transmission line easement and the private property fence line; no ground disturbance or vegetation clearing is required for this action. One pole would be installed as part of the Sterling Solar 1 Proposed Project to connect the two substations.

³Battery storage disturbance would total 9 acres of disturbance spread across the 1,641-acre PV solar panel array and would be included there. The temporary and permanent disturbance acreages are less than the 2,077 acres within the project area because no facilities would be constructed within the 100-year floodplain.

2.5.1 WAPA Interconnection Construction, Operations and Maintenance, and Decommissioning

2.5.1.1 Construction

Construction Work Areas, Staging Areas, and Site Preparation

During construction, WAPA would remove vegetation from approximately 18.6 acres for access road improvements, temporary equipment storage, work areas around the three-pole structures, and for the switchyard footprint. Of this area, approximately 18.5 acres would be permanently disturbed by the three-pole structures and switchyard, and the remaining area would be reclaimed and allowed to naturally revegetate. Pull sites and staging areas used for the overhead fiber optic grounding wire

installation would occur in areas that are already disturbed and would not require vegetation removal. WAPA would reclaim temporary disturbance areas by regrading so that surfaces drain naturally, blend with the natural terrain, and are left in a condition that would facilitate natural revegetation. However, desert ecosystems can take from 70 to over 200 years to recover from disturbance, so these reclaimed areas may not provide pre-construction habitat values within the timeframe of this analysis (Abella 2010).

In addition, ground-disturbing activities can create conditions that would increase the potential for introduction and/or establishment of nonnative plants within the existing ROW. As part of the Proposed Action, WAPA would comply with all Federal, State, and local weed control regulations, and implement construction standards (WAPA 2016, Section 13.6) such as maintaining vehicles and equipment free of mud and vegetation debris when transporting between sites and using only certified weed-free mulches and seed mixes for reclamation.

WAPA would utilize the existing unpaved transmission line access road to avoid potential impacts associated with road construction. WAPA does not plan to improve the existing access road beyond blading the existing road prism to create a safe, level surface if the road becomes rutted due to weather or use by others.

WAPA would also need to perform enhancements at the Topock and Black Mesa substations, to the extent of upgrading the terminals where the transmission line terminates (WAPA 2019). Approximately 38 miles of new 48-strand overhead fiber optic grounding wire would also be installed, replacing the existing static wire, from the Topock Substation, looped through the WAPA interconnection switchyard, to the Black Mesa Substation. In addition, WAPA would install a new microwave path which would connect from WAPA's interconnection switchyard to Crossman Peak, in order to meet relay protection and control requirements. No new permanent ground disturbance would be associated with these activities.

Construction Equipment and Workforce

WAPA estimates construction would require an eight-person workforce. WAPA would use the following construction equipment:

- 1 crane (8 hours/day for 15 days)
- 1 tractor/loader/backhoe (8 hours/day for 15 days)
- 1 pole delivery truck (8 hours or 1 day)
- 1 auger (8 hours/day for 5 days)
- 1 concrete truck (up to two trips)
- 1 grader (8 hours or 1 day)
- 1 water truck (8 hours/day for 15 days)
- 1 bucket truck (8 hours or 1 day)

Fiber Optic Grounding Wire Installation

Every structure along the 38-mile length of the Topock-Black Mesa 230 kv transmission line would need to be modified to hang the fiber optic grounding wire that would serve as primary (and temporary secondary) communication across the length of the transmission line. Structures would be accessed by a line truck or helicopter, as accessibility allows. If helicopters are employed, no landing zones would be

necessary due to the proximity of the project area to the Lake Havasu City Airport. Construction access by line trucks would occur on existing access roads or within the ROW itself; no new access roads would be constructed. Crews would remove the existing static wire, install new fiber optic grounding wire hardware and temporary pulling rings on each structure, and pull the new fiber optic grounding wire across the length of the line. Splice boxes would be installed at each substation and at an additional midpoint, and trucks with reels of fiber optic grounding wire would travel to each splice box location to splice the two ends of the wire together. This process would repeat all along the Topock-Black Mesa 230 kv transmission line. In order to stabilize the fiber optic grounding wire, the equipment would need to be fastened in place by removing the temporary pulling rings and attaching the wire to the permanent hardware. To reach the top of each pole, a line truck or helicopter would be used to allow crews the most efficient access. Crews would stop at each pole to allow a lineman to change the equipment on the fiber optic grounding wire from a pulling ring to the permanent hardware.

Pulling and Tensioning Sites

Pulling and tensioning sites are areas used for pulling in and tightening the conductor and overhead grounding wire to the correct tension to maintain the required clearances underneath the transmission line. Pulling sites are typically located within the ROW (approximately 300 feet by 300 feet) and in line with the transmission line. Pulling site locations are determined by the construction contractor using environmental and land use information provided by WAPA. It is estimated that up to six pulling sites may be needed to install the overhead fiber optic grounding wire. If the pulling sites are identified outside of the ROW, additional surveys for cultural resources and or biological resources may be required for those sites.

Staging Areas

Approximately four temporary staging areas would be needed along or near the proposed transmission line for construction crews to store materials, equipment, and vehicles. Staging areas can range from 5 to 15 acres, depending on the amount of materials and the number of locations needed. The contractors hired to construct the transmission line would be responsible for determining the number of and appropriate staging area locations. Often, the contractor rents an empty parking lot, a farmer's non-irrigated field, or already developed site for use as a staging area. An environmental review of the staging areas would be conducted prior to approval for use, as necessary.

Restoration

Following construction, temporary disturbance areas would be reclaimed in accordance with WAPA construction standards (WAPA 2016, Section 13.4).

2.5.1.2 Operations and Maintenance

Routine Site Inspections and Maintenance

WAPA would incorporate the inspection of the new, project-related three-pole structures and associated improvements into its existing inspection program. WAPA conducts aerial inspections on its systems up to four times a year and ground inspections up to once a year. WAPA uses the inspection reports to prioritize any needed repairs. WAPA dispatches six- to nine-person crews to make repairs, as needed, to maintain the reliability and safety of the bulk electric system.

WAPA operates and monitors its electrical power systems 24 hours a day, 7 days a week via a fiber-optic, microwave, and radio network connected to its operations centers. If a sustained fault is detected, switches will automatically de-energize the affected equipment. WAPA would inspect the equipment and manually return it to operation only when safe.

During operations, ongoing, temporary impacts to vegetation would occur as a result of ground-disturbing maintenance activities and vegetation clearing beneath the transmission line, around the three-pole structures associated with the interconnection, and around the switchyard.

2.5.1.3 Decommissioning

WAPA would re-evaluate the need for the project-related transmission system upgrades if the solar facility is decommissioned in 30 years. Materials that could not be recycled would be disposed of at an approved landfill. WAPA would restore disturbed areas to preconstruction conditions, where feasible.

Decommissioning would result in the same impacts as construction, and WAPA would reclaim the 18.5 acres associated with the three-pole structures and the switchyard for the interconnection to the transmission line ROW in Section 31 of Township 16.5 North, Range 20 West, Gila and Salt River Baseline and Meridian (see Figure 1-2). WAPA would store equipment or materials within the Sterling Solar 1 facility staging areas.

2.5.2 Sterling Solar 1 Construction, Operations and Maintenance, and Decommissioning

2.5.2.1 Construction

Construction Work Areas, Staging Areas, and Site Preparation

In total, the construction work area for Sterling Solar 1's proposed facilities, including those described below, would result in approximately 1,641 acres of permanent disturbance. Sterling Solar 1 would install a battery energy storage system (up to 225 MW) at the site. The battery storage development would be within the area of disturbance of the solar facility and is not anticipated to generate additional permanent disturbance.

Sterling Solar 1 would establish two construction equipment and materials staging areas, comprising 10 acres of temporary disturbance, within the project area—one 5-acre staging area at the site entrance on the west side of the property, and one 5-acre staging area near the east side of the project area.

To prepare the site for construction, the land would be cleared and graded. Vegetation consisting primarily of desert shrubs and grasses would be removed. Site grading would only occur as needed to accommodate the laydown of materials at the staging area, solar panel and underground collection installation, and construction of the access roads and the substation. Cleared vegetation would either be mulched on-site for use in dust abatement or hauled off-site for disposal at an approved facility.

Sterling Solar 1 would minimize land disturbance (including crossings) in natural drainage systems and would locate and construct crossing structures so as not to decrease channel stability or increase water volume or velocity. The 100-year floodplain within the project area would be avoided as shown on Figure 1-2, and Sterling Solar 1 would retain and maintain existing vegetation in a 25-foot-wide avoidance buffer on either side of the remaining washes in the project area. With the exception of road

crossings and temporary excavation to install underground collection lines, no vegetation clearing or disturbance would occur within these buffer areas. Coordination with the U.S. Army Corps of Engineers (USACE) regarding Clean Water Act Section 404 would be carried out as necessary, and all permits for impacts to washes, would be obtained before construction begins.

Additionally, to meet the requirements of the Arizona Pollutant Discharge Elimination System Permit/Stormwater Construction General Permit, Sterling Solar 1 would implement a construction stormwater pollution prevention plan (SWPPP). The SWPPP would include prescriptions for control measures to address airborne dust from construction activities so that entrained dust will not exceed 20 percent visible emissions, as stipulated by the National Ambient Air Quality Standards (NAAQS). The SWPPP would include conservation measures such as the following:

- Preventing channel erosion from project runoff
- Placing barriers and sedimentation devices around drainages
- Controlling water runoff and directing it to settling or rapid infiltration basins, as needed
- Retaining sediment-laden waters from disturbed, active areas within the project by using barriers and sedimentation devices (e.g., berms, straw bales, sandbags, jute netting, or silt fences)
- Removing sediment from barriers and sedimentation devices to restore sediment-control capacity
- Constructing entry and exit pits in work areas to trap sediments from vehicles so they do not enter streams at stream crossings
- Preventing the release of project waste materials into stormwater discharges
- Other conservation measures, such as sediment track-out controls, water trucks, tackifiers, and/or dust palliatives, may be employed as deemed prudent to prevent wind-blown fugitive dust from access routes and spoil piles

Construction Equipment and Workforce

Sterling Solar 1 would require up to 350 workers at peak construction and use the following construction equipment:

- 1 crane (8 hours/day for 90 days)
- 11 tractors/loaders/backhoes/ graders (8 hours/day for 180 days)
- 50 to 100 concrete truck loads total (8 hours/day for 180 days)
- 1 dump truck (8 hours/day for 90 days)
- 1 wood chipper (8 hours/day for 10 days)

Construction of project facilities would occur simultaneously, using single vehicles for multiple tasks. The average number of daily vehicle trips to the site would vary, but would be approximately 100 daily vehicle trips, while the number of vehicles actually working on-site would be approximately 50.

During construction, traffic would stay within designated construction areas and access roads. Contractor and employee vehicles not used for construction would be parked at the staging areas. Construction haul routes would include I-40, Oatman Highway, and Polaris Road. Sterling Solar 1 would plan for site access traffic management to ensure that traffic flow would not be unnecessarily affected and that specific issues of concern are identified and addressed. No closures, lane restrictions, or traffic

lane improvements are anticipated for delivery of construction equipment or materials. Should travel restrictions be determined necessary at a later date, coordination with the Arizona Department of Transportation (ADOT) and/or Mohave County would be completed, as appropriate.

Fencing

Sterling Solar 1 would install a permanent security fence around the project area (2,077 acres), in accordance with the North American Electric Reliability Corporation (NERC) critical infrastructure protection physical security guidelines (NERC 2011). The security fences around Sterling Solar 1 would be 6-foot-tall chain-link metal security fence enclosures with outward-facing 2-foot barbed wire strands on top and would be designed to meet the Arizona Game and Fish Department's (AGFD) Guidelines for Wildlife-Compatible Fencing and Guidelines for Solar Development in Arizona (AGFD 2011b; AGFD 2010).

Materials Source

Gravel and rock materials for the roads, staging areas, substation, and solar panel foundations would be sourced from existing material onsite or, alternatively, from an off-site, ADOT-approved materials source pit.

Water Source and Use Estimates

A total of approximately 106 to 189 acre-feet of water would be used for construction of Sterling Solar 1. Construction water would primarily be used for dust suppression. Other minimal amounts of water would be used during construction of concrete foundations and for equipment washing. A range for water uses during peak construction is provided to represent the highest anticipated use levels required for dust suppression. Actual water use would be dependent upon wind patterns and rainfall amounts during the construction period.

Water for the project would be provided from a well on directly adjacent privately owned lands which are owned by owners of the project site. The rights to the water have been acquired along with the project land. The well produces approximately 2,000 gallons per minute. The water rights to the well are under an Analysis of Adequate Water Supply by the Arizona Department of Water Resources guaranteeing in excess of 8,000 acre-feet per year for 100 years.

Access Road Construction and Improvements

Primary access to the private land would be from Polaris Road via Oatman Highway. Currently, Polaris Road is an existing 40-foot-wide unpaved access route that connects Oatman Highway with the transmission line access road and crosses into the private property boundary. Any project-related damage to Polaris Road would be repaired after construction per Sterling Solar 1's application for a road construction permit from Mohave County.

Within the site, a network of internal access roads would be used to facilitate construction and maintenance of the solar facility, as well as to access the substation. Access roads co-located with underground collection lines (described below) would be 50 feet wide, and roads without collection lines would be 24 feet wide. All roads would consist of graded dirt covered with an aggregate surface adequate to support the size and weight of maintenance vehicles. At the wash crossings, the access

roads would use a permanent at-grade, concrete-surfaced ford crossing. The wash crossings would be designed to allow surface waters to flow unimpeded over the crossing.

Solar Panel and Underground Collection Line Installation

The PV solar panel modules would be placed on single-tilt tracker assemblies that are mounted on driven steel posts/piles approximately 7.5 feet above ground level. Prior to installation, the area around the posts would be cleared and the surrounding soil would be compacted and graded. The posts would then be machine driven into the ground and may require concrete foundations.

The PV modules are connected by wire harnesses and combiner boxes that collect power from several rows of PV modules via underground direct current (DC) cables (i.e., underground collection network). These DC cables then feed to a Power Conversion Station (PCS), composed of DC to alternating current (AC) inverters and a medium-voltage transformer. The PCS inverters and transformers would have concrete foundations measuring up to 12 feet long by 12 feet wide by 1 foot deep. Each PCS would connect to the project substation via an underground collection network. To install the underground collection network across the site, Sterling Solar 1 would excavate 4-foot-wide by 4-foot-deep trenches using both a trencher and a backhoe, install the underground collection network cables, and then backfill and compact the trenches. Where feasible, Sterling Solar 1 would co-locate underground collection with existing features (e.g., roads or other paths of disturbance) to minimize the overall area of surface disturbance.

Substation Installation

All underground collection lines would terminate at the facility substation. The substation would be a 20-acre facility surrounded by a 6-foot-tall chain-link metal security fence enclosure with outward-facing 2-foot-tall barbed wire on top.

The project substation would step up the voltage from 34.5 kv to 230 kv. The substation would include a power transformer, one 34.5 kv breaker, one 230 kv main breaker, switches, a control house, and a substation superstructure used to support equipment, including lines, switches, and poles. The substation would contain a switchyard that would control the connection to the Topock-Black Mesa 230 kv transmission line.

The substation would be constructed by first clearing, grubbing, grading, and compacting the substation site. A buried, steel grounding grid covering the full substation area would be installed to carry electric charges away from equipment and into the ground. A layer of gravel approximately 8 inches thick would be laid on top of the grounding grid throughout the substation area. Drainage would slope toward the wash following slope contours. An approximately 12-foot-long by 12-foot-wide by 4-foot-deep concrete foundation would be poured for the transformer. Sterling Solar 1 would also build a 20-foot-long by 12-foot-wide by 13-foot-tall control house. Pole structures at this facility would have an average height of 40 feet. The tallest element would be a lightning protection tower extending up to 85 feet. Lighting and power for the substation are described further in sections below.

All electrical systems would be designed to meet all applicable safety standards (e.g., National Electrical Safety Code [NEC]) and to comply with WAPA's interconnection requirements.

Aerial Connection to Transmission Line

Sterling Solar 1 would install an aerial connection from their substation on private land to the WAPA switchyard and point of interconnection with WAPA's transmission poles in the existing transmission line ROW on lands owned by Reclamation. Trucks with spooling equipment would be staged within work areas in the existing transmission line ROW or in the Sterling Solar 1 project area. Workers would be able to pull the cables by hand as they walk across the transmission line ROW and the project area line. There would be no ground disturbance or vegetation clearing required for pulling the line by hand across this area. Equipment for wire pulling and tensioning would be staged in the temporary disturbance area described above or on private property.

Testing

The testing phase of construction consists of connecting the project to the grid, energizing the substation, making sure all of the switches respond, generating power on each string of panels, and testing the panels and control systems. The testing sequence would take approximately 6 to 8 weeks to complete.

Battery Storage

An up-to 225 MW battery energy storage system would occupy less than 9 acres of land and would consist of approximately 288 units of 40-foot International Standard Organization shipping containers. The battery containers would be located next to the solar inverter sites throughout the solar facility. Power would be stored before conversion to AC in the inverter systems. Foundations for these systems would be concrete and measure approximately 41 feet long by 9 feet wide by 2 feet deep. The battery containers would come installed with a fire protection system approved through the National Fire Protection Association (NFPA). Fans and/or air conditioning equipment within the battery storage units would be used to maintain the manufacturer's required temperature within the containers.

Wastes and Hazardous Materials

Approximately 16,000 cubic yards of solid wastes, such as debris, scrap, and garbage from workers, would be generated during construction. All wastes would be collected on-site and temporarily stored in trash containers located at the staging areas. Wastes would be hauled off-site via dump trucks for disposal at approved waste handling facilities. The project would not generate hazardous wastes during construction; however, small quantities of hazardous materials are contained within the solar panels and the self-contained battery storage units. Sterling Solar 1 would inspect solar panels and battery storage units prior to installation. Any damaged materials would be handled in accordance with the manufacturer's specifications, including applicable recycling.

2.5.2.2 Operations and Maintenance

Restoration

Following construction, temporary disturbance areas would be reclaimed and vegetation would be allowed to reestablish.

Routine Site Inspections and Maintenance

The facility would be monitored remotely from an O&M site. The solar facility would be maintained by one to five staff for normal preventative maintenance, solar panel washing, and dust abatement (described below). The site would be visited once per week, on average, for routine site inspections and

maintenance. Operations vehicles would include pick-up trucks, small utility vehicles, water trucks for dust abatement, and occasional heavy equipment such as backhoes, front-end loaders, and dump trucks.

On an annual basis, or as needed under emergency conditions, the entire facility would be inspected for signs of deterioration or needed repairs. Additionally, grading and drainage would be maintained for access roads, and damage to roads would be repaired as soon as practical.

Herbicides and pesticides may be used, as needed, to control invasive/noxious weeds and/or pests on site. Sterling Solar 1 would use only U.S. Environmental Protection Agency (EPA)-registered pesticides and/or herbicides that also comply with State and local regulations. Pesticide use would be limited to non-persistent, immobile pesticides which would only be applied in accordance with label instructions, application permit directions, and other stipulations for terrestrial applications.

Water Use and Source

Sterling Solar 1 would use approximately 206.2 acre-feet of water over the 30-year O&M phase of the project; detailed operations water use estimates are provided in Table 2-3. Operations water would be used for panel washing and dust suppression. Sterling Solar 1 would wash the panels a maximum of twice per year, totaling approximately 800,000 gallons annually. Performing dust abatement across the entire facility twice per year would use approximately 1,440,000 gallons annually. The upper estimate of annual water use during O&M is approximately 2,240,000 gallons (6.9 acre-feet). Water for O&M would be sourced from the privately owned well on adjacent lands (refer to Section 2.5.2.1).

Table 2-3. Sterling Solar 1 Facility Operations and Maintenance Water Use Estimates

Action Requiring Water Use	Gallons of Water Used per Episode	Frequency	Total Gallons
Operations panel washing	400,000 (1.2 acre-feet)	Up to 2 times per year	800,000 (2.4 acre-feet)
Operations dust suppression	720,000 (2.2 acre-feet)	Up to 2 times per year	1,440,000 (4.4 acre-feet)
Total Annual Water Use Operations	–	–	2,240,000 (6.9 acre-feet)
Total Water Use Over 30-year Operational Life	–	–	67,200,000 (206.2 acre-feet)

Facility Lighting

The substation would be equipped with floodlights for safety and security purposes, but this lighting would only be used during nighttime emergency maintenance. Additionally, each PCS may be equipped with a small light fixture that would only be turned on in the event of emergency nighttime maintenance.

Power

In the event of a solar facility power outage, backup power to the substation would be provided via the interconnection to the WAPA electrical transmission system. While unanticipated, in the event that both the solar facility and transmission line experience an outage, portable generators would provide backup power to the substation.

Wastes and Hazardous Materials

A minimal amount (less than 1 cubic yard) of solid wastes would be generated each year during O&M. Good housekeeping procedures would be developed and implemented during O&M to ensure that the site is kept clear of debris, garbage, fugitive trash, or waste, and the use of scrap heaps and dumps would be prohibited. All solid wastes generated on-site would be transported off-site for disposal at approved waste handling facilities. As part of routine O&M, solar panels would be routinely inspected for damage and replaced, as needed. Damaged solar panels would be recycled in accordance with the manufacturer's guidance. Additionally, Sterling Solar 1 would develop an emergency response plan for O&M of the facility.

2.5.2.3 Decommissioning

The solar facility has an estimated lifespan of 30 years. At the end of the facility lifespan, Sterling Solar 1 may choose to seek to update the solar facility under a new power purchase agreement. If Sterling Solar 1 determines that the facilities are no longer needed, Sterling Solar 1 would remove all structures and facilities, including foundations, and allow vegetation to become re-established. Property boundary fencing would remain, as well as internal roads to allow continued access through the site.

2.5.3 Design Elements

Design elements specific to Sterling Solar 1's facilities are presented below and are considered part of the WAPA Proposed Action and the Sterling Solar 1 Proposed Project. WAPA's Construction Standards would also be implemented as part of the Proposed Action (WAPA 2016).

2.5.3.1 Sterling Solar 1 Conservation Measures

Soil/Erosion

- Grading on the solar site would be minimized to only those areas where necessary to meet the construction and operational requirements of the project.
- Construction and operational activities would be conducted in compliance with a SWPPP that would include Best Management Practices (BMPs) and other erosion-control measures designed to minimize soil erosion and limit sheet flow and downstream sedimentation. The SWPPP would also incorporate adaptive management actions if erosion and sedimentation control measures are found to be insufficient to control surface water at the site.
- To minimize wind erosion, all construction activities shall comply with the Fugitive Dust Control Plan that would be developed and implemented for the proposed project.
- A Site Restoration Plan would be implemented as needed to limit impacts to temporary disturbance areas as much as practicable.
- Soil-disturbing activities on wet soils would be minimized.
- Temporary disturbance areas that are no longer needed would be recontoured and revegetated in order to increase infiltration and reduce soil compaction.
- Routine site inspections would be performed to assess the effectiveness of maintenance requirements for erosion and sediment control systems. Roadway ditches, and culverts would be regularly maintained.

Hydrology/Water Quality

- The solar facility would be designed to maintain existing drainage patterns and control the rate and amount of surface water runoff.
- The site would be graded so that downstream flows would not be adversely impacted as a result of proposed changes to natural washes from grading, drainage management measures, or the addition of retention ponds.
- The number of drainage crossings would be minimized to the extent possible and each would be designed to accommodate adequate flow.
- All large ancillary facilities (e.g., project substation) would be located outside of drainages. Some PV supports could be placed within ungraded drainages where technically feasible.
- A Spill Prevention and Emergency Response Plan would be developed and implemented during construction and the O&M phases of the proposed project. Adequately sized secondary spill containment would be incorporated around the transformers at the on-site substation to ensure proper capture and control measures for potential spills. The Plan would also provide for hazardous material spill prevention and clean-up measures, were a spill to occur.
- The necessary permits in accordance with the Clean Water Act Section 404 and Section 401 would be obtained and complied with.

Air Quality

- The area of grading and vegetation removal would be limited to only that area required for project construction and operation.
- Ground disturbing activities would be undertaken in accordance with the approved dust control plan(s) to minimize the amount of time areas would be exposed to wind erosion.
- Vehicular speeds on unpaved roads would be limited to 25 miles per hour (MPH).
- Grading operations would be phased where appropriate to limit the amount of disturbance at any one time, and water would be used for stabilization of disturbed surfaces under windy conditions.
- Water would be applied to disturbed areas to control dust and facilitate soil compaction, where necessary. Water would be applied using water trucks and application rates would be monitored to prevent runoff and ponding. Palliatives would be used to control dust as required.
- Exposed material stockpile areas would be covered and excavation and grading would be suspended during windy conditions (forecast or actual wind conditions of approximately 25 MPH or greater).
- All trucks hauling soil and other loose material would be covered or at least 2 feet of freeboard would be maintained.
- All paved roads would be kept clean of objectionable amounts of mud, dirt, or debris, as necessary. Gravel or other similar material would be used where unpaved access roads intersect paved roadways to prevent mud and dirt track-out.
- Unnecessary idling of equipment would be limited.

Invasive Species and Weed Management

- Sterling Solar 1 would implement controls at entry locations to facilitate weed management and invasive species control to minimize infestation of the project site from outside sources. A controlled inspection and cleaning area would be established to visually inspect construction

equipment arriving at the project area and to remove and collect seeds that may be adhering to tires and other equipment surfaces.

- Develop and implement control of noxious weeds and invasive species, which could occur as a result of new surface disturbance at the site.

Biological Resources

- To minimize activities that attract prey and predators during construction and O&M, garbage would be placed in approved containers with lids and removed promptly when full to avoid attracting nuisance wildlife. Open containers that may collect rainwater would also be removed or stored in a secure or covered location to avoid attracting wildlife.
- If construction activities are scheduled to commence during the breeding season for western burrowing owls (February 1 through August 31), a qualified biologist would conduct pre-construction surveys of suitable western burrowing owl habitat no more than 30 days prior to construction. All areas within 250 feet of ground disturbing activities would be surveyed, per USFWS 2007 Burrowing Owl guidance.
- Lighting would be designed to provide the minimum illumination needed to achieve O&M objectives and to not emit excessive light to the night sky by installing light absorbing shields on top of all light fixtures and by focusing lights in a downward direction.
- Worker environmental awareness training conducted by WAPA DSW Regional staff would be required for all O&M staff for the duration of the project. In addition to an overview of minimization measures for all biological resources, the training will include specific BMPs designed to reduce effects to desert tortoises.
- Prior to construction, temporary tortoise-proof fencing would be installed around the boundary of the solar facility. Biologists trained to handle and relocate tortoises would be present during fence installation to relocate all tortoises outside of the project area.
- No overnight hazards to desert tortoises (e.g., auger holes, trenches, pits, or other steep-sided depressions) would be left unfenced or uncovered; such hazards will be eliminated each day before work crews and biologists leave the site. All excavations would be inspected by a trained biologist for trapped desert tortoises at the beginning, middle, and end of the workday, at a minimum, but would also be continuously monitored by a trained biologist.
- Fencing:
 - Fencing during O&M would be designed to meet the AGFD Guidelines for Wildlife-Compatible Fencing and Guidelines for Solar Development in Arizona (AGFD 2011b; AGFD 2010).
 - During O&M, fencing with a minimum of 8 inches of clearance from the bottom of the fence to the ground surface will be used to allow passage of desert tortoise and small mammals.
- Transmission lines, poles, and associated structures:
 - As recommended by Avian Power Line Interaction Committee (APLIC 2006), transmission lines will have at least 60 inches of horizontal separation and a vertical separation of 40 inches between phase conductors, which is greater than the physical dimensions of all large birds and bats that could potentially use the structures for perching.

- In situations where particular hardware would present an electrocution risk (e.g., jumpers, cutouts, arrestors, transformers, etc.), perch guards and/or insulators would be installed per APLIC (2006) guidelines to minimize electrocution risk.
- Line marking devices would be installed as needed to reduce risk of avian collisions (APLIC 2012).
- Vegetation:
 - The 100-year floodplain in the project area would be avoided as shown on Figure 1-2. Sterling Solar 1 would retain and maintain the existing vegetation in a 25-foot-wide avoidance buffer on either side of the remaining washes in the project area.
 - Herbicides and pesticides may be used, as needed, to control invasive/noxious weeds and/or pests on site. Sterling Solar 1 would use only EPA-registered pesticides and/or herbicides that also comply with State and local regulations. Herbicide and pesticide use shall be limited to non-persistent immobile herbicides/pesticides and shall only be applied in accordance with label and application permit directions and stipulations for terrestrial applications.
- Human Activity:
 - Should tortoises be encountered during project activities, the AGFD guidelines for handling tortoises would be followed (Appendix A).
- Lighting:
 - Utilize the minimum intensity lighting that meets safety criteria.
 - Fully shield all permanent lighting (e.g., full cut-off), except for emergency lighting triggered by alarms.
 - Mount lighting so that no light is emitted above an imaginary horizontal plane through the fixture.
 - Consider lighting control through timers, sensors, dimmers, or switches that are available to facility operators.

Cultural Resources

- Fencing or other protective barriers would be placed as needed to protect historic properties during construction.
- No ground disturbance would occur within the site boundary or within 65 feet of the site boundary of known NRHP-eligible, recommended-eligible, or indeterminate sites.
- Project-related vehicular traffic will be restricted to existing access roads and overland travel within the transmission line ROW. Access roads will be used in their current condition and will not be improved.
- Project-related vehicular traffic within NRHP-eligible, recommended-eligible, or indeterminate archaeological site boundaries will be restricted to existing access roads, a 5 MPH speed limit, and only during dry conditions.
- Flag site boundaries of NRHP-eligible or indeterminate sites prior to any construction-related activities. Site boundaries will be flagged only where they intersect the transmission line ROW by affixing flagging tape to trees. Points along site boundaries immediately adjacent to the transmission line ROW will be demarcated by attaching flagging to lathe that has been driven into the ground. Site boundaries will be flagged in pink on the right-hand side of access roads as

viewed from outside the site boundary and flagged in white on the left-hand side of the site boundary as viewed from the same. This will ensure work crews always know when they enter a site (i.e. pink flagging on the right) and when they are exiting a site (i.e. white flagging on the right). Individual features within sites that are flagged for avoidance will be demarcated using white flagging affixed to lathe that has been driven into the ground around the feature.

- In the event that previously unreported cultural resources are encountered during ground disturbing activities, all work must cease immediately within 100 feet until a qualified archaeologist has documented the discovery and evaluated its eligibility for the NRHP, in consultation with WAPA, Arizona State Museum (ASM), Arizona State Historic Preservation Office (SHPO), and Tribes, as appropriate. Work must not resume in this area without approval of WAPA.
- If human remains are encountered during ground-disturbing activities, all work must immediately cease within 100 feet of the discovery. The ASM, WAPA, SHPO, and appropriate Tribes must be notified of the discovery within 24 hours (following ASM and/or WAPA protocol). All discoveries will be treated in accordance with Native American Graves Protection and Repatriation Act ([NAGPRA] Public Law 101-601; 25 U.S.C. 3001-3013) or Arizona burial laws (A.R.S. § 41-844 and A.R.S. § 41-865), as appropriate, and work must not resume in this area without proper authorization.
- Any historic properties that cannot be avoided should be subjected to appropriate treatment, mitigation, or data recovery, or if unevaluated, subjected to an archaeological testing program to determine potential listing in the Arizona Register of Historic Places (ARHP) and/or the NRHP.

Transportation

- Deliveries of materials would be scheduled for off-peak hours, when practical, to reduce effects during periods of peak traffic.
- Truck traffic would be phased throughout construction, as much as practical.
- Carpooling or mass transportation options for construction workers would be encouraged.
- Sterling Solar 1 would obtain the applicable permits needed to transport equipment and materials (e.g., oversized transformers, lightning protection pole) and coordinate closely with ADOT and other State transportation departments, as appropriate.

Public Health and Safety

- The project would be designed in accordance with all applicable Federal and industrial standards including the American Society of Mechanical Engineers, NESC, International Energy Conservation Code, International Building Code, Uniform Plumbing Code, Uniform Mechanical Code, NFPA standards, and Occupational Safety and Health Administration regulations.
- Sterling Solar 1 would develop and maintain an emergency response plan. A copy of the plan would be kept onsite at all times and facility staff would be trained on the procedures outlined in the plan.

Wastes and Hazardous Materials

- Sterling Solar 1 would design and operate systems containing hazardous materials in a manner that limits the potential for their release.

- Vehicles and equipment would be kept in proper working condition to reduce the potential for leaks of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials.
- The containment and disposal of hazardous waste would be outlined in a Spill Prevention and Emergency Response Plan developed by the Sterling Solar 1 construction contractor for the project to reduce the likelihood that substantive spills would adversely affect wildlife.

Visual Resources

- Reduce visual impacts during construction by minimizing areas of surface disturbance, controlling erosion, using dust suppression techniques, and, if applicable, restoring exposed soils as closely as possible to their original contour and vegetation.
- All PV solar panels would be treated with anti-reflection coatings or have a geometric texture to diffuse the incident rays.
- New galvanized steel transmission poles would be artificially weathered to reduce their visual impact.

2.6 No Action Alternative

The No Action Alternative provides a baseline against which the impacts of the Proposed Action can be compared. Under the No Action Alternative:

- WAPA would not approve a large generator interconnection request, would not enter into an interconnection agreement, and would not implement project-related transmission system upgrades, additions, or configurations;
- BLM would not issue a ROW amendment; and
- Sterling Solar 1 would not develop the private property for the solar energy generation facility, including the battery energy storage system.

2.7 Alternatives Considered but Not Further Evaluated

Prior to submitting the large generator interconnection request, Sterling Solar 1 considered multiple factors in the evaluation of potential project locations, including proximity to the Topock-Black Mesa 230 kv transmission line, contiguous parcel(s) of private lands suitable for solar resource development and with low resource value, proximity to existing transportation and utility infrastructure, and proximity to developed areas to minimize materials transportation and workforce commute. Based on these and other development factors, Sterling Solar 1 optioned the proposed 2,077-acre parcel for development.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

The information in this chapter describes the affected (existing) environment within the Sterling Solar 1 project area and presents the potential effects of the Proposed Action and the No Action Alternative on the resources identified for analysis. The resource issues addressed in this EA were developed using comments received from the public, Tribes, and agencies during internal and external scoping (Table 3-1). Resource issues considered but dismissed from further analysis are described in Section 3.2.

3.2 Impact Analysis Methodology

The terms “impacts” and “effects” are used interchangeably, and the terms “increase” and “decrease” are used for comparison purposes in this EA. Direct, indirect, and cumulative impacts are described in this chapter. Potential impacts are described in terms of duration, intensity, type, and context. Definitions of impact terms are provided below.

- **Direct:** caused by the action, same time and place
- **Indirect:** caused by the action, but later in time or further in distance, but still reasonably foreseeable
- **Cumulative:** caused by the incremental impact of the action, decision, or project when added to other past, present, and reasonably foreseeable future actions

For the purposes of this analysis, duration (temporal scale) of the direct or indirect effects of the analysis is defined as follows. These durations would apply to each of the resources/uses that are analyzed in this EA, but may vary slightly depending on the resource/use.

- **Short-term:** impacts that would be less than 5 years in duration, includes temporary construction-related impacts
- **Long-term:** impacts that would be greater than 5 years in duration

For the purposes of this analysis, intensity or severity of the impact is defined as follows:

- **Negligible:** changes would not be detectable and/or measurable. The resource/use would be essentially unchanged or unaltered
- **Minor:** changes would be detectable and/or measurable and would have a slight change or alteration to the resource/use
- **Moderate:** changes would be clearly detectable, measurable, and/or have an appreciable effect on the resource/use. The resource/use would be notably changed or altered and the effect is apparent. Project activities could change the indicator over a small area or to a lesser degree.
- **Major:** changes would be readily detectable, and/or have a severe effect on the resource. The resource/use would be substantially changed or altered over a large area or to a large degree.

For the purposes of this analysis, the type of impact is defined as follows:

- **Adverse:** impacts that would have a detrimental effect to a resource/use
- **Beneficial:** impacts that would have a positive effect to a resource/use

Context is the setting within which an impact is analyzed. For the purposes of this analysis, the contexts are defined as follows:

- **Local:** within and immediately adjacent to the Sterling Solar 1 project area
- **Regional:** remaining area outside of but within 15 miles of the Sterling Solar 1 project area

Table 3-1 identifies the presence or absence of resource elements or uses in the project area, and states the rationale for the inclusion or exclusion of a detailed analysis of those resource elements in the EA.

Table 3-1. Determination and Rationale for Resources/Uses Dismissed from Further Analysis

Resource/Use	Additional Analysis Determination and Rationale
Air Quality	<p>The Federal Clean Air Act (CAA) of 1970 was the first comprehensive legislation aimed at reducing levels of air pollution throughout the country. The 1970 law required the EPA to establish NAAQS, which set maximum allowable concentrations for seven criteria pollutants: carbon monoxide, nitrogen dioxide, ozone, particulate matter and fine particulate matter (particulate matter less than 10 and 2.5 microns in diameter (PM₁₀ and PM_{2.5}), sulfur dioxide, and lead. The project area meets all the NAAQS (EPA 2020), and therefore, is considered in attainment.</p> <p>The main source of fugitive dust (particulates) in the vicinity of the project area would include vehicular traffic on unpaved roads and windblown dust. Potential impacts from construction, O&M, and decommissioning of a solar facility and interconnection on local and regional air quality would result from fugitive dust emissions and vehicle exhaust emissions primarily during construction and decommissioning. Fugitive dust on unpaved roads would be reduced through watering the roads or other dust control measures. With the implementation of BMPs for dust control, impacts would be minor and would not require measures to minimize or avoid adverse impacts.</p> <p>During the construction and decommissioning activities, there would be short-term, localized negligible increases in vehicle emissions and fugitive dust from ground disturbance and vehicle travel associated with the WAPA Proposed Action and Sterling Solar 1 Proposed Project. Once these activities are completed (construction activities are estimated to take up to eight months), operation of the solar project is not expected to contribute to measurable or detectable impacts to air quality. Long-term, negligible increases in emissions from a limited amount of maintenance vehicle traffic is expected with the WAPA Proposed Action and Sterling Solar 1 Proposed Project. No additional detailed analysis in the EA is warranted.</p>
Climate Change/Greenhouse Gas Emissions	<p>Climate change is a global issue that results from several factors, including, but not limited to, the release of greenhouse gases (GHGs), land use management practices, and the albedo effect, or reflectivity of various surfaces (including reflectivity of clouds). Specific to the proposed project, GHGs are produced and emitted by various sources during the development and operational phases of transmission lines and utility-scale solar facilities. The primary sources of GHGs associated with transmission lines and substations are carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) from fuel combustion in construction and maintenance vehicles and equipment. In addition, removing vegetation may result in a small short-term indirect increase in GHG emissions due to the loss of carbon uptake from the removal of vegetation.</p> <p>Construction of the WAPA Proposed Action and Sterling Solar 1 Proposed Project would result in temporary activity and minor levels of GHG emissions that would cease after the construction period. During the O&M phase, periodic O&M activities would generate negligible GHGs emissions. Overall emissions from construction and operation of the project would be minimal in comparison to global GHG emissions.</p>

Resource/Use	Additional Analysis Determination and Rationale
	<p>Furthermore, this fossil fuel-free energy generation means there are also no GHG emissions due to the extraction of fossil fuels. In addition, equipment (switches and reclosers) containing sulfur hexafluoride (SF6) are not planned for this project.</p> <p>The GHG emissions from the WAPA Proposed Action and Sterling Solar 1 Proposed Project would result in negligible, short-term, incremental impacts to the existing air quality and would be limited to activities during project implementation. No additional analysis in this EA is warranted.</p>
Cultural Resources	See Detailed Analysis in Section 3.3.
Environmental Justice	<p>There are no minority or low-income populations identified residing, working within or adjacent to the project area. In the communities of Golden Shores and Topock, located approximately 3 miles from the project area, approximately 16 percent of the population is below the poverty level. These communities may experience minor beneficial socioeconomic impacts from the WAPA Proposed Action and Sterling Solar 1 Proposed Project. Therefore, there are no disproportionate impacts to environmental justice populations. No additional detailed analysis in the EA is warranted.</p>
Farmlands (Prime or Unique)	<p>There are no U.S. Department of Agriculture designated prime or unique farmlands within the in the project area. No additional detailed analysis in the EA is warranted.</p>
Floodplains	<p>Executive Order 11988, Floodplain Management, requires an evaluation of impacts to floodplains for all Federal actions and directs Federal entities to reduce impacts to floodplains and minimize flood risks to human safety. Further, the DOE is required under 10 CFR § 1022.11 to determine if a proposed action would be located in a floodplain. Approximately 344 acres (17 percent) of the total project boundary (2,077 acres) fall within the 100-year floodplain. Lands within the floodplain have been excluded from the buildable area for the PV solar panel array.</p> <p>The WAPA Proposed Action would have no impact on existing floodplains.</p> <p>Construction activities associated with the Sterling Solar 1 Proposed Project within the 100-year floodplain would be limited to access road crossings and underground collection lines at ephemeral washes. The Sterling Solar 1 Proposed Project would construct four permanent, at-grade, concrete ford crossings and underground collection lines perpendicular to the ephemeral washes in the project area. All permanent road crossings would be designed to meet roadway standards when building low-water crossings within the designated floodplain. All wash crossings would be designed to allow surface waters to flow unimpeded over the crossing. Temporary disturbance during construction would also occur from trenching across the washes for the placement of the collection lines.</p> <p>Once construction is complete, the surface would be restored to existing conditions and elevations, creating no long-term impacts. No impacts to floodplains would occur during the O&M phase of the Sterling Solar 1 Proposed Project. There would be no modification of a floodplain that would impede or redirect flood flows or result in property damage on- or off-site. Neither the flood-carrying capacity of the floodplain, nor the pattern or magnitude of floods flow would be affected. The Sterling Solar 1 Proposed Project would have short-term, negligible, adverse impacts to floodplains from the construction of the Sterling Solar 1 roadway system and underground collection lines. There would be no long-term permanent impacts to the floodplain with the implementation of design features and BMPs. No additional detailed analysis in the EA is warranted.</p>

Resource/Use	Additional Analysis Determination and Rationale
General Vegetation	<p>The predominant vegetation community in the project area is Mohave Desertscrub (Brown 1994). Vegetation in the project area consists of a combination of shrub-dominated upland vegetation and xeroriparian vegetation in ephemeral washes. Upland vegetation in the project area is dominated by creosotebush (<i>Larrea tridentata</i>), and white bursage (<i>Ambrosia dumosa</i>) with other occasional shrubs such as Mormon tea (<i>Ephedra aspera</i>), Spanish needles (<i>Palafoxia linearis</i>), and littleleaf ratany (<i>Krameria erecta</i>). Ephemeral washes support a mixture of shrubs such as cheesebush (<i>Hymenoclea salsola</i>), catclaw (<i>Senegalia greggii</i>), desert lavender (<i>Hyptis emoryi</i>), and desert milkweed (<i>Asclepias subulata</i>) and trees such as smoketree (<i>Psoralea argemone</i>) and blue paloverde (<i>Parkinsonia florida</i>). Occasional forbs such as sand blazing star (<i>Mentzelia involucrata</i>), sand verbena (<i>Abronia villosa</i>), desert tobacco (<i>Nicotiana obtusifolia</i>), climbing milkweed (<i>Sarcostemma cynanchoides</i>), and desert trumpet (<i>Eriogonum inflatum</i>) are found throughout the project site.</p> <p>The WAPA Proposed Action would cause approximately 18.6 acres of temporary disturbance and approximately 18.5 acres of permanent disturbance. This represents a negligible loss of the Mohave Desertscrub vegetation within the region. WAPA's Proposed Action would result in short- and long-term, negligible, adverse impacts to vegetation within the project area.</p> <p>During construction of the Sterling Solar 1 Proposed Project, the project area would be cleared and graded for construction of the PV solar panel array, with the exception of a 25-foot-wide avoidance buffer on either side of the ephemeral washes in the project area, which would remove approximately 1,641 acres of Mohave Desertscrub vegetation. This represents a negligible loss of Mohave Desertscrub vegetation within the region. During O&M, vegetation would be allowed to reestablish, the project area would be managed for low-growing vegetation, and maintenance vehicles would be restricted to designated roads. Decommissioning activities would result in similar impacts to those of construction activities. The Sterling Solar 1 Proposed Project's O&M activities would result in long-term, negligible, adverse impacts to vegetation within the project area. With the implementation of the BMPs, impacts to vegetation would be minor and would not require any measures to minimize or avoid adverse impacts.</p> <p>No additional detailed analysis in the EA is warranted.</p>
General Wildlife and Special Status Wildlife Species	See Detailed Analysis in Section 3.4.
Geology, Mineral Resources, and Energy Production	There are no geologic or mineral resources within the project area; therefore, the project would result in no adverse effects to these resources. No additional detailed analysis in the EA is warranted.
Indian Trust Assets	Indian Trust Assets are legal assets associated with rights or property held in trust by the United States for the benefit of federally recognized Indian Tribes or individual tribal members. The United States, as trustee, protects and maintains the specific rights reserved by, or granted to, Indian Tribes or individuals by treaties, statutes, and executive orders. There are no known Indian Trust Assets within the project area, therefore the project would result in no adverse effects to any Indian Trust Asset.
Intentional Acts of Destruction	The project presents an unlikely target for an act of terrorism or sabotage, with an extremely low probability of attack. The DOE requires that NEPA documents explicitly address potential environmental consequences of intentional acts of destruction (DOE 2006). The purpose is to inform the decision maker and the public about chances

Resource/Use	Additional Analysis Determination and Rationale
	<p>that reasonable foreseeable accidents associated with proposed actions and alternatives could occur, and their potential adverse consequences. Reasonably foreseeable means events that may have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is with the rule of reason or reasonably foreseeable (40 CFR 1502.22). This includes determining the appropriate level of detail for analysis based on the type of project, level of risk, and sensitivity for releasing information to the public.</p> <p>The addition of the interconnection and associated facilities (i.e. the switchyard) as part of WAPA's Proposed Action would continue to support the reliability of delivering electricity in the vicinity because if one line is impacted, the other adjacent line could potentially still be available to continue the delivery of electricity.</p> <p>Vandalism and intentional acts of destruction (sabotage) of the proposed facility and related interconnection are unpredictable events. The chances of such acts occurring would be reduced by the limited and remote access to the Project Area. In addition, WAPA inspects their transmission lines and substations on a regular O&M schedule for any signs of sabotage or vandalism, and takes immediate action if a potential hazard is found. The potential for serious injury resulting from vandalism is negligible; therefore, impacts would be less than significant. The public should call 1-800-209-8962 should any suspicious activity be seen in the Project Area or its immediate vicinity, or if anyone is seen:</p> <ul style="list-style-type: none"> ▪ Shooting at WAPA's insulators, power lines, transmission towers or substation equipment; ▪ Dumping waste or other materials on WAPA's property; ▪ Vandalizing WAPA's property, buildings, and vehicles; ▪ Stealing WAPA equipment, supplies, tools, or materials; or ▪ Harming WAPA staff. <p>No additional detailed analysis in the EA is warranted.</p>
Lands and Realty	<p>The project solar field is located entirely on privately owned lands. The interconnection to the transmission line corridor would be located within the adjacent utility corridor on ROW owned by Reclamation. Much of the Reclamation ROW is on lands administered by the BLM. Because there is the potential for the existing transmission lines to be redirected and enter the new substation, the existing authorized ROW agreements and any permit documentation would need to be reviewed by WAPA and the BLM and revised as appropriate to identify any changes in the ROW location. Although ROWs may be present, impacts to WAPA and activities would be negligible. No temporary or permanent access limitations or alterations are anticipated to lands outside of the project area; therefore, there would be no impacts to privately owned lands. No additional detailed analysis in the EA is warranted.</p>
Migratory Birds and Important Bird Areas	<p>The predominant vegetation community within the project area is Mohave Desertscrub. Typical migratory birds that may occur in this habitat type include ash-throated flycatcher (<i>Myiarchus cinerascens</i>), Crissal thrasher (<i>Toxostoma crissale</i>), Costa's hummingbird (<i>Calypte costae</i>), and loggerhead shrike (<i>Lanius ludovicianus</i>). Under the Sterling Solar 1 Proposed Project, the construction of a PV solar panel array, access roads, underground collection system, and substation would result in approximately 1,641 acres of permanent surface disturbance and vegetation removal. Within the entire 2,077-acre project area, this would result in an approximately 83 percent reduction in habitat for migratory birds. Increased motor vehicle traffic along Polaris Road between Oatman Highway and the Sterling Solar 1 project area during construction would temporarily displace migratory birds along the road corridor and</p>

Resource/Use	Additional Analysis Determination and Rationale
	<p>there would be some potential for increased vehicle collisions. WAPA's Proposed Action would permanently remove approximately 18.5 acres of vegetation and potential habitat for migratory birds. As Mohave Desertscrub land cover is common regionally, migratory birds would likely be displaced into other available habitat within or adjacent to the project area. Utility-scale PV facilities may attract migrating waterfowl and shorebirds through the "lake effect", whereby migrating birds perceive the reflective surfaces of PV panels as bodies of water and collide with the structures as they attempt to land on the panels. According to the DOE "there are many anecdotal events, but to date no empirical research has been conducted to evaluate the attraction of PV facilities to migrating waterfowl or songbirds" (Hatchcock 2018). Therefore, the Sterling Solar 1 Proposed Project would result in long-term, negligible to minor, adverse impacts to migratory birds.</p> <p>There are no Important Bird Areas (IBA) within or directly adjacent to the project area. The Havasu National Wildlife Refuge and the Lower Colorado River Valley IBA are approximately 4 miles to the west of the project area and no impacts to these areas are anticipated. No additional detailed analysis in the EA is warranted.</p>
Native American Religious Concerns	<p>On September 11, 2019, WAPA initiated consultation with Tribes that have an affiliation with the project area (See Section 1.4.2 Tribal Consultation). To date, the Hopi Tribe and Colorado River Indian Tribes have provided input on their desire to consult when there is potential to adversely affect prehistoric sites that would be caused by the proposed Sterling Solar 1 project or WAPA's interconnection. However, no sacred sites have been identified within the project area. Government-to-government consultation will continue with Tribes through project implementation. No additional detailed analysis in the EA is warranted.</p>
Noise	<p>The project area would be located in undeveloped terrain in a remote area north of I-40. There are no nearby identified noise receptors. The nearest sensitive receptors to the project area are residences approximately 2.5 miles west of the project area. Noise impacts would typically be generated by equipment and vehicles during construction, O&M, and decommissioning. Noise generated by construction and decommissioning of the PV solar array and interconnection would result in short-term, negligible, adverse impacts due to the distance from the project area. Noise generated during O&M would result in long-term, negligible, adverse impacts for the life of the PV solar array and interconnection. No additional detailed analysis in the EA is warranted.</p>
Noxious and Invasive Weeds	<p>Some invasive and/or noxious weeds are present in previously disturbed areas, including Sahara mustard (<i>Brassica tournefortii</i>) and Mediterranean grass (<i>Schismus</i> spp.) along existing roads and drainages. Ground-disturbing activities associated with the construction of the WAPA Proposed Action and Sterling Solar 1 Proposed Project may create conditions that could increase the potential for introduction and/or establishment of nonnative plants. Short-term, negligible, adverse impacts would result from the PV solar array and substation/switchyard being cleared of vegetation prior to construction. During O&M, long-term, negligible, beneficial impacts would result from the ongoing site and vegetation maintenance. WAPA and Sterling Solar 1 would comply with all Federal, State, and local weed control regulations and implement noxious and invasive weed BMPs, therefore, the potential for spread of invasive and/or noxious weeds would be very low. No additional detailed analysis in the EA is warranted.</p>
Paleontology	<p>According to the State geologic map of Arizona (Arizona Geologic Survey 2019), the project area overlies two geologic units mapped as Quaternary surficial deposits and Early Pleistocene to Latest Pliocene surficial deposits. The Geological Survey</p>

Resource/Use	Additional Analysis Determination and Rationale
	describes these units as coarse deposits of sand and gravel between 0 and 3 million years old. These coarse sediments, within a highly eroded environment, have a low sensitivity for paleontological resources, which indicates potential paleontological materials are unlikely to be in the project area. No additional detailed analysis in the EA is warranted.
Public Health and Safety	Workers would be exposed to noise and exhaust from motorized equipment and vehicles during construction, O&M, and decommissioning of the WAPA Proposed Action and Sterling Solar 1 Proposed Project. The use of hearing protection and operation of equipment in well-ventilated areas would minimize effects to operator health. It is unlikely that the public would be at risk from any construction, O&M, or decommissioning activities with the incorporation of BMPs, including maintaining safety zones around work area. Sterling Solar 1 would be required to comply with all applicable design codes and implement a range of plans to minimize risks to workers and public alike, such as spill control plans, hazardous materials management plans, emergency response plans, fire management plans, and health and safety programs. WAPA would be required to comply with all FERC standards for large generator interconnections. Therefore, the potential risk to worker and public health during construction, O&M, and decommissioning would be negligible for the WAPA Proposed Action and Sterling Solar 1 Proposed Project. No additional detailed analysis in the EA is warranted.
Recreation	There are no designated public recreation facilities, such as trails, known to occur within or adjacent to the project area. Because the land where the WAPA and Sterling Solar 1 facilities would be built is privately owned ¹ , there are also no opportunities for dispersed recreation activities, such as motorized and non-motorized activities, wildlife viewing, hunting, camping, hiking, and off-highway vehicle (OHV) use. No additional detailed analysis in the EA is warranted.
Sensitive Plant Species	Sensitive species include those designated as species of greatest conservation need (SGCN) or as BLM sensitive; listed species protected under the ESA were evaluated (refer to Appendix B). No sensitive plant species or suitable habitat exists in the project area. No additional detailed analysis in the EA is warranted.
Socioeconomics	<p>Within the vicinity of the project area, the only concentrated areas of population are the Golden Shores and Topock Census Designated Places (CDPs). According to the 2010 Decennial Census and the 2017 American Community Survey 5-Year Estimates, the combined total population of the two CDPs is 1,266 people, with 16 percent of families below the poverty level (U.S. Census Bureau 2010, 2017). The Proposed Project may result in minor beneficial impacts to the socioeconomic conditions of the two CDPs during construction when the number of onsite workers would peak at 350 workers per day. Permanent O&M jobs associated with Sterling Solar 1 would have a negligible effect on overall employment in the CDPs and Mohave County as a whole. Additionally, the improvements made to vacant land would subject that land to a potentially higher tax assessment ratio, which would affect the long-term property tax revenue paid to Mohave County.</p> <p>According to the Policy Research Project results, residential home assessors show that the majority of respondents believe that proximity to a solar installation has either</p>

¹ The underlying ownership of the existing transmission line corridor is privately owned, however, the BLM has jurisdiction over the ROW.

Resource/Use	Additional Analysis Determination and Rationale
	<p>no impact or a positive impact on home values. There are many factors that contribute to an alteration in home values with the construction of a utility-scale solar facility including visual barriers around arrays, appeal of the land before the installation, and home density. Homes beyond one half mile and within three miles of a utility-scale solar project saw an estimated positive property value impact of 0.8 percent, on average (Al-Hamoodah et al. 2018). The WAPA Proposed Action and Sterling Solar 1 Proposed Project's construction and decommissioning activities would have a negligible, beneficial impact to socioeconomics from onsite crews using local services. During O&M, there would be no impact on socioeconomics because they would not employ any local community members. No additional detailed analysis in the EA is warranted.</p>
Soils	<p>Soils in the project area consist almost entirely of aridisols (saline or alkaline soils with little organic matter) that are sandy, cobbly, and gravelly in composition. Impacts to soils from the WAPA Proposed Action and Sterling Solar 1 Proposed Project, including soil compaction and soil erosion by wind and water, would mainly occur from construction and decommissioning of the project and result in short-term, minor, adverse impacts. During O&M activities, maintenance vehicles would be restricted to designated roads. With the implementation of BMPs, including those for stormwater, erosion, and fugitive dust control, impacts to soils would be minimized. The WAPA Proposed Action and Sterling Solar 1 Proposed Project are anticipated to have long-term, negligible, adverse impacts to soil resources. No additional detailed analysis in the EA is warranted.</p>
Threatened, Endangered or Candidate Species	<p>There are no Threatened, Endangered or Candidate Species with the potential to occur in the project area and no proposed or designated critical habitat for Federally listed species in the project area (see Table B-1 in Appendix B). No additional detailed analysis in the EA is warranted.</p>
Transportation	<p>WAPA would use the existing unpaved transmission line access road to the utility corridor ROW in order to reach the work area. WAPA does not plan to improve the existing access road beyond blading the existing road prism to create a safe, level surface if the road becomes rutted due to weather or use by others. During construction, the WAPA Proposed Action and Sterling Solar 1 Proposed Project would result in a minor, short-term increase in traffic on Oatman Highway and Polaris Road in the immediate vicinity of the project area as equipment is transported to the site. Delays may occur during delivery of large equipment, such as the substation components; however, deliveries would be directed to the laydown areas within the project area to minimize traffic delays on local roadways or at intersections, even during peak construction. There will be no road closures required and delays are not expected to impede the existing use of Oatman Highway or Polaris Road. Construction traffic would also result in a negligible impact to I-40. Impacts to transportation from O&M activities would be negligible and would not impact traffic flow on local roadways as the solar site would only be visited once per week, on average. During O&M, the WAPA facilities would be inspected by air quarterly and ground inspections would occur once annually. No additional detailed analysis in the EA is warranted.</p>
Visual Resources	<p>See Detailed Analysis in Section 3.5.</p>
Water Resources and Quality (Drinking/Surface/ Groundwater)	<p>There are several ephemeral washes in the project area that would be avoided, except for the sites of the four at-grade concrete ford crossings and underground collection line trenches associated with the Sterling Solar 1 Proposed Project. A jurisdictional determination for waters of the United States would be necessary to determine the</p>

Resource/Use	Additional Analysis Determination and Rationale
	<p>presence and extent of water of the United States subject to Section 404 of the Clean Water Act. The project would avoid impacts to waters of the United States to the extent practicable, and at full build-out, total impacts to jurisdictional washes are anticipated to be less than 0.50 acres. As the facility design is finalized, Sterling Solar 1 would request a jurisdictional determination and obtain any necessary permits from the USACE (i.e., Nationwide Permit 51 for Land-Based Renewable Energy) for impacts to jurisdictional waters. No ephemeral washes occur in the WAPA project area and, as such, no impacts are anticipated to jurisdictional waters. Additionally, Sterling Solar 1 and WAPA would implement BMPs for stormwater and erosion control as part of the project SWPPP to prevent runoff and sedimentation into the washes in the project area during construction.</p> <p>The project area is located within two hydrologic subbasins: the Havasu-Mohave Lakes subbasin (HUC 15030101) and the Sacramento Wash subbasin (HUC 15030103). Water for Sterling Solar 1 and WAPA project construction, O&M, and decommissioning would be provided from a privately owned well. The water rights to the well are under an Analysis of Adequate Water Supply by the Arizona Department of Water Resources guaranteeing in excess of 8,000 acre-feet per year for 100 years. Sterling Solar 1 construction activities (up to eight months in duration) would use an anticipated maximum of 189 acre-feet of water (2.4 percent of annual guarantee), and O&M would use an anticipated 6.9 acre-feet of water per year (less than 0.1 percent of annual guarantee). Decommissioning activities would use water at rates similar to, or less than, construction activities. WAPA's construction, O&M, and decommissioning activities would use substantially less water than what is anticipated for Sterling Solar 1's facilities. Therefore, impacts to surface water and groundwater from construction, O&M, and decommissioning activities would be negligible. No additional detailed analysis in the EA is warranted.</p>
Wetlands, Riparian Areas	There are no wetlands/riparian zones in the project area. No additional detailed analysis in the EA is warranted.
Wild and Scenic Rivers	There are no Congressionally designated Wild and Scenic Rivers within or immediately adjacent to the project area, so no impact to this resource would result from the WAPA Proposed Action and Sterling Solar 1 Proposed Project. No additional detailed analysis in the EA is warranted.
Wilderness Areas	There are no Wilderness Areas, Wilderness Study Areas, or Lands with Wilderness Characteristics within or immediately adjacent to the project area, so no impact to this resource would result from the WAPA Proposed Action and Sterling Solar 1 Proposed Project. No additional detailed analysis in the EA is warranted.

3.2.1 Cumulative Impacts

The determination of what past, present, and reasonably foreseeable future actions to consider in the impact analysis is based on the resources being affected by the Sterling Solar 1 project. A cumulative effect is defined under NEPA as “the change in the environment which results from the incremental impact of the action, decision, or project when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other action. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR Part 1508.7). Past, present, and reasonably foreseeable future actions that incrementally add to the potential cumulative impacts of the WAPA Proposed Action,

Sterling Solar 1 Proposed Project, and No Action alternatives are considered in this EA. The intent of this analysis is to capture the total effects of several actions over time that would be missed by evaluating each action individually.

3.2.2 Cumulative Effects Analysis Area and Timeframe of Effects

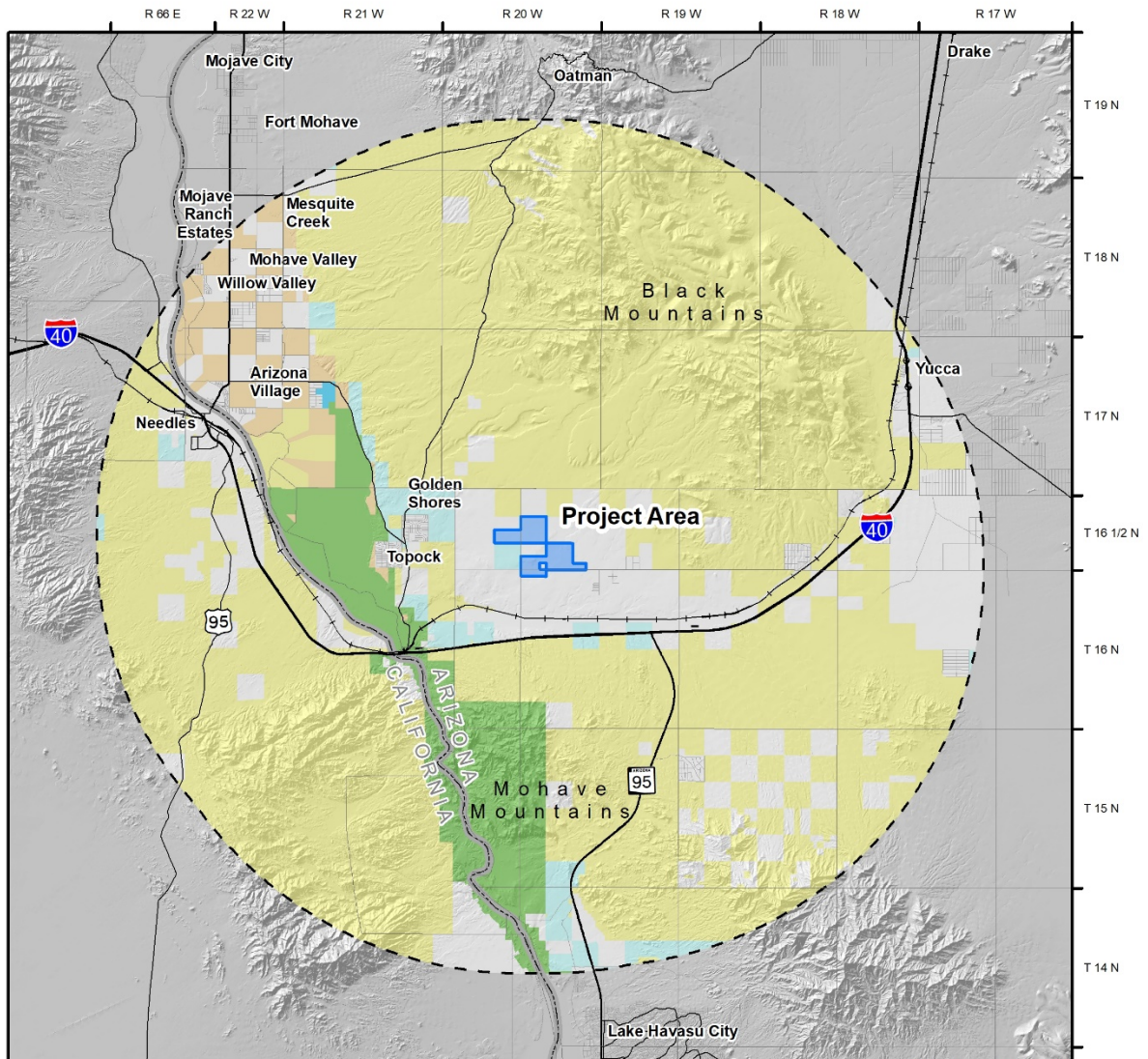
Geographic (spatial) and time (temporal) boundaries have been established for cumulative effects analysis. Each resource that may have a minor, moderate, or major impact from the WAPA Proposed Action and Sterling Solar 1 Proposed Project has a defined cumulative effects study area (CESA). The geographic area of the CESA for visual resources would include the area 15 miles from the project area, which is the distance that form or outline elements and/or patterns in the landscape are discernible. The cultural resources CESA would be the same 15-mile radius and would encompass the area of indirect impacts for any cultural property based with the discernible view of the project area. For general wildlife and special status wildlife species, the CESA is three miles from the project area and is based on the distance that AGFD uses to identify species that may be present in the landscape.

The visual and cultural resources' CESA represents 544,190 acres and the project area constitutes 0.4 percent of this CESA. The BLM manages 69 percent of the CESA, 19 percent is privately owned, and the remaining 12 percent consists of ASLD-managed lands, Havasu National Wildlife Refuge, and the Fort Mohave Indian Reservation. Figure 3-1 shows the 15-mile CESA boundary in relationship to the project area.

The general wildlife and special status wildlife species CESA represents 39,248 acres and the project area constitutes 5.3 percent of this CESA. The BLM manages 33 percent of the CESA, 58 percent is privately owned, and the remaining 9 percent consists of ASLD-managed lands. Figure 3-2 shows the 3-mile CESA boundary in relationship to the project area. A 30-year timeframe is considered for the cumulative effects analysis, which would be the initial term of the ROW grant.

3.2.3 Past and Present Actions

In order to understand the contribution of past actions to the cumulative effects of the WAPA Proposed Action, Sterling Solar 1 Proposed Project, and No Action alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. Existing conditions reflect the aggregate impact of prior human actions and natural events that have affected the environment and could contribute to cumulative effects. The cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. By looking at current conditions, the residual effects of past human actions and natural events are captured, regardless of which particular action or event contributed those effects. The Council on Environmental Quality (CEQ) issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions."



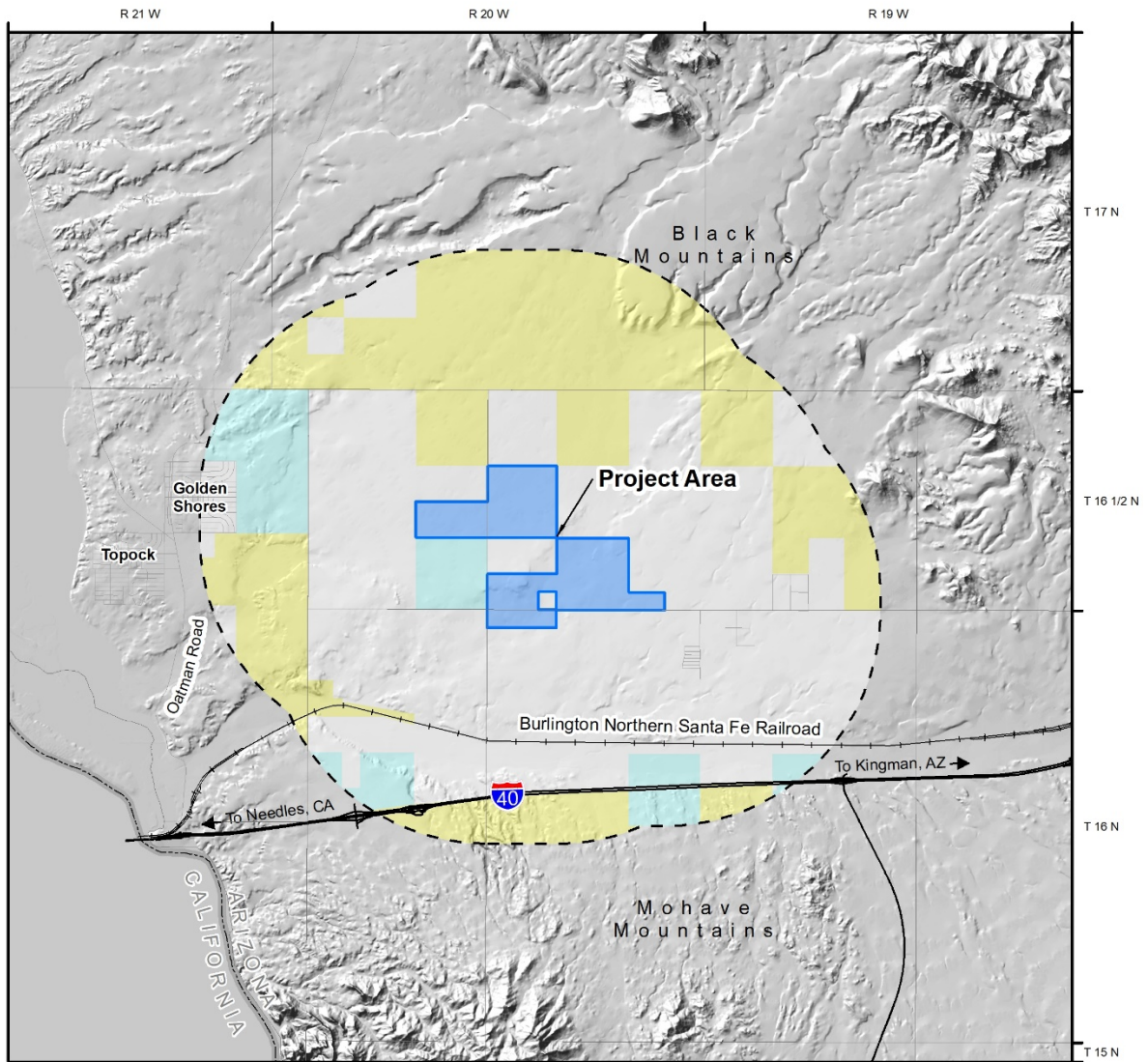
Sterling Solar 1
Visual and Cultural Resources
Cumulative Effects Study Area

Legend

- Sterling Solar 1 Project Area
- Visual Resource Cumulative Effects Study Area
- Private
- State Trust
- Bureau of Land Management
- Fort Mojave Indian Reservation
- Havasu National Wildlife Refuge
- Arizona Game and Fish Department



Figure 3-1. Sterling Solar 1 Visual and Cultural Resources CESA



- Legend**
- Sterling Solar 1 Project Area
 - Biological Resources Cumulative Effects Study Area
 - Private
 - State Trust
 - Bureau of Land Management

**Sterling Solar 1
Sensitive Wildlife Species and General Wildlife
Cumulative Effects Study Area**

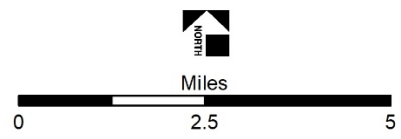


Figure 3-2. Sterling Solar 1 General Wildlife and Special Status Wildlife Species CESA

3.2.4 Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions are actions that have existing decisions, funding, formal proposals, or that are highly probable. These actions are not connected to the WAPA Proposed Action, Sterling Solar 1 Proposed Project, and No Action alternatives. They are projections being made so that future effects, cumulative and otherwise, can be estimated, as required by NEPA. Specific projects by land managers within the two CESAs have been reviewed, including the BLM, ADOT, Mohave County, ASLD, and WAPA. Table 3-2 lists the known future actions. Other reasonably foreseeable future actions and management activities occurring in the CESA which area highly probable include livestock grazing, range improvements, vegetation management, recreation (e.g., OHV use, hunting, hiking), road improvements, mining, utility projects, and potentially the addition of special designation areas and Special Recreation Permits (SRPs). Other disturbances that are ongoing include wildland fire and establishment and spread of noxious weeds and invasive plant species.

Table 3-2. Reasonably Foreseeable Future Actions

Project Name	Proximity to Project Area	Description
CASTLE ROCK WILDLIFE WATER CATCHMENT	13 miles	The AGFD, through a range improvement agreement, proposes to construct a new metal apron catchment, ground-level walk-in drinker with a water sensor installed, three storage tanks buried up to 4.5' deep underneath the apron, pipelines between the storage tanks and drinker, and a pipe-rail fence surrounding the entire facility. The total area of disturbance would be less than 1/10 acre.
MOHAVE CLIFFS WILDLIFE WATER CATCHMENT	15 miles	The AGFD, through a range improvement agreement, proposes to construct a new metal apron catchment, ground-level walk-in drinker with a water sensor installed, three storage tanks buried up to 4.5' deep underneath the apron, pipelines between the storage tanks and drinker, and a pipe-rail fence surrounding the entire facility. The total area of disturbance would be less than 1/10 acre.
PAVEMENT PRESERVATION (I-40 BETWEEN MP 8-33)	3 miles	Located near SR 95 and is anticipated to occur between October and November of 2019. The pavement preservation type of work is listed as "flush."
STERLING SOLAR 2 INTERCONNECTION PROJECT	<1 mile	WAPA has received a large generator interconnection request for Sterling Solar 2, an approximately 2,219-acre PV solar array that would interconnect into the Topock-Black Mesa 230 kv transmission line. NEPA documentation would be required, but the environmental process has not yet been initiated.

3.2.5 Cumulative Impacts on Resources

For this analysis, cumulative resource impacts for the CESA are the combined direct and indirect effects of the present and reasonably foreseeable future actions, in addition to the direct and indirect impacts of the WAPA Proposed Action, Sterling Solar 1 Proposed Project, and No Action alternatives, respectively. The levels of direct and cumulative impacts are categorized as major, moderate, or minor based on the same thresholds defined in Section 3.1. If the results of the analysis of direct or indirect impacts were considered to be none or negligible as a result of the WAPA Proposed Action, Sterling

Solar 1 Proposed Project, and No Action alternatives, there would be no measurable contribution to a cumulative effect and, therefore, no cumulative effects analysis for the respective resource/use has been done.

Based on the analysis of direct and indirect impacts provided in Chapter 3.0, neither the WAPA Proposed Action and Sterling Solar 1 Proposed Project, nor No Action Alternative would have long-term, minor, moderate, or major direct effects to air quality; climate change/greenhouse emissions; environmental justice; prime or unique farmlands; floodplains; general vegetation; geology, mineral resources and energy production; intentional acts of destruction; lands and realty; migratory birds and IBAs; Native American religious concerns; noise; noxious and invasive weeds; paleontology; public health and safety; recreation; sensitive plant species; socioeconomics; soils; threatened, endangered, or candidate species; transportation; water resources and quality; wetlands and riparian areas; Wild and Scenic Rivers; or Wilderness Areas within the project area. There would be no measurable contribution to the resource's/use's respective cumulative impacts; therefore, there is no cumulative effects analysis for these resources/uses. Refer to Table 3-1 for detailed information regarding the potential impacts to these resources/uses. Both the WAPA Proposed Action and Sterling Solar 1 Proposed Project would have short- and long-term, minor to major, direct effects to cultural resources, special status wildlife species and general wildlife, and visual resources within the project area.

3.3 Cultural Resources

The classification of a “cultural resource” for purposes of the Sterling Solar 1 EA includes all districts, sites, buildings, structures, objects, and landscapes that have been created by or are associated with humans and are considered to have historical or cultural value. This section of the EA discusses the presence of cultural resources within the Sterling Solar 1 project area and the impacts that WAPA's Proposed Action, Sterling Solar 1 Proposed Project, and the No Action Alternative would have on those resources. The analysis area consists of the area of potential effects (APE), which is a geographic area or areas in which cultural resources may be directly or indirectly affected by the Sterling Solar 1 project.

3.3.1 Affected Environment

3.3.1.1 Cultural Setting

The Paleoindian period in western Arizona is identified by dispersed finds of Clovis-style points—large, fluted projectile points. In western Arizona, there is little evidence of the Paleoindian period, a time when the earliest humans in North America traveled in small, mobile groups to hunt now-extinct megafauna, such as the mastodon, mammoth, and bison. Later, Paleoindian hunters traveled through the western region, as indicated by artifacts of the Lake Mohave complex (ca. 8000–6000 B.C.) found near the Colorado River and along desert washes south of the Kingman region (Stone 1991).

There is more substantial evidence for occupation during the subsequent Archaic period, especially after 4000 B.C. in western Arizona, with increased population density as a possible result of changing environmental conditions and increased diversification of fauna and flora. Archaic period groups exploited a variety of wild plants and hunted both large and small game. Toward the end of the Archaic period, a major shift in subsistence practices took place. Domesticated crops, such as corn and beans,

increased in importance and contributed to an increase in sedentism by the end of the period (Schwartz 1989).

The Archaic tradition persists to around A.D. 1 in some areas (Huckell 1984, 1995) and as late as A.D. 700 with the advent of pottery production in the Lower Colorado River Valley (Rogers 1945; Schaefer 1994; Schaefer and Laylander 2007; Waters 1982). This ushered in the Formative period in western Arizona, which is dominated by the little understood Patayan cultural tradition. The Patayan culture likely has ancestral roots with ethnographically documented Colorado River Yuman groups, such as the Quechan (McGuire 1982, 218–219; Rogers 1945; Stone 1986, 66–68; 1991).

The Patayan practiced a mixed strategy of seasonal floodwater cultivation of maize, squash, and beans and the supplemental collection of mesquite pods, along with saguaro and other desert plants obtained from interior desert areas (Castetter and Bell 1951; McGuire 1982, 220–221; Rogers 1945; Schroeder 1979). Features associated with the Patayan include petroglyphs, trail systems, rock cairns, and ground-stone quarries and manufacturing sites. Recent data indicate there were at least three episodes of inundation and desiccation from Colorado River floodwater between A.D. 1200 and the late 1600s (Schaefer and Laylander 2007:250). This would have encouraged more multiseasonal habitations. The Patayan III period (post–A.D. 1500) has been defined as the interval following historical contact with Yuman groups that occupied this region along the Colorado River around A.D. 1540, such as the Quechan (Castetter and Bell 1951; Spier 1933). The greatest distribution of Patayan ceramics occurred during this period (Waters 1982:293–295). Palomas and Colorado Buff remain common types, Colorado Buff and Colorado Red-on-buff appear, and ceramic stuccoing becomes an important trait (Waters 1982, 290).

The project area is situated within the traditional territory of the Mohave and the Chemehuevi (Castetter and Bell 1951; Spier 1933; Stone 1987). European contact in the region was first established in 1604 when Don Juan de Oñate traveled down the Bill Williams River to the junction with the Colorado River. Farming settlements were located along the river; subsistence practices included hunting and wild plant gathering in areas outside the riverine corridor to offset the unpredictable nature of the annual flow of the Colorado River (Castetter and Bell 1951). The early Historic period is characterized by nominal Spanish and Mexican rule with the introduction of the horse and the slave trade influencing intertribal relations in the Lower Colorado and adjoining areas (Stone 1991). Mexican rule occurred between 1821 and 1848, but there was very little influence outside of southern Arizona.

Historic mining activities in western Arizona brought steamboat service and overland transportation routes from the river to the towns and mines of western Arizona during the latter half of the nineteenth century. By 1922, reclamation was seen as a solution to the Colorado River “problem,” and by 1928, the Boulder (Hoover) Dam was funded by Congress. Following the completion of the Hoover Dam in 1936, eight more dams were constructed, including Parker Dam in 1938, which impounds Lake Havasu.

During World War II, large-scale military exercises were conducted throughout western Arizona and eastern California by the U.S. Army, under the command of General George Patton, in preparation for the desert campaign in North Africa. In 1964, the U.S. Army conducted another large exercise known as Operation Desert Strike, portions of which were conducted in areas of Yuma and Mohave counties.

Vehicle tracks, rock features, abandoned equipment, and spent munitions associated with these military exercises are commonly found throughout the area.

3.3.1.2 Area of Potential Effects

The APE for direct and indirect physical effects applies to all land ownership types within the Sterling Solar 1 project area, the 38 miles of transmission line ROW where the overhead fiber optic grounding wire would be installed, and the approximately 32 acres of pull sites and staging areas associated with the overhead fiber optic grounding wire installation that would occur outside the transmission line ROW. The APE for visual effects is defined as areas visible within 5 miles of any project component or to the visual horizon, whichever is closer. Within the APE for visual effects, archaeological sites that are significant only for their potential to yield important information generally would not be affected by changes to their visual setting, but setting might be an important element of the historical values of other types of resources, such as historic trails and roads, historic buildings and structures, and traditional cultural properties (TCPs).

3.3.1.3 Identification of Cultural Resources

Class III cultural resources surveys of the APE were completed between 2016 and 2019 (Breternitz et al. 2016; Davis 2019). Cultural resource surveys are needed for the approximately 32 acres of pull sites and staging areas associated with the overhead fiber optic grounding wire installation that would occur outside the transmission line ROW. These Class I and III surveys are currently in progress and the results of which will be included in the Final EA.

The 2019 survey of the 4,376 acres of the APE surrounding the project area resulted in the identification of 6 previously recorded sites, 26 newly recorded sites, and 114 isolated occurrences. A majority of sites are prehistoric lithic scatters with discreet chipping stations. Much of the APE has been disturbed by UTVs and vehicle traffic, and previously recorded sites could have been significantly impacted. Additionally, major sheet washing and erosion was noted throughout the APE, which could have washed artifacts away from their original location or covered features with shifting sand dunes. Out of the 128 sites in the Class III survey area, WAPA determined in consultation with the SHPO that four archaeological sites are eligible for NRHP listing. Twenty-six archaeological sites were determined not eligible for NRHP listing, and two archaeological sites remain unevaluated. The four NRHP-eligible sites, AZ L:3:26(ASM), AZ L:3:80(ASM), AZ L:3:84(ASM), and AZ L:3:86(ASM), are eligible under Criterion D for their research or scientific value. These eligible sites consist of artifact scatters with features with multiple discreet chipping stations located entirely within the APE. The two undetermined sites, AZ L:3:25(ASM) and AZ L:3:89(ASM), are also prehistoric sites with multiple features including rock rings and roasting pit features, and will be treated as eligible until determined otherwise.

The 2016 survey of 1,165 acres of the APE along the transmission line ROW resulted in the identification of 16 previously recorded sites and 14 isolated occurrences. Two previously recorded sites were found outside the APE. A majority of sites are prehistoric lithic scatters with discreet chipping stations. Six of the sites (AZ I:14:334, AZ I:15:156, AZ L:3:21, AZ L:3:42, AZ L:7:29, and AZ L:7:30 [all ASM]) were previously determined eligible for listing in the NRHP. Following consultation with the SHPO, it was determined that AZ L:8:10(ASM) is eligible for inclusion on the NRHP under criterion D and that AZ L:7:29 (ASM) is a non-contributing segment of the site's eligibility within the APE.

3.3.1.4 Traditional Cultural Properties

WAPA reached out to 12 federally recognized tribes regarding the identification of cultural resources including TCPs. No TCPs were identified by the Tribes.

3.3.2 Environmental Consequences

This section assesses the impacts on cultural resources that would result from the construction, O&M, and decommissioning of the Sterling Solar 1 project. Impacts on cultural resources are considered for those resources that are listed in the NRHP, NRHP-eligible, or potentially NRHP-eligible (i.e., those sites for which NRHP-eligibility recommendations or determinations have not been made). For the purpose of this analysis, cultural resources of indeterminate NRHP-eligibility were treated as if they were eligible for inclusion in the NRHP.

The analysis of potential impacts to cultural resources utilized the criteria defined by the regulations for Protection of Historic Properties (36 CFR Part 800), which implement Section 106 of the NHPA. An effect is defined as a direct or indirect alteration to the characteristic(s) of a cultural resource that qualifies it for inclusion in the NRHP. Effects are adverse when the alterations diminish the integrity of a cultural resource's location, design, setting, materials, workmanship, feeling, or association. For cultural resources, effects could be the result of ground disturbances; visual or audible disturbances; increased erosion; or changes in public access, traffic patterns, or land use. For this EA, there would be effects on cultural resources when a site 1) falls within the temporary disturbance footprint of the WAPA Proposed Action and/or Sterling Solar 1 Proposed Project, and/or 2) lies outside but within a 50-foot buffer of the temporary/permanent disturbance footprint of the WAPA Proposed Action and/or Sterling Solar 1 Proposed Project.

3.3.2.1 Direct and Indirect Impacts of the WAPA Proposed Action

Construction activities that disturb or excavate soils may impact unidentified cultural resources by destroying intact archaeological features of deposits. Construction activities that modify the slope of the natural terrain or compact soils have potential to increase erosion, which might affect the integrity of cultural resources. Because construction activities would comply with regulations regarding the control of stormwater discharges, there is only minor potential for increased soil erosion to damage cultural resources. Such secondary impacts would likely be confined to the immediate vicinity of construction zones. There are no known cultural resource sites that would fall within the temporary and/or permanent disturbance footprint and/or the 50-foot-wide buffer of the temporary/permanent disturbance footprint of the WAPA Proposed Action.

Ground disturbance activities associated with construction of the WAPA Proposed Action would be limited to temporary disturbance associated with pulling sites and staging areas for the installation of the overhead fiber optic grounding wire. Ground disturbing activities associated with O&M and decommissioning of the WAPA Proposed Action would be confined to areas in the disturbance footprint created during construction of the Sterling Solar 1 facility. No additional impacts on cultural resources are expected from O&M or decommissioning activities. Therefore, no impacts on NRHP-eligible, or indeterminate cultural resources are expected from construction, O&M, or decommissioning activities associated with the WAPA Proposed Action.

3.3.2.2 Additional Measures to Avoid and/or Minimize Impacts

The implementation of the design elements and conservation measures described in Section 2.5.3.1 will minimize impacts to cultural resources during construction, O&M, and decommissioning of the WAPA Proposed Action. Therefore, no additional measures to avoid and/or minimize impacts are required.

3.3.2.3 Direct and Indirect Impacts of Sterling Solar 1 Proposed Project

The Sterling Solar 1 Proposed Project would involve the construction of new access roads, substation, O&M building, and PV solar arrays. The impacts of unauthorized collection and vandalism vary with distances from structures and access roads, but the types and visibility of sites also are important factors. AZ L:3:26(ASM), AZ L:3:80(ASM), AZ L:3:84(ASM), and AZ L:3:86(ASM) are recommended eligible for inclusion in the NRHP under Criterion D (information potential). These sites would not be directly impacted from any project-related ground-disturbing activities. A 50-foot buffer would be established around the perimeters of these site boundaries, and all project-related ground-disturbing construction activities should avoid these sites.

A formal determination of eligibility for AZ L:3:25(ASM) and AZ L:3:89(ASM) could not be made based on surface observations. An eligibility determination would be possible only following the implementation of an archaeological testing program. It is recommended that a 50-foot buffer be established around the perimeters of these site boundaries, and all project-related ground-disturbing construction activities should avoid these sites.

Ground disturbing activities associated with O&M and decommissioning activities associated with Sterling Solar 1 Proposed Project would be confined to areas in the permanent disturbance footprint created during construction. No impacts on NRHP-eligible cultural resources are expected from O&M or decommissioning activities.

3.3.2.4 Additional Measures to Avoid and/or Minimize Impacts

The implementation of the design elements and conservation measures described in Section 2.5.3.1 will minimize impacts to cultural resources during construction, O&M, and decommissioning of the Sterling Solar 1 Proposed Project. Therefore, no additional measures to avoid and/or minimize impacts are required.

3.3.2.5 Cumulative Impacts of the WAPA Proposed Action and Sterling Solar 1 Proposed Project

Only a portion of the approximately 850 square miles within the cultural resources CESA has been surveyed for cultural resources. In addition to the identified reasonably foreseeable projects that could contribute impacts to cultural resources, other developments such as community development and other renewable energy development may also affect cultural resources in the vicinity. Although the extent of these disturbances is not readily quantifiable, much of the CESA remains undeveloped, and thousands of cultural resources probably remain intact but have yet to be discovered and recorded. The majority of the identified reasonably foreseeable future projects and actions are Federal, and thus the development of projects in the area has provided or could provide occasions to conduct studies that would likely not occur otherwise. Potential impacts to public land managed by Federal and State

agencies would be considered for projects proposed in the future, and measures to avoid, reduce, or mitigate impacts on important cultural resources are likely to be implemented.

The WAPA Proposed Action and Sterling Solar 1 Proposed Project could potentially affect previously unidentified cultural resources during ground disturbing activities. If disturbance to any unidentified cultural resource is unavoidable, recovery and preservation of artifacts and information and other potential mitigation measures would be implemented in accordance with Section 106 consultation. The WAPA Proposed Action and Sterling Solar 1 Proposed Project, in combination with other highly probable reasonably foreseeable projects could result in cumulative indirect impacts to cultural resources. Cumulative impacts resulting from most types of development projects are likely to be long-term because those facilities probably would be present for decades. The construction, O&M, and decommissioning of WAPA Proposed Action and Sterling Solar 1 Proposed Project would have a negligible contribution to cumulative effects to cultural resources.

3.3.2.6 Direct, Indirect, and Cumulative Impacts of the No Action Alternative

Under the No Action Alternative, the Sterling Solar 1 project would not be constructed, and no impacts on cultural resources within the Sterling Solar 1 APE would occur. There would be no contribution to cumulative impacts to cultural resources because the No Action Alternative would not result in any impacts. As such, the No Action Alternative is not analyzed for cumulative impacts to cultural resources.

3.4 General Wildlife and Special Status Wildlife Species

This section discusses effects on general wildlife and special status species that may occur with the implementation of the WAPA Proposed Action, Sterling Solar 1 Proposed Project, and the No Action Alternative. The term special status species as used in this EA includes BLM sensitive species, State-listed species of greatest conservation need (SGCN), USFWS's Birds of Conservation Concern, and species protected under the Bald and Golden Eagle Protection Act of 1940 (BGEPA). A description of special status designations is given in Appendix B.

3.4.1 Affected Environment

The project area is located within the northeastern limit of the Mojave Basin and Range ecoregion (EPA 2013), which is characterized by hot, dry summers and cold, wet winters with the majority of the 4–9 inches of annual precipitation being received in the form of winter rainfall. The sparse and low-growing vegetation in the project area is characteristic of the Mohave Desertscrub biotic community (Turner 1994) (Figure 3-3). Vegetation in the project area consists of a combination of shrub-dominated upland vegetation and xeroriparian vegetation in ephemeral washes. Upland vegetation in the project area is dominated by creosotebush (*Larrea tridentata*), and white bursage (*Ambrosia dumosa*) with other occasional shrubs such as Mormon tea (*Ephedra aspera*), Spanish needles (*Palafoxia linearis*), and littleleaf ratany (*Krameria erecta*). Ephemeral washes support a mixture of shrubs such as cheeseweed (*Hymenoclea salsola*), catclaw (*Senegalia greggii*), desert lavender (*Hyptis emoryi*), and desert milkweed (*Asclepias subulata*) and trees such as smoketree (*Psoralea argemone*) and blue paloverde (*Parkinsonia florida*). Occasional forbs such as sand blazing star (*Mentzelia involucrata*), climbing milkweed (*Sarcostemma cynanchoides*), and desert trumpet (*Eriogonum inflatum*) are found throughout

the project site. Non-native species such as Sahara mustard (*Brassica tournefortii*) and Mediterranean grass (*Schismus* spp.) were frequently observed in disturbed areas and amongst native vegetation communities.

Relatively few wildlife species were observed in the project area during field reconnaissance survey in May 2019 by Logan Simpson. During the field survey, additional attention was paid to the presence and/or signs of Sonoran desert tortoise (*Gopherus agassizii*), which has previously been documented in the surrounding area. Some of the species that were directly observed included desert iguana (*Dipsosaurus dorsalis*), red tailed hawk (*Buteo jamaicensis*), Harris' antelope squirrel (*Ammospermophilus harrissii*), desert horned lizard (*Phrynosoma platyrhinos*), and black-tailed gnatcatcher (*Poliophtila melanura*). Indirectly observed animals (i.e., signs such as burrows, nests, scat, or tracks) included white-throated woodrat (*Neotoma albigula*) middens and coyote (*Canis latrans*) tracks. No Sonoran desert tortoises were directly observed during the 2019 reconnaissance survey, but numerous burrows of suitable size for desert tortoise were observed in caliche-lined ephemeral washes. Sonoran desert tortoise scat was found adjacent to several burrows indicating the presence of this species in the area.

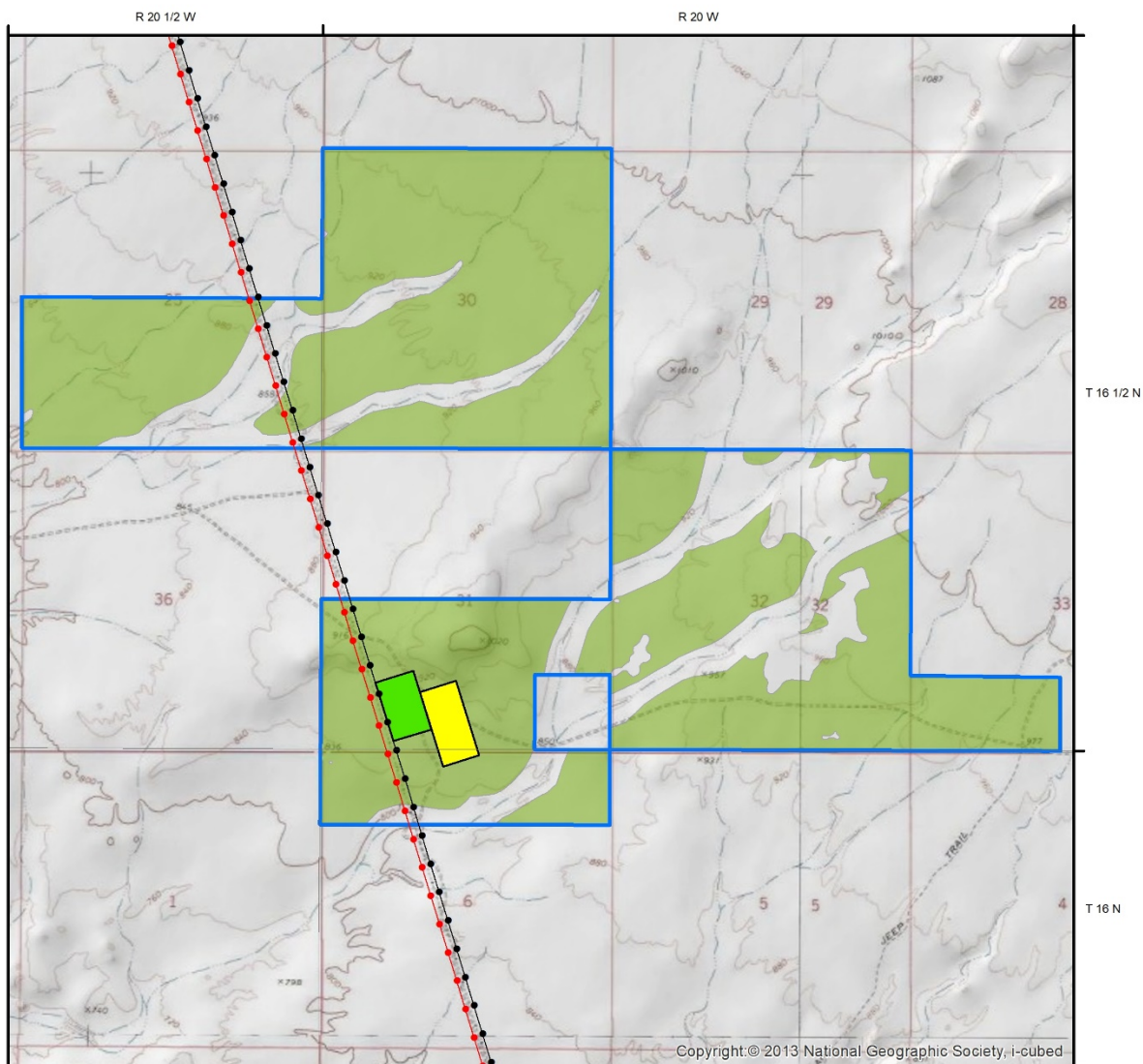
3.4.1.1 Terrestrial Species

No terrestrial species Federally listed as candidate, threatened, or endangered occur within the project area and no proposed or designated critical habitat exists within the project area (see Table B-1 in Appendix B). The Sonoran desert tortoise is not a listed species under the ESA; however, a Candidate Conservation Agreement (USFWS et al. 2015) provides a framework for management of this species in Arizona. The proposed project area is located within Category III tortoise habitat as defined by the BLM (1988). Category III is the lowest tier of Sonoran desert tortoise habitat; the recommended management strategy is to “limit tortoise habitat and population decline to the extent possible by mitigating impacts” (BLM 1988). Other terrestrial species with special status designations that have the potential to occur in the proposed project area are listed in Table 3-3.

Table 3-3. Sensitive Species – Terrestrial Wildlife

Common Name <i>Scientific Name</i>	Habitat Association	Status
Gila monster (<i>Heloderma suspectum</i>)	Undulating rocky foothills and canyons, less frequent in desert grasslands.	SGCN
Harris' antelope squirrel (<i>Ammospermophilus harrissii</i>)	Deserts with cacti and shrubs; open plains with gravel and sand.	SGCN
Kit fox (<i>Vulpes macrotis</i>)	Arid open areas, shrub grassland, and desert dominated by creosote, bursage, or saltscrub.	SGCN
Little pocket mouse (<i>Perognathus longimembris</i>)	Desertscrub on sandy or gravelly soils with sparse vegetation, also dry grassland and coastal sage.	SGCN
Sonoran desert tortoise (<i>Gopherus morafkai</i>)	Rocky slopes and bajadas of Mojave and Sonoran desertscrub.	BLM S, CCA, SGCN

Table Abbreviations: BLM S = BLM sensitive species; CCA=Candidate Conservation Agreement; SGCN = Arizona species of greatest conservation need.



Sterling Solar 1
Vegetation

Legend

- Sterling Solar 1 Project Area
- Mohave Desertscrub
- Sterling Solar Substation
- WAPA Switchyard
- Bureau of Reclamation Transmission Line
- Western Area Power Administration Transmission Line

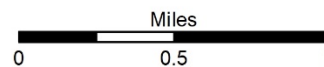


Figure 3-3. Sterling Solar 1 Vegetation Cover

3.4.1.2 Avian and Bat Species

No avian or bat species Federally listed as candidate, threatened, or endangered occur within the project area and no proposed or designated critical habitat exists within the project area (see Table B-1 in Appendix B). Other avian species and bats with special status designations that have the potential to occur in the proposed project area are listed in Table 3-4. Based on the results of the surveys completed for the project, potential project related risks associated with construction, O&M, and decommissioning would include collision with overhead electric lines and other features, electrocution, loss of foraging habitat, nest site disturbance, and disturbance due to ongoing human presence at the facility.

Table 3-4. Sensitive Species – Avian and Bat Species

Common Name <i>Scientific Name</i>	Habitat Association	Status
American peregrine falcon (<i>Falco peregrinus anatum</i>)	Steep, sheer cliffs overlooking woodlands, riparian areas, or other open expanses.	BCC, BLM S, USFS SS, SGCN
Bendire's thrasher (<i>Toxostoma bendirei</i>)	Dry, semi-open habitats with some understory of grass in Sonoran desert.	BCC
Brazilian free-tailed bat (<i>Tadarida brasillensis</i>)	Variety of habitats, from desert communities through pinyon-juniper woodlands.	SGCN
California leaf-nosed bat (<i>Macrotus californicus</i>)	Sonoran and Mojave desertscrub habitats in the lower Colorado River valley.	BLM S, SGCN
Cave myotis (<i>Myotis velifer</i>)	Xeric desertscrub of creosote, brittlebush, paloverde, and cacti near water sources.	BLM S, SGCN
Costa's hummingbird (<i>Calypte costae</i>)	Deserts, washes, sage scrub; dry, open habitats with diverse plant life.	BCC, SGCN
Greater western bonneted-bat (<i>Eumops perotis californicus</i>)	Sonoran desertscrub near cliffs or rocky canyons with abundant crevices.	BLM S, SGCN
LeConte's thrasher (<i>Toxostoma lecontei</i>)	Desert flats with sparse growth of saltbush or creosote with larger mesquite and cactus.	BCC, BLM S, SGCN
Loggerhead shrike (<i>Lanius ludovicianus</i>)	Open country with scattered trees and shrubs, savannas, and desertscrub.	BCC
Pale Townsend's big-eared bat (<i>Corynorhinus townsendii pallescens</i>)	Mesic forested habitats, wooded canyons, and arid scrub.	BLM S, USFS SS, SGCN
Sage thrasher (<i>Oreoscoptes montanus</i>)	Sagebrush, brushy slopes, mesas; in winter, also deserts.	SGCN
Spotted bat (<i>Euderma maculatum</i>)	Low to high desert, riparian areas, and ponderosa or spruce-fir forests.	BLM S, SGCN
Western burrowing owl (<i>Athene cunicularia hypaugaea</i>)	Open, gently sloping, treeless areas within sparsely vegetated grassland, steppe, and desert.	BCC, BLM S, USFS SS, SGCN
Yuma myotis (<i>Myotis yumanensis</i>)	Variety of lowland and upland habitats, including riparian, desertscrub, moist woodlands, and forests.	BLM S, SGCN

Table Abbreviations: BCC = Bird of Conservation Concern, BLM S = BLM sensitive species; SGCN = Arizona species of greatest conservation need; USFS SS = USFS sensitive species.

3.4.2 Environmental Consequences

3.4.2.1 *Direct and Indirect Impacts of the WAPA Proposed Action*

Under WAPA's Proposed Action, construction of a new switchyard, the addition of four new three-pole structures, and the installation of the overhead fiber optic grounding wire would cause approximately 50.6 acres of ground disturbance, with 18.5 acres being permanent disturbance. Activities associated with O&M would be infrequent and may cause ground disturbance or vegetation removal.

Decommissioning would be confined to areas already disturbed during construction and would not lead to any additional ground disturbance. WAPA would reclaim temporary disturbance areas by regrading so that surfaces drain naturally, blend with the natural terrain, and are left in a condition that would facilitate natural revegetation. A detailed description of the WAPA facilities and all construction, O&M, and decommissioning activities is provided in Section 2.5.1.

Terrestrial Species

Ground-disturbing activities associated with construction are potential sources of direct mortality and injury to terrestrial wildlife. Impacts from equipment and vehicles can occur for slower moving species and species that have subsurface burrows (including desert tortoise). Mammals (including kit fox) and reptiles are susceptible to visual and noise disturbances caused by the presence of humans and construction equipment and the generation of dust. Loss of burrows due to construction, ground vibration, or avoidance behavior would cause wildlife to search for and/or dig new burrows. Increased noise as a result of construction could result in wildlife temporarily avoiding the general area surrounding the proposed project. If trash is left out, species such as kit fox and common raven could be attracted to the area. Ravens and other predators may be attracted to elevated structures associated with the proposed project such as perimeter fencing, gen-tie line poles, and the switchyard structures. Such disturbances could cause wildlife to alter foraging and breeding behavior and avoid suitable habitat.

Terrestrial wildlife occurring in and around the project area would also be indirectly impacted. The removal and/or modification of natural vegetation communities would reduce forage, shelter, and nesting opportunities to wildlife including multiple special status wildlife species. The long-term loss and/or degradation of approximately 18.5 acres of wildlife habitat could cause wildlife to rely more on habitat in surrounding areas.

Construction, O&M, and decommissioning of the WAPA Proposed Action could directly impact wildlife by causing wildlife to alter foraging and breeding behavior. For example, increased noise as a result of construction could result in wildlife temporarily avoiding the general area surrounding the proposed project. If trash is left out, species such as kit fox and common raven could be attracted to the area. Ravens and other predators may be attracted to elevated structures associated with the proposed project such as perimeter fencing, gen-tie line poles, and the switchyard structures. Measures would be taken to minimize the availability of perches of predators in the project area (refer to Section 2.5.3.1). The vegetation within the WAPA Proposed Action is common to the region and the area does not contain any sensitive, unique, or notable areas of ecological importance to terrestrial species.

Ground-disturbing activities during construction, O&M, and decommissioning could increase the spread of noxious/invasive weeds, which could potentially out-compete existing annual vegetation and therefore, could indirectly and adversely affect the quality of terrestrial wildlife habitat and forage. Compliance with weed control regulations and implementation of construction standards would reduce the potential spread of noxious/invasive weeds.

During construction and decommissioning, hazardous waste (solid and liquid) could be generated at the site. Exposure to hazardous waste could be a direct source of wildlife mortality and/or injury through the poisoning of individuals. Spills of hazardous material could also indirectly adversely impact wildlife if the spill of the hazardous material results in the loss of natural vegetation community. The containment and disposal of hazardous waste as outlined in a Spill Prevention and Emergency Response Plan developed by the construction contractor for the project would reduce the likelihood that substantial spills would adversely affect wildlife species or habitat.

In summary, there would be negligible localized, short- and long-term, direct and indirect, adverse impacts to general and special status terrestrial species due to the construction, O&M, and decommissioning of the WAPA Proposed Action. There would be a temporary loss of approximately 50.6 acres and permanent loss of approximately 18.5 acres of wildlife habitat as a result of the development of the project. The loss of wildlife habitat would result in the potential localized loss of shelter, nesting habitat, and forage for general and special status terrestrial species from the WAPA Proposed Action.

Avian and Bat Species

The project site is not located in a sensitive, unique, or notable areas of ecological importance to avian or bat species. Vulnerability to collision with overhead transmission lines depends on many factors including flight behavior and maneuverability, topography, weather, and power line design and placement. Bird collision with power lines has been documented for decades and risk of collision is considered highest in areas where birds congregate, such as power lines that bisect daily flight paths to meadows, wetlands, and river valleys (APLIC 2012). Transmission lines are the project components that present the greatest risk of collision. Given that the project area is currently populated with two transmission lines, and that the WAPA Proposed Action would only shift the alignment of a small stretch of the existing lines, it is unlikely to increase in-air collisions. The existing lines have been in place for many years and foraging flight patterns have most likely adapted to the vast size of the utility infrastructure. To further reduce the risk of avian collisions, line marking devices would be installed, as needed, on the transmission lines to make the wires more visible to flying birds (APLIC 2012; refer to Section 2.5.3.1).

Power lines are present in many avian habitats and may result in the electrocution of raptors and other bird species (APLIC 2006; Lehman et al. 2010; and references therein). The potential for electrocutions depends on the arrangement and spacing of energized and grounded components of poles and towers that are sometimes used for perching, nesting, and other activities (APLIC 2006). However, nearly all electrocutions occur on smaller, more tightly spaced residential and commercial electrical distribution lines that are less than 69 kv (APLIC 2006). To protect avian species from electrocution, APLIC (2006)

established guidelines for electric line design. Incorporating appropriate measures into the transmission line interconnection would minimize electrocution risk (refer to Section 2.5.3.1).

There is the potential for bird and bat species to use the project area for foraging and for nesting for some bird species. Ground-disturbing activities associated with construction and decommissioning are potential sources of direct mortality and injury to ground-nesting birds, particularly the western burrowing owl. Vehicles and equipment can also impact any subsurface burrows. Loss of burrows due to construction, ground vibration, or avoidance behavior would cause owls or other ground-nesting birds to search for new burrows. Other birds would be susceptible to noise disturbance, potentially resulting in alteration of foraging and/or nesting behaviors.

There is potential for nest disturbance of birds during the construction and decommissioning phase of the project due to noise, removal of vegetation, and leveling the ground. However, the WAPA Proposed Action would occupy a very small area (approximately 18.5 acres) and the vegetation is common to the region. Impacts to vegetation and presence of humans and machinery would deter most birds from the interconnection area. However, most bird and bat species would return to the area after construction if substantial habitat and foraging opportunities exist.

An estimated 18.5 acres considered suitable foraging habitat for bat species discussed in this section would be permanently affected by the proposed project. Construction, O&M, and decommissioning activities would not occur at night so impacts to bat nocturnal foraging would be negligible. The proposed project permanent impact of 18.5 acres of this habitat is negligible (less than 0.3 percent, assuming a 10-mile foraging area) in comparison to available habitat within the area. No bat roosting habitat currently exists for bat species within or near the project area, and the area encompassed by the WAPA Proposed Action would provide limited bat foraging habitat.

Additional light sources during the operation of the switchyard could result in concentrated foraging locations of avian and bat species that feed on insects nocturnally since the artificial lighting could attract insects. Artificial lighting also has the potential to adversely affect migration patterns of birds and bats that move through the area.

In summary, there would be negligible, localized, short- and long-term, direct and indirect, adverse impacts to general and special status avian and bat species due to the WAPA Proposed Action. The foraging and nesting impacts from the WAPA Proposed Action would result in general and special status avian and bat species having to rely more on habitat outside of the project's 18.5-acre footprint until the area has been restored.

3.4.2.2 Additional Measures to Avoid and/or Minimize Impacts

The implementation of the design elements and conservation measures described in Section 2.5.3.1 will minimize impacts to general wildlife and special status wildlife species during construction, O&M, and decommissioning of the WAPA Proposed Action. Therefore, no additional measures to avoid and/or minimize impacts are required.

3.4.2.3 Direct and Indirect Impacts of the Sterling Solar 1 Proposed Project

The Sterling Solar 1 Proposed Project would involve the construction of new access roads, substation, O&M building, and PV solar arrays. This Proposed Project would result in a total of approximately 1,651 acres of disturbance, of which approximately 1,641 acres would be permanent disturbance. To prepare the site for construction, the land would be cleared and graded. The Mohave Desertscrub vegetation, primarily shrubs and grasses, would be removed (Figure 3-3). Site grading would only occur as needed to accommodate the laydown of materials at the staging area, solar panel and underground collection line installation, and construction of the access roads and the substation.

A detailed description of the Sterling Solar 1 facilities and all construction, O&M, and decommissioning activities is provided in Section 2.5.2.

Terrestrial Species

Ground-disturbing activities associated with construction are potential sources of direct mortality and injury to terrestrial wildlife. Impacts from equipment and vehicles can occur for slow-moving species and species that have subsurface burrows (including desert tortoise). Mammals (including kit fox) and reptiles are susceptible to visual and noise disturbances caused by the presence of humans and construction equipment and the generation of dust. Such disturbances could cause wildlife to alter foraging and breeding behavior and avoid suitable habitat.

Terrestrial wildlife occurring in and around the project area would also be indirectly impacted. The removal and/or modification of natural vegetation communities would reduce forage, shelter, and nesting opportunities to wildlife including multiple special status wildlife species. The solar site would be disturbed to prepare it for construction and decommissioning of the solar field. Sterling Solar 1 would minimize land disturbance (including crossings) in natural drainage systems.

The long-term loss and/or degradation of approximately 1,641 acres of wildlife habitat could cause wildlife to rely more on habitat in surrounding areas. Construction, O&M, and decommissioning of the Sterling Solar 1 facility could directly and adversely impact wildlife by causing wildlife to alter foraging and breeding behavior. Measures would be taken to minimize the availability of perches of predators in the project area (refer to Section 2.5.3.1).

Additionally, removal of resources would add pressure on the food resources in adjacent areas. Ground-disturbing activities during construction, O&M, and decommissioning could increase the spread of noxious/invasive weeds, which could potentially out-compete existing annual vegetation. Compliance with weed control regulations and implementation of construction standards would reduce impacts from nonnative plants.

During construction, hazardous waste (solid and liquid) could be generated at the site. Exposure to hazardous waste could be a direct source of wildlife mortality and/or injury through the poisoning of individuals. Spills of hazardous material could also indirectly adversely impact wildlife if the spill of the hazardous material results in the loss of natural vegetation community. The containment and disposal of hazardous waste as outlined in a Spill Prevention and Emergency Response Plan developed by the construction contractor for the project would reduce the likelihood that substantial spills would adversely affect wildlife.

In summary, there would be minor, localized, short- and long-term, direct and indirect, adverse impacts to general and special status terrestrial species due to the construction, O&M, and decommissioning of the Sterling Solar 1 facilities. There would be a temporary loss of approximately 1,651 acres and permanent loss of about 1,641 acres of wildlife habitat as a result of the development of the project. The loss of wildlife habitat would result in a loss of shelter, nesting habitat, and forage for wildlife species and would result in general and special status terrestrial species having to rely on habitat outside of the project footprint until restoration has been completed.

Avian and Bat Species

Ground-disturbing activities associated with construction are potential sources of direct mortality and injury to ground-nesting birds, particularly the western burrowing owl; vehicles and equipment can also impact the owl's subsurface burrows. Loss of burrows due to construction, ground vibration, or avoidance behavior would cause owls to search for new burrows.

Vulnerability to collision depends on many factors including flight behavior and maneuverability, topography, weather, and power line design and placement. Bird collision with power lines has been documented for decades and risk of collision is considered highest in areas where birds congregate, such as power lines that bisect daily flight paths to meadows, wetlands, and river valleys (APLIC 2012). Transmission lines are the project components that present the greatest risk of collision. Given that the project area is currently populated with two transmission lines, and that the Sterling Solar 1 Proposed Project would add a single, short stretch of overhead line, it is unlikely to increase in-air collisions. The existing lines have been in place for many years and foraging flight patterns have most likely adapted to the vast size of the utility infrastructure. To further reduce the risk of avian collisions, line marking devices would be installed, as needed, on the overhead line to make the wires more visible to flying birds (APLIC 2012; refer to Section 2.5.3.1).

Power lines are present in many wildlife habitats and may result in the electrocution of raptors and other bird species (APLIC 2006; Lehman et al. 2010; and references therein). The potential for electrocutions depends on the arrangement and spacing of energized and grounded components of poles and towers that are sometimes used for perching, nesting, and other activities (APLIC 2006). However, nearly all electrocutions occur on smaller, more tightly spaced residential and commercial electrical distribution lines that are less than 69 kv (APLIC 2006). To protect avian species from electrocution, APLIC (2006) established guidelines for electric line design. Incorporating appropriate design standards into the aerial connector line will minimize electrocution risk.

There is the potential for bird and bat species to use the project area for foraging and some bird species for nesting. Birds would be susceptible to noise disturbance as described above, potentially resulting in alteration of foraging and/or nesting behaviors. There is potential for nest disturbance of migratory birds during the construction and decommissioning phase of the project due to noise, removal of vegetation, and leveling the ground. Short-term impacts could result to birds from the Sterling Solar 1 Proposed Project Impacts to vegetation and presence of humans and machinery would deter most birds from within the facility. Noise impacts to wildlife would be focused upon species immediately adjacent to the facility. Given the location of the facility, it is assumed that only short-term impacts would occur from noise and vibration during the construction, and decommissioning phases of Sterling Solar 1. Most

bird species would return to the area after construction if substantial habitat and foraging opportunities exist.

An estimated 1,641 acres considered suitable foraging habitat for avian and bat species discussed in this section would be permanently affected by the proposed project. Loss of foraging habitat could impact foraging behaviors of these avian and bat species. The proposed project permanent impact of 1,641 acres of this habitat is small (less than 26 percent assuming 10-mile foraging area) in comparison to available habitat within the area. The project area currently supports suitable nesting and foraging habitat for some avian species, and foraging habitat for some bats. These species could potentially be adversely affected during construction and operation activities.

Bat roosts or nursery colonies can occur in a variety of natural substrates or manmade structures that provide specific thermal properties and protection from predators. Typically, these are large, stable structures, uninhabited or with minimal use by humans, such as buildings, barns, bridges, caves, mines, and trees. Likewise, aquatic features that produce insects can be an important resource for foraging bats. No bat roosting habitat currently exists for sensitive bat species within or near the proposed project site, but the site potentially provides bat foraging habitat. Because bats do not forage during daylight hours the potential for project-related construction or operations impacts on bats would be limited.

Direct habitat loss would occur from the project, and habitat fragmentation may reduce the functionality of this area for birds and bats. An abundance of similar lands is available in the vicinity to provide habitat for any individuals displaced from the project site. In addition, this project site is not located in a sensitive, unique, or notable area of ecological importance to bird or bat species. The impacts from Sterling Solar 1 are likely to be minor and have no substantial population level effects on any bird or bat species in the area.

Additional light sources during the operation of the substation could result in concentrated foraging locations of avian and bat species that feed on insects nocturnally since the artificial lighting could attract insects. Artificial lighting also has the potential to adversely affect migration patterns of migratory birds and bats that move through the area.

Noise and activity disturbance would occur as a result of the O&M activities from Sterling Solar 1 described in Section 2.5.2.2. The impacts would be minor and intermittent in nature and are expected to have little or no added impacts to birds or bats in the area.

In summary, there would be negligible to minor, localized, short- and long-term, direct and indirect, adverse impacts to general and special status avian and bat species due to the construction, O&M, and decommissioning of the Sterling Solar 1 Proposed Project. The Sterling Solar 1 Proposed Project would result in the temporary loss of 1,651 acres of habitat and permanent loss of approximately 1,641 acres of habitat. Disturbance from human activity and the loss of wildlife habitat would result in a loss of shelter, nesting habitat, and forage for general and special status avian and bat species and would result in wildlife having to rely more on habitat outside of the project footprint.

3.4.2.4 Additional Measures to Avoid and/or Minimize Impacts

The implementation of the design elements and conservation measures described in Section 2.5.3.1 would minimize impacts to general wildlife and special status wildlife species during construction, O&M, and decommissioning of the WAPA Proposed Action and Sterling Solar 1 Proposed Project. Therefore, no additional measures to avoid and/or minimize impacts are required.

3.4.2.5 Cumulative Impacts of the WAPA Proposed Action and Sterling Solar 1 Proposed Project

The types of projects or actions within the 3-mile CESA that could contribute to impacts to special wildlife species and general wildlife include community development, OHV use, prescribed burns, and vegetation management in addition to the identified reasonably foreseeable future actions. Livestock grazing, as well as wildlife movement, may spread invasive plants and alter the cover and composition of plant communities used by wildlife. Community development and infrastructure development would potentially consume useable habitat and fragment large blocks of habitats into smaller isolated ones. Approximately 33 percent of the lands within the 3-mile CESA are Federally managed. In combination, past, present, and reasonably foreseeable future actions would result in long-term, direct and indirect, minor impacts to special status species because a third of the CESA would have measures implemented by the BLM to minimize potential effects to these special status species and their respective habitats.

In the long-term, both the WAPA Proposed Action and Sterling Solar 1 Proposed Project would have adverse, localized, direct and indirect, minor effects to sensitive wildlife species and to general wildlife and their habitats. These long-term effects would be reduced gradually over time as natural reclamation of plant composition and cover occurs following construction and decommissioning activities. Cumulatively, the effects of the WAPA Proposed Action and Sterling Solar 1 Proposed Project, when combined with past, present, and reasonably foreseeable future actions, would result in minor to moderate cumulative impacts to wildlife within the 3-mile CESA due to the potential for further habitat loss, degradation, and fragmentation. The WAPA Proposed Action and Sterling Solar 1 Proposed Project would have a minor contribution to the cumulative effect on special wildlife species and general wildlife.

3.4.2.6 Direct, Indirect, and Cumulative Impacts of the No Action Alternative

Under the No Action Alternative, the Sterling Solar 1 project would not be constructed, and no impacts on special status species within the Sterling Solar 1 APE would occur. There would be no contribution to cumulative impacts to sensitive wildlife species and general wildlife because the No Action Alternative would not result in any impacts. As such, the No Action Alternative is not analyzed for cumulative impacts to sensitive wildlife species and general wildlife.

3.5 Visual Resources

The term “visual resources” refers to the composite of basic terrain, geologic, and hydrologic features; vegetative patterns; and built features that influence the visual appeal of a landscape. Visual impacts are defined as the change to the visual environment resulting from the introduction of modifications to the landscape. This section describes the existing context of the visual environment and assesses the potential impacts from the WAPA Proposed Action, Sterling Solar 1 Proposed Project, and the No Action

Alternative within the visual resource impact analysis area, including impacts to residential areas near the project area and impacts to views from I-40. The analysis area for direct and indirect impacts is a five-mile radius around the project area, which is roughly the distance from which a casual observer could distinguish the elements of the PV solar array, ancillary facilities, and interconnection.

3.5.1 Affected Environment

The visual resource impact analysis area lies within the Basin and Range physiographic province and is characterized by steep, narrow, isolated mountain ranges—generally on a north-south axis—separated by wide, flat, sediment-filled valleys or basins (EPA 2013). It is located on the gently sloping terrain of the Lower Colorado River Valley on the edge of the Mojave Desert and the Sonoran Desert where the ground consists primarily of tan, khaki, and grey sand and gravel incised by drainages of various sizes that have eroded and shaped the area over time. The vegetation is made up predominantly of mid-height, olive-green creosotebush, which is intermixed with low, yellow grasses and shrubs (white bursage), and scattered tall, bright green blue paloverde trees.

The notable natural features within the analysis area includes two mountain ranges—the Black Mountains to the north/northeast and the Mohave Mountains to the south/southeast—and Topock Marsh to the west of the project area. Both mountain ranges are rugged with hard angular shapes and consist of dark greys and browns with some contrasting lighter tans and whites that add to the visual depth of the landforms. Topock Marsh consists of flat, sandy shores with green, vegetation-covered shorelines and a wide, blue, motionless waterway. The built environment of the analysis area is minimal and consists of the communities of Golden Shores and Topock to the west of the project area, the I-40 corridor to the south, the Burlington Northern Santa Fe (BNSF) Railroad to the south, and the existing Black Mesa-Topock and North Havasu-Topock 230 kv transmission lines that cross the project area.

The primary views of the project area are from the I-40 corridor and the residential areas of Golden Shores and Topock. I-40, which is a major interstate freeway connecting eight states and several large metropolitan areas, passes east-west through the Lower Colorado River Valley and the analysis area. Primary viewers are traveling by vehicle through the analysis area, visiting recreation areas, or are residents of the nearby communities. Residences, an elementary school, and various commercial developments are located along Oatman Highway, the main access to the communities of Golden Shores and Topock. The analysis area contains approximately 2,000 residences, primarily located in Golden Shores and Topock, west of the project area.

The existing landscape character and condition of the visual resource impact analysis area are identified in terms of general landforms, vegetation, built features, and land use by visual analysis units (VAUs). The VAU delineations are based on areas with common landform patterns and features, vegetation communities and patterns, built features, land use patterns, scarcity, and/or surface water resources in relation to the Basin and Range physiographic province. Four VAUs were delineated within the project area (Figure 3-4). VAU 1 (Photograph 3-1) is a flat and expansive unit composed of broken dark brown and black basalt rocks with scattered yellow grasses, olive green creosotebush, and bright green blue paloverde trees. VAU 2 (Photograph 3-2) consists of the main drainages within the project area and their associated floodplains where undulating hills made up of light tan and grey soils are incised by the sinuous drainage channels and include low, yellow grasses and shrubs, olive-green

creosotebush, and taller bright green blue paloverde trees. VAU 3 (Photograph 3-3) is made up of the wash areas above and between the drainages and floodplains of VAU 2, with more rolling hills composed of tan, grey, and brown rocky soils and linear drainages that flow into the main washes in the project area. The vegetation is predominantly the same as VAU 2. VAU 4 (Photograph 3-4) consists entirely of the larger, tan and khaki-colored, rolling sand-dune-like hills that are more sparsely vegetated than the other units and include the low yellow grasses and olive-green creosotebush. In general, the overall scenic quality of the project area has low scenic value because of the lack of variety and distinctiveness of the vegetation, landform, and adjacent scenery to the region. The existing cultural modifications present (transmission lines and towers and network of unpaved roads within the project area) are notable disturbances that attract attention away from the natural landscape.

Key sensitive viewing platforms (SVPs) were selected within and adjacent to the WAPA Proposed Action and Sterling Solar 1 Proposed Project (Figure 3-5) that represent viewing locations where the public would view the Sterling Solar 1 PV solar panel array, its substation, and the interconnection both from a stationary (e.g., residential area or scenic overlook) or a linear (e.g., highway or trail) location. The SVPs that were selected include the communities of Golden Shores and Topock and I-40. The Golden Shores and Topock stationary SVPs were selected due to the number of residences and potential views from residences in these communities. The platforms are located approximately 2.5 and 3.5 miles west of the PV solar array area and approximately 3.7 and 4.6 miles west from WAPA's proposed facilities, respectively. The I-40 linear SVP was selected due to the large amount of vehicular traffic associated with the freeway. The platform is located approximately 2.3 miles south of the PV solar array area and 2.7 miles south of WAPA's proposed facilities. For the I-40 linear platform, the entire length of the route within the visual resource impact analysis area was evaluated, not just a single viewing point location.

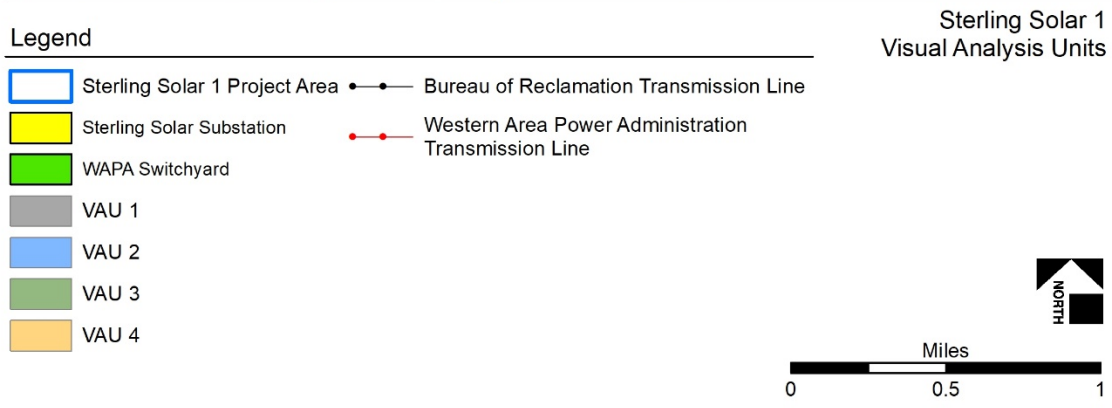
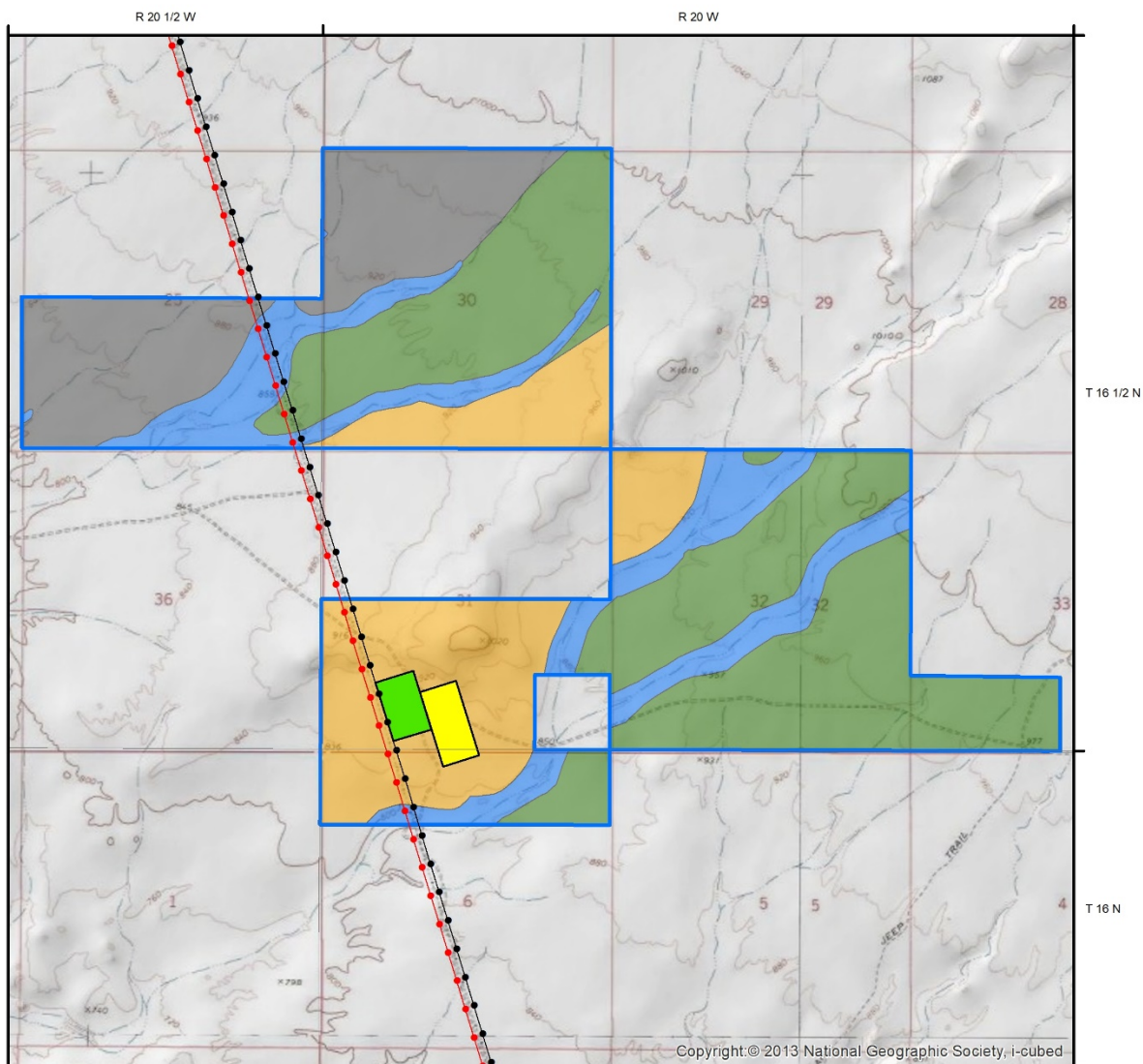


Figure 3-4. Sterling Solar 1 Visual Analysis Units



Photograph 3-1. VAU 1 Representative Landscape



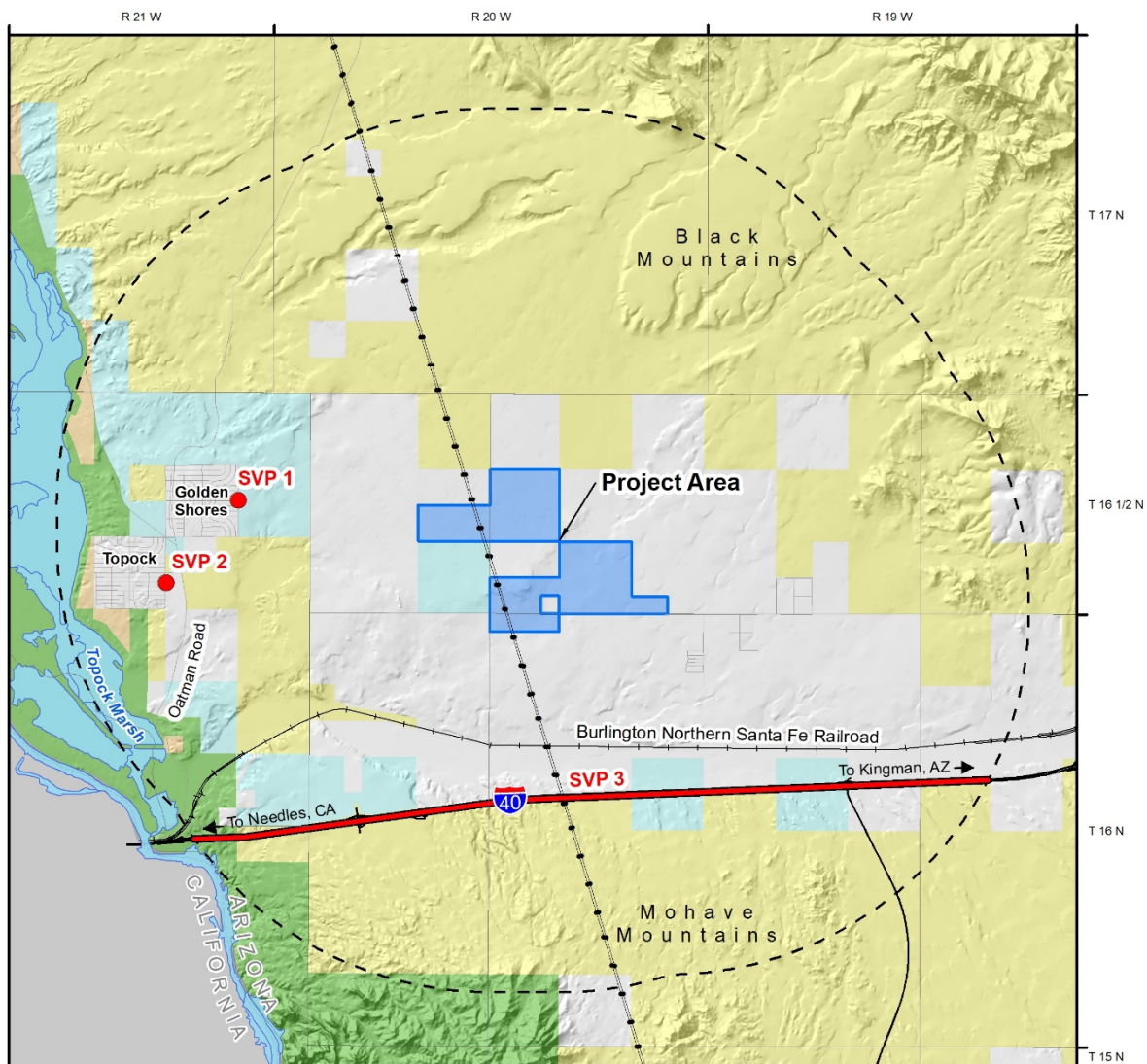
Photograph 3-2. VAU 2 Representative Landscape



Photograph 3-3. VAU 3 Representative Landscape



Photograph 3-4. VAU 4 Representative Landscape



Legend

- Stationary SVP
- Linear SVP
- Existing Transmission Line
- Sterling Solar 1 Project Area
- Visual Resource Analysis Area
- Private
- State Trust
- Bureau of Land Management
- Fort Mojave Indian Reservation
- Havasu National Wildlife Refuge

Sterling Solar 1 Sensitive Viewing Platforms

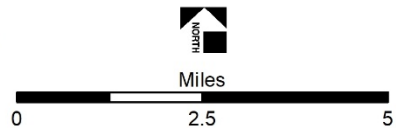


Figure 3-5. Sterling Solar 1 Sensitive Viewing Platforms

3.5.2 Environmental Consequences

An analysis of visual dominance, scale, and contrast was used to determine the degree that the WAPA Proposed Action and Sterling Solar 1 Proposed Project would attract attention and to assess the relative change in character as compared to the existing characteristic landscape and its inherent scenic quality. The amount of visual contrast created is directly related to the amount of attention that is drawn to a feature in the landscape. Changes in the viewsheds from sensitive viewing locations were also evaluated and characterized.

3.5.2.1 *Direct and Indirect Impacts of WAPA's Proposed Action*

Under WAPA's Proposed Action, construction, O&M, and decommissioning activities would take place in, and directly adjacent to, areas already disturbed by the existing Black Mesa-Topock and North Havasu-Topock 230 kv transmission lines. During construction, approximately 50.6 acres of ground disturbance would occur, with 18.5 acres being permanent disturbance. The existing visual character and scenic quality would be affected during construction by the generation of fugitive dust; movement of equipment and vehicles in and out of the WAPA Proposed Action area; and the presence of construction cranes, transmission line stringing, material stockpiles, and overhead fiber optic grounding wire installation pull sites and staging areas. The construction activities would introduce forms, lines, colors, and textures that would temporarily attract attention and create a noticeable contrast with the existing setting of the project area.

The addition of four new, galvanized steel three-pole structures in the transmission line ROW and a substation directly adjacent to the ROW would be a noticeable change in the landscape once complete. These approximately 100-foot-high solid structures would be predominant features in the landscape in terms of form and color in comparison to the existing wire frame transmission structures and the undulating landforms and low stature vegetation within the project area. The addition of 12 total galvanized steel poles constructed under the WAPA Proposed Action would create a moderate level of color and form contrast that would attract attention and notably alter the existing landscape when viewed by the casual observer. There would be no long-term impacts to visual resources from the installation of the overhead fiber optic grounding wire, as the new 48-strand cable would be replacing an existing static wire and would not represent a noticeable alteration to the visual features of the transmission line.

Activities associated with O&M would be infrequent and would not draw attention from SVPs. Decommissioning would be confined to areas already disturbed during construction and would not have any additional impacts. These activities would be visible from the Golden Shores, Topock, and I-40 SVPs and would attract some attention from the casual observer due to notable color and form contrast with the existing cultural modifications.

Effects on Views from Golden Shores and Topock SVPs

The four new three-pole structures would be visible from the foreground of Golden Shores and Topock SVPs, primarily along the eastern edges of the two communities (Photographs 3-5 and 3-6). The potential magnitude of impacts to the views from the SVPs would vary depending primarily on the distance from the project area, time of day, and the visibility conditions. Four three-pole structures associated with WAPA's Proposed Action would draw attention in the visible landscape from the Golden

Shores and Topock SVPs. The landscape from this viewpoint would appear to be visibly altered because of the four three-pole structures in scale, color, line, texture, and form, which would create a moderate level of contrast in the setting.

Effects on Views from I-40 SVP

Within the foreground distance zone of I-40, the four three-pole structures would be visible from the freeway. Eastbound and westbound motorists on I-40 would see the four three-pole structures from the freeway for the majority of the length and time on the linear SVP within the visual resource impact analysis area. The substation would also be visible from the I-40 SVP for a majority of the distance on I-40 within the visual resource impact analysis area.

The potential impacts associated with the decommissioning process would be similar to the construction-related effects for the WAPA Proposed Action. The scenic quality and landscape character of the project area would be affected by the generation of fugitive dust and movement of equipment and vehicles in and out of the project area. The decommissioning activities would introduce forms, lines, colors, and textures that would temporarily attract attention and contrast with the existing setting. In addition, the decommissioning activities would create a subtle degree of change in the characteristic landscape in views from the Golden Shores, Topock, and I-40 SVPs.

3.5.2.2 Summary

There would be approximately 50.6 acres of impacted landscape under the WAPA Proposed Action that would slightly reduce the overall scenic quality associated with cultural modification by the four galvanized steel three-pole structures. The magnitude of change in landscape character associated with the WAPA Proposed Action would be moderate due to the strong color and form contrast of the 100-foot galvanized solid steel poles in comparison to the undulating and rolling landforms, low stature vegetation, and wireframe transmission structures found in the existing landscape. The WAPA Proposed Action would be visible and may attract attention from I-40, Topock, and Golden Shores. Therefore, there would be short- and long-term, minor to moderate impacts on views from the three SVPs within five miles of the WAPA Proposed Action. There would be a minor to moderate change in the characteristic landscape and a minor to moderate change in the scenic quality of the project area from the construction, O&M, and decommissioning of the WAPA Proposed Action.

3.5.2.3 Additional Measure to Minimize Adverse Effects

The implementation of the design elements and conservation measures described in Section 2.5.3.1 would minimize impacts to visual resources during construction, O&M, and decommissioning of the WAPA Proposed Action. Therefore, no additional measures to avoid and/or minimize impacts are required.

3.5.2.4 Direct and Indirect Impacts of Sterling Solar 1's Proposed Project

Under Sterling Solar 1's Proposed Project, the existing visual character and scenic quality would be affected during construction by the generation of fugitive dust, movement of equipment and vehicles in and out of the Sterling Solar 1 Proposed Project area and stockpiling of materials. The construction activities would introduce forms, lines, colors, and textures that would temporarily attract attention and create strong contrast with the existing setting. Vegetation clearing and grading would expose lighter-

color soils and create a more uniform landform in the cleared and graded areas for the PV solar panel array, the substation, staging areas, underground electrical collection system trenches, and new access roads. The construction-related impacts would range from a minor to moderate degree of change in the characteristic landscape visible from the three SVPs (Golden Shores, Topock, and I-40) depending on the viewing distance, type of construction activity taking place, and time of day.

The magnitude of change to the landscape character and scenic quality of the Proposed Project area would introduce elements (i.e., PV solar panels) not currently common in the project area. The proposed substation, security fencing, and O&M building would appear to substantially alter the landscape and be visually prominent. The expansive magnitude of the PV solar panel array and the dark color of the panels would attract attention, create a detectable change in the landscape character, and result in a strong level of visual contrast within the project area. The access roads would be similar to existing features already present within the area and would most likely not attract attention.

Effects on Views from Golden Shores and Topock SVPs

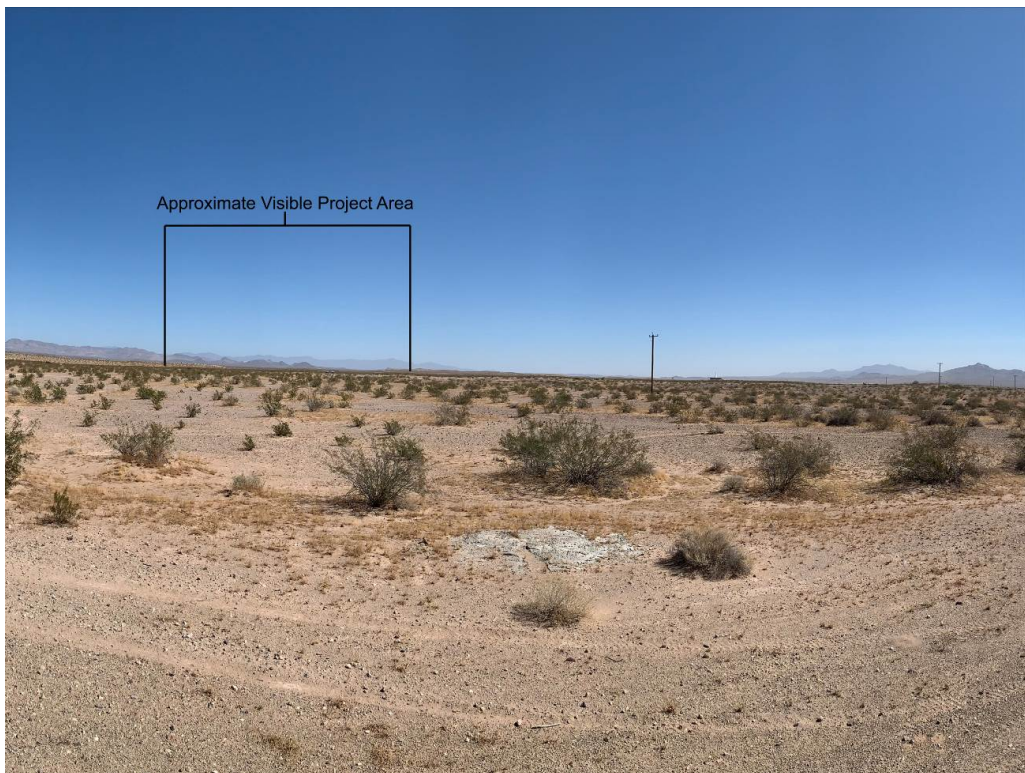
Portions of the PV solar panel array would be visible from the Golden Shores and Topock SVPs (Photographs 3-5 and 3-6), primarily along the eastern edges of the two communities. The potential magnitude of impacts to the views from the SVPs would vary depending primarily on the distance from the project area, time of day, and visibility conditions. From the Golden Shores SVP, 850 acres (52 percent) of the PV solar panel array would be visible in the foreground. From the Topock SVP, 469 acres (27 percent) of the PV solar panel array would be visible in the foreground. The substation would not be visible from either SVP. The PV solar panel array would draw attention in the visible landscape from the Golden Shores and Topock SVPs. The landscape from this viewpoint would appear to be notably altered because of the dominance of the PV solar panel array in scale, color, line, texture, and form, which would create moderate level of contrast in the setting.

Effects on Views from I-40 SVP

Within the foreground distance zone of I-40, a majority of the PV solar panel array would be visible from the freeway (Photograph 3-7). Eastbound motorists on I-40 would have views of the PV solar panel array for approximately 6.9 miles of the 11.0 miles (63 percent of the time) within the visual resource impact analysis area, or for 5.5 minutes driving at 75 MPH. Eastbound motorists on I-40 would have views of the substation for approximately 4.3 miles of the 9.9 miles (43 percent of the time) within the visual resource impact analysis area, or for 3.4 minutes driving at 75 MPH. Westbound motorists on I-40 would see the PV solar panel array from the freeway for approximately 5.1 miles of the 11.0 miles (46 percent of the time) within the visual resource impact analysis area, or for 4.1 minutes driving at 75 MPH. Westbound motorists on I-40 would see the substation from the freeway for approximately 2.5 miles of the 9.9 miles (25 percent of the time) within the visual resource impact analysis area, or for 2.0 minutes driving at 75 MPH.



Photograph 3-5. View from Golden Shores SVP Looking East



Photograph 3-6. View from Topock SVP Looking East



Photograph 3-7. View from I-40 SVP Looking North

The potential impacts associated with the decommissioning process would be similar to the construction-related effects for the Proposed Project. The scenic quality and landscape character of the project area would be affected by the generation of fugitive dust and movement of equipment and vehicles in and out of the project area. The decommissioning activities would introduce forms, lines, colors, and textures that would temporarily attract attention and notably contrast with the existing setting. In addition, the decommissioning activities would create a subtle degree of change in the characteristic landscape when viewed from the Golden Shores, Topock, and I-40 SVPs.

Glint and Glare

Glint and glare² may occur when direct, normal sunlight reflects off a surface and someone is exposed to it. Although a visible light study has not been conducted for the Sterling Solar I Proposed Project, the following conclusions are based on a literature review of glint and glare studies for solar power facilities and the Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (BLM and DOE 2012). Glint and glare from PV solar panels would depend on the type of panels, rotation axis and tilt angle, screening elements, and other factors. The intensity of the glare produced by reflective surfaces varies depending on the type of surface. Solar panel surfaces reflect direct, normal irradiance in a manner similar to water. Glare from solar panels, as with water, is most likely to occur after sunrise and before sunset and during the summer months.

Construction equipment could result in some glare, due to the glass windows or metallic parts, but would not be a source of substantial or distracting glare. No substantial source of glint or glare would be introduced during construction of the WAPA Proposed Action and Sterling Solar 1 Proposed Project.

²Glint is a momentary flash of light produced as a direct reflection of the sun in the surface of an object. Glare is a more continuous and sustained presence of light that may appear to “sparkle.”

The type of equipment used during decommissioning is expected to be similar to that used during the construction period. Effects from glint and glare would be similar to those during construction and would be localized and negligible.

A typical fixed panel PV plant has panels installed at approximately 20–35 degrees above horizontal and are permanently fixed in a southern facing skyward direction; therefore, no movement of the panels is possible. PV panel surfaces are designed specifically not to reflect light, thus reducing the potential for glint and glare (U.S. Air Force 2011). In addition, the PV panels would have a low profile, which would reduce visibility when viewed from level viewing positions.

The Sterling Solar 1 Proposed Project's solar panels have the potential to result in a glint and glare hazards. Sensitive viewers such as residents in Topock and Golden Shores and motorists traveling along I-40 could experience an after-image from glint and glare caused by the solar panels. The potential for residents and motorists to experience hazardous after-images from glint and glare is anticipated to be minor with anti-reflection coatings on the panels and because the experience would be intermittent or limited to certain times of the day. Viewers with superior views of the Sterling Solar 1 Proposed Project may be affected by glint and glare intermittently throughout the day, because larger portions of the solar arrays would be visible from an elevated position. In addition to viewer elevation, glint and glare experience is anticipated to decrease as distance between the proposed solar panels and the viewer increases. Studies indicate that luminance (light intensity) exponentially diminishes over distance (Sullivan et al. 2012).

The project area is not located within an airport sphere of influence or any restricted airspace or designated route. Public and private aircraft may cross the project area at high elevations. The likelihood of the Sterling Solar 1 Proposed Project causing an aviation hazard from glint and glare is very low due to the distance to the nearest airport and the reflectivity characteristics of PV solar panels.

Summary

There would be approximately 1,641 acres of impacted landscape under the Sterling Solar 1 Proposed Project that would reduce the overall scenic quality associated with cultural modification by the proposed solar facility and ancillary components. The magnitude of change in landscape character associated with the Sterling Solar 1 Proposed Project would be major due to the dominant and expansive scale of the PV solar panel array in comparison to the undulating and rolling landforms, low stature vegetation, and minimal built features found in the existing landscape. The Sterling Solar 1 Proposed Project would be visible and attract attention from I-40, Topock, and Golden Shores. Therefore, there would be short- and long-term, moderate, adverse impacts on views from the three SVPs within five miles of the Sterling Solar 1 Proposed Project. There would be a major change in the characteristic landscape and a moderate change in the scenic quality of the project area from the construction, O&M, and decommissioning of the Sterling Solar 1 Proposed Project.

3.5.2.5 Additional Measure to Minimize Adverse Effects

The implementation of the design elements and conservation measures described in Section 2.5.3.1 would minimize impacts to visual resources during construction, O&M, and decommissioning of the

Sterling Solar 1 Proposed Project. Therefore, no additional measures to avoid and/or minimize impacts are required.

3.5.2.6 Cumulative Impacts of the WAPA Proposed Action and Sterling Solar 1 Proposed Project

In addition to the identified reasonably foreseeable future actions, the types of projects or actions that could contribute to impacts to visual resources include overhead transmission lines, communication towers, wind energy facilities, and community development. These actions generally result in a transformation of the natural landscape to a more developed setting when viewed during both day and night conditions over the long-term. The reasonably foreseeable future actions that have been identified may contribute to overall cumulative impacts to visual resources, though at this time there is not sufficient documentation to evaluate the level of impact associated with these identified projects. In addition, wildland fire would also create a substantial change in the characteristic landscape for decades depending on the scale and intensity of the wildfire. The expansion of residential areas would expand the footprint of developed areas through the addition of structures, roads, and electrical distribution lines. The expanded developed area would be particularly evident during nighttime conditions, when lighting would extend for a substantial distance from the developed area. Impacts of the combined actions would be perceived as strongest where viewed from SVPs and traditional areas identified by Native American Tribes. The implementation of the respective visual management objectives for BLM lands within the visual resources CESA would help to implement measures to reduce impacts. In combination, past, present, and reasonably foreseeable future actions would result in long-term, direct and indirect, minor to moderate, impacts to visual resources that overall would reduce scenic quality and notably transform the characteristic landscape.

Cumulatively, effects of the WAPA Proposed Action and Sterling Solar 1 Proposed Project, when combined with past, present, and reasonably foreseeable future actions, would result in long-term, direct and indirect, minor to major, cumulative impacts to the visual resources within the visual resources CESA. The WAPA Proposed Action and Sterling Solar 1 Proposed Project would have a moderate contribution to the cumulative effects to visual resources because of the scale, strong contrast, and industrial characteristic of the solar facility in a sparsely populated and relatively undeveloped area. Visual resource impacts created by the solar facility would be largely reversible with decommissioning of the Sterling Solar 1 project at the end of its useful life and restoration of the landscape.

3.5.2.7 Direct, Indirect, and Cumulative Impacts of the No Action Alternative

Under the No Action Alternative, WAPA would not approve a large generator interconnection request or construct any project-related transmission system upgrades, and Sterling Solar 1 would not construct the PV solar panel array or any other ancillary facilities. Therefore, no new disturbance to the characteristic landscape would occur, and no new elements or patterns would be introduced to the project area. Therefore, there would be no impact on the casual viewer from stationary or linear SVPs.

There would be no contribution to cumulative impacts to visual resource because the No Action Alternative would not result in any impacts. As such, the No Action Alternative is not analyzed for cumulative impacts to visual resources.

4.0 COORDINATION AND CONSULTATION

For this project, WAPA and/or Sterling Solar 1 contacted the Federal, State, county, and Tribal agencies listed below.

4.1 Federal Agencies

- U.S. Army Corps of Engineers, Arizona Field Office
- U.S. Bureau of Land Management, Lake Havasu Field Office
- U.S. Bureau of Reclamation, Phoenix Area Office
- U.S. Department of Defense, Siting Clearinghouse
- U.S. Environmental Protection Agency, Region 9 Environmental Review Office
- U.S. Fish and Wildlife Service, Arizona Ecological Services

4.2 State Agencies

- Arizona Game and Fish Department
- Arizona Department of Environmental Quality
- Arizona State Parks, Arizona State Historic Preservation Office
- Arizona Corporation Commission / Arizona Power Plant and Transmission Line Siting Commission

4.3 County Government

- Mohave County

4.4 Tribal

WAPA is the lead Federal agency in the NHPA Section 106 process. The following section describes WAPA's Tribal consultation activities completed to date.

WAPA initiated Tribal consultation with the following Tribes in a letter dated March 13, 2018:

- Chemehuevi Indian Tribe
- Colorado River Indian Tribes
- Hopi Tribe
- Fort McDowell Yavapai Nation
- Fort Mojave Indian Tribe
- Fort Yuma-Quechan Tribe
- Pueblo of Zuni
- Salt River Pima-Maricopa Indian Community
- Yavapai-Apache Nation
- Yavapai-Prescott Indian Tribe

5.0 APPLICABLE LAWS, REGULATIONS, AND OTHER REQUIREMENTS

Federal, State, and local agencies have jurisdiction over certain aspects of the proposed interconnection and solar facility. Major Federal, State, and local agencies and their respective permit/authorizing responsibilities are summarized in Table 5-1.

Table 5-1. Permit/Authorizing Responsibilities

Permit/Authorization	Agency with Jurisdiction
Interconnection/Transmission Service Agreement	WAPA
NEPA	WAPA; BLM
BLM ROW Grant	BLM
Clean Air Act	WAPA
Easement Grants and Road Crossing Permits	Mohave County
Zoning Ordinances	Mohave County
NHPA	WAPA; SHPO
Native American Graves Protection and Repatriation Act	WAPA
American Indian Religious Freedom Act	WAPA
Construction Stormwater Permit	-
Pesticide General Permit	-
Clean Water Act Compliance	U.S. Army Corps of Engineers and Arizona Department of Environmental Quality
Safety Plan	-
Migratory Bird Treaty Act	USFWS; WAPA
Bald and Golden Eagle Protection Act	USFWS; WAPA
Endangered Species Act	USFWS; WAPA
Executive Order 13690 (Federal Flood Risk Management)	WAPA
Executive Order 119088 (Floodplain Management)	WAPA

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APPENDIX A: SONORAN DESERT TORTOISE HANDLING GUIDELINES

GUIDELINES FOR HANDLING SONORAN DESERT TORTOISES ENCOUNTERED ON DEVELOPMENT PROJECTS Arizona Game and Fish Department Revised October 23, 2007

The Arizona Game and Fish Department (Department) has developed the following guidelines to reduce potential impacts to desert tortoises, and to promote the continued existence of tortoises throughout the state. These guidelines apply to short-term and/or small-scale projects, depending on the number of affected tortoises and specific type of project.

The Sonoran population of desert tortoises occurs south and east of the Colorado River. Tortoises encountered in the open should be moved out of harm's way to adjacent appropriate habitat. If an occupied burrow is determined to be in jeopardy of destruction, the tortoise should be relocated to the nearest appropriate alternate burrow or other appropriate shelter, as determined by a qualified biologist. Tortoises should be moved less than 48 hours in advance of the habitat disturbance so they do not return to the area in the interim. Tortoises should be moved quickly, kept in an upright position parallel to the ground at all times, and placed in the shade. Separate disposable gloves should be worn for each tortoise handled to avoid potential transfer of disease between tortoises. Tortoises must not be moved if the ambient air temperature exceeds 40° Celsius (105° Fahrenheit) unless an alternate burrow is available or the tortoise is in imminent danger.

A tortoise may be moved up to one-half mile, but no further than necessary from its original location. If a release site, or alternate burrow, is unavailable within this distance, and ambient air temperature exceeds 40° Celsius (105° Fahrenheit), the Department should be contacted to place the tortoise into a Department-regulated desert tortoise adoption program. Tortoises salvaged from projects which result in substantial permanent habitat loss (e.g. housing and highway projects), or those requiring removal during long-term (longer than one week) construction projects, will also be placed in desert tortoise adoption programs. *Managers of projects likely to affect desert tortoises should obtain a scientific collecting permit from the Department to facilitate temporary possession of tortoises.* Likewise, if large numbers of tortoises (>5) are expected to be displaced by a project, the project manager should contact the Department for guidance and/or assistance.

Please keep in mind the following points:

- These guidelines do not apply to the Mojave population of desert tortoises (north and west of the Colorado River). Mojave desert tortoises are specifically protected under the Endangered Species Act, as administered by the U.S. Fish and Wildlife Service.
- These guidelines are subject to revision at the discretion of the Department. We recommend that the Department be contacted during the planning stages of any project that may affect desert tortoises.
- Take, possession, or harassment of wild desert tortoises is prohibited by state law. Unless specifically authorized by the Department, or as noted above, project personnel should avoid disturbing any tortoise.

APPENDIX B: SPECIAL STATUS SPECIES LIST AND SPECIAL STATUS DEFINITIONS

Table B-1. Special Status Species with the Potential to Occur in the Sterling Solar 1 Project Area

Common Name (<i>Scientific Name</i>)	Status*	Range/Habitat Requirements	Potential for Occurrence in Project Area	Season/Life History Information Relevant to Project Area
Birds				
Abert's towhee (<i>Melospiza aberti</i>)	USFS SS, SGCN	Typically found in dense brush near water in arid lowlands, as in streamside thickets, edges of ponds or irrigation ditches, and understory of cottonwood-willow groves. Rarely found even short distances from favored habitat. Year-round range includes the lower Colorado River valley.	Unlikely to present: SS1 area is within the year-round range for the species, but there is no suitable habitat within the project area. eBird (2019) indicates nearest species records from the town of Topock approximately 2 miles west of the SS1 area.	Year-round
American bittern (<i>Botaurus lentiginosus</i>)	SGCN	Marshlands and very wet meadows. Rarely seen away from dense reeds, rushes, cordgrass, cattails, and other emergent vegetation. Non-breeding range includes northeast Arizona and lower Colorado River marshes.	Unlikely to be present: SS1 area is within the breeding range for the species, but there is no suitable habitat in the project area. eBird (2019) indicates nearest species records from Havasu National Wildlife Refuge approximately 5 miles west of the SS1 area.	Breeding
American peregrine falcon (<i>Falco peregrinus anatum</i>)	BCC (BCR 33), BLM S, SGCN, USFS SS	Found near cliffs that support sufficient abundance of prey. Optimum habitat is generally considered to be steep, sheer cliffs overlooking woodlands, riparian areas, or other habitats supporting avian prey species in abundance. The presence of an open expanse is critical. Breeding range includes northeast Arizona, non-breeding range includes central and southeast Arizona.	May be present: SS1 area is within the year-round range for the species and suitable foraging habitat is present within the project area, but there are no cliffs present within or near the project area. eBird (2019) indicates nearest species records from Havasu National Wildlife Refuge, approximately 5 miles to the southwest of the SS1 area.	Migration
Arizona Bell's vireo (<i>Vireo bellii arizonae</i>)	BCC (BCR 33), SGCN	Low, shrubby vegetation in riparian areas, brushy fields, second-growth forest, scrub oak, and mesquite brushlands. Breeding range includes much of far western Arizona.	Unlikely to be present: SS1 area is situated in northwestern extreme border of breeding range for the species and there are no shrub thickets or riparian areas within the project area. eBird (2019) indicates nearest species records from Havasu National Wildlife Refuge approximately 4 miles southwest of the SS1 area.	Breeding
Bald eagle (<i>Haliaeetus leucocephalus</i>)	BGEPA, BCC (BCR 33), BLM, S, USFS SS, SGCN	Aquatic habitats with open water or Southwest arid regions with available food and roost sites. Non-breeding eagles range throughout Arizona; breeding eagles occur in limited, fragmented locations of the state.	Unlikely to be present: the SS1 area is within the non-breeding range for the species, and the area may provide marginal foraging habitat, but adequate perch sites are lacking. The SS1 area is within non-breeding range, breeding pairs have been historically documented at Havasu National Wildlife Refuge (USFWS 2012).	Non-breeding
Bendire's thrasher (<i>Toxostoma bendirei</i>)	BCC (BCR 33)	Lives in various kinds of dry, semi-open habitats. Most common in Sonoran desert with variety of shrubs and cholla cactus with some understory of grass. Breeding range includes most of Arizona, except for the far western portion of the state.	May be present: SS1 is within the year-round range for the species, and suitable foraging and breeding habitat is present within the project area. eBird (2019) indicates nearest species records from Havasu Heights approximately 12 miles southeast of the SS1 area. Rare occurrences have been documented at Havasu National Wildlife Refuge (USFWS 2012).	Breeding
Black-chinned sparrow (<i>Spizella atrogularis</i>)	BCC (BCR 33)	Brushy mountain slopes, open chaparral, sagebrush; mostly in arid scrub on hillsides from low foothills up to almost 7,000 feet in mountains. In winter also found locally in desert area, mesquite thickets. Breeding range includes portions of central Arizona, non-breeding range includes far southern Arizona.	Unlikely to be present: SS1 is within the migratory range but situated outside of the breeding and wintering ranges for the species, and there is no suitable habitat in the project area. eBird (2019) indicates nearest species records from Havasu Lake approximately 18 miles south-southeast of the SS1 area.	Vagrant/ Accidental
Brewer's sparrow (<i>Spizella breweri</i>)	SGCN	Shrublands dominated by big sagebrush. May occur in desertscrub, large openings in pinyon-juniper, or large parklands with coniferous forests. Migration range includes west-central, central, eastern, and northeastern portions of New Mexico. Breeding range includes far northeast Arizona, non-breeding range includes southern Arizona.	Unlikely to be present: SS1 is within the migratory range but situated outside of the breeding and wintering ranges for the species, and there is no suitable habitat in the project area. eBird (2019) indicates nearest species records from Havasu National Wildlife Refuge approximately 3 miles west of the SS1 area.	Migration

Common Name (<i>Scientific Name</i>)	Status*	Range/Habitat Requirements	Potential for Occurrence in Project Area	Season/Life History Information Relevant to Project Area
California least tern (<i>Sterna antillarum browni</i>)	LE, BLM S, SGCN	Seacoasts, beaches, bays, estuaries, lagoons, lakes, and rivers. Prefers sandy beaches, mudflats, and salt-pond dikes. Arizona is outside of the breeding and non-breeding range for the species, but may be within the migratory range	Unlikely to be present: SS1 is outside of the range for the species and there is no suitable habitat in the project area. Mohave county is identified as a location where this species is believed to occur (USFWS 2019).	Migration
Costa's hummingbird (<i>Calypte costae</i>)	BCC (BCR 33), SGCN	Deserts, washes, sage scrub. Mostly in dry and open habitats having a good variety of plant life. Year-round range includes much of southwestern Arizona, breeding range extends up the lower Colorado River into Northwest Arizona.	May be present: SS1 is within the year-round range for the species, and marginal habitat exists within the project area, but a high diversity of plant life and abundant nectar sources are lacking. Nesting pairs have been regularly documented at Havasu National Wildlife Refuge (USFWS 2012).	Year-round
Ferruginous hawk (<i>Buteo regalis</i>)	BLM S	Open scrublands, woodlands, and grasslands, along with agricultural areas in the winter; preferably those dotted with suitable low hills or short trees, which serve as perches. Year-round range includes far northern Arizona, non-breeding range is scattered throughout the state, especially in the southeast.	Unlikely to be present: SS1 is within the migratory range but situated outside of the year-round and wintering range for the species. The project area may provide marginal foraging habitat, but lacks adequate perch sites. eBird (2019) indicates the nearest species record from Havasu National Wildlife Refuge, approximately 3 miles to the southwest of the SS1 area.	Migration
LeConte's thrasher (<i>Toxostoma lecontei</i>)	BCC (BCR 33), BLM S, SGCN	Desert flats with sparse growth of saltbush, also on creosote bush flats in some areas, mainly where there are a few slightly larger mesquites or cholla cactus. The year-round range for the species includes much of western Arizona.	May be present: SS1 is within the year-round range for the species and marginal habitat is present in the project area, but larger trees and cacti are lacking. eBird (2019) indicates nearest species records from the Colorado River approximately 8 miles to the west-northwest of the SS1 area.	Year-round
Lincoln's sparrow (<i>Melospiza lincolni</i>)	SGCN	Willow and alder thickets, muskeg, brushy bogs. Breeds in mountainous areas in dense low vegetation near water; winters in dense thickets, overgrown fields. The wintering range for the species includes much of southern and western Arizona.	Unlikely to be present: SS1 is situated in the northern extreme border of the wintering range of the species, and there is no suitable habitat in the project area. eBird (2019) indicates nearest species records from Havasu National Wildlife Refuge approximately 3 miles southwest of the SS1 area.	Non-breeding
Loggerhead shrike (<i>Lanius ludovicianus</i>)	BCC (BCR 33)	Open country with scattered trees and shrubs, savanna, desertscrub, and occasionally open woodland. Often found on poles, wires, or fence posts. Year-round range spans all of Arizona.	May be present: SS1 is within the year-round range for the species and the project area may provide marginal foraging and nesting habitat, but lacks adequate perch sites. eBird (2019) indicates nearest species records from Havasu National Wildlife Refuge approximately 3 miles west of the SS1 area.	Year-round
Lucy's warbler (<i>Oreothlypis luciae</i>)	SGCN	Riparian mesquite bosques and other riparian associations. Breeding range includes much of western and southern Arizona.	Unlikely to be present: the SS1 area is within the breeding range for the species but there is no suitable habitat in the project area. Nesting pairs have been regularly documented at Havasu National Wildlife Refuge (USFWS 2012).	Breeding
Pacific wren (<i>Troglodytes pacificus</i>)	SGCN	Dense coniferous forests, woodlands and brush in winter in the southwest, especially along streambanks or among tangles, brush piles, and fallen logs. Non-breeding range includes a small portion of north-central Arizona.	Unlikely to be present: the SS1 area is outside of the range for the species, and there is no suitable habitat in the project area. Occasional occurrences have been recorded at Havasu National Wildlife Refuge (USFWS 2012).	Non-breeding
Sage thrasher (<i>Oreoscoptes montanus</i>)	SGCN	Sagebrush, brushy slopes, mesas; in winter, also deserts. Breeding range includes northeastern Arizona, non-breeding range includes southern and far western Arizona.	May be present: the SS1 area is within the wintering range for the species, and there is suitable habitat in the project area. eBird (2019) indicates nearest species records from Havasu National Wildlife Refuge approximately 3 miles west of the SS1 area.	Non-breeding
Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)	LE, BLM S, SGCN	Riparian obligate that prefers dense canopy cover, large volume of foliage, and surface water. Year-round range for the species includes riparian corridors throughout much of Arizona.	Unlikely to be present: the SS1 area is within the potential year-round range for the species (USFWS 2019) but there is no suitable habitat in the project area. Two nesting pairs were documented in Topock Marsh at Havasu National Wildlife Refuge in 2018 (McLeod and Pellegrini 2019).	Year-round

Common Name (<i>Scientific Name</i>)	Status*	Range/Habitat Requirements	Potential for Occurrence in Project Area	Season/Life History Information Relevant to Project Area
Western burrowing owl (<i>Athene cunicularia</i>)	BCC (BCR 33), BLM S, USFS SS, SGCN	Open, gently-sloping, treeless areas within sparsely vegetated grassland, steppe, and desert biomes. Often associated with high densities of burrowing mammals such as prairie dogs. Year-round range includes southern half of New Mexico; breeding range includes northern half of the state.	May be present: the SS1 area is within the year-round range for the species, and suitable habitat may be present in the project area. Nesting pairs have been documented at Havasu National Wildlife Refuge (USFWS 2012).	Year-round
Yellow warbler (<i>Setophaga petechia</i>)	BCC (BCR 33), SGCN	Bushes, swamp edges, streams, gardens; in west breeds in streamside thickets. Breeding range include southeast Arizona and riparian corridors in northern Arizona.	Unlikely to be present: the SS1 area is situated in the extreme southwestern edge of the breeding range for the species, and there is no suitable habitat in the project area. eBird (2019) indicates nearest species records from Havasu National Wildlife Refuge approximately 3 miles southwest of the SS1 area.	Breeding
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	LT, BCC (BCR 33), BLM S, USFS SS, SGCN	Limited to narrow, and often widely separated, riparian cottonwood-willow galleries; cuckoos in Arizona can be found in larger mesquite bosques. Breeding range includes southeastern Arizona and the lower Colorado River valley.	Unlikely to be present: the SS1 area is within the breeding range for the species, but no suitable habitat is present in the project area. Proposed Critical Habitat is located along the Colorado River (USFWS 2019) approximately 3 miles southwest of the SS1 area, and nesting pairs have been occasionally documented at Havasu National Wildlife Refuge (USFWS 2012).	Breeding
Yuma Ridgway's (clapper) rail (<i>Rallus obsoletus</i> [= <i>longirostris</i>] <i>yumanensis</i>)	LE, BLM S, SGCN	Prefer tallest and densest cattail and bulrush marshes; most common where standing water gives way to saturated soil. Year-round range includes the lower Colorado River valley and other marshy areas of southwestern Arizona.	Unlikely to be present: the SS1 area is within the year-round range for the species but no suitable habitat is present in the project area. Nesting pairs have been documented at Havasu National Wildlife Refuge (USFWS 2012).	Year-round
Mammals				
American beaver (<i>Castor canadensis</i>)	SGCN	Swamps, lakes, rivers, and streams in wooded areas. Year-round range includes riparian habitats throughout all but southwest Arizona.	Unlikely to be present: the SS1 area is within the year-round range for the species, but no suitable habitat is present in the project area.	Year-round
Brazilian free-tailed bat (<i>Tadarida brasillensis</i>)	SGCN	Wide variety of habitats from desert communities through pinyon-juniper woodland and pine-oak forests. Maternity colonies are formed in limestone caves, abandoned mines, under bridges, and in buildings; smaller colonies have been found in hollow trees. In the spring, these migratory bats move northward from southern Arizona and Mexico, to the Lower and Upper Sonoran life zones. Summer range includes all of Arizona, winter range includes southern Arizona.	May be present: SS1 area is within the summer range for the species, and suitable foraging habitat is present within the project area, but adequate roost sites are lacking. There are documented occurrences at Havasu National Wildlife Refuge (AGFD 2004b).	Summer
California leaf-nosed bat (<i>Macrotus californicus</i>)	BLM S, SGCN	Sonoran and Mojave desertscrub habitats in the lower Colorado River valley. Roosts in caves and abandoned mines with large areas of ceiling and flying space. Year-round range includes all of Arizona south of the Mogollon Plateau at elevations of less than 4,000 feet.	May be present: SS1 area is within the year-round range for the species, and suitable foraging habitat is present within the project area, but adequate roost sites are lacking. There are documented occurrences at Havasu National Wildlife Refuge and the vicinity of the project area (AGFD 2014b).	Year-round
Cave myotis (<i>Myotis velifer</i>)	BLM S, SGCN	Xeric desertscrub of creosote, brittlebush, paloverde, and cacti, although never more than a few miles from a water source. Roosts colonially in clusters, usually near the entrance of a cave or mine; also known to roost under bridges. Year round range includes much of Arizona south of the Mogollon plateau.	May be present: SS1 area is within the year-round range for the species, and suitable foraging habitat is present within the project area, but adequate roost sites are lacking. There are documented occurrences at Havasu National Wildlife Refuge (AGFD 2002c).	Year-round
Greater western bonneted-bat (<i>Eumops perotis californicus</i>)	BLM S, SGCN	Lower and Upper Sonoran desertscrub near cliffs, preferring rugged, rocky canyons with abundant crevices; prefers to forage over large, open bodies of water. Year-round range includes all but the northeastern corner of Arizona.	May be present: SS1 area is within the year-round range for the species, but no suitable foraging or roosting habitat is present within the project area.	Year-round

Common Name (<i>Scientific Name</i>)	Status*	Range/Habitat Requirements	Potential for Occurrence in Project Area	Season/Life History Information Relevant to Project Area
Harris' antelope squirrel (<i>Ammospermophilus harrisi</i>)	SGCN	Deserts with cacti and shrubs, open plains with gravel and sand. Range includes western and southern Arizona.	Known to occur: the SS1 area is within the range for the species, and suitable habitat is present in the project area. The species has been documented on site during biological surveys of the project area.	Year-round
Kit fox (<i>Vulpes macrotis</i>)	SGCN	Arid open areas, shrub grassland, and desert dominated by creosote bushes and bursage or mixed saltscrub. Year-round range includes lower elevations throughout Arizona.	May be present: the SS1 area is within the year round range for the species, and suitable habitat is present in the project area.	Year-round
Little pocket mouse (<i>Perognathus longimembris</i>)	SGCN	Desertscrub on sandy or gravelly soils with sparse vegetation, also dry grassland and coastal sage. Range includes far northern and far southwestern Arizona.	May be present: the SS1 area is situated within the extreme northern boundary of the range for the species in the lower Colorado River valley; suitable habitat is present in the project area.	Year-round
Pale Townsend's big-eared bat (<i>Corynorhinus townsendii pallescens</i>)	BLM S, USFS SS, SGCN	Day roosts and maternity and hibernation colonies in caves, mines, or buildings. Night roosts may include caves, buildings, and tree cavities. Associated with mesic forested habitats, but occupies a broad range of habitats including arid scrub, pine forest, pinyon-juniper, and wooded canyons between 500 and 8,400 feet. Range throughout Arizona.	May be present: the SS1 area is within the range for the species, there may be suitable foraging habitat in the project area, but roost sites are lacking. There are documented occurrences throughout the lower Colorado River valley (AGFD 2003a)	Year-round, may migrate locally by elevation
Spotted bat (<i>Euderma maculatum</i>)	BLM S, SGCN	Roosts in crevices and cracks of cliff faces; sometimes roosts in caves or in buildings near cliffs. Variety of habitats including low to high deserts, riparian areas, ponderosa, and spruce-fir forests below 10,600 feet. In New Mexico, range includes western half of the state.	May be present: the SS1 area is within the year-round range for the species, and suitable foraging habitat is present within the project area, but adequate roost sites are lacking.	Year-round; may migrate locally by elevation
Western red bat (<i>Lasiurus blossevillii</i>)	USFS SS, SGCN	Riparian and wooded areas usually roosts in tree foliage, sometimes in leafy shrubs, and occasionally in cave-like situations. Typically forage within 1000 yards of roost site. Summer range includes south central and southeastern Arizona with limited observations along the lower Colorado River.	Unlikely to be present: the SS1 area is within the summer range for the species, but no suitable foraging or roosting habitat is present in the project area.	Summer
Western yellow bat (<i>Lasiurus xanthinus</i>)	USFS SS, SGCN	Not well understood, but appears to be associated with palm trees and other leafy vegetation such as sycamores, hackberries, and cottonwoods, which provide roost sites. Year-round range includes much of southern Arizona and the lower Colorado River valley.	Unlikely to be present: the SS1 area is within the year-round range for the species, but no suitable foraging or roosting habitat is present in the project area.	Year-round
Yuma myotis (<i>Myotis yumanensis</i>)	SC, SGCN	Wide variety of lowland and upland habitats, including riparian, desertscrub, moist woodlands, and forests; prefer cliffs and rocky walls near water. Prefers to forage over calm water with forested edges. Usually roost in buildings, caves, and mines, or under bridges. Year-round range includes the lower Colorado River valley; found near water throughout Arizona during summer months.	May be present: the SS1 area is within the year-round range for the species, but no suitable foraging or roosting habitat is present in the project area. The nearest documented occurrences are at Havasu National Wildlife Refuge Area (AGFD 2011e).	Year-round
Reptiles				
Gila monster (<i>Heloderma suspectum</i>)	SGCN	Primarily in Sonoran Desert and extreme western edge of Mohave Desert; most common in undulating rocky foothills and canyons, less frequent in desert grassland and rare in oak woodland; absent on open sandy plains. Range for banded (<i>cinctum</i>) subspecies includes far western Arizona; reticulate (<i>suspectum</i>) subspecies range includes southeastern Arizona.	May be present: the SS1 area is within the year-round range for the banded subspecies and suitable habitat is present in the project area. The nearest documented occurrences are in the vicinity of Crossman Peak, east of Lake Havasu City (AGFD 2013b), approximately 19 miles to the southeast of the SS1 area.	Year-round

Common Name (<i>Scientific Name</i>)	Status*	Range/Habitat Requirements	Potential for Occurrence in Project Area	Season/Life History Information Relevant to Project Area
Northern Mexican gartersnake (<i>Thamnophis eques megalops</i>)	LT, BLM S, USFS SS, SGCN	Ponds and cienegas, lowland riparian forests and woodlands, upland stream gallery forests; most abundant in densely vegetated habitat. Range in Arizona limited to Verde River, Tonto Creek, and Cienega Creek drainages, and isolated wetlands in the southeast.	Unlikely to be present: the SS1 area is outside of the known range for the species, and there is no suitable habitat in the project area.	Year-round
Sonoran desert tortoise (<i>Gopherus morafkai</i>)	CCA, BLM S, USFS SS, SGCN	Rocky slopes and bajadas of Mojave and Sonoran deserts scrub, most often in paloverde and mixed cacti. Caliche caves in cut banks of washes are used for shelter sites. Range includes western and southwestern Arizona.	Known to occur: the SS1 area is within the range for the species, and suitable habitat is present in the project area. Desert tortoise scat was found adjacent to several burrows in caliche-line ephemeral washes on-site during biological surveys of the project area, indicating the presence of the species.	Year-round
Amphibians				
Sonoran desert toad (<i>Incilius alvarius</i>)	SGCN	Variety of habitats including Sonoran deserts scrub, semi-desert grasslands, and occasionally oak-pine woodlands; typically in close association with permanent water. Range includes southern and far southwestern Arizona.	Unlikely to be present: the SS1 area is outside of the known range for the species, and suitable habitat is not present in the project area.	Year-round
Fishes				
Bonytail chub (<i>Gila elegans</i>)	LE, SGCN	Mainstream portion of mid-sized to large rivers (both strong current and pools), usually over mud or rocks. In reservoirs they occupy a variety of habitat types, but prefer open water areas.	Unlikely to be present: the SS1 area is within the range for the species, but no aquatic habitat is present in the project area. Listed Critical Habitat for the species includes the mainstem of the Colorado River approximately 4 miles to the southwest of the SS1 area.	Year-round
Razorback sucker (<i>Xyrauchen texanus</i>)	LE, SGCN	Uses a variety of habitat types, from mainstem channels to slow backwaters of medium and large streams and rivers, sometimes around cover. In reservoirs, they prefer depths of a meter or more over sand, mud, or gravel substrates.	Unlikely to be present: the SS1 area is within the range for the species, but no aquatic habitat is present in the project area.	Year-round

Notes: Range or habitat requirement information and potential occurrence justification from AGFD species abstracts, National Audubon Society(2019), Bat Conservation International (2018), CBD (2019), eBird (2019), IUCN (2019), McLeod and Pellegrini (2019), NatureServe (2019), Reid (2006), Rorabaugh (2008), USFWS (2012; 2019), Woodin and Woodin (2019). Cited references are listed in Chapter 7. Literature Cited of the Sterling Solar 1 ADEA.

BCC = Bird of Conservation Concern

BCR = Bird Conservation Region

BLM S = BLM sensitive species

CCA = Candidate Conservation Agreement

USFS SS= USFS sensitive species

LE = Federally-Listed Endangered

LT = Federally-Listed Threatened

SGCN = Species of Greatest Conservation Need; species that are indicative of the diversity and health of the State's wildlife

Special Status Designation Definitions

The Arizona State Wildlife Action Plan (2012a) was created to meet the eligibility requirements for receipt of annual funds from the State Wildlife Grant (SWG) program, established through federal legislation in 2001. Element 1 of the SWG program requires states to include information on the distribution and abundance of species of wildlife, including low and declining populations as the State fish and wildlife agency deems appropriate, that are indicative of the diversity and health of the State's wildlife. Those species that each State identified as most in need of conservation actions are often referred to as the SGCN. AGFD developed a list of the State's SGCNs by conducting a vulnerability assessment for all species for which the department has statutory authority as defined in Arizona Revised Statutes (ARS) Title 17. Species designated as SGCN were ranked as "vulnerable" under one or more of the following criteria (AGFD 2012a):

- Extirpated from Arizona
- Concentration status

- Declining Status
- Disjunct status
- Demographic status
- Distribution status
- Fragmentation status
- Federal or State status

The BLM special status species include: 1) species listed or proposed for listing under the ESA and 2) species designated as BLM-sensitive by the State Director(s) since they require special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA (BLM 2008). The ESA protects listed species and their habitat by prohibiting a “take.” Section 7 of the ESA requires Federal agencies to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of threatened or endangered species, or result in the destruction or adverse modification of their critical habitats. The BGEPA, originally passed in 1940, provides for the protection of the bald eagle and the golden eagle (as amended in 1962) by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit (16 U.S.C. 668[a]; 50 CFR 22).